



Benefits and Actuarial Committee (B&A) Meeting

**1111 E. Main Street
3rd Floor Board Room
Richmond, VA 23219
Wednesday, 10/13/2021
10:00 AM - 1:00 PM ET**

I. Welcome and Introductions

II. Approve Minutes

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III. Action Item

Cavanaugh Macdonald Consulting, LLC, 2021 Actuarial Valuation Results for Five Statewide Retirement Plans, Group Life Insurance, State and Teacher Retiree Health Insurance Credit, and the Virginia Sickness and Disability Program (includes self-funded Long-Term Care)

- **RBA - Certify the contribution rates for the Five Statewide Retirement Plans and associated OPEBs effective for FY 2023 and FY 2024.**

RBA_RatesForFiveStatewidePlansAndAssociated OPEBs - Page 6

VRS Presentation 2021 BA FINAL 10.13.21 (10.11.21) - Page 8

IV. Information Item

- **Upcoming B&A Committee Meeting**
- November 15, 2021 at 1:00 p.m. - Local Valuations and Line of Duty Act

Minutes

An electronic meeting of the Virginia Retirement System Benefits and Actuarial Committee was held on September 1, 2021 pursuant to § 2.2-3708.2(A)(3) of the *Code of Virginia*, with the following members participating:

William A. Garrett, Vice Chair
Michael P. Disharoon
John Bennett

Board members present:
O’Kelly E. McWilliams, III, Board Chair (*entered at 1:14 p.m.*)
Hon. J. Brandon Bell, II
Troilen G. Seward

VRS Staff:
Patricia Bishop, Jennifer Schreck, Rory Badura, Judy Bolt, Jeanne Chenault, Cassandra Coles, Michael Cooper, Sara Denson, Valerie Disanto, Barry Faison, Andy Feagans, Brian Goodman, Krystal Groff, Robert Irving, Angela Payne, Mark Rein, Jillian Sherman and Cindy Wilkinson.

Guests:
NaTosha Palmer, Securian; Adam Rosatelli, Senate Finance and Appropriations Committee; Latosha Johnson, Department of Planning and Budget; Jamie Bitz, Joint Legislative Audit and Review Commission; Jessica Dotson, Virginia Municipal League; and Bea Snidow, Virginia Education Association.

The meeting convened at 1:01 p.m.

Opening Remarks

Mr. Garrett called the meeting to order and welcomed everyone to the September 1, 2021 meeting of the Benefits and Actuarial Committee.

Next, Mr. Garrett noted that due to the Governor’s declared state of emergency related to tropical depression Ida, the Committee is unable to meet in person and, therefore, used electronic means to hold the meeting in accordance with § 2.2-3708(A)(3) of the *Code of Virginia*.

Mr. Garrett then took attendance with the following roll call:

Mr. Bell: Here
Mr. Bennett: Here
Mr. Disharoon: Here
Ms. Seward: Here
Mr. Garrett: Here

Approve Minutes

Upon Mr. Bennett's motion, with a second by Mr. Disharoon, the Committee approved the minutes of its June 9, 2021 meeting upon the following roll call vote*:

Mr. Bell: Aye
Mr. Bennett: Aye
Mr. Disharoon: Aye
Ms. Seward: Aye
Mr. Garrett: Aye

**Mr. McWilliams was not present for this vote.*

Election of Committee Vice Chair

Mr. Garrett advised that the next item of business was to elect a Committee Vice Chair. Mr. Bennett moved, with a second by Ms. Seward, to nominate Michael P. Disharoon to serve as Vice Chair. The Committee approved the nomination upon the following roll call vote*:

Mr. Bell: Aye
Mr. Bennett: Aye
Mr. Disharoon: Aye
Ms. Seward: Aye
Mr. Garrett: Aye

**Mr. McWilliams was not present for this vote.*

Group Life Insurance

Robert Irving, Customer Services Director, presented the recommendation of VRS' third-party administrator, Securian, to increase the optional group life insurance maximum coverage from four times creditable compensation to eight times creditable compensation. The increase is subject to an unchanged maximum dollar amount limit of coverage, which is reviewed at least once every five years by the Board's actuary and, upon their recommendation, increased by the Board.

The guaranteed issue maximum of four times creditable compensation, or \$400,000, will remain the same, as will the coverage maximum of \$800,000. Securian has proposed a one-time opportunity for members to increase coverage without underwriting and subject to the maximum amounts. Current employees will be able to increase existing coverage by one-times creditable compensation, subject to the guaranteed issue limit.

VRS and Securian are partnering to provide members online access to apply for optional life insurance coverage within myVRS by the end of the calendar year. The online application functionality will integrate with myVRS online capabilities and provide an easier application process for members.

Mr. Garrett thanked Mr. Irving for his presentation.

Following some discussion, the Committee recommended approval of the RBA with a delayed effective date to allow planned online functionality to be in place prior to allowing Securian to implement the increase. Staff will inform the Board of the effective date of the change at a subsequent Board meeting.

RBA: Approve with a delayed effective date increasing optional insurance maximum coverage from up to four times annual salary to eight times annual salary (subject to an unchanged maximum dollar amount limit of coverage).

Request for Board Action: After considering the recommendations of its group life insurance third-party administrator, the Board approves increasing optional insurance maximum coverage from four times annual salary to eight times annual salary (subject to an unchanged maximum dollar amount limit of coverage).

Upon a motion by Mr. Bennett, with a second by Mr. Disharoon, the Committee recommended approval of the action to the full Board of Trustees upon the following roll call vote:

Mr. Bell: Aye
Mr. Bennett: Aye
Mr. Disharoon: Aye
Mr. McWilliams: Aye
Ms. Seward: Aye
Mr. Garrett: Aye

Information Items

Review Stress Test and Sensitivity Analysis Report

Rory Badura, Senior Staff Actuary, presented the findings of the VRS Stress Test and Sensitivity Analysis report. He noted that the report is based on the June 30, 2020 actuarial valuation and reflects the changes to actuarial assumptions adopted by the VRS Board of Trustees in April 2021 as a result of the quadrennial experience study, as well as the 27.5% investment return earned in fiscal year 2021. The report provided analysis of risk to long-term funding, including investment volatility, contribution risk and longevity risk.

The report analyzes the potential effect on plan funding of various adverse economic scenarios that illustrate impacts of higher inflation and continued market uncertainty related to COVID variants. The report focuses on adverse events as they better highlight areas of risk. In addition, the impacts of the recent change in the VRS mortality table, which incorporates generational mortality improvement, were highlighted showing the increases in life expectancy and corresponding increases in unfunded liabilities. The change in the mortality table is expected to better position the plan to deal with longevity risk.

As in prior years, the report continued to highlight opportunities that exist to proactively address the legacy unfunded liabilities and to better position the retirement plans to provide financial stability for current and future members. Due to the uncertainty surrounding the COVID-19 recovery and the

corresponding impacts on the economy at large, analysis of future impacts on the VRS trust fund will continue as new information becomes available.

Mr. Garrett thanked Mr. Badura for his report.

Ms. Bishop then provided the Committee with additional information pertaining to an inquiry related to the optional group life insurance presentation. She advised that, as of June 30, 2021, there were 69,607 active members, 3,438 retirees, 26,409 spouses, and 26,607 dependents covered by the optional group life insurance program.

Upcoming B&A Meetings

Next, Mr. Garrett reviewed the B&A Committee's remaining 2021 meeting schedule and the confirmed 2022 meeting schedule:

- October 13, 2021 at 10:00 a.m.
- November 15, 2021 at 1:00 p.m.
- February 9, 2022 at 1:00 p.m.
- June 6, 2022 at 1:00 p.m.
- October 17, 2022 at 1:00 p.m.
- November 14, 2022 at 1:00 p.m.

Lastly, Mr. Garrett noted that the DCPAC will meet September 2nd at 1:00 p.m., the Audit and Compliance Committee will meet September 13th at 1:30 p.m., the Administration and Personnel Committee will meet September 15th at 10:00 a.m., and the full Board of Trustees will meet September 21st at 1:00 p.m.

