Members of the public may attend the public portion of the virtual meeting by viewing the livestream of the meeting.

To view the livestream of the meeting please follow the instructions below.

ABOR Live is available at the following link: https://www.youtube.com/user/abornews
- Click the top video for the live stream of the meeting.

If the above link does not work, open a browser, go to www.youtube.com or search YouTube
- Once in YouTube, use the search bar to search for ABOR News
- Click the video that says Live

If livestream fails a call-in option will be available for public access and will be posted on the ABOR website at http://www.azregents.edu/about/abor-live.

For technical assistance, click the link here ABOR Tech Support or email Tom.Merriam@azregents.edu and John.Murnane@asu.edu

Thursday, August 20, 2020

9:00 a.m. – 12:30 p.m.   ABOR Meeting

12:30 p.m. – 1:15 p.m.  BREAK

1:15 p.m. – 1:30 p.m.   ABOR Meeting

1:30 p.m. – 4:45 p.m.   Executive Session
    (1:30 – 2:30 p.m. – Review of Assignments with President Robbins)
    (2:30 - 3:00 p.m. – Review of Assignments with Executive Director Arnold)
    (3:00 – 4:45 p.m. – Executive Session)

4:45 p.m. – 5:00 p.m.   ABOR Meeting
Members of the public may attend the public portion of the virtual meeting by viewing the livestream of the meeting.

To view the livestream of the meeting please follow the instructions below.

ABOR Live is available at the following link: [https://www.youtube.com/user/abornews](https://www.youtube.com/user/abornews)
  - Click the top video for the livestream of the meeting.

If the above link does not work, open a browser, go to [www.youtube.com](http://www.youtube.com) or search YouTube
  - Once in YouTube, use the search bar to search for ABOR News
  - Click the video that says Live

If livestream fails a call-in option will be available for public access and will be posted on the ABOR website at [http://www.azregents.edu/about/abor-live](http://www.azregents.edu/about/abor-live).

For technical assistance, click the link here [ABOR Tech Support](mailto:ABOR Tech Support) or email [Tom.Merriam@azregents.edu](mailto:Tom.Merriam@azregents.edu) and [John.Murnane@asu.edu](mailto:John.Murnane@asu.edu).

9:00 a.m.  CALL TO ORDER

9:05 a.m.  ADOPTION OF CONSENT AGENDA ACTION ITEMS AND ACCEPTANCE OF CONSENT INFORMATION ITEMS

All items on the Consent Agenda are listed at the end of this agenda, underlined and marked with an asterisk (*). These items will be considered by a single motion with no discussion. All other items will be considered individually.

9:10 a.m.  1. University of Arizona Global Campus Presentation and Discussion

The board will receive a presentation on the University of Arizona Global Campus and will provide direction to the university and board staff.
10:10 a.m.  GENERAL DEBT OVERVIEW AND DISCUSSION

2.A. Debt Overview, Proposed Revisions to ABOR Policy 3-501
"Issuance of Debt and Financing" (First Reading and Immediate
Implementation) and Repeal the Guidelines for Lines of Credit.

The board will receive presentations on university debt and available
debt instruments. In addition, the board office asks the board to review
on first reading and adopt for immediate implementation the proposed
revisions to ABOR Policy 3-501 “Issuance of Debt and Financing,” and
repeal the Guidelines for Lines of Credit as the guidelines are being
incorporated into the proposed policy.

2.B. Authorization to Refinance Outstanding System Revenue Bonds
and/or Certificates of Participation (ASU, NAU, UArizona)

Arizona State University, Northern Arizona University and the University
of Arizona ask the board for approval to sell System Revenue
Refunding Bonds or Refunding Certificates of Participation to refinance
all or a portion of the principal and interest payments accruing in fiscal
years 2021 through 2022 to provide cash flow relief in light of the
financial pressures placed on the universities by the COVID-19
pandemic.

2.C. Guidance Regarding Statutory Changes for Authority to Issue
Debt

The board office and universities ask the board for guidance on
pursuing statutory changes to allow the board/universities to issue debt
for general purposes of the university.

11:10 a.m.  BREAK

11:30 a.m.  3. Request to Approve Report of the Free Expression Committee

The board office asks the board to approve the statutory report of the
Free Expression Committee for submission to the state as required by
A.R.S. §15-1867.

11:40 a.m.  4. FY 2020 Arizona Teachers Academy Presentation and Annual
Report

The board will receive a presentation regarding the Teachers Academy.
In addition, the board office asks the board to approve the FY 2020
Arizona Teachers Academy Annual Report.
12:30 p.m.  BREAK

1:15 p.m.  5.  Proposed Revision to ABOR Policy 1-119 “Nondiscrimination and Anti-Harassment” (First Reading and Immediate Implementation)

The board office asks the board to review on first reading and adopt for immediate implementation the proposed revisions to ABOR Policy 1-119 “Nondiscrimination and Anti-Harassment.”

1:30 p.m.  EXECUTIVE SESSION

Pursuant to A.R.S. §38-431.03(A) the board will convene in executive session for the items listed on the executive session agenda.

4:45 p.m.  RESUME PUBLIC MEETING

12.  Possible Discussion and Action Related to the Items Listed under I.E. of the Board’s Executive Session Agenda.

The board may take action to direct the board’s legal counsel to proceed as discussed in executive session related to the items listed under I.E. of the board’s executive session agenda.

CONSENT AGENDA

These items were considered by a single motion with no discussion and approved earlier in the meeting.


The board office and the universities ask the board to approve the FY 2020 Technology and Research Initiative Fund (TRIF) Annual Report for submission to the Governor and the Legislature.

7.  *Annual Personnel Report

The board office asks the board to approve the Annual Personnel Report for the Arizona University System.

8.  *Annual Cost Containment Report

The board office asks the board to approve the Annual Cost Containment Report for Arizona State University, Northern Arizona University and University of Arizona.
9. *Adaptive Athletics Funding Allocation*

The board office asks the board to approve the FY 2020 Adaptive Athletics Special Line Item funding allocation.

10. *Request to Accept ABOR Annual Report*

The board office asks the board to accept the ABOR Annual Report.

11. *Approval of List of Qualifying Examinations for High School and High School Teacher Incentive Bonuses*

The board office asks the board to approve a revised list of qualifying examinations for incentive bonuses to schools and high school teachers for students that receive a passing score.

5:00 p.m.    ADJOURN

PLEASE NOTE: This agenda may be amended at any time prior to 24 hours before the board meeting. Estimated starting times for the agenda items are indicated; however, discussions may commence, or action may be taken, before or after the suggested times. Any item on the agenda may be considered at any time out of order at the discretion of the board chair. The board may discuss, consider, or take action regarding any item on the agenda. During the meeting, the board may convene in executive session pursuant to A.R.S. §38-431.03(A)(3) for legal advice regarding any item on the agenda.
### NOTE:
This agenda may be amended at any time prior to 24 hours before the board meeting. Executive session is scheduled for 1:30 p.m. on Thursday, August 20, 2020. Executive session may be recessed and continued as necessary.

<table>
<thead>
<tr>
<th>Statutory Authorization</th>
<th>Items to be Discussed</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.R.S. § 38-431.03</td>
<td></td>
</tr>
<tr>
<td>I.</td>
<td>From the board, board office staff or counsel to the board.</td>
</tr>
<tr>
<td>(A. 1, 3 &amp; 4)</td>
<td>A. Review of assignments with President Robbins.</td>
</tr>
<tr>
<td>(A. 1 &amp; 3)</td>
<td>B. Review of assignments with Executive Director Arnold</td>
</tr>
<tr>
<td>(A. 1, 3 &amp; 4)</td>
<td>C. Legal advice and discussion regarding the board’s contracts with the presidents</td>
</tr>
<tr>
<td>(A. 3)</td>
<td>D. Legal advice and discussion concerning debt options</td>
</tr>
<tr>
<td>(A. 2, 3 &amp; 4)</td>
<td>E. Legal advice and discussion regarding:</td>
</tr>
<tr>
<td></td>
<td>1. Legal advice and discussion concerning the State of Arizona, ex rel. Mark Brnovich,</td>
</tr>
<tr>
<td></td>
<td>Attorney General, v. Arizona Board of Regents (Case Nos. CV 2017-012115; 1 CA-CV 18-</td>
</tr>
<tr>
<td></td>
<td>0420; T-19-0002- CV; CV-19-0027-SA, CV-19-0247 and related filings and matters)</td>
</tr>
<tr>
<td></td>
<td>2. Legal advice and discussion concerning the State of Arizona, ex rel. Mark Brnovich,</td>
</tr>
<tr>
<td></td>
<td>Attorney General, v. Arizona Board of Regents; John P. Creer, Assistant Vice President</td>
</tr>
<tr>
<td></td>
<td>for University Real Estate Development at ASU, Defendants, Paul D. Petersen, in his</td>
</tr>
<tr>
<td></td>
<td>official capacity as Maricopa County Assessor, and Royce T. Flora, in his official</td>
</tr>
<tr>
<td></td>
<td>capacity as Maricopa County</td>
</tr>
</tbody>
</table>
3. Legal advice, discussion and report on pending or contemplated litigation and related filings and matters

II. From the University of Arizona

(A. 1, 3 & 4) A. Legal advice and discussion regarding the University of Arizona Men’s Basketball

PLEASE NOTE: This agenda may be amended at any time prior to 24 hours before the meeting. Estimated starting times for the agenda items are indicated; however, discussions may commence before or after the suggested time. Any item on the agenda may be considered at any time out of order at the discretion of the Chair. Pursuant to A.R.S. §38-431.03 (A)(3) the board may convene in Executive Session at any time during the meeting to receive legal advice regarding any item on the agenda.

Instruction re: Confidentiality

Pursuant to A.R.S. §38-431.03(B) & (C) all are reminded that minutes of and discussions that occur in executive sessions are confidential by law and that violations of that confidentiality may subject the individuals involved to such penalties as are prescribed by law, including fines, costs, attorneys’ fees, and removal from office.
Item Name: University of Arizona Global Campus Presentation and Discussion

☑️ Action Item

Requested Action: The board will receive a presentation on the University of Arizona Global Campus and will provide direction to the university and board staff.

Background

The University of Arizona intends to create a new nonprofit entity — University of Arizona Global Campus — that will acquire the assets of Ashford University. University of Arizona Global Campus will be a fully online university providing access to affordable high-quality higher education with flexible opportunities to students from diverse backgrounds around the world.

Ashford University is an online university with approximately 35,000 students and a geographic reach across the United States. University of Arizona Global Campus will focus on serving underrepresented and nontraditional students, including veterans and those in need of flexible pathways to advance their education or to learn new skills.

By establishing University of Arizona Global Campus, the University of Arizona intends to expand its reach as a land-grant university to provide access to quality education, enhance its Online platform, further diversify its educational enterprise and provide short- and long-term revenue.

Ashford University is accredited by WASC Senior College and University Commission and is currently owned by Zovio, Inc. an education technology services company based in Chandler, Arizona. The University of Arizona signed a definitive agreement with Zovio, Inc., which includes the sale of the assets of Ashford University to University of Arizona Global Campus. The company will continue to provide its education technology services under a long-term Strategic Services Agreement.

The University of Arizona is taking immediate steps to commence the final approval process with Ashford's accreditor, which is needed to formally operate University of Arizona Global Campus. Ashford University's faculty and approximately 35,000 students will continue coursework and degree programs with no interruptions or delays.

Contact Information:
John Arnold, ABOR  john.arnold@azregents.edu  602-229-2500
Chad Sampson, ABOR  chad.sampson@azregents.edu  602-229-2512
Discussion

The University of Arizona will make a presentation to the board regarding the University of Arizona Global Campus. The board will engage in discussion with UArizona and will provide direction to university and board staff on matters including oversight and reporting.

Statutory/Policy Requirements

A.R.S. §15-1626(A) “General Administrative Powers and Duties of Board”
What...?

- A separate, non-profit university
- Named UA Global Campus through an affiliation agreement with the University of Arizona
- UA Global Campus will receive the assets of Ashford University, including the Forbes School of Business and Technology
- Global Campus will enter into an agreement with Zovio, the current parent company of Ashford, to provide online program management services
Quality online education
Open and accessible
A diverse student body
Opportunity for Worldwide reach
REACH

• Launch with over 35,000 students
• Offer Associate’s, Bachelor’s, Master’s and Doctoral degrees
• Will serve domestic and international students
• Significant potential for growth domestically and globally
• Provide large global pipeline to UA main campus in Tucson
DOMESTIC STUDENT DEMOGRAPHICS

UNIVERSITY OF ARIZONA

- Hispanic/Latino: 15%
- Black/African American: 29%
- White: 52%
- Other: 4%

ASHFORD UNIVERSITY

- Hispanic/Latino: 10%
- Black/African American: 32%
- White: 43%
- Other: 15%

- 89% of Ashford’s students are over 25
- 71% of Ashford’s students are women.
- 25% of Ashford’s students are connected to the military.
ASHFORD DEGREE PROGRAMS

ASSOCIATE OF ARTS DEGREES
AA in Early Childhood Education

BACHELOR OF ARTS DEGREES
BA in Accounting
BA in Applied Behavioral Science
BA in Business Administration
BA in Business Economics
BA in Business Information Systems
BA in Business Leadership
BA in Child Development
BA in Communication Studies
BA in Early Childhood Development with Differentiated Instruction
BA in Early Childhood Education
BA in Early Childhood Education Administration
BA in Education Studies
BA in English
BA in Entrepreneurship
BA in Finance
BA in Health and Human Services
BA in Health and Wellness
BA in Health Care Administration
BA in History
BA in Homeland Security and Emergency Management
BA in Human Resources Management
BA in Instructional Design
BA in Marketing
BA in Liberal Arts
BA in Library Science and Media
BA in Operations Management and Analysis
BA in Organizational Management
BA in Political Science and Government
BA in Project Management
BA in Psychology
BA in Real Estate Studies
BA in Social and Criminal Justice
BA in Sociology
BA in Sports and Recreation Management
BA in Supply Chain Management

BACHELOR OF SCIENCE DEGREES
BS in Computer Software Technology
BS in Cyber & Data Security Technology
BS in Health Information Management
BS in Information Technology
BS in Nursing

MA in Early Childhood Education Leadership
MA in Education
MA in Organizational Management
MA in Psychology
MA in Special Education
Master of Accountancy
Master of Business Administration (MBA)
Master of Human Resource Management
Master of Information Systems Management
Master of Public Health
MS in Criminal Justice
MS in Finance
MS in Health Informatics and Analytics
MS in Instructional Design and Technology
MS in Technology Management

DOCTORAL DEGREES
Doctor of Psychology (PsyD)
PhD in Education
PhD in Human Services
PhD in Organizational Development and Leadership
Arizona:  5,000 online students
ASU:  56,000 online students
Grand Canyon:  81,000 online students
U Phoenix:  94,000 online students

...and now
Southern New Hampshire Univ (SNHU)  
135,000 online students

Just set up in Tucson  
(on E. Congress St.)
150 staff with plans to grow to 300 to 350 in 2021
RESPONSIBILITY:
Commitment to providing quality education to students under ethical management.
14:1 student-faculty ratio
Class size capped at 40 students
Average class size less than 25
WSCUC accredited
Leads country in courses certified by Quality Matters (an independent non-profit, quality assurance organization)
According to the NSSE, Ashford provides an academic challenge that ranks with the top 10% of four-year colleges in the U.S.
24/7 student support services at no additional cost; Predictive flagging technology to identify at-risk students
50 academic starts a year; Five-week classes
Retention and Graduation Rate (FTFT)

<table>
<thead>
<tr>
<th>FTFT Retention</th>
<th>FTFT Grad. 6 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ashford</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td>7%</td>
</tr>
</tbody>
</table>

• Ashford students that identify as primarily working students (70%) complete their degrees at a rate (20%) almost twice the national average (11%)

• “True” persistence rate is 69% [Proportion of Ashford students active one year who either graduate or attended any school the following year]

• The FTFT category excludes 83% of Ashford students who are transfer students.
QUALIFIED FACULTY

- 100% hold master’s degrees or higher
- Over 50% hold a PhD or other terminal degree
- 47% of Forbes Business faculty held director or higher positions
CHALLENGES ASSOCIATED WITH ASHFORD

- Past allegations of aggressive marketing & debt collection
- Federal and state investigations
- Declining enrollments
- Low retention and graduation rates
The Team’s review of Ashford’s performance in this area cannot address Ashford’s history; however, current practices and procedures are evidence of Ashford’s commitment to operate with integrity (CFR 1.7). The Team determined that Ashford is using state of the art methods and technologies to ensure open, honest communication with prospective and current students about material matters, thus providing demonstrable evidence that the University is adhering to WSCUC policies (CFR 1.8).
WSCUC 2019 Report on Integrity, Retention and Student Success Efforts

Ashford appears to operate with integrity in pursuit of enacting its educational mission. Its faculty, staff, and leadership exhibit a zealous affinity for that mission.

Ashford seems to have made considerable progress toward reinventing itself since its last accreditation visit. This is especially evident in the institution-wide commitment to enhancing student learning, persistence, and graduation.

Ashford evinces an almost palpable desire to foster higher levels of student success as demonstrated by the broad array of initiatives it has implemented.
CHANGES UNDER UNIVERSITY OF ARIZONA GLOBAL CAMPUS

• Control over marketing & debt collection practices
• Strict oversight to ensure compliance with federal and state regulations
• Complete control over academic programs
• Joint Academic Advisory Council
• Commitment to material increases in retention, graduation and persistence rates among peer levels within five years.
This page intentionally left blank
Item Name: Debt Overview, Proposed Revisions to ABOR Policy 3-501 “Issuance of Debt and Financing” for First Reading and Immediate Implementation, and Repeal the Guidelines for Lines of Credit

☐ Action Item

**Requested Action:** The board will receive presentations on university debt and available debt instruments. In addition, the board office asks the board to review on first reading and adopt for immediate implementation the proposed revisions to ABOR Policy 3-501 “Issuance of Debt and Financing,” and repeal the Guidelines for Lines of Credit as they would be incorporated into the proposed policy, as described in this executive summary.

**Background/History of Previous Board Action**

- In August 2012, the board approved standing authority for each university to refund outstanding system revenue bonds and certificates of participation without specific board approval for each refunding provided that the net present value savings was at least 2.5% of the par amount of debt being refunded and the term of the refunding debt is the same or shorter than the maturity term of the debt being refunded.

- In 2016 Arizona statutes were amended to allow ABOR/universities to establish lines of credit for cash management and liquidity purposes, and to issue commercial paper as bridge funding for capital projects. In November 2016, the board approved revisions to ABOR Policy 3-501 and guidelines to establish the approval process for lines of credit, as well as revisions to ABOR Policy 7-102 to establish the approval process for commercial paper.

**Discussion**

- The board will receive a general overview of the debt instruments available to the board and the universities and how they work.

- Given the budget challenges presented by the COVID-19 pandemic, the universities have reviewed various areas of costs and expenses and have identified the refinancing of outstanding debt as a possible mechanism to significantly reduce annual debt service payments for Fiscal Years 2021 and 2022 that will provide financial relief during the crisis.

**Contact Information:**
Lorenzo Martinez, ABOR lorenzo.martinez@azregents.edu 602-229-2525
• The universities have standing authority to refund outstanding system revenue bonds and certificates of participation without board approval provided the refunding generates a minimum level of savings and does not extend the repayment period.

• The proposed revisions to ABOR Policy 3-501 (C) would establish the standing debt refunding authority in policy and also allow for a university to seek board approval for debt refunding that does not meet the net savings or repayment period criteria for refunding without board approval.

• The proposed revisions are requested for immediate implementation as the universities will be seeking contemporaneous board approval for authorization to refund debt in order to lower annual debt service payments in the next two fiscal years; these refunding actions likely will not generate overall savings and may extend the repayment period(s).

• Given the proposed revisions to ABOR Policy 3-501, the ABOR office and universities request that the guidelines related to lines of credit be placed in ABOR Policy 3-501 (B) and that the existing separate guidelines be eliminated. Consolidating will simplify the reference points for lines of credit requirements.

• The board is asked to review the proposed policy revisions on first reading and to adopt these proposed policy revisions for immediate implementation pursuant to ABOR Policy 1-202(J).

Statutory/Policy Requirements

• ABOR Policy 3-501 “Issuance of Debt and Financing”
• ABOR Guidelines for Lines of Credit
• ARS 15-1681, et seq, is the section of state statute that deals with board/university authority to issue debt, including bonds and bond refunding, certificates of participation, lease-purchase, lines of credit and commercial paper.
3-501 Issuance of Debt and Financing

A. Matters relating to the issuance and sale of debt shall be presented for board action as outlined in board policy.

B. The board will adopt guidelines related to the use of Lines of Credit for cash management or liquidity purposes. LINES OF CREDIT MAY BE OBTAINED AND DRAWN ON BY THE UNIVERSITIES FOR CASH MANAGEMENT AND/OR LIQUIDITY PURPOSES IN ACCORDANCE WITH THE FOLLOWING GUIDELINES:

1. MATTERS RELATED TO OPENING ANY LINE OF CREDIT SHALL BE SUBMITTED FOR REVIEW BY THE FINANCE, CAPITAL AND RESOURCES COMMITTEE AND APPROVAL BY THE BOARD.

2. REQUESTS FOR OPENING A LINE OF CREDIT SHALL INCLUDE:
   i. JUSTIFICATION AND PURPOSE FOR OPENING THE LINE OF CREDIT;
   ii. TERMS AND CONDITIONS OF THE LINE OF CREDIT AGREEMENT INCLUDING: INTEREST RATES, REPAYMENT TERMS, PAYMENT SCHEDULES, AND OTHER RELEVANT COVENANT REQUIREMENTS.

3. ANY DRAWS ON APPROVED LINES OF CREDIT SHALL BE REPORTED TO THE ABOR OFFICE AND ANY USE OF LINES OF CREDIT AND OUTSTANDING BALANCES SHALL BE REPORTED IN THE FINANCIAL STATUS UPDATES PROVIDED TO THE FINANCE, CAPITAL AND RESOURCES COMMITTEE.

C. A UNIVERSITY MAY REFUND OUTSTANDING DEBT WITHOUT BOARD APPROVAL PROVIDED THAT:

1. THE REFUNDING PRODUCES NET PRESENT VALUE SAVINGS OF AT LEAST 2.5 PERCENT OF THE PAR AMOUNT OF THE DEBT BEING REFUNDED AND THE TERM FOR EACH REFUNDING IS THE SAME OR SHORTER THAN THE EXISTING MATURITY TERM OF THE DEBT BEING REFUNDED;

2. THE INTENT TO REFUND OUTSTANDING DEBT SHALL BE REPORTED TO THE ABOR OFFICE PRIOR TO EXECUTING ANY REFUNDING, AND THE TERMS OF ANY REFUNDING SHALL BE REPORTED TO THE ABOR OFFICE AFTER A
EXECUTIVE SUMMARY

REFUNDING HAS BEEN COMPLETED; AND

3. REFUNDINGS ARE INCLUDED IN DEBT REPORTS REQUIRED TO BE SUBMITTED BY THE UNIVERSITIES TO THE BOARD.

D. REFUNDING OF ANY OUTSTANDING DEBT WITH PARAMETERS OUTSIDE THOSE DESCRIBED IN PARAGRAPH C OF THIS SECTION SHALL REQUIRE APPROVAL BY THE BOARD.
REPEAL

Guidelines for Lines of Credit

Lines of credit may be obtained and drawn on by the universities for cash management or liquidity purposes in accordance with the following guidelines.

A. Matters related to opening any line of credit shall be submitted for review by the Finance, Capital and Resources Committee and approval by the board.

B. Requests for opening a line of credit shall include:

1. Justification and purpose for opening the line of credit

2. Terms and conditions of the line of credit agreement including: interest rates, repayment terms, schedules, and other relevant covenant requirements.

C. Any draws on approved lines of credit shall be reported to the business and finance section of the ABOR office and any use of lines of credit and outstanding balances shall be reported in the financial status updates provided to the Finance, Capital and Resources Committee.
EXECUTIVE SUMMARY

Item Name: Authorization to Refinance Outstanding System Revenue Bonds and/or Certificates of Participation (ASU, NAU, UArizona)

☑️ Action Item

Requested Action: Arizona State University, Northern Arizona University and the University of Arizona ask the board for approval to sell System Revenue Refunding Bonds or Refunding Certificates of Participation to refinance all or a portion of the principal and interest payments accruing in fiscal years 2021 through 2022 to provide cash flow relief in light of the financial pressures placed on the universities by the COVID-19 pandemic, as described in the executive summary.

Background/History of Previous Board Action

- The universities are facing financial uncertainties as a result of the impacts of the COVID-19 pandemic, in terms of both potential decreased revenue and increased costs to address associated health concerns. To address this situation, each university is continually assessing and evaluating its financial position and developing strategies and action steps to meet the financial challenge, including personnel actions, adjustments in course delivery, and other measures.

- An additional strategy to assist the universities in addressing the financial constraints caused by the pandemic involves the refinancing of debt payments associated with the universities' system revenue bonds (“Bonds”) and certificates of participation (“COPs”). By restructuring their debt payment obligations, the universities can decrease debt service accruing in the current and next fiscal years and thereby help to create cash flow relief. The restructured debt would then be paid back in subsequent years when the expectation is for adverse impacts of COVID-19 pandemic to diminish or no longer exist.

- Current bond market conditions are excellent for the universities to be able to restructure debt payments at near historically low interest rates, with tax-exempt interest rates for a sample ten-year financing currently in the range of 1.25% to 1.50%.

Contact Information:
Morgan Olsen, ASU  Morgan.R.Olsen@asu.edu  480-727-9920
Bjorn Flugstad, NAU  Bjorn.Flugstad@nau.edu  928-523-5420
Lisa Rulney, UArizona  lngentry@email.arizona.edu  520-621-5977
As refinancings require timely action when market conditions provide opportunity, the Board has previously provided the universities with the authority to refinance their outstanding bonds and certificates of participation. That authority, however, requires that the restructuring generates debt service savings of at least 2.5% of the par amount of the debt being refinanced and that the final maturity remain the same or be shorter than the existing maturity term. The requested debt restructuring approval at this time would involve extending the final maturity of the debt being refinanced and, as such, would not produce debt service savings.

As the expectation is that the COVID-19 pandemic is a limited duration event, the universities are only seeking approval to restructure all or a portion of each of their respective debt payments accruing in fiscal years 2021 and 2022.

Discussion

Each university will issue Refunding Bonds, and/or Refunding COPs in amounts sufficient to make the scheduled payments of principal and/or interest due on any outstanding Bonds and/or COPs selected for restructuring, to pay the costs of issuance, and to fund payments to bond/COPs insurers or other credit enhancers. Any Refunding Bonds will be issued pursuant to a Supplemental Resolution to the current Revenue Bond Master Resolution of each university. Any Refunding COPs will be executed and delivered pursuant to financing documents similar to those for the existing COPs.

Depending on market conditions at the time of sale, each university may refinance all or a portion of the principal and interest payments coming due on its existing Bonds or COPs through the issuance and sale of fixed rate or variable rate Refunding Bonds and/or Refunding COPs at a price at, above or below par. Given current market conditions, including low long-term interest rates and the shortage of credit and liquidity facilities in the short-term variable rate markets, the expectation is that the universities will most likely issue primarily fixed rate Refunding Bonds and/or Refunding COPs. As permitted by federal tax law, the Refunding Bonds or Refunding COPs would be issued either as taxable or tax-exempt debt.

While the restructuring of the universities debt service payments will result in increased debt service in subsequent fiscal years when the restructuring debt is repaid, the cost of doing so is relatively low given today’s historically low interest rates. Depending on interest rates at the time of the restructuring, it is estimated that the present value cost of the restructuring would amount to 1% to 3% of the amount restructured (e.g. restructuring $10 million is estimated to cost $100,000 to $300,000 in current dollars).
EXECUTIVE SUMMARY

- Each university would pay debt service on Refunding Bonds and/or Refunding COPs from available resources and will include the debt service in future budget planning.

- Each university will evaluate bond insurance from any viable bond insurer available in the market at the time of sale. Deciding whether insurance will be used will be a function of market conditions and the bond insurer’s ratings at the time of pricing. Bond insurance will only be used if the insurance provides a demonstrated economic benefit to the university, as required by federal tax law.

- Each university will utilize a financial advisor, a bond counsel, and a bond trustee previously selected in accordance with university procurement policies. The Refunding Bonds and/or Refunding COPs will be marketed and sold either on a competitive bid basis, on a negotiated basis to one or more investment banking firms selected via a competitive solicitation process or by a direct sale to a bank or banks or other financial institutions.

- Each university may enter into various agreements, as needed, in connection with the Refunding Bonds and/or Refunding COPs, such as a bond insurance or other credit enhancement agreement to lower the net borrowing costs to the university, a bond or certificate purchase agreement, and a liquidity facility agreement in the event any portion of the Refunding Bonds and/or Refunding COPs are sold on a variable rate basis.

- Each university shall report to the board office and Chair of the Finance, Capital and Resources Committee, prior to the issuance of refunding debt, its intent to pursue refunding and provide information related to outstanding and refunding debt principal, current and anticipated debt service payments and interest rates, existing and anticipated repayment periods, and the estimated net present value costs or savings associated with the refunding.

Statutory/Policy Requirements

- ABOR Policy 7-102D requires Finance, Capital and Resources Committee review and Board approval of all bond and certificates of participation financings.

- ABOR Policy 3-501 requires that matters relating to the issuance and sale of debt shall be presented for board action as outlined in board policy.
Item Name: Guidance Regarding Statutory Changes for Authority to Issue Debt

☑️ Action Item

Requested Action: The board office and universities ask the board for guidance on pursuing statutory changes to allow the board/universities to issue debt for general purposes of the university, as described in this executive summary.

Background/History of Previous Board Action

- The board/universities have authority under Arizona statutes (and ABOR policies) to issue debt for capital projects and to establish lines of credit for cash management and liquidity purposes.

Discussion

- Given the budget challenges presented by the COVID-19 virus pandemic, the universities have identified the use of debt instruments as possible mechanisms to provide additional financial flexibility.

- Statutory changes would be required for the board/universities to be able to issue debt for purposes other than to finance capital projects, such as enhanced liquidity to support general operating purposes and to lock in historically low interest rates for a stable source of future capital.

- The current authority for the board/universities to issue debt, specifically bonds, for capital projects is found in ARS §15-1683 “Issuance of Bonds.”

- The board office and universities would propose amending this state statute to authorize the board/universities to issue bonds with board approval for purposes other than to finance capital projects. Additionally, to permit debt to be issued with a final maturity greater than 40 years if approved by the board. These changes will permit the universities to take advantage of low interest rate environments, particularly when the yield curve is flat, and to lock in low rates and enhance their overall liquidity and financial position.

- The board is asked to provide direction on whether the board and university government affairs staff should pursue the statutory changes.

Contact Information:
Lorenzo Martinez, ABOR lorenzo.martinez@azregents.edu 602-229-2525
Statutory/Policy Requirements

- There is no statutory authorizing the issuance of debt for purposes other than financing capital projects. ARS §15-1683 only addresses board/university authority to issue bonds for capital projects.
Item Name: Request to Approve the Report of the Free Expression Committee

☑ Action Item

Requested Action: The board office asks the board to approve the statutory report of the Free Expression Committee for submission to the state as required by A.R.S. §15-1867, and as described in this executive summary.

Background and Discussion

- The Free Expression Committee has forwarded the attached statutory report for board approval and submission in compliance with the requirements of A.R.S. §15-1867. The report demonstrates the commitment of the board and the universities to protecting and promoting free expression. The committee approved the report at its July 20, 2020 meeting.

- Upon board approval and no later than September 1, 2020, Executive Director Arnold will submit the approved report to the governor, the speaker of the house of representatives, the president of the senate, the secretary of state and the ABOR office will post the final report on the ABOR website as required by law.
This page intentionally left blank
ARIZONA BOARD OF REGENTS’ COMMITTEE ON FREE EXPRESSION ANNUAL REPORT

September 1, 2020

THE ARIZONA BOARD OF REGENTS AND ARIZONA’S PUBLIC UNIVERSITIES PROMOTE AND PROTECT FREE EXPRESSION

The board and the universities protect and ensure intellectual freedom and free expression at our institutions. Students, staff and faculty members may discuss any topic, as the First Amendment allows and within the limits of reasonable content- and viewpoint-neutral restrictions on time, place and manner of expression that are consistent with applicable law.

The Arizona Board of Regents has established a Committee on Free Expression, which submits this report as required by A.R.S. §15-1867. The membership of the Free Expression Committee is provided in Exhibit A.

The universities and the board have historically protected free expression. A comprehensive list of current board and university policies that protect and promote free speech is provided in Exhibit B. The ABOR Policy on Free Expression is included as Exhibit C.

THE BOARD AND THE UNIVERSITIES DO NOT TOLERATE BARRIERS TO OR DISRUPTIONS OF PROTECTED SPEECH

There were no barriers to or disruptions of lawful free expression within any of Arizona’s public universities, as described in A.R.S. §15-1867. All three of Arizona’s public universities maintain the highest green light rating from the Foundation for Individual Rights in Education (FIRE), recognizing the commitment of the board and the universities to free speech. “Arizona’s green light schools are setting a standard for free expression that colleges across the country should aspire to follow,” said FIRE’s Laura Beltz, policy reform senior program officer.

Each university has policies and procedures to encourage and protect all lawful speech. All expressive activities are subject to reasonable time, place and manner restrictions as permitted by law. Expressive activities are subject to applicable law, including laws that address discrimination, harassment, safety, defamation, threats, privacy and confidentiality. The board and universities do not permit actions that unlawfully disrupt the functions of the institutions. As required by statute, board policy provides:

A student who is subject to the jurisdiction of a university and who engages in individual conduct that materially and substantially infringes on the rights of other persons to engage in or listen to expressive activity, as defined in A.R.S. § 15-1861, is subject to disciplinary sanctions under the Student Code of Conduct and other applicable university and board policies. This does not preclude students from engaging in counter speech as First Amendment principles may permit.
Although a more complete list of applicable policies is provided in Exhibit B, here are some examples of how the Board and University policies promote lawful free expression within any of Arizona’s public universities without barriers.

**ASU**

ASU is committed to free speech, subject to reasonable restrictions designed to promote free speech while serving the university’s educational function.

The University of Chicago Statement affirms the role of academic freedom and freedom of expression on college campuses. ASU has adopted the core principles of the Statement as those principles reflect and are consistent with ASU's existing policies.

ASU community members and visitors may reserve space both indoors and outside in accordance with University policy ([SSM 802-01](#) and [SSM 801-02](#)) and may use other areas where reservations are not necessary. The university respects the ASU community’s rights to engage in expressive activities within public and designated public fora while: 1) facilitating the free flow of pedestrian traffic and access for all fire, police and emergency services; 2) preserving the health and safety of its community members; and 3) protecting the mission of the university, which includes activities related to studying, teaching, research, service, and university administration. ASU staff are available to actively assist in facilitating and supporting speech activities on campus, including arranging and managing space to permit speakers, listeners, and protestors to engage in speech without disrupting university activities. In addition, during the current pandemic situation when in-person gatherings are limited by public health orders and considerations, ASU staff have worked with student organizations to increase their awareness of available tools for virtual events, such as Zoom.

**NAU**

The NAU Speech Expressive Action Knowledge (SpEAK) team worked to ensure all planned, reported and spontaneous representations of speech on campus were supported. The Campus Inclusion Team (CIT), which includes the SpEAK team, serves as an impartial support system committed to fostering a campus community that honors freedom of expression and therefore does not discipline, investigate or adjudicate any reported concerns. The CIT served as a support resource for several on-campus speakers, events, and protests, and also provided support for students and community members who expressed concerns about the speech activity of others by listening, discussing and connecting individuals with resources such as counseling services and Office of Inclusion support services.

**UARIZONA**

University of Arizona policy reflects individual rights to free speech and expressive activity within public and designated public forums, while preserving public health, safety, and welfare; the
normal business uses of the campus; and the rights of others to legitimately use and enjoy the campus. The UArizona’s “Campus Use Policy - Interim,” provides:

The campus grounds and properties of the University of Arizona (the “University”) are devoted to and maintained for the sovereign function of providing higher education to the people and are not places of unrestricted public access.

The University is committed to protecting the free speech rights of students, faculty, staff, and invited guests. The purpose of this policy is to respect the Campus Community’s rights to free speech and expressive activity within public and designated public forums, while preserving public health, safety, and welfare; the normal business uses of the campus; and the rights of others to legitimately use and enjoy the campus.

The University may regulate the time, place, and manner of free speech and expressive activities in order to prevent unreasonable interference with or disruption of its educational, research, outreach, and business functions, and normal or scheduled uses of University property by the Campus Community, as well as to protect public health, safety, and welfare. Commercial Activity… is prohibited on campus except as authorized by the Business Practices Guidelines Policy, guidelines on ‘Sponsored Commercial Activity on University Property.’

THE BOARD AND THE UNIVERSITIES PROMOTE PROTECTED SPEECH AND PROMPTLY ADDRESS ALL ALLEGATIONS OF BARRIERS TO OR DISRUPTIONS OF PROTECTED SPEECH

Each university has an administrative process for responding to allegations of barriers to or disruptions of protected speech. All three universities provide active support for free speech activities on campus, including managing campus events to support meaningful opportunities for protest and to listen to invited speakers. The universities also engage in dialogue with, and providing support for, students and community who feel negatively impacted by the speech of others. However, consistent with the provisions of ABOR’s policy on free expression and the ABOR Student Code of Conduct, the universities do not impose discipline for constitutionally protected speech solely because that speech is controversial or objectionable to others. As appropriate, the response may address the conduct immediately and may include additional review or sanctions under board or university policy. Campus police may be involved if allegations include criminal conduct or implicate safety concerns.

ASU

ASU reported one allegation involving the election code adopted and enforced by the student government, which certain candidates claimed violated their speech rights as written and applied. The university reviewed the candidates’ concerns and found no violation of their speech rights.
NAU

There were no conduct-related incidents this past year related to barriers to or disruptions of free expression at NAU. However, there were incidents addressed by the Campus Inclusion Team (CIT), which includes the SpEAK team, who serves as an impartial support system committed to fostering a campus community that honors freedom of expression and therefore does not discipline, investigate or adjudicate any reported concerns. The CIT served as a support resource for students that felt negatively impacted by speech, both protected and not protected, as well as a resource for the campus community, including the Office of the Dean of Students (ODOS) and Residence Life. The CIT provided support for several impacted community members by listening, discussing and connecting individuals with resources such as counseling services and Office of Inclusion support services. In particular, the CIT served as a support for the following reported concerns:

- Early fall – SpEAK Team was deployed for a March for LGBTQ rights, and provided resources to organizers.
- Fall – A Non-student made statements to a Jewish student that the Jewish student found upsetting. The Jewish student was provided resources from ODOS and NAU’s Office of Inclusion.
- October 2019 – Near Halloween, a few NAU students posted pictures on social media while dressed in attire that other NAU students found culturally insensitive. To express their opinions, the second group of students posted comments on the social media pages of the original students who had posted the pictures. After the postings were reported to ODOS, staff met with each group of students, to educate the students regarding freedom of expression (and the right that the original group of students had to post photos and express themselves by their attire, as well as the right the second group of students had to “fight speech with speech”) and to provide them with resources to assist them in navigating social media.
- March 3, 2020 – SpEAK Team was deployed for a “March! Stand Up to Rita” event. This involved roughly 6 students who gathered at the Union and marched down to the High Country Conference Center (HCCC) prior to a Campus Forum. Once at the HCCC the students dispersed. The SpEAK team let the students know that they had a right to Freedom of Expression and provided materials on NAU’s support of Freedom of Expression on campus.
- Spring 2020 – A social media photo of a person with a swastika drawn on their face was brought to the attention of Fraternity & Sorority Life (FSL) staff. One person in the photo was a member of a fraternity but the other two people, including the person with the swastika drawn on their face, were not members. FSL staff reached out to the fraternity president and also reported it to the CIT.
- June 2020: A former student posted racist comments on Social Media. This student’s social media account incorrectly listed her as a current student. Many current students called and emailed the university with concerns about this post. No action was taken related to former student’s posts.

UARIZONA

During the Fall 2019 semester, many UArizona students and community members participated in on-campus protests related to the University’s handling of an on-campus assault of a Black student. These protests were peaceful and did not result in any University discipline or actions for the speech-related
activities. After this event, there was increased dialogue between students and University leaders on issues of race, safety, and inclusion.

More recently, in the wake of the mass protests related to George Floyd's death, the University has received a large number of complaints about the social media accounts of UArizona students (or purported students) who allegedly have a history of posting racially insensitive or blatantly racist content. There has been intense community pressure on UArizona leaders to rescind the admission of or initiate disciplinary actions towards these individuals. Although each case is unique, the University is keenly aware of the First Amendment rights of current or prospective students and how those rights intersect with the Arizona Board of Regents Code of Conduct for Students. No students have been disciplined for their social media posts, nor have any offers of admission been rescinded. The UArizona believes that focusing on student safety and the opportunity to receive and benefit from an education are its top priorities. In that vein, it plans to connect with those students who allegedly posted racist or offensive content when they arrive on campus or enroll in classes.

Also, there was a large Black Lives Matter rally on campus in June of 2020. The rally was peaceful and was very well attended. Since the event, a number of students have reengaged the University leadership to address the concerns and other issues that remain regarding their experience on campus, including their ability to engage in lawful expression.

THE BOARD AND THE UNIVERSITIES PROMOTE DIVERSITY OF THOUGHT AND ADMINISTRATIVE AND INSTITUTIONAL NEUTRALITY

The board and the universities are committed to maintaining a posture of administrative and institutional neutrality about speech and to allowing all protected speech, even speech that some may find offensive. From time to time, the board and the universities hear concerns from members of campus and the broader community who may not appreciate the broad constitutional protections afforded to speech – even to speech that many in the community may find deeply offensive. The universities are committed to protecting all lawful expression. The universities are also committed, as part of their educational missions, to providing information about protected speech to those who may seek to have the board or universities interfere with or suppress free expression. When protected but offensive speech occurs on campus, universities may use this as an opportunity to educate the broader community as to the nature of constitutional protections as well as to identify opportunities for the safe expression of divergent viewpoints – countering the offensive speech with more speech.

At its August 23, 2018 meeting, the board adopted a free expression policy in compliance with A.R.S. § 15-1866. A copy of the policy is attached as Exhibit C. State statute and board policy also address political speech. Board and university policies recognize the limitations imposed by A.R.S. § 15-1633, which limits the use of university resources or employees to influence elections.

ABOR
To highlight its support of free speech, while maintaining administrative and institutional neutrality, on November 16, 2019, ABOR and the universities held the inaugural Regents’ Cup debate competition at
the University of Arizona. The Regents’ Cup is a tri-university team debate competition designed to highlight and encourage civil discourse among students.

Thirty-six students on two-student teams from ASU, NAU and the UA competed during the daylong event at UArizona showcasing Arizona’s public universities commitment to freedom of expression. Subjects debated included how (if at all) social media sites should regulate speech, free speech on college campuses, and if the United States should have tougher libel, slander and defamation laws.

Winning student teams received scholarships and were eligible for course credit. The Regents’ Cup was an opportunity for Arizona’s public universities to showcase their commitment to diversity of thought and civil discourse.

The Second 2020-21 Regents Cup is scheduled to take place in Spring 2021.

**ASU**

ASU, its faculty, and its student organizations continue to host numerous events encouraging public discourse on a wide variety of topics, many of which focus on free speech. Examples during the Academic Year 2020 include Rodney Smolla, Free Speech at 100 and Robby Soave, Panic Attack: Young Radicals in the Age of Trump.

ASU regularly communicates its values regarding campus speech, such as in this November 2019 message from President Crow to the campus community reminding them that the university aspires to be a place that “invites civil dialogue and debate and where thoughts and ideas can be shared in an environment free from threat and intimidation.”

ASU is also a joint sponsor of the Future Tense initiative, whose ongoing Free Speech Project is conducting a series of public programs on timely free expression topics, including a recent virtual program on the effect of the pandemic on free speech, See its recent “Symptoms May Include Censorship” event focused on the pandemic.

**NAU**

To reinforce NAU’s commitment to the First Amendment, NAU added language to its orientations for both students and parents regarding free expression, namely:

- **NAU is a public institution committed to free, robust and uninhibited sharing of ideas among all members of the University’s community.**
- **Freedom of Speech is protected by the US Constitution.**
- **There are limits to free speech: Inciting comments and discrimination are not allowed.**
- **Free speech visitors come to campus to share their ideas. Students have the choice of engaging with them or walking away.**
- **Free Speech is allowed even when we don’t agree with the person or group speaking.**
- **Even though Free Speech is given by visitors, this does not mean the University approves of the message.**
- **Freedom of speech allows us to expand our thinking.**
NAU also shared the [First Amendment: Free Expression on Campus Handout](#) when training with our student organizations who are planning or hosting events and on the day of events as we interact/engage with students. It is also used for training Student Affairs and the SpEAK team members.

NAU also added the following *New Student Handbook* Language:

- *Northern Arizona University honors its commitment to the freedoms of speech and assembly guaranteed by the First Amendment of the Constitution. NAU is a public institution, and public universities are considered to be the quintessential “marketplace of ideas” – where both the campus community and the general public engage in free speech activities. As a public institution, NAU recognizes that freedom of expression is integral to the purpose and process of the University, whose primary goal is education. Many speakers use our campus, and some may have messages which seem inconsistent with the mission and values of the institution. In the “marketplace of ideas” not all ideas will resonate with the listener and some ideas may even seem distasteful or offensive. NAU encourages both the listener and the speaker to exercise this important freedom with respect, civility and responsibility. Students always have the choice of engaging with the free speech visitor(s) or walking away.*

Furthermore, NAU’s Economic Policy Institute continues to host an annual conference on economic climate, bringing information to the northern region with a variety of perspectives from panelists. Finally, NAU’s students participated in the inaugural Regents Cup.

**UARIZONA**

The UA[ Arizona’s](#) mission is one of service, and fundamental to its success is ensuring that all students and faculty practice and promote principles of freedom of expression and inquiry. One example of UA[ Arizona’s](#) engagement in its mission is that in mid-November, the University of Arizona hosted the above-referenced inaugural Regents’ Cup for a weekend in Tucson, promoting the discussion of diverse and civil discourse.

**ALLOCATION OF STUDENT ACTIVITY FEES**

Exhibit D provides the allocation of student activity fees, if any, that are used to support and facilitate the expression and activities of students or student organizations as required by A.R.S. §15-1867 (B)(5).

