



State of the College of Science

College of Science Faculty Council, September 30, 2024



Vision for the College of Science

We aspire to be the most impactful College of Science in the nation. Through the integration of high-quality education, transformational research, and public engagement, we are building a better future.



College of Science Strategic Plan

Faculty and department driven goals with CoS faculty committee identification of the biggest opportunities. Pillars defined by University and College strategic goals. Metrics defined based on highest impact and sustainable financial planning.

- **Student success** centered on meeting diverse learning needs, supporting students at earliest identification of struggle, and connection with hands on research, internships, jobs, and activities
- **Curriculum and enrollment** efforts centered on jobs & 4th industrial revolution opportunities – Computer & Data Science, Applied Science
- **Belongingness** efforts centered on initiatives that create a safe and welcoming environment for all to engage in advancing the College and University; creating connection, identity within a supportive community
- **Research** focused on the next wave of ingenuity and funding in a range of strategic directions; weave computational and data science throughout College and University efforts



State of the College

Select goals and metrics based on strategic plan and financial sustainability

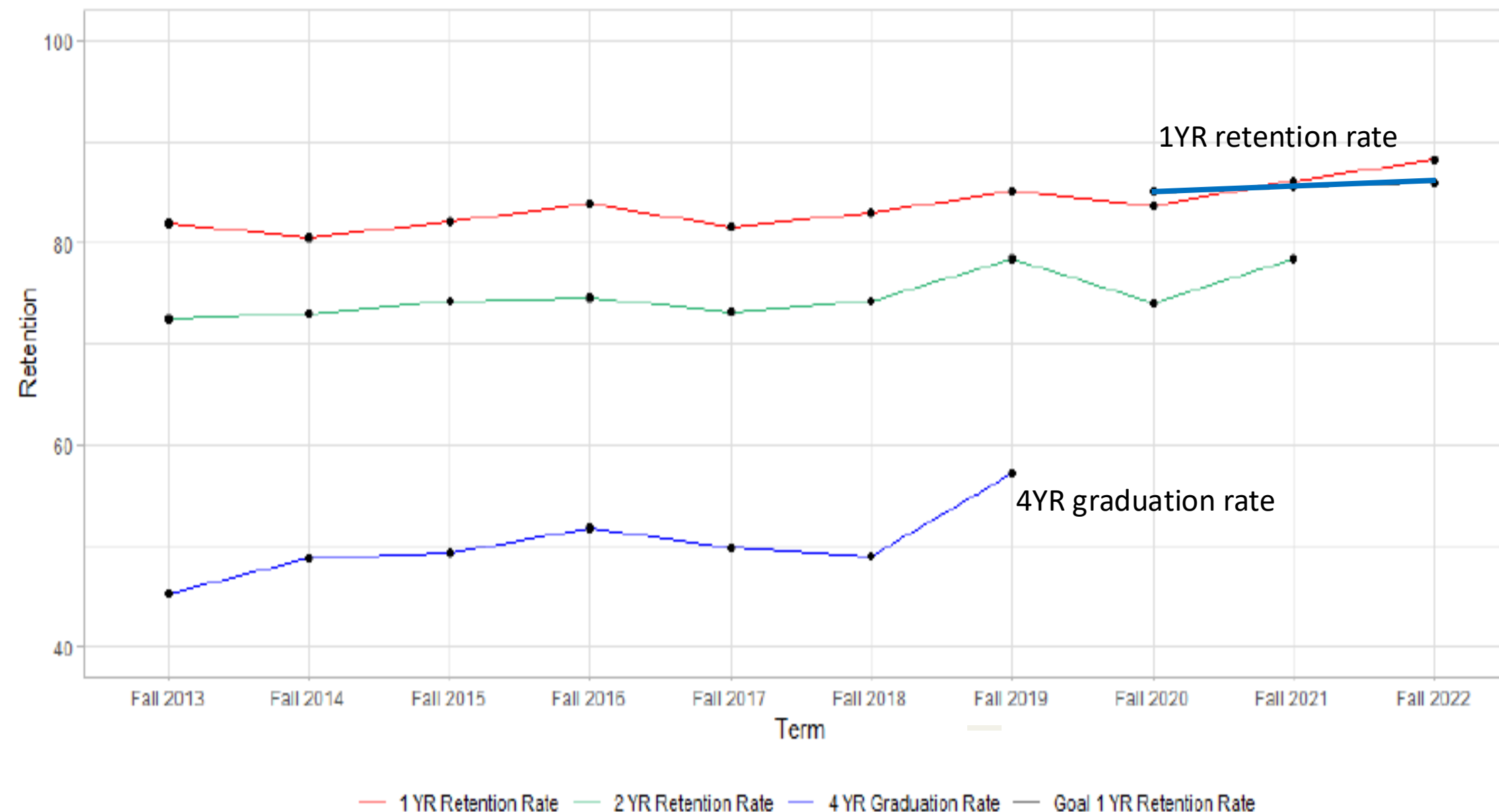
- **State of undergraduates – retention, enrollment, graduation rates**
- **State of the Faculty – faculty trends over time**
- **State of Research – research expenditures over time**
- **What we've learned from working with Ernst and Young**
- **College of Science Impacts – achieving our vision**

Undergraduate Retention

Goal: Increase first-year undergraduate main campus enrollment by 0.5% every year

- Implemented standards for reporting student grades
- Faculty use of student progress reports
- Faculty participation in workshops to increase cultural responsiveness and inclusivity in the classroom
- Enhanced advisor training to ensure high-quality advising in all departments
- Advising support for re-enrollment; financial support for students “in need” to re-enroll.

College of Science Retention and Graduation Rates



- Vastly exceeded goals over the last two years. Fall 2022 entry cohort goals was 86%. Achieved 88.2%!
- IPEDS change to require schedule-for-success students to enroll full-time predicted 5% drop to 83% in Fall 2024.

Undergraduate Retention – Fall 2024

Goal: Increase first-year undergraduate main campus enrollment by 0.5% every year

- University goal under new IPEDS requirement = 82.5%
- College of Science goal under new IPEDS requirement = 83%
- Today, University average = 82.6%
- College of Science = 85.1% - vastly beating our goal!
- Highlights the strength of the students that we attract and the strong student support that we provide.