Adjournment

Upon a motion by Ms. Seward, with a second by Mr. Bennett, the Committee agreed to adjourn the meeting upon the following roll call vote:

Mr. Bell: Aye
Mr. Bennett: Aye
Mr. Disharoon: Aye
Mr. McWilliams: Aye
Ms. Seward: Aye
Mr. Garrett: Aye

There being no further business, the meeting concluded at 2:10 p.m.

Date

William A. Garrett, Chair
Benefits and Actuarial Committee



Certify the contribution rates for the Five Statewide Retirement Plans and associated OPEBs effective for FY 2023 and FY 2024.

Requested Action

After considering the recommendations of its actuary, the Board certifies the rates as presented for: the five statewide Retirement Plans (State Employees, Teachers, JRS, SPORS, and VaLORS) and the associated OPEBs; Group Life Insurance (GLI); Health Insurance Credit (HIC); and the Virginia Sickness and Disability Program (VSDP), including self-funded Long-Term Care, all effective July 1, 2022.

Rationale for Requested Action

In accordance with *Code of Virginia* § 51.1-145, the VRS Board of Trustees determines the required contribution rate for the various employer groups in the Retirement Program. Based on the June 30, 2021 actuarial valuations conducted by the VRS plan actuary, Cavanaugh Macdonald LLC, the Board certifies the full employer contribution rates as follows:

Retirement Systems

Fiscal Year 2023/2024

Plan	Full Employer Rate for Defined Benefit Plan	Estimated Employer Rate for Hybrid Defined Contribution Component	Board Certified Full Employer Contribution Rate
State Employees	13.07%	1.06%	14.13%
Teacher	13.95%	0.81%	14.76%
State Police Officers	29.98%	N/A	29.98%
Virginia Law Officers	24.60%	N/A	24.60%
Judges	28.81%	1.86%	30.67%

Contribution rates for retirement systems are net of 5% member contribution rate.

Other Post Employment Benefit Plans (OPEBs)

Fiscal Year 2023/2024

Plan	Board Certified Full Employer Contribution Rate
Group Life	1.19%
HIC State	1.04%
HIC Teachers	1.21%
VSDP	0.56%

The certified employer contribution rates for the retirement systems and OPEBS listed above reflect the assumptions and provisions in effect as of June 30, 2021 including: 1) the assumption and method changes from the most recent experience study for the period from July 1, 2016 to June 30, 2020 and 2) the funding principles approved by the Board effective on or after June 30, 2013, as amended, which include a 30-year closed amortization of unfunded actuarial accrued liability as of 2013 with 30 years decreasing by one each year until reaching 0 years, and future annual increases or decreases in unfunded liability to be funded over closed 20-year periods beginning on each valuation date.

The certified employer contribution rates for the retirement plans and associated OPEBs will go into effect on July 1, 2022.

Authority for Requested Action

Code of Virginia § 51.1-145 authorizes the Board to determine the required contribution rate for the various employer groups in the Retirement Program.

The above action is approved.

O’Kelly E. McWilliams, III, Chair
VRS Board of Trustees

Date



Cavanaugh Macdonald
CONSULTING, LLC

The experience and dedication you deserve



Virginia
Retirement
System

Virginia Retirement System June 30, 2021 Actuarial Valuations

October 13, 2021

Larry Langer, ASA, FCA, MAAA, EA
Principal and Consulting Actuary

Alisa Bennett, FSA, FCA, MAAA, EA
President



- The Actuarial Valuation Process and Purpose

- June 30, 2021 Results:
 - Employer Contribution Rates
 - Funded Status
 - Unfunded Actuarial Accrued Liability (UAAL)

- Plan by Plan Analysis

- Appendix

Purpose of the June 30, 2021 Actuarial Valuation



- The actuarial valuation provides a basic source document for information regarding actuarially determined contributions (employer rates) as well as the funded status of pension and other post-employment benefit (OPEB) plans.

- The June 30, 2021 valuations will be used to set contribution rates for the two-year period from July 1, 2022 through June 30, 2024
 - Odd year valuations are for rate setting.
 - Even year valuations are for informational purposes.

Purpose of the June 30, 2021 Actuarial Valuation



- Each fall, CMC presents results over two Board meetings:

Pension	Other Post Employment Benefits (OPEB)
Virginia Retirement System <ul style="list-style-type: none"> ▪ State Employees ▪ Teachers ▪ Political Subdivisions Virginia Law Officers (VaLORS) State Police Officers (SPORS) Judges (JRS)	Group Life Insurance Fund Retiree Health Insurance Credit (HIC) <ul style="list-style-type: none"> ▪ State Employees ▪ Teachers ▪ Political Subdivisions ▪ Constitutional Officers ▪ Social Services Employees ▪ Registrars Virginia Sickness and Disability Program (VSDP) Virginia Local Disability Program (VLDP) <ul style="list-style-type: none"> ▪ Teachers ▪ Political Subdivisions Line of Duty Act Fund (LODA)

- We present results for the plans **in bold** in October; the remainder will be presented November.

Basic funding equation for benefits:

$$\mathbf{C + I = B + E}$$

Contributions + Investment returns = Benefits + Expenses

- Over the long term, actual investment returns, benefits and expenses determine the amount of contributions.
- Over the short term, estimated investment returns, benefits and expenses developed in an actuarial valuation will determine the amount of contribution.

- The valuation process can be viewed as a budgeting process. Like a budget, we make use of information we know as of a certain date, and using assumptions, we estimate what we think will happen in the future.
- Member data, asset data and benefit provisions are provided by Staff. Thank you!!
- Assumptions and funding methodology are determined by the Board of Trustees, Code of Virginia and GASB, with input from the actuary and other professionals.

Inputs

Member Data
Asset Data
Benefit Provisions
Assumptions
Funding Methodology



Results

Actuarial Value of Assets (AVA)
Actuarial Accrued Liability (AAL)
Net Actuarial Gain or Loss
Funded Ratio/UAAL
Employer Contribution Rates
Projections

Executive Summary

- Since the prior valuation, there have been several significant changes to assumptions as well as plan experience that differed from what was assumed which will impact future contribution rates.

- Significant factors that impacted results:
 - Assumptions changes
 - Investment return
 - Salary increases
 - Demographic changes
 - Possible COVID Impacts?
 - Headcounts are down in several plans
 - Higher terminations, deaths, and refunds
 - Fewer new hires

- The impact of these events had mixed results across plans as we will see on the following slides.

- The Teacher plan received an ad-hoc contribution of \$61.3 million in June 2021 which was applied to the 10-year deferred contribution balance.
- The State HIC plan received an ad-hoc contribution of \$38.7 million in June 2021.
- Investment gains had a smaller effect on OPEB plans than the pension plans because the OPEB plans had lower funded status so less opportunity for large gains.

Experience Study Recommendations

- Most significant change was to the mortality assumptions
 - PUB-2010 with generational mortality improvement scale

- Generally increased liabilities for pension plans and had mixed results on OPEB plans

Executive Summary



- Changes in assumptions recommended by CMC and adopted by the Board in April 2021 *generally* increased liabilities:

System	Actuarial Accrued Liability		
	Before Assumption Changes	After Assumption Changes	% Change in Liability
State	\$ 26,326,136	\$ 26,727,971	1.53%
Teachers	\$ 51,871,407	\$ 52,747,596	1.69%
SPORS	\$ 1,267,565	\$ 1,326,646	4.66%
VaLORS	\$ 2,339,223	\$ 2,407,153	2.90%
JRS	\$ 681,969	\$ 733,408	7.54%
Group Life	\$ 3,717,938	\$ 3,524,464	-5.20%
HIC State	\$ 1,033,299	\$ 1,044,663	1.10%
HIC Teachers	\$ 1,457,810	\$ 1,471,397	0.93%
VSDP	\$ 254,646	\$ 250,103	-1.78%

