PENSION BENEFITS, DESIGN, AND FUNDING TASK FORCE

Final Report

January 10, 2022

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Executive Summary

The Pension Benefits, Design, and Funding Task Force (Task Force) was created by 2021 Acts and Resolves No. 75, entitled "An act relating to the membership and duties of the Vermont Pension Investment Commission and the creation of the Pension Benefits, Design, and Funding Task Force."

The purpose of the Task Force is to review and report on the benefits, design, and funding of retirement and retiree health benefit plans for the Vermont State Employees' Retirement System (VSERS) and the Vermont State Teachers' Retirement System (VSTRS).

Specifically, Act 75 directed the Task Force to make recommendations about benefit provisions and appropriate funding sources along with other recommendations it deems appropriate for consideration, consistent with actuarial and governmental accounting standards, as well as demographic and workforce trends and the long-term sustainability of the benefit programs.[1]

The Task Force held 17 meetings between July and December 2021 and received public input through a public hearing and written comments. As a result of these meetings and public participation, the Task Force recommends the following to reduce the underfunded pension and health care liabilities:

For the Vermont State Employees' pension and other postemployment benefit (OPEB) plans:

- modify the cost-of-living-adjustment (COLA) calculation and increase employee contributions;
- appropriate one-time funds to address the underfunded liability in the pension fund;
- allocate FY 2021 General Fund year-end surplus to the VSERS pension fund and reallocate the General Fund year-end surplus to the pension fund in future years;
- direct the Treasurer and the VSERS Board of Trustees to develop a recommendation to the General Assembly to create a new pension benefit group for Department of Corrections' staff that is actuarially neutral to the pension system and results in no additional employer pension costs;
- beginning in FY 2024, and annually thereafter, fund an additional payment to the actuarially determined employer contribution (ADEC) using monies saved from a reduction on the required annual unfunded liability amortization payment until the plan reaches a 90 percent funded status; and
- building on the one-time $52.4 million appropriation in FY 2021 to the State Employees' Postemployment Benefits Trust Fund to prefund other postemployment benefits and creating a prefunding schedule in statute.

For the Vermont State Teachers' pension and OPEB plans:

- modify the cost-of-living-adjustment (COLA) calculation and increase employee contributions;

[1] *See Id.,* Sec. 10(c).

- appropriate one-time funds to address the underfunded liability in the pension fund;
- allocate FY 2021 General Fund year-end surplus to the VSTRS pension fund and reallocate the General Fund year-end surplus to the pension fund in future years;
- beginning in FY 2024, and annually thereafter, fund an additional payment to the ADEC using monies saved from a reduction on the required annual unfunded liability amortization payment until the plan reaches a 90 percent funded status; and
- prefund other postemployment benefits by making a one-time $13.3 million Education Fund appropriation into the Retired Teachers' Health and Medical Benefits Fund and creating a prefunding schedule that funds the normal cost from the Education Fund.

Task Force Membership

Act 75 structured the Task Force to have 13 members (12 have a vote) consisting of five legislators, one administration official, and six representatives from labor organizations. The Office of the State Treasurer's designee serves as a nonvoting member.

Legislative Members:
Rep. Sarah Copeland-Hanzas (co-chair)
Sen. Jeanette White (co-chair)
Rep. Peter Fagan
Rep. John Gannon
Sen. Corey Parent

Administration Official:
Michael Pieciak, Commissioner of Financial Regulation

Labor Representatives:
Eric Davis, Vermont State Employees' Association
Andrew Emrich, Vermont-NEA
Kate McCann, Vermont-NEA
Molly Stoner, Vermont-NEA
Dan Trottier, Vermont Troopers' Association
Leona Watt, Vermont State Employees' Association

Office of the State Treasurer (nonvoting member):
Michael Clasen, Deputy Treasurer

Hearings and Testimony

The Task Force met 17 times between July 2, 2021 and December 15, 2021. The Task Force also held a public hearing on November 1, 2021. The Task Force meetings were open to the public and made available online.[2] Below is a summary of the testimony received:

[2] The meeting on September 22, 2021 was disrupted by a power outage at the State House, during which the livestream was temporarily unavailable. Additionally, the small group discussions that occurred during that meeting were not available via livestream.

July 2

- Testimony from Jennifer Carbee, Esq., Deputy Chief Counsel, Office of Legislative Counsel – providing an overview of Act 75 and the Task Force's charge.
- Testimony from Chris Rupe, Senior Fiscal Analyst, Joint Fiscal Office -"Pension 101" covering a basic overview of pensions, how pensions work, the challenges and numbers, why the numbers changed, and a summary and next steps

July 7

- Testimony from Chris Rupe, Senior Fiscal Analyst, Joint Fiscal Office
  - Providing an Overview of Other Post-Employment Benefits (OPEB)
  - Discussing the impact of one-time funds on the VSERS and VSTRS Systems
- Review of the recommendations made in the 2009 Pension Report submitted to the Governor and General Assembly by the Commission on the Design and Funding of Retirement and Retiree Health Benefits Plans for State Employees and Teachers
- Testimony from Thomas Golonka, Chair, Vermont Pension Investment Committee discussing VPIC and its duties and activities
  - Presenting historical data on the investment rate of return vs. the assumed rate of return in VSTRS
  - Presenting a monthly investment performance analysis for the period ended May 31, 2021
- Written testimony from Eric Henry, Chief Investment Officer, State of Vermont, addressing capital market assumptions, expected returns, actuarial rates of return, and pension liabilities and contributions

July 22

- Testimony from Beth Pearce, Treasurer, State of Vermont – presentation discussing pension funding status, method, and trends; gains, losses, and drivers of the unfunded liability; experience study data; overview of investments; prefunding OPEB; and conclusions
- Testimony from Beth Fastiggi, Commissioner; Harold Schwartz, Director of Operations; and Doug Pine, Director; Department of Human Resources – presentation providing an overview of State workforce demographics
- Testimony of Mark Hage, Director of Member Benefits, Vermont Education Health Initiative (VEHI) addressing enrollment in VEHI benefit plans

July 29

- Testimony from Stephen Klein, Chief Fiscal Officer, Joint Fiscal Office – presentation on the overall budget context, including Vermont's underlying revenue and fiscal outlook; potential impacts from demographic change, COVID-19 pandemic, and global warming; demands for State services; and other areas of fiscal pressure
- Testimony from Graham Campbell, Senior Fiscal Analyst, Joint Fiscal Office – presentation on the tax and revenue landscape; basic structure of taxes; current and potential sources of tax revenue; and tax expenditures
- Testimony from Chris Rupe, Senior Fiscal Analyst, Joint Fiscal Office concerning further discussion on the impact of one-time funds on the VSERS and VSTRS pension systems

- Testimony from David Hall, Esq., Legislative Counsel, Office of Legislative Counsel concerning development of a Task Force document articulating guiding principles and statement of the pension and OPEB problems

August 4

- Testimony from Chris Rupe, Senior Fiscal Analyst, Joint Fiscal Office
  - Further discussion concerning Task Force document articulating guiding principles and statement of the pension and OPEB problems
  - Presentation addressing strategies to reduce ADEC pressures and improve funding ratio
  - Presentation addressing the impact of various possible changes to plan design
- Testimony from Stephen Klein, Chief Fiscal Officer, Joint Fiscal Office – providing a preliminary education fund outlook for FY 2022 and addressing the July 2021 consensus economic review and revenue forecast update

August 18

- Testimony from Chris Rupe, Senior Fiscal Analyst, Joint Fiscal Office –
  - Further discussion concerning Task Force document articulating guiding principles and statement of the pension and OPEB problems, including Treasurer comments and updated revisions with comments
  - Presentation addressing pension unfunded liability drivers
  - Updated presentation addressing the impact of various possible changes to plan design
- Written testimony from the National Conference on Public Employee Retirement Systems (NCPERS) – "Unintended Consequence – How Scaling Back Public Pensions Puts Government Revenues at Risk – 2020 Update"

August 25

- Testimony from Keith Brainard, Research Director; and Alex Brown, Research Manager; National Association of State Retirement Administrators (NASRA) providing an overview of public pension issues in Vermont, comparison of Vermont pensions to other state pension systems and other state reform efforts, and COLA arrangements.
  - Overview of Public Pension Issues and Trends
  - Benefit Levels for General State Employees and School Teachers
  - Overview of variations to cost-of-living adjustments among public retirement systems
- Testimony from Doug Hoffer, State Auditor, concerning State expenditures and potential options for realizing cost savings; presentation concerning public safety expenditures
- Testimony from Annie Noonan, Former Commissioner, Vermont Department of Labor concerning State employee demographics, recruitment, and retention

September 9

- Testimony from Chris Rupe, Senior Fiscal Analyst, Joint Fiscal Office –
  - Further discussion concerning past underfunding of retirement liabilities, including VSERS unfunded liability growth by actuarial year
  - Presentation concerning cross-subsidization among groups within the VSERS and VSERS member data

        - Allocation of Liabilities and Costs Between Groups (actuarial request #1)
    - Overview of revenue analysis performed by the actuary (linked below).
        - Impact of Additional Funds for VSERS and VSTRS (actuarial requests #2 and #3)
- Testimony from Dan Doonan, Director, National Institute on Retirement Security – presentation concerning economic impacts of pensions in Vermont
- Testimony from Paul Cillo, President and Executive Director, Public Assets Institute concerning Vermont-specific policy and revenue strategies, including raising additional revenues
- Written testimony from Alex Brown, NASRA, in response to Task Force questions relating to retirement plans that offer participants an option to elect different contribution rates and benefit levels; plan designs that potentially incentivize participants to work longer and other issues

September 15

- Task Force discussion concerning potential options for system design changes and concerning modeling scenarios to present for actuarial analysis
- Testimony from Beth Pearce, Treasurer, State of Vermont – memorandum and presentation concerning the impact of treatment of additional revenues on pension funds' unfunded liabilities and ADECs

September 22

- Breakout groups and Task Force discussion concerning modeling scenarios to present for actuarial analysis
- Updated presentation from Chris Rupe, Senior Fiscal Analyst, Joint Fiscal Office, concerning impact of various possible changes to plan design
- Testimony from Beth Pearce, Treasurer, State of Vermont – memorandum and testimony concerning teacher pension underfunding. A memorandum from the State Treasurer concerning OPEB background information, initiatives, and funding requests was subsequently sent to the Task Force but not discussed during the September 22 meeting.

October 6

- Task Force discussion with legislative staff and walk through of draft interim report
- Testimony and discussion with Hank Kim, Executive Director and Counsel, National Conference on Public Employee Retirement Systems, concerning the NCPERS Unintended Consequences Study and the NCPERS Sustainability Study

October 13

- Task force discussion with legislative staff and walk through of revised draft interim report
- Testimony and discussion with Chris Rupe, Senior Fiscal Analyst, Joint Fiscal Office, concerning actuarial modeling and analysis pursuant to actuarial requests four and five
- Testimony from Beth Pearce, Treasurer, State of Vermont and Senator Jane Kitchel, Chair, Senate Committee on Appropriations concerning pension and OPEB obligations and long-term fiscal stability

November 1

- A compilation of written testimony submitted to the public hearing

November 10

- Testimony and discussion with Chris Rupe, Senior Fiscal Analyst, Joint Fiscal Office, concerning cross-subsidization
- Testimony and discussion with Graham Campbell, Senior Fiscal Analyst, Joint Fiscal Office, revenues sources
- Testimony and discussion with Tom Golonka, Chair, Vermont Pension Investment Commission
    - VPIC - January 2021 CIO Report
    - VPIC - July 2021 CIO Report
    - Presentation on Capital Markets Assumptions Update
    - VPIC Expected Returns

December 1

- Presentation and discussion by Campaign for Vermont on public sector wages
- Testimony and discussion with Chris Rupe, Senior Fiscal Analyst, Joint Fiscal Office, concerning Actuarial Request #4
    - Overview Presentation of Actuarial Request #4
    - Analysis of Potential Changes to VSERS and VSTRS
    - Supplement to Actuarial Modeling for Certain Scenarios
    - Modeling of Individual Scenarios
    - Modeling for VSERS Group F and VSTRS

December 9

- Testimony and discussion with Chris Rupe, Senior Fiscal Analyst, Joint Fiscal Office, concerning Actuarial Request #4
    - Modeling of Revenue Scenarios
    - Overview of Actuarial Request (Revised)

December 15

- Testimony and discussion with Chris Rupe, Senior Fiscal Analyst, Joint Fiscal Office, concerning Actuarial Request #6
    - Overview of Actuarial Request 6
    - Letter from Segal - Actuarial Modeling of Follow-Up Scenarios
    -

Background

Impact of the Great Recession

Vermont's pension systems, like those of other states, experienced significant investment losses from the Great Recession. In just one year from FY2008 to FY2009, the unfunded liabilities grew by $239.4 million (275%) for VSERS and $348.3 million (92%) for VSTRS. The funded ratios for each system also declined by approximately 15% during that one-year period.

Change in Pension Funded Status, FY08-09		
	VSERS	**VSTRS**
Unfunded Actuarial Accrued Liability		
As of FY08 Valuation	$87.1 million	$379.5 million
As of FY09 Valuation	$326.5 million	$727.8 million
Funded Ratio		
As of FY08 Valuation	94.1%	80.9%
As of FY09 Valuation	78.9%	65.4%

In 2009, in the aftermath of the Great Recession, the State of Vermont established a Commission on the Design and Funding of Retirement and Retiree Health Benefits Plans for State Employees and Teachers to address the affordability and long-term sustainability of the pension and retirement health care plans serving State employees and teachers.[3]

While the implosion of financial markets in 2008 and the first quarter of 2009 severely impacted the value of plan assets and contributed to a large increase in required employer contributions, the Commission also identified the economic and demographic trends pre-dating the Great Recession that had already set the retirement systems on an unsustainable financial trajectory, including:

- Financial commitments for retirement benefits, including health care, growing much faster than the rate of revenue growth at a time when the State was projecting significant deficits due to the impacts of the Great Recession.
- Steep annual increases in the actuarially determined employer contribution (ADEC) for both pension systems:
    - VSERS ADEC increased 117% from FY 2003 to FY 2008, with a projected increase from FY 2003 to FY 2011 of 328%.
    - VSTRS ADEC increased by approximately 100% from FY 2003 to FY 2006, prior to re-amortization.
- An aging workforce, a baby boomer retirement bubble, longer life expectancies, and workforce changes impacting retirement were resulting in a rate of growth in retirees outpacing the rate of growth in active members. There were 2,800 more retired teachers and State employees in 2009 than in 2003. As the ratio of active members to annuitants declines, pension costs are often at risk of increasing – particularly in a poorly funded plan.
- The amount of pension benefit payouts were steadily increasing by approximately $15-16 million per year in total across both systems and projected to increase by approximately 50% over 2009 levels by 2014.

[3] The full 2009 Commission report and background materials are available on the State Treasurer's website: https://www.vermonttreasurer.gov/content/retirement-commission

- An assumed rate of return of 8.25% that exceeded the actual rate of return and that was higher than the rate used by a majority of other plans. In 2009, close to 75% of other plans used a return assumption less than 8.25%.[4]
- Failure of the State to fully fund the actuarially determined employer contribution (ADEC) preceding the Great Recession, particularly for the VSTRS system. The actual VSTRS contribution was less than 100% of the recommended amount in all but four years from 1979 to 2006. This caused the VSTRS system to have a lower funded ratio than VSERS and added costs to future VSTRS ADEC payments.
- Funding of VSTRS retiree health benefits from pension assets rather than a dedicated funding source, resulting in an actuarial loss to the VSTRS pension system. The practice of paying for these costs ended in 2015.
- Multi-million dollar annual increases in the employer cost for providing subsidized retiree health benefits.

The 2009 Commission made several recommendations to place the retirement systems on a sustainable path, some of which were ultimately adopted. The consulting actuary estimated that adoption of all the recommendations made in the 2009 report would reduce the FY2011 ADEC by $29 million. Actual savings from implementation of the plan totaled roughly $20 million. However, the demographic and economic factors that the Commission identified in its report have only been exacerbated since that time, and the financial struggles of the retirement systems have only accelerated.

[4] The assumed rate of return was 8.25% from 2006 to 2010 and was revised downward in 2011. The current rate of return (effective FY21) is 7.0%, which is slightly lower than the average (7.11%) and in line with the median (7.00%) among major pension plans surveyed by NASRA as of August 2021.

Updates Since the 2009 Commission

Several notable changes to the retirement systems have occurred in the years leading up to, and subsequent to, the 2009 Commission:

	Recent Changes to Pension Systems[5]
2005	VSTRS study made changes to Vermont's actuarial methods and put full funding of the actuarially required contribution on track. The Legislature has consistently adopted a budget with full funding of the VSTRS actuarially required contribution since 2007.
2008	Committee restructured VSERS Group F benefits, lengthening the age of retirement, effective in FY 2009, in concert with tiered health care changes. For employees hired after July 1, 2008: • Normal retirement eligibility was increased from Age 62 or with 30 years of service to Age 65 or a combination of age plus years of service credit that equals 87 (Rule of 87). • Maximum benefit payable increased from 50% of AFC to 60% of AFC. • Medical coverage subsidies are tiered based on years of service. Formerly, all retirees received an 80% employer subsidy. Employees hired after July 1, 2008, receive a subsidy based on their years of service and must have 20 years of service to qualify for the 80% subsidy.
2009	Pension and Health Care Study completed, providing basis for negotiated savings of the next few years for both VSERS and VSTRS systems.
2010	VSTRS: Lengthened normal retirement age, increased contributions, and other changes: • For members younger than 57 and with less than 25 years of service as of June 30, 2010, normal retirement eligibility was increased from Age 62 or with 30 years of service to Age 65 or a combination of age plus years of service credit that equals 90 (Rule of 90). • Employee contributions increased from 3.4% to 5%. • Maximum benefit payable increased from 50% of AFC to 60%. • Benefit multiplier increased from 1.67% per year to 2% per year for years worked beyond attaining 20 years of service.[6] Changes resulted in $15 million in annual pension savings. Additional health care savings also accrued from implementing a tiered health care benefit.
2011	VSERS: Employee contribution rates increased, initially generating $5 million in savings per year and increasing each year.[7] • Group A and D contributions increased from 5.1% to 6.4%. • Group C contributions increased from 6.98% to 8.28%.

[5] Data from Treasurer's Office 2020 Annual Report. https://www.vermonttreasurer.gov/sites/treasurer/files/Reports/2020/Treasurer%27s%20Office%20Annual%20Report%202020.pdf

[6] Data from the summary of plan provisions included in the FY09 and FY10 VSTRS Actuarial Valuations.

[7] See page 31 of the VSERS FY11 Actuarial Valuation.

	• Group F contributions increased from 5.1% to 6.4%.
2011–12	Secured one-time revenues in excess of $5 million for VSERS and VSTRS OPEB under the Federal Early Retirement Reinsurance Program.
2013	Pension forfeiture statute enacted for both retirement systems. This provision allows for the forfeiture of retirement benefits for members who are convicted of a crime related to public office.[8]
2014	VSTRS: Additional 1% contribution increases (from 5% to 6%) for new and non-vested members, effective for FY 2015, which generated $1 million in initial annual savings that increased each year.
2014	VSTRS: Statute change permitting teacher pension costs to be charged to federal grants (effective for FY 2016), with projected savings to State tax dollars in excess of $6 million per year.[9]
2015	VSTRS OPEB Reformed: • Created Retired Teachers' Health and Medical Benefits Fund starting FY 2015. • Ended practice dating to 1980s of paying for health care premiums from a sub-trust of the VSTRS pension fund, which was costing over $20 million per year in interest costs and adding to the unfunded liability. • A new health care assessment for LEAs was implemented, linking local employment decisions to the benefit costs. • Changes were projected to save taxpayers $480 million in unfunded liability interest costs through FY 2038.
2015	VSERS Disability retirement reform enacted to permit wage verification of disability pensioners.
2016	Changes made to the amortization financing schedule for VSERS and VSTRS, saving approximately $165 million in interest through FY 2038. Change involved lowering the rate of annual increases in future amortization payments from 5% to 3% beginning in FY 2020.[10]
2016	VSERS: Increased employee contributions will result in $1.2 million in annual savings, with savings growing larger in future years. • Group A and D contributions increased from 6.4% to 6.55%. • Group C contributions increased from 8.28% to 8.43%. • Group F contributions increased from 6.4% to 6.55%. • All groups' contribution rates increased by an additional 0.10% beginning in FY 2017.[11]
2018	Legislature appropriated an additional $26.2 million above ADEC for VSTRS and $12.5 million for VSERS.
2018	Risk assessment performed for both VSERS and VSTRS pension systems in accordance with Actuarial Standards of Practice No. 51.[12]