**DISTRIBUTION OF THIS REPORT**

As required by A.R.S. §15-1867, this report will be posted on the ABOR website and submitted to:

- The governor
- The speaker of the Arizona House of Representatives
- The president of the Arizona Senate
- The Arizona Secretary of State
EXHIBIT A

MEMBERS OF THE COMMITTEE ON FREE EXPRESSION
AS OF SEPTEMBER 1, 2020

Committee Chair: John Arnold, Executive Director, Arizona Board of Regents

ASU REPRESENTATIVES:

- Derrick Anderson, School of Public Policy and Design and Advisor to the President
- José Cárdenas, Senior Vice President and General Counsel
- Courtnee King, Student
- Stefanie Lindquist, Deputy Provost and Vice President for Academic Affairs
- Joanne Vogel, Deputy Vice President and Dean of Students, Tempe campus

NAU REPRESENTATIVES:

- Erin Grisham, Associate Vice President for Student Affairs
- Joe Carter, ASNAU Student Body President
- Kimberley Ott, Assistant to the President for Executive Communications & Media Relations
- Michelle Parker, General Counsel
- Eric Yordy, Associate Professor, Business Law, The W.A. Franke College of Business

UA REPRESENTATIVES:

- Sydney Hess, ASUA Student Body President
- Toni Massaro, College of Law
- David Schmidt, Social & Behavioral Sciences, Political Economy and Moral Science
- Bob Sommerfeld, UA Police Department
- Kendal Washington White, Dean of Students
EXHIBIT B

• ABOR Policies
  • 1-124 (Free Expression) https://public.azregents.edu/Policy%20Manual/1-124-Free%20Expression.pdf
  • 5-303(11) (Prohibited Conduct) https://public.azregents.edu/Policy%20Manual/5-303-Prohibited%20Conduct.pdf
  • 5-308 (A)(1) and (B)(1) (Student Code of Conduct) https://public.azregents.edu/Policy%20Manual/5-308-Student%20Code%20of%20Conduct.pdf
  • 6-905 (Political Activity) https://public.azregents.edu/Policy%20Manual/6-905-Political%20Activity.pdf

• ASU Policies and Statements
  • ACD 201 (Academic Freedom)
  • ACD 201-01 (Faculty Responsibilities)
  • ACD 204-01 (Code of Ethics)
  • ACD 204-02 (Standards of Professional Conduct for Faculty Members and Academic Professionals)
  • ACD 205-01 (Political Activity)
  • Policy Statement Supporting Diversity and Free Speech https://inclusion.asu.edu/cci/policies-procedures

• NAU Policies and Statements
  • Safe Working and Learning Environment Policy
  • NAU HR Policy 5.10 regarding Political Activity http://hr.nau.edu/apps/policy-manual/10256
  • NAU HR Policy 5.14 Use of university property http://hr.nau.edu/apps/policy-manual/10258
  • NAU Faculty Handbook 1.7.1 (Role of the Faculty)
  • NAU Faculty Handbook 4.1 (Code of Ethics and Conduct)
  • NAU Conditions of Faculty Service
  • NAU Statement Regarding Planned Events https://nau.edu/student-life/statement-regarding-planned-events/
  • Information distribution policy https://nau.edu/student-life/university-policies-rules-regulations/
  • First Amendment: Free Expression on Campus Handout
• UA Policies and Statements

• Policy and Regulations Governing the Use of Campus, SA-200: http://policy.arizona.edu/ethics-and-conduct/policy-and-regulations-governing-use-campus
• Political Activity: UHAP 2.10: http://policy.arizona.edu/employmenthuman-resources/political-activity-uhap
• Non-discrimination and anti-harassment policy, HR-200E: http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy
• Religious Accommodation Policy, HR-202: http://policy.arizona.edu/human-resources/religious-accommodation-policy
• Academic Freedom
  ▪ Statement on academic freedom from the Committee on Academic Freedom and Tenure, approved by Faculty Senate 9/14/09: https://facultygovernance.arizona.edu/sites/default/files/def-academic_freedom_with_senate_edit_9-14-09_final.pdf
  ▪ From University Handbook for Appointed Personnel Definitions: “Professional and intellectual freedom means the right and responsibility to exercise judgment within the standards of the employee's profession. Professional and intellectual freedom is defined as ‘academic freedom’ for employees involved in teaching or research.” http://policy.arizona.edu/uhap-definitions
• Faculty Responsibilities: UHAP 3.1, Duties and Responsibilities of Faculty: http://policy.arizona.edu/employmenthuman-resources/duties-and-appointments-faculty#revision
• Statement on Professional Conduct, UHAP 7.01: http://policy.arizona.edu/employmenthuman-resources/statement-professional-conduct
  ▪ Proposed revision: http://policy.arizona.edu/faculty-affairs-and-academics/proposed-revision-uhap-statement-professional-conduct
EXHIBIT C

ABOR FREE EXPRESSION POLICY

1-124 Free Expression

A. The primary function of Arizona’s public universities is to promote the discovery, improvement, transmission and dissemination of knowledge through research, teaching, discussion and debate. The universities must strive to ensure the fullest degree of intellectual freedom and free expression. It is not the proper role of a university to shield individuals from speech protected by the First Amendment, including ideas and opinions that may be unwelcome, disagreeable or deeply offensive.

B. Students, staff and faculty members may discuss any topic, as the First Amendment allows and within the limits of reasonable content- and viewpoint-neutral restrictions on time, place and manner of expression that are consistent with applicable law and that are necessary to achieve a compelling institutional interest if these restrictions are clear, are published and provide ample alternative means of expression. The board’s policy on political activity by employees or others acting on behalf of a university is set forth in Board Policy 6-905.

C. Students, staff and faculty members may assemble and engage in spontaneous expressive activities if those activities are not unlawful and do not materially and substantially disrupt the functioning of the university.

D. A student who is subject to the jurisdiction of a university and who engages in individual conduct that materially and substantially infringes on the rights of other persons to engage in or listen to expressive activity, as defined in A.R.S. § 15-1861, is subject to disciplinary sanctions under the Student Code of Conduct and other applicable university and board policies. This does not preclude students from engaging in counter speech as First Amendment principles may permit.

E. Universities may restrict expressive activity that is not protected by the First Amendment.

F. The board will establish a committee on free expression composed of representatives from the universities and the board office, which will submit an annual report as required by A.R.S. §15-1867.
EXHIBIT D

ALLOCATION OF STUDENT ACTIVITY FEES BY UNIVERSITY

ASU:
The Associated Students of Arizona State University is responsible for oversight of the student programming fee that provides funding to more than 1,000 student organizations annually. This includes funding for the Programming and Activities Board, Sport Club Organizations, Cultural Coalitions, College Councils and registered organizations who seek funding. Students and student organizations can also seek funding for traveling to professional and academic conferences. The Undergraduate Student Government spent approximately $2,343,938 on appropriations for more than 700 undergraduate clubs and organizations (including general clubs, sport clubs, cultural coalitions, college councils and programming and activities board) in the Fiscal Year 2019-2020. The Undergraduate Student Government also spent approximately $100,000 on 280 individuals who traveled to academic and professional conferences. The Graduate and Professional Student Association spent approximately $47,000 on appropriations for more than 40 graduate clubs and organizations. The Graduate and Professional Student Association also spent approximately $305,000 on 607 individuals who traveled to academic and professional conferences. Undergraduates pay $30/semester and Graduate students pay $35/semester for the student programming fee. The remainder of the student programming fee budget supported the Safety Escort Service, Bike Co-op, large events such as the Infernofest concert, community gatherings, professional artists and speakers, rental fees, and supplies.

NAU:
NAU supported 25 different events this past year. Our total expenditure FY20 was $108,920.31 ($2,798.45 of that going to Student Wages/ERE).

UA:
The Associated Students of the University of Arizona (ASUA) operates the Wildcat Events Board (WEB), a student-run group that programs campus-wide social and educational events that are open and accessible to all UA students. The WEB is funded by a $5 fee per-student. This fee is refundable for any student who requests one. WEB aims to bring about a greater spirit of unity and cooperation among all students and to encourage the development of leadership abilities and other skills through participation in programming. This year the budget supported large events such as concerts, community gatherings, partnering with campus departments for speakers, rental and facility fees, and supplies. At this time, WEB has not received any requests for funding specifically for events related to freedom of expression.
REQUESTED ACTION: The board will receive a presentation regarding the Teachers Academy. In addition, the board office asks the board to approve the FY 2020 Arizona Teachers Academy Annual Report.

Background/History of Previous Board Action

- The Arizona Teachers Academy (Academy) started in FY 2018 as a university funded year-for-year tuition waiver scholarship for students who commit to teaching in Arizona public schools.

- The board annually receives this report to approve prior to submittal to the Governor, President of the Senate, Speaker of the House of Representatives and the Secretary of State.

Discussion

Summary of the attached FY 2020 Annual Report:

- The $15 million State appropriation for the Academy has allowed enrollment to grow exponentially. The addition of Post-Baccalaureate certifications at Pima Community College, Rio Salado Community College and Scottsdale Community College has also increased the number of teachers able to be certified in Arizona.

- Enrollment went from 464 in FY 2019 to 2,367 in FY 2020 and 802 students who completed a program of study.

- Students are enrolled in 77 different degree programs at the universities and nine different certificate programs at the Community Colleges.

The full report can be accessed here.
Statutory/Policy Requirements

Arizona Revised Statutes §15-1655 requires that an annual report be submitted by September 1.
<table>
<thead>
<tr>
<th></th>
<th>Undergrad</th>
<th>Grad</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total MLFTC</strong></td>
<td>3402</td>
<td>1070</td>
<td>4469</td>
</tr>
<tr>
<td><strong>Non-MLFTC</strong></td>
<td>1252</td>
<td>98</td>
<td>1350</td>
</tr>
<tr>
<td><strong>Total ATA</strong></td>
<td></td>
<td></td>
<td>1229</td>
</tr>
<tr>
<td>MLFTC Majors</td>
<td>846</td>
<td>236</td>
<td></td>
</tr>
<tr>
<td>Other Majors</td>
<td>146</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Total Graduated</strong></td>
<td></td>
<td></td>
<td>616</td>
</tr>
<tr>
<td>MLFTC</td>
<td>392</td>
<td>167</td>
<td></td>
</tr>
<tr>
<td>Other Majors</td>
<td>56</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
## New, Continuing and Waitlisted ATA Awardees

### Headcount FY 21

<table>
<thead>
<tr>
<th></th>
<th>Undergraduate</th>
<th>Graduate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New</strong></td>
<td></td>
<td></td>
<td>367</td>
</tr>
<tr>
<td>MLFTC</td>
<td>230</td>
<td>108</td>
<td></td>
</tr>
<tr>
<td>Other Majors</td>
<td>27</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Total Continuing</strong></td>
<td></td>
<td></td>
<td>613</td>
</tr>
<tr>
<td>MLFTC</td>
<td>453</td>
<td>69</td>
<td></td>
</tr>
<tr>
<td>Other Majors</td>
<td>91</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Waitlist</strong></td>
<td></td>
<td></td>
<td>616</td>
</tr>
<tr>
<td>MLFTC</td>
<td>334</td>
<td>130</td>
<td></td>
</tr>
<tr>
<td>Other Majors</td>
<td>144</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>
MLFTC prepares all TFA Corp members for certification and masters degree at a reduced tuition rate.

There are currently 74 first year Corp members and 70 second year Corp members for FY 21 in AZ; all of whom are enrolled in our Masters/cert program.

We are unable to support all of them with ATA as we have had insufficient funding at the graduate level.

Last year ASU recruited 255 applicants to TFA (those not accepted are actively recruited into the ASU program; additional students from this pool could also be supported with additional funds at the graduate level).
ALTERNATIVE PATHWAYS TO TEACHING
MLFTC Graduate Certification Pathways

Graduate Certification Only*
- On-line only Teacher of Record
- 2 Semesters
- Elementary and Secondary
- Optional Masters degree specialization within 3 years.

*Starting Fall 2021

Graduate Certification and Masters Degree
- On-line and Face-to-Face
- Year 1 or Year 2 Teacher of Record Start with Induction Support
- Elementary, Secondary, Special Education
- 3 or 4 semesters
Undergraduate Pathways with Other ASU Colleges

The College
• History (Secondary Education), BA
• English (Secondary Education) BA
• Mathematics (Secondary Education) BS
• Physics (Secondary Education) BS - disestablishing, but currently on the books

New College
• English (Secondary Education) BA
• History (Secondary Education) BA

CISA
• Applied Biological Sciences (Secondary Education) BS

HIDA
• Art Education BFA
• Dance Education BFA
• Performance and Movement BA

Engineering
• Complete a 4+1 pathway that lead to Secondary Education certification

Two formally established concurrent degree pathways can be completed in 120 credits:
• Biology and Secondary Education
• Chemistry and Secondary Education

Add a Secondary Certificate to any degree program
New courses to attract more non-MLFTC students to teaching:

EDU 394 - Exploring Education: Finding Your Voice (1 credit hour) - Fall 2020
Examine the roles of education through educational experiences and discussions related to educators, learners, current issues, and culture.

EDU 394 - Personal Dimensions in Education (1 credit hour) - Spring 2021
Educational experiences and discussions related to educators, learners, environments, current issues, and roles in the field of education.
Jumpstart Academy: Paraprofessional Pathway

- The Jumpstart Academy provides cross-course support (e.g., team of instructors from different courses work together to develop and co-teach) through extended time periods and allows for an assignment completion week mid-semester.
- General academic skills and ASU transition services are integrated from academic coaches and wellness specialists.
- Courses offered in hybrid in-person/ASU Sync formats. Approximately 50% of learning takes place in the traditional classroom and 50% using asynchronous approaches.
- Assigned placements in the districts/schools/classrooms in which the paraprofessionals hold employment.
- Inclusion of candidates from both the elementary education and special education/elementary education dual certification programs.
Educators Rising and Teacher Academies

Educators Rising

• Educators Rising Arizona provides MLFTC access to a cohort of high school students (~1,400 student members across 70 chapters) across the state.
• MLFTC is represented on the board of directors.
• MLFTC recruiters partner with Educators Rising AZ chapters to recruit through in-classroom/virtual presentations communicating the value of higher education and, more generally, our vision for the profession.
• In 2019, MLFTC recruiters hosted 480 Ed Rising AZ members and 45 teacher-leaders at the annual Educators Rising Fall Leadership Conference at the Tempe campus.
• In 2020, MLFTC recruiters and marketers are partnering with Ed Rising AZ on a virtual Fall Leadership Conference to reach students during the pandemic.

Teacher Academies

• With ASU Prep Digital, building on-line content for teachers who teach Teacher Academy courses in high schools.
Possible New Jobs and Supporting Roles for Professional Teachers

Online Course Assistant
- Engaging students in discussion
- Providing help feedback
- Creating educational videos

Literacy Accelerator
- Professionalism
- Apply Word Solve Strategies
- Support Reading Comprehension
- Support Culturally Linguistically Diverse Learners
- Small Group and Guided Reading

Mentor
- Professionalism
- Understanding mentorship
- Coaching Student Thinking
- Small Group Management

Digital Advocate for Families
- School 101
- Forming support communities

...and many more
Community Educators

Designed for parents and other community members, a library of short modules on how to teach—literacy, mathematics, socio-emotional support, behavior strategies, problem or project base learning, science teaching, and other in-home support skills.
Induction

• Developing 20+ asynchronous modules for teachers in their first year of teaching.
• Creating an alumni outreach manager who can connect new teachers to personalized professional learning.
• Developing training for district-based mentorship and induction support which creates a leadership specialization for teachers.
• Continuing to support new teachers on team creation, personalized learning, and distributed expertise.
Next Education Workforce

- in June 2020, MLFTC provided training to over 700 teacher leaders and school leaders to support working in teams to personalize and deepen learning for students. New models were tested in AY19-20 in 84 schools; 10 schools are adopting whole school models of team enhanced instruction. This model is challenging the 1 classroom-1 teacher model and improving working conditions to retain teachers and get better learning outcomes. (Funded by U.S. Dept of Education, Walton, Schusterman, Kern, and the Gates Foundation)

Digital Literacy

- ASU Prep Digital and MLFTC providing digital literacy training to teachers and leaders--up to 48,000 teachers and 800 leaders in Arizona. (Funded by ADE, Governor’s Office, Helios).
Next Education Workforce

Provides students with deeper and personalized learning by building teams of educators with distributed expertise, and empowers educators by developing new opportunities for role-based specialization and advancement.
This page intentionally left blank
Multiple Teaching Pathways and the Arizona Teachers Academy @ NAU

Ramona Mellott
Dean, College of Education
Northern Arizona University
Figure 1. Project TOGETHER: Partnering Continuum
Overall Impact of ATA at NAU

- There has been significant growth in the numbers of students that are part of the ATA at NAU.
<table>
<thead>
<tr>
<th>Subject Areas</th>
<th>FY2020 ATA Enrollment</th>
<th>FY2020 Program Enrollment</th>
<th>Percentage Part of ATA at NAU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art, Music, English, Global Languages, History</td>
<td>170</td>
<td>533</td>
<td>32%</td>
</tr>
<tr>
<td>Science, Math, Physical Education</td>
<td>78</td>
<td>215</td>
<td>36%</td>
</tr>
<tr>
<td>Other Secondary Subject Matter</td>
<td>1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Early Childhood, Elementary</td>
<td>418</td>
<td>1,023</td>
<td>41%</td>
</tr>
<tr>
<td>Early Childhood &amp; Special Education</td>
<td>29</td>
<td>94</td>
<td>31%</td>
</tr>
<tr>
<td>Special &amp; Elementary Education</td>
<td>175</td>
<td>365</td>
<td>48%</td>
</tr>
<tr>
<td>Special Education Mild/Moderate Disabilities</td>
<td>29</td>
<td>37</td>
<td>78%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>900</td>
<td>2,268</td>
<td>40%</td>
</tr>
</tbody>
</table>
FY 2020 Non-Education Majors at NAU Students who were part of ATA

For FY2020, approximately 5% (or 49/900) of ATA NAU students were enrolled in 31 PROGRAMS NOT related to a teacher education (certification) major:

- Anthropology (BA),
- Applied Science – Early Childhood (BAS),
- Autism Spectrum Disorders (GCERT),
- Biology (BS), Biomedical Science (BS),
- Chemistry (BS),
- Communication Studies (BS),
- Creative Media & Film (BS),
- Creative Writing (UCERT),
- Criminology & Criminal Justice (BS),
- English (BA),
- Exercise Science (BS),
- History (BS),
- Health Sciences – Public Health (BS),
- Interdisciplinary Studies – Learning and Pedagogy (B),
- Mathematics (BS), Music Performance (BMUS),
- Physics & Astronomy Merged (BS), Physics (BS), Political Science (BA),
- Positive Behavior Support (GCERT),
- Psychological Sciences (BS),
- Psychology (BS),
- Public Administration (MPA),
- Speech - Language Pathology Assistant (UCERT),
- University Studies (BUS)
NAU Programs Leading to Standard Professional Secondary Grades 6-12 Certificate
Option A: Teacher Preparation Program

The following programs lead to a degree in a major outside of education and along with education-related courses, students are eligible for teacher certification. Specific degree requirements include:

- **90 units in the major + general education coursework**
- **30 units in education-related courses**

- Art Education (BSED) (also Arts Education, PreK-12 Certificate)
- Music Secondary Education (BMED) (also Arts Education, PreK-12 Certificate)
- Secondary Education - English (BSED)
- Secondary Education - History and Social Studies (BSED)
- Secondary Education - Spanish (BSED)
- Secondary Education - Biology (BSED)
- Secondary Education - Chemistry (BSED)
- Secondary Education - Earth Science (BSED)
- Secondary Education - General Science (BSED)
- Secondary Education - Physics (BSED)
- Secondary Education - Mathematics (BSED)
Option A – Continued

- Teaching Science with Certification, Master of Arts in Teaching Science (34 units)
  - Admission requirements related to certification include the following:
    - **24 units of appropriate content-specific coursework** in the area of teacher certification
    - Must pass the appropriate AEPA or NES subject knowledge exam
    - Passing score on the required Professional Disposition Modules
    - Must meet Arizona requirement for U.S./Arizona constitution (Option 1: POS 220 or equivalent course; Option 2: AEPA Constitutions of the United States and Arizona exam)

- Post Baccalaureate, Secondary Education Certification (30 units)
Option B: Teaching Experience and Coursework/Training (part of ATA)

- **Science Teaching, Master of Arts**
  - Program admission requirements include K-12 experience
  - Students complete graduate level science content courses (15 units) as well as science education courses (15 units)

- **Mathematics Education, Master of Science**
  - Program admission requirements include at least 2 years of mathematics teaching experience and completion of 23 units of undergraduate mathematics and statistics coursework
  - Students complete graduate level math content courses (15 units) as well as math education courses (22 units)

- **Teaching Introductory Community College Mathematics, Graduate Certificate**
  - Program admission requirements include completion of 23 units of undergraduate mathematics and statistics coursework
  - Students complete graduate level math content courses (9-12 units) as well as math education courses (6-9 units)
NAU Programs Leading to Standard Professional Elementary Grades K-8 (Option A)

- BSED Elementary Education
- BSED Special and Elementary Education
- MED Elementary Education – Certification
  - Admission open to any undergraduate major
NAU Programs Leading to Standard Professional Early Childhood Education (Option A)

• BSED Early Childhood Education (phasing out)
• Early Childhood Education, Undergraduate Certificate (along with a BSED in Elementary Education)
• BSED Early Childhood Education and Early Childhood Special Education (new program as of Fall 2019)
Standard Mild-Moderate Disabilities Special Education, K – 12 Certificate (Option A)

- BSED Special and Elementary Education
- MED Special Education – Mild Moderate Disabilities Certified
Alternative Teaching Certificate - Teacher Intern Program

• Prospective students with a Bachelor’s or more advanced degree* in any subject area can select one of the following ATA eligible NAU graduate programs leading to teacher certification:
  • MEd Elementary Education with Certification
  • MEd Special Education Mild Moderate Disabilities with Certification
  • MEd Early Childhood Special Education with Certification
  • MAT Teaching Science with Certification (newly added as a pathway)

*Must meet additional admission requirements as specified on the AZ Dept of Ed website.
Teacher Education Programs Across Arizona

NAU and Arizona community colleges have strong, long lasting partnerships

- opportunity to complete your associate degree,
- transfer (up to 64 credits) to NAU and earn your Bachelor of Science in Education
- taking university courses offered at an NAU statewide location or a Grow Your Own (GYO) Program
- **Choice of two popular BSEd degrees:**
  - Elementary Education
  - Special and Elementary Education
  - An undergraduate certificate in Early Childhood Education is available at multiple locations.

- For FY 2020, approximately 40% (or 363/900) ATA students at NAU were completing their program at a NAU statewide campus location
TEACHER EDUCATION PROGRAMS ON COMMUNITY COLLEGE CAMPUSES

Choose from one of 15 NAU statewide locations. With two degrees and one certificate option as well as many evening courses, NAU offers you the flexibility to reach your aspirations.

SOME NAU TEACHER EDUCATION COURSES INCLUDE:

**ECI 330**
Evolution of Learning
Develop the knowledge, skills, and dispositions necessary to effectively assess, evaluate, and monitor student learning and growth in grades K-8 in a professionally responsible and ethical manner.

**ECI 321**
Elementary School Curriculum
Plan developmentally appropriate instruction that includes the pedagogies for teaching various content areas and meeting the needs of diverse students in the classroom.

**ECI 405**
Mathematics and Evidence-Based Practices in the Elementary School
Learn how to provide meaningful and developmentally appropriate mathematical instruction for elementary and middle school children.

**ECI 406**
Science and Evidence-Based Practices in Elementary Education
Discover principles of teaching science in K-8 classrooms. This course will prepare you to teach in diverse classrooms and understand how students learn science. Become familiar with teaching strategies and how to prepare lesson plans for science content areas.

**ECI 402**
Integrated Literacy I
Become familiar with teaching language and literacy. The curriculum focuses on research-based instructional strategies to develop competencies for phonological awareness, systematic phonics, fluency, vocabulary, and comprehension.

**ESE 423**
Assessment And Eligibility Of Exceptional Children
Evaluation of school-aged students with mild/moderate disabilities to include basic concepts of measurement, data literacy, procedural safeguards, and professional responsibilities, communication with stakeholders, and the team approach to assessment.

**ETC 447**
Technology in the Classroom
Explores technology used in schools, including computers, multimedia, telecommunications, distance learning, software preview, integration, issues, and trends.

<table>
<thead>
<tr>
<th>NAU Statewide Location</th>
<th>Elementary Education, BSEd</th>
<th>Special and Elementary Education, BSEd</th>
<th>Early Childhood Education Undergraduate Certificate</th>
<th>Endorsements</th>
<th>Semester Start</th>
<th>Daytime or Evening Cohort</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Arizona College</td>
<td></td>
<td>X</td>
<td></td>
<td>Fall</td>
<td>Evening</td>
<td></td>
</tr>
<tr>
<td>Chandler-Gilbert Community College</td>
<td>X</td>
<td></td>
<td></td>
<td>Fall</td>
<td>Evening</td>
<td></td>
</tr>
<tr>
<td>Eastern Arizona College</td>
<td></td>
<td></td>
<td></td>
<td>Fall</td>
<td>Evening</td>
<td></td>
</tr>
<tr>
<td>Estrella Mountain Community College</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Fall</td>
<td>Evening</td>
<td></td>
</tr>
<tr>
<td>Glendale Community College</td>
<td></td>
<td></td>
<td></td>
<td>Fall</td>
<td>Evening</td>
<td></td>
</tr>
<tr>
<td>Mesa Community College</td>
<td></td>
<td></td>
<td>X</td>
<td>Fall</td>
<td>Evening</td>
<td></td>
</tr>
<tr>
<td>Mohave Community College</td>
<td>X</td>
<td></td>
<td></td>
<td>Fall</td>
<td>Evening</td>
<td></td>
</tr>
<tr>
<td>NAU-North Valley</td>
<td>X</td>
<td></td>
<td></td>
<td>Fall</td>
<td>Daytime</td>
<td></td>
</tr>
<tr>
<td>NAU-Yuma</td>
<td>X</td>
<td></td>
<td></td>
<td>Fall / Spring</td>
<td>Evening</td>
<td></td>
</tr>
<tr>
<td>Northland Pioneer College</td>
<td></td>
<td></td>
<td></td>
<td>Fall</td>
<td>Evening</td>
<td></td>
</tr>
<tr>
<td>Paradise Valley Community College</td>
<td>X</td>
<td></td>
<td></td>
<td>Fall</td>
<td>Daytime</td>
<td></td>
</tr>
<tr>
<td>Phoenix College</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Fall</td>
<td>Evening</td>
<td></td>
</tr>
<tr>
<td>Pima Community College</td>
<td>X</td>
<td></td>
<td>X</td>
<td>Fall</td>
<td>Evening</td>
<td></td>
</tr>
<tr>
<td>South Mountain Community College</td>
<td>X</td>
<td></td>
<td>X</td>
<td>Fall</td>
<td>Evening</td>
<td></td>
</tr>
<tr>
<td>Yavapai College</td>
<td>X</td>
<td></td>
<td></td>
<td>Fall</td>
<td>Evening</td>
<td></td>
</tr>
</tbody>
</table>

NAU's teacher education programs prepare highly qualified teachers to succeed in schools across Arizona through:

- 45 - 90 hours in schools each semester for either of the BSEd degrees
- up to 180 hours each semester in a school setting for the early childhood certificate
- a culminating semester of student teaching
Arizona Teacher Academy and Programs for Non-Education Majors

August 20, 2020
Arizona Teacher Academy

- Students from 4 colleges: agriculture & life sciences, education, fine arts & science

- Student numbers FY20
  - Undergraduate: Fall: 99, Spring: 113, Summer: 17
  - Graduate: Fall: 56, Spring: 59, Summer: 95

- Student numbers FY21
  - Undergraduate: Fall: 107 – Wait list: 42
  - Graduate: Fall: 100 – Wait list: 17
Serving Non-Education Majors

- High demand for ATA funding
- Focus on those most likely to become effective teachers and remain in the profession
  - Residents, particularly from underserved communities
  - Dedicated to teaching as a profession
- Strategies target:
  - Undergraduates – students in disciplinary majors and those not currently at a university
  - Graduates – career changers and recent graduates with disciplinary degrees

Teach Arizona graduate program

- Who – recent graduates and career changers with non-education undergraduate degrees; Residents, particularly from underserved communities
- What – one year (May to May), leading to secondary teaching certification and a master’s degree
- How – summer classes followed by field experience in a classroom (every day for a full school year) with afternoon/evening classes (in-person and hybrid/online options)
- Where – cohorts in Tucson and Maricopa county, expanding to rural areas of the state
- Results – 717 graduates over last 20 years, 97% graduation rate, 92% take teaching positions (91% in AZ)
Alternative Path graduate program

- **Who** – recent graduates and career changers with non-education undergraduate degrees who need to work full time while in the program
- **What** – two year program, leading to secondary teaching certification and a master’s degree – students are paid as full time teacher of record hired by partner school
- **How** – online (with some hybrid elements) summer and school year classes while teaching full time
- **Where** – Pima, Cochise and Santa Cruz counties
- **Results** – since 2014, 80% graduate rate (graduates already have teaching positions)
Special Education graduate program

- Who – recent graduates and career changers with non-education undergraduate degrees & current general education teachers and paraprofessionals interested in special education
- What – one year, leading to K-12 mild to moderate special education teaching certification and a master’s degree
- How – fully online; students typically employed by a school on an intern certificate, so they are getting paid during the program.
- Where – recently expanded statewide, with students in Phoenix, Prescott, Nogales, and the Navajo Nation.
- Results – all ATA students have graduated and entered the teaching profession.
Mathematics undergraduate program

- Who – undergraduate mathematics majors in the college of science
- What – earn degree in mathematics and secondary mathematics teaching certification
- How – one of several options for mathematics majors, earn regular mathematics degree while also taking classes in teaching math and doing field work in schools
- Where – Tucson campus
- Results – 75% graduation rate (some switch to other options within the math degree), 90% enter teaching profession
Art & Music programs

- **Who** – art and music majors, including community college transfers, double majors and post-bac students
- **What** – earn degree in art or music education and K-12 teaching certificate
- **How** – courses along with field experience in schools
- **Where** – Tucson campus
- **Results** – 20-30 students/year, vast majority are employed in teaching positions
Agricultural Education undergraduate program

- **Who** – undergraduate STEM students
- **What** – earn bachelor’s degree with secondary teaching certification in Agriscience (Career & Technical Education), many also obtain teaching certification in Biology
- **How** – courses along with field experience in schools
- **Where** – Tucson campus
- **Results** – program began in 1950s, 100% graduation rate, 100% in last 5 years have become teachers, 95% of graduate have remained in the profession
Pathways to Teaching undergraduate program

- **Who** – “grow your own” program for local-area residents who cannot afford to attend university, including para-professionals working minimum-wage jobs in schools
- **What** – in partnership with school districts, participants are paid a living stipend – complete 2 years (jr & sr) years of university in 17 months to earn undergraduate degree
- **How** – classes offered in partner schools combined with field experience, including serving as co-teacher or teacher in a classroom during final 2 semesters
- **Where** – currently in Sunnyside school district, starting in 2021 in 5 other districts in Pima, Cochise & Santa Cruz counties
- **Results** – new program, first graduates in May 2021
Arizona Teacher Academy

- In addition, an undergraduate minor in education for students in non-education majors
- Needs – more ATA funding for undergraduate programs serving community college transfers, currently have a waiting list
- Many ATA-funded students would not be in these programs without ATA funding
This page intentionally left blank
ABOUT THIS REPORT

Per Arizona Revised Statutes §15-1655, the Arizona Board of Regents prepares an annual report of the Arizona Teachers Academy. Included in this report is information on student enrollment and completion in the academy. Narratives for each institution were provided by the institution.

ABOUT THE ARIZONA BOARD OF REGENTS

The Arizona Board of Regents is committed to ensuring access for qualified residents of Arizona to undergraduate and graduate institutions; promoting the discovery, application, and dissemination of new knowledge; extending the benefits of university activities to Arizona’s citizens outside the university; and maximizing the benefits derived from the state’s investment in education.

MEMBERS

Larry Penley, Chair
Lyndel Manson, Chair Elect
Karrin Taylor Robson, Secretary
Ron Shoopman, Treasurer
Bill Ridenour
Fred DuVal
Kathryn Hackett King
Anthony Rusk, Student Regent
Nikhil Dave, Student Regent
Gov. Doug Ducey, Ex-Officio
Superintendent Kathy Hoffman, Ex-Officio

ABOR EXECUTIVE DIRECTOR

John Arnold
ABOUT THE ACADEMY

The Arizona Teachers Academy (Academy) offers a year-for-year tuition waiver scholarship for students who commit to teach in Arizona public schools. Each of the three public universities, Rio Salado Community College, Scottsdale Community College and Pima Community College, operates a unique Academy allowing the enterprise to offer undergraduate and graduate students in rural and urban settings an opportunity to earn their teaching degree tuition free. Program Graduates have a one-year grace period to begin teaching after completion and each university tracks graduates to determine whether they have met the teaching obligation in their student agreement.

In addition to tuition waiver scholarships, students enrolled in the Academy have access to support services during and after completion of their program of study. These services are provided by the university in partnership with school districts and include new teacher induction and mentoring to improve outcomes and retention.

Although the Academy was limited in its initial launch in fiscal year 2018, new State funding for the Academy in fiscal year 2020 has allowed for increased enrollments and the addition of certificate programs at the community colleges.

More information at arizonateachersacademy.com.

FISCAL YEAR 2020

In its third year, enrollment in the Academy has grown exponentially due to the $15 million General Fund appropriation there are more than 2,700 students receiving funding and over 800 students completing a program. With the new State funding participation in the Academy grew to include Post Baccalaureate Certificate programs at Maricopa County Community College District’s Rio Salado College and Scottsdale Community College and Pima Community College. The certificate programs offered by the Community Colleges provide an opportunity for students to participate in online or in person to earn their teaching certification in 17 programs.

The entire $15 million general fund appropriation was spent, $14,550,000 went to the institutions for their programs and $450,000 was used for marketing and administrative expenses.
MARKETING FOR THE ACADEMY

With the new funding available for marketing the Board Office launched an awareness campaign to promote the Academy throughout the state and updated the Academy website. The campaign promoted the Academy through various social media, Spanish radio and print ads, contemporary radio and streaming digital radios, and print ads. Nearly 2,000 posters were distributed to community colleges, libraries, universities, high schools after-school programs and more.

On the Academy’s website a video campaign, “Teachers Matter” celebrated teachers as heroes, with clips produced from various Arizonans (Governor Doug Ducey, former Arizona Diamondback Luis Gonzales, Olympic Gold Medalist Misty Hyman and Phoenix Police Chief Jeri Williams, among others) discussing the teachers who made a difference in their lives. Along with the Teachers Matter videos, the Board produced videos of Academy students sharing their stories about how the program is making a difference in their educational journey and career trajectories.
You Handle College. We’ll Handle Tuition.

Become a teacher and we’ll provide tuition coverage, plus you’ll have a job waiting.

Encárgate de tus estudios y nosotros nos encargaremos de tu colegiatura.

Arizonateachersacademy.com

Left: Updated website; Upper right: Teachers matter videos; Bottom-right: posters
## Enrollment and Completion

### Total Number Enrolled by Year, by Institution

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Arizona State University</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sophomore</td>
<td>2</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>Junior</td>
<td>24</td>
<td>87</td>
<td>376</td>
</tr>
<tr>
<td>Senior</td>
<td>71</td>
<td>109</td>
<td>436</td>
</tr>
<tr>
<td>Graduate</td>
<td>66</td>
<td>90</td>
<td>149</td>
</tr>
<tr>
<td>Non-Degree</td>
<td>2</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td><strong>Northern Arizona University</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>4</td>
<td>10</td>
<td>128</td>
</tr>
<tr>
<td>Sophomore</td>
<td>11</td>
<td>31</td>
<td>151</td>
</tr>
<tr>
<td>Junior</td>
<td>40</td>
<td>68</td>
<td>222</td>
</tr>
<tr>
<td>Senior</td>
<td>4</td>
<td>52</td>
<td>311</td>
</tr>
<tr>
<td>Graduate</td>
<td></td>
<td></td>
<td>88</td>
</tr>
<tr>
<td><strong>University of Arizona</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sophomore</td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Junior</td>
<td></td>
<td></td>
<td>38</td>
</tr>
<tr>
<td>Senior</td>
<td></td>
<td></td>
<td>52</td>
</tr>
<tr>
<td>Graduate</td>
<td>15</td>
<td>28</td>
<td>55</td>
</tr>
<tr>
<td>Non-Degree</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Maricopa Community Colleges</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Degree</td>
<td></td>
<td></td>
<td>200</td>
</tr>
<tr>
<td><strong>Pima Community College</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Degree</td>
<td></td>
<td></td>
<td>127</td>
</tr>
<tr>
<td><strong>National Board Certification</strong></td>
<td></td>
<td></td>
<td>340</td>
</tr>
</tbody>
</table>
### Percentage of Students who completed each year of the academy and who plan to continue to the subsequent year

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ASU</td>
<td>93%</td>
<td>94%</td>
<td>100%</td>
</tr>
<tr>
<td>NAU</td>
<td>98%</td>
<td>96%</td>
<td>99%(^1)</td>
</tr>
<tr>
<td>UA</td>
<td>NA(^2)</td>
<td>NA(^3)</td>
<td>100%</td>
</tr>
<tr>
<td>Maricopa CC</td>
<td></td>
<td></td>
<td>90%</td>
</tr>
<tr>
<td>Pima CC</td>
<td></td>
<td></td>
<td>95%</td>
</tr>
</tbody>
</table>

\(^1\)This is tentative and subject to change once Summer 2020 graduates are finalized  
\(^2\)The Academy at the UA is a one-year program and therefore does not have students continue from year to year  
\(^3\)ibid  
\(^4\)This is tentative and subject to change once Summer 2020 graduates are finalized

### Number of teachers who completed an Academy program of study

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ASU</td>
<td>87</td>
<td>116</td>
<td>406</td>
</tr>
<tr>
<td>NAU</td>
<td>NA</td>
<td>27</td>
<td>256(^4)</td>
</tr>
<tr>
<td>UA</td>
<td>15</td>
<td>28</td>
<td>91</td>
</tr>
<tr>
<td>Maricopa CC</td>
<td></td>
<td></td>
<td>44</td>
</tr>
<tr>
<td>Pima CC</td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>102</td>
<td>171</td>
<td>802</td>
</tr>
</tbody>
</table>
The ASU Arizona Teachers Academy offers bachelor’s degree, master’s degree and non-degree certification programs. Students in these programs can major in early childhood, elementary, physical, secondary, special education or arts education within the Mary Lou Fulton Teachers College, or any other degree at ASU if the student chooses to seek alternative teacher certification.

The Arizona Teachers Academy engages Mary Lou Fulton Teachers College graduates as educator professionals to meet the challenges of teaching in Arizona PreK-12 schools. We strive to offer an authentic learning experience for our participants by providing personalized coaching, collaborative communities and educational resources to support successful teaching in Arizona classrooms. Induction supports focused on topics of interest and critical topics in education to increase the ability of new teachers to respond appropriately to student needs.
<table>
<thead>
<tr>
<th>Degree Program</th>
<th># of Students Enrolled</th>
<th># of Students who Graduated</th>
<th># of Students Expected to Continue</th>
<th>% Expected to Continue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Biological Sciences (BS)</td>
<td>3</td>
<td></td>
<td>3</td>
<td>100%</td>
</tr>
<tr>
<td>Applied Mathematics (BS)</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Art (BFA)</td>
<td>24</td>
<td>13</td>
<td>11</td>
<td>100%</td>
</tr>
<tr>
<td>Biochemistry (BS)</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biological Sciences (BS)</td>
<td>3</td>
<td></td>
<td>3</td>
<td>100%</td>
</tr>
<tr>
<td>Chemistry (BA)</td>
<td>2</td>
<td></td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td>Curriculum &amp; Instruction (MED)</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td>Dance (BFA)</td>
<td>16</td>
<td>10</td>
<td>6</td>
<td>100%</td>
</tr>
<tr>
<td>Early Childhood &amp; Early Childhood Special Education (BAE)</td>
<td>73</td>
<td>37</td>
<td>36</td>
<td>100%</td>
</tr>
<tr>
<td>Earth &amp; Space Exploration (BS)</td>
<td>1</td>
<td></td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Educational Studies (BAE)</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Elementary Education (BAE)</td>
<td>235</td>
<td>91</td>
<td>144</td>
<td>100%</td>
</tr>
<tr>
<td>Elementary Education (MED)</td>
<td>52</td>
<td>33</td>
<td>19</td>
<td>100%</td>
</tr>
<tr>
<td>English (BA)</td>
<td>23</td>
<td>6</td>
<td>17</td>
<td>100%</td>
</tr>
<tr>
<td>Family &amp; Human Development (BS)</td>
<td>1</td>
<td></td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>History (BA)</td>
<td>14</td>
<td>3</td>
<td>11</td>
<td>100%</td>
</tr>
<tr>
<td>Interdisciplinary Studies (BA)</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Jewish Studies (BA)</td>
<td>1</td>
<td></td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Mathematics (BS)</td>
<td>8</td>
<td>3</td>
<td>5</td>
<td>100%</td>
</tr>
<tr>
<td>Microbiology (BS)</td>
<td>2</td>
<td></td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td>Music (BA)</td>
<td>1</td>
<td></td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Music Education (BMUS)</td>
<td>16</td>
<td>3</td>
<td>13</td>
<td>100%</td>
</tr>
<tr>
<td>Performance (BMUS)</td>
<td>1</td>
<td></td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Philosophy (BA)</td>
<td>1</td>
<td></td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Physical Education (MPE)</td>
<td>10</td>
<td>4</td>
<td>6</td>
<td>100%</td>
</tr>
<tr>
<td>Physics (BS)</td>
<td>2</td>
<td></td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td>Political Science (BS)</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td>Psychology (BA)</td>
<td>2</td>
<td></td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td>Secondary Education (BAE)</td>
<td>250</td>
<td>96</td>
<td>154</td>
<td>100%</td>
</tr>
<tr>
<td>Secondary Education (CERT)</td>
<td>9</td>
<td>4</td>
<td>5</td>
<td>100%</td>
</tr>
<tr>
<td>Secondary Education (MED)</td>
<td>48</td>
<td>32</td>
<td>16</td>
<td>100%</td>
</tr>
<tr>
<td>Sociology (BS)</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Spanish (BA)</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Special Education &amp; Elementary Education (BAE)</td>
<td>130</td>
<td>36</td>
<td>94</td>
<td>100%</td>
</tr>
<tr>
<td>Special Education (MED)</td>
<td>35</td>
<td>22</td>
<td>13</td>
<td>100%</td>
</tr>
<tr>
<td>Sustainability (BA)</td>
<td>1</td>
<td></td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Sustainability (BS)</td>
<td>1</td>
<td></td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Theatre (BA)</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>985</strong></td>
<td><strong>406</strong></td>
<td><strong>579</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
The Arizona Teachers Academy at NAU offers bachelors and masters degrees with certification at NAU Flagstaff, NAU statewide locations and NAU online. These delivery options include traditional bachelor’s programs beginning with freshman students as well as transfer programs in partnership with community colleges and Grow Your Own programs in local communities to meet specific needs identified by school districts as well as graduate programs for individuals who are seeking a second certification, a specialty area or re-careering to the teaching profession.

NAU’s programs meet critical shortage areas such as special education and secondary education fields as well as elementary education in communities throughout Arizona. Induction and mentoring support is provided for Graduates of the Arizona Teachers Academy, supporting their first-year in the classroom.
<table>
<thead>
<tr>
<th>Degree Program</th>
<th># of Students Enrolled</th>
<th># of Students who Graduated</th>
<th># of Students Expected to Continue</th>
<th>% Expected to Continue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art Education BSED</td>
<td>17</td>
<td>4</td>
<td>12</td>
<td>94%</td>
</tr>
<tr>
<td>Early Childhood Education &amp; Early Childhood Special Education BSED</td>
<td>21</td>
<td>21</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Early Childhood Education BSED</td>
<td>15</td>
<td>7</td>
<td>8</td>
<td>100%</td>
</tr>
<tr>
<td>Elementary Education - Certification</td>
<td>7</td>
<td>7</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Elementary Education - Certification MED</td>
<td>33</td>
<td>1</td>
<td>28</td>
<td>88%</td>
</tr>
<tr>
<td>Elementary Education BSED</td>
<td>338</td>
<td>111</td>
<td>223</td>
<td>99%</td>
</tr>
<tr>
<td>Elementary Education Yuma BSED</td>
<td>28</td>
<td>8</td>
<td>19</td>
<td>96%</td>
</tr>
<tr>
<td>English - Secondary Education MA</td>
<td>1</td>
<td>1</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Health Sciences - Physical Education BSED</td>
<td>7</td>
<td>2</td>
<td>5</td>
<td>100%</td>
</tr>
<tr>
<td>Mathematics Education MS</td>
<td>9</td>
<td>2</td>
<td>6</td>
<td>89%</td>
</tr>
<tr>
<td>Music Secondary Education BMED</td>
<td>23</td>
<td>3</td>
<td>18</td>
<td>91%</td>
</tr>
<tr>
<td>Post-Baccalaureate Secondary Education Certification UCERT</td>
<td>1</td>
<td>1</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Science Teaching MA</td>
<td>1</td>
<td>1</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Secondary Education - Biology BSED</td>
<td>14</td>
<td>5</td>
<td>9</td>
<td>100%</td>
</tr>
<tr>
<td>Secondary Education - Chemistry BSED</td>
<td>6</td>
<td>1</td>
<td>7</td>
<td>67%</td>
</tr>
<tr>
<td>Secondary Education - Earth Science BSED</td>
<td>4</td>
<td>4</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Secondary Education - English BSED</td>
<td>58</td>
<td>16</td>
<td>41</td>
<td>98%</td>
</tr>
<tr>
<td>Secondary Education - General Science BSED</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>75%</td>
</tr>
<tr>
<td>Secondary Education - History and Social Studies BSED</td>
<td>58</td>
<td>13</td>
<td>44</td>
<td>98%</td>
</tr>
<tr>
<td>Secondary Education - Mathematics BSED</td>
<td>27</td>
<td>2</td>
<td>23</td>
<td>93%</td>
</tr>
<tr>
<td>Secondary Education - Physics BSED</td>
<td>3</td>
<td>3</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Secondary Education - Spanish BSED</td>
<td>11</td>
<td>2</td>
<td>8</td>
<td>91%</td>
</tr>
<tr>
<td>Spanish Education MAT</td>
<td>1</td>
<td>1</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Special and Elementary Education BSED</td>
<td>177</td>
<td>61</td>
<td>110</td>
<td>97%</td>
</tr>
<tr>
<td>Special Education - Early Childhood Special Education with Certification MED</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>100%</td>
</tr>
<tr>
<td>Special Education - Mild/Moderate Disabilities Certified</td>
<td>7</td>
<td>7</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Special Education - Mild/Moderate Disabilities Certified MED</td>
<td>22</td>
<td>5</td>
<td>16</td>
<td>95%</td>
</tr>
<tr>
<td>Teaching Science with Certification MAT</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>900</strong></td>
<td><strong>256</strong></td>
<td><strong>633</strong></td>
<td></td>
</tr>
</tbody>
</table>
The University of Arizona has expanded its number of ATA-eligible programs from two to nearly twenty, across five different colleges, and now funds teacher candidates throughout the state. Candidates may pursue certification through graduate, undergraduate, or non-degree courses of study in general and special education, as well as in specialized fields like agricultural education, mathematics, music, and the visual arts. Priority consideration for the academy is given to candidates from local and indigenous communities, particularly first-generation students with high economic need.