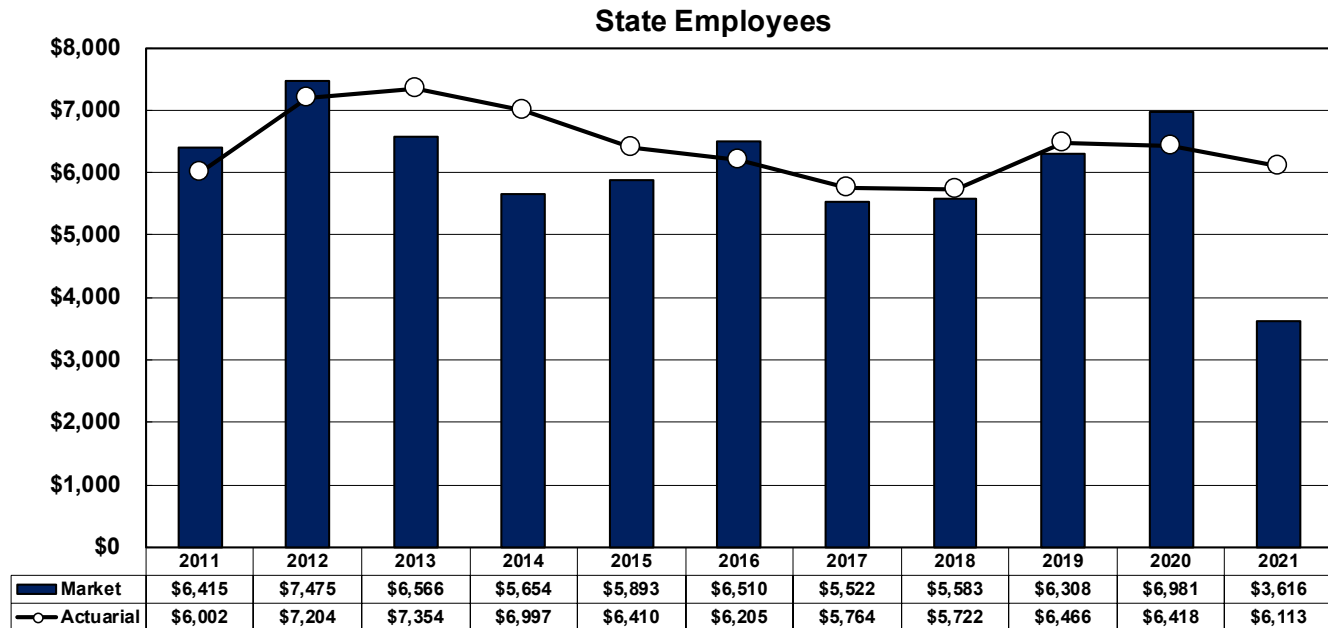
Investment Return for 2021

- Fiscal year investment return for 2021 was 27.5%
- Immediate positive impact to funded status on market value of asset basis
- Investment gain is phased in over a five-year period due to actuarial smoothing of assets for funding calculations

Executive Summary



- Since the actuarial value of assets smooths in the excess gains over a four-year period, the unfunded liabilities on an actuarial value of assets basis should trend downward toward the unfunded liabilities on a market value basis if all other assumptions are met. As seen in projections later, this could help to moderate future contribution rates.



- UAAL graphs for other plans are in the appendix and show similar patterns.

Salary Increases for State Employees

- Governor's budget included 5% salary increases for State employees, with additional compression increases for SPORS members.

System	Average Salary		% Change in Average Salary
	2020	2021	
State	\$ 58,992	\$ 62,350	5.70%
Teachers	\$ 56,401	\$ 57,125	1.30%
SPORS	\$ 68,220	\$ 73,341	7.50%
VaLORS	\$ 42,541	\$ 44,879	5.50%
JRS	\$ 166,445	\$ 174,669	4.90%

Demographic Changes

- Active headcounts are down for State, Teachers and VaLORS. There were more terminations, deaths and refunds than expected and fewer new hires.
- State agencies were generally under a hiring freeze for most of the period and most pay actions were suspended.
- Generally, the impact of demographic changes on the valuation results was less than the impact of the change in assumptions, market returns being more than expected and COLAs being less than expected.

Demographic Changes

System	Active Counts		
	2020	2021	% Change in Active Counts
State	\$ 75,069	\$ 73,686	-1.80%
Teachers	\$ 150,681	\$ 149,793	-0.60%
SPORS	\$ 1,924	\$ 1,947	1.20%
VaLORS	\$ 8,554	\$ 7,823	-8.50%
JRS	\$ 449	\$ 453	0.90%

Results

Employer Defined Benefit Contribution Rate Pension Plans

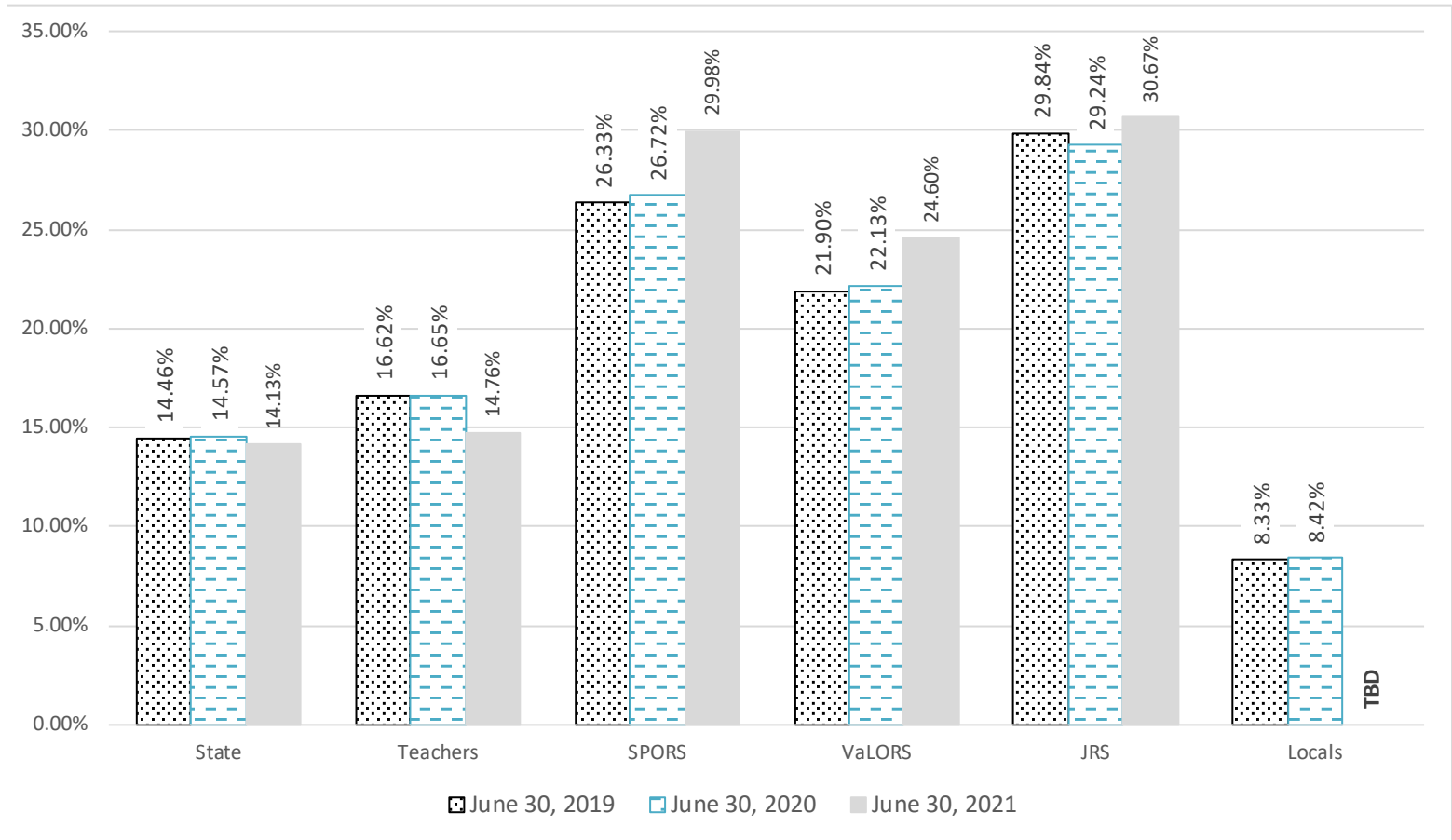


Chart of employer contribution results is also shown in appendix on slide 43.

