

University of Missouri Retirement, Disability, and Death Benefit Plan

Actuarial Valuation and Review as of October 1, 2024



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March 3, 2025

Board of Curators
University of Missouri
Columbia, MO 65211

Dear Board Members:

We are pleased to submit this Actuarial Valuation and Review as of October 1, 2024. It summarizes the actuarial data used in the valuation, analyzes the preceding year's experience, and establishes the funding requirements for the University's fiscal year July 1, 2025 – June 30, 2026.

This report has been prepared in accordance with generally accepted actuarial principles and practices for the exclusive use and benefit of the Board of Curators, based upon information provided by the staff of the University.

Segal does not audit the data provided. The accuracy and comprehensiveness of the data is the responsibility of those supplying the data. To the extent we can, however, Segal does review the data for reasonableness and consistency. Based on our review of the data, we have no reason to doubt the substantial accuracy of the information on which we have based this report, and we have no reason to believe there are facts or circumstances that would affect the validity of these results.

The measurements shown in this actuarial valuation may not be applicable for other purposes. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; and changes in plan provisions or applicable law.

The actuarial calculations were directed under the supervision of Joshua Kaplan. I am a member of the American Academy of Actuaries, and I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of my knowledge, the information supplied in this actuarial valuation is complete and accurate, except as noted in Section 4. The assumptions used in this actuarial valuation were selected by the Board of Curators based upon my analysis and recommendations. In my opinion, the assumptions are reasonable and take into account the experience of the Plan and reasonable expectations. In addition, in my opinion, the combined effect of these assumptions is expected to have no significant bias.

Segal makes no representation or warranty as to the future status of the Plan and does not guarantee any particular result. This document does not constitute legal, tax, accounting or investment advice or create or imply a fiduciary relationship. The Board of Curators are encouraged to discuss any issues raised in this report with the Plan's legal, tax and other advisors before taking, or refraining from taking, any action.

We look forward to reviewing this report with you and to answering any questions.

Sincerely,

Segal

A handwritten signature in black ink, reading "Joshua Kaplan", is positioned above a horizontal line.

Joshua Kaplan, FSA, FCA, MAAA, EA
Senior Vice President and Actuary

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Section 1: Actuarial Valuation Summary

Purpose and basis

This report has been prepared by Segal to present a valuation of the Plan as of October 1, 2024. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits.

The contribution requirements presented in this report are based on:

- The benefit provisions of the Plan, as administered by the Board of Curators;
- The characteristics of covered active members, inactive vested members, and retired members and beneficiaries as of September 30, 2024, provided by the University;
- The assets of the Plan as of September 30, 2024, provided by the University;
- Economic assumptions regarding future salary increases and investment earnings;
- Other actuarial assumptions regarding employee terminations, retirement, death, etc. and
- The funding policy adopted by the University.

Certain disclosure information required by GASB Statements No. 67 and 68 as of June 30, 2025 for the Plan is provided in a separate report.

Section 1: Actuarial Valuation Summary

Valuation highlights

- Segal strongly recommends an actuarial funding method that targets 100% funding of the actuarial accrued liability. Generally, this implies payments that are ultimately at least enough to cover normal cost, interest on the unfunded actuarial accrued liability and the principal balance. The funding policy adopted by the University meets this standard.
- The actuarial gain of \$15,209,802, or 0.3% of actuarial accrued liability, is due to an investment gain of \$44,126,211, or 0.8% of actuarial accrued liability, and a loss from sources other than investments of \$28,916,409, or 0.5% of the actuarial accrued liability. This non-investment loss was primarily due to higher salaries than projected.
- The rate of return on the market value of assets was 15.1% for the year ending September 30, 2024. The return on the actuarial value of assets was 8.0% for the same period due to the recognition of prior years' investment gains and losses. This resulted in an actuarial gain when measured against the assumed rate of return of 7.0%. Given the target asset allocation and expectations of future investment returns for various asset classes, we advise the Board to continue to monitor actual and anticipated investment returns relative to the assumed long-term rate of return on investments of 7.0%.
- The actuarial value of assets is 97.3% of the market value of assets. The investment experience in the past years has only been partially recognized in the actuarial value of assets. As the deferred net gain is recognized in future years, the cost of the Plan is likely to decrease unless the net gain is offset by future experience. The recognition of the net deferred gains of \$123.2 million will also have an impact on the future funded ratio. If the net deferred gains were recognized immediately in the actuarial value of assets, the ADEC would decrease from \$161.8 million to \$151.6 million, or 6.3%.

Changes from prior valuation

- The funded ratio (the ratio of the actuarial value of assets to actuarial accrued liability) is 78.4%, compared to the prior year funded ratio of 77.1%. This ratio is one measure of funding status, and its history is a measure of funding progress. Using the market value of assets, the funded ratio is 80.6%, compared to 74.4% as of the prior valuation date. These measurements are not necessarily appropriate for assessing the sufficiency of the plan assets to cover the estimated cost of settling the Plan's benefit obligation or the need for or the amount of future contributions.
- The ADEC for the year beginning July 1, 2025 is \$161.8 million, a decrease of \$3.4 million from last year. As a percentage of payroll of members in the defined benefit plan, the employer contribution rate is 19.47% for Level 1 members and 16.04% for Level 2 members (18.07% combined) and is based on the funding policy adopted by the University, which includes level amortizations of the total plan liability in accordance with the amortization base schedule shown in Exhibit D. Section 2 of this report shows a derivation of these results as well as the determination of the Minimum Actuarially Determined Contribution (MADC) set out in the Plan's Financial Management Policy, which this year equals the standard ADC amount.

Section 1: Actuarial Valuation Summary

Risk

- It is important to note that this actuarial valuation is based on plan assets as of September 30, 2024. The Plan's funded status does not reflect short-term fluctuations of the market, but rather is based on the market values on the last day of the plan year. Segal is available to prepare projections of potential outcomes of market conditions and other demographic experience upon request.
- Since the actuarial valuation results are dependent on a given set of assumptions, there is a risk that emerging results may differ significantly as actual experience proves to be different from the assumptions. We have not been engaged to perform a detailed analysis of the potential range of the impact of risk relative to the Plan's future financial condition, but have included a brief discussion of some risks that may affect the Plan in Section 2. A more detailed assessment would provide the Board with a better understanding of the inherent risks and could be important for the Plan because relatively small changes in investment performance can produce large swings in the unfunded liabilities.

Section 1: Actuarial Valuation Summary

Summary of key valuation results

Valuation Result	Current	Prior
Contributions for fiscal year beginning	July 1, 2025	July 1, 2024
• Actuarially determined employer contributions	\$161,835,086	\$165,207,802
• Level 1 employer ADEC as a percent of payroll	19.47%	19.10%
• Level 2 employer ADEC as a percent of payroll	16.04%	15.64%
• Total blended employer ADEC as a percent of payroll	18.07%	17.68%
• Minimum actuarially determined employer contributions	\$161,835,086	\$165,207,802
• Level 1 employer MADEC as a percent of payroll	19.47%	19.10%
• Level 2 employer MADEC as a percent of payroll	16.04%	15.64%
• Total blended employer MADEC as a percent of payroll	18.07%	17.68%
Actuarial accrued liability for plan year beginning	October 1, 2024	October 1, 2023
• Retired members and beneficiaries	\$2,932,975,637	\$2,828,814,720
• Inactive vested members	497,779,068	542,004,715
• Inactive members due a refund of employee contributions	14,648,110	14,163,926
• Active members	2,268,532,112	2,251,006,320
• Total	\$5,713,934,927	\$5,635,989,681
• Normal cost for plan year beginning October 1	49,380,145	51,836,103
Assets for plan year beginning October 1		
• Market value of assets (MVA)	\$4,603,598,076	\$4,193,500,773
• Actuarial value of assets (AVA)	4,480,388,890	4,346,731,457
• Actuarial value of assets as a percentage of market value of assets	97.32%	103.65%