◆ Fall 2020
◆ Fall 2021
◆ Fall 2022
◆ Fall 2023

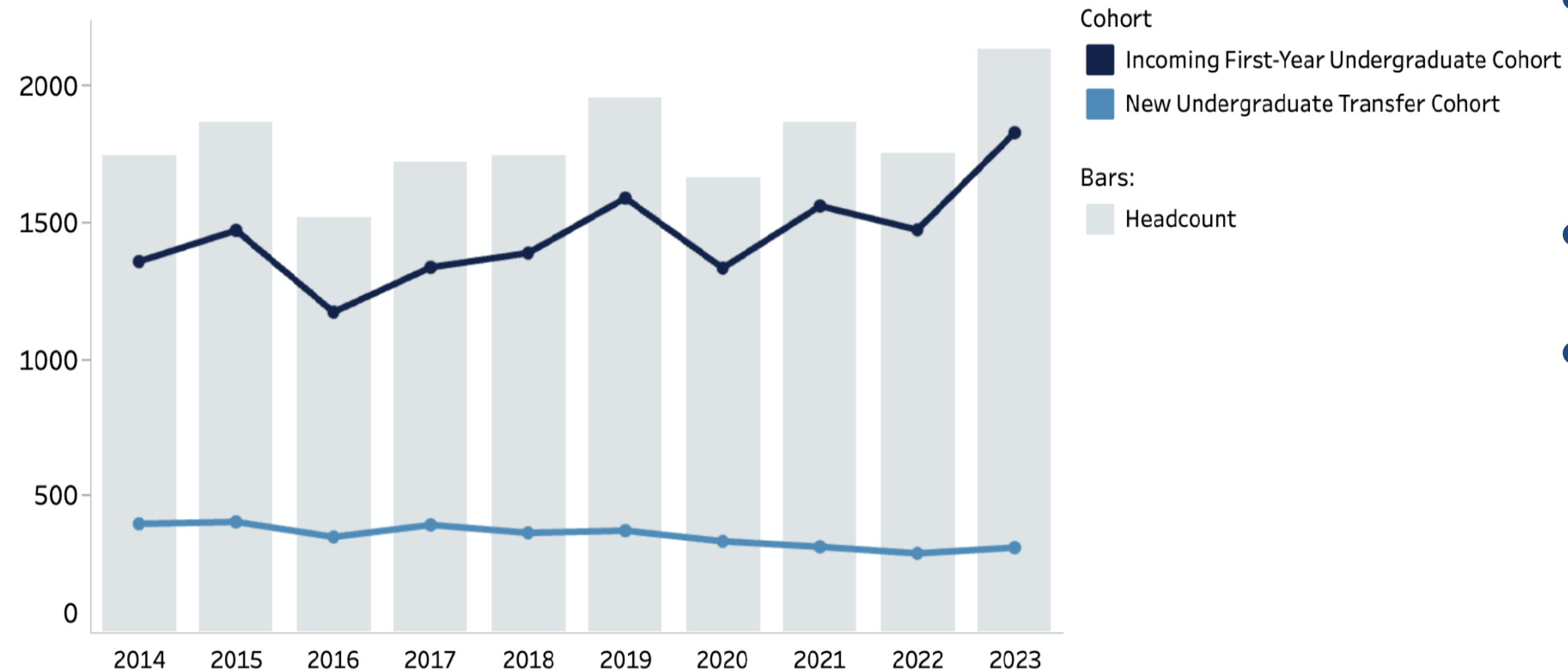


THE UNIVERSITY OF ARIZONA
College of Science

Undergraduate First Time and Transfer Enrollment

Goal: Increase first-time full-time (FTFY) undergraduate main campus enrollment by 1.1% every year

Fall Enrollment by Cohort



- Between 2021 and 2023 census, we achieved a 14% growth in FTFT main campus enrollment – vastly beat our goal!
- Fall 2024 FTFY enrollment up by ~30 students from to last year.
- Fall 2024 transfer enrollment is down by ~60 students relative to last year.

Cohort	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Incoming First-Year Undergraduate Cohort	1,352	1,466	1,167	1,331	1,383	1,584	1,328	1,555	1,468	1,823
New Undergraduate Transfer Cohort	393	400	345	389	360	368	329	309	285	306
Grand Total	1,745	1,866	1,512	1,720	1,743	1,952	1,657	1,864	1,753	2,129