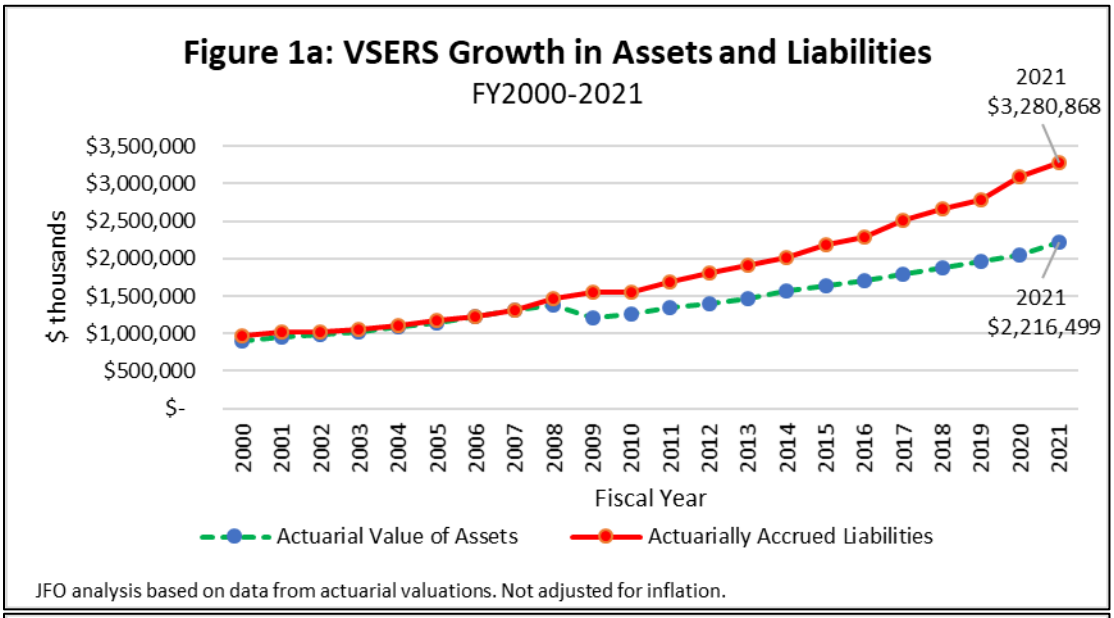
[8] See 32 V.S.A. § 623.
[9] See 16 V.S.A. § 1944c.
[10] See Sec. E.133.1 of H.875 (Act 172 of 2016).
[11] See the FY16 and FY17 VSERS Actuarial Valuations.
[12] The risk assessment is available at https://www.vermonttreasurer.gov/sites/treasurer/files/VSTRS/VSTRS-reports/other-reports/Vermont%20Retirement%20Systems%27%20Risk%20Assessment%20September%2020%2C%202019%20%281%29.pdf.
ASOP 51 is available here: http://www.actuarialstandardsboard.org/wp-content/uploads/2017/10/asop051_188.pdf

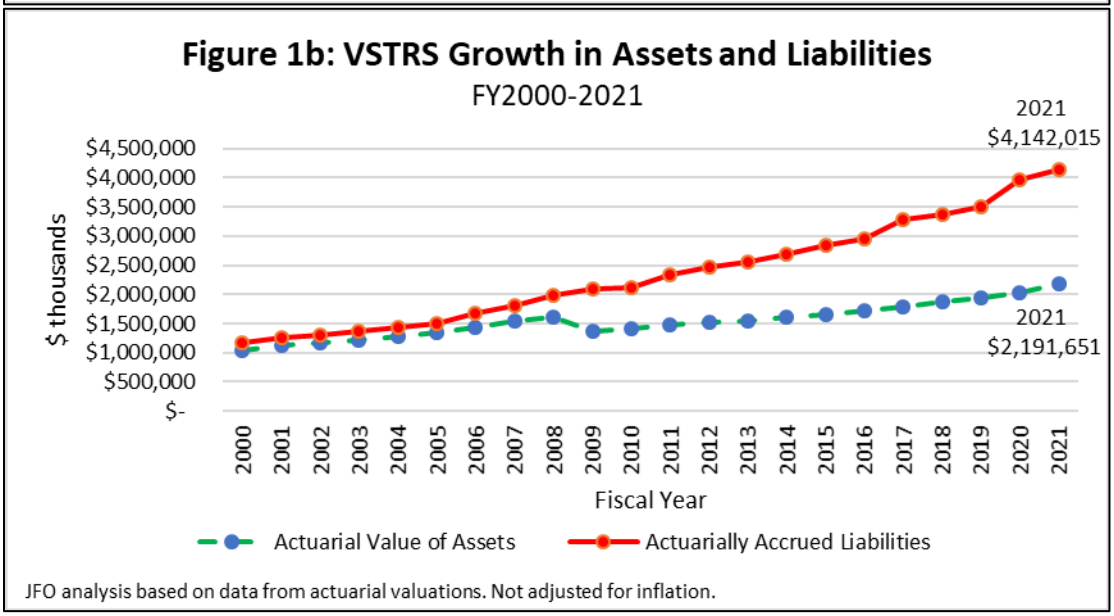
2019	Governor and Legislature enact statute to devote 50% of unrestricted General Fund surplus at year end to VSERS OPEB fund to begin prefunding long-term liabilities.[13]
2020	Assumed rate of return lowered from 7.5% to 7.0% by VPIC and system trustees based on independent analysis. Demographic and mortality assumptions revised.
2021	Legislature enacts Act 75 to reform membership of VPIC, require experience studies on a 3-year basis, and solely empower VPIC to adjust the actuarial rate of return. Act 75 also created a Pension Benefits, Design, and Funding Task Force to make recommendations on the VSERS and VSTRS systems and a Joint Public Pension Oversight Committee in the Legislature.[14]

[13] See 32 V.S.A. § 308c.
[14] See H.449 (Act 75 of 2021).

Scope of the Problem

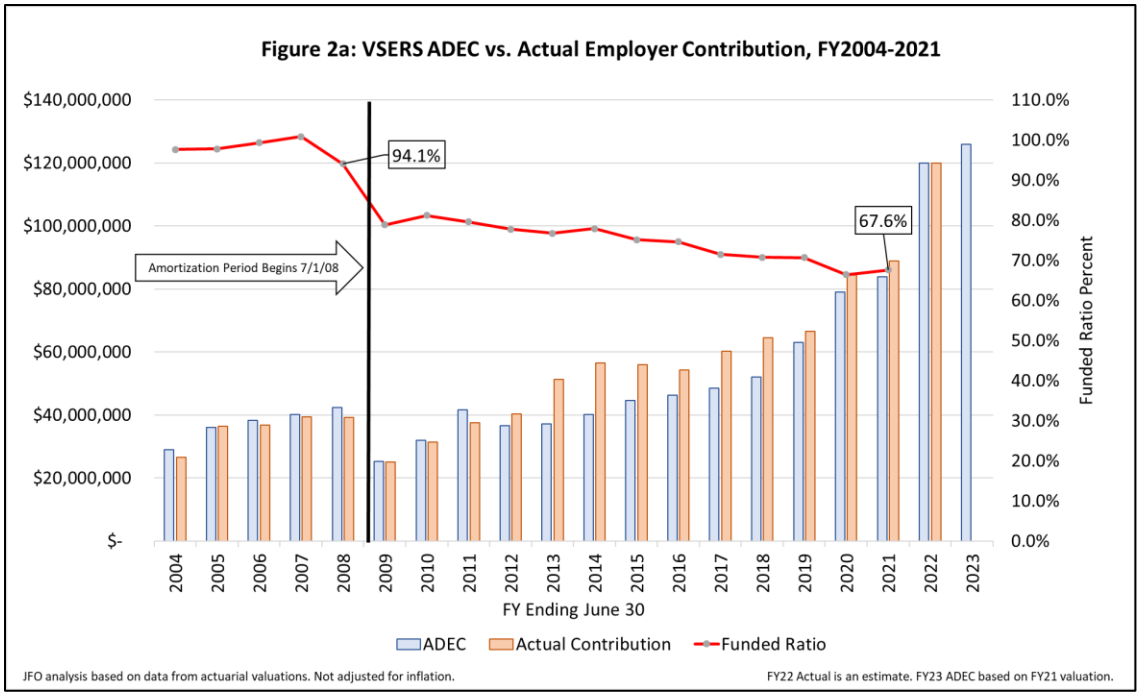
Since the current 30-year closed amortization period began in FY2009, and despite the measures previously described, the accrued liabilities of both pension systems have grown faster than plan assets. As a result, the gap between what the pension systems expect to pay out in future benefits and the assets the systems have available to pay out those benefits (the unfunded liabilities) have grown, and the funded ratios of both pension systems have steadily declined (*see Figures 1a and 1b)*. This has occurred even though the actuarially recommended payments (the ADEC) have been fully funded by the State, and in some cases funded more than 100 percent, during the current amortization period.





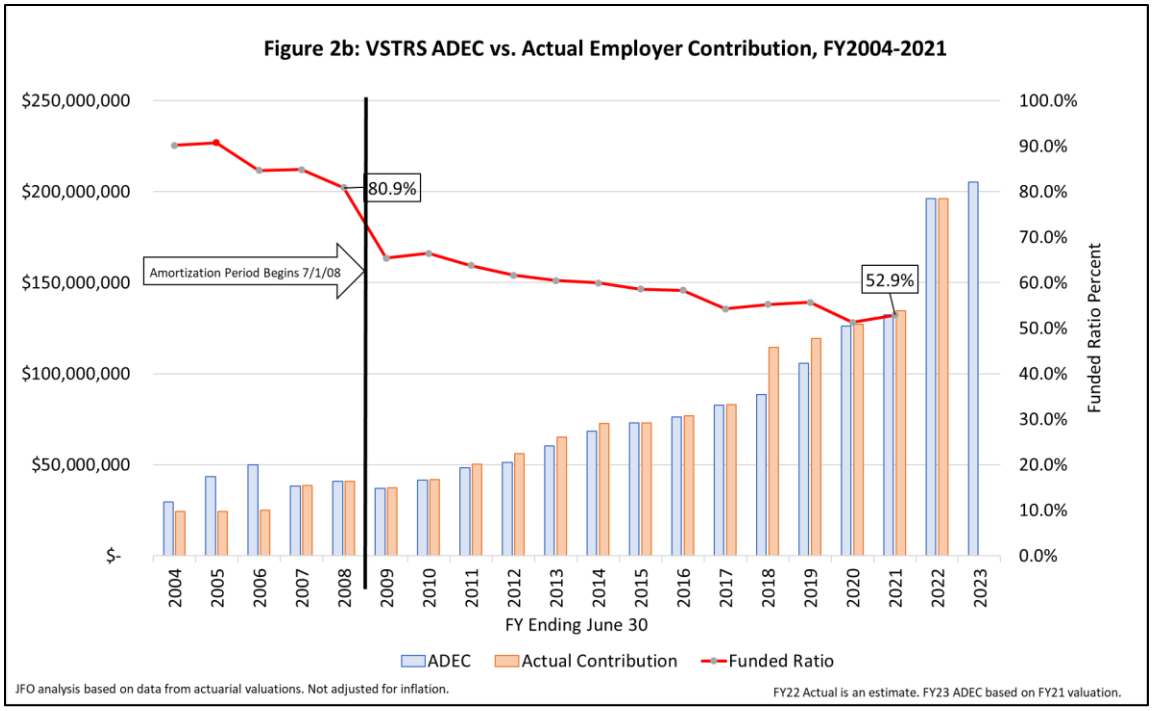
History of Employer Payments:

VSERS: The VSERS system began the amortization period with a 94.1% funded ratio, which was down slightly from 100.8% (fully funded) in FY2007. Although the actual employer contribution was slightly less than the ADEC in several years proximate to the Great Recession, the employer has made contributions in excess of the ADEC every year since FY2012 that have more than offset these comparatively minor shortfalls.[15] Cumulatively, the ADEC has been overfunded by $87.3 million from FY2009–2021. However, despite this overfunding of a steadily rising ADEC (which increased from $25.3 million in FY2009 to $125.9 million for FY2023 – a compound annual growth rate of 12.1%), the funded ratio of the system has declined from 94.1% at the end of FY2008 to 67.6% by the end of FY 2021. *(see Figure 2a).*

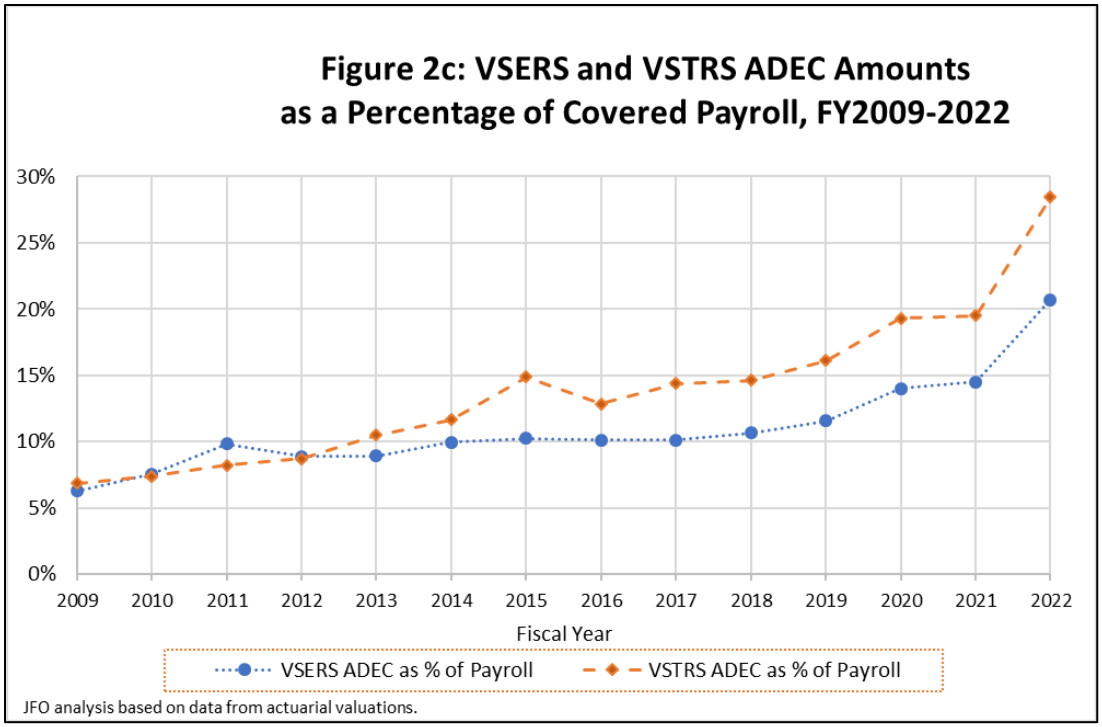


VSTRS: The teacher retirement system began the amortization period with an 80.9% funded ratio. VSTRS had a lower funded ratio than VSERS due, in part, to the fact that the VSTRS ADEC was underfunded all but four years between FY1979 and FY2006. The employer has subsequently fully funded the ADEC every year since FY 2007, including in every year of the current amortization period. Cumulatively, the ADEC has been overfunded by $60.8 million from FY 2009-2021. However, despite this overfunding of a steadily rising ADEC (which increased from $37.1 million in FY2009 to $205.2 million for FY2023 – a compound annual growth rate of 13.0%), the funded ratio of the system has declined from 80.9% at the end of FY2008 to 52.9% by the end of FY 2021. *(see Figure 2b).*

[15] In the current amortization period, the VSERS ADEC funding shortfall occurred for three years (FY2009-2011) with a cumulative impact of $4.75 million. In the 10 years from FY2012-2021, the ADEC was over-funded by $92.1 million.



The employer's actuarially determined cost of paying for pension benefits (the ADEC) has increased significantly for both systems—both in dollars and in relation to the size of the active payroll. From FY2009 to FY2021, the ADECs have more than tripled as a percentage of payroll for each retirement system. In other words, pension costs have been growing much faster than the cost of compensating the overall workforce (*See Figure 2c)*.



How Pension Costs are Funded in Vermont:

While certain federal and local sources contribute funding to the retirement plans to the extent that those funds support members of the active payroll, state government bears most of the responsibility for paying the employer share of pension costs.

The employer pension costs are composed of two components—a contribution to fully fund the **normal cost** and an **amortization payment** toward the unfunded liability. The Actuarially Determined Employer contribution **(ADEC)**, which is calculated annually, reflects the total recommended amount the employer should pay to fully fund both of these costs in the upcoming fiscal year.[16]

The **normal cost** represents the present value of future retirement benefits accrued during the current year and, in practice, is the amount that should be paid into the pension fund every year to pay for the years' worth of future retirement benefits earned by the active workforce. The normal cost is typically expressed as a percentage of pay that, if contributed every year over the course of an active member's employment, is expected to be sufficient to fund their future retirement benefits.

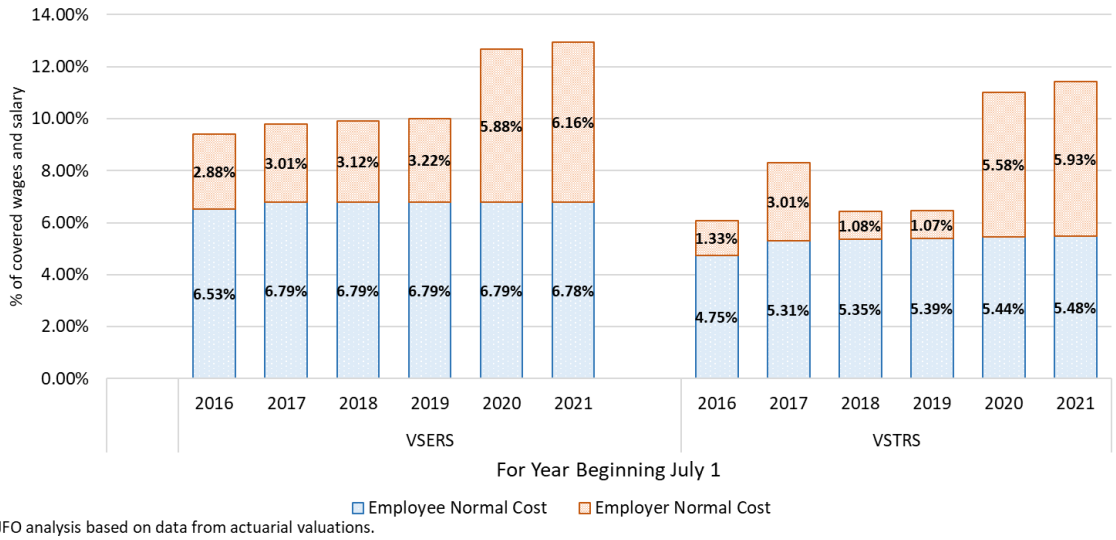
The normal cost is calculated based on the pension system's economic and demographic assumptions in place at the time. Active members pay pension

[16] Due to timing reasons, there is a lag between the actuarial valuation and the budgeting of the ADEC. Annual actuarial valuations, which measure the status of the pension fund each fiscal year to calculate the ADEC, are not completed until approximately midway through the subsequent fiscal year. The status of the pension fund at the beginning of a fiscal year determines the ADEC for the following fiscal year. For example, the unfunded liability and normal costs at the beginning of FY2021 (which are reflected in the FY2020 actuarial valuation) determined the ADEC to be paid from the FY2022 budget.

contributions on a pre-tax basis through payroll deductions at a fixed rate set in statute, and these contributions fund a portion of the normal cost. The rate each active member pays varies based on which pension plan group they are enrolled in.[17]

The normal costs have grown over time as plan assumptions, such as the assumed rate of return and demographic factors, have changed. This drove the significant increase in normal costs from FY2019 to Fy2020. Employee contributions, however, have not grown at the rate the normal costs have grown, and as a result, employee contributions now pay approximately half of the total aggregate normal costs across all employee groups *(see Figure 2d on the following page).* The remaining portion of the normal cost is paid by the employer through the ADEC.

Figure 2d: Expected Employee and Employer Normal Cost Contributions
(across all employee groups)
FY2017-2022



JFO analysis based on data from actuarial valuations.

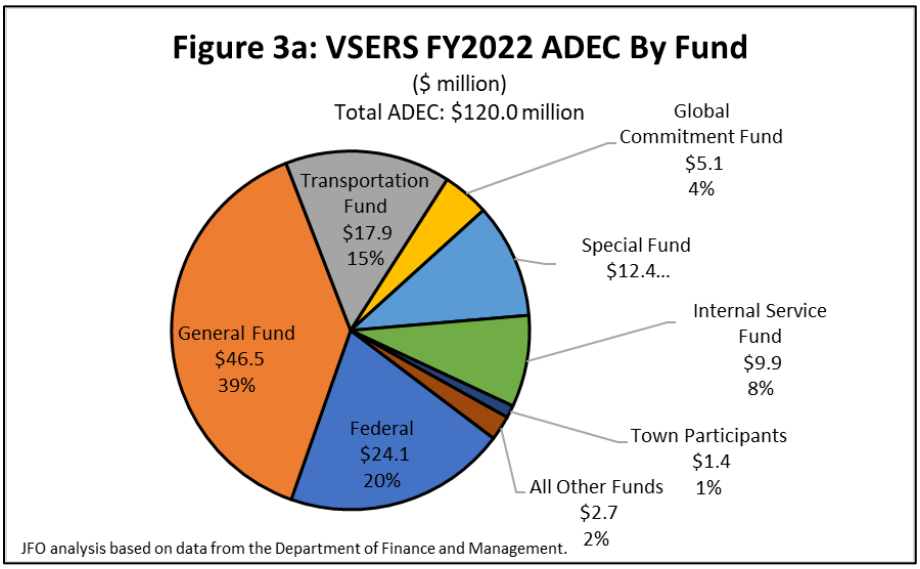
In addition to the normal costs, each retirement system has an **unfunded liability**—a shortfall between the costs of future benefits owed to the active and retired members and the assets available to pay for them. The unfunded liability arises from prior years of underperformance relative to assumptions, legacy underfunding of the employer contribution in prior years (a contributing factor for VSTRS), and increased costs from changes to assumptions, such as adopting lower assumed rates of investment return or changes to demographic projections. The unfunded liability is amortized, with interest, over a closed 30-year amortization period that ends in FY2038. Although the payoff schedule is fixed in statute, the amount of the unfunded liability changes annually based on the performance of the pension funds. When the size of the unfunded liability changes from year to year, so does the amount of future amortization payments.