Once candidates begin their first year of teaching, they are invited to participate in the academy’s new teacher induction program through which they can access a range of supports, from virtual learning opportunities to one-on-one coaching to networking events. These supports accommodate our new teachers’ busy schedules and provide them with opportunities to develop valuable communities of practice with similarly-situated educators — all while reinforcing evidence-based practices foundational to classroom instruction.

Given both current and projected demand for academy scholarships, the need for additional funding is expected to grow significantly this coming fiscal year.
<table>
<thead>
<tr>
<th>Degree Program</th>
<th># of Students Enrolled</th>
<th># of Students who Graduated</th>
<th># of Students Expected to Continue</th>
<th>% Expected to Continue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major in Agricultural Technology Management and Education</td>
<td>8</td>
<td>3</td>
<td>5</td>
<td>100%</td>
</tr>
<tr>
<td>Major in Art and Visual Culture Education</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>100%</td>
</tr>
<tr>
<td>Major in Early Childhood Education</td>
<td>12</td>
<td>3</td>
<td>9</td>
<td>100%</td>
</tr>
<tr>
<td>Major in Elementary Education</td>
<td>56</td>
<td>22</td>
<td>34</td>
<td>100%</td>
</tr>
<tr>
<td>Major in Mathematics</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Major in Mild Moderate Disabilities</td>
<td>13</td>
<td>10</td>
<td>3</td>
<td>100%</td>
</tr>
<tr>
<td>Major in Music Education</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td>Master of Arts in Special Education</td>
<td>18</td>
<td>16</td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td>Master of Education in Secondary Education</td>
<td>13</td>
<td>8</td>
<td>5</td>
<td>100%</td>
</tr>
<tr>
<td>Master of Education in Teaching and Teacher Education</td>
<td>24</td>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master of Science in Agricultural Education</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>155</strong></td>
<td><strong>91</strong></td>
<td><strong>64</strong></td>
<td></td>
</tr>
</tbody>
</table>
MARICOPA COUNTY COMMUNITY COLLEGES

The Maricopa County Community Colleges (MCCCD) Arizona Teachers Academy at Rio Salado and Scottsdale Community Colleges offer post-baccalaureate certification programs. Rio Salado College offers certification programs in Early Childhood Education, Arts Education, Elementary, Secondary and Special Education. Scottsdale Community College offers an Elementary certification program. All certification programs are offered in a hybrid setting with real world teaching experiences throughout Maricopa County and Arizona. Teacher candidates have the choice of two options, Alternative and Traditional Pathways. The Alternative Pathway is for teacher candidates who are working as the teacher of record in a preK-12 classroom but need to complete Arizona state teaching certification and students complete in one to 2 years. The Traditional Pathway is for teacher candidates interested in teaching who complete a 12-week student teaching capstone. This model provides individuals an excellent opportunity for content experts and professionals to recareer into teaching with a strong base of knowledge in such areas as science, technology, engineering and mathematics, among others to the benefit of K-12 classrooms across Arizona.

The programs are designed for working adults and provide extensive mentoring support in the preK-12 classroom environment in addition to credit-bearing certification coursework.

Maricopa’s post-baccalaureate certification programs are Arizona State Board approved and programs are offered at affordable tuition rates. Rio Salado and Scottsdale Community Colleges are proud to collaborate with the Arizona Teachers Academy, to provide scholarships for tuition and fees.

PIMA COMMUNITY COLLEGE

The Arizona Teachers Academy at the Pima Community College offers post-baccalaureate certification programs in Elementary, Secondary or Special Education. All three certificates offer online didactic instruction with real world teaching experiences throughout Pima County and Arizona. Students have the choice of two options, Alternative Pathway and Traditional Student Teaching. The Alternative Pathway is for those teachers who are working in a school district but need to complete Arizona State Certification with most students completing in about two years while they are working. The Traditional Pathway is for people interested in teaching but not currently working with a school district, the program supports the student in student teaching placement and because teaching is a high demand occupation, many who graduate obtain employment at one of their student teaching experiences.

The program is designed for people who are working and provides extensive mentoring support in addition to the didactic and student teaching experiences. As for cost, Pima has that covered. Pima’s Teachers Education program, which is fully online, has been selected by the State of Arizona to offer the Arizona Teacher’s Academy, which offers scholarships covering tuition and fees. Students must hold a bachelor degree or higher, be admitted into one of the Post-baccalaureate teacher preparation certificates, and complete a competitive application.
### MARICOPA COUNTY COMMUNITY COLLEGES

<table>
<thead>
<tr>
<th>Degree Program</th>
<th># of Students Enrolled</th>
<th># of Students who Graduated</th>
<th># of Students Expected to Continue</th>
<th>% Expected to Continue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary Certification - Post Baccalaureate Certificate</td>
<td>22</td>
<td>4</td>
<td>17</td>
<td>94%</td>
</tr>
<tr>
<td>Elementary Certification-Post Baccalaureate Certificate</td>
<td>110</td>
<td>24</td>
<td>81</td>
<td>89%</td>
</tr>
<tr>
<td>Special Education Mild-Moderate Disabilities - Post Baccalaureate Certificate</td>
<td>55</td>
<td>12</td>
<td>41</td>
<td>95%</td>
</tr>
<tr>
<td>Early Childhood - Post Baccalaureate Certificate</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>100%</td>
</tr>
<tr>
<td>Arts Education (Fine Arts, Music, Theater, Dance)</td>
<td>8</td>
<td>3</td>
<td>5</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
<td><strong>44</strong></td>
<td><strong>148</strong></td>
<td></td>
</tr>
</tbody>
</table>

### PIMA COMMUNITY COLLEGE

<table>
<thead>
<tr>
<th>Degree Program</th>
<th># of Students Enrolled</th>
<th># of Students who Graduated</th>
<th># of Students Expected to Continue</th>
<th>% Expected to Continue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary Certification - Post Degree Certificate</td>
<td>37</td>
<td>2</td>
<td>35</td>
<td>100%</td>
</tr>
<tr>
<td>Elementary Certification-Post Degree Certificate</td>
<td>28</td>
<td>1</td>
<td>27</td>
<td>100%</td>
</tr>
<tr>
<td>Special Education Mild-Moderate Disabilities Certification - Post-Degree Certificate</td>
<td>47</td>
<td>1</td>
<td>44</td>
<td>96%</td>
</tr>
<tr>
<td>Special Education Mild-Moderate Disabilities Certification for Certified Teachers - Post-Degree Certificate</td>
<td>15</td>
<td>1</td>
<td>14</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>127</strong></td>
<td><strong>5</strong></td>
<td><strong>120</strong></td>
<td></td>
</tr>
</tbody>
</table>
Item Name: Proposed Revision to ABOR Policy 1-119 “Nondiscrimination and Anti-Harassment”

☑ Action Item

Requested Action: The board office asks the board to review on first reading and adopt for immediate implementation the proposed revisions to ABOR Policy 1-119 “Nondiscrimination and Anti-Harassment”, as described in this executive summary.

Background/History of Previous Board Action

- ABOR Policy 1-119 “Nondiscrimination and Anti-Harassment” addresses discrimination and harassment, and it has been revised several times to comply with applicable anti-discrimination laws, most recently in October of 2018.

- ABOR Policy 1-119 establishes that the Arizona Board of Regents and the universities are committed to creating and maintaining a university system with an environment free from unlawful discrimination, including harassment, and retaliation. In support of this commitment, the board and the universities prohibit unlawful discrimination, harassment, and retaliation based on race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity, and genetic information.

- On May 6, 2020, the U.S. Department of Education (“Department”) released its final regulations governing campus sexual assault under Title IX, the law prohibiting sex discrimination at federally funded institutions. The new regulations have an effective date of August 14, 2020. The proposed revisions to ABOR Policy 1-119 are intended to make board policy consistent with the new federal regulations and the board has requested compliance with the regulations between the effective date and any board action.

- The three universities are modifying their respective policies and will be complying with the federal regulations as of the effective date.

Discussion

The new federal regulations require substantive changes to the board and university policies and procedures. Board staff and the three universities created a tri-university work group to draft and implement the new changes. The work group recommended
creating a separate provision in the board policy that specifically governs sexual harassment as regulated by Title IX of the Education Amendments of 1972 and its applicable regulations, as its standards are different from other antidiscrimination laws. The new language mirrors the new regulatory definitions of harassment. The new language also delegates to the universities the authority to create a process that complies with the new regulations and the unique staffing and student climates at each university. The three universities will have implemented their policy and procedure changes to comply by August 14, 2020.

Some of the more critical federal regulatory changes include, but are not limited to, the following:

- The definition of sexual harassment is more narrow than previous guidance. It is defined as “any unwelcome conduct that a reasonable person would find so severe, pervasive and objectively offensive that it denies a person equal educational access.” Reports of sexual assault, dating violence, domestic violence and stalking do not need to meet the description of “severe, pervasive and objectively offensive.”

- Stalking, domestic violence and dating violence are now officially considered examples of sexual harassment under Title IX.

- Universities are only obligated to respond to reports of sexual harassment that occurred off-campus if the location is in use by an officially recognized student or institution organization, such as recognized fraternity or sorority housing or athletic housing.

- Universities will now be required to allow cross-examination of the complaining and responding parties, as well as any witnesses, during a live hearing led by institution officials. Cross-examination will be conducted by advisers for parties, including legal counsel, but not the parties themselves. Universities cannot consider hearsay, even if it falls under an exception to applicable Rules of Evidence.

- Universities will be able to determine whether to use a “preponderance of the evidence” or “clear and convincing” standard as a burden of proof, but they must use the same standard for all complaints, no matter if they involve student or faculty misconduct.

- Universities are not obligated to handle complaints of sexual harassment that occur outside the United States in American education programs abroad.
• Universities can no longer use a “single investigator model,” which has one official tasked with investigating, adjudicating and issuing disciplinary sanctions against respondents. The regulations instead require three separate officials to work through separate pieces of a single Title IX complaint process: a Title IX coordinator, who receives reports of sexual misconduct; an investigator, to gather facts and interview parties and witnesses; and a decision maker, to determine sanctions and remedies for parties.

• Universities must train all personnel involved in the Title IX process and publish training materials on their websites. Training must involve review of the new rule’s definition of sexual harassment and the scope of the application of Title IX to college programs and activities, how to conduct a formal or informal process, and how to “serve impartially,” including avoidance of “prejudgment of the facts at issue, conflicts of interest, and bias.”

• Universities must provide evidence related to allegations to parties and advisers at least 10 days prior to requiring a response, and parties will not be prohibited from speaking about the allegations.

• Universities are not obligated to follow a specific time frame for responding to reports of sexual misconduct. They are instead required to have “reasonably prompt” periods for carrying out each step in the Title IX complaint process.

• The board is asked to review the proposed policy revisions on first reading and to adopt these proposed policy revisions for immediate implementation pursuant to ABOR Policy 1-202(J).

Statutory/Policy Requirements

A. The Policy

The Arizona Board of Regents and the universities are committed to creating and maintaining a university system with an environment free from unlawful discrimination, including harassment, and retaliation. In support of this commitment, the board and the universities prohibit unlawful discrimination, harassment, and retaliation based on race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity, and genetic information.

The board and universities will take prompt and appropriate action to: (1) thoroughly investigate complaints under this policy; and (2) prevent, correct and, if necessary, discipline individuals who engage in behavior that violates this policy.

B. Application of Policy

1. This policy applies to all board and university employees in all aspects of their employment relationship with the board or universities; all university students in all aspects of their relationship with the universities; all board or university applicants, whether for employment or for admission to educational programs; all persons participating in or accessing board or university sponsored programs and activities; and all vendors, contractors, or volunteers in all aspects of their relationships with the board or universities.

2. Each university president and the executive director of the board shall maintain policies and procedures to address, investigate, and promptly remedy complaints of discrimination, harassment, and retaliation as prohibited by this policy.

3. The board and the universities shall provide reasonable accommodations for religious practices and for persons with disabilities as required by law.

4. Enforcement of this Policy is subject to constitutional protections related to freedom of speech, association, and the press. Additionally, an individual's complaint filed with any outside agency will not affect any board or University investigation concerning the same or similar events.
C. Definitions

1. Discrimination

Discrimination is defined in federal and state law. In general, unlawful discrimination is a failure to treat persons equally if the motivation for treating a person differently is based, at least in part, on a status protected under applicable law or policy.

2. Harassment

Harassment is a specific form of discrimination. For purposes of this policy, harassment is unwelcome behavior, based on a protected classification, that is sufficiently severe or pervasive to create an intimidating, hostile, or offensive environment for academic pursuits, employment, or participation in board or university sponsored programs or activities. Additionally, sexual harassment, whether between individuals of the same or different sex, includes unwelcome conduct of a sexual nature that is made, either explicitly or implicitly, a condition of an individual’s education, employment, or participation in board or university sponsored programs or activities, or the submission to or rejection of such conduct is a factor in decisions affecting that individual’s education, employment, or participation in board or university sponsored programs or activities.

Examples of conduct that may, if severe or pervasive, constitute sexual harassment may include but are not limited to the following:

a. Sexual Violence, which includes physical sexual acts perpetrated against a person’s will or where a person is incapable of giving consent due to the use of drugs or alcohol, due to an intellectual or other disability, or due to age. This can include rape, sexual assault, sexual battery, and sexual coercion;

b. Unwelcome physical or implied sexual advances, or requests for sexual favors;

c. Unwelcome inappropriate physical touching, kissing, or brushing up or rubbing against another;

d. Unwelcome sexually suggestive or degrading jokes,
comments, or insults, or gestures;

e. Voyeurism (which occurs while observing others in a state of full or partial undress or engaged in sexual activity) or non-consensual photographing or audio or video recording of another, or publishing or disseminating such materials; or

f. The inappropriate display or circulation of sexually explicit materials such as photos, pictures, posters, magazines, cartoons, or statements, whether in printed or electronic form.

3. TITLE IX SEXUAL HARASSMENT (“SEXUAL HARASSMENT AS REGULATED BY TITLE IX OF THE EDUCATION AMENDMENTS OF 1972 AND ITS APPLICABLE REGULATIONS”), IS CONDUCT BASED ON SEX, THAT CONSTITUTES ONE OR MORE OF THE FOLLOWING:

a. UNWELCOME CONDUCT, OCCURRING IN THE UNITED STATES, THAT A REASONABLE PERSON WOULD FIND SO SEVERE, PERVERSIVE, AND OBJECTIVELY OFFENSIVE THAT IT EFFECTIVELY DENIES A PERSON EQUAL ACCESS TO BOARD OR UNIVERSITY SPONSORED EDUCATION PROGRAMS OR ACTIVITY.

b. AN EMPLOYEE CONDITIONING THE PROVISION OF AN AID, BENEFIT, OR SERVICE OF THE BOARD OR UNIVERSITY ON AN INDIVIDUAL’S PARTICIPATION IN UNWELCOME SEXUAL CONDUCT.

c. ANY OF THE FOLLOWING SPECIFIC ACTS OF SEXUAL HARASSMENT TAKING PLACE WITHIN THE UNITED STATES AND WITHIN A BOARD OR UNIVERSITY SPONSORED PROGRAM OR ACTIVITY: SEXUAL ASSAULT, DATING VIOLENCE, DOMESTIC VIOLENCE, AND STALKING.

4. Retaliation

Retaliation in the context of non-discrimination and anti-harassment occurs when an adverse action is taken against an individual for engaging in protected activity. Protected activity consists of: (1) opposing conduct reasonably believed to constitute discrimination,
including harassment, which violates an employment or education discrimination statute or which board or university policy prohibits; or (2) filing a complaint about such practice; or (3) testifying, assisting, or participating in any manner in an investigation or other proceeding related to a discrimination complaint. Adverse actions that are reasonably likely to deter a complaining individual or others from engaging in protected activity are prohibited.

D. Responsibilities

1. All individuals identified in Section B.1. of this policy are responsible for participating in creating and maintaining a workplace and/or educational environment free from all forms of prohibited discrimination, including harassment and retaliation, and for cooperating with board and university officials who investigate allegations of violations of this policy.

2. Individuals charged with supervisory authority are required to engage in appropriate measures to prevent violations of this policy. Individuals charged with supervisory authority who are informed of or who have a reasonable basis to believe that a violation of this policy has occurred are required to promptly report it to the individual or office designated by each university president or, if applicable, the board’s executive director for investigation. Supervisory inaction may be cause for disciplinary action.

3. An individual believing that he or she has been subjected to discrimination, harassment, or retaliation in violation of this policy should report the matter immediately to the university in accordance with the policies and procedures in place at that university. Complaints about alleged violations of this policy by any board employees should be reported to the executive director of the board or, if that is not practicable, to the general counsel or the Chair of the board.

4. Each University shall maintain at least one Title IX Coordinator to assist with complaints with Title IX of the Education Amendments of 1972 AND SHALL ESTABLISH A PROCESS FOR ADDRESSING FORMAL COMPLAINTS OF TITLE IX SEXUAL HARASSMENT IN COMPLIANCE WITH APPLICABLE LAW.
E. Confidentiality

All board and university employees who, in their administrative capacity, receive reports of discrimination, harassment, or retaliation shall maintain the confidentiality of the information they receive, except where disclosure is required by law or is necessary to facilitate legitimate board or university processes, including the reporting, investigation, and resolution of discrimination, harassment, or retaliation allegations.
EXECUTIVE SUMMARY

Item Name: 2020 TRIF Report

☑️ Action Item

Requested Action: The board office and the universities ask the board to approve the FY 2020 Technology and Research Initiative Fund (TRIF) Annual Report for submission to the Governor and the Legislature.

Background/History of Previous Board Action

The FY 2020 TRIF Annual Report presented for board approval is a brief summary of the prior year’s TRIF activity and actual expenditures. The report also highlights the performance measures for each TRIF funded research area. The TRIF funded research areas were approved by the board as part of the TRIF 2017-2021 five-year budget related project plans.

The Annual Report also reports the statutorily required TRIF funding amount used for debt service.

The vast majority of TRIF funds are allocated to the universities for specific projects on a five-year budget cycle. The current 5-year cycle ends in FY 2021. University TRIF projects are focused in five themed areas:

1. Improving Health
2. Water, Environment and Energy
3. Space Exploration and Optical Science
4. National Security Systems

The 2020 TRIF Annual Report may be found here.

Discussion

TRIF Expenditures

In FY 2020, Arizona public universities received approximately $81.4 million in TRIF revenue. The graph shows where TRIF dollars were invested.

Contact Information:

Neal Woodbury, ASU nwoodbury@asu.edu 480-965-4430
David Schultz, NAU david.schultz@nau.edu 928-523-6274
Elizabeth Cantwell, UA ecantwell@email.arizona.edu 520-621-3513
Chad Sampson, ABOR chad.sampson@azregents.edu 602-229-2512
Jan Oestreich, ABOR jan.oestreich@azregents.edu 602-229-2591
Return on Investment

The TRIF report highlights various expenditure outcomes including the financial impact of the state’s TRIF investment, technology transfer activity and workforce contributions. The chart below highlights the return on investment to Arizona for FY 2020.

<table>
<thead>
<tr>
<th>2020 FINANCIAL IMPACT OF TRIF INVESTMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sponsored Awards (from outside sources, including fed. and industry sponsored)</td>
</tr>
<tr>
<td>Gifts &amp; Other Sources</td>
</tr>
<tr>
<td>Royalty Income</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TECHNOLOGY TRANSFER ACTIVITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invention Disclosures Transacted</td>
</tr>
<tr>
<td>US Patents Issued</td>
</tr>
<tr>
<td>Licenses and Options Executed</td>
</tr>
<tr>
<td>Startup Companies</td>
</tr>
</tbody>
</table>
TRIF Research Expenditures

In addition to the financial return on investment, TRIF funds support research initiatives that target important economic sectors, including aerospace and defense, semiconductors, optics, bioscience and renewable energy, water supply and use, which are critical for Arizona. These initiatives support the board’s goal of strengthening Arizona’s economy by facilitating the creation of technology development and transfer that is valuable to a knowledge-based global economy.

Examples of TRIF supported research in FY 2020, including:

- Developed Arizona’s first saliva-based COVID-19 test.
- Using nanomaterials to purify drinking water, industrial wastewater, contaminated soils and sludge from municipal wastewater treatment plants.
- Developing and testing the world’s first fully flexible X-ray detector backplane.
- Determining the most effective combination of cancer-fighting drugs to fight melanoma.
- Evaluating strategies for managing and restoring dryland ecosystems degraded by drought.
- Directing the path and daily tasks of the NASA Curiosity rover on Mars.
- Using elevated wind tunnel capacity to experiment on vehicles traveling at the speed of sound.
- Enhancing the performance of optical fiber lasers for detecting and defeating missile attacks.
- Understanding the lifecycle of the novel coronavirus, and identifying potential treatments.

TRIF Regent Innovation Fund Expenditures

- The annual TRIF Report also reports information on Regent Innovation Fund (RIF) projects’ during the prior year. Each year the Regents review the project proposals and allocate approximately $1 million towards RIF projects. These projects are generally tri-university in focus and further expand the research capabilities at each of the universities.

- Based upon the June 2019 board approval, $1.012 million was granted for three tri-university projects.
### Statutory/Policy Requirements

Arizona law (A.R.S. §15-1648) establishes the Technology and Research Initiative Fund (TRIF) to receive Proposition 301 state sales tax revenue and gives the Arizona Board of Regents the authority to administer the funds.

ABOR Policy 3-412 “Administration of Technology and Research Initiative Fund” governs the administration and use of TRIF funds.
ABOUT THIS REPORT

The fiscal year 2020 Arizona Board of Regents Technology and Research Initiative Fund filed in accordance with A.R.S. §15-1648(D) includes the prior year’s TRIF expenditures. The board adopted TRIF five-year project plans, available on the ABOR website, detailing anticipated budgets and expected outcomes.

TRIF was established through Proposition 301 that increased the state’s sales tax to be dedicated to K-12, community colleges and Arizona’s public universities. Collection of the tax began on June 1, 2001, and the proposition was extended for another 20 years in 2018. Arizona law establishes TRIF using Proposition 301 sales tax revenue and gives the Arizona Board of Regents the responsibility to administer the fund. TRIF monies are continuously appropriated to ABOR and do not lapse at the end of the fiscal year.

The fiscal year 2020 TRIF report details research goals, accomplishments and highlights from the universities that address challenges to the state and society as well as detailed financial information on how the funds were utilized. Through TRIF funds, the institutions are able to accomplish advances in vital research, including COVID-19 research, virus biotech detection, water resources and more.

ABOUT THE ARIZONA BOARD OF REGENTS

The Arizona Board of Regents is committed to ensuring access for qualified residents of Arizona to undergraduate and graduate institutions; promoting the discovery, application, and dissemination of new knowledge; extending the benefits of university activities to Arizona’s citizens outside the university; and maximizing the benefits derived from the state’s investment in education.

MEMBERS
Larry Penley, Chair
Lyndel Manson, Chair Elect
Karrin Taylor Robson, Secretary
Ron Shoopman, Treasurer
Bill Ridenour
Fred DuVal
Kathryn Hackett King
Anthony Rusk, Student Regent
Nikhil Dave, Student Regent
Gov. Doug Ducey, Ex-Officio
Superintendent Kathy Hoffman, Ex-Officio

ABOR EXECUTIVE DIRECTOR
John Arnold
# Table of Contents

1. **Technology and Research Initiative Fund**

3. **Arizona State University**

17. **Northern Arizona University**

33. **University of Arizona**

47. **Arizona Board of Regents**

55. **Arizona State University Exhibits**

63. **Northern Arizona University Exhibits**

71. **University of Arizona Exhibits**

79. **Arizona Board of Regents Exhibits**
TECHNOLOGY AND RESEARCH INITIATIVE FUND

TRIF BUDGET

Arizona’s public universities received approximately $81.4 million in TRIF revenue in fiscal year 2020. The universities leveraged that investment to attract outside research funding, resulting in $465.7 million return on investment through TRIF-related research. Total TRIF revenue received to date since the inception of the program in June 2001 is over $1.205 billion.

ABOR approves the TRIF budgets and project plans in five-year cycles. The fiscal year 2017-2021 project plans were approved by the board in June 2016 using the sales-tax forecast from the Joint Legislative Budget Committee (JLBC). These project plans are available on the ABOR web site at: http://www.azregents.edu/reports-0.

The TRIF statute includes a 20 percent limitation on the use of TRIF funds for capital projects expenditures.

TRIF INITIATIVES ADDRESS ISSUES CRITICAL TO STATE, SOCIETY

TRIF money is used to support initiatives and projects that meet one or more of the following categories established by the board.

Research investment areas:

- Improving Health
- Water, Environmental, and Energy Solutions
- National Security Systems
- Space Exploration and Optical Solutions

Workforce development investment area:

- Higher Education Access for Workforce Development

Pursuant to A.R.S. §15-1648(C), TRIF funds will be used to support initiatives and projects that meet one or more of the following criteria:

- Promote university research, development and technology transfer related to the knowledge-based global economy.
- Expand access to baccalaureate or post-baccalaureate education for time-bound and place-bound students.
- Implement recommendations from the Governor’s Task Force on Higher Education and/or the Arizona Partnership for the New Economy.
- Develop programs that will prepare students to contribute in high technology industries located in Arizona.
- These same criteria are used in considering tri-university awards of the Regents’ Innovation Fund and grants.

MILKEN REPORT CITES TRIF’S IMPACT

In April of 2020, the Milken Institute published a new report, “Examining Arizona’s Technology and Research Initiative Fund,” that analyzes TRIF’s significant impact on Arizona’s public universities and the innovation economy in the state. The report, commissioned by the Flinn Foundation, stresses TRIF’s importance to Arizona’s continued success, citing it as a major reason for the growth of the biosciences in the state.
TRIF-supported researchers at Arizona State University are providing innovative solutions to safeguard human health, security and prosperity in Arizona and around the world in the following focus areas:

During the TRIF cycle of fiscal year 2017 through fiscal year 2021, ASU is investing in four focus areas:

- Improving Health
- Water, Environmental and Energy Solutions
- National Security Systems
- Access and Workforce Development

In fiscal year 2020, ASU leveraged TRIF investment to attract $220 million in new funding. For example, the ASU-led, national Center for Bio-mediated and Bio-inspired Geotechnics (CBBG) Engineering Research Center was renewed for five years with $16.4 million from the National Science Foundation. CBBG draws inspiration from nature to develop sustainable, resilient and cost-effective civil infrastructure systems.

The value of Arizona’s long-term commitment to research and innovation has never been more apparent than during the coronavirus pandemic that began in early 2020. Researchers across ASU were able to quickly leverage TRIF-enabled technologies, expertise and infrastructure to assist in the global crisis.

For example, researchers in the Biodesign Institute pivoted automated diagnostic technology originally developed to detect radiation exposure. This technology now provides the capacity to process thousands of COVID-19 tests per day. The institute also launched the first saliva-based COVID-19 test in the western U.S., providing a safer and less invasive alternative to nasopharyngeal swabs.

TRIF-supported research also engaged 1,219 undergraduates, 2,426 graduate students and 398 post-doctoral appointees in the past fiscal year. Through innovative programs such as Practice Labs™, ASU is connecting students to companies, nonprofits and government organizations to help solve their critical business challenges while providing hands-on professional experience and exposing students to potential employers and career paths.

ASU’s faculty and students are also translating their efforts into the marketplace. In fiscal year 2020, 111 patents were issued and 35 new startup companies were launched based on technology from TRIF-supported research. ASU ranks No. 12 among universities worldwide for U.S. patents issued, a testament to the university’s capacity to bring new inventions to market.

In recognition of the university’s rapid growth and societal impact, U.S. News & World Report named ASU the most innovative university in the country for five consecutive years. In 2020, Times Higher Education ranked ASU No. 1 in the U.S. and No. 5 in the world for impact based on the United Nations Sustainable Development Goals.

“Arizona State University is heavily invested in the communities we serve. The state’s reinvestment in us as an institution allows us to provide a substantial benefit to the local economy through the creation of an educated citizenry that supports the attraction of leading industries and the development of new, innovative businesses. Our focus on research, discovery and translation is fostering the creation of the kind of high-tech ecosystem in Arizona that provides high-paying jobs and external investment. We appreciate the vital infusion of TRIF funding, and are committed to being a good steward of these resources, returning benefit to the community in all possible ways.”

— Neal Woodbury, Interim Executive Vice President, ASU Knowledge Enterprise
ASU’s Improving Health efforts are anchored in the Biodesign Institute, which was launched with TRIF support in 2003 to create nature-inspired solutions for human health and well-being. The Biodesign Institute advances scientific discovery and accelerates commercialization to serve the public good in areas of pressing concern from the current coronavirus pandemic to cancer to Alzheimer’s disease and more.

The institute’s network of local and global collaborations — from Norway to South Korea to India — helps generate research synergy, significantly improving the pace and impact of scientific discovery. It draws on the interdisciplinary expertise of biologists and biochemists, geneticists and informaticians, physicians, engineers, epidemiologists and researchers in evolutionary theory, enabling multifaceted investigations of some of today’s most urgent challenges.

In addition, TRIF investment contributes to programs and facilities that support this discovery through infrastructure and instrumentation, technology transfer and external collaborations.

GOALS:

- Attract significant additional external funding to continue a trajectory of success in biosciences and health-related research.
- Transfer scientific advancements from lab to marketplace through inventions, startups and licensing agreements.
- Create and strengthen clinical partnerships and other private-sector collaborations to accelerate research and share resources and capabilities.
- Provide advanced education and training in state-of-the-art biosciences research and accelerate the pipeline of highly trained biosciences research critical to the state’s economic development plan.
- Inform and inspire the broader community through educational outreach efforts, including engagement and collaboration with K-12 educators and nonprofit organizations.

“The Biodesign Institute at ASU has been an invaluable partner in our response to the COVID-19 pandemic. We needed to move quickly to test our essential employees who are responsible for keeping the lights on and air conditioners running for our customers across the state of Arizona. The Biodesign Institute collaborated with APS to set up qPCR testing at multiple sites within just a few days, and has continued to work with us to improve the process so that we can sustain an effective testing program and maintain a healthy workforce.”

— Pat Dinkel, Vice President of Strategy and Risk, APS
SUMMARY OF ACCOMPLISHMENTS

Since 2003, the Biodesign Institute has leveraged $210 million in TRIF funding to attract over $750 million in external awards, supporting research that saves lives. Biodesign scholars have also generated over 100 U.S. patents and more than 50 licensing agreements for the technologies they have created. TRIF also supports Biodesign’s work in STEM education.

- One example of the multiplier effect of TRIF investment is Biodesign’s Virginia G. Piper Center for Personalized Diagnostics, which has secured major contracts from the Biomedical Advanced Research and Development Authority and the Defense Advanced Research Projects Agency. That foundational research primed the center to rapidly spin up the ASU Biodesign Clinical Testing Lab (ABCTL) to fill the gap in COVID-19 testing in Arizona, with additional support from the Virginia G. Piper Charitable Trust. This Clinical Laboratory Improvement Amendments-certified lab developed Arizona’s first saliva-based COVID-19 test. Saliva testing is less invasive for patients, easier to run at scale, safer for testing staff and less resource intensive than commonly used nasopharyngeal swabs. ABCTL has conducted tens of thousands of tests, initially focusing on essential workers and vulnerable populations in partnership with over a dozen organizations. Now the lab is also partnering with the Arizona Department of Health Services (AZDHS) and Arizona Department of Administration (ADOA) to expand public testing across the state.

- TRIF investment also enabled the following efforts to address the coronavirus:
  - Researchers are working with AZDHS and ADOA to provide Arizonans the most up-to-date modeling information and predictions about the spread of the coronavirus.
  - The student-led PPE Response Network has crowdsourced 3D printing and sterilization capabilities in the community to provide tens of thousands of pieces of PPE for around 75 medical providers to date.
  - Students also invented two low-cost PPE sterilization devices and have applied for patents.
  - ASU is assisting the state with case investigations to identify individuals who may have been exposed.
  - The coronavirus pandemic has highlighted the urgent need for better warning systems for infectious diseases, including influenza, which killed roughly 80,000 people last year in the U.S. With $1.53 million in support from the National Library of Medicine, three Biodesign research teams are working to improve prediction of viral outbreaks. Their work has already enabled the discovery of over 3,000 new viruses, which helps researchers and clinicians prepare for outbreaks and design better defenses against them.
  - Biodesign researchers are advancing efforts toward effective, pre-made cancer vaccines that combine common mutations occurring in RNA rather than DNA. Results in mice have already shown this approach to be as effective as complex therapies that are 1,000 times the cost. An ASU spinout company, Calviri, builds on these efforts and will eventually conduct human clinical trials.
  - The ASU-Banner Neurological Disease Research Center is exploring new therapies for Alzheimer’s and other devastating degenerative brain diseases. Researchers from the Biodesign Institute and the UArizona College of Pharmacy are exploring a small molecule drug known as DYR219. Rather than directly attacking visible hallmarks of Alzheimer’s like plaques and tangles, the new drug inhibits an early pathway believed to be critical in the development of this devastating disease.
WATER, ENVIRONMENTAL AND ENERGY SOLUTIONS

ASU’s Water, Energy and Environmental Solutions efforts are anchored in the Global Futures Laboratory, launched in 2019 as the next evolution of ASU’s longstanding leadership in sustainability activities. The laboratory is a bold new framework to organize and align ASU’s sustainability efforts, including the Julie Ann Wrigley Global Institute of Sustainability, which previously guided activities in this focus area.

ASU efforts in the Water, Energy and Environmental Solutions focus area build on the university’s foundational expertise in solar energy research and innovation, nanotechnology, and bio-inspired solutions, as well as strong interdisciplinary collaboration and partnerships with industry, nonprofits and governments.

In addition, TRIF investment contributes to programs and facilities that support these activities through infrastructure and instrumentation, technology transfer and strategic partnerships.

GOALS:

- Continue to advance ASU’s university-wide commitment to sustainability.
- Attract additional external funding to enable ASU units and their partners in the teaching, learning and discovery of sustainability and complex global systems.
- Implement, extend, share and promote sustainable practices locally, nationally and globally.
- Connect scientists, scholars, humanists, engineers, technologists, policymakers, business leaders, students and communities to enhance the capacity to address global challenges.
- Support research and development in technologies and systems used by cities and businesses that will generate revenue and jobs in Arizona.
- The Center for Bio-mediated and Bio-inspired Geotechnics (CBBG) and the NanoEnabled Water Treatment Technologies (NEWT) center are National Science Foundation-supported Engineering Research Centers. ASU leads CBBG and is a partner in NEWT. These centers advance engineering research and design to tackle imminent sustainability issues by developing applied solutions for transportation, water, power, sanitation, and residential and commercial development.
SUMMARY OF ACCOMPLISHMENTS

- At the start of fiscal year 2020, ASU reached an important milestone in its commitment to sustainable operations, achieving full carbon neutrality six years ahead of its planned schedule. This action is one of many that have helped ASU earn the Sustainability Tracking, Assessment & Rating System (STARS) Platinum sustainability rating from the Association for the Advancement of Sustainability in Higher Education in March 2020 — a rating shared with only seven other institutions in the world.

- ASU engineers working in the Solar Power Lab have discovered how a microscopic alteration to industry-standard silicon wafers can boost the efficiency of solar panels. Increased solar efficiency reduces the cost of energy production, making solar power less expensive. The research group has repeatedly broken solar cell efficiency records in the past.

- Researchers with the Nanotechnology Enabled Water Treatment (NEWT) Engineering Research Center were awarded three patents related to the use of nanomaterials to purify drinking water, industrial wastewater, contaminated soils and sludges from municipal wastewater treatment plants.

- Future H2O is creating a future of water abundance through solutions-oriented research and implementation partnerships. Future H2O is training the next generation of water leaders through three new online education programs, including a 300-level ASU Online course; micro-learning modules for companies, utilities or teachers; and graduate hybrid specialty courses for water professionals in training.

- A team of four graduate students worked with Sun Power Puerto Rico to design a disaster-resilient solar electricity system that allows community leaders to safely remove and replace panels. The team completed installation in July 2019, right before hurricane season and a major earthquake that affected Puerto Rico’s electricity grid. A wireless monitoring system was added in October 2019.

- Grasshoppers and locusts have substantial impact on agriculture and livelihoods worldwide. Researchers in ASU’s Global Locust Initiative (GLI) discovered that soil amendments that increase crop nitrogen content can reduce locust damage and significantly boost crop yield. GLI is putting this research into action in West Africa with support from the U.S. Agency for International Development.

- The School of Sustainability’s executive and professional education initiative designed an innovative online sustainability training for Wells Fargo’s nearly 200,000 employees. A public version of the training reaches thousands of additional learners. The initiative is now working with Wells Fargo to develop five online professional training courses with micro-credentials for the Sustainable Earth portal.

- Project Cities successfully completed two semester-long partnerships with the City of Peoria and the Town of Clarkdale, and an extended project with the City of Glendale. The partnerships provided 224 students with hands-on learning opportunities while helping communities with sustainability challenges ranging from water conservation to transit to recycling management.

- Researchers in ASU’s Center for Bio-mediated and Bio-inspired Geotechnics (CBBG) Engineering Research Center were issued three patents for enzyme-induced carbonate precipitation technology, which turns loose sand into cemented sand. The technology offers a wide variety of applications, such as controlling fugitive dust, strengthening building foundations, reducing the potential for ground failure during earthquakes and reducing soil erosion from runoff.
ASU’s National Security Systems efforts are anchored in the Global Security Initiative. GSI addresses security challenges that are global in scale, borderless by nature, interdependent and often have no clear solutions. These threats require a novel, holistic approach centered on interdisciplinary research that spans the public, private and academic sectors. GSI develops practical, mission-relevant approaches and effective decision-oriented tools for policymakers and implementers, drawing upon faculty expertise and connections with the defense, security and diplomacy communities.

TRIF investment in National Security Systems at ASU also supports innovative efforts in space exploration. This includes NewSpace, which pairs ASU expertise with the commercial space industry, and the Interplanetary Initiative, which approaches critical questions about our space future that are neglected elsewhere.

In addition, TRIF investment contributes to programs and facilities that support these efforts through infrastructure and instrumentation, technology transfer and external collaborations.

GOALS:

• Attract significant additional external funding to advance research in emerging areas such as cybersecurity, resilience, health and human security, and resource security.
• Transfer scientific advancements from lab to marketplace through inventions, startups and licensing agreements.
• Create and strengthen private-sector collaborations to accelerate research and share resources and capabilities.
• Provide advanced education and training and accelerate the pipeline of highly trained researchers into the defense, intelligence and space industries.
• Inform and inspire the broader community through educational outreach efforts, including engagement and collaboration with K-12 educators and nonprofit organizations.

“As one of the most unique and exciting courses to take while at ASU, Space Business & Entrepreneurs ... is also one of the most instrumental for hopeful space professionals to get an intimate glimpse into the growing industry.”

— Jonathan Roll, ASU Master’s Student, Science and Technology Policy
SUMMARY OF ACCOMPLISHMENTS

• GSI’s Center for Cybersecurity and Digital Forensics is engaging the next generation of Arizona's technical workforce, providing hands-on research experience working with government and industry on complex cybersecurity challenges. More than 45 students are gaining the advanced skills Arizona needs to continue to thrive as a technological hub through CDF’s $28 million research portfolio on binary analysis, phishing, scams and other topics.

• In November, GSI’s Cybersecurity Education Consortium (CEC) partnered with IBM to host a CyberDay4Girls learning event that introduced cybersecurity concepts and skills to more than 200 middle school girls. CEC also created a curriculum on cybersecurity to help local teachers introduce the topic in their classrooms.

• GSI provided upskilling courses on management and business techniques to information security experts at PayPal, giving participants the skills needed to advance in the company. GSI also helped organize the annual National Initiative for Cybersecurity Education Conference in Phoenix in November, which brought more than 800 people from around the country together to discuss the changes needed to develop the cybersecurity workforce of the future.

• Supported by a $3 million award from the Department of Defense, GSI’s Center for Human, Artificial Intelligence, and Robot Teaming is working with industry, universities and other organizations to incorporate team science into the next generation of AI technology — critical for the use of AI not only in national security missions, but any situation where teamwork and trust are vital to successful outcomes. This research is applicable to the future of work, particularly in technology hubs like the greater Phoenix area.

• ASU has been selected by the U.S. Defense Advanced Research Projects Agency (DARPA) to create an epigenetic tool to fight against weapons of mass destruction. This field-deployable, point-of-care device will determine in 30 minutes or less if a person has been exposed to weapons of mass destruction or their precursors. The DARPA award, worth up to $38.8 million over four years, will build on the university’s growing capabilities in developing molecular diagnostics for applications in defense and human health.

• The Flexible Electronics and Display Center has completed its U.S. Army flexible X-ray detector project, developing and testing the world’s first fully flexible X-ray detector backplane and flexible scintillator. X-ray panels were previously built on glass substrates, which were heavy and easily broken, making them unsuitable to deploy in the field to inspect suspected IEDs. FEDC’s flexible technology can be draped across an object to be inspected and rolled into a two-inch tube for easy transport.

• In August 2020, The Interplanetary Initiative will launch its three-year Bachelor of Science in Technological Leadership degree program. Between July 2019 and March 2020, the initiative’s public events have reached 700 people in person and 13,000 people via livestream.

• ASU NewSpace supported the Space Business & Entrepreneurs course with 16 speakers from across the commercial space industry. As part of the class, 16 students developed teams and created their own business pitches to support a space-related startup.
ACCESS AND WORKFORCE DEVELOPMENT

Programs supported through the Access and Workforce Development focus area are working to upskill today’s workforce, educate and train the leaders of tomorrow, support entrepreneurs and small businesses, and advance critical and emerging industries.

As the most innovative university in the country, ASU is continually seeking new ways to partner with businesses, nonprofits, governments and others to provide accessible lifelong learning and support a thriving, sustainable economy in Arizona and beyond. For example, ASU brings together interdisciplinary teams of students — mentored by faculty members — to collaborate with outside organizations to help solve key challenges. Partners get to work with a problem-solving team selected to provide the optimal skill set, while students gain valuable hands-on career experience.

GOALS:

• Attract additional external funding and stimulate new funding opportunities by effectively communicating to potential sponsors the outcome-focused nature of programming.

• Guide the launch of new startup companies, particularly among student entrepreneurs.

• Create and strengthen partnerships with corporations, municipal and state governments, regional economic development organizations and chambers of commerce, and local community members, including entrepreneurs.

• Provide educational opportunities throughout the community, such as teacher trainings, apprenticeships, conference presentations, curriculum development and dissemination, maker camps and classes, and community engagement.

“With its student-led design, (the ShipShape) project not only brings fresh thinking to our work, but also provides students with a window into international development work and the work of our agency, which many do not know about. It’s a win-win!”

– Sharmila Raj, USAID Health Development Officer
SUMMARY OF ACCOMPLISHMENTS

- ASU Corporate Engagement and Strategic Partnerships (CESP) created a public-private partnership with Infosys, a global leader in next-generation digital services and consulting. The partnership is creating over 1,000 jobs for Arizonans through the opening of the Technology Innovation Center at SkySong, the ASU-Scottsdale Innovation Center. ASU will continue accelerating the Infosys workforce when they move to the Novus Innovation Corridor.

- ASU Practice Labs™ offer a custom approach to identifying, addressing and solving complex business issues. Practice Labs mobilize student teams, with oversight from faculty members or project managers, to work on pressing industry partner needs. To date, the program has involved more than 50 students and over $600,000 in funding from 10 local, national and international partners.

- ASU Entrepreneurship + Innovation supports the development of a circular economy, a sustainable approach that includes designing out waste and pollution, keeping products and materials in use, and regenerating natural systems. From January 2017 to December 2019, 19 circular economy ventures participated in the RISN Incubator, a business accelerator offered by ASU and the City of Phoenix. These ventures raised $3.72 million in capital and $4.14 million in revenues, filed 14 patents and launched 25 products.

- MacroTechnology Works is advancing Arizona's semiconductor industry, creating a regional ecosystem of innovation to develop and manufacture new technologies. Industry partners have the unique opportunity to lease space at MTW and to utilize ASU's Advanced Electronics and Photonics facility while engaging in collaborative research with ASU faculty and students. In FY 2020, two industry partners — Applied Materials and Von Ardenne North America — signed lease agreements. Several startup companies, including Cactus Materials, NuevoGen, SwiftCoat and Amberwave, have also established presence on site.

- ShipShape is a free, offline mobile education game that teaches basic supply chain skills to health care workers. The app was developed by ASU students with funding from the U.S. Agency for International Development. It combines a user-friendly interface with curriculum designed specifically for the developing world. The app is currently being implemented in Ghana in partnership with the Kwame Nkrumah University of Science and Technology (KNUST), with plans to expand to Nigeria, Kenya and other developing countries in the future.

- 450 employees of Chemonics, a leading international development firm, have participated in a fully online MiniMaster's in supply chain management taught by ASU business faculty. Ten MiniMaster’s students have matriculated into ASU and are currently completing master’s degrees.