Section 1: Actuarial Valuation Summary

Valuation Result	Current	Prior
Funded status for plan year beginning	October 1, 2024	October 1, 2023
• Unfunded actuarial accrued liability on market value of assets	\$1,110,336,851	\$1,442,488,908
• Funded percentage on MVA basis	80.57%	74.41%
• Unfunded accrued liability on actuarial value of assets	\$1,233,546,037	\$1,289,258,224
• Funded percentage on AVA basis	78.41%	77.12%
Key assumptions		
• Net investment return	7.00%	7.00%
• Inflation rate	2.20%	2.20%
Demographic data for plan year beginning October 1		
• Number of retired members and beneficiaries	12,293	12,027
• Number of inactive vested members ¹	5,799	6,671
• Number of inactive members due a refund of employee contributions	11,425	11,487
• Number of active Level 1 members	5,373	5,856
• Number of active Level 2 members	4,136	4,586
• Average salary for Level 1 members	\$98,672	\$93,995
• Total payroll for Level 1 members	\$530,166,371	\$550,433,113
• Average salary for Level 2 members	\$88,338	\$83,741
• Total payroll for Level 2 members	\$365,366,476	\$384,037,086

¹ Includes participants on long term disability who are continuing to accrue service

Section 1: Actuarial Valuation Summary

Important information about actuarial valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast – the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare a valuation, Segal relies on a number of input items. These include:

Input Item	Description
Plan provisions	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
Participant information	An actuarial valuation for a plan is based on data provided to the actuary by the System. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Financial information	Part of the cost of a plan will be paid from existing assets — the balance will need to come from future contributions and investment income. The valuation is based on the asset values as of the valuation date, typically reported by the System. A snapshot as of a single date may not be an appropriate value for determining a single year's contribution requirement, especially in volatile markets. Plan sponsors often use an "actuarial value of assets" that differs from market value to gradually reflect year-to-year changes in the market value of assets in determining the contribution requirements.
Actuarial assumptions	In preparing an actuarial valuation, Segal starts by developing a forecast of the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of participants in each year, as well as forecasts of the plan's benefits for each of those events. In addition, the benefits forecasted for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The forecasted benefits are then discounted to a present value, typically based on an estimate of the rate of return that will be achieved on the plan's assets. All of these factors are uncertain and unknowable. Thus, there will be a range of reasonable assumptions, and the results may vary materially based on which assumptions are selected within that range. That is, there is no right answer (except with hindsight). It is important for any user of an actuarial valuation to understand and accept this constraint. The actuarial model may use approximations and estimates that will have an immaterial impact on our results. In addition, the actuarial assumptions may change over time, and while this can have a significant impact on the reported results, it does not mean that the previous assumptions or results were unreasonable or wrong.

Section 1: Actuarial Valuation Summary

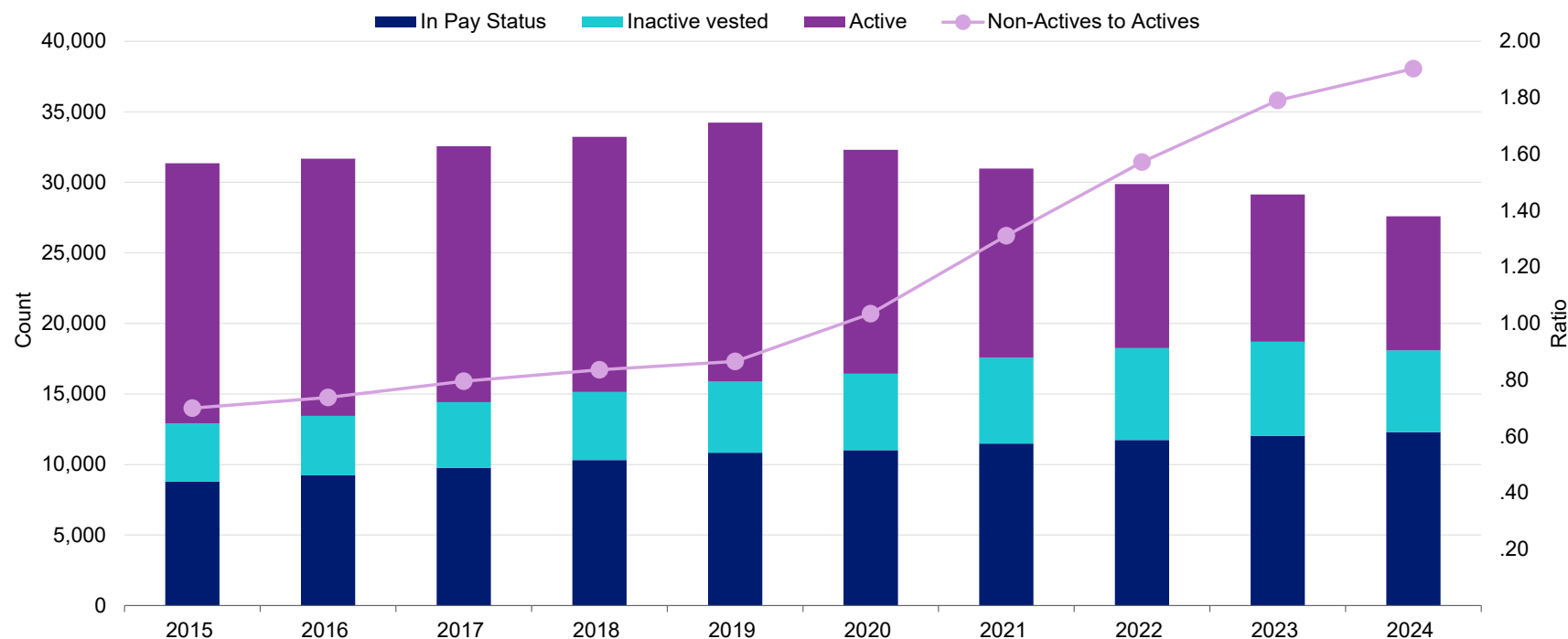
The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

- The actuarial valuation is prepared at the request of the University. Segal is not responsible for the use or misuse of its report, particularly by any other party.
- An actuarial valuation is a measurement at a specific date — it is not a prediction of a plan's future financial condition. Accordingly, Segal did not perform an analysis of the potential range of financial measurements, except where otherwise noted.
- If the University is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
- Segal does not provide investment, legal, accounting, or tax advice and is not acting as a fiduciary to the University of Missouri Retirement, Disability, and Death Benefit Plan. The valuation is based on Segal's understanding of applicable guidance in these areas and of the University of Missouri Retirement, Disability, and Death Benefit Plan's provisions, but they may be subject to alternative interpretations. The University should look to their other advisors for expertise in these areas.
- While Segal maintains extensive quality assurance procedures, an actuarial valuation involves complex computer models and numerous inputs. In the event that an inaccuracy is discovered after presentation of Segal's valuation, Segal may revise that valuation or make an appropriate adjustment in the next valuation.
- Segal's report shall be deemed to be final and accepted by the University upon delivery and review. Trustees should notify Segal immediately of any questions or concerns about the final content.

Section 2: Actuarial Valuation Results

Member information

Member Population as September 30



Legend	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
In Pay Status	8,790	9,242	9,763	10,316	10,836	11,015	11,479	11,746	12,027	12,293
Inactive Vested ¹	4,126	4,215	4,659	4,817	5,046	5,417	6,098	6,513	6,671	5,799
Active	18,445	18,233	18,135	18,102	18,352	15,883	13,409	11,615	10,442	9,509
Ratio	0.70	0.74	0.80	0.84	0.87	1.03	1.31	1.57	1.79	1.90

¹ Excluding terminated participants due a refund of employee contributions.