The ADEC is calculated to bring the pension systems to full funding by the end of the amortization period**.** When all else is equal, the employer underfunding the ADEC in one

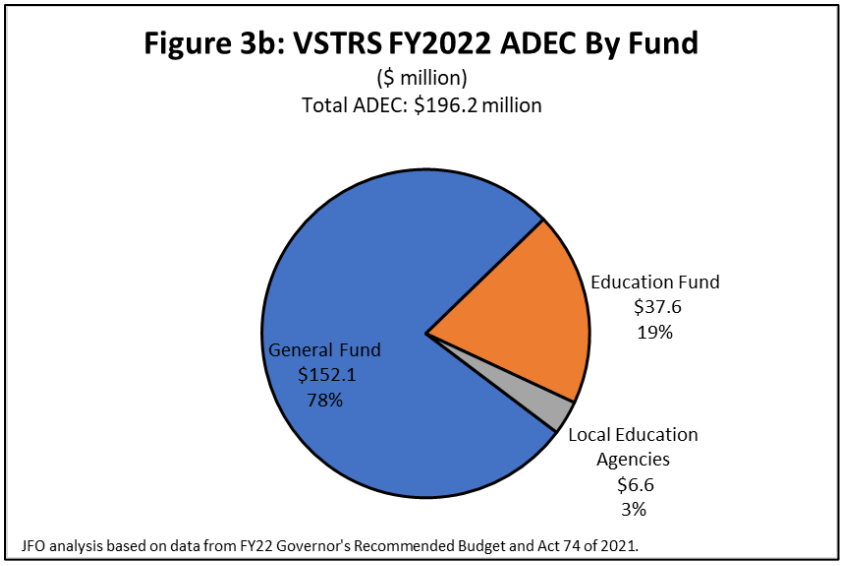
[17] The vast majority of VSERS active members (Groups D and F) currently pay contributions of 6.65% of wages and salary, and Group C (law enforcement and public safety) members pay 8.53%. Most VSTRS active members pay either 5% or 6% (for members with less than 5 years of service as of June 30, 2014).

year will lead to higher expected ADEC costs in future years – and conversely, over-funding the ADEC in any year will lead to lower expected ADEC costs in future years. Actuarial experience deviating from assumptions, however, influences the ADEC as well. For example, the employer could overfund the ADEC in a given year but still see its unfunded liability (and future ADEC payments) increase if the system experiences actuarial losses from other factors (like an economic downturn or high cost of living adjustments) that offset the actuarial gains from overfunding the ADEC. This has occurred regularly for both pension systems.

The VSERS employer pension costs (both the normal cost and unfunded liability amortization payment) are paid out of the various funds of State government in proportion to those funds' share of the active payroll *(see Figure 3a)*. The State annually calculates a payroll charge as a percentage of wages and salaries that is expected to be sufficient to meet the projected funding requirement and remits those funds to the respective benefit trust funds. For FY2022, the VSERS employer retirement charge totals 25.5% of wages and salary, with 19.5% dedicated to pension costs and 6% dedicated to OPEB. This 25.5% rate is a substantial year-over-year increase from the FY2021 rate of 21.4%. Approximately 35–40% of these costs are paid out of the General Fund, with the remainder charged to federal and special funds that pay the salaries of the active workforce.



The VSTRS employer pension costs are budgeted differently than VSERS. The VSTRS employer normal cost is charged to the Education Fund, and the unfunded liability amortization payment is paid from the General Fund. A smaller portion of these costs are also paid by Local Education Agencies for their employees who are federally funded *(see Figure 3b).*

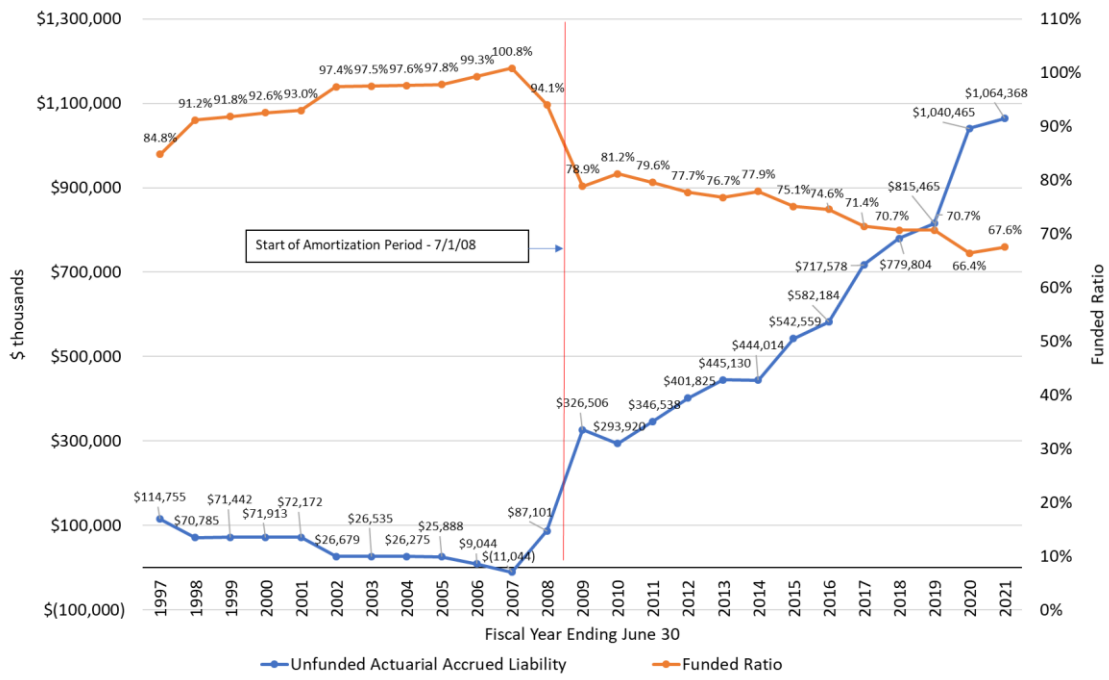


Growth in Unfunded Liabilities and Budgetary Pressures:

Despite the employer fully funding—and in most years more than fully funding—the actuarially required amounts during the current amortization period, the unfunded liabilities for each system have grown significantly since the 2009 Commission report.

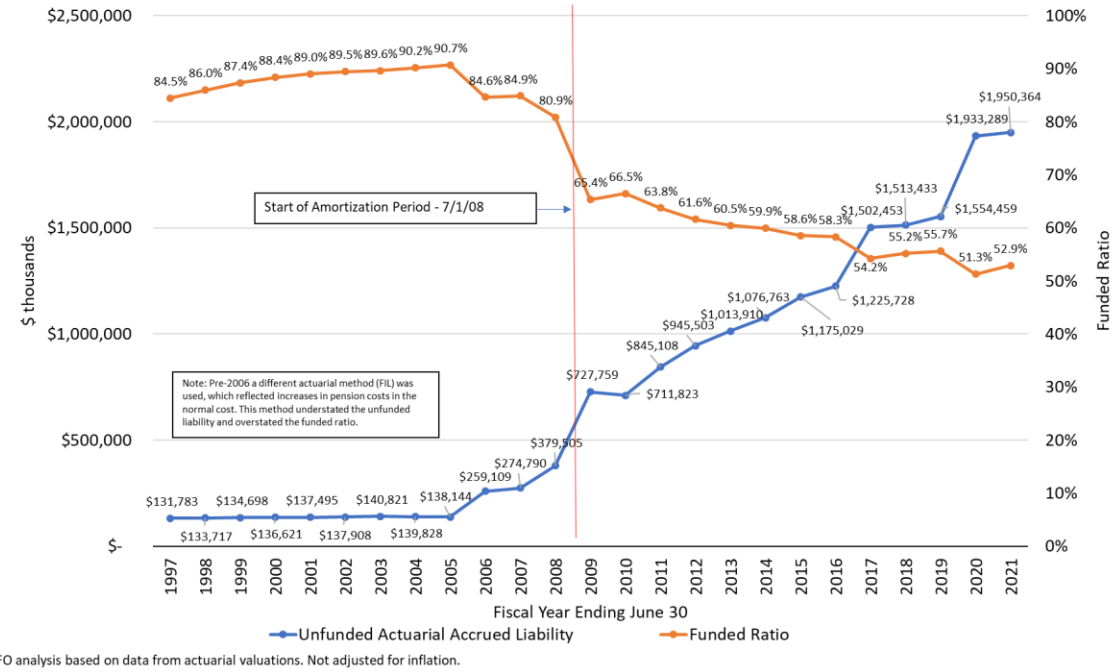
- The VSERS unfunded liability has increased from $87.1 million at the end of FY2008 to $1.064 billion at the end of FY2021. Notably, the VSERS system was fully funded as recently as the end of FY2007 but its funded ratio declined to 67.6% by FY2021 *(see Figure 4a).*
- The VSTRS unfunded liability has increased from $379.5 million at the end of FY2008 to $1.950 billion at the end of FY2021, and its funded ratio declined from 80.9% to 52.9% *(see Figure 4b).*

Figure 4a: VSERS Unfunded Liability and Funded Ratio, FY1997-2021



JFO analysis based on data from actuarial valuations. Not adjusted for inflation.

Figure 4b: VSTRS Unfunded Liability and Funded Ratio, FY1997-2021



JFO analysis based on data from actuarial valuations. Not adjusted for inflation.

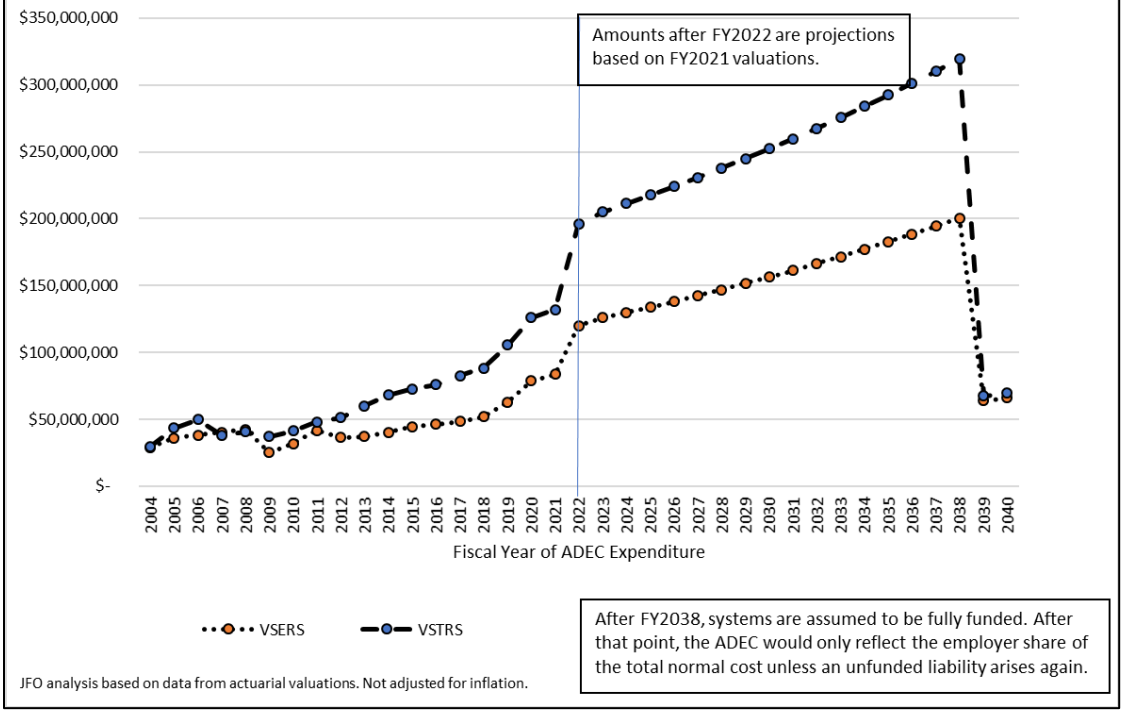
The amount that the employer must annually contribute to fully fund the normal costs of the plans and to pay down the unfunded liability—which together comprise the ADEC, or actuarial determined employer contribution—has also grown significantly and in the future could very well exceed the State's fiscal capacity to pay:

- In FY2008, the combined ADECs for both systems totaled approximately $82 million.
- By FY2022, the combined ADECs for both systems grew to approximately $316 million (and will total $325.8 million for FY2023).

Under current assumptions, the normal costs are expected to grow in future years (in dollar terms) at a rate of approximately 3.5% (VSERS) and 3% (VSTRS) annually, in line with projected payroll growth. Additionally, the unfunded liability amortization payments are calculated, per statute, to increase in 3% annual increments for both systems until FY2038. In a status quo situation with all actuarial assumptions met, therefore, the total ADECs are projected to grow by approximately 3% annually (slightly higher than 3% annually for VSERS due to the higher rate of assumed payroll growth). At that growth rate, the two ADECs, combined, will exceed $500 million by FY 2038.

Subsequent to FY 2038 (or upon the systems reaching fully funded at a different date), the ADEC would be expected to only reflect the employer normal cost because there would be no unfunded liability to amortize *(see Figure 5).* It is common, however, for unfunded liabilities to arise from year to year due to plan experience deviating from assumptions or changes to assumptions. Therefore, it is unrealistic to assume that the pension systems would remain fully funded in perpetuity or that there would be no future amortization payments required beyond FY2038.

Figure 5: Historic and Projected ADEC Growth for VSERS and VSTRS



Informed by the most recent experience studies and economic forecasts, economic and demographic assumptions for both pension systems were revised in 2020. These assumption changes included lowering the assumed rate of return from 7.5% to 7.0%, revising inflation assumptions, and adopting new mortality and other demographic projections. These changes were intended to ensure that assumptions are met more consistently in future years; however, the assumption changes themselves led to significant increases in the unfunded liabilities, normal costs, and ADEC payments for both systems from FY2021 to FY2022.

As reflected in the FY2020 actuarial valuations, from FY2021 to FY2022:

- The VSERS unfunded liability grew by $225.0 million and the ADEC by $36.1 million.
- The VSTRS unfunded liability grew by $378.8 million and the ADEC by $64.1 million.[18]

If nothing changes, and if all actuarial assumptions are met moving forward, the ADEC payments will continue to grow and will exceed $500 million by FY2038.

Although some elements of VSERS pension costs are charged to different funds of state government, the increasing cost for retirement liabilities continues to consume an ever-larger share of the General Fund.

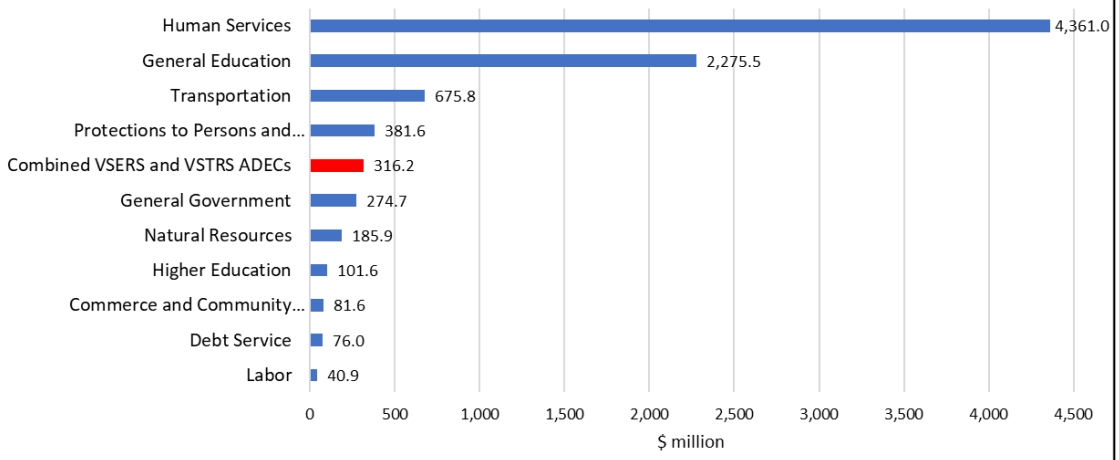
- In FY2019, the total General Fund employer contribution to retiree pensions and OPEB (other post-employment benefits) for both VSERS and VSTRS was $167.8 million, or 10.51% of the General Fund.
- For FY2022, the total General Fund employer contribution has increased to $249.5 million, accounting for approximately 13.8% of the General Fund.

Across all funds, the FY2022 pension ADEC expenditure is now larger than total appropriations for entire categories of state government functions. For a sense of scale, the $316.2 million of combined VSERS and VSTRS ADEC is more than state government spends on Labor, Debt Service, Commerce and Community Development, and Higher Education combined *(see Figure 6).*

[18] Act 75 charged this Task Force with recommending options to lower the unfunded liabilities and ADECs based on the numbers expressed in the June 30, 2020, actuarial valuations of each system. These numbers are from those valuations. Note that on October 31, 2018, the VSTRS Board of Trustees adopted Alternative Amortization Schedule 3 of the Addendum to the June 30, 2018, actuarial valuation. This action increased the VSTRS ADEC for FY2021 in the 2019 valuation by $3.5 million as part of a plan to maximize a $26.2 million additional employer contribution by holding it harmless and adding it to the statutory amortization schedule. As a result, the ADEC was higher in FY2021, lowering the delta to $60.6 million instead of the $64.1 million reflected in the FY2020 valuations. Ultimately, the Governor and General Assembly reverted to the previous amortization schedule without the add-on.

Figure 6: FY2022 Employer Pension Costs In Comparison to Total Appropriations by Government Function

(All Funds, Excluding ARPA and One-Time Appropriations)



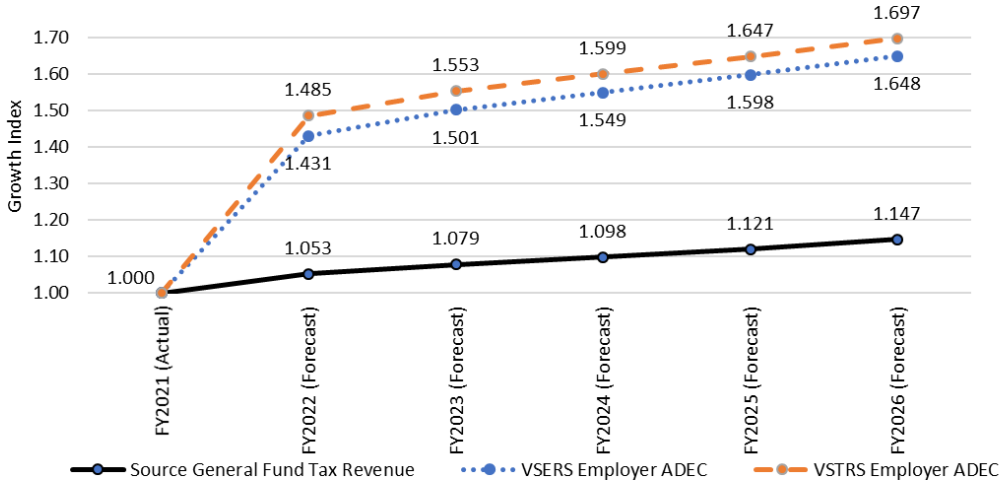
Note: Data is intended to illustrate comparative scale and does not reflect unduplicated appropriations. The VSERS ADEC expense is embedded in the appropriations to all other categories in relation to the size of the covered payroll. The VSTRS ADEC is included in the appropriations for General Education. Estimate by JFO based on Act 74 of 2021 appropriations.

In a status quo situation when all assumptions are met moving forward, employer pension costs are expected to continue growing faster than General Fund revenues. According to the July 2021 consensus revenue forecast, source General Fund revenues in FY2026 are expected to be 14.7% higher than FY2021 levels.[19] Employer pension costs in FY2026, however, are expected to be 64.8% (VSERS) to 69.7% (VSTRS) greater than FY2021 levels *(see Figure 7a on the following page).* Source General Fund revenues are expected to grow at a compounded annual rate of 2.8% from FY2021 to FY2026, while pension costs are projected to grow at compound annual rates of 10.5% (VSERS) to 11.2% (VSTRS).*[20]*

[19] The July 2021 Consensus Revenue Forecast is available at https://ljfo.vermont.gov/assets/Subjects/Consensus-Revenue-Forecasts-Legislative-Economic-Outlook/577acac1ec/July-2021-Economic-Review-and-Revenue-Forecast-Update.pdf

[20] ADEC data from the respective actuarial valuations. Using FY2021 as a baseline is instructive because it ties into the fiscal targets outlined in Act 75. FY2022 is the first year that the ADEC reflects the fiscal impact of the significant changes to plan assumptions that were made during 2020.

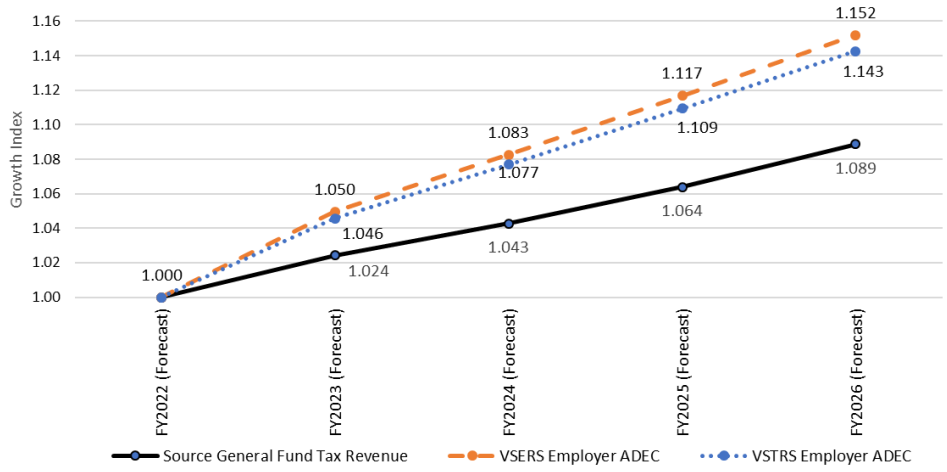
Figure 7a: Comparing Projected Growth Rates of Source General Fund Revenue vs. VSERS and VSTRS ADECs, FY2021-2026



Index uses FY2021 (prior to actuarial assumption changes) as the "base" year. Future ADEC assumptions based on the FY2021 actuarial valuations. JFO analysis based on actuarial valuations and July 2021 consensus revenue forecast.