- SciHub is an integrated research, teaching, outreach and product development lab. SciHub’s Clubes de Ciencia summer program engages students in hands-on, intensive, one-week science workshops. In 2019, 166 high school students from Arizona and Mexico participated. In the 2019-2020 school year, 60 high school students also participated in SciHub’s SCience and ENgineering Experience (SCENE), which provides science research experience in state-of-the-art labs at ASU.

- ASU’s Center for Wireless Information Systems and Computational Architectures (WISCA) is spinning out two companies. One will advance ASU-developed small-scale radars for contactless heart rate monitoring. Another is based on technologies developed through a $20 million DARPA award for the Domain-Specific System on Chip program.
In fiscal year 2020, ASU continued its trajectory of rapid growth and impact. The university reached $640 million in research expenditures and submitted a record $2.4 billion in proposals, largely based on TRIF-enabled activities. ASU researchers address the most pressing challenges in each of the TRIF focus areas in order to benefit the citizens of Arizona and beyond.

The coronavirus crisis is far from over, and ASU is mobilizing efforts not only toward testing, tracking and treating the disease, but also understanding and mitigating its effect on our economy and society. For example, GSI’s Center for Accelerating Operational Efficiency, a Department of Homeland Security Center of Excellence, is leveraging its ongoing research in disaster preparation and response to address logistics and supply chain challenges related to the pandemic. In addition, ASU’s Research Development team is assisting more than 240 faculty and staff members interested in developing collaborative proposals in response to COVID-19 in areas ranging from immigration policy to disinformation to how people use data visualizations.

The Biodesign Institute’s compact X-ray free electron laser (CXFEL) is poised to increase our understanding of viruses and other pathogens, as well as countless other molecules and materials. The CXFEL took a major leap forward this year with a comprehensive design study, supported by a $4.7 million grant from the National Science Foundation. In November, ASU hosted a Nature conference focused on XFEL technology, attended by top scientists in the field. Conference attendees, as well as senior leadership from the National Institutes of Health, toured the CXFEL facility and learned about the potential for research projects and collaborations.

New technologies are revolutionizing industries and transforming the workplace. ASU has leveraged TRIF investment to secure funding that will advance critical industries and train tomorrow’s workforce to meet the demands of the future.

Corporate Engagement and Strategic Partnerships (CESP) secured a $30 million gift from State Farm to drive a new education and career development program that targets high school and transfer students, as well as working adults. This program creates connections between students, faculty, mentors and employers that enable lifelong learning, providing learners the knowledge necessary for life and work in the 21st century.

CESP also won a $2 million Department of Labor grant focused on public-private partnerships to address the acute need for a skilled information technology workforce. This program targets 1,600 ASU students and new learners over a four-year timeframe, promoting the large-scale expansion of apprenticeships across the nation to a range of employers, including small and medium-sized businesses.

The Navrotsky Eyring Center for Materials of the Universe is uniting interdisciplinary teams of scientists to help design next-generation materials for space exploration. Initial TRIF investment in the center has attracted nearly $5 million in grant funding and infrastructure development, in addition to a $1 million endowment for expanding and sustaining the center.

These are just a few of the ways that ASU is building on its foundation of TRIF-enabled impact. As the university’s research enterprise grows, ASU accelerates discoveries and technologies that provide real solutions for health, sustainability, security and economic well-being. ASU provides valuable opportunities for hands-on learning to graduate, undergraduate and K-12 students. And, ASU shares knowledge broadly, reinvesting in Arizona to help communities prosper and thrive.
Northern Arizona University’s capacity to invest in areas of strategic research growth was significantly expanded in 2016 when the Arizona Board of Regents approved NAU’s bold five-year plan for fiscal years 2017-21 TRIF. NAU’s TRIF financial investments have had a meaningful impact throughout Arizona, producing economic benefits through scientific advancements, workforce training and access to higher education. In fiscal year 2020, TRIF funding has enabled NAU faculty to attract a total of $23,685,184 in external funding through all five initiatives.

Beyond their economic benefits, NAU’s investments have also increased the university’s capacity to form successful research partnerships, strengthened the capability to commercialize new technologies and capitalized on the intellectual talent of faculty to achieve the university’s mission of enriching lives and creating opportunities for students and the communities NAU serves. This year, NAU was issued 19 patents. In addition, NAU filed 41 new patent applications and submitted 43 new invention disclosures.

One of the most compelling examples of NAU’s successful research partnerships is the response to the COVID-19 pandemic. In April 2020, NAU’s Pathogen and Microbiome Institute (PMI) launched the COVID-19 Testing Service Center (CTSC). By quickly repurposing its existing biodefense research infrastructure for the new testing facility — labs rated at Biosafety Level 3 (BSL-3), one of the highest levels of biocontainment — PMI dedicated much of its significant research capacity to fight the COVID-19 pandemic, enabling both industry and nonprofit partners to test potential vaccines and treatments against the coronavirus.

- Through its five TRIF initiatives—Improving Health (iHealth), National Security Systems (NSS), Access and Workforce Development (AWD), Water, Environmental and Energy Solutions (WEES) and Space Exploration and Optical Solutions (SPACE)—NAU has consistently generated a positive return on TRIF investments.
- The iHealth initiative has propelled NAU to innovate and discover — in the lab, in clinical settings and in the public health arena — in ways that elevate translational research capabilities to new heights. This has become even more evident as NAU researchers have catalyzed their efforts around the COVID-19 pandemic.
- The NSS initiative has driven investment in research-intensive hires and in high-tech laboratories, and as a result, NAU has already become a leader in the critical area of cybersecurity, developing new technologies to protect Arizona’s businesses and consumers while spurring its economy. This discipline is a core national security priority that will affect all Arizonans in the years ahead and NAU is committed to developing the highly qualified workforce needed to meet these challenges.
- AWD supports the state’s economic growth through the development and delivery of degree and certificate programs that support workforce needs in high-demand areas such as health and teacher education, particularly focused on serving communities throughout Arizona.
- The WEES initiative, based on regional research that is one of NAU’s historic strengths, has driven the university to explore and discover on a global scale, enhancing the university’s leadership position in this discipline.
- The SPACE initiative capitalizes on the recent recruitment of research-intensive faculty in the areas of astronomy and planetary science, while leveraging the wealth of astronomical resources found throughout Arizona at partner institutions, to prepare a workforce that will strengthen Arizona’s stature as a worldwide leader in this rapidly growing area of research.
“Ongoing funding from the Technology and Research Initiative Fund (TRIF) has enabled Northern Arizona University to significantly increase its research productivity, becoming globally recognized for achievements in a wide range of disciplines.

“NAU’s research enterprise is a vital growth engine for Arizona’s economy. As our researchers and research centers work to carry out their missions, they actively collaborate with state and community agencies, foundations, nonprofit organizations and initiatives and a host of other partners.

“Our success in research has a significant impact on the quality of Arizona’s education system. Through our public service and outreach initiatives, we influence curricula in K-12 classrooms throughout the state. Our dedicated faculty researchers, who serve as both educators and mentors, provide meaningful hands-on experiences to our students, preparing the next generation for the challenges of the future.

“NAU’s public service and outreach initiatives are making our state a better place for every Arizonan by increasing access to healthcare, quality education and social support services for underserved populations in our region.

“Research thrives at NAU, and with funding from TRIF, we continue to build our capacity for research in a broad range of disciplines that will help improve health, the environment, the economy — and quality of life — for all.”

– Rita Hartung Cheng, President
IMPROVING HEALTH

Northern Arizona University’s investments in the iHealth initiative focus on three areas: health research initiatives, pathogen genomics and bioengineering/biotechnology.

Health Research Initiatives: NAU is expanding its capacity to produce nationally recognized translational health research and to make discoveries in personalized medicine, infectious disease control and clinical research around a wide range of chronic health conditions. NAU established the Center for Health Equity Research (CHER) to address the health care disparities of the state’s underserved populations, including Native Americans, Hispanics and rural communities. This initiative has resulted in millions of dollars in new grant funding — most notably, the Southwest Health Equity Research Collaborative, a five-year, grant-funded initiative supported by more than $21.4 million in funding from the National Institute on Minority Health and Health Disparities of the National Institutes of Health.

Pathogen Genomics: Investments in NAU’s world-renowned Pathogen and Microbiome Institute (PMI) have led to the creation of intellectual property and national recognition in biosecurity. This expansion and investment in PMI has led to increased extramural research funding as well as startup companies formed to commercialize its discoveries. PMI’s research focuses on the evolution, ecology and epidemiology of some of the most threatening disease-causing viruses, bacteria and fungi, from COVID-19 to hospital-acquired infections, anthrax, plague, Valley Fever and biological warfare agents. In fiscal year 2020, NAU launched the COVID-19 Testing Service Center (CTSC) to grow the SARS-CoV-2 virus and test new drugs against it, giving Arizona an edge in responding to the crisis.

Bioengineering/Biotechnology: Investments in NAU’s strengths in bioengineering and biotechnology are catalyzing discoveries that improve lives, foster economic growth in Arizona and beyond and provide cutting-edge training in bioengineering research for undergraduates and graduate students who will join the biotechnology workforce. Research in this field focuses on a wide range of areas, including personal bionics and wearable robotics, rehabilitation, hearing improvement and materials and devices for biocompatible implants and sensors. In fiscal year 2019, NAU established the Center for Materials Interfaces for Research and Applications (¡MIRA!). Through basic and applied science discoveries in materials interfaces, NAU will impact health, energy and the environment, and these new technological applications can improve lives and enhance economic potential. NAU launched a new Ph.D. program in Applied Physics and Materials Science in fiscal year 2020, positioning NAU to attract students to a unique state program: a research-intensive Ph.D. program that prepares graduates for meaningful and fulfilling careers in the application of physics or materials science to critical areas of national need.

GOALS:

• Leverage NAU’s existing research and intellectual assets to generate external funds.
• Create curricular innovations related to key workforce needs in the state and region.
• Catalyze an entrepreneurial spirit among university faculty and students.
• Build and strengthen partnerships with health care providers in Northern Arizona.
• Generate new biotechnology startup enterprises and jobs in the region.

As the principal investigator for the Partnership for Native American Cancer Prevention, Professor Jani Ingram has been awarded $6.83 million by the National Cancer Institute (NCI) for NAU to continue its efforts in cancer research, training and outreach programs serving Native American communities for the next five years. Since 2002, NAU and the University of Arizona Cancer Center have received funding from NCI, working in partnership to alleviate the unequal burden of cancer among Native Americans.
• Northern Arizona University’s TRIF investments under the Improving Health initiative range from basic, applied and translational research in human biology, bioengineering and microbiology/genomics, to clinical, community and behavioral health sciences. By building valuable partnerships with local and regional health care providers, research institutions and tribal communities, NAU researchers continue to make discoveries and invent new technologies that have an immediate and long-lasting impact on the health and well-being of the diverse populations of Arizona.

• NAU faculty who received TRIF funds through the Improving Health initiative received $6,234,337 in external grant funds in fiscal year 2020.

• The U.S. Army Contracting Command awarded Regents Professor Paul Keim, executive director of PMI, $2.8 million to develop prototype Bartonella hensalae and Chikungunya virus biothreat detectors. Keim also received a $214,493 award to collaborate with Arizona State University on a major project for the Defense Advanced Research Projects Agency to develop a field deployable diagnostic test that can quickly detect an individual's history of exposure to weapons of mass destruction.

• Assistant Professor Jason Ladner, assistant director of PMI, was awarded $781,269 to collaborate with TGen on a project for the National Institutes of Health (NIH). The researchers will develop a technology that enables antibodies against hundreds of thousands of selectable targets to be measured simultaneously in a small drop of blood, with a focus on antibodies that recognize any of the more than 300 viruses capable of infecting humans.

• Associate Professor Jeffrey Foster, assistant director of PMI, received a $563,784 award from the National Science Foundation (NSF) and the National Natural Science Foundation of China to collaborate on a major genetic study of white-nose syndrome in bats.

• The NSF awarded Regents Professor Kiisa Nishikawa $551,792 to develop a novel approach for investigating the neuromechanics of in vivo muscle function.

• Professor David Wagner, director of PMI’s Biodefense and Disease Ecology Center, received $500,000 from the U.S. Defense Threat Reduction Agency (DTRA) to study the human plague in Madagascar.

• The NIH awarded Assistant Professor Emily Cope, assistant director of PMI, $468,472 to seek a microbial link between chronic rhinosinusitis and asthma, both serious and costly diseases. She was also awarded $50,000 by the Arizona Alzheimer’s Consortium to study the causality of the gut microbiome via the gut-brain axis in Alzheimer’s disease.

• Assistant Professor Zachary Lerner received a $423,876 award from the NIH to evaluate the novel use of powered ankle assistance from a wearable exoskeleton to improve walking economy across varied terrain in children with cerebral palsy.

• The DTRA awarded Assistant Professor C. Todd French $374,656 to explore how environmental factors affect the presence and virulence of Burkholderia pseudomallei. He also received $55,112 from the NIH to develop vault nanoparticles as a delivery platform for Burkholderia pseudomallei and Burkholderia mallei antigens.

• Regents Professor Julie Baldwin, director of NAU’s Center for Health Equity Research, received a $250,000 grant from the NIH to study the unique needs of caregivers of persons with Alzheimer’s disease and related dementias, identifying how family caregivers are coping with current COVID-19-related demands. She was also awarded $75,000 by the Flinn Foundation to develop mathematical models describing the spread of SARS-CoV-2 that are fine-tuned to the rural communities of northern Arizona.

• Assistant Professor Crystal Hepp, assistant director of PMI, was awarded a $225,000 New Investigator Award grant by the Arizona Biomedical Research Centre to investigate the circulation and source locations of West Nile virus in the state.

• Professor Miguel José Yacamán received $200,000 from the NSF to develop a new physics-based test technology for COVID-19.

• Assistant Professor Amirhossein Arzani was awarded $174,999 by the NSF to develop a computational framework to predict cardiovascular disease progression.

• Assistant Professor Matt Salanga is leading a project funded through $100,000 from the Flinn Foundation to determine the most effective combination of cancer-fighting drugs to fight melanoma, the most lethal type of skin cancer.

• PMI has executed service agreements with two industry partners to leverage its new COVID-19 Testing Service Center (CTSC) capabilities. Assistant Professor French, who leads the CTSC, is working with scientists at Vault Pharma and Oncology Venture to test the effectiveness of their drugs on COVID-19. The Flinn Foundation awarded PMI $100,000 to accelerate the CTSC’s ramp-up to begin this work; the grant will also support the work of Associate Professor Bridget Barker, associate director of PMI.

• NAU was jointly awarded U.S. patents for technologies co-invented by Regents Professor Paul Keim: Systems and Methods for Universal Tail-based Indexing Strategies for Amplicon Sequencing; Single Molecule-Overlapping Read Analysis for Minor Variant Mutation Detection in Pathogen Samples (which was also awarded a European Union patent); and Isolated Genes and Transgenic Organisms for Producing Biofuels. NAU was jointly awarded a U.S. patent and a Japanese patent for Ionic Liquids for Transdermal Drug Delivery, co-invented by Associate Professor Andrew Koppisch.

• In fiscal year 2020, TRIF funds strengthened resources in NAU’s core facilities serving health research communities via NAU’s Research Equipment Acquisition Program, including the Imaging and Histology Core Facility and Environmental Genetics and Genomics Lab.
According to the U.S. Department of Homeland Security, the country’s economic vitality and national security depend on a stable, safe and resilient cyberspace. Under the fiscal year 2017-2021 business plan, Northern Arizona University’s investments in the National Security initiative focus on cybersolutions, which are being delivered through NAU’s School of Informatics, Computing and Cyber Systems (SICCS). Because of these investments, NAU is successfully attracting major funding from a variety of government agencies responsible for national security, including the U.S. Air Force and the U.S. Navy.

Cybersolutions address key challenges for secure computing. The most obvious challenge is the need for cybersecurity and encryption that cannot be easily defeated. Novel approaches and solutions will include both software designs and embedded encryption in hardware. Reconfigurable computing represents major challenges for cybersecurity due to a need for computing programs that are adaptable and often less secure, e.g. machine learning. Cyberphysical systems will require security to ensure that computers talking to other computers are not corrupted and harm entire systems of machine-to-machine communications. The same concern can be extended to remote sensing data and smart infrastructure systems such as smart cities, smart buildings and even smart cars.

GOALS

• Develop new secure applications of computing and computer-systems design.

• Collaborate with technology-driven industry partners.

• Generate nationally recognized science and scholarship by integrating emerging research domains with NAU’s areas of strength, including biological and environmental research.

• Emphasize scholarly productivity and extramural funding by creating a culture that centers on high expectations and high-impact interdisciplinary research.

• Provide cutting-edge training and learning opportunities to students by integrating research into existing curricular programs and building new programs that support 21st-century technological challenges.
Northern Arizona University’s National Security Systems initiative leverages research, discovery and training to develop and disseminate innovative and secure applications in informatics, computing and cyber systems. The university will accomplish its goals largely through NAU’s School of Informatics, Computing and Cyber Systems (SICCS), which was formed to meet the need for advanced interdisciplinary computational and data sciences, and to enable NAU to successfully compete for major external research grants in informatics, cyber systems development and cybersecurity.

- NAU faculty who received TRIF funds through the NSS initiative received $6,445,205 in external grant awards in fiscal year 2020.
- Associate Professor Fatemeh Afghah was awarded $349,149 by the National Science Foundation to develop transformative changes to the way challenges and responses to physical unclonable functions (PUF) are corrected.
- Assistant Professor Ryan Behunin was awarded $150,000 by the Defense Advanced Research Projects Agency to collaborate with Honeywell Aerospace Advanced Technology, which is leading a team of world-class universities and industry-leading technology partners, to make the first truly compact optical frequency standard-based clock. With short- and long-term stability more than 1,000 times better than any existing portable clock technology, the results of this project could dramatically improve real-world timing and navigation systems.
- Professor Bertrand Cambou received $49,526 from industry partner Sawblade Ventures for a project to develop and deploy a set of technologies strengthening Sawblade’s product offering. The researchers will build on the portfolio of cyber technologies developed by NAU, as well as those jointly developed with Sawblade, to select those that are synergistic with an advanced electronic design automation environment.
- NAU was awarded patents for five new technologies invented by Cambou:
  - Encoding Ternary Data for PUF Environments (two separate patents)
  - Systems Implementing Hierarchical Levels of Security
  - PUF Hardware Arrangement for Increased Throughput (two separate patents)
- NAU was awarded three separate patents for new technologies co-invented by Cambou and Afghah, Multi-State Unclonable Functions and Related Systems.
- NAU was awarded a patent for Authentication of Images Extracted from Unclonable Objects, a new technology co-invented by Cambou and Assistant Professor Abolfazl Razi.
- NAU was awarded a patent for False Alarm Suppression in Intensive Care Units, a new technology co-invented by Afghah and Razi.
- NAU launched three new online programs in cybersecurity — a Bachelor of Science, Master of Science and a graduate certificate. These programs prepare students with the technical skills to analyze and understand cybersecurity exploits and to design hardened computational systems.

Associate Professor Fatemeh Afghah was one of only 40 researchers nationwide — and the only one in Arizona — recognized with the Air Force Young Investigator Award, a three-year, $450,000 grant intended to foster creative basic research in science and engineering, enhance career development and provide opportunities for engineers to address military challenges in science and engineering. Through this project, Afghah is developing an algorithm to enable an unmanned aerial vehicle — a UAV or drone — to monitor disaster-impacted areas. The fully autonomous system should be able to monitor the area, send pictures, develop a task list and a task allocation mechanism to assign work to other UAVs.
ACCESS AND WORKFORCE DEVELOPMENT

Northern Arizona University continues to expand upon more than three decades of success providing flexible, affordable, market-driven degree programs across Arizona. NAU’s TRIF initiative, Access and Workforce Development (AWD), supports statewide and online efforts to connect community members to degrees in the health sciences and education. By integrating cutting-edge pedagogy and instructional technology, these programs meet both student and employer needs throughout the state. Whether through concurrent enrollment at local community colleges or through robust transfer articulation agreements, a growing number of Arizonans have achieved a higher education degree and career success through NAU’s workforce-driven programs.

Health services and education remain high demand workforce industries in Arizona. NAU continues to expand nursing program offerings to meet a variety of new and practicing nurse employment and advancement needs. In the spring of 2020, NAU launched its first for credit microcredential for nurses with a master’s degree to gain prescriptive authority. NAU’s heritage as a teacher’s college is honored by this initiative through support of teacher education programming throughout Arizona and online.

Student success and degree completion are supported through integrated, on-demand services, informed by the best practices in student onboarding, retention and coaching, and through the application of adaptive learning technologies.

GOALS

- Advanced training for high demand health professions, including expanded concurrent programs with community colleges and a new competency-based nursing program.
- Continuing education and advanced degree offerings in teacher education.
- Expansion of student success and retention efforts through engaged academic coaching and advising for online and statewide students.
- Design and coordination of a coherent and comprehensive teaching and learning support structure for university-wide application.
- Applying e-Learning strategies to increase degree productivity; transform how faculty teach; and improve how and how much students learn while preparing students with life-long skills for learning through technology.
- Intentional course design for student success with a focus on blended delivery modes and application of adaptive learning technologies for individuation of learning.
SUMMARY OF ACCOMPLISHMENTS

A vital component of the mission and strategic plan of Northern Arizona University is to provide access to higher education and create opportunities for Arizonans. In addition to the residential campus in Flagstaff, NAU offers over 100 programs online and across the state in partnership with local community colleges to meet current and emerging workforce needs. As workforce and market priorities evolve, especially during these unprecedented times, it is imperative that access to relevant higher education programs are available when needed, at a price Arizonians can afford. Equally important is the ability for all students to receive the same high-quality services, regardless of their learning modality or location.

• Nursing and other skilled health professionals are in high demand. Health care and social assistance remain in the top six section of industry in Arizona by job volume, and are expected to continue to grow into the next decade (U.S. Bureau of Labor Statistics). NAU offers seven health sciences bachelor’s degree completion programs in addition to a concurrent RN-BSN nursing program to provide flexibility to working health professionals. These programs are offered online and around the state with our community colleges partners.

• The College of Education expanded its initiatives in serving the behavioral health needs of Arizona. Specifically, program capacities were doubled to admit twice the number of students in school counseling, school psychology and clinical mental health counseling.

• The university was able to respond to the needs of students who were displaced as a result of university (Argosy) closures in Arizona. NAU expanded the reach of teacher education programs across Arizona, with the support of the Arizona Teachers Academy scholarship, and especially in rural Arizona.

• NAU Online continues to support and build web-enhanced, blended, hybrid and fully online (both traditional and competency-based) courses through its e-Learning unit, with an emphasis on course consistency, quality and student success.

• NAU Online piloted a continuing education unit in the fall that was supported by e-Learning in the development of non-credit education microcredentials. In the spring, an Entrepreneurship series and a group of virtual summer camps including Meaning Making in a Pandemic, Introduction to Brewing Science and The World of Olympians were highlights of this effort.

• NAU Online’s e-Learning unit has been pivotal in preparations for the delivery of NAUFlex courses in anticipation of enrollment challenges related to COVID-19, where live synchronous remote instruction via Zoom and Collaborate Ultra is backed up by asynchronous content. This included the delivery of dozens of well-attended webinars on effective instruction and technology tools.

• NAU continues to leverage its strengths in individualized learning and student support as the university provides access to Arizonans who choose to learn away from the main campus. Aligning services for nontraditional learners, such as expanded advising hours, access to Cline Library 24/7, writing support and career development have reinforced NAU’s commitment to the success of all students, regardless of their learning modality.

• TRIF dollars provided not just academic programming for Arizona students, but also ensured professional advising and support services for statewide and online students, including fieldwork placements for health professionals.
Under the fiscal year 2017-2021 Business Plan, Northern Arizona University’s investments in the WEES initiative focus on two areas: Adapting to a Changing Environment (environmental sciences) and Forest Health and Land Management (forest and land). These programs build on NAU’s historical strengths in environmental and ecosystem sciences. Investments in these areas have created several important research centers at NAU:

- **Center for Ecosystem Science and Society (Ecoss):** Researchers in Ecoss study the interactions of biological communities to determine how they respond to and influence environmental change. Ecoss prioritizes the training of future scientists and disseminating information about their discoveries to the public.

- **Ecological Restoration Institute (ERI):** Investments in ERI support the development of solutions to the costly environmental problems of degraded forest health and unnatural wildfire. Losses of revenue from decreased tourism, short-term job losses and damage to water supplies and water quality are just a few of the economic impacts that ERI’s work seeks to alleviate.

- **In fiscal year 2020, NAU established the Center for Adaptable Western Landscapes (CAWL). CAWL will capitalize on the ongoing success and the great legacy of achievement of the Merriam-Powell Center for Environmental Research (MPCER), which has been instrumental in advancing cross-disciplinary environmental research and training at NAU, and the Land Conservation Initiative (LCI), which has supported applied biological research, collaborative planning and field-based educational experiences to forge new solutions to landscape-scale environmental challenges, bringing strong scientific support to public deliberation and land-management efforts across Arizona. CAWL will synthesize these two streams of success, preserving much of the very best of both, and creating new synergy to achieve even more. NAU has great expectations for CAWL to have robust success in scientific achievement, collateral benefit for the training and mentoring of students, success in attracting and maintaining significant sponsored projects, producing broad societal benefit and serving western communities.**

**GOALS**

- **Leverage NAU’s existing research and intellectual assets to generate external funds.**

- **Create curricular innovations related to key workforce needs in the state and region.**

- **Catalyze an entrepreneurial spirit among university faculty and students.**

- **Build/strengthen partnerships with Arizona environmental and land-management groups.**

- **Generate new environmental business opportunities and jobs in the region.**
SUMMARY OF ACCOMPLISHMENTS

Northern Arizona University’s investments under the TRIF WEES initiative have generated a significant increase in external funding and enhanced capacity for addressing complex issues in environmental variability and ecosystem science as well as forest restoration and land management. Because of this enhanced capacity, NAU researchers have been able to develop solutions to some of the unique environmental challenges of the southwestern United States.

- NAU faculty who received TRIF funds through the WEES initiative received $8,910,904 in external grant awards in fiscal year 2020.

- Regents Professor Bruce Hungate, director of NAU’s Center for Ecosystem Science and Society (Ecoss), received a $2.24 million grant from the U.S. Department of Energy to investigate and describe the microbial ecology of nutrient feedbacks to climate warming, conducting experiments in arctic, boreal, temperate and tropical biomes.

- Professor Edward Schuur, who leads the global Permafrost Carbon Network (PCN), was awarded $1 million by the National Science Foundation to provide a platform for collaborative research and networking activities that will give scientists and decision makers an annually updated view of changing Arctic carbon emissions into the atmosphere. Results of this research will inform the Intergovernmental Panel on Climate Change. He also received $456,652 from the NSF to acquire IonPlus automated radiocarbon instrumentation, which will enable researchers to produce an integrated gas analysis and labeling radiocarbon system with a focus on Arctic carbon and geochronology. Schuur received $1 million from the U.S. Department of Energy to continue his research into changing environmental conditions in high latitude arctic and boreal ecosystems as a result of permafrost thaw.

- The NSF awarded Associate Professor Nicholas McKay four grants totaling $1.34 million:
  - $527,906 to compare the rate of Arctic system response to past warming events with similar rate and duration to that of modern warming, providing a better understanding of the potential response to future warming.
  - $453,466 to build on his previous work to develop PReSto: A Paleoclimate Reconstruction Storehouse to Broaden Access and Accelerate Scientific Inference, which will make paleoclimate information vastly more accessible beyond academia.
  - $209,116 to build on previous work to support a hybrid-federated annotation system within the geosciences.
  - $152,451 to launch a data mobilization campaign designed to bring Earth systems data into community-curated scientific that allow users to detect, map and investigate abrupt change in Earth systems.

- The NSF awarded Assistant Professor Rebecca Best $882,310 to conduct a study to investigate the magnitude, evolution and community consequences of phenotypic plasticity in a widespread foundation tree, Populus fremontii.

- Assistant Professor Christopher Doughty was awarded $273,453 by NASA to validate the effects of climate change on plant water use efficiency in the tropical regions of South America and Western Africa.

- Professor Han-Sup Han, director of forest operations and biomass utilization for NAU’s Ecological Restoration Institute, was awarded $260,000 by the U.S. Forest Service for a project designed to reduce wildfire risk, develop the wood products market, invest in rural economies and increase forest restoration treatments across Arizona, New Mexico and Colorado.

John & Pit Lucking Family Professor Catherine Gehring, co-director of the new Center for Adaptable Western Landscapes, received $217,380 from the U.S. Geological Survey to evaluate strategies for managing and restoring dryland ecosystems degraded by drought.
SPACE EXPLORATION AND OPTICAL SOLUTIONS

Under the fiscal year 2017-2021 Business Plan, Northern Arizona University’s investments in the SPACE initiative focus on three areas - solar system origins, Mars and exoplanets. These programs build on NAU’s historical strengths in astronomy and planetary science, while leveraging partnerships with institutions across Arizona and beyond that provide access to an abundance of world-class telescopes, observatories and state-of-the-art imaging systems.

Solar system origins researchers study the formation and evolution of the solar system, detecting and characterizing the physical and chemical properties of rocky asteroids that could potentially impact the Earth. They are looking for the elusive “Planet X,” a large and undiscovered planet in the most distant regions of the solar system. They are also studying objects in the Kuiper Belt, a vast region of comets and other icy objects beyond the orbit of Neptune.

Mars researchers use spacecraft data to study the geology of the Red Planet while hunting for water and life on its surface. Faculty members and their students direct the path and daily tasks of the NASA Curiosity Rover on the surface of Mars from the NAU campus; they also build flight instruments for spacecraft bound for Mars.

Exoplanets researchers study planets orbiting distant stars using telescopes and computer simulations to characterize their physical and chemical properties. The researchers’ goal is to identify which of the thousands of known exoplanets are the best candidates to harbor life and are therefore worthy of further study.

GOALS

- Double external research funding in astronomy and planetary science.
- Partner with Arizona companies to develop instrumentation for shoe-box sized spacecraft (CubeSats).
- Fly a CubeSat to an extraterrestrial object, such as an asteroid.
- Expand partnerships with private observatories such as Lowell Observatory, FRoST and ATLAS.
- Build and/or operate small telescopes such as FRoST and ATLAS to detect potentially hazardous near Earth asteroids.
- Continue to operate and expand the capabilities of the Astrophysical Ice Laboratory on the NAU campus.

Assistant Professor Mark Salvatore was awarded $167,000 by the National Science Foundation to develop a protocol to analyze a massive amount of data — more than 60,000 images — across the frozen landscape of Antarctica. Ultimately, Salvatore aims to build the cyberinfrastructure required to make the most of satellite imagery for geosciences, starting with researchers working in polar areas and branching out to the larger non-polar community.
SUMMARY OF ACCOMPLISHMENTS

As the first International Dark Sky City, Flagstaff — at 7,000 feet above sea level — is a natural location for studying astronomy and planetary sciences. Through TRIF investment in the Exploring Planetary Systems research initiative, Northern Arizona University is developing unique and cutting-edge research and academic programs in solar system origins, Mars and exoplanet research. TRIF investment enables NAU to expand its partnerships with Lowell Observatory and the U.S. Naval Observatory, and provides access to highly sought-after telescopes such as the Discovery Channel Telescope and the Flagstaff Robotic Survey Telescope.

NAU researchers leverage TRIF support with external funding to discover new ways of exploring space, to contribute to a new understanding of our place in the universe and to seek opportunities to translate research into economically productive innovations with commercial applications.

- NAU faculty who received TRIF funds through the SPACE initiative received $2,094,738 in external grant awards in fiscal year 2020.
- Professor David Trilling was awarded $792,164 by NASA to support a large-scale telescope survey in Chile he is leading with a multi-institution team. The project’s overall science goals are to measure the properties of faint bodies in the outer Solar System to help understand the formation and evolution of our Solar System.
- NASA awarded Associate Professor Joshua Emery four grants totaling $781,298:
  - $320,717 for a project to search for the presence of water on Near Earth Objects (NEOs) and asteroids in the Main Asteroid Belt in collaboration with scientists at the University of Arizona.
  - $261,907 for his work on the OSIRIS-REx Asteroid Sample Return Mission, whose primary objective is to send a spacecraft to the asteroid Bennu and return with a pristine sample from its surface. Scientists will study the sample in depth to address some of NASA's (and humanity's) fundamental questions: How did the Solar System form? How did life evolve in the Solar System? Are asteroids harbingers of life or death, or both?
  - $160,904 to investigate the origin of CO_2 ice and dark, spectrally red material on the surfaces of the regular satellites of Uranus.
  - $37,770 to collaborate with the Southwest Research Institute on the Lucy mission, the first reconnaissance of the Jupiter Trojan asteroids — objects that hold vital clues to deciphering the history of the Solar System.
- Professor Devon Burr received $198,730 from NASA to investigate the source(s) of dark sand in the western medusae fossae formation on Mars. He also received $64,976 from NASA to collaborate with Colgate University to investigate endmember sedimentological processes on Titan, the largest moon of Saturn and the second-largest natural satellite in the Solar System.
- In fiscal year 2020, TRIF funds were used to strengthen partnerships with telescope facilities used by NAU astronomers and planetary scientists, including the Discovery Telescope Partnership with Lowell Observatory.
At NAU, aspirations are at the heart of everything the university does. Students bring their aspirations to NAU to learn, grow and achieve academic success that will ultimately lead to fulfilling lives. Faculty researchers are always aspiring, too — to solve the most compelling problems, to meet the most complex challenges, to boldly explore the next frontiers of knowledge. NAU continues to generate impressive research outcomes, and TRIF funding is a strong mainstay, enabling NAU to make strategic investments that promise to sustain this growth well into the future.

TRIF funding has provided the foundation for NAU to attract new external research funding; increase capability to develop inventions with high potential for technology transfer; and strategically invest in workforce development. These accomplishments enhance Arizona’s research enterprise and reputation while addressing critical issues facing the world today in the areas of health care, defense and security, land and water management, and space exploration. Strategic investments in high-research faculty, research centers and new graduate programs have enabled NAU to make significant financial impact progress, generating technology transfer activity, including invention disclosures, patents issued, and licenses and options.

TRIF resources have enhanced NAU’s educational infrastructure and capability to prepare its students to be complex problem solvers, addressing the workforce needs of today and an increasingly diversified workforce for the future. These investments develop new talent as demonstrated by the increasing number of NAU graduates who are staying in Arizona to live and work after graduation, as well as the attraction of new talent to Arizona to study, teach and conduct research.

NAU’s TRIF initiative in Access and Workforce Development complements NAU’s mission to serve the state of Arizona through accessible education delivery models. This initiative includes the integration of technology and advanced learning designs to increase student engagement across all of NAU’s campuses. The primary focus of this effort is to provide educational alternatives to attending a residential campus in order to meet both student demands for a degree and workforce needs in local communities. NAU has advanced this effort through community campuses, in partnership with community colleges, online learning and the competency-based Personalized Learning program.
As the largest research university in the state, with nearly $690 million in research expenditures, the University of Arizona is producing results that are creating impactful solutions to many global problems, preparing students for the workforce of tomorrow and contributing as one of the largest economic engines for Arizona.

The philosophy of UArizona’s TRIF program is to advance economic development opportunities and benefit Arizonans. The university does this by catalyzing research and development; supporting the infrastructure, facilities and computing that enables cutting-edge research and development; producing results that leverage UArizona’s expertise; and attracting outside resources to the state.

UArizona is combining that philosophy with the newly approved Strategic Plan, inspired by the Fourth Industrial Revolution — a time of augmented intelligence and the fusion of digital, physical and biological worlds. UArizona’s plan is bold and distinctive with 90+ initiatives organized under five pillars.

**UArizona participates in the following TRIF initiatives:**

- **Improving Health:** Health care is changing, and UArizona is at the forefront of the precision health movement — finding individual solutions to medical problems by taking into account individual variation in genes, environments and lifestyles. TRIF investments in Improving Health allow the BIOS Institute — which aims to harness the power of its five disciplines (agriculture, engineering, medicine, pharmacy and science) — to connect and mobilize hundreds of world-class plant, animal and human bioscientists, engineers, physicians and computational researchers to develop creative solutions for complex challenges such as disease, hunger, water and food safety, and other environmental issues facing Arizona.

- **Water, Environmental and Energy Solutions:** UArizona has been recognized as the world’s No. 1 program in water resources by the Shanghai Academic Ranking of World Universities for the second consecutive year, recognizing outstanding leadership in water research. The WEES initiative invests TRIF dollars in cutting-edge food, energy and water research, cross-campus collaborations and innovative partnerships that promote fresh ideas, technologies and effective resource management practices necessary to help sustain a swelling global population. UArizona’s decision-support tools that integrate rainfall data into transportation and agricultural scenario planning as well as research on how groundwater pumping affects rivers, makes Arizona a safer and healthier place to live, now and in the future.

- **National Security Systems:** Harnessed by UArizona’s Defense and Security Research Institute, researchers are finding effective and practical solutions in one of the most critical areas of research today — national security. UArizona’s National Security Systems initiative impacts a range of technology and research at the university — from optics to high-temperature materials to hypersonics.

- **Space Exploration and Optical Solutions:** UArizona continues as an international research powerhouse in both space science and optics. Not only does the campus sit at the center of “Optics Valley” — a high concentration of optics companies and research in Southern Arizona - but it also has led space system development since the inception of the U.S. space program. Given these strengths, it’s no surprise that SEOS is the most lucrative of UArizona’s TRIF initiatives, with an almost eight-fold return on investment. Strategies in this area will help the university continue to reach farther, faster, in this age of information and space exploration.
“TRIF funding enables the University of Arizona to advance knowledge and its applications by investing across our institution so that we not only stimulate the highest quality thought leadership, research and scholarship, but also allow our faculty, students and staff to translate knowledge into impact. Now — perhaps more than ever — we have seen just how truly transformative and impactful TRIF has been in enabling our researchers to give Arizonans significant returns on their investment as our research enterprise collectively pivoted to address COVID-19 swiftly, head on and statewide. No matter what complex challenges come our way in the years ahead, we look forward to continuing to leverage our TRIF dollars to provide an even greater economic and societal benefit to our state for generations to come.”

— Dr. Elizabeth Cantwell, Senior Vice President, Research and Innovation, The University of Arizona
SPACE EXPLORATION AND OPTICAL SOLUTIONS

The Space Exploration and Optical Solutions (SEOS) TRIF initiative seeks to provide real-world learning for Arizona students in optics, astronomy and space sciences; expand Arizona dominance and leadership in optics and space research to support regional economic development; enhance partnerships with industry, community groups and governments; and create and maintain an infrastructure to advance distinctiveness and diversity with business practices that are effective, efficient and entrepreneurial.

SEOS has been very successful in creating newly funded “big science and engineering” programs, establishing new research facilities, stimulating innovation and initiating successful start-up companies, employing intellectual property (IP), and enhancing outreach to under-represented populations in Arizona and technology transfer to local companies.

GOALS

- Leveraging TRIF funds to obtain more than a ten-fold return on investment (ROI) through increased external research funding, directly impacting Arizona’s economy.

- Making key faculty hires in optics, engineering and space to support new research areas and more students.

- Creating new photonics and imaging infrastructure and facilities to support defense/security, medical and industrial research to help the U.S. remain competitive.

- Enhancing Arizona’s diverse workforce development directly through increased student support as well as outreach to companies and underrepresented populations in Arizona.

- Encouraging technology transfer and innovation activities, creating new Arizona startup companies with UArizona-developed IP to directly impact Arizona’s economy.
SELECTED ACCOMPLISHMENTS

• With TRIF support and through several years of strategic planning and execution, UArizona established a strong
  team to put the university in a unique position to compete for the multi-billion dollar National Quantum Initiative
  Act. The university leveraged a multi-college collaboration, which includes five new TRIF faculty hires, and its world-
  renowned strengths in optics and photonics to compete for this award on the national stage.

• TRIF funding enabled the preparation of five proposals to NASA, one of which has already resulted in a contract to
  Alfred McEwen for the Phase A of a Discovery mission, Io Volcanic Observer (IVO). IVO was one of four proposals
  selected for Phase A studies, and NASA has announced that it hopes to select two of them to fly. This award is
  $361,000 for 13 months, but if IVO is chosen for a full mission, it will cost more than $500 million and will travel to
  Io, one of Jupiter’s moons and the most volcanically active body in the solar system.

• In fiscal year 2020, TRIF supported 47 undergraduate students, 117 graduate students and 46 post-docs.

• TRIF funds contributed to new collaborative opportunities with Sandia National Labs, Universities Space Research
  Association, NASA, Jet Propulsion Laboratory and Oak Ridge National Laboratory of the U.S. Department of Energy.
  SEOS faculty are cultivating a program with the Department of Energy to establish a new center in Quantum Science
  Technologies. Faculty from the Lunar and Planetary Laboratory (LPL) and Steward Observatory have initiated
  programs with NASA, potentially resulting in several hundred-million dollar programs.

• TRIF support enabled UArizona researchers to compete for several Multi-University Research Initiative (MURI)
  Department of Defense projects, each at $7.5 million over five years. UArizona has been working on two winning
  MURIs and currently has pending MURI proposals.

• SEOS faculty established 10 startup companies, six of them during fiscal year 2020. All six secured venture capital
  funds for their UArizona-generated IP. Four of the startups focus on manufacturing and commercializing lasers at
  wavelengths ranging from ultraviolet to mid-infrared for medical, defense and material processing applications.

• Partnerships with industry resulted in working with 30 companies generating industrial support of more than
  $4 million in fiscal year 2020 alone. For example, projects funded by companies such as Facebook, Magic Leap
  and Microsoft resulted in state-of-the-art advances in augmented reality, autonomous systems and low-energy
  consumption data center networks with multi-million dollar budgets over several years.

• TRIF contributions to Native Nation communities in Arizona include supporting undergraduate students who are
  either Native American by citizenship or are attending an American Indian serving college or university by allowing
  them to gain research experience in laboratories at the Colleges of Optical Sciences, Engineering, and Science and
  participating in Native-American focused workshops.

A UArizona-led mission proposal to one of Jupiter’s moons is among four finalists for the next $500 million NASA Discovery. If selected, the Io Volcano Observer, or IVO, will investigate whether a magma ocean lies beneath the surface of the volcanically active moon.
The Water, Environmental and Energy Solutions (WEES) TRIF initiative is developing innovative, practical solutions for water, environmental and energy sustainability in Arizona. Research findings are applied globally, as many other semiarid regions face increasing natural resource demands and uncertainties related to drought and extreme events. Strategic investment shapes innovative research and brings federal dollars to Arizona, and projects help secure adequate supplies of clean water for Arizona, optimize sustainable stewardship of the state’s lands, create resiliency in the face of climate variability and advance Arizona’s leadership in the renewable energy industry.

GOALS

- Build on UArizona’s world-renowned expertise in water and climate variability and its emerging excellence in the renewable energy sector to enhance multidisciplinary collaboration for science, technology and resource management.

- Focus on use-inspired research performed by multidisciplinary teams that will result in innovative, practical solutions for Arizona and beyond.

- Leverage investment in strategic areas to increase public and private funding and commercialization of research results in tech and industry.

- Train a new generation of scientists, engineers and other professionals to meet state and national needs.
SELECTED ACCOMPLISHMENTS

- UArizona has been ranked No. 1 in the U.S. and No. 2 globally in the area of water resources in the 2020 Academic Ranking of World Universities by academic subjects. Faculty across campus have leveraged the university’s natural surroundings to generate influence in water studies that go well beyond the Southwest to benefit other regions. For example, TRIF-supported work on computationally intensive modeling at continental scales is generating new insights about the relationships between atmospheric, ground and surface waters with implications for long-term resilience in the eastern U.S.

- As Arizona wildfires become more frequent and disruptive, debris flows in recently burned landscapes pose a serious threat to human life and infrastructure. With TRIF support, UArizona researchers who study mechanisms that trigger post-fire debris flows defined rainfall intensity thresholds specific to Arizona conditions, thereby helping Arizona communities and land managers mitigate danger and damage.

- Throughout the COVID-19 pandemic, Charles Gerba at the Water and Energy Sustainable Technology (WEST) Center addressed public concerns by providing understanding of the survival of the novel coronavirus in wastewater treatment systems. Gerba also collaborates with industry partners to manufacture antimicrobial surface coatings that kill and reduce the spread of the virus.

- The Earth’s critical zone, where most terrestrial life flourishes, extends from the top of the vegetation canopy to the base of weathered bedrock. Last year, UArizona led multi-institution workshops, generating fresh ideas that resulted in $1.1 million in critical zone National Science Foundation funding with two additional large grants still pending.

- UArizona researchers are conducting landmark research into the chemical properties and transport of per- and poly-fluoroalkyl substances (PFAS), environmentally durable chemicals used to manufacture items like fire retardants, nonstick pans and rainproof clothing. By 2016, PFAS and related pollutants had affected 16 million people in the U.S. and have been found in numerous locations in Arizona. Some studies in humans have shown that certain PFAS may affect growth, learning and behavior of infants and children, interfere with the body’s natural hormones and increase the risk of cancer, among other potential effects. The researchers hope to identify the pollutant so that water treatment experts can help reduce exposure.

- Reliance on energy-consuming data centers is increasing dramatically as the world becomes more dependent on robust networking and connectivity. UArizona researchers from the School of Architecture are collaborating and contracting with Arizona data centers, utilities and international companies such as Microsoft and Google to evaluate how systems can be optimized to reduce both energy and water consumption.

- Following the spring 2018 E. Coli contamination of Yuma-grown romaine lettuce, Cooperative Extension scientists began a multi-year study looking at environmental factors for bacterial persistence and distribution. Their work helps growers mitigate risks, ultimately enhancing the safety of produce grown in the region and strengthening the economy of the state’s agriculture sector.

- Over the past six years, Erin Ratcliff competed for and received five WEES grants to support her nationally acclaimed work in material sciences research on superconductors and energy storage. She leveraged less than $200,000 in WEES funding to bring in nearly $1.9 million in federal dollars, with an additional $1.2 million in pending funding for a 16:1 return on investment.

- TRIF funds supported three startups - Auxilium Technology Group, SaiOx, Inc. and Throohealth.

- TRIF funding enabled assistantships, employment, scholarships, grants and research experiences for 159 graduate students, 140 undergraduate students and 35 post-docs, preparing them to enter the workforce through education and experiential learning.
IMPROVING HEALTH

The Improving Health TRIF funding that helped launch the BIOS Institute in 2001 continues to catalyze and mobilize a highly effective, cross-disciplinary research and translational bio/health sciences hub at the University of Arizona. Initiatives and projects are carefully chosen to align with areas of state and national need and with existing faculty expertise.