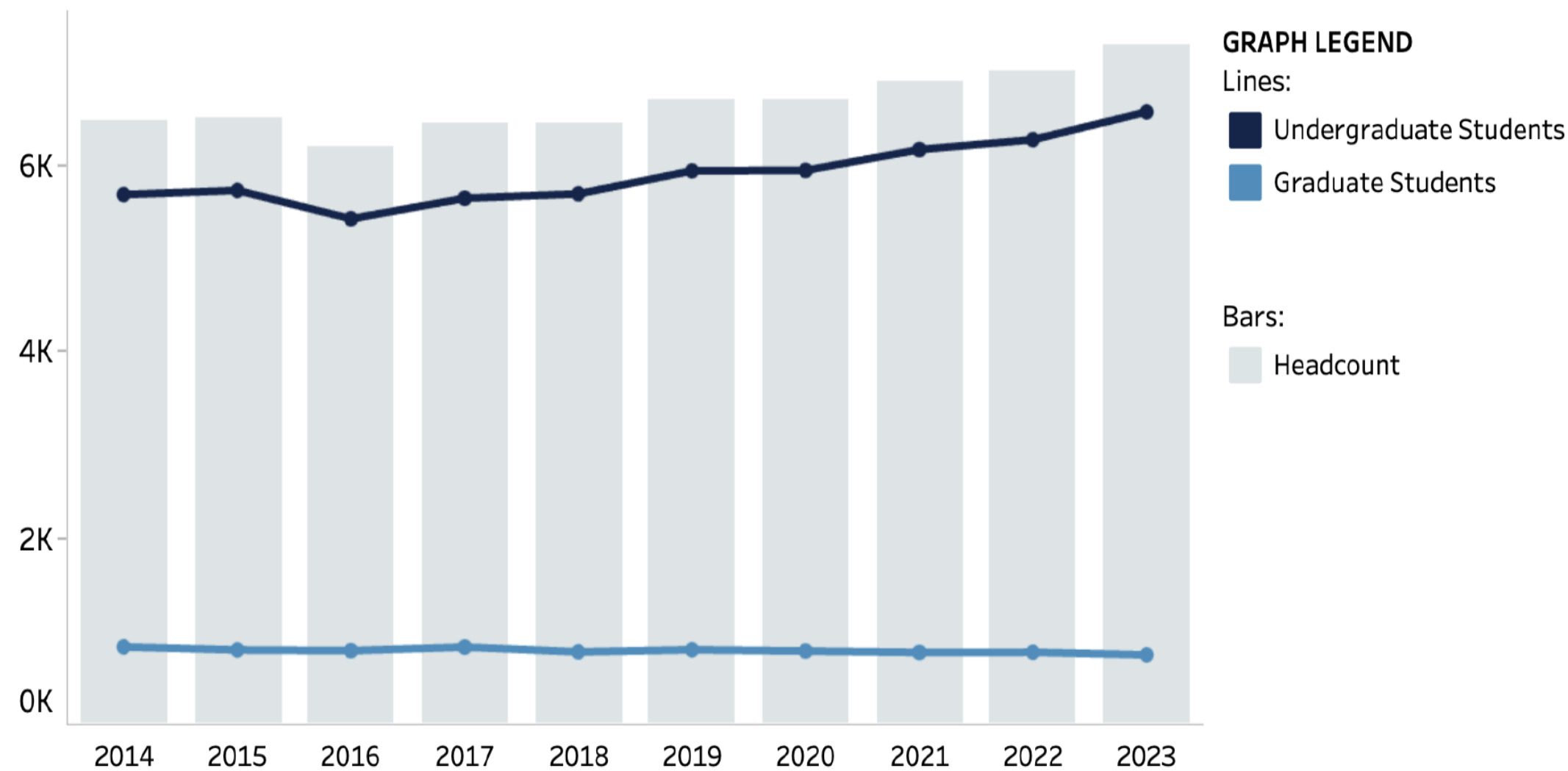


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College of Science

Total Enrollment

Goal: Through retention and recruitment, increase full-time undergraduate main campus enrollment by 1.6%/yr

Fall Enrollment by Academic Career



- Between 2021 and 2023 census, we achieved a 6.6% growth in full-time undergraduate main campus enrollment – vastly beat our goal!
- Total full-time undergraduate enrollment continues to climb this year – now at 6695.
- Revised Data Science B.S., new Artificial Intelligence B.S., and new Neuroscience B.S. should help maintain strong enrollment.
- Graduate enrollment also up at 792.

Academic Career	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Undergraduate Students	5,663	5,708	5,403	5,624	5,671	5,918	5,923	6,146	6,252	6,550
Graduate Students	812	779	771	810	758	781	767	752	754	726
Grand Total	6,475	6,487	6,174	6,434	6,429	6,699	6,690	6,898	7,006	7,276