Vermont's General Fund revenues received a significant boost during FY2021 due in large part to federal stimulus dollars flowing through the economy in response to the COVID-19 pandemic. However, revenue growth rates are expected to flatten out in the years beyond FY2022. By FY2026, source General Fund revenues are expected to be 8.9% higher than FY2022 levels. Over this same period of time, VSERS employer pension costs are expected to increase by 14.3% and VSTRS costs are expected to grow by 15.2% *(see Figure 7b).* Source General Fund revenues are expected to grow at a compounded annual rate of 2.1%, whereas employer pension costs are expected to grow by 3.4% (VSTRS) to 3.6% (VSERS) annually. Employer pension costs, therefore, are expected to grow faster than the State revenues available to pay them when assuming all actuarial assumptions will be consistently met moving forward.

Figure 7b: Comparing Projected Growth Rates - Source General Fund Revenue vs. VSERS and VSTRS ADECs, FY2022-2026



Index uses FY2022 (includes impacts of revised actuarial assumptions) as the "base" year. Future ADEC assumptions based on the FY2021 actuarial valuations. JFO analysis based on actuarial valuations and July 2021 consensus revenue forecast.

Causes of Significant Growth in Liabilities

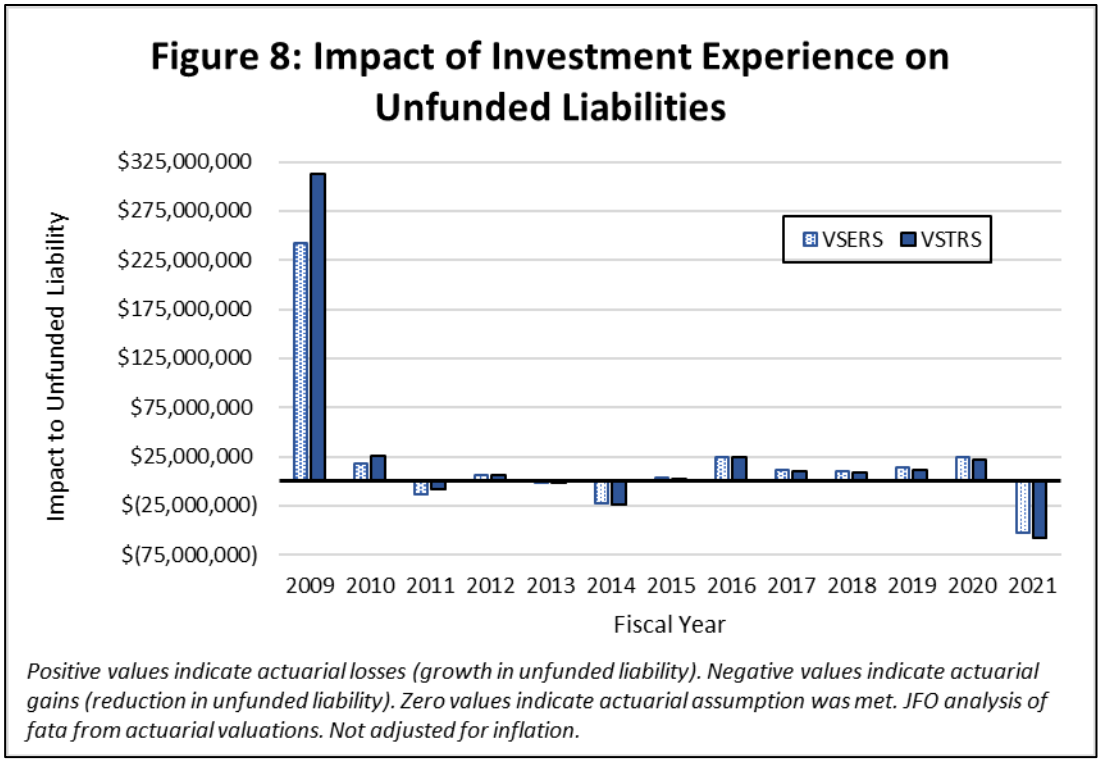
Vermont's pension liabilities have grown significantly since 2009 and at a faster rate than State revenues. See tables in the appendix for more details about the various growth factors.

Steadily increasing unfunded liabilities, ADECs, and the State's total cost for retirement obligations are not due solely to any one factor. Rather, they are rooted in a variety of experience, economic, and demographic factors, including:

Legacy underfunding. The State underfunded the VSTRS actuarially recommended employer contribution in all but four years from 1979 to 2006. Although this historic underfunding occurred prior to the current closed 30-year amortization period and is not responsible for the significant increases in liabilities subsequent to 2008, it added cost to the ADEC to make up for lost investment opportunities in the past and contributed to why VSTRS has a lower funded ratio than VSERS. Analysis from the State Treasurer estimates that legacy ADEC underfunding, combined with the former practice of paying VSTRS OPEB expenses from pension plan assets (see below), contributed approximately $353 million to the VSTRS unfunded liability (equivalent to approximately 18.3% of the $1,933.3 million unfunded liability) and $28 million to the ADEC (equivalent to approximately 14.3% of the $196.2 million ADEC) by FY2020. The State Treasurer estimates that had these practices not occurred, the VSTRS system would have been approximately 60.2% funded at the end of FY 2020 instead of 51.3% funded. Although there were also occasions in the past when the VSERS ADEC was not fully funded, the VSERS system did not experience the degree of chronic underfunding or OPEB-related contribution shortfalls that VSTRS did, and any legacy under-funding of VSERS was made up for by other actuarial gains as evidenced by the fact that the VSERS system was 100.8% funded by the end of FY2007.[21]

Great Recession. The dramatic economic downturn in 2008–2009 created a hole in each pension fund that remains unfilled as of the end of FY2021. Actuaries in 2009 estimated that it would take more than 20 years at the then- actuarial investment rate of return of 8.25% to get back to the FY2008 funding level. From the beginning of FY2009 to the end of FY2021, investment performance falling short of assumptions increased the VSERS unfunded liability by $265.1 million and the VSTRS unfunded liability by $333.3 million. The actuarial losses related to investment performance are mainly driven by the impact of the Great Recession. When looking at the period from FY2011 to FY2020 and excluding most of the Great Recession, investment performance falling short of assumptions had a much smaller impact and contributed $56.2 million to the VSERS unfunded liability and $52.0 million to the VSTRS unfunded liability. Unusually strong investment performance in FY2021 offset virtually all of the cumulative investment losses incurred in the previous decade, but the hole created by the Great Recession investment losses remains unfilled (*see Figure 8).*

[21] The ADEC is typically calculated with the objective of the pension system reaching 100% funded by the amortization date. In cases where the pension system is funded at levels higher than 100%, less money is required to be contributed into the fund because the impact of the over-funding is amortized to reduce the normal cost that would otherwise need to be paid. Therefore, it is not realistic to assume that the pension systems would have funded ratios higher than 100% today had there been no underfunding in decades past.



Positive values indicate actuarial losses (growth in unfunded liability). Negative values indicate actuarial gains (reduction in unfunded liability). Zero values indicate actuarial assumption was met. JFO analysis of fata from actuarial valuations. Not adjusted for inflation.

Changes to the Assumed Rate of Return and Other Assumptions

Changes are occasionally made to actuarial assumptions (often in response to experience study recommendations) to more realistically mirror anticipated demographic and investment experience in the future. Actuarial assumptions influence both the normal cost and the unfunded liability, and over time changes to assumptions have increased both substantially. In the aggregate, changes to actuarial assumptions (including both economic and demographic assumptions) have had the most significant impact on the growth of unfunded liabilities since FY2009.

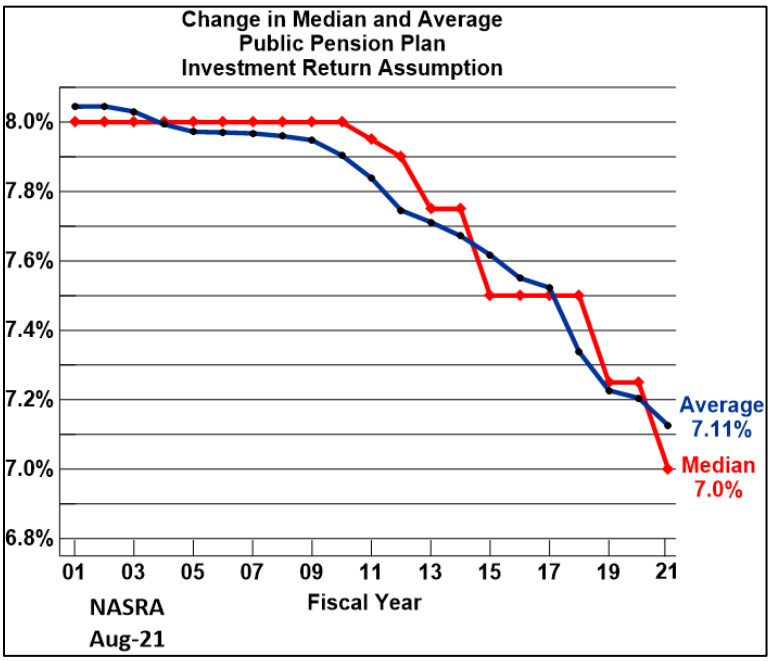
From the beginning of FY2009 through FY2021, changes in actuarial assumptions increased the unfunded liability by:

- VSERS: $489.4 million (46.0% of the $1.064 billion total unfunded liability at the end of FY2021)
- VSTRS: $769.4 million (39.4% of the $1.950 billion total unfunded liability at the end of FY2021)

Actuarial rate of return. The systems previously adopted actuarial rates of return that proved over time to be overly optimistic. When a higher rate of return is assumed, the actuarial math expects that assets will grow over time at a higher rate, leading to lower recommended employer contributions into the pension funds and lower accrued liabilities. It is important to note that the rate of return does not affect the performance or outcomes of the fund or dictate asset allocation or investment policy; however, the assumed rate of return (and the extent to which experience meets that assumption over time) influences the size of the projected future liabilities and assets, which inform shorter-term funding recommendations and decisions.

In 2008, the two pension systems used an 8.25% rate of return. However, in the years since, actual investment experience has fallen short of this assumption due to the Great Recession and a changing global financial landscape.

Most states, including Vermont, have lowered their assumed rates of return since then due to changing global investment expectations. Vermont lowered its rate of return from 7.5% to 7.0% in 2020, which is the rate used by the median of major pension systems surveyed by NASRA as of August 2021.[22]



While a lower assumed rate of return is more likely to be consistently achieved through investment experience over time, it also leads to larger projected liabilities and higher employer ADEC costs to make up for the fact that less of the money required to pay benefits is expected to come from investment gains in the future.[23]

Table 9: Average Investment Returns on an Actuarial Basis
(as of FY2020)

	VSERS	VSTRS
5-Year Average	6.78%	6.94%
10-Year Average	7.04%	7.15%
15-Year Average	6.16%	6.15%
20-Year Average	6.39%	6.47%

Source: FY20 Actuarial Valuations

Additional changes to other actuarial assumptions beyond the assumed rate of return also contributed to the growth in the unfunded liability. Adopting revised mortality tables, adjusting assumed retirement, disability and termination rates, and changing inflationary and payroll growth assumptions are all examples of factors that can increase or decrease

[22] Chart from NASRA: https://www.nasra.org/latestreturnassumptions

[23] Investment decisions are within the purview of the Vermont Pension Investment Commission (VPIC) and are outside the scope of this Task Force or the Legislature. Pension funds invest in fundamentally different ways than individuals. Whereas an individual may have a higher tolerance for investment risk and short-term volatility in the market, pension funds (particularly mature pension funds like VSERS and VSTRS that pay out increasing amounts of benefits to retirees) intentionally invest with a long-term, diversified strategy that aims to earn the maximum return within acceptable standards of risk and volatility while protecting its assets from downside risk. Pension funds, therefore, often earn lower annual returns than an individual investor might.

the unfunded liability, as well as the normal cost. The expected positive or negative impact of increasing or decreasing various actuarial assumptions is illustrated in the experience studies for the pension systems.

Retired teacher health benefits paid from pension fund. The State formerly paid VSTRS retiree health benefits (OPEB) from pension assets at an actuarial loss until 2015. This practice added approximately $138.5 million to the VSTRS unfunded liability since the beginning of FY2009, which must ultimately be paid back with interest through future ADECs or actuarial gains. Subsequent to 2015, the employer share of these expenses have been paid on a pay-as-you-go basis out of the State's General Fund. The impact of this practice is included in the estimates of legacy underfunding noted above.[24]

Demographic and Experience Factors. Differences between the actual experience of plan participants compared to assumptions have significantly contributed to the increase in the unfunded liability and ADEC. Every pension plan has actuarial gains or losses each year as actual events during the year do not exactly match the long-term assumptions previously made. The State's actuary, Segal, categorizes them as follows:

- Economic:
    - Inflation (which is an underlying component in all other economic assumptions)
    - Investment return
    - Salary increases
    - Payroll growth
    - Cost of Living Adjustments (COLA)
- Demographic:
    - Mortality rates in active service and/or retirement
    - Retirement rates
    - Member termination/turnover rates for reasons other than retirement
    - Disability

As noted above, investment performance falling short of assumptions was a significant cause of prior actuarial losses, particularly when including the Great Recession years—although this factor has had less of an impact after 2010. Member turnover and retirement experience were major causes of actuarial loss (particularly for VSTRS) that have continued to grow over the course of the amortization period.

Other experience factors, however, have led to actuarial gains. Cost of Living Adjustments (COLAs), for example, have been less than assumed in both systems for much of the amortization period. However, these assumptions can be significant risk factors going forward depending on inflation trends, as higher rates of inflation will likely lead to higher than expected salary increases and COLAs. While reviewing past experience is critical for understanding the change in liabilities to date, a review of all assumptions through periodic experience studies and risk assessments is important for

[24] For further background on the impact of legacy OPEB funding practices please see analysis from the Office of the State Treasurer: https://legislature.vermont.gov/Documents/2022/WorkGroups/PensionTaskForce/Documents%20and%20Testimony/W~Office%20of%20the%20Vermont%20State%20Treasurer~Calculation%20of%20Impact%20of%20VSTRS%20Underfunding%20updated%201979%20%20to%202020_FINAL~9-22-2021.pdf

ensuring that assumptions and funding policies are reasonable and realistic moving forward.

VSERS:

- Salary growth patterns of the active workforce deviating from assumptions increased the unfunded liability by $99.9 million.
- Workforce turnover for reasons other than retirement (e.g. lower rates of people leaving service earlier in their careers than expected) increased the unfunded liability by $59.4 million.
- Retirement experience (e.g. higher rates of people retiring at specific ages than expected) increased the unfunded liability by $131.3 million.
- Mortality and disability experience deviating from assumptions increased the unfunded liability by $59.4 million and $3.2 million, respectively.

Table 10a: VSERS Unfunded Liability Drivers (Cumulative), FY2009-2021

	Total FY09-21	% of Total Unfunded Liability
Beginning FY Unfunded Liability	**$ 87,100,468**	8.2%
Changes in Actuarial Assumptions	$ 489,354,525	46.0%
Changes in System Provisions	$ (8,924,494)	-0.8%
Incorporation of Temp Salary Decreases	$ (69,913,212)	-6.6%
Change in Employee Contribution Rate	$ (2,610,261)	-0.2%
All Other Expected Increases/Reductions Excluding Above	$ (45,550,961)	-4.3%
Normal Cost	*$ 603,451,027*	
Contributions In	*$ (1,148,210,900)*	
Interest	*$ 499,208,912*	
Experience (Gain)/Losses		
Other Expense Gain/Loss	$ 7,842,470	0.7%
Salary Experience Gain/Loss	$ 99,891,584	9.4%
COLA Experience Gain/Loss	$ (86,557,833)	-8.1%
Net Turnover	$ 59,406,857	5.6%
Investments	$ 265,060,306	24.9%
Mortality	$ 36,975,626	3.5%
Retirements	$ 131,339,979	12.3%
Disability Experience	$ 3,160,211	0.3%
Other gain/loss	$ 97,792,934	9.2%
Ending FY Unfunded Liability	**$ 1,064,368,199**	

JFO analysis based on data from actuarial valuations.

- COLA experience resulted in actuarial gains of $86.6 million due to lower than expected inflation. This trend, however, showed a significant change in FY2021 when higher inflation began to result in actuarial losses.
- Other factors, such as temporary salary decreases implemented following the Great Recession and changes to employee contribution rates, resulted in actuarial gains.

VSTRS:

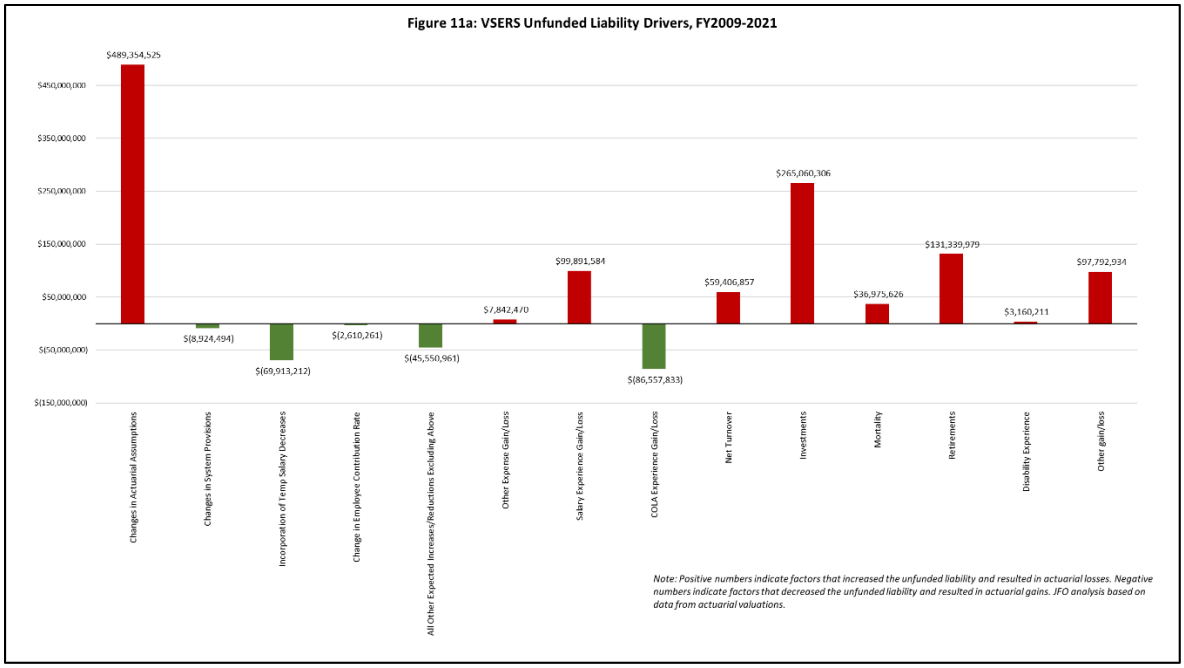
- Salary growth patterns of the active workforce deviating from assumptions *decreased* the unfunded liability by $135.5 million.
- Workforce turnover for reasons other than retirement (e.g. lower rates of people leaving service earlier in their careers than expected) increased the unfunded liability by $341.7 million.
- Retirement experience (e.g. higher rates of people retiring at specific ages than expected) increased the unfunded liability by $158.5 million.
- Mortality and disability experience deviating from assumptions increased the unfunded liability by $5.3 million and $3.6 million, respectively.

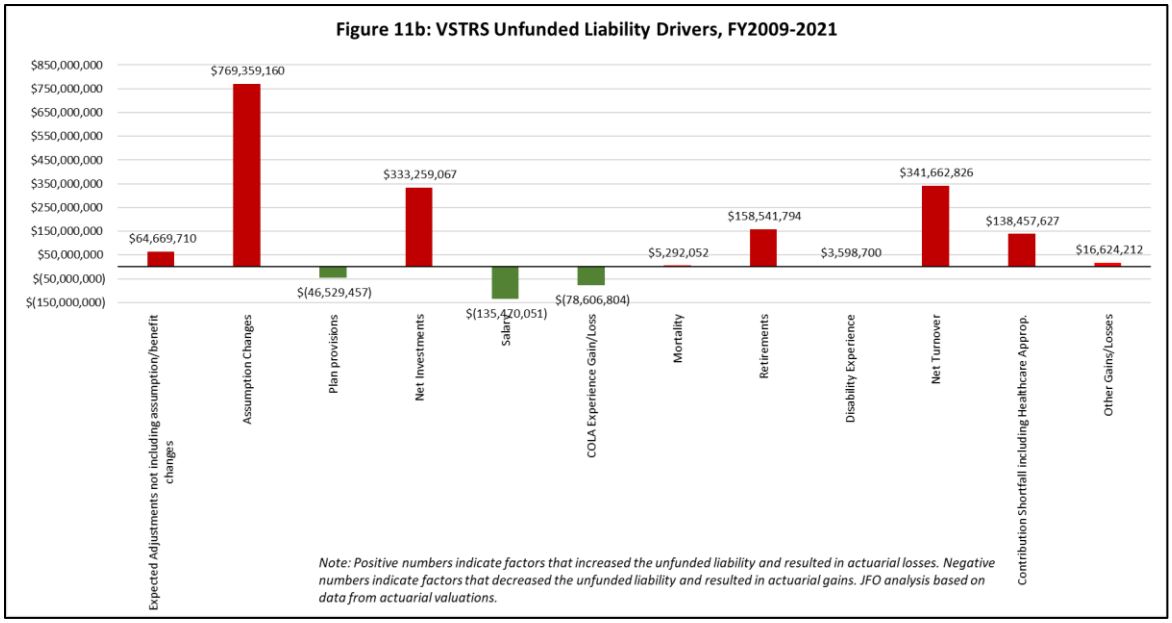
Table 10b: VSTRS Unfunded Liability Drivers (Cumulative), FY2009-2021		
	Total FY09-21	**% of Total Unfunded Liability**
Beginning FY Unfunded Liability	**$ 379,505,069**	19.5%
Expected Adjustments not including assumption/benefit changes	$ 64,669,710	3.3%
Normal Cost	*$ 517,571,560*	
Contributions In	*$ (1,499,632,849)*	
Interest	*$ 1,046,730,999*	
Assumption Changes	$ 769,359,160	39.4%
Plan provisions	$ (46,529,457)	-2.4%
Net Investments	$ 333,259,067	17.1%
Salary	$ (135,470,051)	-6.9%
COLA Experience Gain/Loss	$ (78,606,804)	-4.0%
Mortality	$ 5,292,052	0.3%
Retirements	$ 158,541,794	8.1%
Disability Experience	$ 3,598,700	0.2%
Net Turnover	$ 341,662,826	17.5%
Contribution Shortfall including Healthcare Approp. (OPEB)	$ 138,457,627	7.1%
Other Gains/Losses	$ 16,624,212	0.9%
Ending FY Unfunded Liability	**$ 1,950,363,905**	
JFO analysis based on data from actuarial valuations.		