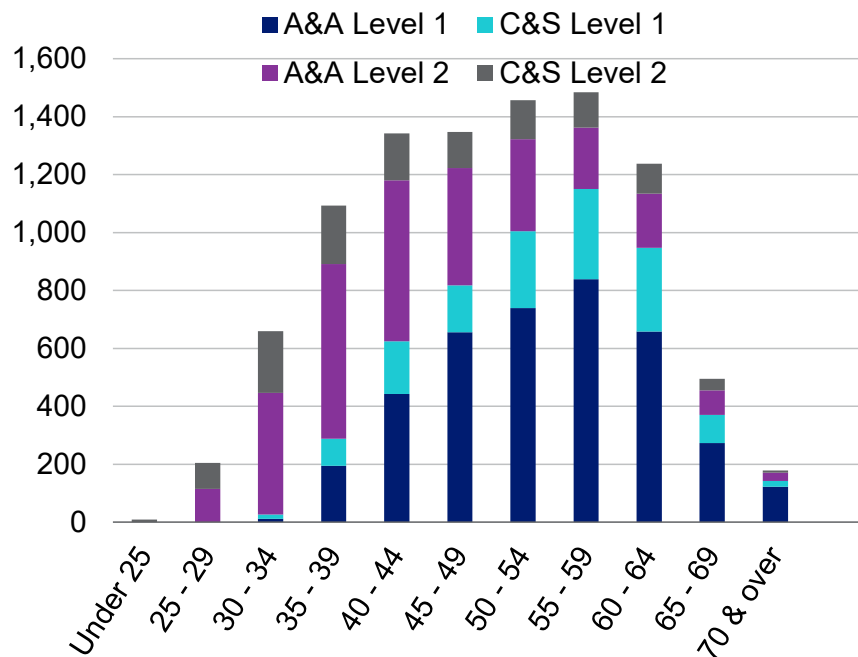
Section 2: Actuarial Valuation Results

Active members

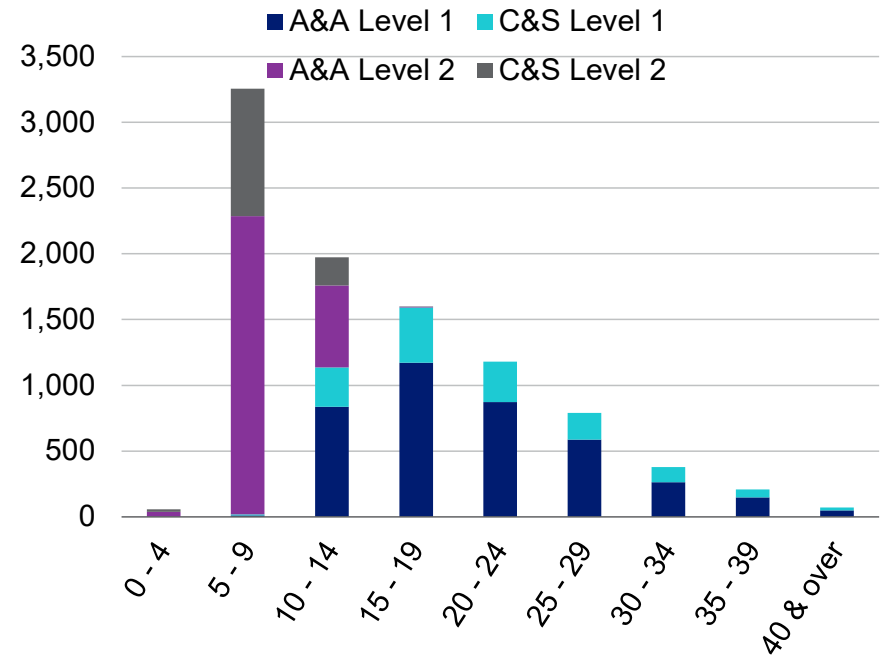
As of September 30,	2024	2023	Change
Active participants	9,509	10,442	-8.9%
Average age	50.0	49.3	0.7
Average years of service	15.4	14.5	0.9
Average compensation	\$94,177	\$89,491	5.2%
Academic & Administrative (A&A) percentage	72.2%	72.7%	N/A
Clerical & Service (C&S) percentage	27.8%	27.3%	N/A

Distribution of Active Members as of September 30, 2024

Actives by Age



Actives by Years of Service



Section 2: Actuarial Valuation Results

Inactive members

- In this year's valuation, there were 5,799 inactive members with a vested right to a deferred or immediate vested benefit. This includes members who are inactive due to long-term disability but who continue to accrue service. Of the 5,799 inactive vested members, 4,176 are Academic and Administrative and 1,623 are Clerical and Service.
- In addition, there were 11,425 inactive members entitled to a return of their employee contributions.

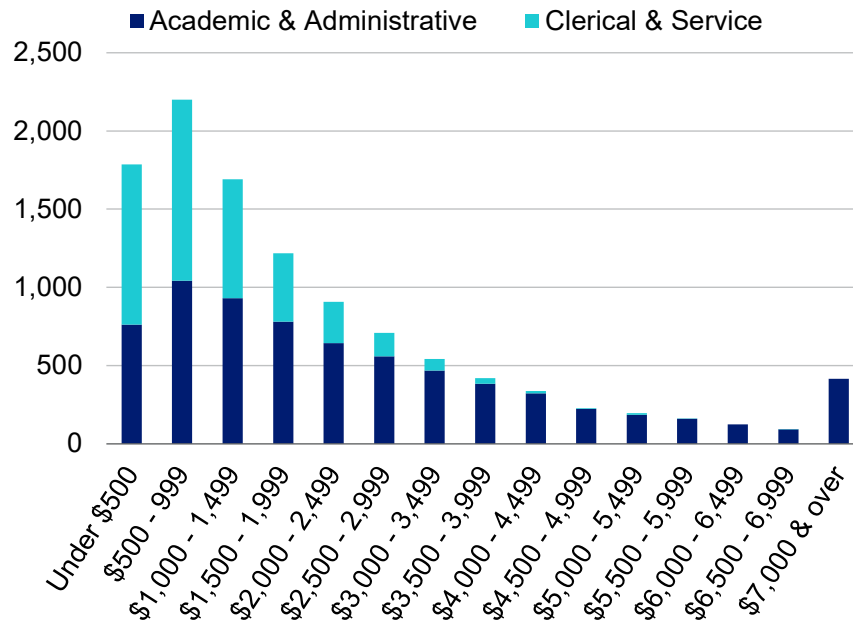
Section 2: Actuarial Valuation Results

Retired members and beneficiaries

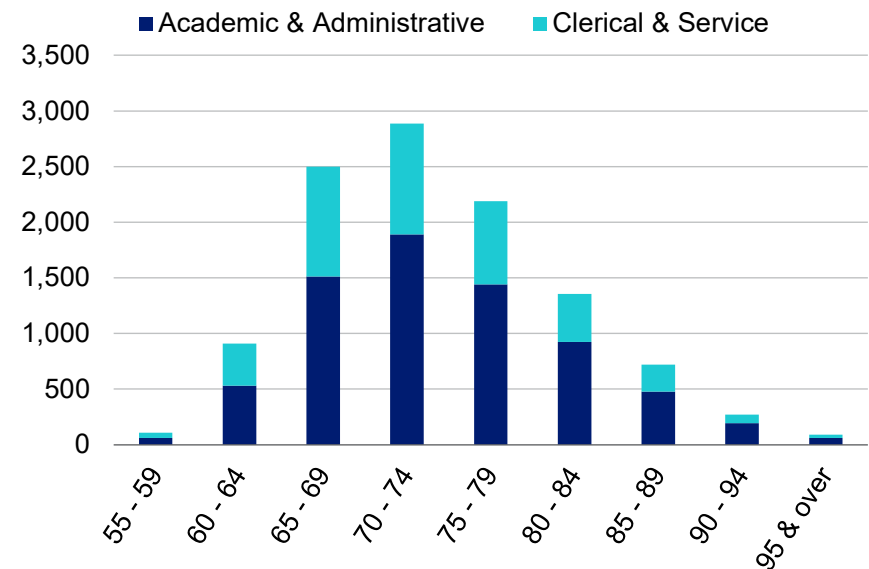
As of September 30,	2024	2023	Change
Retired participants	11,107	10,866	2.2%
Average age	73.8	73.5	0.3
Average amount for A&A	\$2,674	\$2,624	1.9%
Average amount for C&S	\$1,107	\$1,080	2.5%
Beneficiaries	1,186	1,161	2.2%
Total monthly amount	\$25,238,260	\$24,198,990	4.3%

Distribution of Retired Members and Beneficiaries as of September 30, 2024

By Monthly Amount



By Age



Section 2: Actuarial Valuation Results

Financial information

- It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board of Curators has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable. The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

Determination of Actuarial Value of Assets for Year Ended September 30, 2024

Step	Original Amount ¹	Percent Deferred ²	Unrecognized Amount ³	Amount
1. Market value of assets, September 30, 2024				\$4,603,598,076
2. Calculation of unrecognized return				
a. Year ended September 30, 2024	\$331,292,229	80%	\$265,033,783	
b. Year ended September 30, 2023	-84,821,407	60%	-50,892,843	
c. Year ended September 30, 2022	-553,527,683	40%	-221,411,074	
d. Year ended September 30, 2021	652,396,599	20%	130,479,320	
e. Year ended September 30, 2020	-71,077,937	0%	0	
f. Total unrecognized return				\$123,209,186
3. Preliminary actuarial value: (1) - (2f)				4,480,388,890
4. Adjustment to be within 20% corridor				0
5. Final actuarial value of assets as of September 30, 2024: (3) + (4)				\$4,480,388,890
6. Actuarial value as a percentage of market value: (5) ÷ (1)				97.3%
7. Amount deferred for future recognition: (1) - (5)				\$123,209,186

¹ Total return minus expected return on a market value basis.