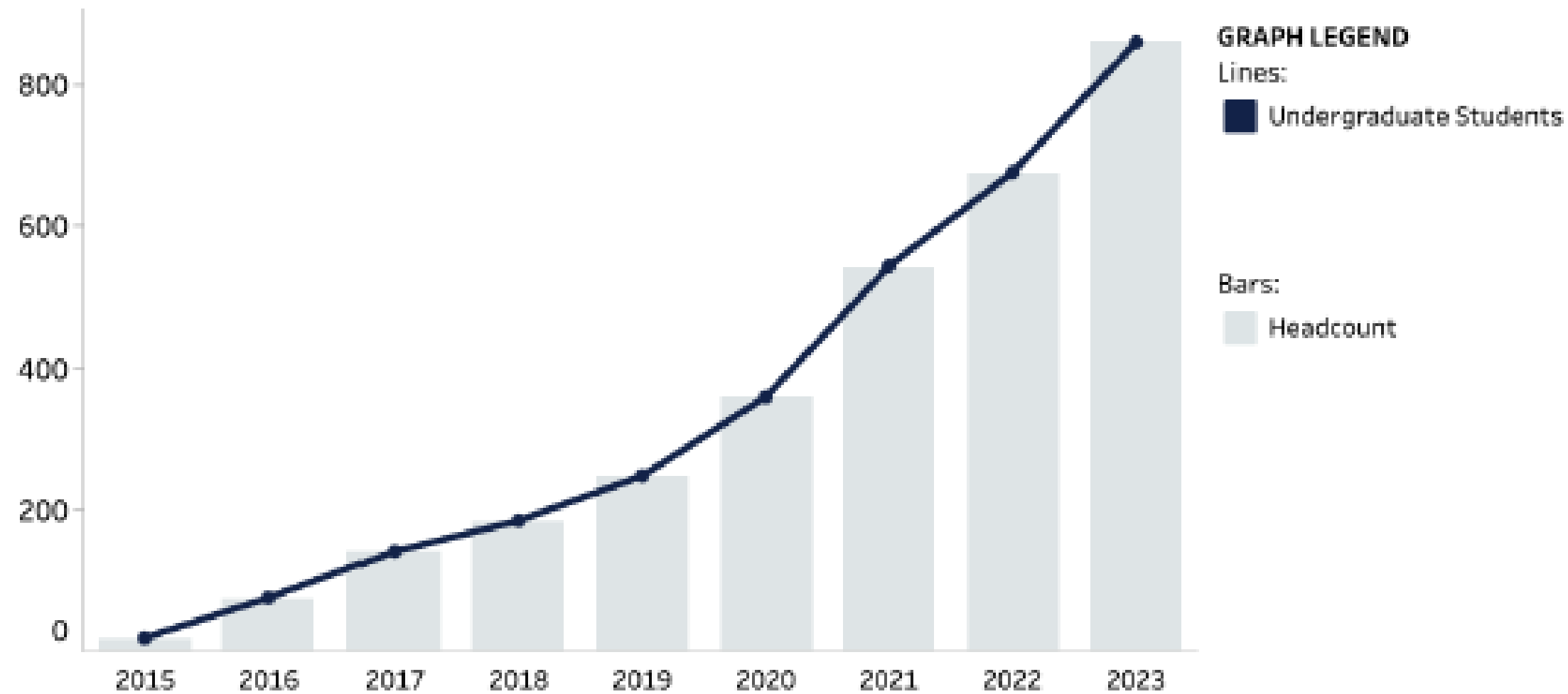


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Online Enrollment

Goal: Modest growth of 3% per year

Fall Enrollment by Academic Career



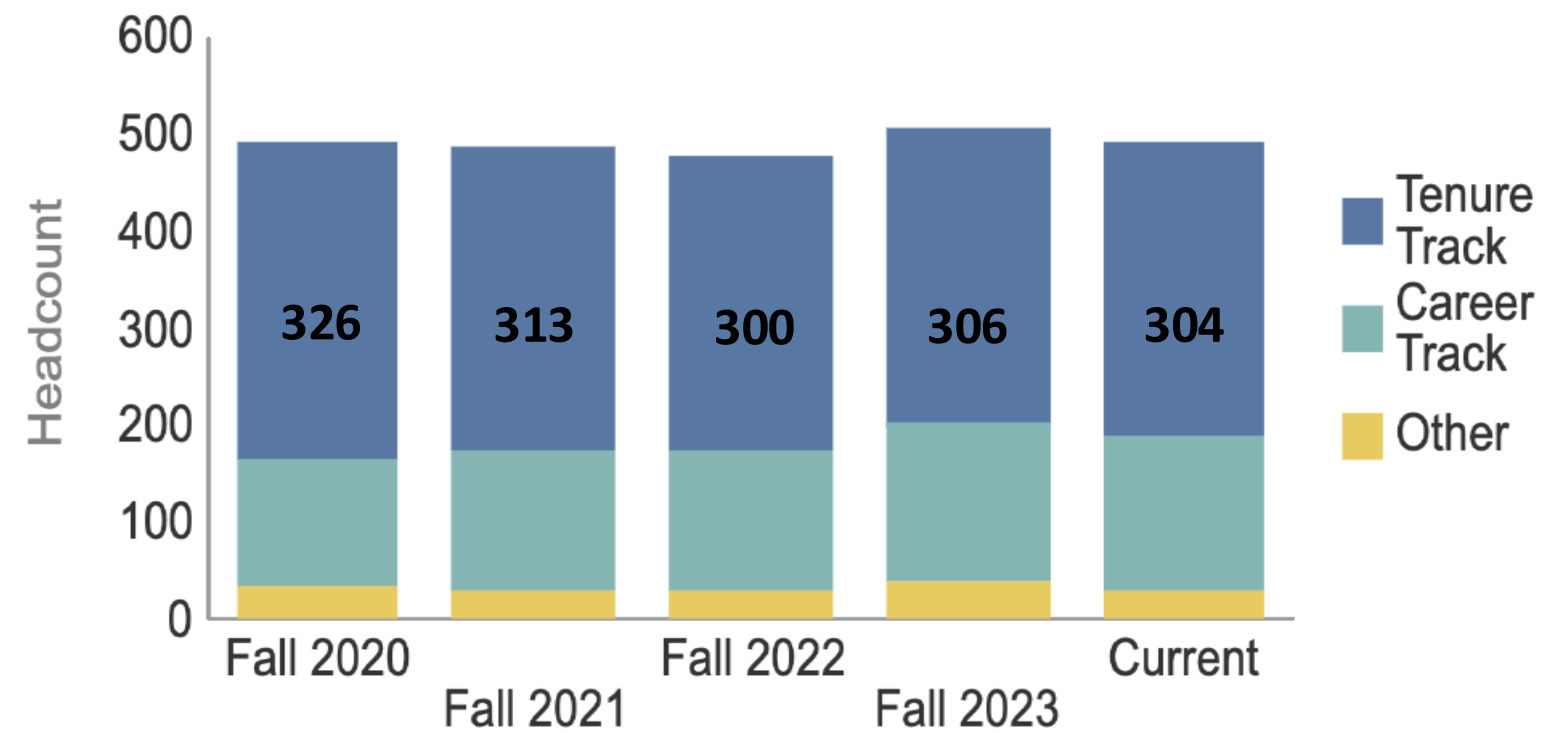
- Between 2021 and 2023 census, we achieved a 58% growth in online enrollment – Beat our goal!
- Current enrollments are at ~1000 students in Fall 2024.

College of Science Enrolled Majors - AZO

Department	FY 21	FY 22	FY 23	FY 24
TOTAL	376	548	678	864
Psychology	374	396	407	439
EEB	2	146	222	346
Neuroscience/Cog Sci	0	2	49	78

College of Science Faculty Trends

Goal: Maintain healthy balance between CT and TT faculty, while sustaining faculty size



- Healthy rate of hiring of TE Assistant Professors in from FY2022 – FY2023, with challenges financing start-ups and renovations.
- Maintained healthy ratio of TT:CT faculty: currently at 1.9 (includes research professors).
- **Challenge: need to maintain TT faculty size with current budget restrictions in place requires faculty attrition to cover the salaries of new hires.**
- **Challenge: coverage of high-cost start-ups.**

Tenure/Contract Status Fall 2020 Fall 2021 Fall 2022 Fall 2023 Current

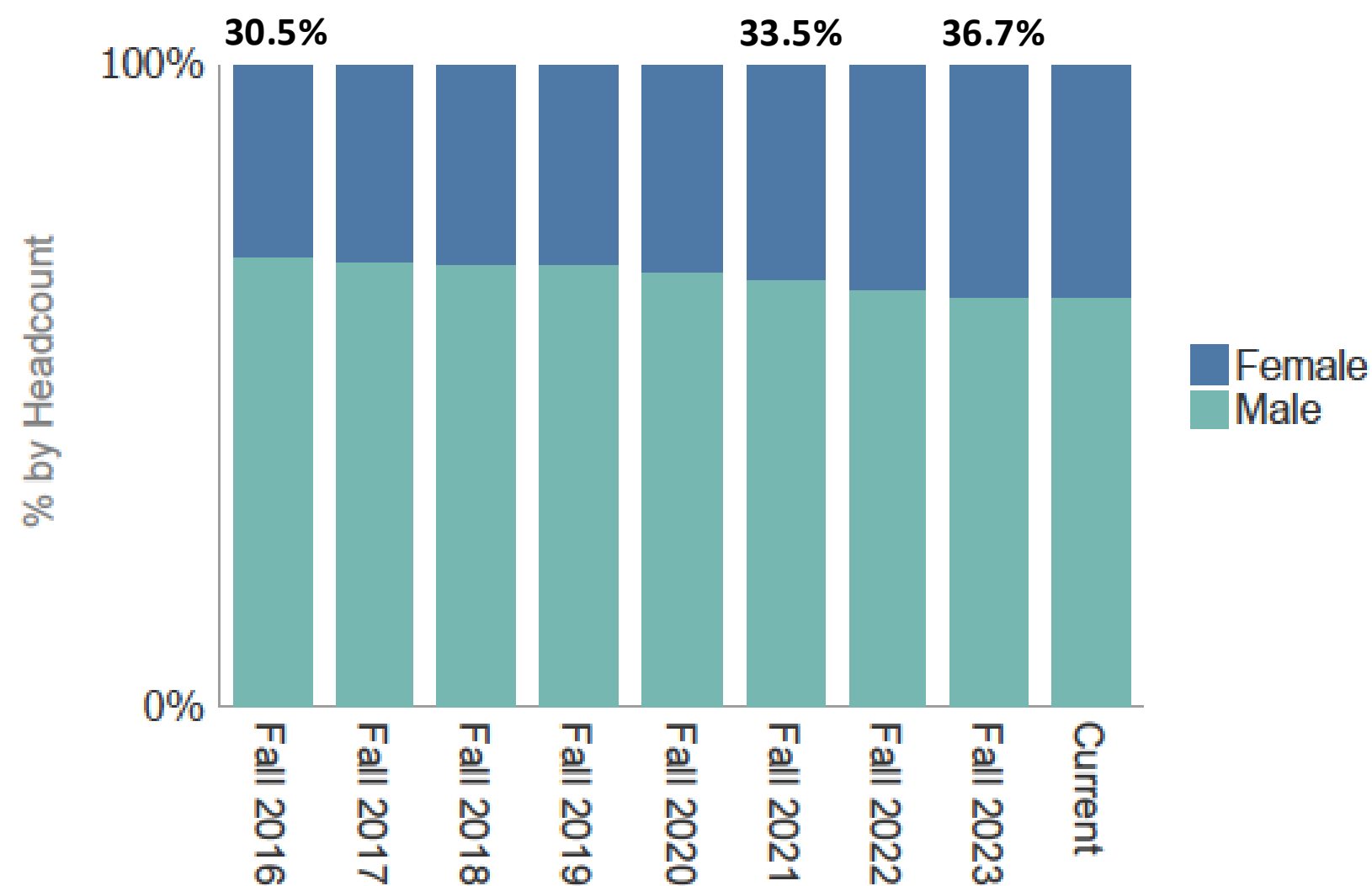
Tenure/Contract Status	Fall 2020	Fall 2021	Fall 2022	Fall 2023	Current
Grand Total	491	489	476	507	491
Tenure	252	250	246	249	248
Tenure Eligible	74	63	54	57	56
Career Track	131	145	145	163	157
Other	34	31	31	38	32