- COLA experience resulted in actuarial gains of $78.6 million due to lower than expected inflation. This trend, however, showed a significant change in FY2021 when higher inflation began to result in actuarial losses.
- Negative amortization (contributions into the system being insufficient to fully fund the normal cost and interest that accrued that year) also contributed $64.7 million to the unfunded liability.
- Other factors, such as changes to plan provisions, resulted in actuarial gains.

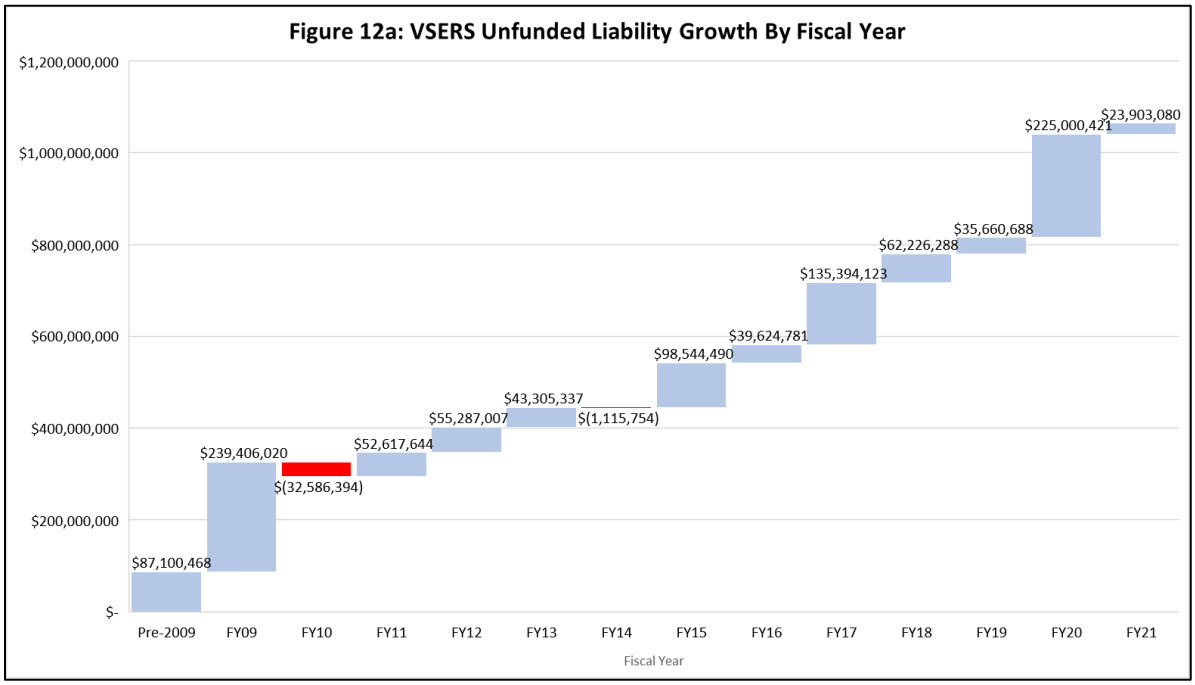
According to testimony from the Office of the State Treasurer, reports in 2017 indicated that numerous schools statewide offered some type of retirement incentive. Incentivizing longer-tenured teachers to apply for retirement has the potential to save employing schools in salary expenses. However, higher than expected retirement volumes may (and have) cause actuarial losses to the teacher pension system and effectively transfer costs to the state's General Fund through higher unfunded liability amortization payments. During the current amortization period, retirement and net turnover experience deviated from actuarial assumptions, combined, added approximately $500.2 million to the VSTRS unfunded liability (25.6% of the total unfunded liability).

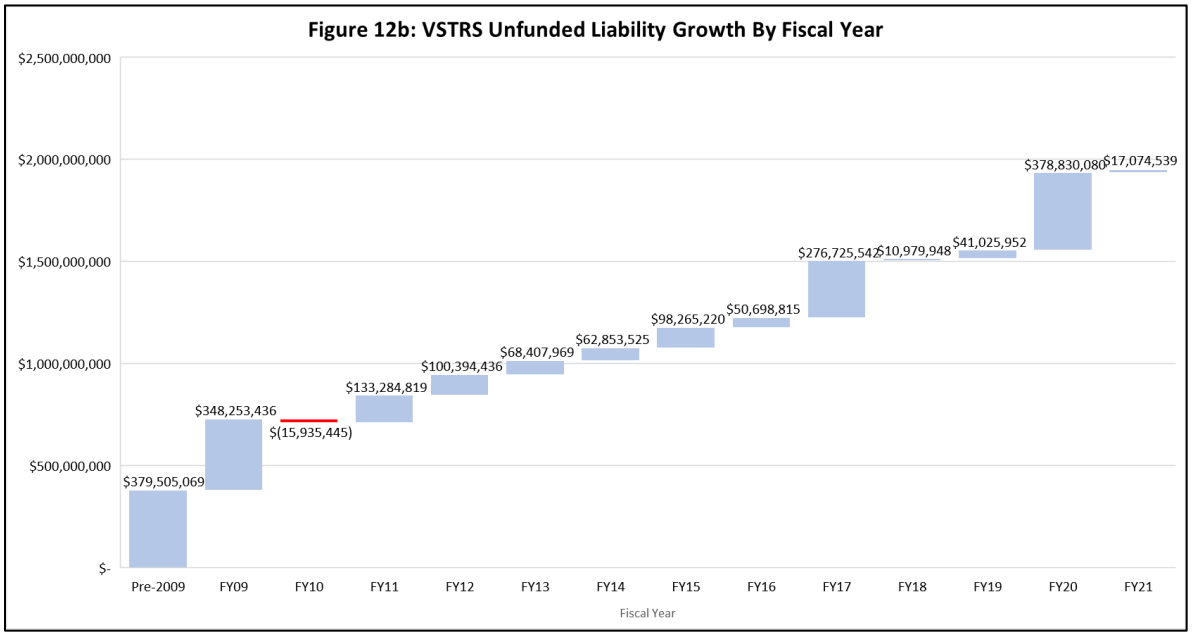
Other miscellaneous factors, including system provision changes, expected adjustments, and other gains and losses accounted for the remaining pressures on the unfunded liability.





Figures 11a and 11b (above) depict the cumulative impact of each factor on the growth of the unfunded liabilities since FY2009. However, each of these factors contributes a different degree of actuarial gain or loss to the systems on an annual basis. *Figures 12a and 12b (below)* depict the degree to which the unfunded liabilities grew or got lower on an annual basis throughout the amortization period, with the pre-2009 block representing "legacy" unfunded liability that predated the start of the current amortization period. For further details about how much each specific economic or demographic factor contributed to each year's growth or reduction in the unfunded liabilities, please see tables in the appendix.





Other Post-Employment Benefits (OPEB)

The term “OPEB” refers to “other post-employment benefits,” primarily subsidized health care offered to retirees through the VSERS and VSTRS health plans. Like pensions, OPEB is a significant component of Vermont’s long-term retirement liabilities.

Significant steps have been taken over time to contain OPEB costs, including by moving to tiered benefit structures for most VSERS and VSTRS employees and capturing rebates from Employee Group Waiver Plans. Most recently in 2021, the State Treasurer

worked with benefit providers to reduce premium costs significantly for VSTRS OPEB benefits moving forward. While OPEB costs have not exerted the same degree of pressures on the State budget as pension benefits in recent years, they are a major source of the State's long-term liabilities which impact the State's balance sheet and bond ratings – largely due to the way these benefits are funded.

Unlike prefunded pension benefits, which are funded in part from investment gains earned on contributions made over the course of a member's employment, OPEB benefits are currently almost entirely funded on a pay-as-you-go (or "paygo") basis—the State appropriates funds annually from current revenues to pay for benefits and premiums for today's retirees as they become due for payment. The annual General Fund expense has remained relatively consistent since FY 2019 for State employees at approximately $14.9 million, but has increased for teachers from $31.6 million in FY2019 to $35.1 million in FY2022. While contributions and subsidy rates are codified in statute, potential recipients are not vested in the same way as pension benefits, and these benefits are not as secure for future retirees.

There is general recognition that prefunding OPEB benefits would yield long-term savings for the State and more stability and predictability for retirees in the future. The lack of a formal and codified system of prefunding OPEB liabilities is responsible for $1.68 billion of Vermont's long-term liabilities as of the end of FY2020.

With prefunding, Vermont can calculate its unfunded liabilities by applying the assumed rate of return based on anticipated investment performance of the plan assets over time. The pension systems currently use a 7.0% rate of return. Without prefunding, GASB government accounting rules require Vermont to use a standardized discount rate tied to the 20-year AA municipal bond rate, which is heavily influenced by federal monetary policy and interest rates. At the end of FY2020, this rate was approximately 2.2%. If Vermont was prefunding its OPEB benefits, it could have used the 7% rate instead of the 2.2% rate, which would result in Vermont's combined OPEB liabilities decreasing by $1.68 billion.

Table 13: Impact of Prefunding on Vermont's OPEB Liabilities (million)

	VSERS OPEB	VSTRS OPEB	TOTAL
FY2022 Estimated Net (unfunded) OPEB Liability – Status Quo Paygo	$1,616.8	$1,480.7	$3,097.5
FY2022 Estimated Net OPEB Liability if Prefunded, Using 7.0% Discount Rate	$754.9	$658.8	$1,413.7
Change in Net OPEB Liability	-$861.9	-$821.9	-$1,683.8

Prefunding OPEB benefits will significantly reduce the State's long-term liabilities. However, prefunding OPEB benefits would require a long-term commitment of additional appropriations above the pay-as-you-go amount to build up a pool of assets that can be invested to grow over time. Further, OPEB costs can be heavily influenced by both federal health care policy and pensions policies that influence the age at which employees retire, as the per-member premium cost of providing benefits is higher in the years prior to the member being eligible for Medicare.

Vermont does not need to fully prefund its OPEB obligations in order to realize the benefits of using the 7% rate. Rather, Vermont just needs to codify a prefunding policy into statute and begin the process of building up a pool of assets in an actuarially sound manner. Payments can be structured in various ways. For example:

- In 2021, the State Treasurer put forth a proposal to prefund teacher OPEB through a gradual increase of contributions above the paygo amount. This proposal involved three years of 10% increases above the prior year's contribution amount, with 3% annual increases thereafter. Under this scenario, the teacher OPEB would be fully funded in approximately 25 years.

- OPEB costs could also be funded through an ADEC and amortization schedule similar to what is used for the pension system, with the normal cost funded separately from the unfunded liability. In 2021, a proposal was put forth by members of the Vermont Senate to fund the normal cost for teacher OPEB from the Education Fund. This would mirror the existing funding arrangement for pensions, as the normal cost represents a cost of providing a future benefit to today's active workforce. The costs to amortize the unfunded liability of the benefits already earned by the workforce would remain in the General Fund.

Regardless of which strategy is pursued, prefunding OPEB would generally require a commitment of approximately $20 million in additional funds above the paygo amounts each year for each of the two systems, and a long-term commitment by the State to continue making these higher contributions until the two OPEB trust funds are sufficiently funded. The VSERS OPEB trust received approximately $52 million in additional one-time funds in FY2021 based on statutory provisions that direct 50% of unreserved General Fund balances into the VSERS OPEB trust. This is a significant influx of dollars that almost doubled the net assets of the VSERS OPEB fund and may lower the up-front funding requirements to initiate prefunding. However, even with this one-time infusion of funds, a prefunding plan will still require an incremental increase of funding above the paygo amount and a sustained commitment over time to continue making those increased payments.

Prefunding OPEB will reduce Vermont's liabilities and save taxpayer dollars in the *long term* due to the compounded investment gains that would be earned over time on the prefunded assets. However, any path forward on prefunding OPEB will require identifying cost reductions in other areas of the budget, or other revenue sources, to offset its higher *near-term* fiscal impact.

Actuarial Issues and Analysis

The Task Force is grateful for the assistance of the Office of the State Treasurer for facilitating actuarial analysis with Segal. As the Task Force continues to work toward recommendations, it has requested actuarial modeling to evaluate the impact of possible options and scenarios under consideration. To date, the Task Force has received or requested actuarial analysis on the following issues:

1) Cross-subsidization of pension costs between VSERS employee groups.
2) Projected impacts of one-time revenue on the ADEC and funded ratios for each of the two pension systems.
3) Projected impacts of recurring revenue on the ADEC and funded ratios for each of the two pension systems. No specific recurring revenue source has been identified by the Task Force. Rather, modeling was performed using generic timing and annual growth assumptions on different sums of base-year revenue.
4) Projected impacts of various changes to contribution rates, contribution rate structures, the COLA formula, and incentives to encourage employees to work longer.
5) Estimated required contributions for certain VSERS Group F members employed by the Department of Corrections to receive a retirement benefit similar to VSERS Group C members without adversely impacting the VSERS system overall.
6) Possible funding schedules to prefund OPEB benefits.

Recommendations

Following six months of receiving expert testimony, actuarial valuations on a number of scenarios, public input, and engaging in significant committee debate, the Task Force recommends several modifications to the VSERS and VSTRS pension and health benefit structure to address the significant underfunded liability in the pension fund, and the high risk of increasing costs of pension and healthcare benefits for future beneficiaries.

These recommendations represent a collaborative effort between the Legislature, the Executive Branch, and representatives of the VSERS and VSTRS, and recognizes the State's role in providing economic security for State employees and teachers and the fiscal imperative to addressing the rising cost of these benefits.

Vermont State Employees' Retirement System
The VSERS pension fund has an underfunded liability of $1.064 billion and health care benefits is higher still at $1.664 billion. In addition, the cost of the pension benefit itself has increased significantly due to the recent actuarial experience review. The recommendations below represent a reduction of approximately $133.4 million in the underfunded pension liability and $891.3 million in the underfunded healthcare liability.

With respect to pension benefits for State employees (except Group D members), the Task Force recommends:

- Make no changes to the pension benefits of current retirees, beneficiaries, or terminated vested members.
- In FY 2022, making a one-time payment of $75 million in general funds towards the unfunded liability using 50 percent of the $150 million reserved in general funds in the FY 2021 Budget.
- Modifying the COLA structure by:
    - amending the minimum and maximum amounts of any decreases and increases used to determine the net percentage change in the Consumer Price Index from the current one percent minimum and five percent maximum to zero percent minimum and four percent maximum for Groups C and F; and
    - Requiring a member to receive retirement benefits for at least 24 months prior to receiving a COLA.
    - COLA changes shall not apply to active members who are eligible for normal (unreduced) retirement as of July 1, 2022.
- Beginning in FY 2023, increase the contribution rates of active employees as follows:
    - For Group C members, by 0.5 percent per year for three fiscal years, with full phase-in occurring in FY 2025; and
    - For Group F members:
        - No change for members with base salaries below the 25th percentile.
        - 0.5 percent per year for three fiscal years, for members with base salaries between the 25th and up to the 50th percentile.
        - 0.5 percent per year for four fiscal years for members with base salaries above the 50th percentile and up to the 75th percentile.

        - 0.5 percent per year for five fiscal years for members with base salaries above the 75th percentile.
- Increasing the Group C mandatory retirement age from 55 to 57 years of age.
- For Group C members, increase the maximum benefit cap by 1.5 percent of average final compensation for each year worked beyond reaching the later of age 50 or 20 years of benefit service, applied prospectively to service actually worked after July 1, 2022.
- Beginning in FY 2024, codifying the State's intent to annually fund an additional payment to the ADEC using monies saved from a reduction on the required annual unfunded liability amortization payment. The "plus" payment will grow to $15 million in FY 2026 and remain at that level until the fund reaches 90% funded.
- Amending the General Fund year end surplus to reallocate 25 percent to VSERS pension underfunding.
- By April 15, 2022, directing the State Treasurer and the VSERS Board of Trustees to recommend to the General Assembly:
    - a plan for creating a new pension benefit group for DOC employees that is actuarially neutral to the pension system and results in no additional employer pension costs; and
    - a longevity incentive that encourages Group F members who are eligible for a normal (unreduced) retirement to continue working past their retirement date, provided that the incentive is designed to result in actuarial savings to the pension system and reduce employer pension expenses.

With respect to Group D members, the Task Force recommends:

- Beginning in FY 2023, increase the contribution rates of active judges as follows:
    - No change for members with base salaries below the 25th percentile.
    - 0.5 percent per year for three fiscal years, for members with base salaries between the 25th and up to the 50th percentile.
    - 0.5 percent per year for four fiscal years for members with base salaries above the 50th percentile and up to the 75th percentile.
    - 0.5 percent per year for five fiscal years for members with base salaries above the 75th percentile.

- Making the following pension benefit changes to all active members except those that have five years or more of service and are either: (1) within five years of 62 years of age or 62 years of age and older, or (2) have 15 years or more of service ("exempt judges"):
    - Amend the calculation for final salary to the average salary for the final two years of employment for active members who retire after July 1, 2022 and who are not exempt as defined above.
    - Beginning in FY 2023, reduce the maximum pension benefit from 100 percent to 80 percent of salary for all active judges.
    - Raise the retirement age to 65 years or older for any new judges appointed or elected July 1, 2022 or after.
    - For any judge appointed or elected July 1, 2022 or after, modify the COLA structure to apply the maximum amount on any increases used to determine the net percentage payable to the first $75,000 of benefit paid. For amounts $75,000 or more, the COLA is set at 50 percent of the net percentage change in the CPI index.

- Applies the COLA payments to members who have received a retirement benefit for at least twenty-four (24) months and makes no changes to the current COLA for judges who are appointed or elected on or before June 30, 2022.

With respect to health care benefits for State employee retirees, the Task Force recommends:

- Prefunding OPEB benefits by building on the $52.4 million one-time appropriation into the State Employees' Postemployment Benefits Trust Fund from the FY 2021 general fund surplus and enacting a prefunding schedule in statute.
- Continuing to apply current "pay go" amount for retired employees into the State Employees' Postemployment Benefits Trust Fund.

Vermont State Teachers' Retirement System

The VSTRS pension fund has an underfunded liability of $1.950 billion and health care benefits this is a bit lower at $1.504 billion. In addition, the cost of the pension benefit itself has increased significantly due to the recent actuarial experience review. The recommendations below represent a reduction of approximately $159.9 million in the underfunded pension liability and $836.8 million in the underfunded healthcare liability.

With respect to the pension benefits for VSTRS members, the Task Force recommends:

- Make no changes to the pension benefits of current retirees, beneficiaries, or terminated vested members.
- In FY 2022, making a one-time payment of $75 million in general funds towards the unfunded liability using 50 percent of the $150 million reserved in general funds in the FY 2021 Budget, plus an additional $50 million in general funds towards the unfunded liability.
- Modifying the COLA structure by:
  - amending the minimum and maximum amounts of any decreases and increases used to determine the net percentage change in the Consumer Price Index from the current one percent minimum and five percent maximum to zero percent minimum and four percent maximum;
  - requiring a member to be receiving a retirement benefit for at least 24 months prior to receiving a COLA, an increase from the current 12-month requirement;
  - increase the 50 percent of CPI COLA formula by 7.5 percent each year once the pension system reaches an 80 percent funded status, provided that the increase does not result in the fund projected to fall below the 80 percent funded status. If the increase would result in a drop below 80 percent, then the formula is paused at the levels in place at the time pending re-evaluation in the subsequent year; and
  - applies any increases to the COLA to members who leave active service July 1, 2023 or after.
- Beginning in FY 2023, increases the contribution rates for all active members over a three-year period according to the following marginal rate schedule:

Base Salary Level	Year 1 Rate	Year 2 Rate	Year 3 Rate
$0-$40,000	6.00%	6.25%	6.25%

$40,000.01-$60,000	6.50%	6.75%	6.75%
$60,000.01-$80,000	6.75%	7.00%	7.50%
$80,000.01-$100,000	7.00%	7.50%	8.25%
$100,000.01 +	7.25%	8.00%	9.00%

Effective contribution rates would be calculated annually based on a member's base salary as of July 1 and assessed on the member's total compensation during the fiscal year.

- Beginning in FY 2024, codifying the State's intent to annually fund an additional payment to the ADEC using monies saved from a reduction on the required annual unfunded liability amortization payment. The "plus" payment will grow to $15 million in FY 2026 and remain at that level until the fund reaches 90% funded.
- Amend the General Fund year end surplus to reallocate 25 percent to VSTRS pension underfunding.

With respect to other postemployment benefits for retired teachers, the Task Force recommends:

- Using $13.3 million of Education Fund money currently in reserve to begin prefunding other postemployment benefits by making a one-time appropriation into the Retired Teachers' Health and Medical Benefits Fund.
- Enacting a prefunding schedule into statute that charges the OPEB normal cost to the Education Fund.
- Continuing to apply current "pay go" for retired employees into the Retired Teachers' Health and Medical Benefits Fund.