² Percent deferred applies to the current valuation year.

³ Recognition at 20% per year over five years

Section 2: Actuarial Valuation Results

Actuarial experience

- To calculate any actuarially determined contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), any contribution requirement will decrease from the previous year. On the other hand, any contribution requirement will increase if overall actuarial experience is less favorable than expected (an actuarial loss).
- Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience. If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

Actuarial Experience for Year Ended September 30, 2024

Assumption	Amount
1. Net gain/(loss) from investments ¹	\$44,126,211
2. Net gain/(loss) from salary	-23,657,792
3. Net gain/(loss) from other experience	-5,258,617
4. Net experience gain/(loss): 1 + 2 + 3	\$15,209,802

¹ Details on next page

Section 2: Actuarial Valuation Results

Investment experience

- A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the Plan's investment policy. The rate of return on the market value of assets was 15.10% for the year ended September 30, 2024.
- For valuation purposes, the assumed rate of return on the actuarial value of assets for the year ended September 30, 2024 was 7.00%. The actual rate of return on an actuarial basis for the 2024 Plan Year was 8.04%. Since the actual return for the year was greater than the assumed return, the Plan experienced an actuarial gain during the year ended September 30, 2024 with regard to its investments.

Investment Experience *Year Ended September 30, 2024 vs. Year Ended September 30, 2023*

Investment	YE 2024 Market Value	YE 2024 Actuarial Value	YE 2023 Market Value	YE 2023 Actuarial Value
1. Net investment income	\$617,575,545	\$341,135,675	\$200,235,471	\$254,652,866
2. Average value of assets	4,089,761,652	4,242,992,336	4,072,241,120	4,171,054,408
3. Rate of return: 1 ÷ 2	15.10%	8.04%	4.92%	6.11%
4. Assumed rate of return	7.00%	7.00%	7.00%	7.00%
5. Expected investment income: 2 x 4	\$286,283,316	\$297,009,464	\$285,056,878	\$291,973,809
6. Net investment gain/(loss): 1 – 5	\$331,292,229	\$44,126,211	-\$84,821,407	-\$37,320,943

Section 2: Actuarial Valuation Results

Non-investment experience

Retirement experience

- During the year ended September 30, 2023, the number of retirements closely matched the assumption in aggregate for academic and administrative employees and the number of retirements was lower than projected for clerical and service employees.

Salary experience

- Between the 2023 and 2024 actuarial valuations, the average salary increased by 5.1% for academic and administrative employees and increased by 5.2% for clerical and service employees. These patterns were greater than assumed producing an actuarial loss of \$23.7 million.

Other experience

- There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:
 - Mortality experience (more or fewer than expected deaths)
 - The extent of turnover among members
 - The number of disability retirements (more or fewer than projected)

Section 2: Actuarial Valuation Results

Actuarial assumptions

- There are no assumption changes since the prior valuation.
- Details on actuarial assumptions and methods are in Section 4, Exhibit I.

Plan provisions

- There were no changes in plan provisions since the prior valuation.
- In the prior plan year, a lump sum buy-out window was offered to inactive vested participants. Based on information reported by the University, approximately 1,000 participants elected to receive the buy-out.
- A summary of plan provisions is in Section 4, Exhibit II.

Section 2: Actuarial Valuation Results

Unfunded actuarial accrued liability

Development of Unfunded Actuarial Accrued Liability for Year Ended September 30, 2024

Unfunded Actuarial Accrued Liability	Amount
1. Unfunded actuarial accrued liability at beginning of year	\$1,289,258,224
2. Normal cost at beginning of year	49,980,246
3. Prior year's actuarially determined contribution (ADC) at beginning of year	-172,176,938
4. Interest on 1, 2 & 3	81,694,307
5. Expected unfunded actuarial accrued liability	1,248,755,839
6. Changes due to:	
a. Actuarial investment gain	-\$44,126,211
b. Salary increase greater than expected	23,657,792
c. Other (gain)/loss	5,258,617
d. Total changes	-15,209,802
7. Unfunded actuarial accrued liability at end of year	\$1,233,546,037

Section 2: Actuarial Valuation Results

Actuarially determined contribution

The actuarially determined contribution is equal to the employer normal cost payment and a payment on the unfunded actuarial accrued liability. As of October 1, 2024, the actuarially determined employer contribution is \$161,835,086, or 18.07% of projected plan-covered payroll in aggregate, or 19.47% for Level 1 members and 16.04% for Level 2 members.

The methodology used to calculate the actuarially determined contribution separately amortizes the initial unfunded liability as of October 1, 2021 over 20 years, the impact of the assumption changes over 20 years, and future experience gains and losses over 25 and 15 years, respectively. See Section 3, Exhibit D for a schedule of amortization bases established under this methodology.

Note that the Plan uses a level dollar amortization schedule. Since the Plan is closed to new entrants and the active population and payroll are declining, the percent of payroll contribution rates reported herein as of October 1, 2024 may amortize the unfunded liability slower than the scheduled period when applied to the reduced payroll in the period July 1, 2025 – June 30, 2026. Note that payroll only applies to those actives who are members in this Plan.

The contribution requirement as of October 1, 2024 is based on the data previously described, the actuarial assumptions and plan provisions described in Section 4, including all changes affecting future costs adopted at the time of the actuarial valuation, actuarial gains and losses, and changes in the actuarial assumptions.

Actuarially Determined Contribution for Year Beginning October 1

	2024 Total Plan	2024 Level One % of Projected Payroll	2024 Level Two % of Projected Payroll	2023 Total Plan	2023 Level One % of Projected Payroll	2023 Level Two % of Projected Payroll
1. Normal cost	\$49,380,146	6.93%	3.46%	\$51,836,103	7.00%	3.47%
2. Amortization of unfunded liability	<u>125,469,008</u>	<u>14.01%</u>	<u>14.01%</u>	<u>126,734,077</u>	<u>13.56%</u>	<u>13.56%</u>
3. Actuarially determined contribution 1 + 2	174,849,154	20.94%	17.47%	178,570,180	20.56%	17.03%
4. Expected employee contribution	<u>-13,014,068</u>	<u>-1.48%</u>	<u>-1.42%</u>	<u>-13,362,378</u>	<u>-1.46%</u>	<u>-1.39%</u>
5. Actuarially determined employer contribution 3 + 4	\$161,835,086	19.47%	16.04%	\$165,207,802	19.10%	15.64%

Section 2: Actuarial Valuation Results

Reconciliation of actuarially determined contribution

The chart below details the changes in the actuarially determined contribution from the prior valuation to the current year's valuation.

Reconciliation of Actuarially Determined Contribution from October 1, 2023 to October 1, 2024

Step	Amount	Percent of Payroll
Actuarially determined contribution as of October 1, 2023	\$178,570,180	19.11%
Changes in Actuarially Determined Contribution		
• Effect of salary loss	1,967,727	0.21%
• Effect of investment (gain)/loss	-3,670,180	-0.39%
• Net effect of other gains and losses on accrued liability	437,385	0.05%
• Net effect of other changes, including composition and number of members	-2,455,958	-0.26%
• Total change	-\$3,721,026	-0.40%
Total change in percentage due to payroll change	N/A	0.81%
Actuarially determined contribution as of October 1, 2024	\$174,849,154	19.52%

Section 2: Actuarial Valuation Results

Minimum actuarially determined contribution

The Plan's financial management policy has a provision for a Minimum Actuarially Determined Contribution (MADC) that states that the amortization component of the ADC may not be lower than the amortization component of the ADC in the October 1, 2021 actuarial valuation until the plan is fully funded.