Increase in Diversity of the Faculty

Goal: Growth in underrepresented faculty to better reflect student population

- Intentional recruiting practices that broaden representation in applicant pools
- Strong support and retention of underrepresented faculty
- Pursuit of Strategic Priority Faculty Hiring Initiative (SPFI), with ability to hire faculty without Provost funding (est. 2022)
- College of Science Career Track Hiring Initiative (est. 2022)
- New Faculty onboarding & welcome event; Faculty Affairs weekly office hours for Promotion and Tenure support

Changing female:male faculty demographics



- Average change in % female faculty was 0.6%/yr prior to 2021 and increased to 1.6%/yr from 2021 to 2023.
- Change in Black, Native American, and Hispanic (BNH) faculty was negligible prior to 2021, and increased by 1.6% since 2021.
- **Challenge: pause on strategic hiring initiatives in in FY 2024 may slow progress.**



College of Science Faculty Salary Trends

Goal: To increase faculty salaries to the median of public AAU universities.

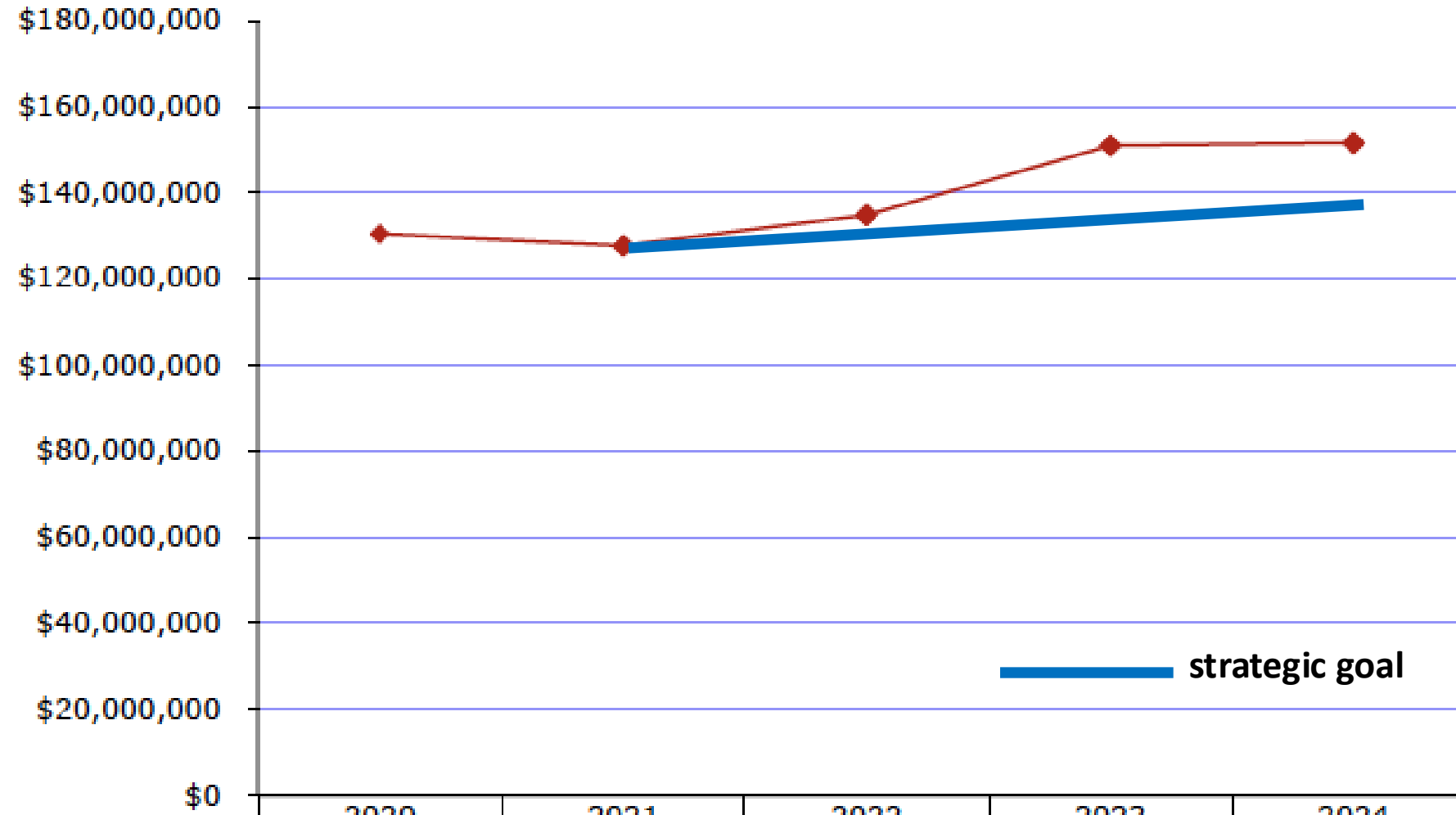
- In 2021, almost every faculty rank and discipline was at or below the 10th percentile in salary compared to public AAU universities.
- By FY2024, 6 out of 14 departments CoS were at or above the median salaries compared to public AAU universities; remaining department were moving toward goal at ~10th to 40th percentile.
- **Challenge: Lack of 2024 compensation program has slowed or stopped progress.**