Appendix

OVERVIEW OF THE TWO RETIREMENT SYSTEMS

Table A.1: Vermont Pension Systems At A Glance (FY21)		
	VSERS	**VSTRS**
Active Members	8,192	9,955
Retired Members and Beneficiaries	7,716	10,106
Terminated Vested Members	771	911
Ratio of No-Active to Active Members	1.04	1.11
Average Payroll (Active)	$67,421	$66,091
Average Annual Benefit (Retirees and Beneficiaries)	$20,927	$22,075
Actuarial Value of Assets	$2,216,499,478	$2,191,650,755
Actuarial Accrued Liability	$3,280,867,677	$4,142,014,660
Unfunded Actuarial Accrued Liability	$1,064,368,199	$1,950,363,905
Funded Ratio (on AVA basis)	67.6%	52.9%

Table A.2: VSERS and VSTRS Membership Overview (FY21)		
	VSERS	**VSTRS**
Number of Active Members	8,192	9,955
Vested	*5,523*	*7,486*
Not Vested	*2,669*	*2,469*
Average Active Salary ($)	$67,421	$66,091
Average Active Years of Service	10.9	12.3
Average Active Age	45.7	45.3
Number of Pensioners and Beneficiaries	7,716	10,106
Retired Members	*6,573*	*9,392*
Disabled Retirees	*400*	*181*
Beneficiaries	*743*	*533*
Average Annual Retirement Benefit	$20,928	$22,080
Total Annual Benefit Expenditure	$161,473,056	$223,092,408
Number of Terminated Vested Members (entitled to benefits but not yet receiving them)	771	911
Number of Inactive Members (left active service and not entitled to a future benefit)	1,716	2,915
TOTAL PARTICIPANTS	18,395	23,887

GOVERNANCE

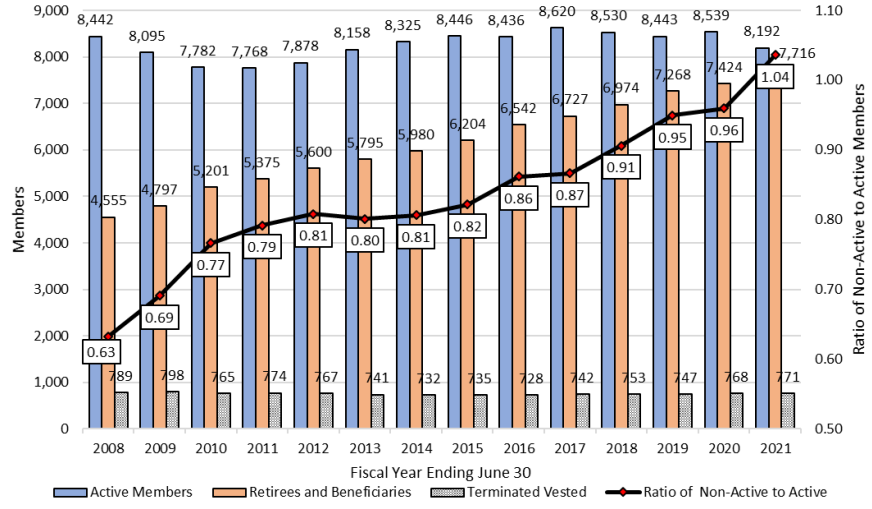
Below are the lists of trustees and VPIC commissioners according to the website of the Office of the State Treasurer as of December 11, 2021.

Table A.3: Members of VSERS and VSTRS Boards of Trustees	
VSERS Board of Trustees	**VSTRS Board of Trustees**
Roger Dumas, Chair – VRSEA Representative	Jon Harris, Chair – VRTA Representative
John Federico – VSEA Representative	Erin Carter – Active Member Representative
Eric Davis – VSEA Representative	Sandra Mings-Lamar – Active Member Representative
Jean Paul Isabelle – VSEA Representative	*Perry Lessing – VRTA Alternate*
Barbara Kessler – VSEA Alternate	*Genevieve Hamby – Active Member Alternate*
Allen Blake – VRSEA Alternate	Beth Pearce – State Treasurer (ex officio)
Beth Pearce – State Treasurer (ex officio)	Dan Raddock – Representative of Department of Financial Regulation (ex officio)
Beth Fastiggi – Commissioner of Human Resources (ex officio)	Emily Simmons – Representative of Department of Education (ex officio)
Adam Greshin – Commissioner of Finance & Management (ex officio)	
Jay Wisner – Governor's Delegate (ex officio)	

Table A.4: Members of Vermont Pension Investment Commission
Tom Golonka, Chair
Beth Pearce – State Treasurer
Lauren Wobby – Governor's Appointee
Kimberly Gleason – VMERS Representative
Robert Hooper – VSERS Representative
Joe Mackey – VSTRS Representative
Mary Alice McKenzie – Governor's Appointee
Jim Salsgiver – VSBA Representative
Seth Abbene – VLCT Representative
Perry Lessing – VSTRS Alternate
Jeff Briggs – VSERS Alternate
Chris Dube – VMERS Alternate
Ronald Plante – Governor's Delegate Alternate

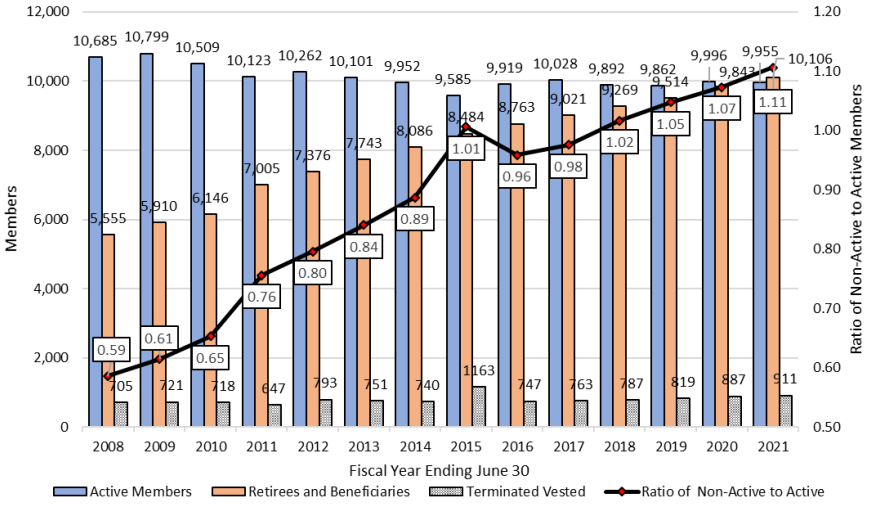
RETIREMENT SYSTEM MEMBERSHIP CHARACTERISTICS

Figure A.5: VSERS Membership Trends



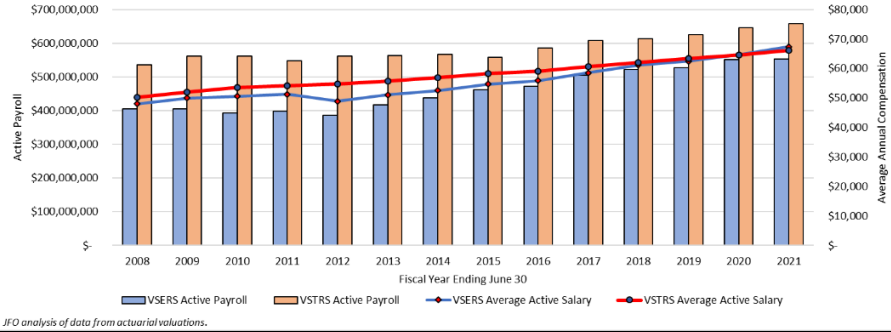
JFO analysis of data from actuarial valuations.

Figure A.6: VSTRS Membership Trends



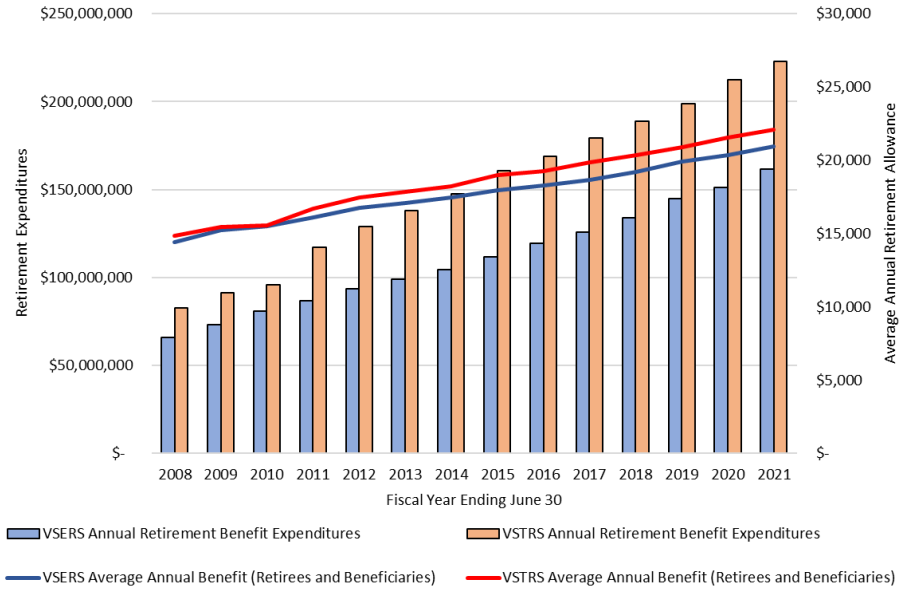
JFO analysis of data from actuarial valuations.

Figure A.7: VSERS and VSTRS Active Salary Trends



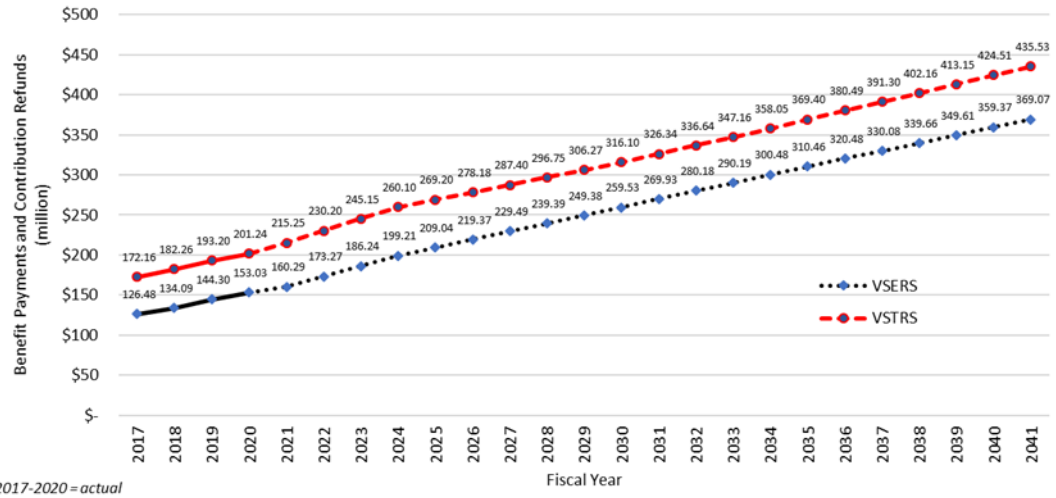
JFO analysis of data from actuarial valuations.

Figure A.8: VSERS and VSTRS Retirement Allowance Trends



JFO analysis of data from actuarial valuations.

Figure A.9: VSERS and VSTRS Estimated Benefit Payments To Members



FY2017-2020 = actual
Data from actuarial analysis performed by Segal based on the FY2020 valuations. Not adjusted for inflation.

RETIREMENT SYSTEM FINANCIAL OVERVIEWS

VSERS Financial Overview, Start of FY2009-End of FY2021

Year Ending June 30	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Compound Annual Growth Rate
Active Members	8,442	8,095	7,782	7,768	7,878	8,158	8,335	8,446	8,436	8,610	8,530	8,443	8,539	8,192	-0.2%
Payroll	$ 404,937,574	$ 404,516,961	$ 393,828,924	$ 398,264,150	$ 385,525,891	$ 416,766,932	$ 437,675,917	$ 462,057,022	$ 471,268,111	$ 504,553,289	$ 521,670,606	$ 527,371,033	$ 551,981,001	$ 553,216,523	2.4%
Average Age	46.6	47.0	47.0	47.0	46.4	46.2	45.2	46.5	46.2	46.0	45.9	45.7	45.6	45.7	
Average Service	11.3	11.7	11.6	11.6	11.5	12.2	11.8	11.7	11.3	11.1	11.0	10.8	10.8	10.9	
Average Compensation	$ 47,967	$ 49,971	$ 50,608	$ 51,270	$ 48,937	$ 51,087	$ 51,574	$ 54,707	$ 55,864	$ 58,533	$ 61,157	$ 62,486	$ 64,642	$ 67,421	2.7%
Retirees and Beneficiaries	4,555	4,797	5,101	5,375	5,600	5,795	5,980	6,204	6,542	6,727	6,974	7,268	7,424	7,716	4.1%
Annual retirement allowances	$ 65,701,435	$ 73,179,785	$ 80,723,060	$ 86,681,452	$ 93,712,861	$ 98,934,427	$ 104,462,793	$ 111,516,073	$ 119,421,979	$ 125,628,642	$ 134,073,423	$ 144,601,613	$ 150,974,105	$ 161,473,057	7.2%
Average annual allowance	$ 14,424	$ 15,255	$ 15,821	$ 16,127	$ 16,734	$ 17,072	$ 17,467	$ 17,975	$ 18,255	$ 18,675	$ 19,225	$ 19,896	$ 20,336	$ 20,927	2.9%
Inactive Members	900	939	857	849	835	796	867	891	1012	1098	1266	1443	1482	1716	5.1%
Terminated Vested Members	789	798	765	774	767	741	732	735	728	742	753	747	768	771	-0.3%
Ratio of Non-Active to Active	0.63	0.69	0.77	0.79	0.81	0.80	0.81	0.82	0.86	0.87	0.91	0.95	0.96	1.04	
Actuarial Accrued Liabilities	$ 1,454,201,939	$ 1,544,144,066	$ 1,599,324,389	$ 1,655,300,528	$ 1,800,803,807	$ 1,914,299,984	$ 2,010,089,866	$ 2,178,816,481	$ 2,289,451,540	$ 2,511,372,455	$ 2,661,608,857	$ 2,779,965,533	$ 3,095,290,972	$ 3,280,867,677	6.4%
Actuarial Value of Assets	$ 1,377,101,471	$ 1,217,637,578	$ 1,265,404,185	$ 1,348,762,790	$ 1,400,779,062	$ 1,468,169,902	$ 1,566,075,540	$ 1,636,167,663	$ 1,707,167,941	$ 1,793,794,733	$ 1,881,804,847	$ 1,964,500,825	$ 2,054,825,853	$ 2,216,499,478	3.7%
Unfunded Actuarial Accrued Liability	$ 87,100,468	$ 326,506,488	$ 293,920,094	$ 346,537,738	$ 401,824,745	$ 445,130,082	$ 444,014,326	$ 542,558,818	$ 582,183,599	$ 717,577,722	$ 779,804,010	$ 815,464,688	$ 1,040,465,119	$ 1,064,368,199	21.2%
Funded Ratio	94.0%	78.8%	81.2%	79.5%	77.7%	76.7%	77.9%	75.1%	74.5%	71.4%	70.7%	70.7%	66.4%	67.5%	
Annual Amortization Payment	$ 6,590,972	$ 17,378,604	$ 15,982,619	$ 19,479,244	$ 23,108,413	$ 26,127,179	$ 25,809,339	$ 32,687,873	$ 36,216,746	$ 44,375,781	$ 50,090,049	$ 63,628,324	$ 81,066,478	$ 86,331,362	21.9%
Employer Normal Contribution Rate	5.93%	5.52%	4.81%	3.99%	3.96%	3.91%	4.13%	2.93%	2.88%	3.01%	3.12%	3.22%	5.88%	6.16%	

VSTRS Financial Overview, Start of FY2009-End of FY2021

Year Ending June 30	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Compound Annual Growth Rate
Active Members	10,685	10,799	10,509	10,123	10,262	10,101	9,952	9,585	9,919	10,028	9,892	9,862	9,996	9,855	-0.5%
Payroll	$ 535,807,012	$ 561,588,013	$ 562,149,916	$ 547,748,405	$ 561,179,272	$ 563,623,421	$ 567,073,601	$ 557,708,310	$ 586,397,072	$ 607,354,756	$ 612,899,069	$ 614,908,253	$ 645,902,984	$ 657,934,953	1.6%
Average Age	46.9	47.1	47.1	46.9	46.9	46.6	46.5	46.2	45.9	45.8	45.7	45.7	45.4	45.3	
Average Service	13.6	13.8	13.8	13.8	13.1	13.1	13.2	12.9	12.7	12.6	12.6	12.7	12.4	12.3	
Average Compensation	$ 50,146	$ 52,004	$ 53,452	$ 54,108	$ 54,685	$ 55,799	$ 56,981	$ 58,186	$ 59,119	$ 60,566	$ 61,959	$ 63,365	$ 64,616	$ 66,091	2.1%
Retirees and Beneficiaries	5,555	5,910	6,146	7,005	7,376	7,743	8,086	8,484	8,763	9,011	9,269	9,514	9,843	10,106	4.7%
Annual retirement allowances	$ 82,480,807	$ 91,393,401	$ 95,664,775	$ 117,019,135	$ 128,763,117	$ 138,079,875	$ 147,409,221	$ 160,847,936	$ 168,768,818	$ 179,082,530	$ 188,721,417	$ 198,695,903	$ 212,287,265	$ 223,052,411	8.0%
Average annual allowance	$ 14,848	$ 15,464	$ 15,565	$ 16,705	$ 17,457	$ 17,833	$ 18,230	$ 18,959	$ 19,159	$ 19,852	$ 20,360	$ 20,885	$ 21,567	$ 22,075	3.1%
Inactive Members	2,929	2,655	2,853	2,675	2,193	2,312	2,416	2,260	2,454	2,381	2,613	2,756	2,710	2,915	0.0%
Terminated Vested Members	705	721	718	647	793	751	740	1163	747	763	787	819	887	911	2.0%
Ratio of Non-Active to Active	0.59	0.61	0.65	0.76	0.80	0.84	0.89	1.01	0.96	0.98	1.02	1.05	1.07	1.11	
Actuarial Accrued Liabilities	$ 1,984,966,797	$ 2,101,837,843	$ 2,122,191,495	$ 2,331,806,338	$ 2,462,912,787	$ 2,566,834,655	$ 2,687,049,333	$ 2,837,374,737	$ 2,941,024,080	$ 3,282,045,614	$ 3,379,553,748	$ 3,505,319,267	$ 3,968,002,977	$ 4,142,014,660	5.8%
Actuarial Value of Assets	$ 1,605,461,728	$ 1,374,079,337	$ 1,410,368,434	$ 1,486,698,448	$ 1,517,410,471	$ 1,552,924,370	$ 1,610,265,523	$ 1,662,345,707	$ 1,716,296,235	$ 1,779,592,227	$ 1,866,120,413	$ 1,950,859,980	$ 2,035,719,611	$ 2,191,630,755	2.4%
Unfunded Actuarial Accrued Liability	$ 379,505,069	$ 727,758,506	$ 711,823,061	$ 845,107,890	$ 945,502,316	$ 1,013,910,285	$ 1,076,783,810	$ 1,175,029,030	$ 1,225,727,845	$ 1,502,453,387	$ 1,513,433,335	$ 1,554,459,287	$ 1,933,283,366	$ 1,950,363,905	13.4%
Funded Ratio	80.88%	65.38%	66.46%	63.76%	61.61%	60.50%	59.95%	58.59%	58.34%	54.12%	55.22%	55.65%	51.29%	52.91%	
Annual Amortization Payment	$ 20,648,422	$ 38,735,696	$ 38,731,326	$ 47,504,388	$ 54,374,994	$ 59,740,310	$ 62,588,336	$ 70,792,693	$ 76,150,643	$ 91,913,342	$ 97,214,107	$ 121,289,738	$ 150,629,709	$ 158,194,853	17.0%
Employer Normal Contribution Rate	3.54%	3.89%	1.80%	1.80%	1.92%	1.89%	1.70%	1.39%	1.33%	1.23%	1.08%	1.07%	5.58%	5.95%	

VSERS GROUP PLANS

VSERS Group Comparisons	Group A	Group C (law enforcement/public safety)	Group D (judicial)	Group F (hired before 7/1/08)	Group F* (hired after 7/1/08)
Employee Contributions	6.65%	8.53%	6.65%	6.65%	6.65%
Average Final Compensation	3 Highest Consecutive (including unused annual leave payoff)	2 Highest Consecutive (including unused annual leave payoff)	Final salary at retirement	3 Highest Consecutive (excluding unused annual leave payoff)	3 Highest Consecutive (excluding unused annual leave payoff)
Benefit Formula	1.67% x service credit	2.5% x service credit	3.33% x service credit (after 12 years in Group D)	1.25% x service credit prior to 12/31/90 + 1.67% x service credit after 1/1/91	1.25% x service credit prior to 12/31/90 + 1.67% x service credit after 1/1/91
Maximum Benefit Payable	100% of AFC	50% of AFC	100% of final salary	50% of AFC	60% of AFC
Normal Retirement (no reduction)	Age 65 or 62 with 20 years of service	Age 55 (mandatory)	Age 62	Age 62 or with 30 years of service	Age 65 or combination of age plus service that equals 87 (Rule of 87)
Post-Retirement COLA	Full CPI, from a minimum of 1% to max of 5%, after 12 months of retirement	Full CPI, from a minimum of 1% to max of 5%, after 12 months of retirement	Full CPI, from a minimum of 1% to max of 5%, after 12 months of retirement	Full CPI, from a minimum of 1% to max of 5%, after reaching age 62 or 30 years of service.	Full CPI, from a minimum of 1% to max of 5%, after reaching age 65 or Rule of 87
Early Retirement Eligibility	Age 55 with 5 years of service, or any age with 30 years of service	Age 50 with 20 years of service	Age 55 with 5 years of service	Age 55 with 5 years of service	Age 55 with 5 years of service
Early Retirement Reduction	Actuarially reduced benefit if under 30 years of service	No reduction	3% per year from age 62	6% per year from age 62	Service Yrs / Monthly Red. 35+ / 1/8 of 1% 30-34 / 1/4 of 1% 25-29 / 1/3 of 1% 20-24 / 5/12 of 1% <20 / 5/9 of 1%
Medical Benefits	80% of premium	80% of premium	80% of premium	80% of premium	Service Yrs / Monthly Red. 5-9 / Buy-in 10-14 / 40% state pays 15-20 / 60% state pays 20+ / 80% state pays