Employer Contribution Rate OPEB Plans

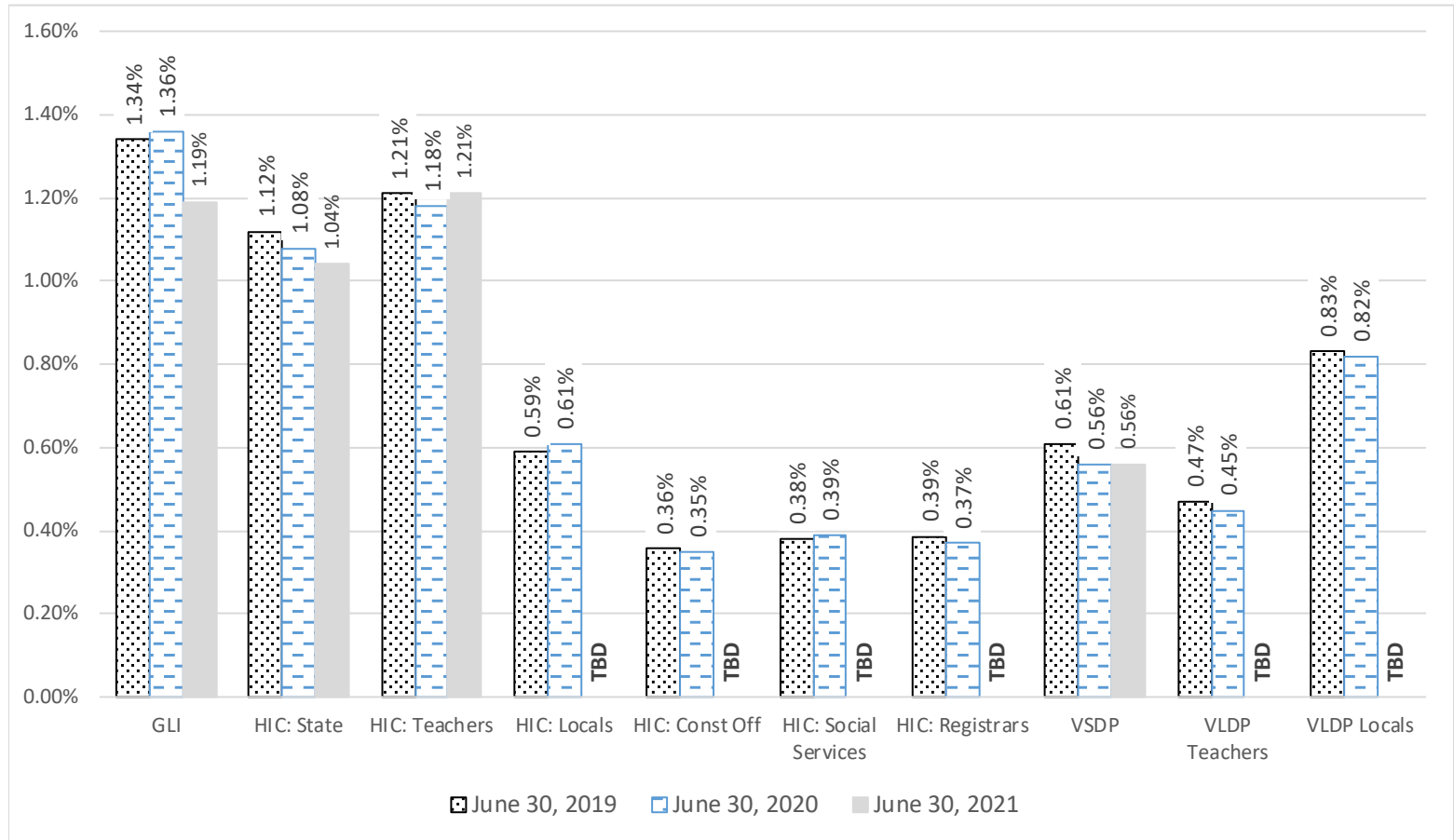
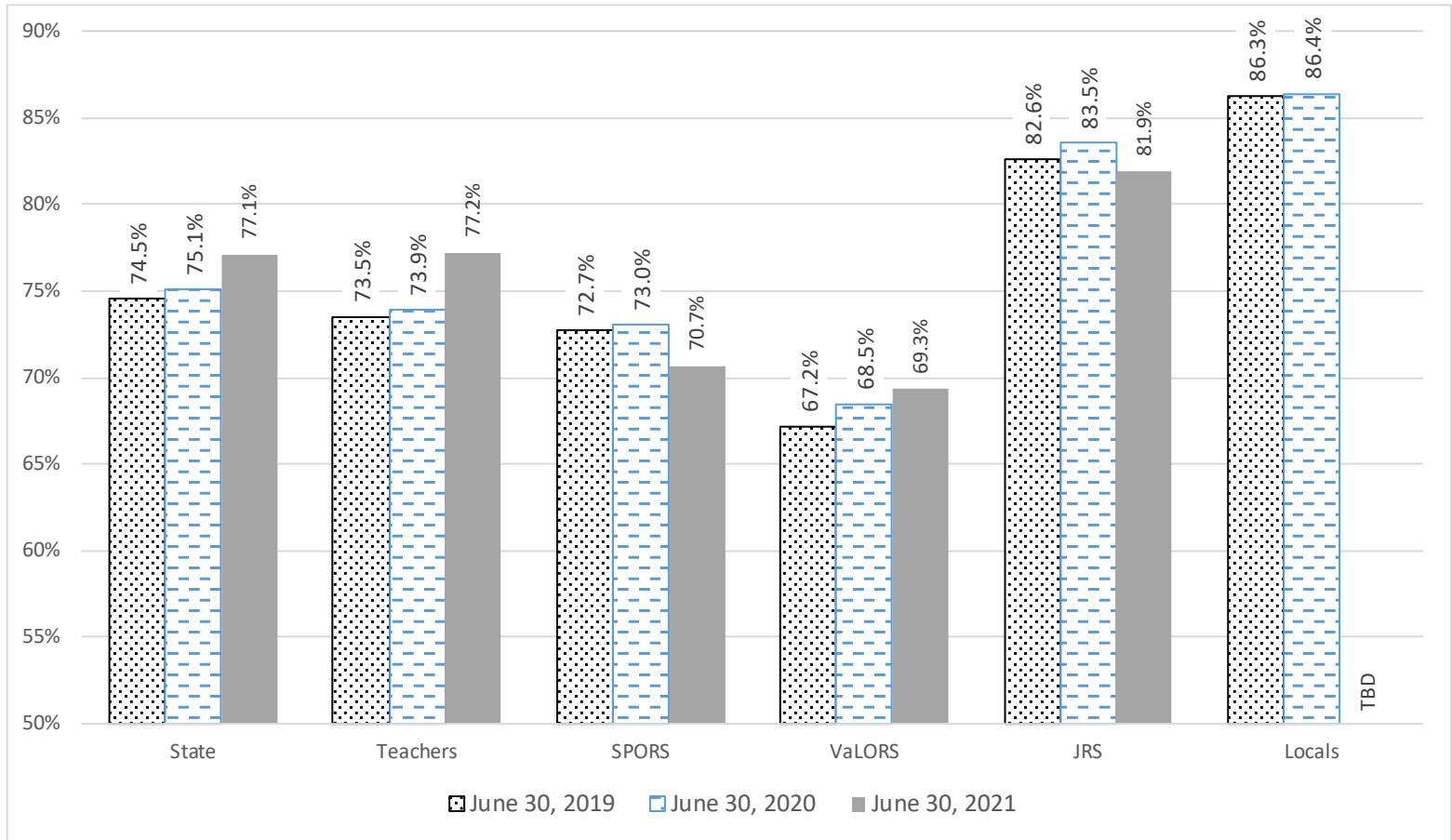
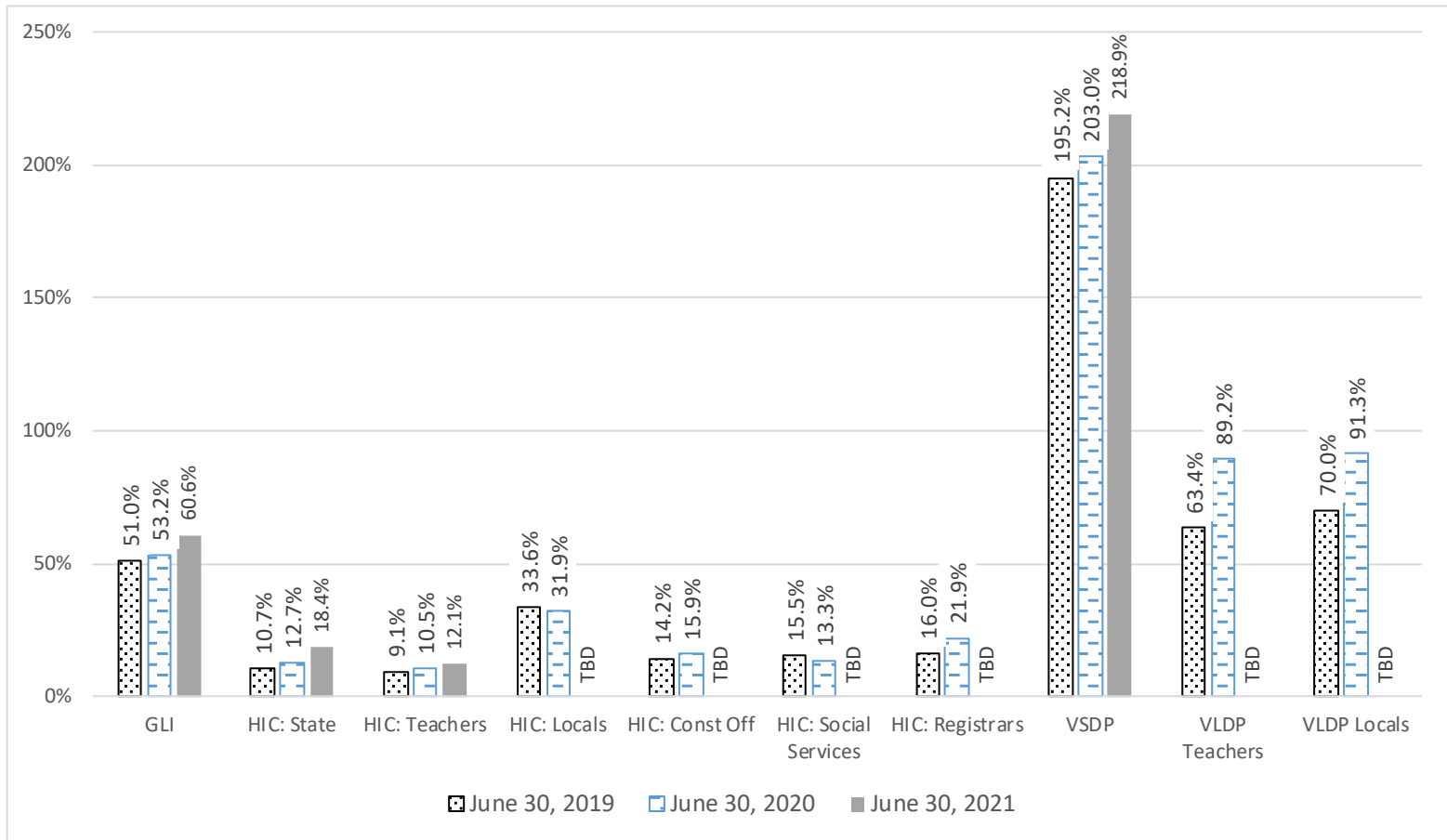