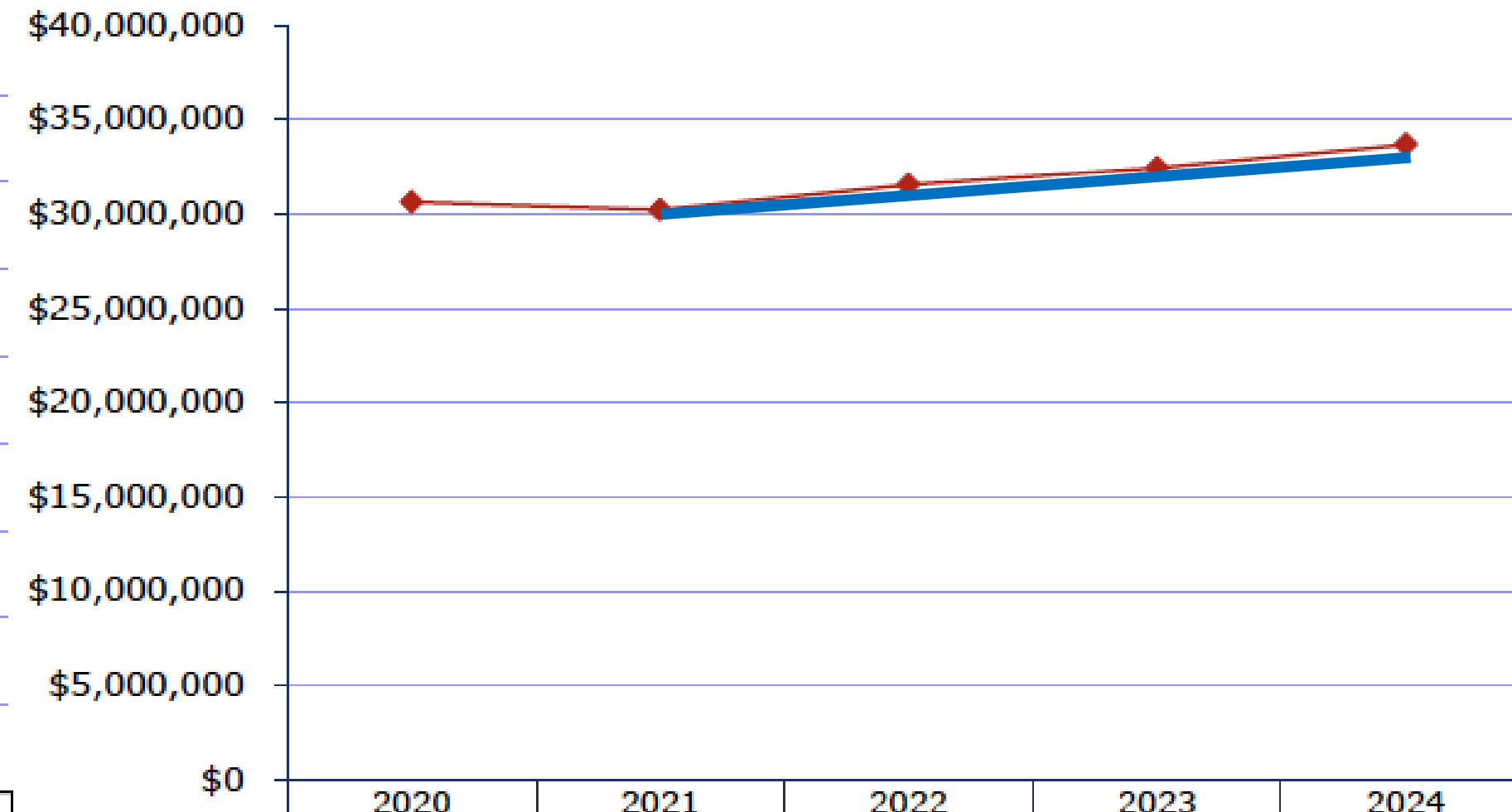
Annual Research Expenditures

STRATEGIC GOAL: 3% increase in grant and F&A expenditures per year

COLLEGE OF SCIENCE
TOTAL GRANT EXPENDITURES



COLLEGE OF SCIENCE
F&A EARNED



	2020	2021	2022	2023	2024
GRANT EXPENDITURES	\$130,373,590	\$127,711,633	\$134,736,637	\$151,042,508	\$151,637,560
% CHANGE	1.8%	-2.0%	5.5%	12.1%	0.4%

	2020	2021	2022	2023	2024
F&A	\$30,648,260	\$30,223,312	\$31,521,239	\$32,437,784	\$33,648,621
% CHANGE	0.5%	-1.4%	4.3%	2.9%	3.7%

- Since FY2021, we've grown research expenses by \$24 million and 19%, far exceeding goals.
- Grant expenditures/TT faculty (by FTE) have increased from \$406K to \$511k annually.
- New multi- to 10s of millions dollar grants over the past year suggests continued growth.

Research Technology Transfer & Societal Relevance

College Totals

Metric	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024
Invention Disclosures	64	57	44	60	51	58	63
US Patents Filed	98	74	69	72	85	80	77
US Patents Issued	8	16	28	25	20	17	8
Asset Development Awards	10 \$367,399 awarded	4 \$119,442 awarded	6 \$250,278 awarded	5 \$212,520 awarded	2 \$92,521 awarded	2 \$156,835 awarded	3 \$269,000 awarded
Exclusive Licenses & Options	9	8	10	13	12	5	9
Total Agreements	16	13	14	21	25	15	16
Startups	4	2	3	3	3	1	2

21% of total invention disclosures

21% of total patents filed

30% of total exclusive licenses & options

22% of total start-ups

- We are remarkably impactful in innovation and tech transfer for a College of Science, making up 1/5th to 1/3rd of the total University activity.