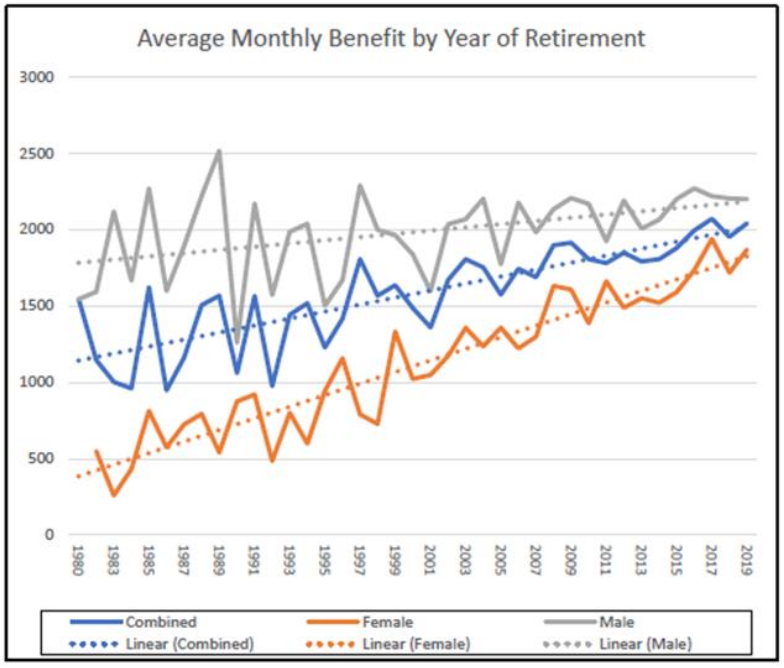
VSTRS GROUP PLANS

VSTRS Group Comparisons	Group A	Group C-1 (at least 57 yrs old or at least 25 years of service on 6/30/10)	Group C-2 (less than 57 yrs old or less than 25 years of service on 6/30/10)
Employee Contributions	5.5%, contributions cease after 25 years of service	5.0%	5.0% (members with less than 5 yrs of srvice as of 6/20/14 pay 6.0%)
Average Final Compensation	3 Highest Consecutive (including unused annual leave payoff)	3 Highest Consecutive (excluding payments for anything other than service actually performed)	3 Highest Consecutive (excluding payments for anything other than service actually performed)
Benefit Formula	1.67% x service credit	1.25% x service credit prior to 6/30/90 + 1.67% x service credit after 7/1/90	1.25% x service credit prior to 6/30/90 + 1.67% x service credit after 7/1/91; 2.0% x years of service after attaining 20.0 years.
Maximum Benefit Payable	100% of AFC	53.34% of AFC	60% of AFC
Normal Retirement (no reduction)	Age 60 or with 30 years of service	Age 62 or with 30 years of service	Age 65 or combination of age plus service that equals 90 (Rule of 90)
Post-Retirement COLA	Full CPI, from a minimum of 1% to max of 5%, after 12 months of retirement	50% CPI, from a minimum of 1% to max of 5%, after 12 months of retirement	50% CPI, up to max of 5%, after 12 months of retirement
Early Retirement Eligibility	Age 55 with 5 years of service	Age 55 with 5 years of service	Age 55 with 5 years of service
Early Retirement Reduction	Actuarially reduced	6% per year from age 62	Actuarially reduced
Medical Benefits	Health subsidy based on member's service credit		

VSERS – Demographic Data from Treasurer's Analysis (FY19), February 7, 2020.

Distribution of Retiree Benefits by Gender

Gender	Count	Average Monthly Benefit	Avg Annual Benefit	Average Years of Service	Average Final Compensation (Avg)
Female	2,928	1,460.84	17,530.14	21.90	48,017.96
Male	3,145	2,069.17	24,830.10	24.78	59,115.39
Average		1,775.88	21,310.54	23.40	53,778.67
Grand Total	6,073				



Distribution of Benefits to Retirees by Group and Gender

Group	Count	Average Monthly Benefit	Average Annual Benefit	Average Final Compensation (Avg)
A Total	**110**	**2,186.59**	**26,239.06**	**39,735.33**
Female	52	1,793.53	21,522.33	30,930.86
Male	58	2,538.99	30,467.85	47,629.00
B Total	**6**	**1,999.14**	**23,989.66**	**46,500.72**
Female	-		-	
Male	6	1,999.14	23,989.66	46,500.72
C Total	**329**	**4,278.36**	**51,340.38**	**84,405.43**
Female	12	3,379.83	40,557.94	73,256.78
Male	317	4,312.38	51,748.54	84,830.14
D Total	**60**	**6,041.98**	**72,503.72**	**94,275.52**
Female	19	5,770.24	69,242.86	89,649.39
Male	41	6,167.90	74,014.85	96,419.34
E Total	**417**	**500.44**	**6,005.33**	**24,478.67**
Female	224	438.67	5,264.05	21,838.67
Male	193	572.14	6,865.69	27,529.03
F Total	5,068	**1,677.67**	**20,132.08**	**53,904.40**
Female	2,574	1,517.59	18,211.09	49,925.39
Male	2,494	1,842.89	22,114.69	57,992.63
F* Total	83	**616.32**	**7,395.88**	**62,653.10**
Female	47	624.63	7,495.54	65,705.08
Male	36	605.48	7,265.77	58,816.32
Average		1,775.88	21,310.54	53,778.67
Grand Total	6,073			

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VSERS – Data from Treasurer's Analysis (FY19), February 7, 2020.

Distribution of Benefits to Retirees by Years of Service

Years of Service	Count	Average Monthly Benefit	Average Annual Benefit	Average Final Compensation (Avg)
Less than 5 years (see note next page)	93	1,274.69	15,296.28	48,146.26
5 years to less than 10 years	705	435.42	5,225.07	44,877.08
10 years to less than 15 years	882	660.26	7,923.14	41,079.00
15 years to less than 20 years	689	1,115.98	13,391.76	48,125.59
20 years to less than 25 years	752	1,919.08	23,029.01	54,797.42
25 years to less than 30 years	647	2,680.24	32,162.91	62,707.94
30 years to less than 35years	1,525	2,448.26	29,379.14	58,648.55
35 years to less than 40 years	544	2,695.90	32,350.75	63,541.94
40 years to less than 45years	196	2,608.34	31,300.05	61,987.95
45 years to less than 50 years	32	3,008.87	36,106.48	74,957.31
50 years and over	8	2,897.20	34,766.43	57,422.13
Average		1,775.88	21,310.54	53,778.67
Grand Total	6,073			

Average of Annual Benefit by Type of Retirement

	Female	Male	Total	Count
Early	9,941.81	21,605.26	15,613.84	1,059
Less than 5 years (see note)	12,326.02	33,938.52	23,132.27	10
5 years to less than 10 years	4,124.60	4,368.72	4,233.23	209
10 years to less than 15 years	6,614.11	7,345.86	6,897.25	199
15 years to less than 20 years	10,053.87	11,905.00	10,667.72	193
20 years to less than 25 years	13,970.61	26,494.90	20,898.94	235
25 years to less than 30 years	15,452.43	41,112.99	34,216.72	160
30 years to less than 35years	24,864.06	36,097.14	31,802.14	34
35 years to less than 40 years	26,675.26	27,899.96	27,287.61	12
40 years to less than 45years	26,521.98	21,588.30	24,877.42	6
45 years to less than 50 years	43,651.44	-	43,651.44	1
Service/Normal	19,261.70	25,461.58	22,513.73	5,014
Less than 5 years (see note)	14,654.12	14,042.89	14,352.19	83
5 years to less than 10 years	5,063.85	6,369.57	5,643.00	496
10 years to less than 15 years	7,421.54	9,114.25	8,222.04	683
15 years to less than 20 years	12,962.80	16,446.32	14,451.72	496
20 years to less than 25 years	19,988.79	28,245.19	23,997.22	517
25 years to less than 30 years	24,579.82	37,619.95	31,488.14	487
30 years to less than 35years	27,989.38	30,436.79	29,323.88	1,491
35 years to less than 40 years	30,573.93	33,440.10	32,464.96	532
40 years to less than 45 years	30,558.78	31,887.50	31,502.87	190
45 years to less than 50 years	29,031.00	38,658.04	35,863.09	31
50 years and over	38,782.86	30,750.00	34,766.43	8
Grand Total	**17,530.14**	**24,830.10**	**21,310.54**	**6,073**

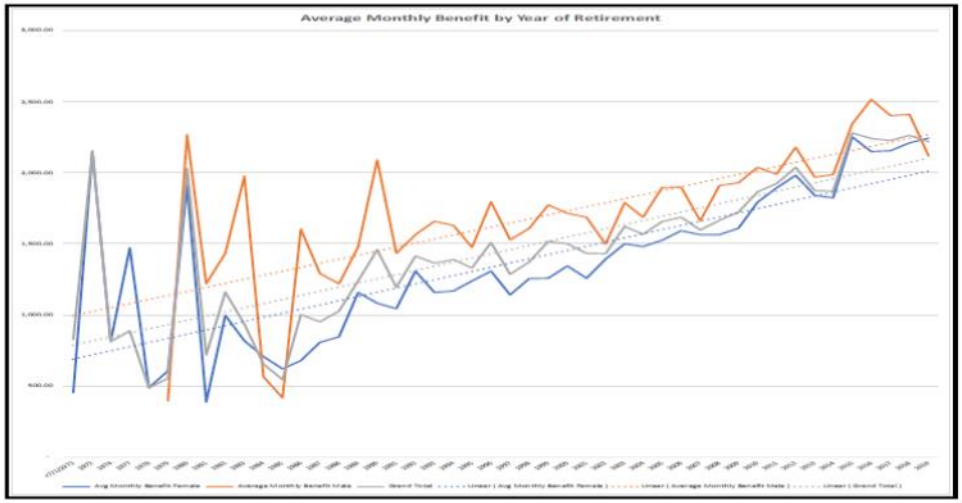
VSTRS – Demographic Data from Treasurer's Analysis (FY19), February 7, 2020.

Distribution of Benefits by Gender

Gender	Count	Average Monthly Benefit	Avg Annual Benefit	Average Years of Service	Average Final Compensation (Avg)
Female	5,948	1,733.32	20,799.86	23.18	55,525.03
Male	2,852	1,913.58	22,962.99	26.14	56,663.82
Average		1,791.74	21,500.91	24.14	55,894.10
Grand Tot	8,800				

Distribution of Benefits to Retirees by Group and Gender

Group	Count	Average Monthly Benefit	Annual Annual Benefit	Average Final Compensation (Avg)
A	235	2,391.25	28,695.00	43,021.18
Female	149	2,124.42	25,493.09	41,007.59
Male	86	2,853.54	34,242.51	46,509.84
B	506	459.01	5,508.16	23,733.56
Female	278	457.39	5,488.63	22,986.80
Male	228	461.00	5,531.97	24,644.09
C	8,059	1,857.94	22,295.27	58,288.73
Female	5,521	1,787.01	21,444.17	57,555.22
Male	2,538	2,012.22	24,146.70	59,884.36
Average		1,791.74	21,500.91	55,894.10
Grand Tot	8,800			



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VSTRS – Data from Treasurer's Analysis (FY19), February 7, 2020.

Distribution of Benefits to Retirees by Years of Service

Years of Service	Count	Average Monthly Benefit	Average Annual Benefit	Average final Compensation (Avg)
Less than 5 years	72	267.75	3,213.00	45,982.22
5 years to less than 10 years	515	475.89	5,710.73	50,427.26
10 years to less than 15 years	1,268	645.01	7,740.06	42,898.81
15 years to less than 20 years	1,190	1,099.00	13,188.06	51,903.07
20 years to less than 25 years	1,229	1,544.04	18,528.53	56,075.64
25 years to less than 30 years	885	2,208.89	26,506.67	61,603.52
30 years to less than 35 years	2,551	2,476.34	29,716.07	58,922.47
35 years to less than 40 years	882	2,910.27	34,923.21	66,006.07
40 years to less than 45 years	194	3,057.10	36,685.16	69,192.14
45 years to less than 50 years	13	3,200.35	38,404.24	74,826.29
50 years and over	1	6,114.95	73,379.40	66,300.00
Average		1,791.74	21,500.91	55,894.10
Grand Total	8,800			

Average of Annual Benefit by Type of Retirement

	Female	Male	Total	
Early	11,844.06	11,799.53	11,834.20	1878
Less than 5 years	2,559.84	-	2,559.84	1
5 years to less than 10 years	4,575.25	5,463.81	4,831.05	132
10 years to less than 15 years	7,115.87	6,634.91	7,011.80	476
15 years to less than 20 years	11,186.04	10,539.73	11,075.97	505
20 years to less than 25 years	15,543.80	15,277.87	15,488.83	537
25 years to less than 30 years	19,636.29	17,768.05	19,042.29	195
30 years to less than 35years	19,245.26	20,033.98	19,654.23	27
35 years to less than 40 years	17,633.10	16,614.72	17,123.91	4
40 years to less than 45years	23,477.16	-	23,477.16	1
Service/Normal	23,718.58	24,869.40	24,123.58	6,922.00
Less than 5 years	3,438.32	2,890.30	3,222.20	71
5 years to less than 10 years	5,777.35	6,657.00	6,013.92	383
10 years to less than 15 years	8,645.01	7,146.76	8,177.75	792
15 years to less than 20 years	15,339.55	13,162.18	14,745.15	685
20 years to less than 25 years	21,544.37	18,648.54	20,887.37	692
25 years to less than 30 years	28,607.22	28,645.83	28,616.18	690
30 years to less than 35years	30,456.52	28,931.00	29,823.71	2,524
35 years to less than 40 years	35,401.95	34,546.22	35,004.30	878
40 years to less than 45years	36,577.29	36,959.61	36,753.59	193
45 years to less than 50 years	32,249.68	40,250.60	38,404.24	13
50 years and over	73,379.40	-	73,379.40	1
Grand Total	20,799.86	22,962.99	21,500.91	8,800

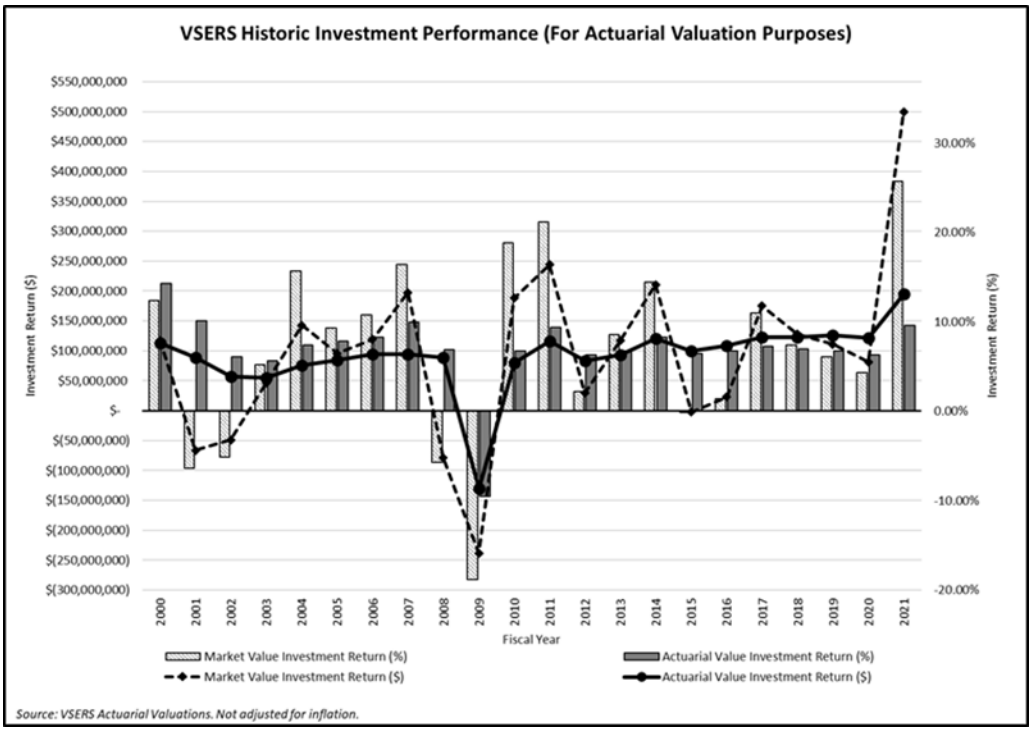
VSERS Member Data (FY21 Valuation)	**Group A**	**Group C** (law enforcement/public safety)	**Group D** (judicial)	**Group F** (combined)	**All Employee Groups**
Active Members	1	439	51	7701	8192
Average Payroll	$61,369	$86,032	$137,760	$65,896	$67,421
Service Pensioners	97	399	62	6007	6573
Annual Allowance	$2,628,194	$18,928,261	$4,379,450	$118,808,496	$144,900,067
Average Annual Allowance	$27,095	$47,439	$70,636	$19,778	$22,045
Disability Pensioners	5	34	0	359	400
Annual Allowance	$50,760	$1,277,321	$0	$4,790,812	$6,163,705
Average Annual Allowance	$10,152	$37,568	$0	$13,345	$15,409
Beneficiaries	33	81	10	615	743
Annual Allowance	$425,044	$1,850,748	$476,021	$7,590,801	$10,409,285
Average Annual Allowance	$12,880	$22,849	$47,602	$12,343	$14,010

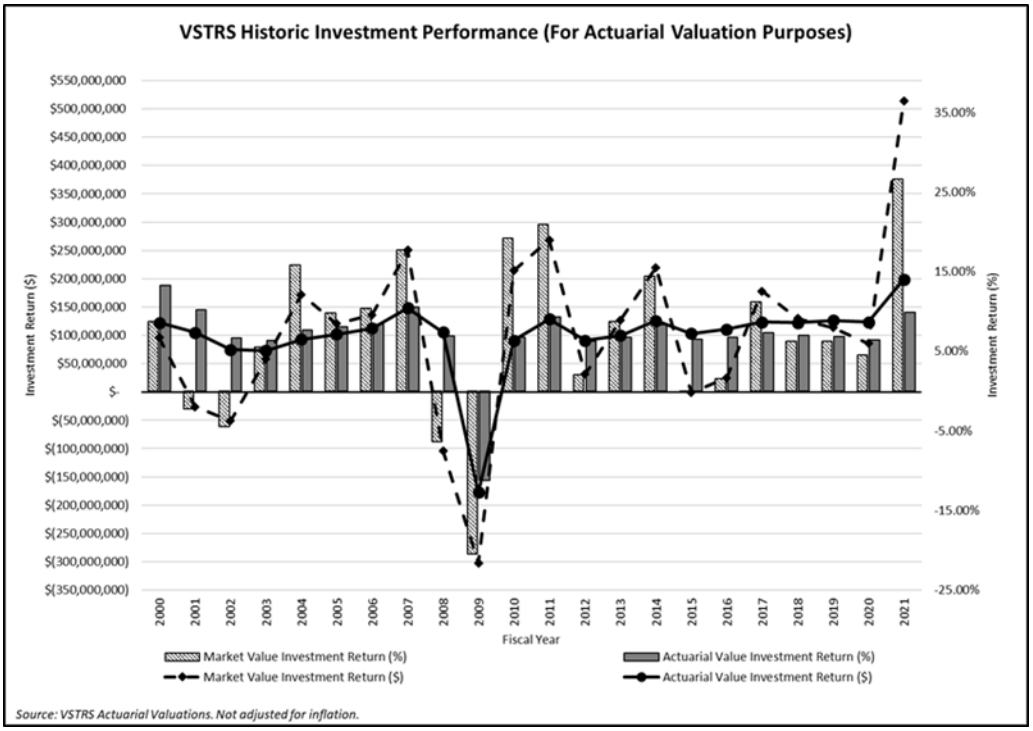
VSERS Membership Trends (FY21 Valuation)	**Retired Members**	**Beneficiaries**	**Deferred Members**	**Total Non-Active Members**	**Active Members**	**Ratio of Non-Active to Active**
Year Beginning July 1						
2008	4035	520	789	5344	8442	0.63
2009	4262	535	798	5595	8095	0.69
2010	4678	523	765	5966	7782	0.77
2011	4851	524	774	6149	7768	0.79
2012	5060	540	767	6367	7878	0.81
2013	5248	547	741	6536	8158	0.80
2014	5421	559	732	6712	8325	0.81
2015	5554	650	735	6939	8446	0.82
2016	5858	684	728	7270	8436	0.86
2017	6092	635	742	7469	8620	0.87
2018	6302	672	753	7727	8530	0.91
2019	6567	701	747	8015	8443	0.95
2020	6704	720	767	8191	8539	0.96
2021	6973	743	771	8487	8192	1.04

VSTRS Member Data (FY21 Valuation)	**All Employee Groups**
Active Members	9955
Average Payroll	$66,091
Service Pensioners	9392
Annual Allowance	$212,028,624
Average Annual Allowance	$22,575
Disability Pensioners	181
Annual Allowance	$3,206,178
Average Annual Allowance	$17,714
Beneficiaries	533
Annual Allowance	$7,857,609
Average Annual Allowance	$14,742

VSTRS Membership Trends (FY21 Valuation)	**Retired Members**	**Beneficiaries**	**Deferred Members**	**Total Non-Active Members**	**Active Members**	**Ratio of Non-Active to Active**
Year Beginning July 1						
2008	5247	308	705	6260	10685	0.59
2009	5586	324	721	6631	10799	0.61
2010	5831	315	718	6864	10509	0.65
2011	6667	338	647	7652	10123	0.76
2012	7014	362	793	8169	10262	0.80
2013	7356	387	751	8494	10101	0.84
2014	7674	412	740	8826	9952	0.89
2015	8006	478	1163	9647	9585	1.01
2016	8259	504	747	9510	9919	0.96
2017	8581	440	763	9784	10028	0.98
2018	8809	460	787	10056	9892	1.02
2019	9040	474	819	10333	9862	1.05
2020	9340	503	887	10730	9996	1.07
2021	9573	533	911	11017	9955	1.11

INVESTMENT PERFORMANCE


VSERS Historic Investment Performance (For Actuarial Valuation Purposes)
Investment Return ($)
Investment Return (%)
Fiscal Year
Market Value Investment Return (%)
Actuarial Value Investment Return (%)
Market Value Investment Return ($)
Actuarial Value Investment Return ($)
Source: VSERS Actuarial Valuations. Not adjusted for inflation.