The amortization component of the ADC in the October 1, 2021 actuarial valuation is \$94,838,104, including an adjustment for monthly payments. The amortization component of the October 1, 2024 ADC is \$125,469,008. Since this exceeds the October 1, 2021 value, as of October 1, 2024, the MADC is equal to the ADC.

Minimum Actuarially Determined Contribution for Year Beginning October 1

	2024 Total Plan	2024 Level One % of Projected Payroll	2024 Level Two % of Projected Payroll	2023 Total Plan	2023 Level One % of Projected Payroll	2023 Level Two % of Projected Payroll
1. Normal cost	\$49,380,146	6.93%	3.46%	\$51,836,103	7.00%	3.47%
2. Amortization of unfunded liability	<u>125,469,008</u>	<u>14.01%</u>	<u>14.01%</u>	<u>126,734,077</u>	<u>13.56%</u>	<u>13.56%</u>
3. Minimum actuarially determined contribution 1 + 2	174,849,154	20.94%	17.47%	178,570,180	20.56%	17.03%
4. Expected employee contribution	<u>-13,014,068</u>	<u>-1.48%</u>	<u>-1.42%</u>	<u>-13,362,378</u>	<u>-1.46%</u>	<u>-1.39%</u>
5. Minimum actuarially determined employer contribution 3 + 4	\$161,835,086	19.47%	16.04%	\$165,207,802	19.10%	15.64%

Section 2: Actuarial Valuation Results

Schedule of funding progress through September 30, 2024

Actuarial Valuation Date of October 1	Unfunded AAL (UAAL)	Funded Ratio MVA	Funded Ratio AVA	UAAL as a Percentage of Covered Payroll
2015	\$474,031,119	82.6%	87.4%	42.0%
2016	459,286,212	84.9%	88.2%	40.1%
2017	738,711,563	82.9%	82.9%	64.4%
2018	798,247,042	82.5%	82.1%	67.2%
2019	904,627,693	80.0%	80.6%	73.7%
2020	899,503,574	79.2%	81.2%	80.6%
2021	1,036,557,118	88.4%	79.9%	101.1%
2022	1,198,944,556	76.2%	78.0%	123.5%
2023	1,289,258,224	74.4%	77.1%	138.0%
2024	1,233,546,037	80.6%	78.4%	137.7%

Section 2: Actuarial Valuation Results

History of ADC rates

History of Actuarially Determined Contributions: 2020 – 2024

Level One

Plan Year Beginning October 1	Normal Cost Percentage	Amortization Percentage	Total Contribution Rate	Employee Contribution Rate	Net Contribution Rate	Net Contribution Rate Reflecting MADC
2020	6.99%	7.04%	14.03%	1.37%	12.66%	12.66%
2021	7.08%	9.25%	16.33%	1.39%	14.93%	14.93%
2022	7.03%	11.70%	18.73%	1.43%	17.30%	17.30%
2023	7.00%	13.56%	20.56%	1.46%	19.10%	19.10%
2024	6.93%	14.01%	20.94%	1.48%	19.47%	19.47%

History of Actuarially Determined Contributions: 2020 – 2024

Level Two¹

Plan Year Beginning October 1	Normal Cost Percentage	Amortization Percentage	Total Contribution Rate	Employee Contribution Rate	Net Contribution Rate	Net Contribution Rate Reflecting MADC
2020	3.35%	7.04%	10.39%	1.28%	9.11%	9.11%
2021	3.47%	9.25%	12.71%	1.32%	11.40%	11.40%
2022	3.49%	11.70%	15.19%	1.36%	13.83%	13.83%
2023	3.47%	13.56%	17.03%	1.39%	15.64%	15.64%
2024	3.46%	14.01%	17.47%	1.42%	16.04%	16.04%

¹ Does not include contributions to the defined contribution plan for Level Two employees.

Section 2: Actuarial Valuation Results

History of Actuarially Determined Contributions: 2020 – 2024 Blended Level One and Level Two¹

Plan Year Beginning October 1	Net Contribution Rate ¹	Net Contribution Rate Reflecting MADC ¹
2020	11.03%	11.03%
2021	13.39%	13.39%
2022	15.85%	15.85%
2023	17.68%	17.68%
2024	18.07%	18.07%

¹ Does not include contributions to the defined contribution plan for Level Two employees. The blended contribution rates shown are based on the total plan-covered employee population and salaries as of the valuation date.

Section 2: Actuarial Valuation Results

Low-Default-Risk Obligation Measure (LDROM)

In December 2021, the Actuarial Standards Board issued a revision of Actuarial Standard of Practice No. 4 (ASOP 4) *Measuring Pension Obligations and Determining Pension Plan Costs or Contributions*. One of the revisions to ASOP 4 requires the disclosure of a Low-Default-Risk Obligation Measure (LDROM) when performing a funding valuation. The LDROM presented in this report is calculated using the same methodology and assumptions used to determine the Actuarial Accrued Liability (AAL) used for funding, except for the discount rate. The LDROM is required to be calculated using “a discount rate...derived from low-default-risk fixed income securities whose cash flows are reasonably consistent with the pattern of benefits expected to be paid in the future.”

The LDROM is a calculation assuming a plan's assets are invested in an all-bond portfolio, generally lowering expected long-term investment returns. The discount rate selected and used for this purpose is the Bond Buyer General Obligation 20-year Municipal Bond Index Rate, published at the end of each week. The last published rate in September of the measurement period, by The Bond Buyer (www.bondbuyer.com), is 3.81% for use effective September 30, 2024. This is the rate used to determine the discount rate for valuing reported public pension plan liabilities in accordance with Governmental Accounting Standards when plan assets are projected to be insufficient to make projected benefit payments, and the 20-year period reasonably approximates the duration of plan liabilities. The LDROM is not used to determine a plan's funded status or Actuarially Determined Contribution. The plan's expected return on assets, currently 7.00%, is used for these calculations.

As of September 30, 2024, the LDROM for the system is \$8,569,038,303. The difference between the plan's AAL of \$5,713,934,927 and the LDROM can be thought of as the increase in the AAL if the entire portfolio were invested in low-default-risk securities. Alternatively, this difference could also be viewed as representing the expected savings from investing in the plan's diversified portfolio compared to investing only in low-default-risk securities.

ASOP 4 requires commentary to help the intended user understand the significance of the LDROM with respect to the funded status of the plan, plan contributions, and the security of participant benefits. In general, if plan assets were invested exclusively in low-default-risk securities, the funded status would be lower and the Actuarially Determined Contribution would be higher. While investing in a portfolio with low-default-risk securities may be more likely to reduce investment volatility and the volatility of employer contributions, it also may be more likely to result in higher employer contributions or lower benefits.

Section 2: Actuarial Valuation Results

Risk

The actuarial valuation results are dependent on a single set of assumptions; however, there is a risk that emerging results may differ significantly as actual experience proves to be different from the current assumptions.

We have not been engaged to perform a detailed analysis of the potential range of the impact of risk relative to the Plan's future financial condition but have included a brief discussion of some risks that may affect the Plan.

- Economic and Other Related Risks. Potential implications for the Plan due to the following economic effects (that were not reflected as of the valuation date) include:

- Volatile financial markets and investment returns lower than assumed
- High inflationary environment impacting salary increases

- Investment Risk (the risk that returns will be different than expected)

Since the Plan's assets are much larger than contributions, investment performance may create volatility in the actuarially determined contribution requirements. For example, for the prior plan year, if the actual return on market value were 1% different, the actuarially determined contribution would increase or decrease by \$3.3 million (0.4% of payroll) once fully recognized in the actuarial value of assets.

The market value rate of return over the last 10 years has ranged from a low of -5.4% to a high of 24.8%.