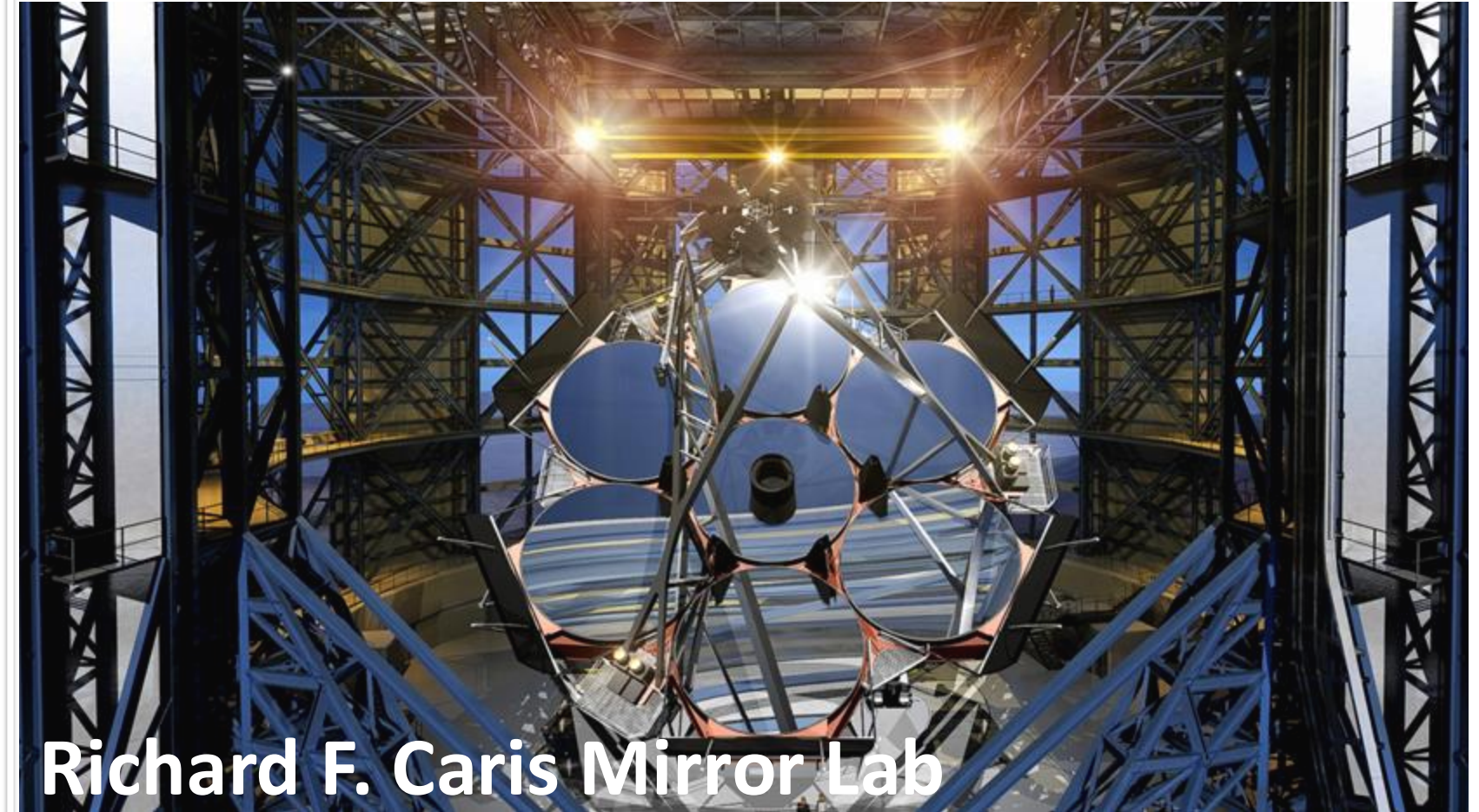
University-wide Totals

Metric	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024
Invention Disclosures	275	284	263	274	303	298	307
US Patents Filed	349	341	347	391	389	392	367
US Patents Issued	36	56	87	100	87	80	78
Asset Development Awards	16 \$646,072 awarded	16 \$776,732 awarded	13 \$519,842 awarded	20 \$966,831 awarded	9 \$390,050 awarded	15 \$1,004,425 awarded	16 \$1,276,367 awarded
Exclusive Licenses & Options	54	54	51	68	54	45	30
Total Agreements	112	96	95	124	116	100	75
Startups	16	11	19	17	10	7	9

The College of Science engages 10s of thousands to ~100 thousand kids and adults per year, sharing the value of STEM and a college education



Flandrau Science Center & Planetarium



Richard F. Caris Mirror Lab



Mt. Lemmon SkyCenter



Laboratory of Tree-Ring Research

Why did we choose to work with Ernst and Young?

- Given increased efficiencies over the past 5 years, understand major drivers of rising costs/expenses
- Understand strengths and challenges relative to external peer colleges to assess opportunities for improvement
- Evaluate organizational structure of peer colleges within and external to U of A to consider potential reorganization to better cover needs
- Develop strategies to evaluate critical needed investments during current period of financial limitations

Increased efficiency between FY2019 and FY2024

- Responsible financial management and success of strategic plan resulted in increased efficiency across all metrics for CoS (next slide)
- Despite efficiency gains, the following rising costs resulted in increased need to spend reserves:
 - Salary increases (faculty and staff) made up 74% of increased expenditures. These increases were consistent with U of A salary increase programs, not unique to CoS
 - Rising renovation costs and reduction of central support for faculty start-ups also resulted in draw on reserves

Efficiency metrics were created for each FTE category to help understand net FTE gains or losses in the context of activities performed

Overview of key unrestricted FTE metrics, by metric type and category (FY19-FY24)