Chart of employer contribution results is also shown in appendix on slide 44.

Funded Ratio on Actuarial Value Pension Plans



Funded Ratio on Actuarial Value OPEB Plans



Unfunded Actuarial Accrued Liability on Actuarial Value Basis Pension Plans

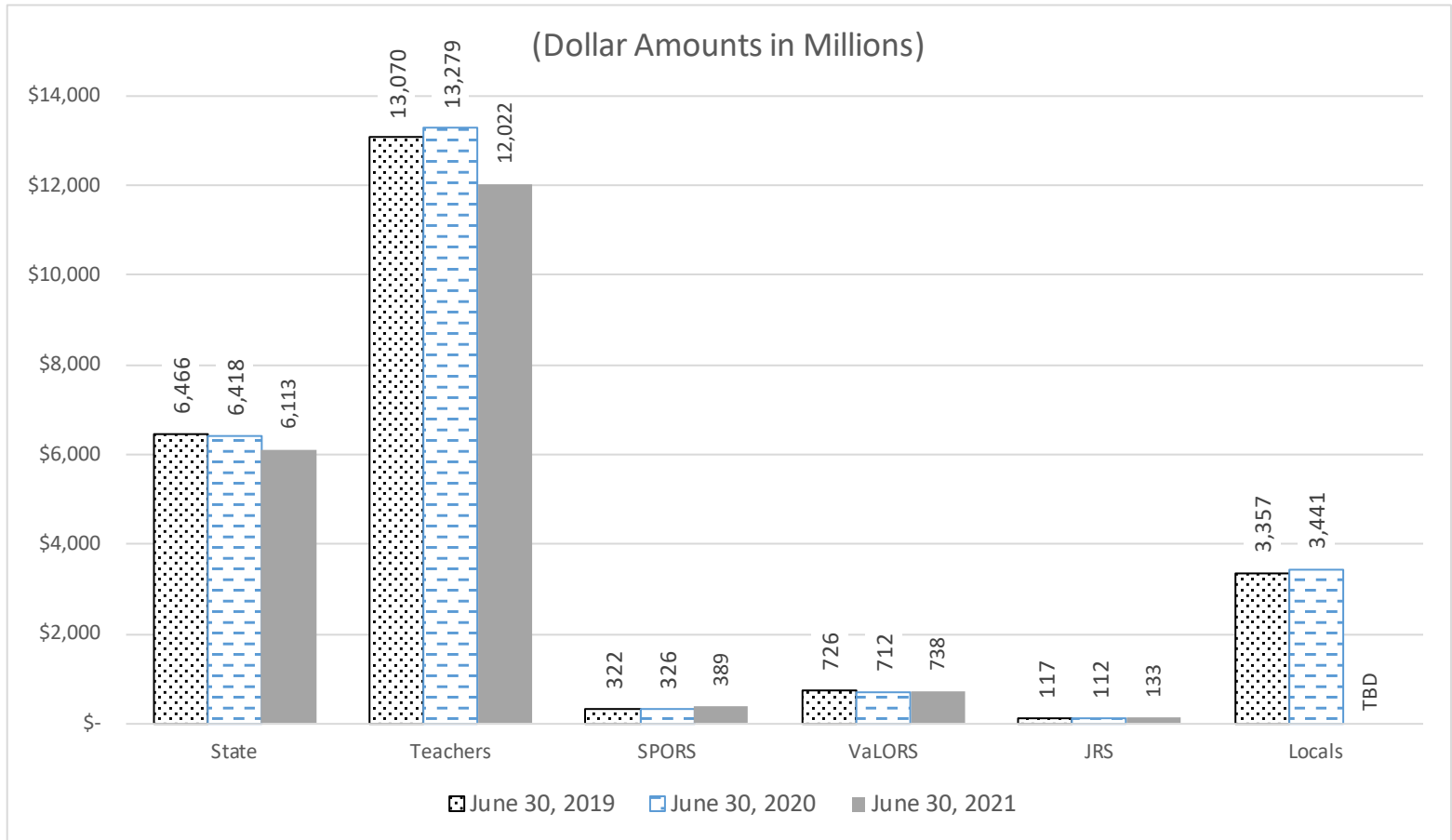


Chart of unfunded liabilities is also shown in appendix on slide 45.