- Longevity Risk (the risk that mortality experience will be different than expected)

The actuarial valuation includes an expectation of future improvement in life expectancy. Emerging plan experience that does not match these expectations will result in either an increase or decrease in the actuarially determined contribution.

- Contribution Risk (the risk that actual contributions will be different from actuarially determined contribution)

The Plan's funding policy requires payment of the actuarially determined contribution. As long as this policy is adhered to, contribution risk is negligible. Note, however, that the ADC as a percent of payroll shown in this report needs to be adjusted for the declining payroll base due to the plan closure. Simply paying the ADC percentages shown in this report will create a small contribution risk.

- Demographic Risk (the risk that participant experience will be different than assumed)

Examples of this risk include:

- Actual retirements occurring earlier or later than assumed. The value of retirement plan benefits is sensitive to the rate of benefit accruals and any early retirement subsidies that apply.

Section 2: Actuarial Valuation Results

- More or less active participant turnover than assumed.
 - Salary increases more or less than expected
- There are external factors including legislative or financial reporting changes that could impact the Plan's funding and disclosure requirements. While we do not assume any changes in such external factors, it is important to understand that they could have significant consequences for the Plan.
- Actual Experience Over the Last Ten Years

Past experience can help demonstrate the sensitivity of key results to the Plan's actual experience. Over the past ten years:

 - The funded percentage on the actuarial value of assets has ranged from a low of 77.1% to a high of 88.2% since 2015.
- Maturity Measures

As pension plans mature, the cash needed to fulfill benefit obligations will increase over time. Therefore, cash flow projections and analysis should be performed to assure that the Plan's asset allocation is aligned to meet emerging pension liabilities.

Currently the Plan has a non-active to active participant ratio of 1.90 as compared to 1.79 for the prior year.

For the prior year, benefits paid were \$207.5 million more than contributions received. Plans with high levels of negative cash flows may have a need for a larger allocation to income generating assets, which can create a drag on investment return.
- Detailed Risk Assessment

A more detailed assessment of the risks would provide the Board with a better understanding of the risks inherent in the Plan. This assessment may include scenario testing, sensitivity testing, stress testing, and stochastic modeling.

Section 3: Supplemental Information

Exhibit A: Table of plan demographics

Category	Year Ended September 30, 2024	Year Ended September 30, 2023	Change From Prior Year
Level One Academic & Administrative Members:			
• Number	3,938	4,314	-8.7%
• Average age	54.2	53.6	0.6
• Average years of service	21.1	20.3	0.8
• Average salary	\$112,928	\$108,526	4.1%
• Total payroll	\$444,709,621	\$468,180,410	-5.0%
Level One Clerical & Service Members:			
• Number	1,435	1,542	-6.9%
• Average age	54.0	54.0	0.0
• Average years of service	21.4	20.9	0.5
• Average salary	\$59,552	\$53,342	11.6%
• Total payroll	\$85,456,750	\$82,252,703	3.9%
Level Two Academic & Administrative Members:			
• Number	2,930	3,280	-10.7%
• Average age	44.6	43.6	1.0
• Average years of service	8.0	6.9	1.1
• Average salary	\$101,089	\$97,180	4.0%
• Total payroll	\$296,191,289	\$318,751,882	-7.1%
Level Two Clerical & Service Members:			
• Number	1,206	1,306	-7.7%
• Average age	44.4	43.8	0.6
• Average years of service	7.8	6.8	1.0
• Average salary	\$57,359	\$49,989	14.7%
• Total payroll	\$69,175,187	\$65,285,204	6.0%

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Category	Year Ended September 30, 2024	Year Ended September 30, 2023	Change From Prior Year
Inactive members			
• Inactive vested members	5,799	6,671	-13.1%
• Inactive members due a refund of employee contributions	11,425	11,487	-0.5%
Retired members:			
• Number in pay status	11,107	10,866	2.2%
• Average age	73.8	73.5	0.3
• Average monthly benefit	\$2,114	\$2,071	2.1%
Beneficiaries:			
• Number in pay status	1,186	1,161	2.2%
• Average age	77.6	77.6	0.0
• Average monthly benefit	\$1,478	\$1,463	1.0%

Section 3: Supplemental Information

Exhibit B: Members in active service as of September 30, 2024 by age and years of service

Academic & Administrative, Level One

Years of Service

Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	--	--	--	--	--	--	--	--	--	--
25 - 29	--	--	--	--	--	--	--	--	--	--
30 - 34	12	--	1	11	--	--	--	--	--	--
35 - 39	195	--	1	147	46	1	--	--	--	--
40 - 44	443	--	3	182	214	44	--	--	--	--
45 - 49	656	--	1	170	273	169	42	1	--	--
50 - 54	739	--	1	120	239	211	134	30	3	1
55 - 59	839	--	3	95	203	216	200	77	43	2
60 - 64	658	--	1	61	114	157	153	107	55	10
65 - 69	273	--	--	39	65	52	44	38	26	9
70 & over	123	--	--	11	18	22	14	11	21	26
Total	3,938	--	11	836	1,172	872	587	264	148	48

Section 3: Supplemental Information

Academic & Administrative, Level Two

Years of Service

Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	--	--	--	--	--	--	--	--	--	--
25 - 29	115	9	105	1	--	--	--	--	--	--
30 - 34	419	8	369	42	--	--	--	--	--	--
35 - 39	604	8	474	122	--	--	--	--	--	--
40 - 44	555	6	427	122	--	--	--	--	--	--
45 - 49	405	3	290	112	--	--	--	--	--	--
50 - 54	318	1	238	79	--	--	--	--	--	--
55 - 59	212	--	152	60	--	--	--	--	--	--
60 - 64	188	2	138	48	--	--	--	--	--	--
65 - 69	85	1	58	26	--	--	--	--	--	--
70 & over	29	--	16	13	--	--	--	--	--	--
Total	2,930	38	2,267	625	--	--	--	--	--	--

Section 3: Supplemental Information

Clerical & Service, Level One

Years of Service

Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	--	--	--	--	--	--	--	--	--	--
25 - 29	--	--	--	--	--	--	--	--	--	--
30 - 34	15	--	1	14	--	--	--	--	--	--
35 - 39	93	--	--	53	39	1	--	--	--	--
40 - 44	182	--	2	59	82	37	2	--	--	--
45 - 49	162	--	3	36	61	43	18	1	--	--
50 - 54	266	--	--	37	67	66	61	33	2	--
55 - 59	312	--	2	41	72	70	53	36	32	6
60 - 64	289	--	--	39	66	66	54	37	19	8
65 - 69	97	--	--	19	25	23	8	8	6	8
70 & over	19	--	--	3	8	1	6	--	1	--
Total	1,435	--	8	301	420	307	202	115	60	22

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Clerical & Service, Level Two

Years of Service

Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	9	--	9	--	--	--	--	--	--	--
25 - 29	90	5	85	--	--	--	--	--	--	--
30 - 34	214	6	182	26	--	--	--	--	--	--
35 - 39	201	4	153	44	--	--	--	--	--	--
40 - 44	162	1	131	30	--	--	--	--	--	--
45 - 49	125	--	100	25	--	--	--	--	--	--
50 - 54	134	2	99	33	--	--	--	--	--	--
55 - 59	121	--	99	22	--	--	--	--	--	--
60 - 64	103	2	72	29	--	--	--	--	--	--
65 - 69	40	--	35	5	--	--	--	--	--	--
70 & over	7	--	4	3	--	--	--	--	--	--
Total	1,206	20	969	217	--	--	--	--	--	--

Section 3: Supplemental Information

Exhibit C: Summary statement of income and expenses on a market value basis

Year Ended September 30, 2024 versus Year Ended September 30, 2023

Item	Year Ended 2024	Year Ended 2023
Net assets at market value at the beginning of the year	\$4,193,500,773	\$4,151,216,937
Contribution and other income:		
• Employer contributions	\$165,142,528	\$137,742,403
• Employee contributions	14,063,169	13,900,130
• Total contribution income	\$179,205,697	\$151,642,533
Investment income:		
• Interest, dividends, and other income	49,492,389	\$30,556,998
• Net gain/(loss) from sales of investments	343,823,200	127,844,371
• Unrealized appreciation/(depreciation)	231,572,068	55,896,047
• Expenses	-7,312,111	-14,061,945
• Net investment income	\$617,575,545	\$200,235,471
• Total income available for benefits	\$796,781,242	\$351,878,004
Less disbursements:		
• Benefit payments	-386,683,939	-309,594,168
• Net benefit payments and administrative expenses	-\$386,683,939	-\$309,594,168
Change in market value of assets	\$410,097,303	\$42,283,836
Net assets at market value at the end of the year	\$4,603,598,076	\$4,193,500,773