BIOS connects almost 400 world-class plant, animal and human bioscientists, engineers, physicians and computational researchers to develop creative solutions to disease, hunger, water and food safety, and other complex health challenges facing Arizona and the world. This approach has resulted in, and will continue to produce, disease prevention strategies and promising new therapies, innovative diagnostics and devices, and improved food crops.

Because of TRIF, BIOS is able to help quickly connect, facilitate and deploy people, resources and funding to expedite the university’s community impact related to COVID-19 and other large-scale crises. This strategy expands impact, economic opportunity and external funding opportunities.

GOALS

- Foster collaborative projects that address major challenges in the biosciences, biomedicine and biotechnology and forge significant progress on novel treatments for asthma, cancer, valley fever, diabetes, sudden cardiac death, malnutrition, infectious disease, Alzheimer’s and other age-related brain diseases, and other public health crises.

- Strengthen and expand translational research by supporting innovative faculty and teams that will advance the development of new medicines, devices, diagnostics, and nutritional and therapeutic strategies.

- Engage and train future generations of scientists by maintaining successful outreach and internship programs to promote experiential learning and STEM proficiency in the state.

- Expand shared resources in computational biology, imaging, high throughput screening, genomics, proteomics and cell analysis across all life science disciplines to expedite large-scale, team science grants that will boost federal research funding, serve as a resource for local industry, and create new services and companies in Arizona.

- Promote an entrepreneurial culture in which scientists work across disciplines to accelerate commercial translation of research breakthroughs.

This year, the BIOS KEYS Research Internship Program – a unique, seven-week summer research opportunity offered since 2007 – has taken a new form this summer, as 49 students engage in computational projects from the safety of their homes. Nearly 500 Arizona high school students have participated in the program since 2007.
SELECTED ACCOMPLISHMENTS

- Through TRIF funding, UArizona awarded 43 pilot/seed/equipment grants totaling $1.9 million to support catalytic early stage research. Additionally, in quick response to COVID-19, 13 research teams comprised of BIO5 members from seven UArizona colleges received a total of $500,000 in rapid-turnaround seed grants to combat the global pandemic. Projects include understanding the lifecycle of the novel coronavirus, identifying potential treatments, and creating technology and patient databases to expand knowledge of how the disease spreads and who is most vulnerable.

- Because of TRIF support over the past 19 years, UArizona was able to mobilize labs to produce 15,615 COVID-19 diagnostic collection kits and ship these statewide, including to the Navajo Nation; print 3D masks for health care workers and first responders, produce hand sanitizer for health workers, invent a respiratory-assist device, launch a texting system to gather and provide COVID-19 information, and partner with the state to begin antibody testing.

- With support from a $1.8M National Institute on Aging grant, a UArizona-led research team is testing a novel intervention using near-infrared light treatments that could help enhance cognition and reduce Alzheimer’s disease risk in older adults.

- TRIF funding enabled assistantships, employment, scholarships, grants and research experiences for 535 graduate students, 557 undergraduate students, 126 post-docs and 49 high schoolers, preparing them to enter the workforce through education and experiential learning. In addition, Michael Marty has developed the Arizona Science, Engineering and Math Scholars Veterans Program to support veteran students who are pursuing STEM degrees at UArizona and bring their skills into research labs.

- The National Institutes of Health awarded Ying-hui Chou a $3.4 million grant to combine her expertise in transcranial magnetic stimulation technology with brain imaging techniques to learn more about how to prevent memory loss and enhance brain function in patients experiencing mild cognitive impairment.

- TRIF funds supported three startup companies in fiscal year 2020, including ElectroSoniX. Russell Witte developed patented acoustoelectric imaging technology that has the potential to improve the accuracy of cardiac ablation procedures in treating cardiac arrhythmias. Now the chief science officer at ElectroSoniX, Witte is bringing the new heart imaging technique to market. The company licensed UArizona patents for acoustoelectric imaging for both the heart and brain.
The TRIF National Security Systems (NSS) Initiative strategic plan is intended to advance access and workforce development opportunities for Arizona defense industries; provide experiential learning and research opportunities to strengthen students seeking careers in the defense industry; expand Arizona’s deep contributions to the national security sector; enhance partnerships with appropriate defense industrial base companies in the state; support regional economic development; and create and maintain advanced research and development infrastructure to provide fundamental research capabilities for national security.

NSS delivers innovative concepts, broadens the technical agility of the defense sector, stimulates technology transfer, particularly in dual use technologies, and creates new intellectual property for the university. While engaging in cutting-edge, strategic research, faculty are proving themselves thought leaders in the national security realm, winning awards and honors, publishing widely, preparing students for the defense industry, and forging partnerships that help spur Arizona’s economy and tech standing.

GOALS

- Increase external U.S. Department of Defense and private-sector research and development funding to scale capacity.
- Strengthen and expand defense- and security-related research by recruiting the best and brightest faculty to Arizona and supporting projects that will advance the development of new technologies and products to aid in securing our national interest.
- Support workforce development directly through student research teaming experiences in partnership with defense agencies, UArizona and industry.
- Set the stage for innovation and commercialization of research results by spawning invention disclosures that will support future licensing and spinout companies.
SELECTED ACCOMPLISHMENTS

- Thirty-seven faculty researchers were supported through TRIF NSS this year, proposing more than $145 million in research activities and winning millions in awards from various Department of Defense sponsors, NASA and defense industrial base companies such as Ball Aerospace, Raytheon and General Dynamics.

- Faculty made six invention disclosures to advance quantum technologies for sensing, computing and communications. These efforts are contributing to a revolution in military navigation, imaging and secure communications.

- Bio-marker specific wearable sensors are the target of a new joint effort between researchers in the colleges of engineering and medicine to develop low-cost human performance-monitoring capabilities with the Air Force Research Laboratory and the Nano Bio Manufacturing Consortium, a group of high-tech industries affiliated with the U.S. Air Force.

- Faculty developed the highest fidelity modeling capability to understand the plasma properties around hypersonic vehicles, allowing Raytheon and other defense industrial base firms to better integrate mission capabilities and deliver capabilities that leverage the plasma properties for higher performance systems.

- TRIF enabled the purchase of a Quantum Design Physical Property Measurement System, which covers a temperature range of 50 milli Kelvins to 400 Kelvins. This is the first instrument of this type available at UArizona. The access to extremely low temperatures allows researchers to probe into quantum phenomenon in upcoming funded research.

- A diverse cadre of students contributed directly to research focused on implantable carbon nanofiber sensors for biological sample interrogation, the placement of the fuel injector in a scramjet engine to reduce engine failures, and other experiences that helped prepare for future endeavors. In total, TRIF enabled 42 undergraduate students in the NSS focus area.

- TRIF funding also enabled research and professional development experiences for 49 graduate students and five post-docs who made contributions to national security, delivering papers advancing quantum technologies and optics, and more.

- With NSS support, faculty worked with two local 11th grade students to explore the flow of chemical reactions in computational fluid dynamic models for re-entry into the Martian atmosphere and to improve data interpolation within UArizona computational fluid dynamic modeling code, CFDWARP.
HIGHLIGHTS

Navigating an unprecedented viral pandemic during fiscal year 2020 required the University of Arizona’s research enterprise to quickly yet prudently pivot to keep essential lab and facility activities operational and maintain productivity to the extent possible, while prioritizing and protecting the health and safety of researchers and student workers.

Researchers and staff, in response, showed remarkable resiliency to these unprecedented circumstances, and UArizona continued to make substantial progress toward fiscal year 2021 goals, even after ramping down activity in March with the governor’s stay-at-home order. With overall TRIF expenditures of $35.6 million, UArizona’s calculated financial impact (sponsored awards, gifts and other sources and royalty income) of these investments was $227 million, well over the expected projections of $184.5 million.

Technology transfer exceeded previous years totals, despite the pandemic. The university launched a record-breaking 19 startups, nearly doubling the previous year’s total and surpassing the previous record of 16. With these nascent companies, UArizona also reached a significant milestone in bringing the total number of UArizona startups since Tech Launch Arizona’s inception to over 100.

As we head into fiscal year 2021, challenges center around COVID-19, with disruptions to the global supply chain as well as productivity potentially resulting in lower higher education research and development numbers and less facilities and administrative expense recovery for the year. And, while the U.S. Office of Management and Budget has continued to provide exceptions and administrative relief to awards in response to COVID-19, such allowances might not continue even if high numbers of COVID-19 cases persist. This risk is shared by all research universities, not just UArizona.

Nevertheless, the university’s research enterprise is as well positioned as any in the nation. In March, the Office of Research, Innovation and Impact (RII) formed a campus-wide Research Coordination Group, now totaling more than 200 faculty, to promote and support research initiatives on coronavirus and assist with state and local community efforts to prevent, contain and/or surveil COVID-19. RII also developed a waiver process for the smooth ramp down and ramp up of laboratory research and designed a dynamic Research Restart Plan that includes six phases for safe re-entry.

UArizona also has, thanks to TRIF investment over the years, the personnel and infrastructure in place to redeploy resources quickly to address a pandemic like COVID-19 and other crises. The world saw this this spring, when some of the university’s core facilities and laboratories were able to rapidly pivot from their main functions to develop testing, PPE and other essential responses to the pandemic statewide.

The university will continue to maximize the dollars received through the TRIF initiative to enable economic vibrancy, speedy innovation and deliver public benefit. Even as COVID-19 presents obstacles for research continuity, the university will continue applying its values — integrity, exploration, inclusion, adaptation, determination and compassion — to TRIF focus areas to deliver ever-greater impact and solutions for Arizonans.
ARIZONA BOARD OF REGENTS

ABOR TRIF FUNDS

The regents retain a small amount of funds in support of projects that advance Arizona’s public universities in accordance with Arizona law and board guidelines. Each project funded through TRIF is intended to further goals outlined in the board’s strategic plan and strengthen research at the universities and Arizona’s workforce development.

ABOR TRIF funds support initiatives in these general areas - data resources and technological support; science, technology, engineering and math (STEM) and innovation projects; and the Regents’ Innovation Fund.

INVESTING IN DATA, RESOURCES AND TECHNOLOGY

Strategic investments in data, resources and technology through TRIF provide data and analysis for stakeholders, including regents and legislators. Investing in the National Student Clearinghouse and data sharing with the Arizona Department of Education provides enhanced data mining resources. A portion of TRIF funding provides access to expertise from faculty at Arizona’s public universities through the Elsevier Pure Experts (SciVal) searchable database and Arizona State University’s Decision Theater to visualize and forecast educational attainment in Arizona. Funding also supports the board’s business intelligence and database projects, which use Tableau’s software and server to compile, analyze and visualize data. Tableau also supports university researchers across the system in their efforts to report data. Development of a central database management system allows the board office to respond to requests regarding Arizona’s workforce, higher education and the K-12 pipeline.

PROMOTING STEM AND INNOVATION PROJECTS FOR ARIZONA’S FUTURE

In fiscal year 2020, TRIF funds were invested in two projects promoting STEM and innovation - Arizona Tech Council’s SciTech Festival and the ASU Innovation Open (ASUio).

The Arizona SciTech Festival continues to be an annual statewide celebration of STEM. As a foundational gold sponsor, funding through the board and TRIF supports the administration and operation of the festivals that are held in various locations across Arizona. The SciTech Festival leverages Arizona’s STEM ecosystem to excite and inform Arizonans of all ages about STEM and educate them on how it is driving the state forward. Drawing more than 560,000 attendees in 2019, the goal of the festival is to inspire Arizonans to pursue careers in STEM and related fields of study.

TRIF funding supported ASUio that is designed to challenge and advance collegiate startups that harness the power of entrepreneurship to tackle the world’s most challenging problems. Sponsors and supporters provided funding and mentorship for student competitors on their ventures. Technology innovators from universities around the world gathered to pitch their ideas for cash prizes during the event held in January of 2020 at ASU’s Sun Devil Stadium.

REGENTS’ INNOVATION FUND SUPPORTS RESEARCH

Regents’ Innovation Fund (RIF) grants are instrumental in supporting research at the universities, and contribute toward collaborative efforts among the universities and community partners. During the board’s June 2019 meeting, regents approved funding for three RIF projects designed and submitted through a tri-university collaborative effort:
Center for Complex System Safety: The Center for Complex System Safety (CCSS) is an ASU-led initiative focused on a single critical element that cuts across many engineering and natural systems - safety. The multi-university CCSS will leverage multiple disciplines (e.g., big data analytics, physics-based learning, risk-based assessment, environmental science and aerodynamics, among others) to create an innovative educational, training and knowledge hub unique to Arizona and the nation on safety assurance and risk management of complex systems. The center will develop new programs and enhance existing ones that will prepare students to contribute to Arizona’s high-tech industries, as well as to the safety of its citizens. It will focus on systems such as the traffic management system for Urban Air Mobility (UAM); and the U.S. national gas pipeline.

Benefits of the grant include enhancing Arizona’s leadership position on the automated transportation system with Urban Air Mobility; improving safety awareness and risk management of aging infrastructure, especially gas and water pipeline systems in Arizona; advancing risk assessment and mitigation of forests in Arizona; and promoting close collaboration between local aerospace industries and university research teams.

Developing an Event Broker for Time-Domain Astronomy: Funding through this grant that is led by Northern Arizona University will support development of an event broker to detect and filter interesting events in the solar system and beyond. It will enable active monitoring of objects in the solar system and the classification of static sources. The project will generate alerts for objects whose observable properties change, indicating the occurrence of dynamic processes. Alerts generated by the event broker will allow for rapid follow-up by other telescope facilities. This data-driven discovery process will lead to insights into the nature of bodies in the solar system and beyond. The project will develop and employ an ensemble of techniques to be used to detect interesting astrophysical events that exploit new parallel and high performance computing technologies.

Students involved in this work will be trained with skills that are in high demand in Arizona, helping to bolster Arizona’s economy, particularly in space exploration and industries requiring expertise in computer science, software engineering, systems analysis and other computational fields.

Advancing Additive Manufacturing Frontiers on Earth and Beyond: The team on this project led by the University of Arizona is focused on 3D printing technologies that use indigenous resources - native soil, minerals, water, flora and energy - under extreme conditions that include extraterrestrial - lunar, Martian, asteroid and meteoritic materials - and isolated and depleted earth-bound environments. Goals include: developing new capabilities in materials chemistry, advanced manufacturing machine design and manufacturing processes that better position Arizona’s universities for aerospace, medical, and defense funding; immersion of students in additive manufacturing curriculum and industry internships; and creating a certificate program to future proof workforce-ready students.

The project will reinforce university strengths in aerospace and defense-related research and development where excellence in additive manufacturing has become a critical precursor for success. Arizona’s manufacturing workforce capabilities will also be strengthened to support the wide base of companies that contribute to Arizona’s gross domestic product.
FINANCIALS & METRICS
## FY 2017 - 2021
### ARIZONA UNIVERSITY SYSTEM
### TECHNOLOGY AND RESEARCH INITIATIVE FUND

<table>
<thead>
<tr>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2020 Budget</th>
<th>FY 2021 Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carry Forward</td>
<td>4,322,940</td>
<td>8,684,576</td>
<td>10,634,673</td>
<td>15,378,549</td>
<td>6,431,213</td>
</tr>
<tr>
<td>TRIF Revenue</td>
<td>72,797,470</td>
<td>77,211,240</td>
<td>83,610,510</td>
<td>81,456,038</td>
<td>81,806,000</td>
</tr>
<tr>
<td><strong>Total Revenue</strong></td>
<td>$77,120,410</td>
<td>$85,895,816</td>
<td>$94,245,183</td>
<td>$96,834,587</td>
<td>$88,237,213</td>
</tr>
</tbody>
</table>

| **Expenses**     |                  |                  |                  |                |                |
| Operating        | 56,555,913       | 61,995,953       | 66,671,410       | 70,283,534     | 66,820,123     |
| Capital          | 8,088,491        | 9,896,688        | 8,830,438        | 10,835,801     | 11,281,877     |
| ASU Polytechnic/West COPs | 3,707,500 | 3,704,000 | 3,704,000 | 3,704,000 | 3,704,000 |
| **Total Capital**| $11,795,991      | $13,600,688      | $12,534,438      | $14,539,801    | $14,985,877    |

| **Total Expenses**| $68,351,904      | $75,596,641      | $79,205,848      | $84,823,335    | $81,806,000    |

### Summary by Program Area

<table>
<thead>
<tr>
<th>Program Area</th>
<th>Actual 2017</th>
<th>Actual 2018</th>
<th>Actual 2019</th>
<th>Actual 2020</th>
<th>Budget 2020</th>
<th>Budget 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving Health</td>
<td>$26,074,280</td>
<td>$29,424,142</td>
<td>$28,687,340</td>
<td>$26,431,233</td>
<td>$29,310,112</td>
<td>$29,368,089</td>
</tr>
<tr>
<td>Water, Environment, Energy Solutions</td>
<td>11,646,602</td>
<td>14,911,510</td>
<td>18,355,957</td>
<td>12,756,544</td>
<td>13,776,695</td>
<td>12,331,426</td>
</tr>
<tr>
<td>National Security Systems</td>
<td>9,566,065</td>
<td>9,852,316</td>
<td>12,555,957</td>
<td>12,756,544</td>
<td>13,776,695</td>
<td>12,331,426</td>
</tr>
<tr>
<td>Space Exploration and Optical Solutions</td>
<td>5,850,345</td>
<td>7,172,981</td>
<td>4,266,589</td>
<td>9,577,737</td>
<td>6,721,329</td>
<td>9,042,423</td>
</tr>
<tr>
<td>Access &amp; Workforce Development</td>
<td>7,656,193</td>
<td>8,054,570</td>
<td>9,152,394</td>
<td>11,151,698</td>
<td>8,264,424</td>
<td>8,463,300</td>
</tr>
<tr>
<td>Regents’ Innovation Fund</td>
<td>1,200,000</td>
<td>1,000,000</td>
<td>1,200,000</td>
<td>1,012,000</td>
<td>1,000,000</td>
<td>1,000,000</td>
</tr>
<tr>
<td>ASU Poly/ASU West COPs</td>
<td>3,707,500</td>
<td>3,704,000</td>
<td>3,704,000</td>
<td>3,704,000</td>
<td>3,704,000</td>
<td>3,704,000</td>
</tr>
<tr>
<td>AZUN</td>
<td>500,000</td>
<td>505,000</td>
<td>510,000</td>
<td>515,000</td>
<td>515,000</td>
<td>520,000</td>
</tr>
<tr>
<td>ABOR Other</td>
<td>2,150,919</td>
<td>514,620</td>
<td>623,578</td>
<td>383,000</td>
<td>1,000,000</td>
<td>1,000,000</td>
</tr>
<tr>
<td><strong>Program Area Total</strong></td>
<td>$68,351,904</td>
<td>$75,139,139</td>
<td>$79,062,905</td>
<td>$84,503,537</td>
<td>$82,013,200</td>
<td>$85,569,000</td>
</tr>
</tbody>
</table>

| **Total Expenses**            | $68,351,904 | $75,139,139 | $79,062,905 | $84,503,537 | $82,013,200 | $85,569,000 |
FY 2020
SYSTEM ACTUAL TRIF EXPENDITURES

- Water-Environment-Energy: $18,972,325 (23%)
- Improving Health: $26,431,233 (32%)
- National Security Systems: $12,756,544 (15%)
- Access/Workforce & AZUN: $11,666,698 (14%)
- Space & Optical Solutions: $9,577,737 (11%)
- Certificates of Participation: $3,704,000 (4%)
- Regents Innovation Fund: $1,012,000 (1%)
# FY 2017 - 2021

**Arizona State University Technology and Research Initiative Fund**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carryforward</td>
<td>$555,600</td>
<td>$335,500</td>
<td>$545,396</td>
<td>$207,204</td>
<td>$19,024</td>
</tr>
<tr>
<td>TRIF Revenue</td>
<td>$30,543,500</td>
<td>$32,306,900</td>
<td>$34,866,604</td>
<td>$33,886,275</td>
<td>$34,144,800</td>
</tr>
<tr>
<td><strong>Total Revenue</strong></td>
<td><strong>$30,543,500</strong></td>
<td><strong>$32,862,500</strong></td>
<td><strong>$34,431,671</strong></td>
<td><strong>$34,352,004</strong></td>
<td><strong>$35,669,024</strong></td>
</tr>
</tbody>
</table>

| **Expenditures** |         |         |         |         |         |
| Operating | $24,876,300 | $25,658,500 | $27,744,500 | $27,227,671 | $26,940,800 |
| Capital | $1,404,100 | $3,500,000 | $3,546,400 | $3,500,000 | $3,500,000 |
| ASU Poly/ASU West COPS | $3,707,500 | $3,704,000 | $3,704,000 | $3,704,000 | $3,704,000 |
| **Total Capital** | **$5,111,600** | **$7,204,000** | **$7,204,000** | **$7,204,000** | **$7,204,000** |

**Total Expenditures** | **$29,987,900** | **$32,862,500** | **$34,431,671** | **$34,352,004** | **$35,669,024** |

**Summary by Initiative**

- **Improving Health** | $13,541,800 | $14,744,400 | $14,964,300 | $11,917,391 | $14,382,300 | $13,009,417 |
- **Water, Environment and Energy Solutions** | $6,572,000 | $6,071,800 | $7,533,200 | $8,262,701 | $7,911,700 | $9,096,560 |
- **National Security Systems** | $3,671,700 | $3,942,300 | $3,450,400 | $3,083,927 | $4,057,900 | $3,807,063 |
- **Access & Workforce Development**
  - Entrepreneurship & Innovation | $614,200 | $732,500 | $1,328,800 | $725,118 | $1,536,600 | $768,000 |
  - Advanced Manufacturing | $1,880,700 | $3,332,000 | $4,014,200 | $6,719,510 | $2,759,500 | $5,264,960 |
- **Total** | $26,280,400 | $28,823,000 | $31,290,900 | $30,708,646 | $30,648,000 | $31,946,000 |
- **ASU Poly/ASU West COPS** | $3,707,500 | $3,704,000 | $3,704,000 | $3,704,000 | $3,704,000 |

**Total Expenditures** | **$29,987,900** | **$32,527,000** | **$34,412,646** | **$34,352,004** | **$35,650,000** |
## Performance Analysis

### TRIF Expenditures

<table>
<thead>
<tr>
<th></th>
<th>FY 2017 Actual</th>
<th>FY 2018 Actual</th>
<th>FY 2019 Actual</th>
<th>FY 2020 Actual</th>
<th>FY 2020 Budget</th>
<th>FY 2021 Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>$13,541,800</td>
<td>$14,744,400</td>
<td>$14,964,300</td>
<td>$11,917,391</td>
<td>$14,382,300</td>
<td>$13,009,417</td>
</tr>
</tbody>
</table>

### Financial Impact of TRIF Investment

<table>
<thead>
<tr>
<th>Source</th>
<th>FY 2017 Actual</th>
<th>FY 2018 Actual</th>
<th>FY 2019 Actual</th>
<th>FY 2020 Actual</th>
<th>FY 2020 Budget</th>
<th>FY 2021 Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sponsored Awards</td>
<td>$82,409,681</td>
<td>$92,909,977</td>
<td>$102,240,048</td>
<td>$111,380,066</td>
<td>$110,750,000</td>
<td>$124,000,000</td>
</tr>
<tr>
<td>Gifts &amp; Other Sources</td>
<td>723,874</td>
<td>1,399,722</td>
<td>1,890,337</td>
<td>2,477,429</td>
<td>1,190,000</td>
<td>1,220,000</td>
</tr>
<tr>
<td>Royalty Income</td>
<td>157,454</td>
<td>196,261</td>
<td>371,958</td>
<td>316,904</td>
<td>800,000</td>
<td>800,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$83,291,009</strong></td>
<td><strong>$94,505,966</strong></td>
<td><strong>$104,502,343</strong></td>
<td><strong>$114,174,399</strong></td>
<td><strong>$112,740,000</strong></td>
<td><strong>$126,020,000</strong></td>
</tr>
</tbody>
</table>

### Technology Transfer Activity

<table>
<thead>
<tr>
<th>Activity</th>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invention Disclosures Transacted</td>
<td>81</td>
<td>97</td>
<td>86</td>
<td>91</td>
<td>59</td>
</tr>
<tr>
<td>US Patents Issued</td>
<td>31</td>
<td>32</td>
<td>27</td>
<td>32</td>
<td>7</td>
</tr>
<tr>
<td>Licenses and Options Executed</td>
<td>37</td>
<td>15</td>
<td>14</td>
<td>21</td>
<td>20</td>
</tr>
<tr>
<td>Startup Companies</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>7</td>
<td>3</td>
</tr>
</tbody>
</table>

### Workforce Contribution

<table>
<thead>
<tr>
<th>Category</th>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic and Postdoctoral Appointees</td>
<td>145</td>
<td>145</td>
<td>154</td>
<td>187</td>
<td>133</td>
</tr>
<tr>
<td>Graduate Students</td>
<td>542</td>
<td>630</td>
<td>749</td>
<td>1,070</td>
<td>416</td>
</tr>
<tr>
<td>Undergraduate Students</td>
<td>267</td>
<td>230</td>
<td>264</td>
<td>359</td>
<td>306</td>
</tr>
</tbody>
</table>
# Arizona State University
## Technology and Research Initiative Fund
### National Security Systems

## Performance Analysis

<table>
<thead>
<tr>
<th>TRIF Expenditures</th>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>$3,671,700</td>
<td>$3,942,300</td>
<td>$3,460,400</td>
<td>$3,083,927</td>
<td>$4,057,900</td>
</tr>
</tbody>
</table>

## Financial Impact of TRIF Investment

<table>
<thead>
<tr>
<th>Sponsored Awards</th>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Royalty Income</td>
<td>-</td>
<td>76,305</td>
<td>14,898</td>
<td>118,013</td>
<td>50,000</td>
</tr>
<tr>
<td>Total</td>
<td>$39,063,761</td>
<td>$33,292,653</td>
<td>$48,532,922</td>
<td>$53,113,731</td>
<td>$53,000,000</td>
</tr>
</tbody>
</table>

## Technology Transfer Activity

<table>
<thead>
<tr>
<th>Invention Disclosures Transacted</th>
<th>35</th>
<th>52</th>
<th>40</th>
<th>39</th>
<th>27</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Patents Issued</td>
<td>9</td>
<td>9</td>
<td>11</td>
<td>26</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Licenses and Options Executed</td>
<td>4</td>
<td>8</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Startup Companies</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

## Workforce Contribution

<table>
<thead>
<tr>
<th>Academic and Postdoctoral Appointees</th>
<th>43</th>
<th>50</th>
<th>79</th>
<th>82</th>
<th>34</th>
<th>36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Students</td>
<td>338</td>
<td>366</td>
<td>479</td>
<td>594</td>
<td>281</td>
<td>303</td>
</tr>
<tr>
<td>Undergraduate Students</td>
<td>190</td>
<td>176</td>
<td>247</td>
<td>243</td>
<td>142</td>
<td>153</td>
</tr>
</tbody>
</table>
## Performance Analysis

<table>
<thead>
<tr>
<th></th>
<th>FY 2017 Actual</th>
<th>FY 2018 Actual</th>
<th>FY 2019 Actual</th>
<th>FY 2020 Actual</th>
<th>FY 2020 Budget</th>
<th>FY 2021 Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TRIF Expenditures</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$6,572,000</td>
<td>$6,071,800</td>
<td>$7,533,200</td>
<td>$8,262,701</td>
<td>$7,911,700</td>
<td>$9,096,560</td>
</tr>
<tr>
<td><strong>Financial Impact of TRIF Investment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sponsored Awards</td>
<td>$27,874,447</td>
<td>$26,139,847</td>
<td>$28,545,795</td>
<td>$30,121,498</td>
<td>$30,100,000</td>
<td>$34,000,000</td>
</tr>
<tr>
<td>Gifts &amp; Other Sources</td>
<td>4,248,699</td>
<td>3,196,485</td>
<td>1,213,249</td>
<td>546,272</td>
<td>4,650,000</td>
<td>4,790,000</td>
</tr>
<tr>
<td>Royalty Income</td>
<td>2,000</td>
<td>2,000</td>
<td>117,016</td>
<td>25,005</td>
<td>100,000</td>
<td>100,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$32,125,146</td>
<td>$29,338,332</td>
<td>$29,876,060</td>
<td>$30,692,775</td>
<td>$34,850,000</td>
<td>$38,890,000</td>
</tr>
<tr>
<td><strong>Technology Transfer Activity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invention Disclosures Transacted</td>
<td>22</td>
<td>13</td>
<td>24</td>
<td>30</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>US Patents Issued</td>
<td>3</td>
<td>13</td>
<td>27</td>
<td>25</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Licenses and Options Executed</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>6</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Startup Companies</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Workforce Contribution</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic and Postdoctoral Appointees</td>
<td>60</td>
<td>35</td>
<td>80</td>
<td>73</td>
<td>33</td>
<td>36</td>
</tr>
<tr>
<td>Graduate Students</td>
<td>210</td>
<td>147</td>
<td>400</td>
<td>345</td>
<td>171</td>
<td>183</td>
</tr>
<tr>
<td>Undergraduate Students</td>
<td>241</td>
<td>104</td>
<td>190</td>
<td>121</td>
<td>206</td>
<td>221</td>
</tr>
</tbody>
</table>
### ARIZONA STATE UNIVERSITY
**TECHNOLOGY AND RESEARCH INITIATIVE FUND**
**ACCESS & WORKFORCE DEVELOPMENT: ADVANCED MANUFACTURING**

#### PERFORMANCE ANALYSIS

<table>
<thead>
<tr>
<th></th>
<th>FY 2017 ACTUAL</th>
<th>FY 2018 ACTUAL</th>
<th>FY 2019 ACTUAL</th>
<th>FY 2020 ACTUAL</th>
<th>FY 2021 BUDGET</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TRIF EXPENDITURES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$1,880,700</td>
<td>$3,332,000</td>
<td>$4,014,200</td>
<td>$6,719,510</td>
<td>$2,759,500</td>
</tr>
<tr>
<td><strong>FINANCIAL IMPACT OF TRIF INVESTMENT</strong></td>
<td>$13,047,918</td>
<td>$22,677,335</td>
<td>$18,810,146</td>
<td>$21,305,970</td>
<td>$21,250,000</td>
</tr>
<tr>
<td>Sponsored Awards</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$25,000,000</td>
</tr>
<tr>
<td>Gifts &amp; Other Sources</td>
<td>112,652</td>
<td>138,791</td>
<td>158,936</td>
<td>456,603</td>
<td>100,000</td>
</tr>
<tr>
<td>Royalty Income</td>
<td>16,000</td>
<td>91,800</td>
<td>75,000</td>
<td>67,011</td>
<td>50,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$13,176,570</td>
<td>$22,907,926</td>
<td>$19,044,082</td>
<td>$21,829,584</td>
<td>$25,150,000</td>
</tr>
</tbody>
</table>

#### TECHNOLOGY TRANSFER ACTIVITY

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Invention Disclosures Transacted</td>
<td>27</td>
<td>44</td>
<td>28</td>
<td>42</td>
<td>10</td>
</tr>
<tr>
<td>US Patents Issued</td>
<td>5</td>
<td>18</td>
<td>26</td>
<td>28</td>
<td>2</td>
</tr>
<tr>
<td>Licenses and Options Executed</td>
<td>8</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Startup Companies</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

#### WORKFORCE CONTRIBUTION

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic and Postdoctoral Appointees</td>
<td>33</td>
<td>25</td>
<td>59</td>
<td>44</td>
<td>13</td>
</tr>
<tr>
<td>Graduate Students</td>
<td>155</td>
<td>98</td>
<td>323</td>
<td>272</td>
<td>62</td>
</tr>
<tr>
<td>Undergraduate Students</td>
<td>75</td>
<td>27</td>
<td>89</td>
<td>58</td>
<td>69</td>
</tr>
</tbody>
</table>

---

61 | TECHNOLOGY AND RESEARCH INITIATIVE FUND
## Performance Analysis

<table>
<thead>
<tr>
<th></th>
<th>FY 2017 Actual</th>
<th>FY 2018 Actual</th>
<th>FY 2019 Actual</th>
<th>FY 2020 Actual</th>
<th>FY 2020 Budget</th>
<th>FY 2021 Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TRIF Expenditures</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$614,200</td>
<td>$732,500</td>
<td>$1,326,800</td>
<td>$725,118</td>
<td>$1,536,600</td>
<td>$768,000</td>
</tr>
<tr>
<td><strong>Financial Impact of TRIF Investment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sponsored Awards</td>
<td>$2,960,137</td>
<td>$4,021,094</td>
<td>$5,527,000</td>
<td>$0</td>
<td>$4,100,000</td>
<td>$5,000,000</td>
</tr>
<tr>
<td>Gifts &amp; Other Sources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Royalty Income</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$2,960,137</td>
<td>$4,021,094</td>
<td>$5,527,000</td>
<td>$0</td>
<td>$4,100,000</td>
<td>$5,000,000</td>
</tr>
<tr>
<td><strong>Technology Transfer Activity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invention Disclosures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transacted US Patents</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issued</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Licenses and Options Executed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Startup Companies</td>
<td>15</td>
<td>17</td>
<td>18</td>
<td>19</td>
<td>21</td>
<td>23</td>
</tr>
<tr>
<td><strong>Workforce Contribution</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic and Postdoctoral Appointees</td>
<td>1</td>
<td>0</td>
<td>6</td>
<td>12</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Graduate Students</td>
<td>99</td>
<td>173</td>
<td>143</td>
<td>145</td>
<td>29</td>
<td>30</td>
</tr>
<tr>
<td>Undergraduate Students</td>
<td>246</td>
<td>346</td>
<td>342</td>
<td>438</td>
<td>145</td>
<td>152</td>
</tr>
</tbody>
</table>
## FY 2017 - 2021
### Northern Arizona University
#### Technology and Research Initiative Fund

<table>
<thead>
<tr>
<th>Initiative</th>
<th>FY 2017 Actual</th>
<th>FY 2018 Actual</th>
<th>FY 2019 Actual</th>
<th>FY 2020 Actual</th>
<th>FY 2020 Budget</th>
<th>FY 2021 Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving Health</td>
<td>$1,987,146</td>
<td>$2,287,367</td>
<td>$2,498,001</td>
<td>$2,203,645</td>
<td>$2,660,594</td>
<td>$2,876,838</td>
</tr>
<tr>
<td>Water, Environment and Energy Solutions</td>
<td>$1,547,695</td>
<td>$3,336,334</td>
<td>$3,275,370</td>
<td>$3,073,482</td>
<td>$2,127,794</td>
<td>$3,111,473</td>
</tr>
<tr>
<td>Space Exploration &amp; Optical Solutions</td>
<td>$382,661</td>
<td>$248,513</td>
<td>$1,006,205</td>
<td>$1,167,503</td>
<td>$2,618,073</td>
<td>$4,441,829</td>
</tr>
<tr>
<td>Access &amp; Workforce Development</td>
<td>$5,161,293</td>
<td>$3,990,070</td>
<td>$3,809,394</td>
<td>$3,707,070</td>
<td>$3,968,324</td>
<td>$3,985,200</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$12,884,220</td>
<td>$12,435,998</td>
<td>$12,864,528</td>
<td>$13,061,133</td>
<td>$15,220,400</td>
<td>$15,973,000</td>
</tr>
</tbody>
</table>

### Actual vs. Budget

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Actual</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TECHNOLOGY AND RESEARCH INITIATIVE FUND</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carryforward</td>
<td>$1,281,965</td>
<td>$8,582,291</td>
</tr>
<tr>
<td>TRIF Revenue</td>
<td>$13,417,994</td>
<td>$15,973,000</td>
</tr>
<tr>
<td><strong>TOTAL REVENUE</strong></td>
<td>$14,699,959</td>
<td>$24,555,291</td>
</tr>
</tbody>
</table>

### Expenditures

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>OPERATING</td>
<td>11,089,829</td>
<td>11,619,310</td>
<td>11,780,490</td>
<td>12,010,332</td>
<td>12,328,523</td>
<td>12,778,400</td>
</tr>
<tr>
<td>CAPITAL</td>
<td>1,794,391</td>
<td>816,688</td>
<td>1,084,038</td>
<td>1,050,801</td>
<td>2,891,877</td>
<td>3,194,600</td>
</tr>
<tr>
<td><strong>TOTAL EXPENDITURES</strong></td>
<td>$12,884,220</td>
<td>$12,435,998</td>
<td>$12,864,528</td>
<td>$13,061,133</td>
<td>$15,220,400</td>
<td>$15,973,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Actual</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TOTAL EXPENDITURES</strong></td>
<td>$12,884,220</td>
<td>$15,973,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Actual</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carryforward</td>
<td>$1,281,965</td>
<td>$8,582,291</td>
</tr>
<tr>
<td>TRIF Revenue</td>
<td>$13,417,994</td>
<td>$15,973,000</td>
</tr>
<tr>
<td><strong>TOTAL REVENUE</strong></td>
<td>$14,699,959</td>
<td>$24,555,291</td>
</tr>
</tbody>
</table>

### Summary by Initiative

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving Health</td>
<td>$1,987,146</td>
<td>$2,287,367</td>
<td>$2,498,001</td>
<td>$2,203,645</td>
<td>$2,660,594</td>
<td>$2,876,838</td>
</tr>
<tr>
<td>Water, Environment and Energy Solutions</td>
<td>$1,547,695</td>
<td>$3,336,334</td>
<td>$3,275,370</td>
<td>$3,073,482</td>
<td>$2,127,794</td>
<td>$3,111,473</td>
</tr>
<tr>
<td>Space Exploration &amp; Optical Solutions</td>
<td>$382,661</td>
<td>$248,513</td>
<td>$1,006,205</td>
<td>$1,167,503</td>
<td>$2,618,073</td>
<td>$4,441,829</td>
</tr>
<tr>
<td>Access &amp; Workforce Development</td>
<td>$5,161,293</td>
<td>$3,990,070</td>
<td>$3,809,394</td>
<td>$3,707,070</td>
<td>$3,968,324</td>
<td>$3,985,200</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$12,884,220</td>
<td>$12,435,998</td>
<td>$12,864,528</td>
<td>$13,061,133</td>
<td>$15,220,400</td>
<td>$15,973,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Actual</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TOTAL EXPENDITURES</strong></td>
<td>$12,884,220</td>
<td>$15,973,000</td>
</tr>
</tbody>
</table>
## Performance Analysis

<table>
<thead>
<tr>
<th></th>
<th>FY 2017 Actual</th>
<th>FY 2018 Actual</th>
<th>FY 2019 Actual</th>
<th>FY 2020 Actual</th>
<th>FY 2020 Budget</th>
<th>FY 2021 Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TRIF Expenditures</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$1,658,683</td>
<td>$2,287,367</td>
<td>$2,498,001</td>
<td>$2,203,645</td>
<td>$2,660,594</td>
<td>$2,876,838</td>
</tr>
<tr>
<td><strong>Financial Impact of TRIF Investment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sponsored Awards</td>
<td>$9,823,529</td>
<td>$11,421,671</td>
<td>$11,799,528</td>
<td>$6,234,337</td>
<td>$2,878,568</td>
<td>$3,868,878</td>
</tr>
<tr>
<td>Gifts &amp; Other Sources</td>
<td>200,000</td>
<td>200,000</td>
<td>-</td>
<td>-</td>
<td>143,928</td>
<td>193,444</td>
</tr>
<tr>
<td>Royalty Income</td>
<td>24,070</td>
<td>10,000</td>
<td>10,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>10,047,599</td>
<td>11,631,671</td>
<td>11,809,528</td>
<td>6,234,337</td>
<td>3,022,496</td>
<td>4,097,478</td>
</tr>
</tbody>
</table>

## Technology Transfer Activity

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Invention Disclosures Transacted</td>
<td>27</td>
<td>19</td>
<td>18</td>
<td>19</td>
<td>26</td>
<td>29</td>
</tr>
<tr>
<td>US Patents Issued</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Licenses and Options Executed</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Startup Companies</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

## Workforce Contribution

<table>
<thead>
<tr>
<th></th>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic and Postdoctoral Appointees</td>
<td>13</td>
<td>10</td>
<td>26</td>
<td>23</td>
<td>5</td>
</tr>
<tr>
<td>Graduate Students</td>
<td>29</td>
<td>45</td>
<td>52</td>
<td>43</td>
<td>30</td>
</tr>
<tr>
<td>Undergraduate Students</td>
<td>75</td>
<td>129</td>
<td>125</td>
<td>121</td>
<td>50</td>
</tr>
</tbody>
</table>
## Technology and Research Initiative Fund

### Water, Environmental, Energy Solutions

#### Performance Analysis

<table>
<thead>
<tr>
<th></th>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TRIF Expenditures</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$1,547,695</td>
<td>$3,336,334</td>
<td>$3,275,370</td>
<td>$3,073,482</td>
<td>$2,127,794</td>
</tr>
<tr>
<td><strong>Financial Impact of TRIF Investment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gifts &amp; Other Sources</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>205,418</td>
</tr>
<tr>
<td>Royalty Income</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11,241,109</td>
<td>8,262,452</td>
<td>4,490,896</td>
<td>8,910,904</td>
<td>4,313,776</td>
</tr>
</tbody>
</table>

#### Technology Transfer Activity

<table>
<thead>
<tr>
<th></th>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invention Disclosures Transacted</td>
<td>5</td>
<td>11</td>
<td>2</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>US Patents Issued</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Licenses and Options Executed</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Startup Companies</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Workforce Contribution

<table>
<thead>
<tr>
<th></th>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic and Postdoctoral Appointees</td>
<td>17</td>
<td>20</td>
<td>30</td>
<td>28</td>
<td>5</td>
</tr>
<tr>
<td>Graduate Students</td>
<td>50</td>
<td>63</td>
<td>77</td>
<td>65</td>
<td>30</td>
</tr>
<tr>
<td>Undergraduate Students</td>
<td>136</td>
<td>127</td>
<td>124</td>
<td>119</td>
<td>200</td>
</tr>
</tbody>
</table>
## PERFORMANCE ANALYSIS

<table>
<thead>
<tr>
<th></th>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACTUAL</td>
<td>ACTUAL</td>
<td>ACTUAL</td>
<td>ACTUAL</td>
<td>BUDGET</td>
</tr>
<tr>
<td>TRIF EXPENDITURES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$3,305,425</td>
<td>$2,068,714</td>
<td>$1,765,557</td>
<td>$2,394,433</td>
<td>$3,330,615</td>
</tr>
<tr>
<td>FINANCIAL IMPACT OF TRIF INVESTMENT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sponsored Awards</td>
<td>$5,493,136</td>
<td>$1,193,274</td>
<td>$1,306,649</td>
<td>$6,445,205</td>
<td>$1,811,342</td>
</tr>
<tr>
<td>Royalty Income</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>90,567</td>
</tr>
<tr>
<td>Total</td>
<td>$5,499,136</td>
<td>$1,223,774</td>
<td>$1,307,149</td>
<td>$6,450,205</td>
<td>$1,948,784</td>
</tr>
</tbody>
</table>

### TECHNOLOGY TRANSFER ACTIVITY

<table>
<thead>
<tr>
<th></th>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invention Disclosures Transacted</td>
<td>9</td>
<td>14</td>
<td>13</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>US Patents Issued</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>Licenses and Options Executed</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Startup Companies</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

### WORKFORCE CONTRIBUTION

<table>
<thead>
<tr>
<th></th>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic and Postdoctoral Appointees</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Graduate Students</td>
<td>3</td>
<td>4</td>
<td>8</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Undergraduate Students</td>
<td>10</td>
<td>17</td>
<td>14</td>
<td>16</td>
<td>25</td>
</tr>
<tr>
<td>PERFORMANCE ANALYSIS</td>
<td>FY 2017</td>
<td>FY 2018</td>
<td>FY 2019</td>
<td>FY 2020</td>
<td>FY 2021</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td></td>
<td>ACTUAL</td>
<td>ACTUAL</td>
<td>ACTUAL</td>
<td>ACTUAL</td>
<td>BUDGET</td>
</tr>
</tbody>
</table>

**TRIF EXPENDITURES**

Total $382,661 $248,513 $1,006,205 $1,167,503 $2,618,073 $4,441,829

**FINANCIAL IMPACT OF TRIF INVESTMENT**

<table>
<thead>
<tr>
<th></th>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sponsored Awards</td>
<td>$1,256,431</td>
<td>$882,075</td>
<td>$1,907,771</td>
<td>$2,094,739</td>
<td>$2,969,534</td>
</tr>
<tr>
<td>Gifts &amp; Other Sources</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>148,477</td>
</tr>
<tr>
<td>Royalty Income</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>23,438</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,256,431</strong></td>
<td><strong>882,075</strong></td>
<td><strong>1,907,771</strong></td>
<td><strong>2,094,739</strong></td>
<td><strong>3,141,449</strong></td>
</tr>
</tbody>
</table>

**TECHNOLOGY TRANSFER ACTIVITY**

<table>
<thead>
<tr>
<th></th>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invention Disclosures Transacted</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>US Patents Issued</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Licenses and Options Executed</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Startup Companies</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**WORKFORCE CONTRIBUTION**

<table>
<thead>
<tr>
<th></th>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic and Postdoctoral Appointees</td>
<td>1</td>
<td>0</td>
<td>7</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Graduate Students</td>
<td>3</td>
<td>3</td>
<td>7</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Undergraduate Students</td>
<td>2</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>50</td>
</tr>
</tbody>
</table>
### PERFORMANCE ANALYSIS