Unfunded Actuarial Accrued Liability on Actuarial Value Basis

OPEB Plans

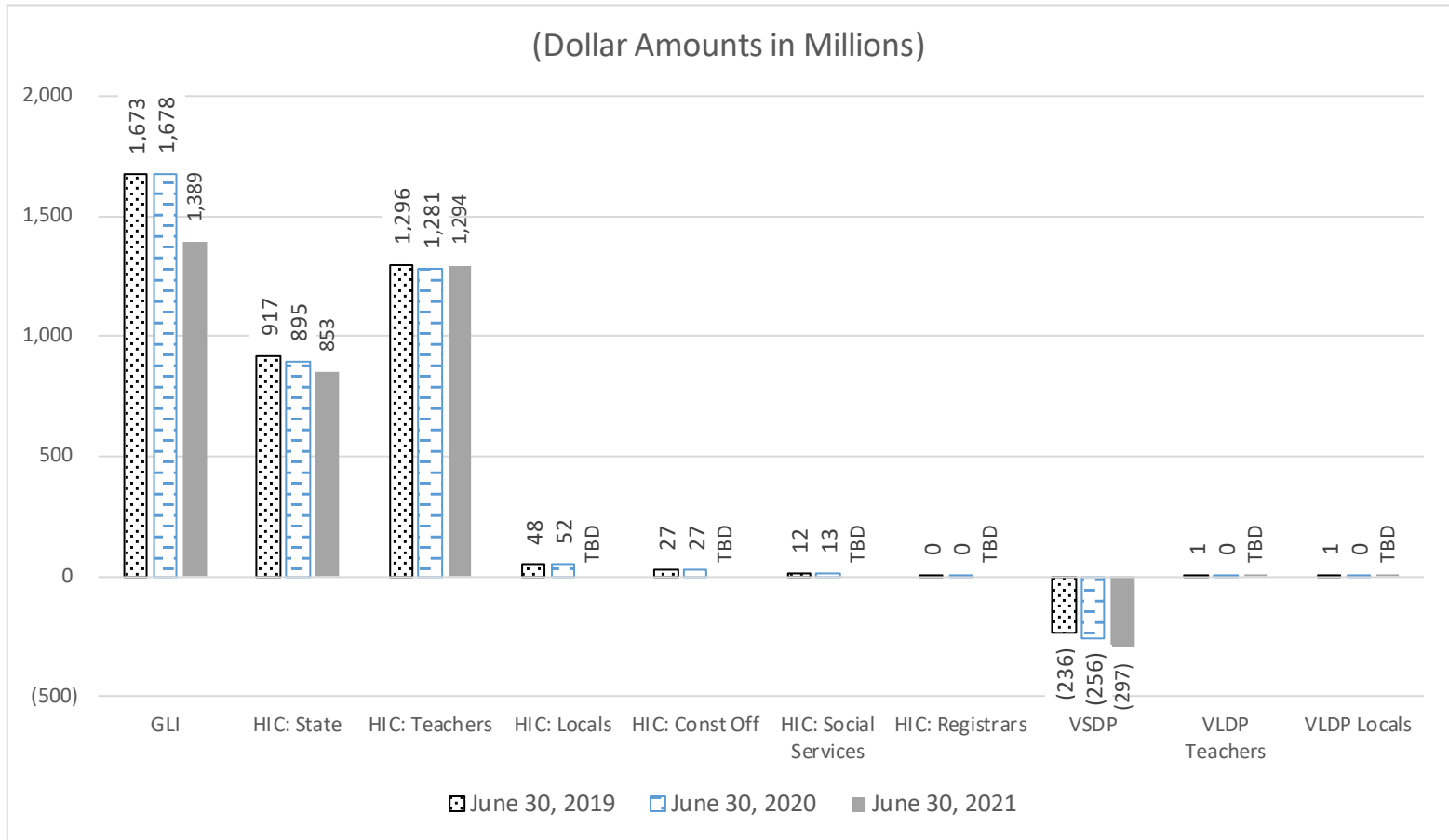
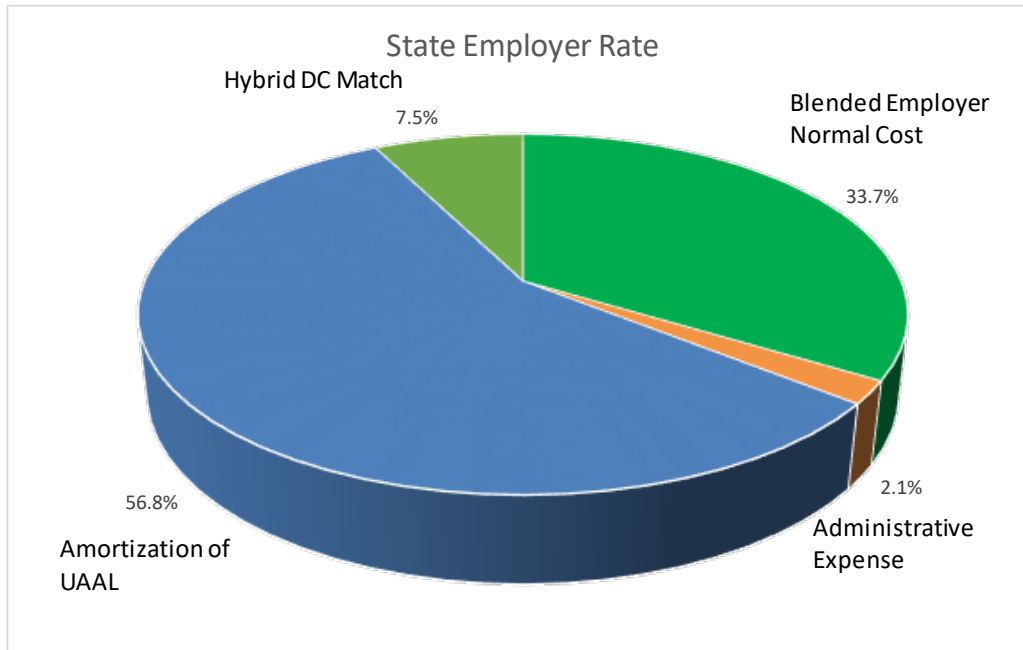


Chart of unfunded liabilities is also shown in appendix on slide 46.

Source of Change in UAAL

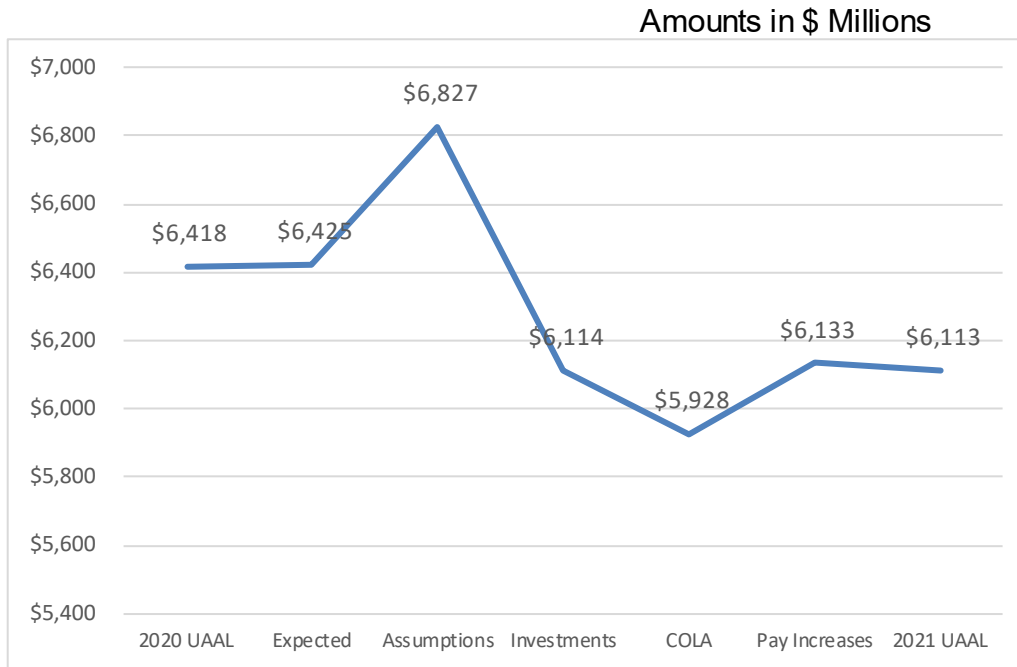
Breakdown of Employer Costs



- Normal cost rate remains relatively stable and continues to trend downward in plans that have hybrid membership.
- Nearly 57% of the employer rate is dedicated to paying down unfunded liabilities, with nearly all of the unfunded liabilities related to the legacy unfunded established in 2013.
- Understanding the impacts of gains and losses is crucial in managing the pay-off of unfunded liabilities.