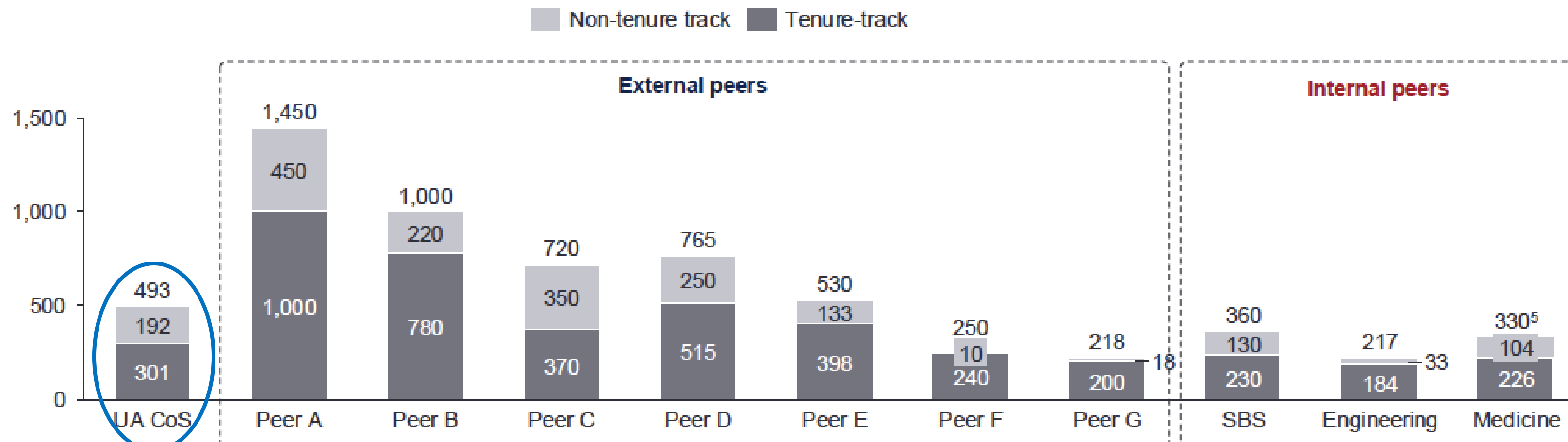
Metric type	Metric category	Metric definition	Median academic department value (FY19)	Median academic department value (FY24)
Unrestricted staff metrics	Academic administration	Enrollment per unrestricted academic admin staff FTE	212	334
		SCH per unrestricted academic admin staff FTE	3,899	7,966
	Business operations	Department FTE per unrestricted biz ops staff FTE	15.0	17.4
	Instruction	SCH per unrestricted instructional staff FTE	1,412	1,712
	Research delivery	Faculty research FTE per unrestricted research delivery FTE	0.9	1.6
	Student services	Enrollment per unrestricted student service staff FTE	186	259
Faculty metrics	Faculty instruction	SCH per unrestricted instruction faculty FTE	1,392	1,345
	Faculty research	Restricted spend per faculty research FTE	\$458k	\$576k

→ We have become much more efficient over the past 5 years. *Note that efficient does not necessarily mean optimal, and in some cases we need more support.

Overall COS efficiency across most metrics improved from FY19-24

Four of the benchmarked colleges have faculty to staff ratios that appear to be much leaner than College of Science (though staff mix cannot be fully controlled for)

Faculty mix, by institution



Enrollment	10,500	17,000	20,300	13,000	14,000	10,000	5,000	2,000	6,000	5,000	2,500
Staff headcount	364 ¹	1000	400	400	230	135	250	N/A	180	155	810 ³
Faculty : staff ratio	1.4	1.5	2.5	1.8	3.3	3.9	1.0	N/A	2.0	1.4	0.9 ⁴
# of academic depts.	14 ²	19	43	13	22	14	6	4	19	8	29 (5 academic)
Restricted (\$m)	\$181m	\$130m	\$118m	\$100	\$50m	\$100m	\$80m	\$50m	\$17m	\$36m	\$300m

1. Reflects all staff funded on unrestricted dollars, excluding post-docs, graduate students, and student workers
 2. 14 academic departments out of 19 total budget units analyzed; included for comparability to benchmarked colleges
 3. Of the total, 128 staff are within the 5 academic departments and 90 staff are in central
 4. Faculty to staff ratio reflects only personnel related to the academic departments
 5. Excludes MDs

Comparison to AAU public peers (major take-aways)

- We are more productive in research income relative to faculty size and unrestricted expenditures
- We are more productive in terms of student support relative to faculty size
- We are less centralized in staffing, including business and finance, and are average to high in terms of staff to faculty ratios covered by unrestricted budget

Comparison to AAU public peers (specific numbers)

- We are the only college among R1 public peers where research income exceeds unrestricted expenditures; indicates financial efficiency wrt support of research infrastructure.
- We also have the highest student to faculty (21:1) ratio among R1 public peers (~12:1 to 20:1).
- Maintaining and further increasing research productivity/impact **and** strong student support requires maintaining a healthy staff and faculty size and optimizing staff support where possible.
- Given gaps in business and finance staffing support, both reorganization of business and finance teams, as well as process improvements are crucial for maintaining and further building our strengths.

Business and finance reorganization - problems we are trying to solve

- Lack of standardization and inefficiencies in business processes makes timely management of college finances extremely difficult.
- Some departmental business and finance teams are understaffed or lack support because of staff attrition and/or HR centralization.
- Low staffing in departments makes it difficult for staff to take real time off without interruption while providing continuity of services.
- In current department structure, professional advancement opportunities for staff can be challenge without jumping to a new unit.
- Current structure makes transparency of budgets and nimble responses to budget challenges very difficult for both the College of Science and the University. Improvements will help avoid a recurrence of the recent challenges.

Business and finance reorganization goals

- Create consistent practices across departments that result in more efficient services.
- Provide high level of customer service to all department heads, faculty, staff and students across the college.
- Respond to the University's centralization of HR and the changes in duties this creates within the remaining business operation.
- Work closely with Central HR and RII Pre-Award to coordinate services between embeds and college business staff.

Business and finance reorganization timeline

- I have charged a committee of department heads and business managers with reviewing the recommended business and finance reorganization by Ernst and Young, as well as in other colleges within the University of Arizona. Will provide recommended structure for business center/s by ~mid. October.
- Based on feedback, we will organize staff working groups aimed at sharing best practices toward business process improvement and standardization (into early 2025).
- Spring 2025, we will roll out initial set of process and gather feedback on user experience.
- Spring 2025, we will develop organizational design with a goal of rolling out design by the end of the spring semester.
- Initial components of reorganization may take place as early as summer 2025, with goal of completing reorganization by summer 2026.

Vision for the College of Science

We aspire to be the most impactful College of Science in the nation. Through the integration of high-quality education, transformational research, and public engagement, we are building a better future.

EXAMPLES of achieving our vision

- Overall, we are a net source of revenue to the University of Arizona
- Among peers, we are both highly productive in external funding and high impact in research publications and tech transfer.
- Among peers, we support more students and deliver more SCH per faculty.
- Among internal and external peers, we support high impact outreach venues and opportunities that serve 10s to 100 thousand people per year. We enable people to understand the value of science and university education to society.