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TRIF EXPENDITURES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AWD</td>
<td>$5,161,293</td>
<td>$3,990,070</td>
<td>$3,809,394</td>
<td>$3,707,070</td>
<td>$3,968,324</td>
<td>$3,985,200</td>
</tr>
<tr>
<td>AZUN</td>
<td>$500,000</td>
<td>$505,000</td>
<td>$510,000</td>
<td>$515,000</td>
<td>$515,000</td>
<td>$520,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$5,661,293</td>
<td>$4,495,070</td>
<td>$4,319,394</td>
<td>$4,222,070</td>
<td>$4,483,324</td>
<td>$4,505,200</td>
</tr>
<tr>
<td><strong>FINANCIAL IMPACT OF TRIF INVESTMENT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Impact of Graduates on Economy</td>
<td>$15,990,000</td>
<td>$15,626,000</td>
<td>$14,235,000</td>
<td>$14,950,000</td>
<td>$15,678,000</td>
<td>$16,146,000</td>
</tr>
<tr>
<td>Degree/Certificate Programs Offered</td>
<td>92</td>
<td>84</td>
<td>89</td>
<td>64</td>
<td>81</td>
<td>83</td>
</tr>
<tr>
<td>Business/Nonprofit Collaborations</td>
<td>211</td>
<td>374</td>
<td>522</td>
<td>516</td>
<td>205</td>
<td>220</td>
</tr>
<tr>
<td>Number of Students Served by A/WD</td>
<td>4,482</td>
<td>4,405</td>
<td>4,220</td>
<td>3,932</td>
<td>5,324</td>
<td>5,856</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$15,990,000</td>
<td>$15,626,000</td>
<td>$14,235,000</td>
<td>$14,950,000</td>
<td>$15,678,000</td>
<td>$16,146,000</td>
</tr>
</tbody>
</table>

### WORKFORCE CONTRIBUTION

- **Web/Hybrid/Enhanced Courses Developed**
  - FY 2017: 191
  - FY 2018: 287
  - FY 2019: 243
  - FY 2020: 260
  - FY 2021: 180

- **Faculty Developing Courses**
  - FY 2017: 405
  - FY 2018: 304
  - FY 2019: 312
  - FY 2020: 450
  - FY 2021: 460

- **Increase in Student Technology Literacy**
  - FY 2017: 4,310
  - FY 2018: 4,555
  - FY 2019: 4,425
  - FY 2020: 4,650
  - FY 2021: 4,675

- **Individual Faculty Trained in Teaching Technologies**
  - FY 2017: 376
  - FY 2018: 307
  - FY 2019: 316
  - FY 2020: 637
  - FY 2021: 325

- **Faculty Support Incidents Resolved Technologies**
  - FY 2017: 13,590
  - FY 2018: 11,734
  - FY 2019: 12,721
  - FY 2020: 19,904
  - FY 2021: 17,775

- **Faculty using Adaptive Courseware**
  - FY 2017: 16
  - FY 2018: 32
  - FY 2019: 36
  - FY 2020: 22
  - FY 2021: 25

---

1. Estimated based on U.S. Census Bureau Data for annual increase in earnings by a baccalaureate-trained worker compared to high school degree
2. Number of degrees supported by A/WD funding
3. Organizations (business, industry, nonprofits, school districts) with formal/informal relationships with NAU related to TRIF A/WD activities
4. Reporting based on number of students eligible to enroll in programs supported by A/WD funding
5. Includes Web, hybrid, IT-enhanced, redesigns and quality review process compliance
6. Number of faculty participating in course development, design and redesign
7. Number of students completing a course with significant or advanced technical fluency skills
8. Number of faculty completing core eLearning training
9. The number of faculty eLearning help desk problems resolved
## FY 2017 - 2021
### UNIVERSITY OF ARIZONA
### TECHNOLOGY AND RESEARCH INITIATIVE FUND

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>REVENUE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carryforward</td>
<td>-</td>
<td>4,707,123</td>
<td>4,648,508</td>
<td>6,431,170</td>
<td>6,431,213</td>
<td>1,287,363</td>
</tr>
<tr>
<td>TRIF Revenue</td>
<td>26,835,988</td>
<td>28,602,907</td>
<td>31,162,604</td>
<td>30,490,949</td>
<td>30,440,800</td>
<td>31,946,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$26,835,988</td>
<td>$33,310,030</td>
<td>$35,811,112</td>
<td>$36,922,120</td>
<td>$36,872,013</td>
<td>$33,233,363</td>
</tr>
<tr>
<td><strong>EXPENDITURES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>17,238,866</td>
<td>23,081,521</td>
<td>25,179,899</td>
<td>30,744,757</td>
<td>25,550,800</td>
<td>28,946,000</td>
</tr>
<tr>
<td>Capital</td>
<td>4,890,000</td>
<td>5,580,000</td>
<td>4,200,000</td>
<td>4,890,000</td>
<td>4,890,000</td>
<td>3,000,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$22,128,865</td>
<td>$28,661,521</td>
<td>$29,379,899</td>
<td>$35,634,757</td>
<td>$30,440,800</td>
<td>$31,946,000</td>
</tr>
<tr>
<td><strong>SUMMARY BY INITIATIVE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improving Health</td>
<td>$10,545,334</td>
<td>$12,392,375</td>
<td>$11,225,039</td>
<td>$12,310,197</td>
<td>$12,267,218</td>
<td>$11,499,951</td>
</tr>
<tr>
<td>Space Exploration &amp; Optical Solutions</td>
<td>5,467,685</td>
<td>6,924,468</td>
<td>7,554,476</td>
<td>8,410,234</td>
<td>7,682,186</td>
<td>8,581,489</td>
</tr>
<tr>
<td>Water, Environmental, Energy Solutions</td>
<td>3,526,907</td>
<td>5,503,376</td>
<td>7,340,000</td>
<td>7,636,142</td>
<td>6,388,180</td>
<td>7,263,966</td>
</tr>
<tr>
<td>National Security Systems</td>
<td>2,588,940</td>
<td>3,841,302</td>
<td>3,260,384</td>
<td>7,278,184</td>
<td>4,103,216</td>
<td>4,600,594</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$22,128,865</td>
<td>$28,661,521</td>
<td>$29,379,899</td>
<td>$35,634,757</td>
<td>$30,440,800</td>
<td>$31,946,000</td>
</tr>
</tbody>
</table>
## PERFORMANCE ANALYSIS

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TRIF EXPENDITURES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>10,545,334</td>
<td>12,392,375</td>
<td>11,225,039</td>
<td>12,310,197</td>
<td>12,455,718</td>
<td>11,499,951</td>
</tr>
<tr>
<td>FINANCIAL IMPACT OF TRIF INVESTMENT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sponsored Awards</td>
<td>74,499,075</td>
<td>89,142,292</td>
<td>78,544,924</td>
<td>111,287,819</td>
<td>67,491,840</td>
<td>70,191,514</td>
</tr>
<tr>
<td>Gifts &amp; Other Sources</td>
<td>117,545</td>
<td>465,399</td>
<td>804,222</td>
<td>565,001</td>
<td>674,918</td>
<td>701,915</td>
</tr>
<tr>
<td>Royalty Income</td>
<td>16,000</td>
<td>200</td>
<td>55,000</td>
<td>46,000</td>
<td>56,243</td>
<td>58,493</td>
</tr>
<tr>
<td>TOTAL</td>
<td>74,632,620</td>
<td>89,607,891</td>
<td>79,404,146</td>
<td>111,898,820</td>
<td>68,223,002</td>
<td>70,951,922</td>
</tr>
</tbody>
</table>

## TECHNOLOGY TRANSFER ACTIVITY

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Invention Disclosures Transacted</td>
<td>55</td>
<td>38</td>
<td>35</td>
<td>67</td>
<td>50</td>
<td>55</td>
</tr>
<tr>
<td>US Patents Issued</td>
<td>7</td>
<td>2</td>
<td>21</td>
<td>18</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Licenses and Options Executed</td>
<td>6</td>
<td>8</td>
<td>9</td>
<td>13</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Startup Companies</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

## WORKFORCE CONTRIBUTION

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Postdoctoral Appointees</td>
<td>160</td>
<td>184</td>
<td>218</td>
<td>126</td>
<td>116</td>
<td>122</td>
</tr>
<tr>
<td>Graduate Students</td>
<td>439</td>
<td>479</td>
<td>643</td>
<td>535</td>
<td>347</td>
<td>365</td>
</tr>
<tr>
<td>Undergraduate Students</td>
<td>741</td>
<td>539</td>
<td>659</td>
<td>557</td>
<td>370</td>
<td>389</td>
</tr>
</tbody>
</table>
**UNIVERSITY OF ARIZONA TECHNOLOGY AND RESEARCH INITIATIVE FUND WATER, ENVIRONMENTAL AND ENERGY SOLUTIONS**

### PERFORMANCE ANALYSIS

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TRIF EXPENDITURES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$3,526,907</td>
<td>$5,503,376</td>
<td>$7,340,000</td>
<td>$7,636,142</td>
<td>$7,867,984</td>
<td>$7,263,966</td>
</tr>
<tr>
<td><strong>FINANCIAL IMPACT OF TRIF INVESTMENT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sponsored Awards</td>
<td>28,190,149</td>
<td>34,978,098</td>
<td>37,230,355</td>
<td>28,666,051</td>
<td>34,870,784</td>
<td>36,265,615</td>
</tr>
<tr>
<td>Gifts &amp; Other Sources</td>
<td>6,797,963</td>
<td>31,228,311</td>
<td>2,470,875</td>
<td>2,434,298</td>
<td>3,824,538</td>
<td>3,977,519</td>
</tr>
<tr>
<td>Royalty Income</td>
<td>8,290</td>
<td>5,145</td>
<td>3,785</td>
<td>2,583</td>
<td>843,648</td>
<td>877,394</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$35,177,062</td>
<td>$66,211,554</td>
<td>$39,705,015</td>
<td>$31,102,932</td>
<td>$39,538,970</td>
<td>$41,120,528</td>
</tr>
</tbody>
</table>

### TECHNOLOGY TRANSFER ACTIVITY

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Invention Disclosures Transacted</td>
<td>18</td>
<td>16</td>
<td>12</td>
<td>11</td>
<td>25</td>
<td>27</td>
</tr>
<tr>
<td>US Patents Issued</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Licenses and Options Executed</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Startup Companies</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

### WORKFORCE CONTRIBUTION

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Postdoctoral Appointees</td>
<td>16</td>
<td>29</td>
<td>55</td>
<td>35</td>
<td>98</td>
<td>103</td>
</tr>
<tr>
<td>Graduate Students</td>
<td>152</td>
<td>175</td>
<td>182</td>
<td>159</td>
<td>313</td>
<td>328</td>
</tr>
<tr>
<td>Undergraduate Students</td>
<td>74</td>
<td>109</td>
<td>123</td>
<td>140</td>
<td>127</td>
<td>134</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------</td>
<td>----------------</td>
<td>----------------</td>
<td>----------------</td>
<td>----------------</td>
<td>----------------</td>
</tr>
<tr>
<td>TRIF EXPENDITURES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$5,467,685</td>
<td>$6,924,468</td>
<td>$7,554,476</td>
<td>$8,410,234</td>
<td>$9,474,458</td>
<td>$8,581,489</td>
</tr>
<tr>
<td>FINANCIAL IMPACT OF TRIF INVESTMENT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sponsored Awards</td>
<td>67,398,490</td>
<td>93,922,125</td>
<td>86,349,520</td>
<td>69,863,665</td>
<td>67,491,840</td>
<td>70,191,514</td>
</tr>
<tr>
<td>Gifts &amp; Other Sources</td>
<td>525,123</td>
<td>597,340</td>
<td>488,660</td>
<td>2,800,000</td>
<td>1,000,000</td>
<td></td>
</tr>
<tr>
<td>Royalty Income</td>
<td>1,256,754</td>
<td>1,438,529</td>
<td>1,932,029</td>
<td>4,393,115</td>
<td>134,984</td>
<td>140,383</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$69,180,367</td>
<td>$95,957,994</td>
<td>$88,770,209</td>
<td>$77,056,781</td>
<td>$68,626,824</td>
<td>$70,331,897</td>
</tr>
<tr>
<td>TECHNOLOGY TRANSFER ACTIVITY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invention Disclosures Transacted</td>
<td>50</td>
<td>62</td>
<td>69</td>
<td>44</td>
<td>50</td>
<td>55</td>
</tr>
<tr>
<td>US Patents Issued</td>
<td>14</td>
<td>11</td>
<td>17</td>
<td>22</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Licenses and Options Executed</td>
<td>21</td>
<td>26</td>
<td>18</td>
<td>22</td>
<td>20</td>
<td>22</td>
</tr>
<tr>
<td>Startup Companies</td>
<td>5</td>
<td>6</td>
<td>4</td>
<td>8</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$69,180,367</td>
<td>$95,957,994</td>
<td>$88,770,209</td>
<td>$77,056,781</td>
<td>$68,626,824</td>
<td>$70,331,897</td>
</tr>
<tr>
<td>WORKFORCE CONTRIBUTION</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postdoctoral Appointees</td>
<td>2</td>
<td>20</td>
<td>25</td>
<td>46</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>Graduate Students</td>
<td>55</td>
<td>115</td>
<td>114</td>
<td>117</td>
<td>46</td>
<td>49</td>
</tr>
<tr>
<td>Undergraduate Students</td>
<td>29</td>
<td>47</td>
<td>57</td>
<td>47</td>
<td>9</td>
<td>10</td>
</tr>
</tbody>
</table>
## University of Arizona Technology and Research Initiative Fund
**National Security Systems**

### Performance Analysis

<table>
<thead>
<tr>
<th></th>
<th>FY 2017 Actual</th>
<th>FY 2018 Actual</th>
<th>FY 19 Actual</th>
<th>FY20 Actual</th>
<th>FY 2020 Budget</th>
<th>FY 2021 Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TRIF Expenditures</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$2,588,940</td>
<td>$3,841,302</td>
<td>$3,260,384</td>
<td>$7,278,184</td>
<td>$4,756,524</td>
<td>$4,600,594</td>
</tr>
<tr>
<td><strong>Financial Impact of TRIF Investment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sponsored Awards</td>
<td>1,066,471</td>
<td>1,281,873</td>
<td>1,343,532</td>
<td>6,984,106</td>
<td>8,000,000</td>
<td>10,000,000</td>
</tr>
<tr>
<td>Gifts &amp; Other Sources</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>150,000</td>
<td>175,000</td>
</tr>
<tr>
<td>Royalty Income</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$1,066,471</td>
<td>$1,281,873</td>
<td>$1,343,532</td>
<td>$6,984,106</td>
<td>$8,150,000</td>
<td>$10,175,000</td>
</tr>
<tr>
<td><strong>Technology Transfer Activity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invention Disclosures Transacted</td>
<td>0</td>
<td>6</td>
<td>8</td>
<td>0</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>US Patents Issued</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Licenses and Options Executed</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Startup Companies</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Workforce Contribution</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postdoctoral Appointees</td>
<td>5</td>
<td>10</td>
<td>10</td>
<td>5</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Graduate Students</td>
<td>12</td>
<td>38</td>
<td>37</td>
<td>49</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Undergraduate Students</td>
<td>10</td>
<td>49</td>
<td>13</td>
<td>42</td>
<td>11</td>
<td>12</td>
</tr>
</tbody>
</table>
## FY 2017-2021
### Arizona Board of Regents Technology and Research Initiative Fund

### REVENUE

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACTUAL</td>
<td>ACTUAL</td>
<td>ACTUAL</td>
<td>ACTUAL</td>
<td>BUDGET</td>
<td>BUDGET</td>
</tr>
<tr>
<td>Carry Forward</td>
<td>$3,040,975</td>
<td>$1,606,114</td>
<td>$1,969,491</td>
<td>$2,004,034</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRIF Revenue</td>
<td>2,000,000</td>
<td>2,000,000</td>
<td>2,000,000</td>
<td>1,833,339</td>
<td>2,000,000</td>
<td>2,000,000</td>
</tr>
<tr>
<td>TOTAL REVENUE</td>
<td>$5,040,975</td>
<td>$3,606,114</td>
<td>$3,969,491</td>
<td>$3,837,373</td>
<td>$2,000,000</td>
<td>$2,000,000</td>
</tr>
</tbody>
</table>

### EXPENDITURES

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACTUAL</td>
<td>ACTUAL</td>
<td>ACTUAL</td>
<td>ACTUAL</td>
<td>BUDGET</td>
<td>BUDGET</td>
</tr>
<tr>
<td>OPERATING</td>
<td>83,944</td>
<td>122,002</td>
<td>142,943</td>
<td>300,774</td>
<td>140,000</td>
<td>150,000</td>
</tr>
<tr>
<td>GRANTS/PROJECTS</td>
<td>3,266,975</td>
<td>1,514,620</td>
<td>1,823,578</td>
<td>1,395,000</td>
<td>1,860,000</td>
<td>1,850,000</td>
</tr>
<tr>
<td>TOTAL EXPENDITURES</td>
<td>$3,350,919</td>
<td>$1,636,622</td>
<td>$1,966,521</td>
<td>$1,695,774</td>
<td>$2,000,000</td>
<td>$2,000,000</td>
</tr>
</tbody>
</table>

### SUMMARY BY INITIATIVE

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Regents’ Innovation Fund Grants</td>
<td>$1,200,000</td>
<td>$1,000,000</td>
<td>$1,200,000</td>
<td>$1,012,000</td>
<td>$1,000,000</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Data/Resources/Technology</td>
<td>200,919</td>
<td>464,620</td>
<td>573,578</td>
<td>333,000</td>
<td>900,000</td>
<td>900,000</td>
</tr>
<tr>
<td>STEM/Innovation Projects</td>
<td>50,000</td>
<td>50,000</td>
<td>50,000</td>
<td>50,000</td>
<td>100,000</td>
<td>100,000</td>
</tr>
<tr>
<td>Over realized funds to universities</td>
<td>1,900,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>TOTAL EXPENDITURES</td>
<td>$3,350,919</td>
<td>$1,514,620</td>
<td>$1,823,578</td>
<td>$1,395,000</td>
<td>$2,000,000</td>
<td>$2,000,000</td>
</tr>
</tbody>
</table>
This page intentionally left blank
EXECUTIVE SUMMARY

Item Name: Annual Personnel Report

☑ Action Item

Requested Action: The board office asks the board to approve the Annual Personnel Report for the Arizona University System.

Background

- The Board of Regents along with all other state personnel systems are required pursuant A.R.S.§41-751 to submit an annual report on personnel to the governor and the legislature by September 1, of each year. The report is to include information about employee turnover, compensation, comparisons to market and overtime pay.

Discussion

- Arizona’s public universities compete with hundreds of other public and private universities throughout the country to attract and retain talented faculty and staff. Salary competitiveness is a leading factor in recruitment and retention.

- Average faculty salaries remain at or near the bottom compared to each university’s peer institutions, and professional and classified staff salaries have not kept up with market movement.

  - ASU ranks 14 among its 15 peers in average faculty salary. The ASU salary gap is 4.3% ($5,100) below the median of their peers in FY 2020.

  - NAU has ranked at or near the bottom of its peers for many years. The NAU salary gap is 15.9% ($13,200) below the peer median in FY 2020. NAU is making concerted efforts to bring average faculty salaries closer to their respective markets as new faculty are hired, but in spite of those efforts over the past five years peer median salaries increased 6.1% compared to no discernable change in NAU’s median faculty salaries.

  - The UA salary gap is 9.2% ($10,357) below peer median in FY 2020. The UA has made notable efforts to increase faculty salaries, with median salaries increasing 11.5% since FY16 compared to peer median salary increases of 5.9%. But despite those efforts UA ranks at the bottom in average faculty salaries among its peer institutions.

Contact Information:
Gale Tebeau, ABOR    gale@azregents.edu    602.229.2522
• Faculty compensation is an important predictor of retention. Studies have shown that institutions with higher average salaries experience lower faculty turnover rates.

• Market competitiveness is also a challenge with regard to professional and classified staff.
  
  o For classified staff, average salary increases needed to reach market in FY 2022 is projected to be 2.3% at the board office, 9.2% at ASU, 30.1% at NAU and 25.1% at UA;

  o For other staff (which includes professional, university staff category and administrative), the projected average salary increases needed to reach market in FY 2022 is between 13.9% and 25.9% at the universities and ABOR.

• There are many reasons for employee turnover at the universities. Turnover can be due to retirements, voluntary terminations, involuntary terminations, non-renewals and deaths, with voluntary terminations as the most common, followed by retirement.

  o The cumulative effect of faculty and staff turnover over the past several years is costly to both in talent and in dollars. In the past 12 months, approximately 727 faculty members (9.6%) and 2,977 staff (18.7%) left the Arizona University System. The reasons for faculty leaving are varied. Retirement is a major factor among full professors, but for other faculty the top reasons are for better career opportunities and higher wages, and limited term appointments for non-tenure tract faculty that were not extended a new contract. In addition, for NAU another top reason is the high cost of living in Flagstaff.

• The average turnover rate for all categories of faculty is: ASU, 8.3%; NAU, 18.3%; and UA, 7.6%. In FY 2020, each of the universities experienced an increase in faculty turnover from the prior year.

• About one out of every six classified and professional staff leave the system each year. Average turnover rates for classified staff range from 12.6% to 20.1% at the three universities, and for professional/university staff categories range from 8.7% to 15.7% at the three universities and system office. The State of Arizona Personnel System turnover rate was approximately 18% in FY 2017 and FY 2018.

• The full report can be accessed [here](#).

Cost Summary

For FY 2022 an estimated $236.4 million (salaries + ERE) is needed for salary adjustments to enable the universities and system office to catch up with their respective markets.

Statutory/Policy Requirements

A.R.S.§41-751 – Annual report
ABOUT THIS REPORT

A.R.S.§41-751 (D) requires the board to submit an annual report on its personnel that includes:

1. Information concerning the number of employees affected by and reasons for turnover of their employees.

2. Information concerning the compensation during the preceding year and the coming year of their employees and the compensation of other public employees and private employees.

3. An advisory recommendation on the salary plan and adjustments for their employees. In establishing the salary plan, they shall consider the relative levels of duties and responsibilities of the various classes of positions, rates paid for comparable positions elsewhere and other relevant factors.

4. The overtime pay for their employees.

ABOUT THE ARIZONA BOARD OF REGENTS

The Arizona Board of Regents is committed to ensuring access for qualified residents of Arizona to undergraduate and graduate institutions; promoting the discovery, application, and dissemination of new knowledge; extending the benefits of university activities to Arizona’s citizens outside the university; and maximizing the benefits derived from the state’s investment in education.

MEMBERS

Larry Penley, Chair
Lyndel Manson, Chair Elect
Karrin Taylor Robson, Secretary
Ron Shoopman, Treasurer
Bill Ridenour
Fred DuVal
Kathryn Hackett King
Anthony Rusk, Student Regent
Nikhil Dave, Student Regent
Gov. Doug Ducey, Ex-Officio
Superintendent Kathy Hoffman, Ex-Officio

ABOR EXECUTIVE DIRECTOR

John Arnold
# Table of Contents

1  Introduction

3  Employee Population

5  Employee Turnover

13  Market Comparisons

20  Other Salary Issues
INTRODUCTION

Talented faculty and staff are necessary to achieve the goals presented in ABOR’s strategic plan, Impact Arizona. Successful employee recruitment and retention is a core objective to meet the challenges of driving student educational success and learning, and to build on research activities to benefit Arizona. In order to attract and keep top talent, Arizona’s public universities and system office must be proactive in offering competitive salaries.

Arizona’s public universities compete with hundreds of other public and private universities throughout the country to attract and retain talented faculty and staff. In spite of quality of life arguments made for Arizona, higher remuneration is still a key reason an individual accepts other employment or stays with Arizona’s universities. It is essential that the universities see people as assets and not just an expense, and therefore investments in people are a strategic priority for the universities. Salary investments based on performance for faculty and staff whose salaries lag the market help retain top performing talent. In addition to the need for salary adjustments to retain faculty and staff, the universities are committed to increasing the number of tenured and tenure track faculty.

- Arizona State University’s Office of Human Resources provides guidance, recommendations and strategic solutions to the hiring and retention of university employees. Objectives include consideration of relevant markets, flexibility in pay administration, opportunities to reward performance, proficiency and outcomes, and support employees’ desire for career growth. ASU maintains a compensation structure reflective of job market dynamics. Each job is assigned a market zone consistent with compensation principles and market relationship.

- Northern Arizona University recognizes that competitive compensation is the cornerstone of recruiting, retaining and motivating employees. The university’s compensation philosophy is to pay all categories of employees at competitive levels established by external labor markets, considering both salary and benefits as a total compensation package. NAU’s compensation programs are intended to meet the following objectives:
  - Establish pay levels for positions on the basis of their external competitiveness with relevant labor markets and their relative internal value.
  - Regularly reward employees on the basis of work performance.
  - Administer pay equitably and consistently.
  - Establish compensation policy that is consistent with the judicious expenditure of funds entrusted by the university.
  - Maximize the effectiveness of compensation funding based on recruiting, retention and employee motivational outcomes.
The University of Arizona established a compensation investment program that raises annual salaries for all benefits-eligible faculty, classified staff and appointed professionals; and elevates stipend levels for graduate assistants and associates. Through this program, the university demonstrates its commitment to increasing the competitiveness of compensation and stressing the importance of recognizing the contributions of those individuals. UArizona’s compensation philosophy acknowledges that a key strategy in attracting, retaining and engaging remarkable talent is an innovative career and compensation architecture that provides market-informed compensation, clear career pathways and career progression opportunities. UArizona’s University Career Architecture Project (UCAP), replaced the current classified staff and appointed professional categories of employment with market-informed job functions and families, and developed:

- A compensation philosophy and total rewards strategy to attract the best talent necessary to deliver on the mission of the university.
- A career architecture that makes it possible to benchmark compensation to the external market and assess internal compensation.
- An annual lifecycle model for strategic compensation planning and management.
- Market-based salary ranges for all positions.
- Modernized policies and procedures to support the new system.

Arizona’s public universities have seen minimal state funding support since the Great Recession, and Arizona is one of seven states that remain more than 30 percent below pre-recession education appropriations per FTE. In addition, Arizona is the only state where the majority of higher education funding did not come from state appropriations. Consequently, the universities have reallocated funds and used other university-generated revenues to address salary deficiencies and to try to catch up and keep up with salary competitiveness.

EMPLOYEE POPULATION

The total number of benefits eligible employees is approximately 26,500, increasing 13.4 percent between fiscal years 2016 and 2020. The increase in staff corresponds with student enrollment growth, which increased 13.4 percent during those years.

ARIZONA UNIVERSITY SYSTEM EMPLOYEE POPULATION¹

<table>
<thead>
<tr>
<th></th>
<th>FY16</th>
<th>FY17</th>
<th>FY18</th>
<th>FY19</th>
<th>FY20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>23,316</td>
<td>23,561</td>
<td>24,714</td>
<td>25,757</td>
<td>26,450</td>
</tr>
<tr>
<td>ABOR</td>
<td>27</td>
<td>33</td>
<td>34</td>
<td>35</td>
<td>34</td>
</tr>
<tr>
<td>UA</td>
<td>10,234</td>
<td>10,326</td>
<td>10,846</td>
<td>11,428</td>
<td>11,629</td>
</tr>
<tr>
<td>NAU</td>
<td>3,089</td>
<td>3,142</td>
<td>3,240</td>
<td>3,273</td>
<td>3,242</td>
</tr>
<tr>
<td>ASU</td>
<td>9,966</td>
<td>10,060</td>
<td>10,594</td>
<td>11,021</td>
<td>11,545</td>
</tr>
</tbody>
</table>

¹ Only Benefits-Eligible Included

ABOR EMPLOYEE BY TYPE

<table>
<thead>
<tr>
<th></th>
<th>FY16</th>
<th>FY17</th>
<th>FY18</th>
<th>FY19</th>
<th>FY20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admin</td>
<td>6</td>
<td>8</td>
<td>8</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Class</td>
<td>16</td>
<td>15</td>
<td>17</td>
<td>21</td>
<td>20</td>
</tr>
</tbody>
</table>
TURNOVER IMPACTS ARIZONA’S PUBLIC UNIVERSITIES

Turnover is an undeniable fact in any organization and Arizona’s public universities are no exception. Turnover impacts the system not only when large numbers of employees leave, but also when the most talented and most experienced employees leave.

A major problem that results when hiring new employees (who often command more competitive rates), is properly addressing salary equity (both in terms of salary compression and salary inversion) in order to retain key faculty and staff.

FACULTY TURNOVER COSTLY TO UNIVERSITIES

Faculty turnover is costly to the universities both in talent and in dollars. There are significant costs associated with recruitment and hiring. In addition to advertising expenses, there are direct costs of interviewing and bringing candidates to campus, and the indirect costs of faculty and staff members’ time in the search process. In the past 12 months, 727 (9.6 percent) of faculty members left the Arizona university system.

There are many reasons for faculty turnover such as retirement, end of assignment, limited term appointments or resignation. Retirement is a major factor among full professors, but for other faculty resignations and leaving the institution for positions in other organizations is the primary factor, often receiving much higher salaries and benefits and greater resources for research and program development and limited term appointments for non-tenure track faculty that were not extended a new contract.

The effects of faculty turnover are often unpredictable and result in the loss of continuity in teaching and research programs, disruptions in graduate and undergraduate advising, and have a negative impact on departmental and institutional management and cohesiveness. Educators who are leaders in their fields contribute to the quality of the educational experience for the 196,000 students in the Arizona university system.

Moreover, in many research-intensive disciplines where the startup package for a new faculty member can often run into the hundreds of thousands of dollars, the lost investment made by the institution can be substantial and can include losses in external funding and grant competitiveness. Additional negative effects are harder to quantify, such as loss in program reputation and faculty morale.

The universities and the communities they serve suffer when faculty leave Arizona. Top scientists and researchers may take millions of dollars in grants and contracts with them when they depart, setting university progress back by years and diminishing the university’s ability to attract additional research funding. When universities’ research efforts are curtailed, it has a negative impact on the local, state and regional economies.
STAFF TURNOVER

Each time a staff member leaves, the universities are faced with the advertising, interviewing and training costs associated with hiring a new employee. The cost of turnover is generally estimated at one to two times the salary of a departing employee. When a position is left unfilled, it puts additional stresses on existing employees, already asked to do more as a result of increased demands and fewer personnel resources, and often at lower than competitive salaries. This cycle can exacerbate turnover and the universities’ ability to attract and retain high quality staff.

With low unemployment rates for most of fiscal year 2020, the task of replacing staff was more difficult and also added to the costs due to extended recruitment periods and extended advertising.

When staff turnover increases, losing the human resources that are essential to the operation and success of the institutions creates reductions in productivity, the potential for diminished services and stalls important institutional initiatives.
### FY 2020 Average Turnover Rate for Classified, Professional and Admin Staff

<table>
<thead>
<tr>
<th></th>
<th>Classified</th>
<th>Professional/University Staff*</th>
<th>Admin</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASU</td>
<td>12.5%</td>
<td>15.7%</td>
<td>6.7%</td>
</tr>
<tr>
<td>NAU</td>
<td>20.1%</td>
<td>15.1%</td>
<td>17.6%</td>
</tr>
<tr>
<td>UA</td>
<td>18.9%</td>
<td>8.7%</td>
<td>6.9%</td>
</tr>
<tr>
<td>ABOR</td>
<td>0.0%</td>
<td>9.1%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

* Professional includes Academic and Service Professionals. University staff carry a secondary designation of "administrative," "professional" or "other."
ASU CLASSIFIED STAFF SEPARATIONS AND TURNOVER RATE

ASU PROFESSIONAL/UNIVERSITY STAFF SEPARATIONS AND TURNOVER RATE

ASU ADMINISTRATIVE STAFF SEPARATIONS AND TURNOVER RATE
NAU CLASSIFIED STAFF SEPARATIONS AND TURNOVER RATE

NAU PROFESSIONAL/UNIVERSITY STAFF SEPARATIONS AND TURNOVER RATE

NAU ADMINISTRATIVE STAFF SEPARATIONS AND TURNOVER RATE

ANNUAL PERSONNEL REPORT | 10
MARKET COMPARISONS

To assess the competitiveness of Arizona university system salaries, the universities and system office conduct an annual comprehensive market study to determine employee pay. Data on average and median pay from a variety of salary surveys\(^2\) is the basis of this analysis.

For faculty, the universities calculate average and median salaries comparing faculty salaries in Arizona to those at peer institutions using the most recent data (fiscal year 2019) from the American Association of University Professors (AAUP). These comparisons include all ranked faculty - professors, associate professors and assistant professors.

For staff, the universities and system office use market survey data. For those jobs where direct comparison data were available, the calculation is the difference between average market salaries and university/ABOR staff average salaries. For titles with no direct comparison data, similar employee categories are used.

FACULTY SALARY INCREASES NEEDED TO REACH MARKET

- Nearly all of the universities’ peer institutions pay higher average salaries then Arizona’s three universities, demonstrating the challenges Arizona faces.
  - All three universities’ average faculty salaries rank at or near the bottom of their peers. Both ASU and NAU ranked 14th among its 15 peers in average faculty salaries, and UArizona had the lowest average salaries compared to peer institutions.

ARIZONA UNIVERSITY SYSTEM MAIN CAMPUSES AVERAGE FACULTY SALARY INCREASE NEEDED TO REACH MEDIAN OF PEERS

\(^2\)American Association of University Professors (AAUP), Association of American Medical College (AAMC), Association of American Universities Data Exchange (AAUDE), Association of Research Libraries (ARL), College and University Professional Association of Human Resources (CUPA-HR), State Higher Education Executive Officers (SHEEO) Staffing and Salary Survey, Bureau of Labor Statistics (BLS), other local and job-specific survey data.
STAFF AVERAGE SALARIES

ASU STAFF AVERAGE SALARIES

$191,349 $199,796 $207,645 $217,949 $238,598

$56,102 $57,775 $58,990 $64,917 $59,893

FY16 FY17 FY18 FY19 FY20

Classified/University Staff Administrative

NAU STAFF AVERAGE SALARIES

$125,506 $126,721 $126,863 $129,988 $133,384

$49,987 $50,216 $52,057 $52,407 $54,083

FY16 FY17 FY18 FY19 FY20

Support Staff Managerial/Admin.
**University of Arizona Staff Average Salaries**

- **Classified**: $72,603 $74,126 $74,953 $75,909 $66,400
- **Appointed**: $70,356 $74,126 $74,953 $75,909

**ABOR - System Office Staff Average Salaries**

- **Classified/Appointed**: $197,441 $165,075 $174,065 $168,300 $188,352
- **Administrative**: $72,603 $71,461 $75,790 $75,790 $82,556
Staff Increases Needed to Reach Market

ASU Staff Salary Increase to Reach Market

<table>
<thead>
<tr>
<th>Year</th>
<th>ASU - Classified</th>
<th>ASU - Other Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY18</td>
<td>11.7%</td>
<td>20.4%</td>
</tr>
<tr>
<td>FY19</td>
<td>11.5%</td>
<td>17.4%</td>
</tr>
<tr>
<td>FY20</td>
<td>6.8%</td>
<td>15.3%</td>
</tr>
<tr>
<td>FY21</td>
<td>7.8%</td>
<td>14.8%</td>
</tr>
<tr>
<td>FY22 est</td>
<td>9.2%</td>
<td>13.9%</td>
</tr>
</tbody>
</table>

NAU Staff Salary Increase to Reach Market

<table>
<thead>
<tr>
<th>Year</th>
<th>NAU - Classified</th>
<th>NAU - Other Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY18</td>
<td>17.2%</td>
<td>19.8%</td>
</tr>
<tr>
<td>FY19</td>
<td>13.6%</td>
<td>18.5%</td>
</tr>
<tr>
<td>FY20</td>
<td>17.0%</td>
<td>22.5%</td>
</tr>
<tr>
<td>FY21</td>
<td>20.4%</td>
<td>26.2%</td>
</tr>
<tr>
<td>FY22 est</td>
<td>23.9%</td>
<td>30.1%</td>
</tr>
</tbody>
</table>
UARIZONA STAFF SALARY INCREASE TO REACH MARKET

ABOR STAFF SALARY INCREASE TO REACH MARKET

*Other Staff is defined as professional staff, university staff category, and administrative Staff.
RESOURCES NEEDED TO MEET MARKET LEVELS

Unmet salary need is the amount needed to raise average faculty salaries to the median of their peers and to raise other staff salaries to the average in other relevant labor markets. For fiscal year 2022, the projected unmet salary need for the Arizona university system is $236.4 million, a slight decrease from the fiscal year 2021 estimate.

Employees’ salaries are expected to remain lower than those at peer institutions and in other relevant markets through 2022. The cost to raise the average salaries of current faculty and staff to the targeted levels will further increase as the market continues to move. Prior to the COVID-19 pandemic, U.S. salaries were projected to rise by an average of 3.3 percent in 2020, (varying slightly from 3.2 percent in 2019 and 3.1 percent in 2018\(^3\)), thus affecting Arizona’s public universities ability to catch up and keep up with salary needs. However, as a result of the pandemic, the labor market will likely see significant changes with little to no wage growth expected.

<table>
<thead>
<tr>
<th>FY 2022 ESTIMATE (IN THOUSANDS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASU</td>
</tr>
<tr>
<td>NAU</td>
</tr>
<tr>
<td>UARIZONA</td>
</tr>
<tr>
<td>ABOR</td>
</tr>
<tr>
<td>TOTAL</td>
</tr>
</tbody>
</table>

OTHER SALARY ISSUES

Employees enrolled in the Arizona State Retirement System have seen their employee contribution rates increase six-fold over the years, from 2 percent in fiscal year 2003 to 12.7 percent anticipated in fiscal year 2022. According to ASRS, contribution rates are expected to increase gradually for a few more years, before gradually beginning to fall. These rate increases amount to real reductions to an employee’s net pay.

Although inflation has remained relatively low, averaging just above 2 percent the past few years, the effects of inflation erode the real value of an employee’s salary. Each time prices increase, an employee’s wage loses some of its value. This coupled with increases in the ASRS contribution rate, further reduces from the competitiveness of salaries offered to employees at Arizona’s public universities.

COMPENSATORY TIME AND OVERTIME

The majority of overtime paid is for positions associated with facilities management and campus police. Special events, inclement weather and the response to the COVID-19 pandemic also contributed to overtime worked by employees, as well as the effects of a reduced work force. Total overtime paid from all sources increased slightly from $5 million in fiscal year 2018 to $5.7 million in fiscal year 2019.

ASRS - EMPLOYEE CONTRIBUTION RATES1 - FY 2003 - FY 2022

1Excludes Long Term Disability (LTD) rates
## FY 2020 Comp Time and Overtime Costs (in Thousands)

<table>
<thead>
<tr>
<th></th>
<th>State Appropriated</th>
<th></th>
<th>Other Sources</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>COMP</td>
<td>OT</td>
<td>TOTAL</td>
<td>COMP &amp; OT</td>
<td></td>
</tr>
<tr>
<td>ASU</td>
<td>$281.7</td>
<td>$610.2</td>
<td>$891.9</td>
<td>$1,272.1</td>
<td>$2,164.0</td>
</tr>
<tr>
<td>NAU</td>
<td>$4.3</td>
<td>$58.9</td>
<td>$63.2</td>
<td>$392.8</td>
<td>$456.0</td>
</tr>
<tr>
<td>UA</td>
<td>$106.5</td>
<td>$702.8</td>
<td>$809.3</td>
<td>$1,801.1</td>
<td>$2,610.4</td>
</tr>
<tr>
<td>ABOR</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$392.5</td>
<td>$1,371.9</td>
<td>$1,764.4</td>
<td>$3,466.0</td>
<td>$5,230.4</td>
</tr>
</tbody>
</table>
EXECUTIVE SUMMARY

Item Name: Annual Cost Containment Report

☑ Action Item

Requested Action: The board office asks the board to approve the Annual Cost Containment Report for Arizona State University, Northern Arizona University and University of Arizona.

Background/History of Previous Board Action

- Arizona Revised Statutes require the Arizona board of regents to submit a comprehensive cost containment report for each university, to the governor and legislature by September 1, of each year. This report was first required in 2018 and is to include the following:

  1. Historical data on tuition and mandatory fee levels and average on-campus housing and meal plan fees at the largest campus for each university during the previous fiscal year and fiscal years 1999, 2004, 2009 and 2014.

  2. The number of FTES and total salaries of university employees differentiated between faculty, classified staff and administrators at each university during the previous fiscal year and fiscal years 1999, 2004, 2009 and 2014.

  3. Actions taken by each university to contain costs at the university and the savings associated with those actions.

  4. The allocation of faculty resources at each university based on the time needed to instruct students and to conduct other research activities.

  5. The number of credit hours required for a baccalaureate degree for the previous academic year and the 2003-2004 academic year for the 10-degree programs that had the largest increase in credit hours required for a baccalaureate degree between the 2003-2004 academic year and the 2017-2018 academic year, and between the previous two academic years.

  6. Detailed information on nontraditional or lower-cost degree options that each university currently offers, has recently developed or is pursuing.

Contact Information:
Matthew Smith, ASU          matthewjsmith@asu.edu          480.727.8117
Bjorn Flugstad, NAU        bjorn.flugstad@nau.edu          928.523.4240
Garth Perry, UA            perryg@arizona.edu           520.955-2860
Gale Tebeau, ABOR          gale@azregents.edu           602.229.2522
Discussion

- The attached report includes data for FY 2020.
- The Cost Containment Report can be accessed here.

Statutory/Policy Requirements

- Arizona Revised Statutes §15-1650.03 (B) – Annual Cost Containment Report
ABOUT THIS REPORT

Arizona Revised Statutes §15-1650.03 (B) requires the Arizona Board of Regents to submit a comprehensive university cost containment report by September 1, of each year for each university under its jurisdiction and shall include at least the following:

1. Historical data on tuition and mandatory fee levels and average on-campus housing and meal plan fees at the largest campus for each university during the previous fiscal year and fiscal years 1999, 2004, 2009 and 2014.

2. The number of full-time equivalent employees (FTEs) and total salaries of university employees differentiated between faculty, classified staff and administrators at each university during the previous fiscal year and fiscal years 1999, 2004, 2009 and 2014.

3. Actions taken by each university to contain costs at the university and the savings associated with those actions.

4. The allocation of faculty resources at each university based on the time needed to instruct students and to conduct other research activities.

5. The number of credit hours required for a baccalaureate degree for the previous academic year and the 2003-2004 academic year for the 10 degree programs that had the largest increase in credit hours required for a baccalaureate degree between the 2003-2004 academic year and the 2017-2018 academic year, and between the previous two academic years.

6. Detailed information on nontraditional or lower-cost degree options that each university currently offers, has recently developed or is pursuing.

ABOUT THE ARIZONA BOARD OF REGENTS

The Arizona Board of Regents is committed to ensuring access for qualified residents of Arizona to undergraduate and graduate institutions; promoting the discovery, application, and dissemination of new knowledge; extending the benefits of university activities to Arizona’s citizens outside the university; and maximizing the benefits derived from the state’s investment in education.

MEMBERS
Larry Penley, Chair
Lyndel Manson, Chair Elect
Karrin Taylor Robson, Secretary
Ron Shoopman, Treasurer
Bill Ridenour
Fred DuVal
Kathryn Hackett King
Anthony Rusk, Student Regent
Nikhil Dave, Student Regent
Gov. Doug Ducey, Ex-Officio
Superintendent Kathy Hoffman, Ex-Officio

ABOR EXECUTIVE DIRECTOR
John Arnold
# TABLE OF CONTENTS

1. ITEM 1 - TUITION AND MANDATORY FEES/AVERAGE ON-CAMPUS HOUSING AND MEAL PLANS
2. ITEM 2 - UNIVERSITY FTES AND SALARIES
3. ITEM 3 - UNIVERSITY COST CONTAINMENT
10. ITEM 4 - ALLOCATION OF FACULTY RESOURCES
11. ITEM 5 - CHANGE IN STUDENT CREDIT HOURS REQUIRED
12. ITEM 6 - NONTRADITIONAL AND LOWER-COST DEGREE OPTIONS

ATTACHMENT: ACADEMIC YEAR 2020 LIST OF DEGREES
ITEM 1

Historical data on undergraduate tuition and mandatory fees levels and average on-campus housing and meal plan fees at the largest campuses for each university during the previous fiscal year and fiscal years 1999, 2004, 2009 and 2014.

<table>
<thead>
<tr>
<th>ASU1</th>
<th>Fiscal Year</th>
<th>Tuition and Mandatory Fees Resident Undergraduate</th>
<th>Average On-Campus Housing Rates</th>
<th>Average Meal Plan Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 1999</td>
<td>$2,158</td>
<td>$2,958</td>
<td>No meal plans required prior to FY 2005</td>
<td></td>
</tr>
<tr>
<td>FY 2004</td>
<td>$3,593</td>
<td>$3,615</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FY 2009</td>
<td>$5,659</td>
<td>$4,979</td>
<td>$1,995</td>
<td>Avg. all plans</td>
</tr>
<tr>
<td>FY 2014</td>
<td>$10,002</td>
<td>$5,380</td>
<td>$4,330</td>
<td>14 meals/wk</td>
</tr>
<tr>
<td>FY 2020</td>
<td>$11,338</td>
<td>$6,300</td>
<td>$5,180</td>
<td>14 meals/wk</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NAU2</th>
<th>Fiscal Year</th>
<th>Tuition and Mandatory Fees Resident Undergraduate</th>
<th>Average On-Campus Housing Rates</th>
<th>Average Meal Plan Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 1999</td>
<td>$2,160</td>
<td>$1,762</td>
<td>$2,160</td>
<td>Avg. all plans</td>
</tr>
<tr>
<td>FY 2004</td>
<td>$3,593</td>
<td>$2,881</td>
<td>$2,565</td>
<td>14 meals/wk</td>
</tr>
<tr>
<td>FY 2009</td>
<td>$5,446</td>
<td>$3,780</td>
<td>$3,132</td>
<td>14 meals/wk</td>
</tr>
<tr>
<td>FY 2014</td>
<td>$9,738</td>
<td>$4,820</td>
<td>$3,928</td>
<td>14 meals/wk</td>
</tr>
<tr>
<td>FY 2020</td>
<td>$11,896</td>
<td>$5,922</td>
<td>$4,838</td>
<td>14 meals/wk</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UA3</th>
<th>Fiscal Year</th>
<th>Tuition and Mandatory Fees Resident Undergraduate</th>
<th>Average On-Campus Housing Rates</th>
<th>Average Meal Plan Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 1999</td>
<td>$2,158</td>
<td>$2,569</td>
<td>No meal plans required except for students living in Honors Village</td>
<td></td>
</tr>
<tr>
<td>FY 2004</td>
<td>$3,603</td>
<td>$3,555</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FY 2009</td>
<td>$5,542</td>
<td>$5,341</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FY 2014</td>
<td>$10,391</td>
<td>$6,705</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FY 2019</td>
<td>$12,447</td>
<td>$7,613</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FY 2020</td>
<td>$12,671</td>
<td>$8,315</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 FY 2014 and after, ASU 14 meals/wk plan includes $375 Maroon & Gold Dollars.
2 Beginning Fall 2008, NAU established a tuition guarantee plan, guaranteeing no tuition increases for eight consecutive semesters for new incoming freshman. In addition, NAU established a meal plan guarantee that when a student purchases a meal plan, the current year’s rates are guaranteed for two years.
3 Beginning Fall 2014, UA established a tuition and mandatory fee guarantee plan, guaranteeing no tuition and mandatory fee increases for eight consecutive semesters for new incoming freshman. Beginning Fall 2019, UA established mandatory meal plan for students living in Honors Village. 15 meal/wk plan at Honors Village is $5,280.
ITEM 2

The number of FTEs and total salaries of university employees differentiated between faculty\(^1\), classified staff and administrators (and other\(^2\)) at each university during the previous fiscal year and fiscal years 1999, 2004, 2009 and 2014.