Blended Employer Normal Cost Rate	4.76%
Administrative Expense	0.29%
Amortization of UAAL	8.02%
Total Defined Benefit Rate	13.07%
DC Contribution for Hybrid Members	1.06%
Total Employer Pension Rate	14.13%

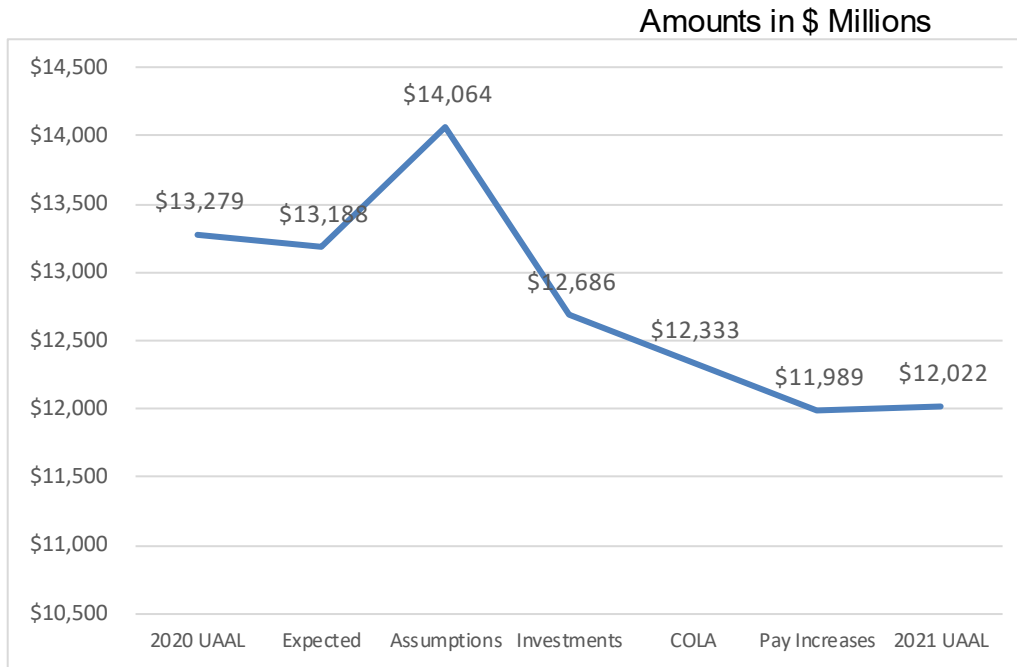
Change in UAAL due to FYE June 30, 2021 Plan Experience State Employees



Change in UAAL by Source	
Expected	\$ 7
Assumptions	402
Investments	(713)
COLA	(186)
Pay Increases	205
All Else	(20)
Total	(305)

- The increases in liability associated with assumption and method changes from the experience study were more than offset by the investment gain.
- Similarly, the decrease in liabilities associated with lower-than-expected COLAs was offset by the larger than expected pay increases.
- The State plan also experienced more deaths than expected which led to a gain of \$38.7 million.

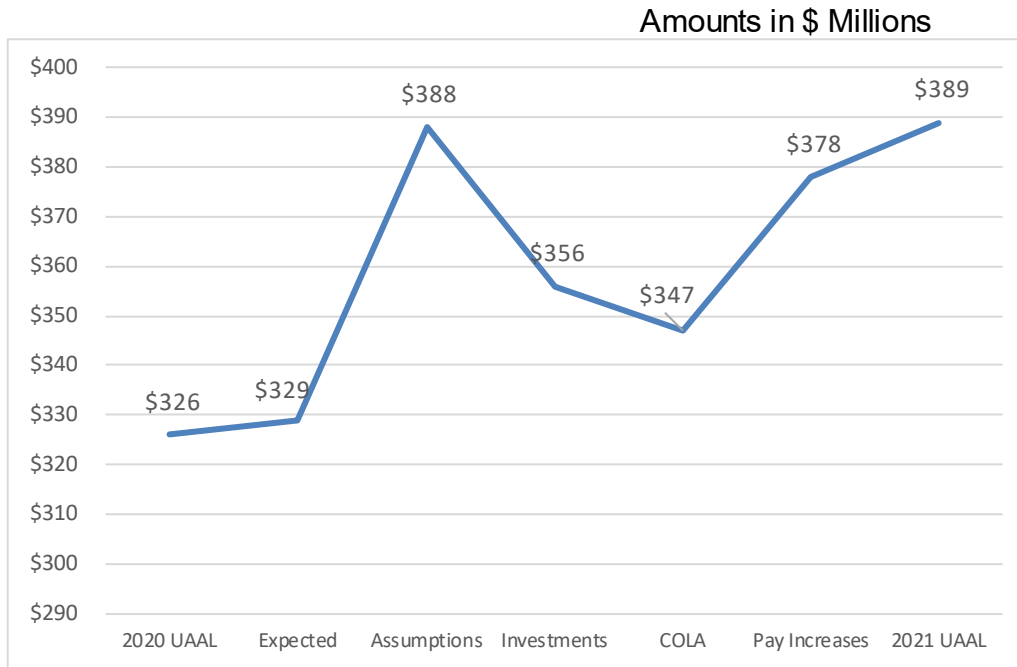
Change in UAAL due to FYE June 30, 2021 Plan Experience Teachers



Change in UAAL by Source	
Expected	(91)
Assumptions	876
Investments	(1,378)
COLA	(353)
Pay Increases	(344)
All Else	33
Total	(1,257)

- The increases in liability associated with assumption and method changes from the experience study were more than offset by the investment gain.
- Lower-than-expected COLAs and pay increases further decreased liabilities.
- Teacher plan received an extra contribution of \$61.3 million in June 2021.
- All other changes including the demographic changes increased the liabilities by approximately \$33 million.

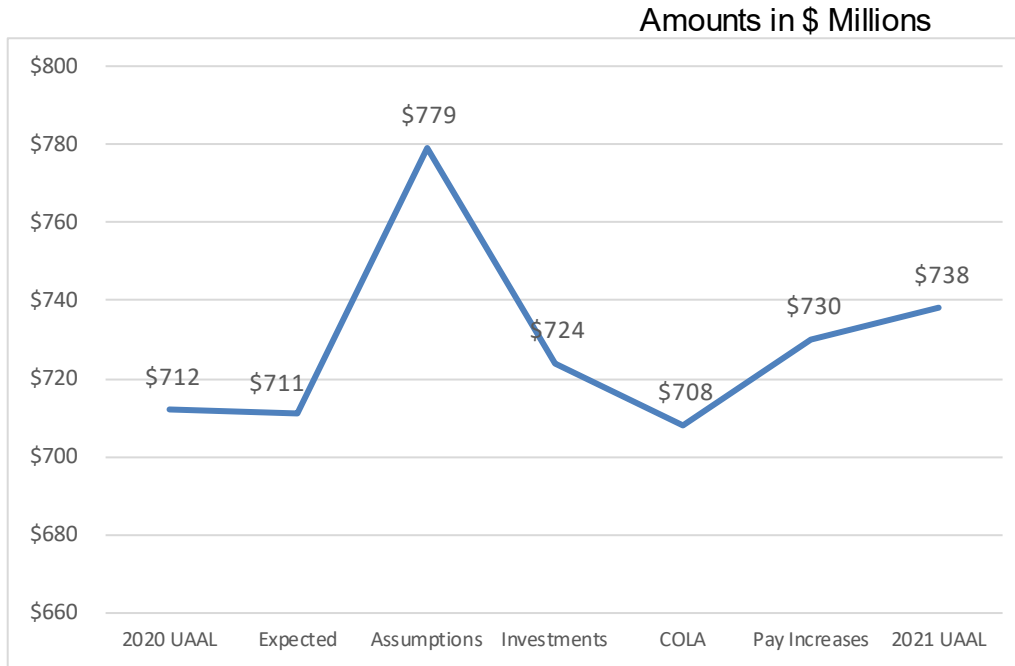
Change in UAAL due to FYE June 30, 2021 Plan Experience State Police



Change in UAAL by Source	
Expected	\$ 3
Assumptions	59
Investments	(32)
COLA	(9)
Pay Increases	31
All Else	11
Total	63

- The increases in liability associated with assumption and method changes from the experience study were partially offset by the investment gain.
- Similarly, higher-than-expected pay increases were partially offset by lower-than-expected COLAs. SPORS received 8% pay increases along with eligible members receiving further compression pay increases.
- All other changes including the demographic changes resulted in increasing the liabilities by approximately \$11 million.