VSTRS Historic Investment Performance (For Actuarial Valuation Purposes)
Investment Return ($)
Investment Return (%)
Fiscal Year
Market Value Investment Return (%)
Actuarial Value Investment Return (%)
Market Value Investment Return ($)
Actuarial Value Investment Return ($)
Source: VSTRS Actuarial Valuations. Not adjusted for inflation.

VSERS Actuarial Investment Returns				
FY Ending	Actuarial Value Investment Return		Market Value Investment Return	
	Amount	Percent	Amount	Percent
1998	$ 103,216,071	16.26%	$ 144,480,676	18.65%
1999	$ 105,789,263	14.77%	$ 83,345,613	9.28%
2000	$ 113,086,381	14.25%	$ 117,824,509	12.37%
2001	$ 89,249,154	10.14%	$ (66,366,171)	-6.36%
2002	$ 57,320,146	6.07%	$ (49,030,960)	-5.15%
2003	$ 55,169,045	5.63%	$ 45,639,510	5.17%
2004	$ 75,261,848	7.41%	$ 142,588,476	15.70%
2005	$ 84,075,397	7.83%	$ 95,845,599	9.28%
2006	$ 94,266,315	8.28%	$ 119,220,681	10.74%
2007	$ 94,266,315	9.93%	$ 197,642,924	16.37%
2008	$ 89,281,830	6.85%	$ (78,966,292)	-5.74%
2009	$ (130,060,430)	-9.55%	$ (238,392,427)	-18.80%
2010	$ 80,550,116	6.71%	$ 187,930,419	18.82%
2011	$ 116,660,083	9.34%	$ 244,063,320	21.16%
2012	$ 83,600,231	6.27%	$ 29,466,721	2.16%
2013	$ 93,222,330	6.71%	$ 116,835,891	8.55%
2014	$ 120,645,037	8.28%	$ 210,491,370	14.43%
2015	$ 100,145,920	6.46%	$ (2,430,832)	-0.15%
2016	$ 108,862,988	6.73%	$ 22,651,623	1.41%
2017	$ 122,942,180	7.28%	$ 175,207,530	11.01%
2018	$ 123,141,054	6.93%	$ 128,188,928	7.41%
2019	$ 125,762,614	6.76%	$ 111,036,177	6.10%
2020	$ 122,202,359	6.27%	$ 81,474,149	4.30%
2021	$ 194,857,120	9.56%	$ 499,339,262	25.71%

VSTRS Actuarial Investment Returns				
FY Ending	Actuarial Value Investment Return		Market Value Investment Return	
	Amount	Percent	Amount	Percent
1998	$ 111,291,980	15.59%	$ 147,347,249	17.08%
1999	$ 119,969,096	14.69%	$ 114,611,557	11.45%
2000	$ 122,585,157	13.28%	$ 96,459,461	8.75%
2001	$ 105,052,742	10.25%	$ (26,277,091)	-2.23%
2002	$ 74,521,272	6.71%	$ (50,765,984)	-4.50%
2003	$ 73,318,724	6.34%	$ 57,742,544	5.48%
2004	$ 92,527,288	7.68%	$ 172,235,639	15.86%
2005	$ 102,130,985	8.05%	$ 120,839,819	9.83%
2006	$ 112,662,977	8.44%	$ 136,026,631	10.35%
2007	$ 148,468,597	10.53%	$ 250,776,668	17.74%
2008	$ 105,606,299	6.94%	$ (103,733,250)	-6.38%
2009	$ (177,198,490)	-11.23%	$ (302,070,164)	-20.49%
2010	$ 90,911,582	6.75%	$ 214,806,420	19.22%
2011	$ 129,010,590	9.32%	$ 268,197,459	20.97%
2012	$ 91,041,364	6.25%	$ 31,182,310	2.09%
2013	$ 99,823,830	6.72%	$ 127,041,593	8.70%
2014	$ 125,880,755	8.29%	$ 219,532,643	14.44%
2015	$ 103,064,276	6.50%	$ (1,244,071)	-0.07%
2016	$ 110,878,140	6.79%	$ 24,710,920	1.52%
2017	$ 123,782,547	7.34%	$ 178,144,379	11.20%
2018	$ 122,579,470	7.02%	$ 129,866,264	6.30%
2019	$ 126,427,866	6.87%	$ 113,804,311	6.30%
2020	$ 123,556,188	6.40%	$ 85,703,874	4.55%
2021	$ 198,785,933	9.87%	$ 514,152,415	26.64%

	VSERS Most Recent Average Returns							
	Based on Actuarial Value				Based on Market Value			
As Of FY	5YR	10YR	15YR	20YR	5YR	10YR	15YR	20YR
2021	7.40%	7.17%	6.36%	6.50%	11.08%	8.37%	7.52%	7.47%
2020	6.78%	7.04%	6.16%	6.39%	6.00%	7.16%	6.05%	5.58%
2019	6.84%	7.11%	6.24%	6.64%	5.19%	8.23%	6.37%	5.93%
2018	7.12%	5.61%	6.25%	6.87%	6.67%	6.17%	6.82%	6.04%
2017	7.09%	5.55%	6.21%	7.15%	6.82%	4.82%	6.68%	6.35%

	VSTRS Most Recent Average Returns							
	Based on Actuarial Value				Based on Market Value			
As Of FY	5YR	10YR	15YR	20YR	5YR	10YR	15YR	20YR
2021	7.54%	7.25%	6.31%	6.55%	11.46%	8.47%	7.39%	7.41%
2020	6.94%	7.15%	6.15%	6.47%	6.24%	7.33%	5.97%	5.74%
2019	6.91%	7.16%	6.21%	6.67%	5.23%	8.49%	6.28%	5.92%
2018	7.18%	5.32%	6.23%	6.90%	6.70%	5.92%	6.75%	6.10%
2017	7.12%	5.28%	6.17%	7.13%	6.96%	4.42%	6.65%	6.39%

VSERS Actuarial Investment Returns				
FY Ending	Actuarial Value Investment Return		Market Value Investment Return	
	Amount	Percent	Amount	Percent
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2011	$ 129,010,590	9.32%	$ 268,197,459	20.97%
2012	$ 91,041,364	6.25%	$ 31,182,310	2.09%
2013	$ 99,823,830	6.72%	$ 127,041,593	8.70%
2014	$ 125,880,755	8.29%	$ 219,532,643	14.44%
2015	$ 103,064,276	6.50%	$ (1,244,071)	-0.07%
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2019	$ 126,427,866	6.87%	$ 113,804,311	6.30%
2020	$ 123,556,188	6.40%	$ 85,703,874	4.55%
2021	$ 198,785,933	9.87%	$ 514,152,415	26.64%

	VSERS Most Recent Average Returns							
	Based on Actuarial Value				Based on Market Value			
As Of FY	5YR	10YR	15YR	20YR	5YR	10YR	15YR	20YR
2021	7.40%	7.17%	6.36%	6.50%	11.08%	8.37%	7.52%	7.47%
2020	6.78%	7.04%	6.16%	6.39%	6.00%	7.16%	6.05%	5.58%
2019	6.84%	7.11%	6.24%	6.64%	5.19%	8.23%	6.37%	5.93%
2018	7.12%	5.61%	6.25%	6.87%	6.67%	6.17%	6.82%	6.04%
2017	7.09%	5.55%	6.21%	7.15%	6.82%	4.82%	6.68%	6.35%

VSERS - CONTRIBUTORS TO UNFUNDED LIABILITY GROWTH

VSERS Drivers of Unfunded Liability Growth, FY2007-2021

	Fiscal Year	Amortization Period Begins 2009																						
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total FY07-21	Total FY09-21
Beginning FY Unfunded Liability	$ 9,044,004	$ (11,043,959)	$ 87,100,468	$ 326,506,488	$ 293,920,094	$ 346,537,738	$ 401,824,745	$ 445,130,082	$ 444,014,328	$ 542,558,818	$ 582,183,599	$ 717,577,722	$ 779,804,010	$ 815,464,698	$ 1,040,465,119	$ 9,044,004	$ 87,100,468
Changes in Actuarial Assumptions	$ (15,744,285)	$ 7,231,106	$ -	$ -	$ 26,425,265	$ 31,587,726	$ 33,541,162	$ 35,135,638	$ 84,606,837	$ 6,099,167	$ 49,130,291	$ -	$ -	$ 222,828,699		$ 480,841,346	$ 489,354,525
Changes in System Provisions	$ -	$ 56,389,496	$ (8,946,746)	$ -	$ 22,252	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 47,465,002	$ (8,924,494)
Incorporation of Temp Salary Decreases	$ -	$ -	$ -	$ (69,913,212)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ (69,913,212)	$ (69,913,212)
Change in Employee Contribution Rate	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (2,610,261)	$ -	$ -	$ -	$ -		$ (2,610,261)	$ (2,610,261)
																$ -	$ -
All Other Expected Increases/Reductions																$ -	
Excluding Above:																	
Normal Cost	$ 2,523,380	$ (1,887,100)	$ 5,158,736	$ 16,450,711	$ 3,408,119	$ (4,722,226)	$ (17,992,939)	$ (18,717,376)	$ (17,066,501)	$ (4,099,308)	$ (8,507,716)	$ (2,213,895)	$ 2,639,467	$ (12,351,185)	$ 12,683,162	$ (44,914,681)	$ (45,559,961)
Contributions In	$ 36,113,361	$ 36,091,226	$ 44,574,324	$ 42,730,487	$ 38,979,778	$ 41,517,079	$ 38,217,558	$ 42,234,214	$ 44,725,724	$ 41,057,178	$ 42,703,770	$ 48,737,692	$ 52,027,602	$ 51,152,694	$ 70,795,127	$ 678,655,614	$ 603,451,027
Interest	$ (35,798,190)	$ (41,609,832)	$ (48,324,859)	$ (54,536,763)	$ (60,584,812)	$ (68,388,004)	$ (81,856,395)	$ (88,682,529)	$ (89,600,885)	$ (88,085,721)	$ (97,032,971)	$ (105,542,404)	$ (107,734,805)	$ (125,926,229)	$ (131,304,523)	$ (1,225,618,922)	$ (1,148,210,900)
	$ 2,208,209	$ 631,506	$ 8,909,271	$ 28,256,087	$ 25,013,153	$ 22,148,689	$ 25,045,898	$ 27,730,639	$ 27,788,660	$ 42,936,235	$ 45,821,485	$ 53,590,817	$ 58,347,270	$ 60,423,950	$ 73,192,558	$ 502,048,627	$ 466,208,912
																$ -	$ -
																$ -	$ -
Experience (Gain)/Losses																$ -	
Other Expense Gain/Loss	$ -	$ 955,848	$ (2,531,248)	$ 891,478	$ 1,487,355	$ 1,369,818	$ 1,416,960	$ 1,193,828	$ 2,169,411	$ 1,844,878	$ -	$ -	$ -	$ -	$ -	$ 8,798,318	$ 7,842,470
Salary Experience Gain/Loss	$ (7,261,077)	$ (30,350)	$ (79,064)	$ (105,795)	$ 35,867,925	$ 10,916,553	$ 23,416,670	$ 4,183,550	$ (8,216,692)	$ 4,731,224	$ 14,254,036	$ 7,120,663	$ (344,400)	$ 3,697,977	$ 4,448,937	$ 92,600,157	$ 99,891,584
COLA Experience Gain/Loss	$ (252,995)	$ (1,184,450)	$ 8,272,076	$ (19,948,790)	$ (7,281,265)	$ 2,278,408	$ (7,319,398)	$ (6,030,170)	$ (11,711,910)	$ (29,591,395)	$ (15,467,145)	$ 726,790	$ (11,993,826)	$ (23,969,841)	$ 35,588,639	$ (87,995,278)	$ (86,557,833)
Net Turnover	$ 1,638,107	$ 13,017,851	$ (819,098)	$ 2,042,729	$ 1,963,014	$ 5,652,331	$ 6,472,581	$ 7,304,431	$ 6,521,089	$ 8,317,659	$ 13,064,871	$ 7,931,592	$ 1,588,998	$ 2,812,974	$ (3,446,914)	$ 74,062,815	$ 59,406,857
Investments	$ (23,408,590)	$ 23,651,900	$ 242,482,443	$ 18,552,665	$ (13,037,923)	$ 5,767,759	$ (130,930)	$ (22,572,940)	$ 3,052,108	$ 24,616,058	$ 11,338,110	$ 10,076,141	$ 13,757,751	$ 23,938,803	$ (52,180,733)	$ 265,303,616	$ 265,060,306
Mortality	$ 10,151,465	$ (1,704,255)	$ (1,459,717)	$ (6,662,067)	$ 4,824,300	$ 4,809,926	$ 4,487,254	$ 5,949,161	$ 4,016,775	$ 4,361,697	$ 9,160,867	$ 4,854,533	$ 1,885,105	$ (3,692,473)	$ 4,440,365	$ 45,422,836	$ 36,975,626
Retirements	$ 13,164,074	$ 3,106,026	$ (5,165,508)	$ 19,969,509	$ 7,040,422	$ 8,036,027	$ 1,549,045	$ 2,414,112	$ 3,543,687	$ 23,347,399	$ 12,233,344	$ 17,048,638	$ 13,424,864	$ 8,802,489	$ 19,015,951	$ 147,610,079	$ 131,339,979
Disability Experience	$ (838,042)	$ (486,572)	$ (710,401)	$ 1,355,018	$ (487,913)	$ (3,127)	$ 172,204	$ (725,311)	$ 753,213	$ 1,207,377	$ 1,124,342	$ 491,425	$ (291,792)	$ 434,484	$ 158,342	$ 2,248,741	$ 3,160,211
Other gain/loss	$ -	$ (1,858,717)	$ 3,264,607	$ 4,781,360	$ (6,903,747)	$ (10,096,078)	$ (2,707,282)	$ (9,240,465)	$ 30,893,873	$ 2,000,386	$ 49,073,123	$ 16,190,401	$ 14,944,521	$ 2,407,484	$ 3,195,331	$ 95,904,717	$ 97,792,934
Ending FY Unfunded Liability	$ (11,043,959)	$ 87,100,468	$ 326,506,488	$ 293,920,094	$ 346,537,738	$ 401,824,745	$ 445,130,082	$ 444,014,328	$ 542,558,818	$ 582,183,599	$ 717,577,722	$ 779,804,010	$ 815,464,698	$ 1,040,465,119	$ 1,064,368,199	$ 1,064,368,199	$ 1,064,368,199

VSTRS - CONTRIBUTORS TO UNFUNDED LIABILITY GROWTH

VSTRS Drivers of Unfunded Liability Growth, FY2007-2021

Fiscal Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total FY07-21	Total FY09-21
			Amortization Period Begins 2009														
Beginning FY Unfunded Liability	$ 259,108,435	$ 274,790,333	$ 379,505,069	$ 727,758,505	$ 711,823,060	$ 845,107,879	$ 945,502,315	$ 1,013,910,284	$ 1,076,763,809	$ 1,175,029,029	$ 1,225,727,844	$ 1,502,453,386	$ 1,513,433,334	$ 1,554,459,286	$ 1,933,289,366	$ 259,108,435	$ 379,505,069
Expected Adjustments not including assumption/benefit changes	$ 1,550,581	$ 2,390,471	$ 6,838,673	$ 32,206,808	$ 11,653,535	$ (550,458)	$ (2,670,835)	$ (7,108,974)	$ (5,728,960)	$ 12,768,859	$ 11,629,574	$ (1,769,543)	$ (7,906,560)	$ (13,853,722)	$ 29,161,313	$ 68,610,762	$ 64,669,710
Normal Cost	$ 41,245,249	$ 42,871,112	$ 35,690,059	$ 38,136,165	$ 35,846,531	$ 35,206,405	$ 36,673,377	$ 36,150,845	$ 36,629,593	$ 33,880,724	$ 35,383,370	$ 40,127,656	$ 39,773,702	$ 40,751,637	$ 72,122,496	$ 601,687,921	$ 517,571,560
Contributions In	$ (61,668,307)	$ (64,066,137)	$ (60,652,640)	$ (67,678,259)	$ (82,538,481)	$ (88,065,146)	$ (97,222,641)	$ (106,617,497)	$ (108,603,224)	$ (112,821,100)	$ (119,271,111)	$ (152,565,987)	$ (158,598,351)	$ (162,948,124)	$ (177,140,108)	$ (1,625,687,250)	$ (1,493,612,849)
Interest	$ 22,273,639	$ 23,615,496	$ 31,801,254	$ 60,548,902	$ 58,345,485	$ 52,309,253	$ 58,378,429	$ 62,377,678	$ 66,244,671	$ 91,709,435	$ 95,517,315	$ 111,058,788	$ 102,918,089	$ 113,342,765	$ 134,178,925	$ 1,052,620,134	$ 1,046,730,999
Assumption Changes	$ -	$ 45,302,660	$ -	$ -	$ 54,007,732	$ 43,012,727	$ 44,499,276	$ 46,354,354	$ 94,966,380	$ -	$ 190,793,964	$ (38,599,309)	$ -	$ 334,265,096	$ -	$ 814,661,820	$ 769,358,160
Plan provisions	$ -	$ 120,335	$ -	$ (46,529,457)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (46,409,122)	$ (46,529,457)
Net Investments	$ (32,083,462)	$ 26,035,387	$ 312,726,392	$ 26,279,396	$ (8,517,121)	$ 6,447,642	$ (356,798)	$ (23,737,319)	$ 2,526,059	$ 24,080,857	$ 10,258,663	$ 8,406,965	$ 11,592,854	$ 21,306,965	$ (57,785,688)	$ 327,210,992	$ 333,294,067
Salary	$ (3,581,940)	$ 167,082	$ 16,569	$ (213,758)	$ (24,546,383)	$ (18,940,673)	$ (26,621,253)	$ (2,246,986)	$ (8,024)	$ (11,832,938)	$ (10,257,168)	$ (10,530,812)	$ (10,427,130)	$ (10,428,437)	$ (9,493,027)	$ (138,884,505)	$ (135,470,051)
COLA Experience Gain/Loss	$ (217,412)	$ (1,312,463)	$ 9,112,436	$ (22,127,388)	$ (5,771,530)	$ 2,591,239	$ (18,895,595)	$ (7,796,599)	$ (8,375,695)	$ (25,808,649)	$ (8,993,747)	$ 1,386,560	$ (7,683,366)	$ (8,838,015)	$ 22,593,555	$ (80,136,679)	$ (78,606,804)
Mortality	$ 11,249,513	$ 47,304	$ (751,028)	$ (12,196,378)	$ 2,167,726	$ 4,238,443	$ 4,851,424	$ 2,503,288	$ (12,663,974)	$ 8,795,806	$ 4,776,996	$ (747,793)	$ 2,743,845	$ 3,335,043	$ (1,761,349)	$ 16,588,869	$ 5,292,052
Retirements	$ 50,324,971	$ (7,384,293)	$ (7,834,716)	$ (13,027,972)	$ 16,297,444	$ 16,962,996	$ 10,034,162	$ 7,255,861	$ 20,398,024	$ 16,650,803	$ 14,884,756	$ 15,053,147	$ 20,019,165	$ 24,972,035	$ 16,872,089	$ 200,882,472	$ 158,541,794
Disability Experience	$ -	$ 723,288	$ 819,381	$ (452,396)	$ 517,915	$ 1,034,926	$ 698,282	$ 128,073	$ (83,400)	$ 138,601	$ 18,161	$ 36,314	$ 128,020	$ 53,881	$ 560,942	$ 4,321,988	$ 3,598,700
Net Turnover	$ (32,133,353)	$ 21,437,443	$ 12,796,566	$ (1,493,927)	$ 32,780,627	$ 56,985,971	$ 40,978,113	$ 34,812,142	$ 20,849,237	$ 27,649,896	$ 33,675,285	$ 29,368,302	$ 21,031,002	$ 21,770,846	$ 10,518,767	$ 330,966,916	$ 341,662,826
Contribution Shortfall including Healthcare Approp.	$ 20,573,000	$ 16,876,994	$ 17,670,950	$ 19,287,898	$ 21,240,905	$ 23,121,145	$ 25,101,767	$ 27,156,759	$ 2,630,383	$ 2,248,220	$ -	$ -	$ -	$ -	$ -	$ 175,907,621	$ 138,457,627
Other Gains/Losses	$ -	$ 910,528	$ (1,081,787)	$ 2,331,939	$ 33,393,969	$ (34,509,522)	$ (9,210,574)	$ (14,467,074)	$ (16,244,810)	$ (3,992,638)	$ 29,916,088	$ 8,326,177	$ 11,508,122	$ 6,226,388	$ 6,407,934	$ 17,534,740	$ 16,624,212
Ending FY Unfunded Liability	$ 274,790,333	$ 379,505,069	$ 727,758,505	$ 711,823,060	$ 845,107,879	$ 945,502,315	$ 1,013,910,284	$ 1,076,763,809	$ 1,175,029,029	$ 1,225,727,844	$ 1,502,453,386	$ 1,513,433,334	$ 1,554,459,286	$ 1,933,289,366	$ 1,950,363,905	$ 1,950,363,905	$ 1,950,363,905