\(^1\) Faculty is defined as all ranked faculty (professor, associate, assistant), other instructional faculty (instructors, lecturers) and graduate assistants/associates.

\(^2\) Other includes academic and service professionals, administrative faculty, post-doctoral students, and beginning FY 2013 a new employee classification called University Staff.
ITEM 3

Actions taken by each university to contain costs at the university and the savings associated with those actions.

ARIZONA STATE UNIVERSITY

In fiscal year 2020, Arizona State University continued its focus on identifying opportunities to reduce and/or contain costs while advancing strategic priorities related to student retention and graduation, faculty research productivity and the economic development of the state. The following outlines some of the opportunities realized this past fiscal year; these totaled $17.7 million in cost savings.

- ASU Facilities Development and Management implemented the following cost containment measures, totaling $1.2 million in fiscal year 2020:
  - Negotiated a new contract for chilled water for the Downtown Phoenix campus and renegotiated the Southwest Gas contract - $1.0 million savings
  - Reduced costs through insourced Downtown Phoenix campus operations from the property management company; renegotiated a chilled water service contract with Clearway Energy (partial year savings), and administered energy conservation efforts at the Downtown Phoenix campus - $175,000 savings
  - Insourced field renovations at Tempe’s Sun Devil Fitness Complex - $42,000 savings
  - Insourced the backflow certificate program at the Polytechnic Campus - $11,250 savings
  - Instituted changes to vehicle fleet operations at residential facilities - $10,000 savings

- ASU’s University Technology Office (UTO) has continued to reduce costs via competitive bidding, price negotiations, rightsizing and consolidation of software and hardware, and cloud cost optimization. The following resulted in $1.7 million of cost savings and avoidance:
  - Negotiated the cost of the Enterprise Service Bus (ESB) platform - $102,500
  - Renegotiated IT software renewals with Heroku, Splunk and EZAppt - $222,000
  - Partnered with Dropbox to eliminate costs for student licenses - $70,500
  - Rightsized and consolidated software and eliminated unnecessary hardware with Checkpoint, Sybase, and Articulate - $200,000
  - Negotiated an annual concession from Microsoft for MS Project and MS Visio software products - $364,000
  - Migrated products and applications to Amazon Web Services (AWS) cloud platform from ASU on premise servers - $713,000

- ASU leveraged its procurement group to achieve additional savings related to sourcing activities, which totaled approximately $2.4 million. Notable examples include:
  - Switched to a new lower-cost supplier for the implementation of a curriculum management solution for the Provost’s Office - $294,000
  - Negotiated discounts for the purchase of COVID-19 “Zoom Room” components and equipment - $203,000
  - Transitioned from Blackboard Transact to Atrium, eliminating the need for UTO server support - $24,000/year ($120,000 over the life of the contract)
  - Renegotiated the Salesforce.org renewal agreement - $600,000
ITEM 3 CONT.

- Renegotiated the custodial services contract with Olympus - $565,000 per year
- Applied ASU’s universal contract pricing to the purchase of Microsoft Surface products - $75,000
- Negotiated discounts on IT hardware standards with Dell - $600,000

- ASU’s Educational Outreach and Student Services (EOSS) implemented the following cost containment efforts that resulted in cost savings of $550,000 in fiscal year 2020:
  - Decreased the number of software licenses and servers in the Sun Devil Fitness Complexes, ASU Preparatory Academy and Student Health Services - $50,000
  - Executed business process improvements, which included streamlined planning for fall and spring outreach events, a transition to DocuSign and other means of electronic communication, and a departmental reorganization that encompassed a review of all unfilled positions - $500,000

- Implementation of the Workday financial management system eliminated the need to print and temporarily store physical records, to scan documents for permanent retention and then securely destroy, and to provide server space for scanned documents. This resulted in cost savings of $150,000 per year.

- ASU’s Office of Knowledge Enterprise reduced international and domestic travel, consolidated and reorganized its finance team, and realigned capital projects and facilities service contracts in fiscal year 2020, resulting in cost savings of $1.6 million.

- Sun Devil Athletics implemented the following cost containment measures, totaling $1.0 million for fiscal year 2020.
  - Reduced bowl game expenses - $331,000
  - Renegotiated the Sodexo contract for student athlete meals - $320,000
  - Implemented a lower-cost international student health insurance plan with better coverage - $145,000
  - Following a departmental review, closed unfilled positions - $254,000
  - Executed a university-wide budget decentralization initiative that generated $9.1 million per year in savings that were reallocated for mission-critical investments.

- The aforementioned savings are in addition to ongoing savings from initiatives identified in last year’s report, including:
  - Closure of the Thunderbird School of Global Management campus in Glendale and relocation to ASU’s Downtown Phoenix campus eliminated operating expenses in excess of $4 million annually and avoided investment in aging facilities of $25 to $30 million over ten years.
  - Sun Devil Athletics (SDA) and Educational Outreach and Student Services (EOSS) partnered to build needed recreation and sports fields, which will be shared by varsity teams, intramural and club teams and the marching band. Co-locating the fields achieved savings of $2.0 million. By constructing the fields on the site of the former Karsten Golf Course, the university was able to locate the fields close to campus and avoided the substantial cost of acquiring new property.
ITEM 3 CONT.

- By directly hiring technicians to maintain toxic and flammable gas systems at Macro Technology Works (MTW), and consolidating the management structure at MTW and the Flexible Electronics and Display Center, the Office of Knowledge Enterprise realized an estimated $1.8 million of savings.
- Replacing ASU Police Department radios with common communication channels, in collaboration with Northern Arizona University and the City of Flagstaff, will provide savings of $160,000 per year through fiscal year 2028.
- The renegotiation of the contract that provided network infrastructure and security support will generate $1.9 million in annual savings through fiscal year 2023.
- The renegotiation of the contract for a digital integrated enrollment support system for students, which improved the student experience, resulted in savings of $336,000.
- Since 2008, ASU has refinanced a significant portion of its outstanding debt, resulting in a net present value savings (in fiscal year 2019 dollars) of $110 million over the terms of the bonds.
- ASU’s procurement group negotiated numerous advantageous contracts resulting in $2.1 million in annual cost savings.
- Implementation of a university-wide budget decentralization initiative generated $4.2 million per year in savings that were reallocated for mission-critical investments.
NAU has adopted a number of actions over the past year to mitigate the impacts that are still felt from reductions in recurring state appropriation amounts both in aggregate dollar amounts and on a per student basis.

The following listing of actions are a sample of both one-time and permanent actions that NAU has focused on in fiscal year 2020 and build upon the actions previously taken during the earlier 2008 – 2019 period (e.g. furloughs, layoffs, early retirements, elimination of centers, program restructurings, debt refinancing, campus site consolidation, contract renegotiations) that were detailed in the previous years’ cost containment reports.

**ACTIONS**

- Refinancing of outstanding debt
  - Two System Revenue Bonds were issued in fiscal year 2020 to refinance outstanding debt that will yield Net Present Value savings of $18.7 million over the original term of the debt: $3.2 million impact for fiscal year 2020
  - Two SPEED Bonds were issued in fiscal year 2020 to refinance outstanding debt that will yield Net Present Value savings of $12.2 million over the original term of the debt. Dollar impact will begin in fiscal year 2021.

- Contract/lease renegotiations, third party partnerships and procurement processes
  - Infrastructure investments and debt service avoided on residence halls built by third party partners: $13 million fiscal year 2020 estimated impact
  - Contract negotiations and renegotiations that include various software, hotels and facility use agreements, advertising contract, and NAU alert system: $2 million estimated impact in fiscal year 2020
  - Increased usage of PCard and Single Use Account payment methods to yield combined savings and revenues: $1.2 million estimated fiscal year 2020 impact
  - Increased loss prevention initiative that included vandalism prevention, increased signage and training: $.1 million estimated fiscal year 2020 impact
  - Assisted State Risk with cost reduction premium project which yielded a 6% reduction in premium: the specific dollar impact for fiscal year 2020 is not yet known
  - Centralized sourcing of commonly used PPE (Personal Protective Equipment) and sanitizing supplies: $.2 million fiscal year 2020 estimated impact

- Library electronic collections review
  - Cline Library’s E-Resources Group completed the second year of planned three-year review of electronic collections to identify those subscriptions with low usage and/or high cost per use. Subscriptions were canceled or replaced with lower cost subscriptions or subscriptions that offered a better value: $.4 million fiscal year 2020 estimated impact

**ITEM 3 CONT.**
ITEM 3 CONT.

- Business Process Improvements

- As part of the University’s Data Governance initiative, SPRRC (Strategic Project Review and Resourcing Committee) continues to identify, review and prioritize cross-divisional business projects. Selection and resourcing of projects is focused on strategic alignment with university goals, and institutional impact based on the potential efficiencies gained from organizational, process and system synergies. An estimated 10,000 business hours are reduced on an annual basis, translating into an estimated fiscal year 2020 impact of $.5 million. Some specific project examples include:

  - Implement initial pilot Administrative Service Delivery team in Academic Affairs providing human resources and financial services support to improve service delivery results through consistent, efficient, transparent and responsive service. This implementation is part of the university’s Organizational Growth and Effectiveness Initiative. These teams support the processing of purchases, purchasing card payments, cash handling, travel, employee recruitment and onboarding, payroll and timesheet support, and various other basic financial accounting and human resources transactions.

  - Institutional Research Surveys and Reporting – An online survey policy has been established allowing for coordinated review and communication of data requests to students, faculty and staff. Tableau dashboards are being developed and utilized making data readily available to decision makers.
The University of Arizona has continued over the past year to be strategic in implementing programs to increase revenues, identify alternative revenue sources, streamline processes and programs, and cut/contain costs. The University of Arizona currently operates at 15 percent below the median of its peers based on the cost per degree.

The university budget consists of centrally managed institutional budget units and decentralized budget units (colleges and support units) which are managed locally by deans and department directors. What follows are some general examples of actions continuously considered and which may be implemented at the institutional level and/or by individual budget units to reduce and contain costs.

- Replace, update and upgrade university enterprise and other systems in order to take advantage of current technologies, avoid obsolescence and down time, enhance security and compliance, and to maintain cost efficiency. A recent example is the implementation of cloud computing. During fiscal year 2020 this strategy has yielded an estimated $3 million in hardware refresh savings. This project provides other benefits as well, including improved security, improved agility/speed of deployment of software, as well as savings in other areas, such as electricity and related equipment purchases (backup generators and battery power).

- Implement energy efficiency programs including metering improvements, software upgrades to the chilled water system, enhancements to the thermal ice storage production and utility contract renegotiations for lower usage rates. These actions have provided over $1 million in purchase utility costs savings for fiscal year 2020 as compared to the previous fiscal year.

- Refinance outstanding debt for cost savings. During the period, fiscal year 2008 to fiscal year 2020, a combined total of 20 series of system revenue bonds, SPEED revenue bonds and certificates of participation were issued to refinance outstanding debt. These issuances are estimated to provide net present value savings of $102.8 million over the original term of the debt. Of this amount, $13.1 million in net present value savings is attributable to the State Research Infrastructure Lease-Purchase Payment funds and $24.4 million in net present value Savings is attributable to State Lottery Revenue Payment funds.

- Consolidate and form business/shared services centers. Several colleges and units have implemented service centers in order to reduce costs and/or make available funding for reallocation to other uses. These centers consolidate the processing of travel, purchase, contract, human resources and other basic financial transactions, freeing units from the need to each have their own business office staffs. Savings has been experienced from reducing the number of staff needed across the university for these functions. Additional benefits include enhanced consistency, compliance, security, and accuracy in transactions processed. During fiscal year 2020 the Business Affair’s Shared Services unit expanded its client base leading to an estimated additional $45,000 savings per year and by University Information Technology Services (UITS), which reorganized its financial services operations into a shared services model resulting in an estimated $200,000 savings.
Continually review staffing needs and restructure/reorganize units in order to reallocate resources and utilize vacancy savings. Colleges and units continually review their vacancy savings and reallocate the savings for other uses. This may take the form of a one-time reallocation of personnel funds to purchase/replace equipment and/or it may take the form of a permanent reallocation, i.e., restructuring or consolidating faculty and staff positions. One such example is the Financial Services Office, which in fiscal year 2020 identified 13 full-time equivalent (FTE) staff positions, which could be eliminated and two leadership positions that could be consolidated through reorganization of its financial management and treasury management functions.

Perform periodic reviews of programs; adding, merging and eliminating programs to optimize cost efficiency and keep program offerings fresh and relative to meet current needs.

Additional examples of cost savings measures implemented in fiscal year 2020 include:

- Renegotiated costs for processing unemployment contracts.
- Increased number of orientation sessions and professional development trainings offered via teleconference leading to reduce staffing requirements and costs associated with room rentals and provision of printed materials.
- Completed the University Career Architecture Project and implemented the university staff employment category. This is expected to provide consistency and promote the quality of the staff workforce while producing a cost savings across the university.
- Launched the Smart Design project--the goal is to improve the overall academic quality and increase the value of higher education at the university by maintaining an optimal, efficient design for performing support functions. Smart design utilizes peer metrics and involves analyzing functions throughout the university looking for ways to operate more efficiently.

  - Under smart design, five options are considered for functions:
    - Fully centralized: All staff report to one administrative unit.
    - Capability centered: Overseen by multiple, centrally managed units.
    - Embedded: Employees work in units but have a “dotted line” to a central administrative unit.
    - Fully decentralized: Unit-level distribution of responsibility and authority.
    - Outsourced: Assignment of function to a third party.

Finally, in response to the impending financial strain caused by the COVID crisis, the university is undertaking these additional cost mitigation actions planned in fiscal year 2020 and fiscal year 2021:

- Implemented a hiring pause/freeze
- Canceled its performance-based salary increase program
- Implement an employee furlough/pay reduction program
- Reduced/delayed investment in its strategic plan initiatives
- Reduced/delayed capital projects
ITEM 4

The allocation of faculty resources\(^3\) at each university based on the time needed to instruct students and to conduct other research activities.

- ASU and UArizona are classified as Highest Research Activity public institutions and mirror their peers in this category.

- NAU is classified as Higher Research Activity public institution and mirrors its peers in this category.

\[\begin{array}{|c|c|c|}
\hline
\text{Activity} & \text{ASU} & \text{NAU} & \text{UA} \\
\hline
\text{Teaching} & 40\% & 50\% & 40\% \\
\hline
\text{Research and Scholarship} & 40\% & 30\% & 40\% \\
\hline
\text{Other Activities - Administrative Duties, Personal Growth/Professional Development, Service} & 20\% & 20\% & 20\% \\
\hline
\end{array}\]

\(^3\) Individual faculty time allocations vary widely based on a variety of factors, needs, and work expectations.
ITEM 5

The number of credit hours\(^4\) required for a baccalaureate degree for the previous academic year and the 2003 - 2004 academic year for the ten-degree programs that had the largest increase in credit hours required for a baccalaureate degree between the 2003 - 2004 academic year and the 2017 - 2018 academic year, and between the previous two academic years.

<table>
<thead>
<tr>
<th>ASU(^5)</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2003-04</td>
</tr>
<tr>
<td>None</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2018-19</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NAU</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2003-04</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td>2018-19</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UA</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2003-04</td>
</tr>
<tr>
<td>Bachelor of Architecture</td>
<td>166</td>
</tr>
<tr>
<td>Bachelor of Science in Animal Sciences (Science &amp; Pre-Professional Emphasis)</td>
<td>120</td>
</tr>
<tr>
<td>Bachelor of Arts in Mathematics (Education Emphasis)</td>
<td>123</td>
</tr>
<tr>
<td>Bachelor of Science in Nursing</td>
<td>120</td>
</tr>
<tr>
<td>Bachelor of Science in Nutritional Sciences (Dietetics Emphasis)</td>
<td>120</td>
</tr>
<tr>
<td>Bachelor of Science in Nutritional Sciences (Nutrition Emphasis)</td>
<td>125</td>
</tr>
<tr>
<td>Bachelor of Music in Performance (Guitar Emphasis)</td>
<td>128</td>
</tr>
<tr>
<td>Bachelor of Music in Performance (Jazz Studies Emphasis)</td>
<td>125</td>
</tr>
<tr>
<td>Bachelor of Music in Performance (Voice Emphasis)</td>
<td>125</td>
</tr>
<tr>
<td>Bachelor of Arts in Studio Arts</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>2018-19</td>
</tr>
</tbody>
</table>

\(^4\) Credit hours are defined as credit hours required to receive a degree for a student starting the program in a specific year.

\(^5\) All undergraduate programs at ASU have a standard baccalaureate degree requirement of 120 credit hours except of B.A.Ed in Special Education of 126 credit hours.
ITEM 6

Detailed information on nontraditional or lower-cost degree options that each university currently offers, has recently developed or is pursuing. In addition to the information below, see attached report.
ACADEMIC YEAR 2020
LIST OF DEGREES
Arizona’s public universities are the state’s largest provider of higher education, enrolling more than 195,000 students of which 104,000 are Arizona residents. Of Arizona’s high school graduates that pursue a four-year degree, 70 percent choose to attend one of the state’s three public institutions.

While the majority of students remain on the universities’ main campuses in a traditional program of study, each university continues to provide opportunities to deliver four-year degree options in localities that are geographically more convenient and in customized pathways that allow students to complete both undergraduate and graduate degrees in an accelerated timeframe. Many of these programs are offered in partnership with the community college system, leveraging the assets of local community college districts to offer four-year degrees in additional locations. Often students can complete local site and accelerated degree programs at a significant financial discount. The presidents continue to believe localized and alternative degree options will allow additional students to seek and obtain a four-year degree, making these efforts a critical component of expanding educational attainment in Arizona.

In addition to the Arizona State University campuses in the metropolitan Phoenix, Northern Arizona University’s campus in Flagstaff and the University of Arizona campus in Tucson, the three universities offer many other ways to access their degree opportunities throughout the state. This brochure summarizes those many options.
TABLE OF CONTENTS

CITIES

1   Avondale
2   Casa Grande
3   Chandler
4   Coolidge
5   Douglas
6   Fort Defiance
7   Glendale
8   Kingman
9   Lake Havasu
10  Mesa
11  Nogales
12  Phoenix
15  Pima County
16  Prescott
17  Prescott Valley
18  Scottsdale
19  Show Low
20  Sierra Vista
22  Thatcher
23  Tucson
25  Yuma

ALTERNATIVE DEGREE EARNING PROGRAMS

27  Arizona State University
31  Northern Arizona University
34  University of Arizona

COMMUNITY COLLEGE PATHWAYS

38  Arizona State University
39  Northern Arizona University
39  University of Arizona
TUITION AND FEES
Tuition and fees for undergraduate students at NAU’s Estrella Community College, Main Campus location are approximately 30% less than it is for similar students at NAU’s Flagstaff campus: $8,365 per year compared to $11,896 per year in Flagstaff.

DEGREES OFFERED
BACHELOR OF SCIENCE IN EDUCATION
Elementary Education

BACHELOR INTERDISCIPLINARY STUDIES
Justice Studies Criminal Justice Emphasis 90/30

BACHELOR OF SCIENCE IN NURSING
Nursing Concurrent Enrollment

More Information:https://nau.edu/admission/nau-campuses-west-valley/
TUITION AND FEES

Tuition and fees for undergraduate resident students at the Central Arizona College campus in Casa Grande are 42% less than it is for similar students at the Tempe campus: $6,594 per year compared to $11,338 at the Tempe campus.

DEGREES OFFERED

BACHELOR OF ARTS
Organizational Leadership

BACHELOR OF APPLIED SCIENCE
Applied Science (Applied Leadership)

More Information: https://admission.asu.edu/transfer/pinal
CHANDLER

TUITION AND FEES

Tuition and fees for undergraduate students at NAU’s Chandler- Gilbert Community College, Pecos Campus are approximately 30% less than it is for similar students at NAU’s Flagstaff campus: $8,365 per year compared to $11,896 per year in Flagstaff.

DEGREES OFFERED

BACHELOR OF BUSINESS ADMINISTRATION
Business Administration

BACHELOR OF SCIENCE IN EDUCATION
Elementary Education

BACHELOR INTERDISCIPLINARY STUDIES
Justice Studies Criminal Justice Emphasis 90/30

BACHELOR OF SCIENCE IN NURSING
Nursing Concurrent Enrollment

More Information: https://nau.edu/admission/nau-campuses-chandler-gilbert/

TUITION AND FEES

Tuition and fees for undergraduate resident students at the Chandler distance learning campus are 62-67 percent less per unit than it is for students at the Tucson campus.

DEGREES OFFERED

BACHELOR OF APPLIED SCIENCE
Applied Computing
Cyber Operations
Human Services
Intelligence & Information Operations
Network Operations

MASTER OF EDUCATION
Teaching & Teacher Education

EDUCATIONAL SPECIALIST
School Psychology

More Information: https://chandler.arizona.edu/
TUITION AND FEES

Tuition and fees for undergraduate students at NAU’s Central Arizona College, Signal Peak Campus location are approximately 30% less than it is for similar students at NAU’s Flagstaff campus: $8,365 per year compared to $11,896 per year in Flagstaff.

DEGREES OFFERED

BACHELOR INTERDISCIPLINARY STUDIES
Industrial Leadership

BACHELOR OF SCIENCE IN EDUCATION
Special and Elementary Education

BACHELOR OF SCIENCE IN NURSING
Nursing (Concurrent Enrollment)

More Information: https://nau.edu/admission/nau-campuses-signal-peak/
Mandatory tuition and fees at the UA South, Douglas are 23% less than the main campus location in Tucson. Compared to $12,671 at UA main campus, South campus tuition and fees amount to $9,797. At these locations, a WUE rate is also available for non-resident students from participating states at 150%.

**DEGREES OFFERED**

**BACHELOR OF SCIENCE**
- Elementary Education

**BACHELOR OF APPLIED SCIENCE**
- Cyber Operations
- Applied Science Emphases Available:
  - Administration of Justice
  - Early Childhood Education
  - Human Services
  - Informatics Intelligence Studies
  - Organizational Leadership Regional Commerce

**BACHELOR OF ARTS**
- English
- Government and Public Service
- History
- Psychology

**MASTER OF EDUCATION**
- Secondary Education

More Information: https://uas.arizona.edu/locations/ua-douglas
TUITION AND FEES

Tuition and fees for undergraduate students at NAU's Fort Defiance location are approximately 30% less than it is for similar students at NAU’s Flagstaff campus: $8,365 per year compared to $11,896 per year in Flagstaff.

DEGREES OFFERED

BACHELOR OF SCIENCE IN NURSING
Nursing

More Information: https://yuma.nau.edu/AZCampuses/Ganado/
TUITION AND FEES

Tuition and fees for undergraduate students at NAU’s Glendale Community College, Main Campus are approximately 30% less than it is for similar students at NAU’s Flagstaff campus: $8,365 per year compared to $11,896 per year in Flagstaff.

DEGREES OFFERED

BACHELOR INTERDISCIPLINARY STUDIES
Applied Human Behavior 90/30

BACHELOR OF SCIENCE IN EDUCATION
Elementary Education

BACHELOR OF SCIENCE
Organizational Communication Studies

BACHELOR OF SCIENCE IN NURSING
Nursing Concurrent Enrollment

APPROVED FOR FALL 2021
BACHELOR OF SCIENCE
Health Sciences - Fitness Wellness

KINGMAN

TUITION AND FEES

Tuition and fees for undergraduate students at NAU's Mohave Community College, Neal Campus are approximately 30% less than it is for similar students at NAU’s Flagstaff campus: $8,365 per year compared to $11,896 per year in Flagstaff.

DEGREES OFFERED

BACHELOR OF SCIENCE IN EDUCATION
Elementary Education

More Information: https://nau.edu/admission/nau-campuses-mohave/
TUITION AND FEES

Resident and nonresident students at the Lake Havasu campus receive a steep discount on tuition and fees, with resident undergraduate tuition and fees 42% less than the Tempe campus: $6,594 per year compared to $11,338 at the Tempe campus.

DEGREES OFFERED

BACHELOR OF SCIENCE
Biology
Biology (Environmental Science)
Communication
Criminology and Criminal Justice
Environmental Science
Health Education and Health Promotion
Kinesiology
Psychology
Tourism and Recreation Management

BACHELOR OF ARTS IN EDUCATION
Elementary Education

BACHELOR OF ARTS
Business (Business Administration)
Business (Communication)
Communication
Environmental Science
General Studies
Organizational Leadership
Political Science
Psychology
Sociology

OTHER OFFERINGS
Exploratory Health and Life Sciences
Exploratory Humanities, Fine Arts and Design
Exploratory Social and Behavioral Sciences

More Information: https://havasu.asu.edu/
TUITION AND FEES

Tuition and fees for undergraduate students at NAU’s Mesa Community College, Southern and Dobson Campus and NAU’s East Valley location are approximately 30% less than it is for similar students at NAU’s Flagstaff campus: $8,365 per year compared to $11,896 per year in Flagstaff.

DEGREES OFFERED: MESA COMMUNITY COLLEGE

BACHELOR INTERDISCIPLINARY STUDIES
Applied Human Behavior 90/30
Industrial Leadership 90/30
Strategic Leadership 90/30

BACHELOR OF SCIENCE IN EDUCATION
Elementary Education
Special & Elementary Education

BACHELOR OF SCIENCE IN NURSING
Nursing (Concurrent Enrollment)

BACHELOR OF SCIENCE
Dental Hygiene Concurrent Enrollment

More Information: https://nau.edu/admission/nau-campuses-mesa/
TUITION AND FEES

Mandatory tuition and fees at the UA South, Nogales are 23% less than the main campus location in Tucson. Compared to $12,671 at UA main campus, South campus tuition and fees amount to $9,797. At these locations, a WUE rate is also available for non-resident students from participating states at 150% of the resident rate.

DEGREES OFFERED

BACHELOR OF SCIENCE
Elementary Education

BACHELOR OF APPLIED SCIENCE
Cyber Operations
Applied Science Emphases Available:
  Administration of Justice
  Early Childhood Education
  Human Services
  Informatics Intelligence Studies
  Organizational Leadership Regional Commerce

BACHELOR OF ARTS
English
Government and Public Service
History
Psychology

MASTER OF EDUCATION
Secondary Education

More Information: https://uas.arizona.edu/locations/ua-santa-cruz
TUITION AND FEES

Tuition and fees for undergraduate students at NAU statewide campuses at various Maricopa Community College locations and their North Valley location are approximately 30% less than it is for similar students at NAU’s Flagstaff campus: $8,365 per year compared to $11,896 per year in Flagstaff.

DEGREES OFFERED: GATEWAY COMMUNITY COLLEGE

BACHELOR OF SCIENCE IN NURSING
Nursing (Concurrent Enrollment)

DEGREES OFFERED: NORTH VALLEY

BACHELOR INTERDISCIPLINARY STUDIES
Justice Studies Criminal Justice Emphasis 90/30

BACHELOR OF SCIENCE IN EDUCATION
Special & Elementary Education

MASTER OF EDUCATION
Counseling – School Counseling
Educational Leadership – Instructional Leadership K-12 School Leadership
Educational Leadership – Principal K-12
Elementary Education – Certification
Human Relations

MASTER
Organizational Leadership

MASTER OF ARTS
Clinical Mental Health Counseling

GRADUATE CERTIFICATE
Principal

DOCTORATE OF EDUCATIONAL PSYCHOLOGY
School Psychology
DEGREES OFFERED: PARADISE VALLEY COMMUNITY COLLEGE

BACHELOR OF SCIENCE IN EDUCATION
Special & Elementary Education

BACHELOR OF BUSINESS ADMINISTRATION
Business Administration

BACHELOR OF SCIENCE IN NURSING
Nursing Concurrent Enrollment

DEGREES OFFERED: PHOENIX COLLEGE

BACHELOR OF SCIENCE IN EDUCATION
Elementary Education

BACHELOR INTERDISCIPLINARY STUDIES
Strategic Leadership 90/30

BACHELOR OF SCIENCE IN NURSING
Nursing Concurrent Enrollment

BACHELOR OF SCIENCE
Dental Hygiene Concurrent Enrollment

DEGREES OFFERED: SOUTH MOUNTAIN COMMUNITY COLLEGE

BACHELOR INTERDISCIPLINARY STUDIES
Applied Human Behavior 90/30

BACHELOR OF SCIENCE IN EDUCATION
Elementary Education

More Information:
https://nau.edu/statewide-campus/
TUITION AND FEES

Tuition and fees for undergraduate resident students at the Phoenix, North Valley distance learning campus are 72 percent less per unit than it is for students at the Tucson campus.

DEGREES OFFERED

BACHELOR OF GENERAL STUDIES
Emphases Areas:
  - Arts, Media and Entertainment
  - Economy and Industry
  - Global and Intercultural Understanding
  - Social, Behavioral & Human Understanding
  - Science, Technology, Health & Society

More Information: https://northvalley.arizona.edu/
TUITION AND FEES

Mandatory tuition and fees at the locations at Pima Community College’s Pima East and Pima Desert Vista campuses are 23% less than the main campus location in Tucson. Compared to $12,671 at UA main campus, South campus tuition and fees amount to $9,797. At these locations, a WUE rate is also available for non-resident students from participating states at 150% of the resident rate.

DEGREES OFFERED

BACHELOR OF SCIENCE
- Elementary Education
- Family Studies and Human Development

BACHELOR OF APPLIED SCIENCE
- Cyber Operations
- Applied Science Emphases Available:
  - Administration of Justice
  - Early Childhood Education
  - Human Services
  - Informatics Intelligence Studies
  - Organizational Leadership Regional Commerce

BACHELOR OF ARTS
- English
- Government and Public Service
- History
- Psychology

MASTER OF EDUCATION
- Secondary Education

More Information: https://uas.arizona.edu/locations/ua-pima-community-college
Tuition and fees for undergraduate students at NAU’s Yavapai College, Prescott Campus are approximately 30% less than it is for similar students at NAU’s Flagstaff campus: $8,365 per year compared to $11,896 per year in Flagstaff.

DEGREES OFFERED

BACHELOR OF SCIENCE IN EDUCATION
Elementary Education (Offered at Prescott Valley location Fall 2020)

BACHELOR OF SCIENCE IN NURSING
Nursing (Concurrent Enrollment)

More Information: https://nau.edu/admission/nau-at-yavapai-college/
TUITION AND FEES
Tuition and fees for undergraduate resident students at the Yavapai College campus in Prescott Valley are 42% less than it is for similar students at the Tempe campus: $6,594 per year compared to $11,338 at the Tempe campus.

DEGREES OFFERED
BACHELOR OF APPLIED SCIENCE
Applied Science (Health Sciences, Applied Leadership)

BACHELOR OF ARTS
Organizational Leadership

More Information: https://admission.asu.edu/transfer/asuyavapai

TUITION AND FEES
Tuition and fees for undergraduate resident students at NAU Yavapai are approximately 30% less than it is for similar students at NAU’s Flagstaff campus: $8,365 per year compared to $11,896 per year in Flagstaff.

DEGREES OFFERED
BACHELOR INTERDISCIPLINARY STUDIES
Applied Human Behavior 90/30
Strategic Leadership 90/30

MASTER OF EDUCATION
Educational Leadership - Instructional Leadership K-12 School Leadership
Educational Leadership – Principal K-12

More Information: https://nau.edu/admission/nau-apai/
TUITION AND FEES
Tuition and fees for undergraduate students at NAU's Scottsdale Community College location are approximately 30% less than it is for similar students at NAU's Flagstaff campus: $8,365 per year compared to $11,896 per year in Flagstaff.

DEGREES OFFERED

BACHELOR
Interdisciplinary Studies – Strategic Leadership 90/30

BACHELOR OF SCIENCE
Biology
Hotel Restaurant Management/
Hospitality Leadership
Interior Design

DOCTORATE OF EDUCATION
Educational Leadership

GRADUATE CERTIFICATE
Superintendent

More Information: https://nau.edu/admission/
nau-campuses-scottsdale/
TUITION AND FEES

Tuition and fees for undergraduate students at NAU’s Northland Pioneer College location are approximately 30% less than it is for similar students at NAU’s Flagstaff campus: $8,365 per year compared to $11,896 per year in Flagstaff.

DEGREES OFFERED

BACHELOR OF SCIENCE IN EDUCATION
Elementary Education

More Information: https://nau.edu/admission/nau-campuses-show-low/
TUITION AND FEES

Tuition and fees for undergraduate resident students at the Cochise College campus are 42% less than it is for similar students at the Tempe campus: $6,594 per year compared to $11,338 at the Tempe campus.

DEGREES OFFERED

BACHELOR OF ARTS
Organizational Leadership

BACHELOR OF APPLIED SCIENCE
Applied Science (Applied Leadership)

More Information: https://admission.asu.edu/transfer/asu-cochise

TUITION AND FEES

Mandatory tuition and fees at the UA South campus are 23% less than the main campus location in Tucson. Compared to $12,671 at UA main campus, South campus tuition and fees amount to $9,797. At these locations, a WUE rate is also available for non-resident students from participating states at 150% of the resident rate.

DEGREES OFFERED

BACHELOR OF SCIENCE
Computer Science Elementary Education
Family Studies and Human Development
Mathematics

BACHELOR OF APPLIED SCIENCE
Cyber Operations
Applied Science Emphases Available:
   Administration of Justice
   Early Childhood Education
   Human Services
   Informatics Intelligence Studies Network Operations
   Organizational Leadership Regional Commerce
SIERRA VISTA

(Continued)

BACHELOR OF ARTS
Government and Public Service
Psychology

MASTER OF EDUCATION
Secondary Education

More Information: https://sierravista.arizona.edu/
Item Name: Adaptive Athletics Funding Allocation

☑ Action Item

Requested Action: The board office asks the board to approve the FY 2021 Adaptive Athletics Special Line Item funding allocation, as described in this executive summary.

Background/History of Previous Board Action

- The FY 2021 General Appropriations Act (Laws 2020, Chapter 58) appropriated $160,000 to ABOR for the Adaptive Athletics Special Line Item (SLI) in FY 2021. The following language is from the SLI’s footnote in the bill:
  - “The Arizona board of regents shall distribute monies appropriated for the adaptive athletics line item to each university under the jurisdiction of the board to maintain and operate an intercollegiate adaptive athletics program that provides opportunities for competitive wheelchair and adaptive sports to students and community members with disabilities. The monies may be spent only when the university collects matching monies of gifts, grants and donations for the intercollegiate adaptive athletics program from sources other than this state. Universities may spend the monies only on scholarships, equipment, uniforms, travel expenses and tournament fees for participants in the intercollegiate adaptive athletics program. The monies may not be used for administrative costs, personal services or employee-related expenditures.”

- Adaptive athletics is a competitive sports program dedicated to promoting athletic activities for students with disabilities.

Discussion

- The ABOR office requested proposals from the universities, and UArizona was the only request submitted.

- UArizona requested funding up to the full $160,000 appropriation.

- Pursuant to the footnote in the FY 2021 General Appropriations Act, the university must provide matching funding from non-state sources.
  - UArizona has received $198,217.50 in non-state matching monies.

Contact Information:
Leatta McLaughlin, ABOR  leatta.mclaughlin@azregents.edu  602-229-2524
The footnote requires the funding to only be spent on scholarships, equipment, uniforms, travel expenses, and tournament fees for participants in the program. Monies may not be spent on administrative costs, personal services, or employee-related expenditures.

- UArizona will spend the $160,000 to expand scholarship offerings, purchase sports equipment, and provide proper uniforms and travel support.

- UArizona supports the largest adaptive athletics program in the United States with seven competitive teams and an adaptive fitness center. UArizona recruits athletes from across the country. The program includes wheelchair track and field, rugby, tennis, men’s and women’s basketball, handcycling, and golf. This year they will start a swimming pilot program.

Statutory/Policy Requirements

- FY 2021 General Appropriations Act (Laws 2020, Chapter 58, Section 90)
Item Name: ABOR Annual Report

☑ Action Item

Requested Action: The board office asks the board to accept the ABOR Annual Report.

Background

This year, the board and universities have been at the forefront of addressing one of the greatest challenges of our time – COVID-19 – providing critical support and resources to support the state in the extraordinary fight against the global public health crisis. This year’s annual report shares the many important outcomes of the board’s strategic plan, but begins with an overview of the many vital contributions and actions of the board and universities during this unprecedented era.

Discussion

The fiscal year 2020 Arizona Board of Regents Annual Report highlights outcomes and accomplishments by the board and universities from the past year, including an overview of the board actions and universities’ vital contributions in response to the challenges brought about by COVID-19.

The 2020 Arizona Board of Regents Annual Report may be found here.

Statutory Requirements

A.R.S. §15-1629

Contact Information:
John Arnold, ABOR  john.arnold@azregents.edu  602-229-2500
This page intentionally left blank
The Arizona Board of Regents Fiscal Year 2020 Annual Report filed in accordance with A.R.S. §15-1629 features news and accomplishments by the board and universities. Priorities for the board this year include: ensuring access to the universities during a global pandemic with no tuition increases for in-state students; conducting research that benefits the state and society, including COVID-19 research; and increasing educational attainment to meet the workforce needs of the New Economy. Data reflected throughout the report represents the most current available.

ABOUT THE ARIZONA BOARD OF REGENTS
The Arizona Board of Regents is committed to ensuring access for qualified residents of Arizona to undergraduate and graduate institutions; promoting the discovery, application, and dissemination of new knowledge; extending the benefits of university activities to Arizona’s citizens outside the university; and maximizing the benefits derived from the state’s investment in education.

MEMBERS
Larry Penley, Chair
Lyndel Manson, Chair Elect
Karrin Taylor Robson, Secretary
Ron Shoopman, Treasurer
Bill Ridenour
Fred DuVal
Kathryn Hackett King
Anthony Rusk, Student Regent
Nikhil Dave, Student Regent
Gov. Doug Ducey, Ex-Officio
Superintendent Kathy Hoffman, Ex-Officio

ABOR EXECUTIVE DIRECTOR
John Arnold
# TABLE OF CONTENTS

1. INTRODUCTION

3. RESILIENT

9. AT A GLANCE

10. IMPACT

19. EDUCATE

24. ACHIEVE

34. DISCOVER

39. CONCLUSION
INTRODUCTION

Arizona is home to three innovative, world-class, public universities that offer exceptional opportunities for learning, discovery, research and public service for Arizona residents and the global community. These universities – Arizona State University, Northern Arizona University and the University of Arizona – are economic powerhouses and represent a crucial base industry in the state. Similar to other base industries in Arizona, such as aerospace, manufacturing and mining, public higher education is crucial to our state’s economic vitality and growth.

As prescribed by the Arizona Constitution, the Arizona Board of Regents is the independent governing authority for our state’s public university enterprise. The board provides strategic direction for the university system and is committed to ensuring Arizonans have access to a high-quality public university education at a competitive cost.

Serving the public good and providing lasting value, the Arizona Board of Regents and public university enterprise provide solutions to grand challenges in the state. This year, the board and universities have been at the forefront of addressing one of the greatest challenges of our time – COVID-19 – providing critical support and resources to support the state in the extraordinary fight against the global public health crisis.

This year’s annual report shares the many important outcomes of the board’s strategic plan, but begins with an overview of the many vital contributions and actions of the board and universities during this unprecedented era of the COVID-19 health crisis.

In this time of unprecedented challenge, the resilience of the Sun Devil, Wildcat and Lumberjack spirit has shined and we are proud to share this year’s many accomplishments amid the challenges. On behalf of Arizona, the board will continue to work to address challenges and work diligently to expand affordable access to Arizona’s world-class public university system.

Larry E. Penley
Chair

John Arnold
Executive Director
RESILIENT

During fearful and troubled times, the late Mr. Rogers famously urged that people remember to “Look for the helpers. You will always find people who are helping.”

So it is with the COVID-19 pandemic that has gripped our state and beyond. Arizona’s public universities have answered the call to help our state. When it became clear that medical and personal protective equipment (PPE) were in short supply for doctors and nurses, ASU created a supply chain that distributed thousands of pieces to hospitals and health care facilities.

When the Navajo Nation and other tribal communities suffered disproportionately due to COVID-19, NAU worked with them to install Wi-Fi at critical locations and provided a team of epidemiologists and volunteers to help contain the outbreak.

And when there emerged an urgent need for more physicians and expanded testing, UArizona cleared qualifying, fourth-year medical students to graduate early, and developed an antibody test that would be made available to 250,000 healthcare workers and first responders statewide.

These are but examples. There are countless others of Arizona universities and their students and faculty members rising to what is the shared challenge of our time. Because this is what our public university enterprise is about: solving problems; adapting in the face of crisis; public service; collaboration; and action for the betterment of our community.

When we leave this traumatic chapter of our lives behind, Arizona will emerge stronger and more unified for what we have faced together. ASU, NAU and UArizona will be there – leading our economic recovery, fostering innovation and helping to solve the challenges of our state. Resilient - for the future of Arizona.
During an unprecedented era presented by the COVID-19 pandemic, the board took several actions to ensure Arizona’s public universities are positioned to weather the challenges of the pandemic. With health and wellness of students, faculty, staff and visitors as its highest priority, the board is guided by local, state and federal health agencies as it works to minimize risk and provide direction to the universities.

**COVID-19 Response Planning Principles**

The board adopted COVID-19 response planning principles to provide a blueprint for universities to follow in the months ahead, focusing on the health and safety of students, employees and members of university communities.

Board principles are derived from guidelines developed by the Centers for Disease Control and Prevention and focus on minimizing health risks for students and members of the university communities as well as maintaining academic excellence and the student experience.

Photo by: Jacob Chinn, UA
NEW PAY REDUCTION POLICY
Providing an option for university presidents and the board’s executive director to respond to severe university-wide budget constraints, the board approved a pay reduction program. The program provides flexibility to reduce pay in response to substantial reductions in state appropriations, natural or physical disasters, terrorism or public health emergencies.

Under the new policy, a university president who wishes to implement or amend a pay reduction program must first provide a description of the program or amendment to the board chair and the executive director of the board. If ABOR’s executive director plans to implement or amend a program, the executive director must submit the program or amendment to the board chair.

ZERO TUITION INCREASE FOR RESIDENT STUDENTS
Resident students at Arizona’s public universities saw no increase to tuition rates after the board approved 2020-21 tuition proposals. Resident tuition was kept at last year’s levels to ensure higher education at Arizona’s public universities remains accessible for students during economic challenges brought about from the COVID-19 pandemic.

Tuition predictability for students remains a priority for the board and universities. ASU continued their commitment to hold tuition increases to 3 percent or less for resident students in future years while NAU and UArizona continue tuition guarantees that provide students with predictable rates.

COMPENSATION SUSPENDED
The board approved a request from university presidents and ABOR’s executive director asking the board to suspend previously scheduled compensation increases for presidents as well as decisions regarding achieving at-risk compensation for the presidents and executive director as they manage challenges and issues related to the COVID-19 pandemic.

The measure suspends assigning new at-risk compensation goals as well as approving decisions by the presidents to lead and participate in university reduction-in-pay initiatives or approved furlough programs. At-risk compensation goals assigned to the presidents by the board reflect the board’s strategic imperatives, including increasing educational attainment in Arizona, generating solutions to societal challenges, enhancing efficiency and affordability and enhancing the quality of students’ experiences.
ARIZONA STATE UNIVERSITY

ASU LAUNCHES DIGITAL EDUCATION PLATFORM – ASU FOR YOU
ASU launched ASU for You, a digital education platform that provides content for all learners, including tools for educators and parents. The initiative is part of ASU’s ongoing commitment to continued learning and meeting changing needs during this crisis. Most content on ASU for You is free.

The site helps educators, families who choose home schooling, and families working to keep their children learning online during the pandemic. The platform provides tools from ASU Prep Digital and assets from the Inspark Teaching Network and the Mary Lou Fulton Teachers College. ASU for You includes Virtual Field Trips, giving people a way to experience new places without ever leaving home. Items of interest on the site include “Ask a Biologist,” “Ask an Anthropologist,” and “The NASA Psyche Mission Innovation Toolkit.”

ASU DEVELOPS STATE’S FIRST SALIVA-BASED COVID-19 TEST
In an effort to make COVID-19 diagnostic testing easier and more readily available to Arizonans, researchers at ASU developed the state’s first saliva-based test. “This new saliva-based test will be a real game-changer for those individuals who want to know whether or not they have an active COVID-19 infection,” said ASU Biodesign Institute Executive Director Joshua LaBaer, who leads ASU COVID-19 research efforts. “As we return to the workplace, schools and other daily activities, testing early and often is going to be the best way to help us prevent the spread of COVID-19.”

RESEARCH ADDRESSES CRITICAL NEEDS
Just a week after the first U.S. case of the new coronavirus was confirmed in Washington state, ASU researchers Brenda Hogue, Bert Jacobs and Qiang “Shawn” Chen rapidly mobilized efforts to begin research toward developing a coronavirus vaccine. ASU scientists Brenda Hogue and Paul Westerhoff developed ways to use heat treatment and UV light to rapidly sterilize and reuse critical supplies of personal protective equipment. ASU’s 3D printing capabilities have also been ramping up and developing prototypes of supplies that are in critical demand for medical personnel and first responders, including face shields and testing kit components.

To read more, go to eoss.asu.edu/health/announcements/coronavirus.
NAU RESPONDS TO PUBLIC HEALTH NEEDS IN RURAL AND UNDERSERVED COMMUNITIES

NAU deployed many of its nursing and physician assistant students to help bolster community health capacity in rural and underserved communities in responding to COVID-19. NAU students provided much needed support for public health needs across Arizona. Additionally, a team of NAU researchers worked in collaboration with the Coconino County Health Department, along with several of NAU’s Master of Public Health students, on the front lines of data entry, management and analysis to develop models that predict the spread of COVID-19 throughout Coconino County and Northern Arizona.