Section 3: Supplemental Information

Exhibit D: Table of amortization bases

Type	Date Established	Initial Period	Initial Amount	Annual Payment ¹	Years Remaining	Outstanding Balance
Initial Liability	10/01/2021	20	\$805,496,269	\$73,697,568	17	\$742,328,594
Change in Assumptions	10/01/2021	20	231,060,849	21,140,536	17	212,940,868
Change in Methodology	10/01/2022	19	97,072,052	9,103,511	17	91,696,324
Actuarial Loss	10/01/2022	15	90,600,047	9,641,835	13	83,136,879
Actuarial Loss	10/01/2023	15	123,570,620	13,150,628	14	118,653,174
Actuarial Gain	10/01/2024	25	-15,209,802	-1,265,070	25	-15,209,802
Total				\$125,469,008		\$1,233,546,037

¹ Reflects adjustment for monthly payments

Section 3: Supplemental Information

Exhibit E: Definition of pension terms

The following list defines certain technical terms for the convenience of the reader:

Term	Definition
Actuarial accrued liability for actives	The equivalent of the accumulated normal costs allocated to the years before the valuation date.
Actuarial accrued liability for retirees and beneficiaries	Actuarial Present Value of lifetime benefits to existing retirees and beneficiaries. This sum takes account of life expectancies appropriate to the ages of the annuitants and the interest that the sum is expected to earn before it is entirely paid out in benefits.
Actuarial cost method	A procedure allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability that are used to determine the actuarially determined contribution.
Actuarial gain or loss	A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., assets earn more than projected, salary increases are less than assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results yield actuarial liabilities that are larger than projected.
Actuarially equivalent	Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial present value (APV)	The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. Each such amount or series of amounts is: Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.) Multiplied by the probability of the occurrence of an event (such as survival, death, disability, withdrawal, etc.) on which the payment is conditioned, and Discounted according to an assumed rate (or rates) of return to reflect the time value of money.

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Term	Definition
Actuarial present value of future benefits	The Actuarial Present Value of benefit amounts expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, anticipated future compensation, and future service credits. The Actuarial Present Value of Future Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive members entitled to either a refund of member contributions or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.
Actuarial valuation	The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan, as well as Actuarially Determined Contributions.
Actuarial value of assets (AVA)	The value of the Plan's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly plans use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the Actuarially Determined Contribution.
Actuarially determined	Values that have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the Plan.
Actuarially determined contribution (ADC)	The employer's contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the Plan's funding policy. The ADC consists of the Employer Normal Cost and the Amortization Payment.
Amortization method	A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the Unfunded Actuarial Accrued Liability. Under the Level Percentage of Pay method, the Amortization Payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the Unfunded Actuarial Accrued Liability. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.
Amortization payment	The portion of the pension plan contribution, or ADC, that is intended to pay off the Unfunded Actuarial Accrued Liability.

Section 3: Supplemental Information

Term	Definition
Assumptions or actuarial assumptions	The estimates upon which the cost of the Plan is calculated, including: Investment return — the rate of investment yield that the Plan will earn over the long-term future; Mortality rates — the rate or probability of death at a given age for employees and retirees; Retirement rates — the rate or probability of retirement at a given age or service; Disability rates — the rate or probability of disability retirement at a given age; Withdrawal rates — the rate or probability at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement; Salary increase rates — the rates of salary increase due to inflation, real wage growth and merit and promotion increases.
Closed amortization period	A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 20 years, it is 19 years at the end of one year, 18 years at the end of two years, etc. See Open Amortization Period.
Decrements	Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or withdrawal.
Defined benefit plan	A retirement plan in which benefits are defined by a formula based on the member's compensation, age and/or years of service.
Defined contribution plan	A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.
Employer normal cost	The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.
Experience study	A periodic review and analysis of the actual experience of the Plan that may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified based on recommendations from the Actuary.
Funded ratio	The ratio of the Actuarial Value of Assets (AVA) to the Actuarial Accrued Liability (AAL). Plans sometimes also calculate a market funded ratio, using the Market Value of Assets (MVA), rather than the AVA.
Investment return	The rate of earnings of the Plan from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.

Section 3: Supplemental Information

Term	Definition
Normal cost	The portion of the Actuarial Present Value of Future Benefits and expenses, if applicable, allocated to a valuation year by the Actuarial Cost Method. Any payment with respect to an Unfunded Actuarial Accrued Liability is not part of the Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of member contributions and employer Normal Cost unless otherwise specifically stated.
Open amortization period	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. If the initial period is set as 30 years, the same 30-year period is used in each future year in determining the Amortization Period.
Unfunded actuarial accrued liability	The excess of the Actuarial Accrued Liability over the Valuation/Actuarial Value of Assets. This value may be negative, in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus or an Overfunded Actuarial Accrued Liability.
Valuation date or actuarial valuation date	The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Benefits is determined. The expected benefits to be paid in the future are discounted to this date.

Section 4: Actuarial Valuation Basis

Exhibit 1: Actuarial assumptions, methods and models

Rationale for assumptions

The information and analysis used in selecting each assumption that has a significant effect on this actuarial valuation is shown in the Actuarial Experience Study for 2016-2020. The recommended assumption changes detailed in the referenced study were reviewed and adopted by the Board of Curators, in effect directing Segal to utilize those recommended assumptions to complete this actuarial valuation. Current data is reviewed in conjunction with each annual valuation and we have no reason to doubt the appropriateness of those mandated assumptions.

Net investment return

7.00%.

Salary increases

The salary increases shown below exclude assumed inflation of 2.20%

Age	Academic & Administrative Rate (%)	Clerical & Service Rate (%)
25	6.0	3.1
30	3.6	2.2
35	2.6	1.8
40	2.1	1.4
45	1.8	1.0
50	1.4	0.7
55	0.8	0.5
60	0.3	0.2

Section 4: Actuarial Valuation Basis

Mortality rates

Academic & Administrative Members:

Healthy: Pub-2010 Teacher Healthy Annuitant Mortality Table, weighted 95% for males and 103% for females, with generational projection using Scale MP-2020

Non-Annuitant: Pub-2010 Teacher Employee Mortality Table, weighted 95% for males and 103% for females, with generational projection using Scale MP-2020

Clerical & Service Members:

Healthy: Pub-2010 General Healthy Annuitant Mortality Table, weighted 124% for males and 112% for females with generational projection using Scale MP-2020

Non-Annuitant: Pub-2010 General Employee Mortality Table, weighted 124% for males and 112% for females, with generational projection using Scale MP-2020

Academic & Administrative and Clerical & Service Members:

Disabled: Pub-2010 Non-Safety Disabled Annuitant Mortality Table, weighted 95% for males and females, with generational projection using Scale MP-2020

Surviving Spouse: 80% of the Pub-2010 Teacher Contingent Survivor Amount-Weighted Tables and 20% of the Pub-2010 General Contingent Survivor Amount-Weighted Tables projected generationally with Scale MP-2020

Section 4: Actuarial Valuation Basis

Academic & Administrative Annuitant Mortality Rates Based on Age at Valuation Date:

Age	Male Mortality Rates	Female Mortality Rates	Male Expected Years of Life Remaining	Female Expected Years of Life Remaining
60	0.35%	0.31%	28.2	29.8
70	0.94%	0.70%	18.9	20.2
80	3.26%	2.64%	10.8	11.8
90	11.75%	9.91%	5.3	5.8

Clerical & Service Annuitant Mortality Rates Based on Age at Valuation Date:

Age	Male Mortality Rates	Female Mortality Rates	Male Expected Years of Life Remaining	Female Expected Years of Life Remaining
60	0.78%	0.45%	24.2	27.7
70	1.75%	1.05%	15.6	18.5
80	5.28%	3.43%	8.6	10.6
90	16.97%	12.27%	4.0	5.1

Section 4: Actuarial Valuation Basis

Termination rates before retirement

Years of Service	Academic & Administrative Withdrawal Rate ¹ (%)	Clerical & Service Withdrawal Rate ¹ (%)
0	21.5	31.0
1	21.0	23.0
2	18.5	19.5
4	15.0	13.5
6	13.0	11.5
8	11.0	11.0
10	9.0	10.0
12	7.0	8.0
14	5.0	6.0
16	5.0	5.0
18	5.0	5.0
20	4.0	5.0
22	4.0	5.0
24	4.0	5.0

¹ Withdrawal rates do not apply at or beyond early retirement or 25 years of service

Age	Disability Rates (%)
40	0.04
45	0.10
50	0.19
55	0.37
60	0.61

Section 4: Actuarial Valuation Basis

Retirement rates

Age	Academic & Administrative Under 25 Years of Service	Academic & Administrative Over 25 Years of Service	Clerical & Service Under 25 Years of Service	Clerical & Service Over 25 Years of Service
55	5%	8%	7%	12%
56 - 58	3	4	5	6
59	3	4	5	12
60	5	8	10	18
61	5	12	10	24
62	10	25	20	50
63 - 64	10	12	15	30
65 - 66	25	25	40	40
67 - 79	20	20	35	35
80	100	100	100	100

Weighted average retirement age

Age 65 for academic & administrative members and age 62 for clerical & service members, determined as follows: The weighted average retirement age for each participant is calculated as the sum of the product of each potential current or future retirement age times the probability of surviving from current age to that age and then retiring at that age, assuming no other decrements. The overall weighted retirement age is the average of the individual retirement ages based on all the active members included in the October 1, 2024 actuarial valuation.

Retirement rates for inactive vested participants

65

Unknown data for members

Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.

Section 4: Actuarial Valuation Basis

Percent married

80%

Age of spouse

Spouses of male participants are female and three years younger and spouses of female participants are male and three years older.

Benefit election

All members are assumed to elect the single life form of payment.

Load for Summer Appointments

2.20% of Academic & Administrative active member liability and normal cost

Actuarial value of assets

Market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual market return and the expected return on the actuarial value, and is recognized over a five-year period, further adjusted, if necessary, to be within 20% of the market value.

Actuarial cost method

Entry Age Actuarial Cost Method. Entry Age is the age at date of employment or, if date is unknown, current age minus years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salary, with Normal Cost determined using the plan of benefits applicable to each participant.

Models

Segal valuation results are based on proprietary actuarial modeling software. The actuarial valuation models generate a comprehensive set of liability and cost calculations that are presented to meet regulatory, legislative and client requirements. Our Actuarial Technology and Systems unit, comprised of both actuaries and programmers, is responsible for the initial development and maintenance of these models. The models have a modular structure that allows for a high degree of accuracy, flexibility and user control. The client team programs the assumptions and the plan provisions, validates the models, and reviews test lives and results, under the supervision of the responsible actuary.

Section 4: Actuarial Valuation Basis

Changes in actuarial assumptions

There have been no changes in actuarial assumptions since the last valuation

Section 4: Actuarial Valuation Basis

Exhibit 2: Summary of plan provisions

This exhibit summarizes the major provisions of the Plan included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Plan year

October 1 through September 30

Plan status

Closed effective October 1, 2019

Membership

Level One Member is one who was initially hired prior to October 1, 2012. Level Two Member is one who is hired or rehired on or after October 1, 2012 (except that a Qualified Member who was initially hired prior to October 1, 2012, earned a vested benefit, terminated service after earning such vested benefit, did not receive a lump sum payment, and is rehired by the University on or after October 1, 2012 shall be a Level One Member).

Normal retirement

Age Requirement	65
Amount	<i>Level One Members:</i> Total years of service multiplied by 2.2% of compensation base <i>Level Two Members:</i> Total years of service multiplied by 1.0% of compensation base
Compensation Base	Average regular annual salary, excluding any incentive compensation and including any shift differential pay, of the member for the five consecutive highest salary years of employment. Salary year is September 1 through August 31.
Minimum Value Accumulation for Level One Members Only	Members shall receive an annual minimum benefit of the actuarial equivalent annuity of an account crediting 5% of each year's pay accumulated at 7.5% interest annually.

Section 4: Actuarial Valuation Basis

Benefit for Summer Employment

Academic Members who receive a summer appointment designated as summer service earn a separate benefit added to normal pension.

Amount	<i>Level One Members:</i> Total number of summer appointments multiplied by 2.2% of compensation base <i>Level Two Members:</i> Total number of summer appointments multiplied by 1.0% of compensation base
Compensation Base	Average of the 5 consecutive highest summer salaries earned during the summers worked. Summer salary may not exceed 3/9 of regular compensation (2/9 of regular compensation prior to May 1, 2011).

Early retirement

Age and Service Requirement	60 with 5 years of credited service, or 55 with 10 years of credited service, with one year of credit earned after age 54
Amount	Normal pension reduced 3-1/3% for each year younger than age 65, or younger than age 62 with 25 years of credited service

Disability

Benefit is deferred to Normal or Early retirement age and is equal to normal pension reflecting compensation base at time of disability and years of service that member would have had if they remained in employment until actual retirement

Vesting

Age Requirement	55
Service Requirement	5 years of credited service
Amount	Normal retirement pension reduced 6-2/3% for each of the first 5 years younger than age 65 and 3-1/3% for each of the next 5 years
Normal Retirement Age	65

Section 4: Actuarial Valuation Basis

Pre-retirement death benefit

Beneficiaries of members who die in active employment will receive the greater of the following:

- One times (Two times for Level One Member) base salary at time of death limited to 100 times the monthly normal retirement benefit based on years of service that member would have had if they remained in employment until normal retirement date at time of death
- Actuarial present value of benefit accrued as of date of death (reflecting minimum value accumulation for Level One members)
- Beneficiaries of terminated vested participants will receive the lump sum member was eligible to receive at date of death with interest from date of termination to date of death.

Post-retirement death benefit

If married, pension benefits are paid in the form of a joint and survivor annuity unless this form is rejected by the participant and spouse. If not rejected, the benefit amount otherwise payable is reduced to reflect the joint and survivor coverage. If not rejected, and the spouse predeceases the employee, the employee's benefit amount will subsequently be increased to the unreduced amount payable had the joint and survivor coverage been rejected. If rejected, or if not married, benefits are payable for the life of the employee or in any other available optional form elected by the employee in an actuarially equivalent amount.

Optional forms of benefits

Employee may elect any combination of 120-month certain and life annuity, 2 or 4% annual cost-of-living increases, or 50%, 75%, or 100% joint-and-survivor annuity with pop-up. Pension will be reduced accordingly for optional benefits added to form.

Employees who terminate employment prior to eligibility for normal or early pension may elect to receive actuarial equivalent value of benefit as a lump sum payment.

Employees who terminate employment after eligibility for normal or early pension may elect to receive 10%, 20%, or 30% of actuarial equivalent value of benefit as a lump sum payment.

Credited Service

Credited service is the number of continuous years and fractional parts thereof between date of employment and termination. A full year's credit shall be granted for twelve months of service with proportional credit for shorter periods of service. Special provisions are made for members on nine-month appointments.

Section 4: Actuarial Valuation Basis

Changes in plan provisions

There have been no changes in plan provisions since the last valuation.

We have reflected the Plan's actual experience for the lump sum buy-out window offered to inactive vested participants in the prior plan year in this valuation.

Section 4: Actuarial Valuation Basis

Exhibit 3: Contribution rates

Member

Effective July 1, 2009, members are required to contribute 1% of their salary up to \$50,000 plus 2% of their salary in excess of \$50,000. Contribution account balances are refunded with interest at 4% per year if the member terminates prior to becoming a Qualified Member. If the member terminates due to death prior to becoming a Qualified Member, the refund of the account balance is paid to the member's beneficiary.

Employer

Equal to actuarially determined employer contribution.