PROFESSOR PRODUCES HAND SANITIZER FOR NAVAJO NATION

A lab at NAU used its resources to produce hand sanitizer to donate to the Navajo Nation. Chemistry professor Jani Ingram and several student researchers focused on making hand sanitizer, which had been in short supply when the pandemic began. In one afternoon, the team made about 80 gallons of hand sanitizer.

FEWSION™ TECHNOLOGY HELPS GOVERNMENTS, COMMUNITIES PLAN

The FEWSION™ Project, led by Ben Ruddel, associate professor in the School of Informatics, Computing and Cyber Systems, is a multi-institution project that brings together engineers and data scientists to map the food, energy and water supply chains for every community in the United States. These maps are available for public use through the FEW-View website, allowing people to understand how the supply chains are affected by external forces, such as natural disasters or public health crises. As the COVID-19 pandemic persists, the technology developed by FEWSION has the potential to help local communities and governments better plan for the impact it will have on their communities.

To read more, go to nau.edu/coronavirus/.
UNIVERSITY OF ARIZONA

PARTNERING WITH THE STATE TO PRODUCE THOUSANDS OF ANTIBODY TESTS
UArizona and the state of Arizona partnered together to test thousands of individuals for COVID-19. Through sites in all of the state’s counties, health care workers and first responders were able to find out if they had antibodies to the virus.

The state of Arizona provided $3.5 million to test 250,000 first responders and health care workers. The COVID-19 antibody tests build upon the work of UArizona Health Sciences researchers Deepta Bhattacharya, associate professor in the College of Medicine – Tucson’s Department of Immunobiology, and Dr. Janko Nikolich-Žugich, chair of the Department of Immunobiology.

ENSURING INTERNET ACCESS FOR RURAL ARIZONA STUDENTS
Leveraging the university’s 26 Cooperative Extension Offices throughout the state — at least one in every county and seven offices on Native nations — UArizona worked to develop a plan to provide all Arizona higher education students with electronic access sufficient to support remote learning. This supports many Native American and rural students who do not have access to dependable internet connections in their communities and cannot access online education during the current crisis.

ADDRESSING THE SHORTAGE OF PERSONAL PROTECTIVE EQUIPMENT
Engineering and health sciences researchers teamed up to address the shortage of personal protective equipment in Tucson health care facilities. Amid the COVID-19 pandemic, hospitals across the world ran short on personal protective equipment, including N95 respirators – masks that, unlike surgical masks, fit tightly around the face and are capable of filtering out 95 percent of airborne particles. In response to the shortage, a group of UArizona researchers worked to design, 3D print and test masks for health care workers at Banner – University Medical Center. Additionally, a group of students in the UArizona School of Theatre, Film & Television addressed the shortage of masks for health care workers in the wake of the COVID-19 pandemic.

To read more, go to covid19.arizona.edu/.
Gov. Doug Ducey appointed Regent Kathryn Hackett King to an eight-year term on the Arizona Board of Regents in March 2020. Regent King is an employment and labor attorney who focuses on labor and employment law and litigation.

Gov. Ducey reappointed Regent Karrin Taylor Robson, who was appointed in June of 2017, to a full term on the board. Regent Taylor Robson is the founder and president of Arizona Strategies, a land-use strategy company headquartered in Phoenix.

Regents Jay Heiler and Ram Krishna concluded their eight-year terms on the board. Regent Krishna and Regent Heiler both worked to ensure Arizona’s public universities were positioned for success for students and Arizona’s future economy.

Student Regent Anthony Rusk began his term July 1, 2019 after Gov. Doug Ducey appointed him to the board. He has served as policy director and Freshmen Class Council president for the Associated Students of the University of Arizona.

---

### ECONOMIC IMPACT

<table>
<thead>
<tr>
<th>Total Jobs</th>
<th>Total Wages</th>
<th>Total Economic Output</th>
<th>Total Taxes</th>
</tr>
</thead>
<tbody>
<tr>
<td>84,355</td>
<td>$4.6B</td>
<td>$11.1B</td>
<td>$451.7M</td>
</tr>
<tr>
<td>67,803 direct</td>
<td>$3.8B direct</td>
<td>$8.5B direct</td>
<td>$180.8M direct</td>
</tr>
<tr>
<td>16,552 indirect/induced</td>
<td>$0.8B indirect/induced</td>
<td>$2.6B indirect/induced</td>
<td>$270.8M indirect/induced</td>
</tr>
</tbody>
</table>

*FY 2017 data

---

### RECORD ENROLLMENT AND DEGREES

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>195,672</td>
<td>Record total enrollment at Arizona’s public universities</td>
</tr>
<tr>
<td>12,668</td>
<td>Record number of graduate degrees conferred by Arizona's public universities</td>
</tr>
<tr>
<td>33,217</td>
<td>Record number of bachelor’s degrees earned by graduates of Arizona's public universities</td>
</tr>
<tr>
<td>$863.8M</td>
<td>Institutional gift aid awarded to 114,091 students from the universities</td>
</tr>
</tbody>
</table>

---

### THE VALUE OF A DEGREE

- **78%** Percentage difference in median wages between individuals with a bachelor’s degree ($51,179) and peers with a high school diploma ($28,821)
- **128%** Percentage difference in median wages between individuals with a graduate degree ($65,573) and peers with a high school diploma ($28,821)
- **$18.6 BILLION** Wages earned by nearly 300,000 graduates of Arizona’s public universities
Arizona’s public universities provide opportunities for learning, discovery, research, public service and economic development. Critical goals outlined in ABOR’s 2025 Impact Arizona strategic plan include improving access for students, promoting student success and contributing to the state. Increases in enrollment, graduation rates, student retention, research, inventions and more boost educational attainment and impact Arizona’s economy and quality of life. The following graphics indicate progress against goals for the board’s strategic plan metrics.

**EDUCATE**
- Freshman Retention: 83.9%
- Undergraduate Enrollment: 158,135
- Graduate Enrollment: 37,537
- Total Enrollment: 195,672
- 6-Year Graduation Rate: 64.1%

**ACHIEVE**
- Bachelor’s Degrees: 33,217
- Graduate Degrees: 12,668
- Education and Related Expenses Per Degree: $61,427
- AZ CC Transfer Student Bachelor Degrees Awarded: 7,671

**DISCOVER**
- Research and Development Activity: $1.4B
- Licenses & Options Executed: 177
- Invention Disclosures Received: 50

**IMPACT**
- Public Service Activity: $167,012K
- High-Demand Degrees: 19,556
BOARD’S NEW METRICS DELIVER “PROMISE” TO INCREASE EDUCATIONAL ATTAINMENT AND SEEK SOLUTIONS TO SOCIETAL CHALLENGES

With a focus on student success and accountability, the board approved updated strategic metrics and an ongoing commitment to the state through a new “promise” to Arizona: to increase postsecondary access and attainment for Arizona students; to seek solutions to societal challenges and to do both while increasing quality, affordability and efficiency.

“I’m encouraged by our new strategic metrics that are designed to not only inform the board on the success of our universities, but to dig deeper into students’ experiences to advance their satisfaction and success,” said ABOR Chair Larry E. Penley. “Equally, because the universities are so intrinsically tied to the economy of our state, I am confident these metrics help the board and universities deliver vital outcomes for Arizona, including the development of a strong workforce positioned to succeed in the New Economy.”

New metrics are designed around four pillars: increasing attainment; generating solutions; enhancing efficiency and affordability; and enhancing quality of students’ experiences. New three- to five-year strategic forecasts are included with the new metric framework and will provide the board with information about each university’s future scale and direction. The board intends to adopt measurable metric goals for each university in fall of 2020.

THE BOARD’S PROMISE TO ARIZONA:

increase postsecondary access and attainment for Arizona students; to seek solutions to societal challenges and to do both while increasing quality, affordability and efficiency.
In response to the COVID-19 pandemic, the board adopted planning principles to provide guidance for universities to follow during the pandemic. Principles are derived from Centers for Disease Control and Prevention guidelines and focus on the health and safety of students, employees and members of university communities.

Principles outline criteria for university COVID-19 planning efforts to: promote the health and safety of students, faculty, and staff; address the continuity of courses of study and other essential operations; provide timely communications with key constituencies, on- and off-campus; address special considerations such as clinical programs, research programs, health and counseling services, student basic needs, meal plans and residential housing; address implications for student services and intercollegiate athletics; and evaluate and address the short- and long-term financial implications.

Board-approved guidelines call for each university’s planning response to the COVID-19 pandemic to address specific measures including:

- Testing or screening of students, faculty and staff;
- Contact tracing;
- Promoting behaviors that reduce the potential for spread of the virus;
- Distancing and reduced density in classrooms, work areas and public areas;
- Addressing risk in residence halls and food service areas;
- Protocols for responding to students or employees who may have come into contact with an infected individual;
- Protocols for responding to students or employees who test positive for the virus or who experience symptoms consistent with the virus;
- Preparing student health resources and facilities for both the physical and mental impacts of COVID-19;
- Education and direction for employees and students on issues related to public health (e.g., social distancing, hand washing, hand sanitizer use, wearing masks and signage promoting healthy behavior);
- Education and direction for employees and students on university health services, counseling support services and disability resources;
- Addressing facilities issues, including enhanced sanitation.
Thirty-six students on two-student teams from Arizona’s public universities competed during the daylong Regents’ Cup event at UA in November. The first-of-its-kind competition showcased Arizona’s public universities commitment to freedom of expression. Subjects debated included how (if at all) social media sites should regulate speech, free speech on college campuses, and if the United States should have tougher libel, slander and defamation laws.

ASU students Valielza O’Keefe and Joshua Pardhe took first place, each winning $16,600 in a one-time scholarship to further their educational goals. The second-place winning team received one-time scholarships totaling $12,450 and third-place winners took home a $6,225 scholarship. Each of the remaining student competitors was awarded a $500 one-time scholarship. Several Arizona companies signed on as sponsors for the inaugural Regents’ Cup, including Salt River Project as the event’s platinum sponsor and Arizona Public Service Company and AZ Strategies as gold sponsors.

Arizona’s public universities are recognized as exemplars in free speech; ASU, NAU and UA are all recognized with the highest rating from the Foundation for Individual Rights in Education. “The Regents’ Cup is really a testament to the leadership of Justice O’Connor. She warned us all that we have a quiet crisis in civics and civil discourse and so the Regents’ Cup was really intended to engage our students in a forum that allows civil discourse and allows freedom of ideas and diversity of ideas to flourish,” said Regent Karrin Taylor Robson, who envisioned the event.
BOARD APPROVES VAPING POLICY

With rising and alarming trends of vaping-related illness and death in the United States, the board took action to address the public health hazard and implemented policies that prohibit the use of tobacco and vaping on university campuses.

Spearheaded by Regent Fred DuVal, revisions create uniform and comprehensive board-level policies that prohibit smoking, the use and sale of tobacco products, and the use and sale of smokeless tobacco products in or on all university property unless an express exception is provided by a university president for certain leased property or pursuant to university policy. This includes a prohibition against the use of electronic smoking devices.

“I BELIEVE THIS CRISIS WARRANTS A UNIFORM AND COMPREHENSIVE BOARD-LEVEL POLICY PROHIBITING NOT ONLY THE USE BUT ALSO THE SALE OF TOBACCO AND VAPING PRODUCTS ON UNIVERSITY PROPERTY.”
- REGENT FRED DUVAL

INCREASING EDUCATIONAL ATTAINMENT CRUCIAL FOR INDIVIDUALS AND ARIZONA

Increasing educational attainment is a key priority for the board to benefit individuals and for the future of Arizona’s workforce. Arizona’s public universities’ efforts to increase educational attainment are evident in the achievements in key measures of student success, including freshmen retention and graduation rates. Freshmen retention was 83.9 percent during the 2019-20 academic year, short of the board’s goal of 84.4 percent and up from the previous year at 81.5 percent. The six-year graduation rate during 2019-20 was 64.1 percent, just shy of the board’s goal of 64.7 percent and an increase from the previous year at 63.3 percent.

Benefits of earning an advanced education - higher wages, lower unemployment and better quality of life - are well documented, yet the state lags the nation in terms of the number of Arizonans who go on to earn a college degree. As Arizona’s economy recovers from the COVID-19 pandemic, it is critical to prepare the state for the future in the New Economy when factors such as automation, artificial intelligence and workforce shortages due to a demographic trough will affect Arizona’s workforce and economy.

COST SAVINGS MEASURES INCREASE EFFICIENCY

Measures taken by Arizona’s public universities to contain costs each year contribute to the overall efficiency of the university system and are reported in the annual Cost Containment Report. The report highlights concrete steps Arizona’s universities have taken to identify and pursue cost-saving opportunities, as well as the associated cost savings.

For example, at ASU, consolidation through the closure of the campus for the Thunderbird School of Global Management in Glendale and the relocation of its graduate and executive education programs to ASU’s Downtown Phoenix campus reaped savings by avoiding investment in aging facilities of $25 to $30 million over the next 10 years. At NAU, infrastructure investments and debt service avoided on residence halls built by third party partners yielded a $13 million estimated impact. At UArizona long-range strategies to implement energy efficiency programs including metering improvements, software upgrades to the chilled water system, enhancements to the thermal ice storage production and more have saved the university more than $10 million in the past several years.
ARIZONA PUBLIC UNIVERSITY ENTERPRISE
AN ECONOMIC POWERHOUSE AND BASE INDUSTRY

With $11.1 billion total impact, 84,355 total jobs, $4.6 billion in total wages and as a leading employer, Arizona’s public universities are significant economic engines for the state. Year over year, Arizona’s public universities continue to be important economic drivers – educating the state’s workforce, creating jobs and driving the state forward. The universities are also major employers in Arizona and spark significant business development, both of which contribute to the expansion of the state’s tax base.

As the state looks forward to a post COVID-19 economic recovery, Arizona’s public universities are critical to leading our state to economic recovery, stability and to ensuring a vital economy and workforce for the future.

In comparing Arizona’s major industries, the Arizona public university enterprise and graduates rank:

---

TOP 5 for number of jobs (367,800)

TOP 5 for highest annual wage ($60,800)

TOP 2 for overall economic impact

ARIZONA’S PUBLIC UNIVERSITIES SPUR BUSINESS DEVELOPMENT

- The university system contributes significantly to the Arizona economy by aiding the state’s ability to recruit high value-added businesses.

- Zoom’s expansion to Arizona near ASU is expected to generate 530 jobs, $29.7M in wages, $67.3M in economic output and $2.3M in tax revenues from this business development.

- Every 1,000 jobs that are created in Arizona that can be attributed to the state’s universities creates an additional 1,100 jobs.

ARIZONA’S PUBLIC UNIVERSITIES CREATE JOBS

- Including student employment, the university enterprise is the top employer in the state.

- Arizona’s three public universities employ a total of 36,725 people (excluding student workers) statewide. These employees earned a combined $2.6B in wages and benefits.

- University student spending on items such as housing, utilities, groceries, retail goods, etc. generated 19,743 jobs with $758.2M in wages.

UNIVERSITY GRADUATES DRIVE ECONOMY

- Nearly 300,000 graduates from Arizona’s public universities worked in the state.

- These alumni represent about 10 percent of the state’s total employment and work in nearly every industry sector throughout Arizona.

- The 300,000 graduates produce about $39.8B in direct economic output. This economic activity supports an additional 281,300 indirect and induced jobs throughout Arizona.
NEW ECONOMY INITIATIVE ADVANCES ARIZONA

The board approved a new model for its state budget request that focused on enhancing Arizona’s competitiveness. Workforce development is a cornerstone of the “New Economy Initiative: Enhancing Arizona’s Competitiveness,” a business plan which defines a strategy of how to grow Arizona’s next generation of talent and lead Arizona’s competitiveness.

“These New Economy forces include transformation of the kind work that we do; the kinds of technology-driven businesses that will dominate the economy; the demographic challenges to available labor that lie ahead; and the risks of job loss, especially outside the urban core. The proposal addresses the education and training that the state will need to maintain its prosperity. It also enhances the capability of the state to support the development of research that leads to New Economy businesses, and it incentivizes student attainment in high school and college with financial aid. Now is the time to capitalize on the state’s momentum,” ABOR Chair Penley said.

Broadly endorsed by Arizona mayors and business organizations, the initiative slowed in the wake of the COVID-19 pandemic. However, the board anticipates advancing the initiative as an innovative solution to driving Arizona’s economic growth and competitiveness.
Enrollment continues to increase at Arizona’s public universities

Enrollment increased at Arizona’s public universities during fiscal year 2020 with notable growth in the number of students taking online programs. During the fall of fiscal year 2020, total student enrollment at Arizona’s public universities was 195,672, a 4.7 percent increase over the prior year with most of the growth in online programs.

Since fiscal year 2016, online degree program enrollment has more than doubled, increasing by 112 percent at Arizona’s public universities. Online degree program students now comprise 27.3 percent of total enrollment with the majority of students taking at least one online class - 114,251 students or 58.4 percent of total enrollment.

Most students enrolled at the universities are residents of the state. These 104,494 resident students are joined by 91,178 non-resident students.

Total Enrollment

<table>
<thead>
<tr>
<th>Year</th>
<th>Actuals</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-2016</td>
<td>163,183</td>
<td></td>
</tr>
<tr>
<td>2016-2017</td>
<td>171,791</td>
<td></td>
</tr>
<tr>
<td>2017-2018</td>
<td>178,487</td>
<td></td>
</tr>
<tr>
<td>2018-2019</td>
<td>186,398</td>
<td></td>
</tr>
<tr>
<td>2019-2020</td>
<td>195,672</td>
<td></td>
</tr>
<tr>
<td>2020-2021</td>
<td>199,591</td>
<td></td>
</tr>
<tr>
<td>2021-2022</td>
<td>204,987</td>
<td></td>
</tr>
<tr>
<td>2022-2023</td>
<td>222,604</td>
<td></td>
</tr>
</tbody>
</table>
COMMUNITY COLLEGE PATHWAYS PROGRAMS PROVIDE SEAMLESS TRANSFERS FOR STUDENTS TO UNIVERSITIES

Arizona’s public universities provide seamless pathways for students transferring from community colleges to the universities. Students can transfer to the universities through hundreds of these partnership programs.

As part of its strategic plan, the Arizona Board of Regents measures growth in undergraduate degrees that are awarded in four years to Arizona community college transfer students. In 2018-19, 7,671 transfer students earned bachelor’s degrees, short of the board’s strategic goal of 8,136.

During the 2018-19 academic year, 10,355 students transferred from Arizona’s community colleges to ASU, NAU or UArizona. Among new university freshmen, 17.6 percent came to college with Arizona community college credits.

FINANCIAL AID ENABLES ACCESS FOR STUDENTS TO ATTEND UNIVERSITIES

Financial aid is essential for students at Arizona’s public universities. Financial aid programs help ensure that a university education remains financially accessible to all academically eligible Arizona students.

Key findings from the Arizona Board of Regents 2019 Financial Aid Report include:

- While more students are relying on financial aid, default rates for Arizona public university students are below average nationally and remain the lowest among all Arizona higher education institutions.

- Debt upon graduation for students in Arizona with financial aid loans remains low compared to other public universities. Concerted efforts by the board and the universities have led to real savings for students and increased tuition predictability and transparency.

- Since 2015, systemwide financial aid from all sources has increased 30 percent from $2.20 billion to $2.87 billion, outpacing enrollment growth of 20 percent over the same time period.

- Forty-two percent of ASU, 43 percent of NAU and 51 percent of UArizona undergraduate students graduated with no debt.

- In 2019, Arizona’s public universities collectively provided $863.3 million in institutional gift aid. Since 2015, total institutional gift aid has increased $302.3 million or 53.9 percent.

FINANCIAL AID AWARDS BY SOURCE (IN BILLIONS)
FRESHMEN RETENTION INDICATES ACADEMIC SUCCESS

Freshmen retention during the 2019-20 academic year was 83.9 percent overall, short of the board’s 84.4 percent goal and an increase from the 2018-19 academic year when 81.5 percent of freshmen were retained at the universities.

The board measures freshmen retention as part of its strategic metrics as students who return for their sophomore year have a higher probability of graduating, contributing to their overall academic success. Arizona public universities offer enhanced student services during key transition points throughout students’ freshman year, including programs such as peer mentoring; online tools for degree requirements and potential careers; first-generation student support; programs to prepare for college; tutoring; and more.

SIX-YEAR GRADUATION RATE STEADILY INCREASING

Arizona public universities’ six-year graduation rate is 64.1 percent, representing a steady rise over time and just shy of the strategic metric goal of 64.7 percent as the board and universities continuously work to improve student retention and graduation rates.

The six-year graduation rate is a federally required metric and reflects improved productivity through degrees awarded while ensuring undergraduate students graduate in a reasonable time frame.

Graduating from college is one of the best investments an individual can make, especially now when jobs increasingly require education past high school. Board data indicates the benefits of earning a degree over a lifetime are considerable including better quality of life for university graduates with Arizona median wages of $65,573 for an individual with a graduate degree, $51,197 for a bachelor’s degree and $28,821 for a high school diploma.

6-YEAR GRADUATION RATE
STATEWIDE TRI-UNIVERSITY TOUR HELPS FAMILIES NAVIGATE ADMISSIONS, FINANCIAL AID PROCESSES

Arizona’s three public universities again collaborated this year to provide parents and students with sessions across the state that equip participants with tools and resources necessary to navigate college. The Tri-University Tour stopped at locations across the state and shared important information about navigating the college admissions process, scholarships and financial aid. To encourage various communities in Arizona in the college admission process, ASU, NAU and the UArizona developed the Tri-University Tour to help participants gain a better understanding of Arizona’s public universities and make informed decisions about their future.

ALL-ARIZONA ACADEMIC TEAM AWARD RECIPIENTS HEAD TO ARIZONA’S PUBLIC UNIVERSITIES

Ninety-five of Arizona’s highest achieving community college students were honored at the 2020 All-Arizona Academic Recognition Ceremony in February. All-Arizona Academic Team members were selected for their demonstration of academic excellence and intellectual rigor combined with leadership and service that extends their education beyond the classroom to benefit society. Every recipient, who must maintain a GPA of 3.5 or higher, was awarded a two-year tuition scholarship to the student’s choice of one of Arizona’s three public universities.

A collaboration between Arizona’s public universities, the Arizona Board of Regents and the state’s community colleges, celebrating the successes of All-Arizona Academic Team members began in 1995. The partnership was met with great success, and the board increased support for the program by providing resident scholarships to all members of the team in 1997. The tuition scholarship program has benefitted more than 1,500 students throughout its history.

WICHE PROGRAMS HELP ARIZONA STUDENTS SUCCEED

Arizona students continue to benefit from the Western Interstate Commission for Higher Education (WICHE) exchange programs. In fiscal year 2019 Arizona students who studied out of state saved $18 million through WICHE programs. Arizona is the largest supporting state in WICHE’s Professional Student Exchange Program (PSEP). During the 2019-20 academic year, 166 students saved more than $4 million through reduced tuition costs for healthcare studies not offered by public institutions in Arizona, and 77 percent of Arizona’s PSEP graduates returned home to practice. Students are contractually required to return and practice their profession in Arizona or reimburse the funds paid on their behalf. Arizona’s educational institutions and local economies benefit from PSEP as well. In 2019-20, 142 PSEP students enrolled in public and private programs in Arizona, and the institutions received $2.8 million in support fees from other WICHE states to reduce students’ tuition costs.

Arizona also received 335 WICHE Western Regional Graduate Program (WRGP) students during the 2019-20 academic year. Additionally, Arizona received 7,880 WICHE Western Undergraduate Exchange (WUE) students at community colleges and universities. These students paid 150 percent of resident tuition. High-demand careers launched through WICHE programs for Arizona residents include dentists, optometrists, osteopathic physicians, podiatrists and veterinarians.

Ensuring the continuation of WICHE as a tool to provide affordable access to higher education is critical for students’ benefit and for the good of the state.
Arizona’s public universities are known for excellence and innovation. National and worldwide rankings recognize the universities’ accomplishments and leadership among institutions of higher learning as the following honors illustrate:

**ARIZONA STATE UNIVERSITY**

- Named No. 1 among the “Most Innovative Schools” since 2016 by U.S. News & World Report
- No. 1 in the U.S and top 5 in the world for global impact in research, outreach and stewardship, Times Higher Education
- Among the top 10 “Best Buy” public universities by Fiske Guide to Colleges

**NORTHERN ARIZONA UNIVERSITY**

- No. 9 best college town in the nation by USA Today
- Top 4.3 percent of academic rankings worldwide by the Center for World University Rankings
- Ranked No. 2 in the nation for awarding master’s degrees to Native Americans by Diverse Issues in Higher Education

**UNIVERSITY OF ARIZONA**

- Hispanic Serving institution by the U.S. Department of Education
- No. 2 globally in water resources (No. 1 in the U.S.) by Shanghai Academic Ranking’s Global Ranking of Academic Subjects
- No. 11 for best online bachelor’s programs by U.S. News & World Report

Photo by: ASU
Arizona’s public universities awarded more bachelor’s degrees to students in 2019, representing historic growth overall and in STEM and other high-demand fields. Graduates from Arizona’s public universities earned 33,217 bachelor’s degrees, an increase of 5.6 percent from last year.

All three of the universities significantly increased bachelor’s degrees in key STEM fields, together producing 8,757 bachelor’s degrees in 2019, a 15.5 percent year-over-year increase and a 62 percent increase over the last five years. The universities are also doing their part to fulfill the state and nation’s need for health-care workers with substantially more bachelor’s degrees awarded in health fields in 2019 than at any time in their history – conferring 2,655 degrees, an increase of 3.3 percent year-over-year and a 63.6 percent increase since 2014.

Bachelor’s degrees awarded in business continued to increase with 6,410 degrees awarded in 2019, representing growth of 5.3 percent over last year and a 45.5 percent increase since 2014. By contrast, bachelor’s degrees in education have slowly declined by 2.4 percent over the last five years with the universities awarding 1,529 bachelor’s degrees in 2019.

**Total Bachelor’s Degrees Awarded**

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Degrees Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-2016</td>
<td>27,472</td>
</tr>
<tr>
<td>2016-2017</td>
<td>28,796</td>
</tr>
<tr>
<td>2017-2018</td>
<td>31,468</td>
</tr>
<tr>
<td>2018-2019</td>
<td>33,217</td>
</tr>
<tr>
<td>2019-2020</td>
<td>31,447</td>
</tr>
<tr>
<td>2020-2021</td>
<td>32,959</td>
</tr>
<tr>
<td>2021-2022</td>
<td>35,056</td>
</tr>
<tr>
<td>2022-2023</td>
<td>36,219</td>
</tr>
<tr>
<td>2023-2024</td>
<td>37,387</td>
</tr>
<tr>
<td>2024-2025</td>
<td>38,700</td>
</tr>
</tbody>
</table>

**实际 vs. 目标**

<table>
<thead>
<tr>
<th>年份</th>
<th>公立大学授予的学士学位数</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>33,217</td>
</tr>
<tr>
<td>2020</td>
<td>28,308</td>
</tr>
<tr>
<td>2021</td>
<td>17,697</td>
</tr>
<tr>
<td>2022</td>
<td>17,697</td>
</tr>
<tr>
<td>2023</td>
<td>17,697</td>
</tr>
<tr>
<td>2024</td>
<td>17,697</td>
</tr>
<tr>
<td>2025</td>
<td>17,697</td>
</tr>
</tbody>
</table>

FY 19 is most current data available. FY 20 data will be posted in spring, 2021.
Arizona’s public universities conferred 12,668 graduate degrees in 2019 – a record number of master’s and doctoral degrees awarded. The universities awarded 10,497 master’s degrees with the greatest numbers in the fields of education, business management, engineering, health professions and public administration. The universities also conferred 2,171 doctoral degrees with the greatest numbers in the fields of health, legal professions, engineering, education and physical sciences.

FY 19 is most current data available. FY 20 data will be posted in spring, 2021.
Increasing the number of high-demand degrees earned by graduates in fields such as education, health, science, technology, engineering and math is critical to fulfilling Arizona's workforce needs now and in the future.

During the 2018-19 academic year, 19,556 degrees were earned by graduates in high-demand fields, surpassing the board’s strategic goal of 18,631. This is an increase of 7.5 percent over the previous year when 18,185 degrees were awarded, representing another increase over the board’s goal of 17,620 degrees.

**High Demand Degrees**

<table>
<thead>
<tr>
<th>Year</th>
<th>Actuals</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-2016</td>
<td>16,464</td>
<td>15,907</td>
</tr>
<tr>
<td>2016-2017</td>
<td>16,817</td>
<td>16,636</td>
</tr>
<tr>
<td>2017-2018</td>
<td>18,185</td>
<td>17,620</td>
</tr>
<tr>
<td>2018-2019</td>
<td>19,556</td>
<td>18,631</td>
</tr>
<tr>
<td>2019-2020</td>
<td>19,598</td>
<td></td>
</tr>
<tr>
<td>2020-2021</td>
<td>20,894</td>
<td></td>
</tr>
<tr>
<td>2021-2022</td>
<td>21,828</td>
<td></td>
</tr>
<tr>
<td>2024-2025</td>
<td>24,702</td>
<td></td>
</tr>
</tbody>
</table>

FY 19 is most current data available. FY 20 data will be posted in spring, 2021.

Photo by: Paul Omara, UArizona
Academic programs offered in 2019-20 at the universities:

- ASU offered 204 bachelor’s degree programs, 215 master’s degree programs, 105 doctoral degree programs, 124 baccalaureate certificate programs and 104 graduate certificate programs. Programs are offered at the Downtown Phoenix campus, Tempe campus, Polytechnic campus, West campus, Lake Havasu and multiple locations throughout Arizona.

- NAU offered 94 bachelor’s degree programs, 62 master’s degree programs, 17 doctoral degree programs, 44 baccalaureate certificate programs and 34 graduate certificate programs. In addition to the Flagstaff Campus, NAU operates more than 20 sites, which offer a range of undergraduate and graduate programs to meet community needs.

- UArizona offered 185 bachelor’s degree programs, 165 master’s degree programs, 110 doctoral degree programs, four first professional programs, three specialist programs, 100 graduate certificates and 20 undergraduate certificates.

Universities Maintain Balanced Budgets

Total fiscal year 2020 revenues for the Arizona public university system were $5.8 billion, an increase of about $360 million or about 6.6 percent over the fiscal 2019 budget.

Each university maintains a balanced budget with tuition and fee revenues and state general fund appropriations comprising the largest share of the universities’ operating budgets at about 56 percent. Fiscal year 2020 state general fund appropriations total $778.5 million for the system, an increase of $53 million or 7.3 percent.

Annual budgets presented to the board by the universities provide a comprehensive overview of each institution’s fiscal position and inform the board’s decisions regarding tuition and fees through information including revenue projections, enrollment assumptions, planned strategic investments and key performance and financial data.

Five-year trends of each university’s net position provide a long-range view of the university’s fiscal health while days cash on hand informs the board of the university’s reserve funds on hand and credit risk.
WAGES OF GRADUATES DEMONSTRATE RETURN ON DEGREE INVESTMENT

A college degree is one of the most important investments an individual or the state can make. Arizonans with a bachelor’s degree earn a median wage that is more than $22,000 higher than those with a high school diploma, according to Arizona Board of Regents data.

Arizonans with an undergraduate degree earn a median wage of $51,197. Their wages are $22,376 higher than their peers with a high school diploma alone and $15,395 more than individuals with an associate degree or some college.

2017 MEDIAN WAGES IN ARIZONA BY EDUCATIONAL ATTAINMENT

$80,000
$60,000
$40,000
$20,000
$0

HIGH SCHOOL DIPLOMA
ASSOCIATE DEGREE OR SOME COLLEGE
BACHELOR’S DEGREE
GRADUATE DEGREE

$28,821
$38,802
$51,197
$65,573

2017 is most current data available. 2018 and 2019 data will be available in fall, 2020.
Faculty and Staff Drive Student Success

Talented faculty and staff are necessary to achieve the goals presented in the Arizona Board of Regents Impact Arizona strategic plan. University employees drive student educational success and learning, and build on research activities to benefit Arizona.

The total number of benefits-eligible employees during fiscal year 2020 was approximately 26,500 at Arizona’s public universities, increasing 13.4 percent between fiscal years 2016 and 2020. The increase in staff corresponds with student enrollment growth, which increased 13.4 percent during those years.

Arizona University System Employee Population¹

<table>
<thead>
<tr>
<th></th>
<th>FY16</th>
<th>FY17</th>
<th>FY18</th>
<th>FY19</th>
<th>FY20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>23,316</td>
<td>23,561</td>
<td>24,714</td>
<td>25,757</td>
<td>26,450</td>
</tr>
<tr>
<td>ABOR</td>
<td>27</td>
<td>33</td>
<td>34</td>
<td>35</td>
<td>34</td>
</tr>
<tr>
<td>UA</td>
<td>10,234</td>
<td>10,326</td>
<td>10,846</td>
<td>11,428</td>
<td>11,629</td>
</tr>
<tr>
<td>NAU</td>
<td>3,089</td>
<td>3,142</td>
<td>3,240</td>
<td>3,273</td>
<td>3,242</td>
</tr>
<tr>
<td>ASU</td>
<td>9,966</td>
<td>10,060</td>
<td>10,594</td>
<td>11,021</td>
<td>11,545</td>
</tr>
</tbody>
</table>

¹ Only Benefits - Eligible Included
In its third year, enrollment in the Arizona Teachers Academy has grown exponentially. Due to the $15 million general fund appropriation, there are more than 2,700 students receiving funding and over 800 students completing a program. With the new state funding, participation in the academy grew to include post-baccalaureate certificate programs at Maricopa Community Colleges’ Rio Salado College and Scottsdale Community College, and Pima Community College. The certificate programs offered by the community colleges provide an opportunity for students to participate online or in person to earn their teaching certification in 17 programs.

The entire $15 million general fund appropriation was spent with $14,550,000 going to the institutions for their programs and $450,000 used for marketing and administrative expenses.

Outcomes of the marketing and awareness campaign to promote the Academy, which included radio, print, digital ads and more, earned excellent returns, including 18.6 million impressions through paid media and nearly 13,000 visits to the academy website.

An owned video campaign by ABOR, “Teachers Matter,” celebrated teachers as heroes, showcasing local luminaries (Governor Doug Ducey, former Arizona Diamondback Luis Gonzales, Olympic Gold Medalist Misty Hyman and Phoenix Police Chief Jeri Williams among others) discussing the teachers who made a difference in their lives. These videos garnered more than 20,000 impressions and views.

New capital projects approved by the board enable student success and enhance research at the universities, benefitting science, society and the state’s economy. Capital projects approved during the past year include: ASU - Herald Examiner Building improvements; pedestrian bridge over University Drive; NAU - Multi-Discipline STEM Academic/Research Building, Student Athlete High Performance Center; and UArizona - Andrew Weil Center for Integrative Medicine, Chemistry Building renovation.
From breakthroughs in COVID-19 testing to pathogen research and health-care innovations, the universities’ research enterprise leads to new spin-off companies and inventions, supports next-generation scientists and provides real-time solutions during a pandemic. Groundbreaking research conducted at the universities contributes to Arizona’s economy and benefits society through new discoveries and scientific advances.

Total research expenditures for ASU, NAU and the UAriizona continue to increase with more than $1.4 billion in 2018-19, an increase of 5.5 percent from the previous year and surpassing the board’s strategic goal of $1.3 billion.

FY 19 is most current data available. FY 20 data will be posted in spring, 2021.
Arizona’s public universities received approximately $81.4 million in Technology and Research Initiative Fund (TRIF) revenue in fiscal year 2020. The universities leveraged that investment to attract outside research funding, resulting in $465.7 million return on investment through TRIF-related research. Total TRIF revenue received to date since the inception of the program in June 2001 is over $1.2 billion.

Projects funded through TRIF strengthen research at the universities and enhance Arizona’s workforce development. Research accomplished through TRIF is focused on key areas that address challenges facing society today and in the future such as health, national security systems, optical sciences and energy solutions. TRIF dollars also support Regents Innovation Fund grants that are instrumental in supporting university research and contribute to collaborative research efforts among the universities to devise solutions to Arizona’s challenging problems.

An independent analysis published in April of 2020 by the Milken Institute analyzes TRIF’s significant impact on Arizona’s public universities and the innovation economy in the state. Commissioned by the Flinn Foundation, “Examining Arizona’s Technology and Research Initiative Fund” stresses TRIF’s importance to Arizona’s continued success, citing it as a major reason for the growth of the biosciences in the state.

Examples of TRIF supported research in fiscal year 2020 include:

- Developing Arizona’s first saliva-based COVID-19 test.
- Using nanomaterials to purify drinking water, industrial wastewater, contaminated soils and sludge from municipal wastewater treatment plants.
- Determining the most effective combination of cancer-fighting drugs to fight melanoma.

TRIF funds are from Proposition 301 that was extended in 2018. Prop. 301 increased the state’s sales tax to be dedicated to K-12, community colleges and Arizona’s public universities.
UNIVERSITIES LICENSES, OPTIONS, INVENTIONS
BENEFIT SOCIETY, CREATE NEW JOBS

ASU and the UArizona executed 177 licenses and options in 2018-19, surpassing the board’s strategic goal of 173. NAU received 50 inventions disclosures for potential patents, 19 more than the enterprise goal of 31.

Arizona’s public universities license technology developed at the institutions to a variety of organizations and individuals for eventual commercialization, translating discoveries and solutions to the marketplace to benefit society locally and around the world. Increasing the number of invention disclosures from Arizona’s public universities increases patents issued, leading to new products, companies and jobs.

LICENSES AND OPTIONS EXECUTED

<table>
<thead>
<tr>
<th>Year</th>
<th>Actuals</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-2016</td>
<td>178</td>
<td>155</td>
</tr>
<tr>
<td>2016-2017</td>
<td>202</td>
<td>163</td>
</tr>
<tr>
<td>2017-2018</td>
<td>160</td>
<td>167</td>
</tr>
<tr>
<td>2018-2019</td>
<td>177</td>
<td>173</td>
</tr>
<tr>
<td>2019-2020</td>
<td>179</td>
<td></td>
</tr>
<tr>
<td>2024-2025</td>
<td>221</td>
<td></td>
</tr>
</tbody>
</table>

FY 19 is most current data available. FY 20 data will be posted in spring, 2021.
CONCLUSION

Arizona’s public universities – ASU, NAU and UArizona - are known for excellence and innovation. During the unprecedented era of the COVID-19 pandemic, Arizona’s public universities have stepped up at every level through real-time research and public service. Public higher education in Arizona has proven to be more impactful than ever before - educating our future workforce and serving the global community during the pandemic while continuing to provide excelling higher education. More information is available at azregents.edu.
Item Name: Approval of List of Qualifying Examinations for High School and High School Teacher Incentive Bonuses

☑️ Action Item

Requested Action: The board office asks the board to approve a revised list of qualifying examinations for incentive bonuses to schools and high school teachers for students that receive a passing score.

Background/History of Previous Board Action

In accordance with A.R.S. §15-249.06, each year the board is required to approve an updated list of qualifying examinations.

Discussion

• The College Credit by Examination Incentive Program requires the Arizona Department of Education to annually pay an incentive bonus to school districts and charter schools for each student in grades 9-12 who receive a passing score during the previous year on a qualifying examination.

• Each year, the list of exams is reviewed by each university's provost's office and the ABOR office for possible revisions.

• In order for an exam to be in the list, it has to have an equivalency (equivalency is the term used describing how a course offered by one university relates to a course offered by another) at all three universities. If it has equivalencies at only two of the universities in a previous year, it cannot be included on the list.

• ASU, NAU and UArizona do extensive and considerable work to align their equivalencies across the different exams in order for the list of courses to be included in the list of qualifying exams.

• The list of approved qualifying exams is sent to the Joint Legislative Budget Committee and the Arizona Department of Education prior to September 1 of each year.

• Approval of the academic year 2020-2021 list of qualifying exams is necessary to be in compliance with A.R.S. §15-249.06.

Contact Information:
Chad Sampson, ABOR  chad.sampson@azregents.edu  602-229-2512
Mark Denke, ABOR  mark.denke@azregents.edu  602-229-2503
Summary of Changes to the List of Qualifying Exams

Based on university and ABOR office review, the following are proposed changes to the current list (attached) of qualifying exams:

- It is recommended that the following exams be added to the list of qualifying exams:
  
  o **Cambridge International Computer Science A and AS Level**
    
    ▪ The aim of the Cambridge International AS and A Level Computer Science courses is to encourage learners to develop an understanding of the fundamental principles of computer science and how computer programs work in a range of contexts.
    
    ▪ Learners will study topics including information representation, communication and Internet technologies, hardware, software development, and relational database modelling. As they progress, learners will develop their computational thinking and use problem solving to develop computer-based solutions using algorithms and programming languages. Studying Cambridge International AS and A Level Computer Science will help learners develop a range of skills such as thinking creatively, analytically, logically and critically.

  o **International Baccalaureate Environmental Systems and Societies**
    
    ▪ The Environmental Systems & Societies (ESS) program is a unique interdisciplinary course focused on various scientific fields, coupled with a societal viewpoint, all intertwined to help students understand the environment and sustainability.
    
    ▪ The EES courses are designed to combine the techniques and knowledge associated with the experimental sciences with those associated with individuals and societies.

  o **International Baccalaureate Information Technology in a Global Society SL**
    
    ▪ The IB IT information technology in a global society (ITGS) program is the study and evaluation of the impacts of information technology (IT) on individuals and society. It explores the advantages and disadvantages of the access and use of digitized information at the local and global level.
ITGS provides a framework for the student to make informed judgments and decisions about the use of IT within social contexts.

The aims of the ITGS standard level courses are to:

1. Enable the student to evaluate social and ethical considerations arising from the widespread use of IT by individuals, families, communities, organizations and societies at the local and global level.

2. Develop the student’s understanding of the capabilities of current and emerging IT systems and to evaluate their impact on a range of stakeholders.

3. Enable students to apply their knowledge of existing IT systems to various scenarios and to make informed judgments about the effects of IT developments on them.

4. Encourage students to use their knowledge of IT systems and practical IT skills to develop IT solutions for a specified client or end-user.

Statutory/Policy Requirements

A.R.S. §15-249.06 College credit examination incentive program, incentive bonuses, report; program termination

ABOR Policy 2-224 (D) Awarding undergraduate credit on the basis of advanced placement, Cambridge International, CLEP, Dantes Subject Standardized Tests, and International Baccalaureate Examination scores.
## Credit by Exam List

<table>
<thead>
<tr>
<th>Exam Type</th>
<th>Course and Exam Name</th>
<th>ASU Score</th>
<th>NAU Score</th>
<th>UA Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Placement</td>
<td>Biology</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>Calculus AB</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>Calculus BC</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>Chemistry</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>Comparative Government &amp; Politics</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>Computer Science A</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>Computer Science Principles</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>English Language and Composition</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>English Literature and Composition</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>Environmental Science</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>European History</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>Human Geography</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>Microeconomics</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>Microeconomics</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>Physics 1</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>Physics 2</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>Physics C: Electricity and Magnetism</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>Physics C: Mechanics</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>Psychology</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>Statistics</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>US Government &amp; Politics</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>US History</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Advanced Placement</td>
<td>World History</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Cambridge International Exam</td>
<td>Biology A Level</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Cambridge International Exam</td>
<td>Biology AS Level</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Cambridge International Exam</td>
<td>Chemistry A Level</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Cambridge International Exam</td>
<td>Chemistry AS Level</td>
<td>D</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>Cambridge International Exam</td>
<td>Computer Science A Level</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Cambridge International Exam</td>
<td>Computer Science AS Level</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Cambridge International Exam</td>
<td>Economics A Level</td>
<td>D</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>Cambridge International Exam</td>
<td>English Language A Level</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Cambridge International Exam</td>
<td>English Literature A Level</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Cambridge International Exam</td>
<td>Geography A Level</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Cambridge International Exam</td>
<td>Geography AS Level</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Cambridge International Exam</td>
<td>History A Level</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Cambridge International Exam</td>
<td>History AS Level</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Cambridge International Exam</td>
<td>Information Technology A Level</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Cambridge International Exam</td>
<td>Information Technology AS Level</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Cambridge International Exam</td>
<td>Mathematics A Level</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Cambridge International Exam</td>
<td>Mathematics AS Level</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Cambridge International Exam</td>
<td>Mathematics Further A Level</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Course Type</td>
<td>Exam Type</td>
<td>Credits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>----------------------------</td>
<td>---------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cambridge International Exam</td>
<td>Psychology A Level</td>
<td>E</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cambridge International Exam</td>
<td>Psychology AS Level</td>
<td>E</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>Biology HL</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>Biology SL</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>Chemistry HL</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>Computer Science HL</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>Computer Science SL</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>Economics HL</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>Environmental Systems and Societies</td>
<td>5 5 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>Geography HL</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>Geography SL</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>Global Politics HL</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>History SL</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>History, Africa and the Middle East HL</td>
<td>5 5 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>History, Americas HL</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>History, Europe HL</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>Information Technology in a Global Society HL</td>
<td>5 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>Language A: Language &amp; Literature HL</td>
<td>5 5 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>Language A: Literature HL</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>Mathematics HL</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>Physics HL</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>Physics SL</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>Psychology HL</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>Psychology SL</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>Social and Cultural Anthropology HL</td>
<td>4 4 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>Social and Cultural Anthropology SL</td>
<td>5 5 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Baccalaureate</td>
<td>World Religions SL</td>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

New items are highlighted
Item Name: Possible Discussion and Action Related to the Items listed under I.E. of the Board’s Executive Session Agenda

☐ Action Item

Requested Action: The board may take action to direct the board’s legal counsel to proceed as discussed in the board’s executive session related to items listed under I.E. of the August 20, 2020 executive session agenda.

Background/Discussion

During the August 20, 2020 special board meeting, the board held an executive session pursuant to §38-431.03 (A)(2), (3) and (4) for legal advice and discussion regarding the following items listed under 1.E. of the agenda:


2. Legal advice and discussion concerning the State of Arizona, ex rel. Mark Brnovich, Attorney General, v. Arizona Board of Regents; John P. Creer, Assistant Vice President for University Real Estate Development at ASU, Defendants, Paul D. Petersen, in his official capacity as Maricopa County Assessor, and Royce T. Flora, in his official capacity as Maricopa County Treasurer, Relief-Defendants. (Case No. TX 2019-000011 and related filings and matters)

3. Legal advice, discussion and report on pending or contemplated litigation and related filings and matters

The board may take action to direct the board’s legal counsel to proceed as discussed in the board’s executive session related to items listed under I.E. of the August 20, 2020 executive session agenda.