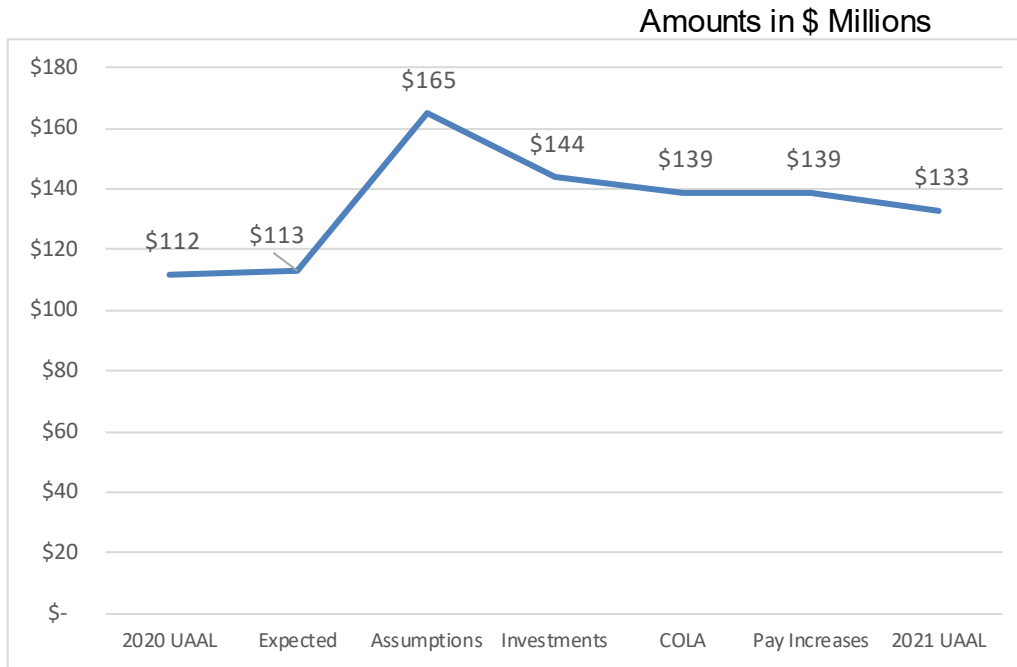
Change in UAAL due to FYE June 30, 2021 Plan Experience Virginia Law Officers



Change in UAAL by Source	
Expected	\$ (1)
Assumptions	68
Investments	(55)
COLA	(16)
Pay Increases	22
All Else	8
Total	26

- The increases in liability associated with assumption and method changes from the experience study were partially offset by the investment gain.
- Similarly, higher-than-expected pay increases were partially offset by lower-than-expected COLAs.
- VaLORS also had more retirements than expected which caused a loss of \$26.3 million.

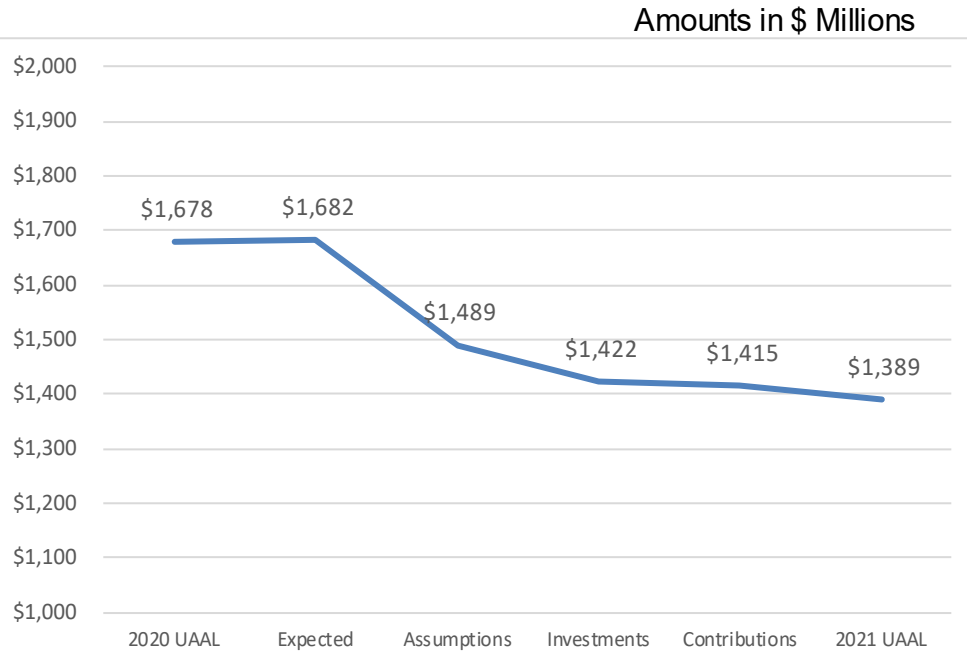
Change in UAAL due to FYE June 30, 2021 Plan Experience Judicial



Change in UAAL by Source	
Expected	\$ 1
Assumptions	52
Investments	(21)
COLA	(5)
Pay Increases	0
All Else	(6)
Total	21

- The increases in liability associated with assumption and method changes from the experience study were partially offset by the investment gain.
- Assumed pay increases for JRS are higher than other employer groups therefore less of an impact related to pay increases.
- Lower-than-expected COLAs further reduced liabilities and were more than offset by retirement losses which increased liability by approximately \$9 million.

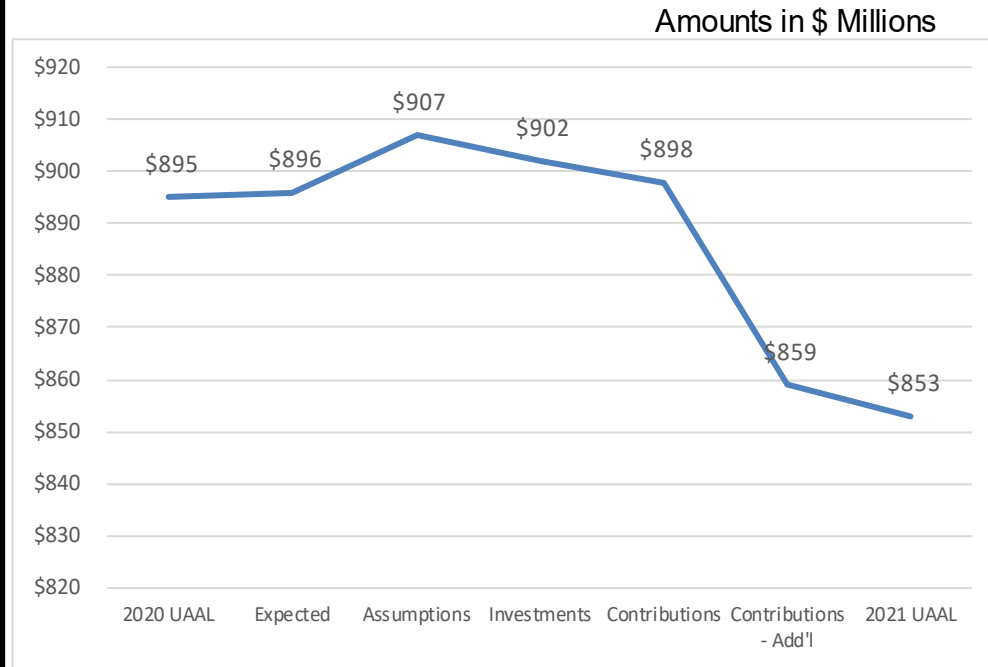
Change in UAAL due to FYE June 30, 2021 Plan Experience Group Life Insurance



Change in UAAL by Source	
Expected	\$ 4
Assumptions	(193)
Investments	(67)
Contributions	(7)
All Else	(26)
Total	(289)

- Experience study caused a decrease in both liabilities and the employer contribution rate, primarily due to improved mortality which lowers life insurance cost.
- There were additional decreases in liability associated with investment gains and higher than anticipated contributions.
- All other changes including the demographic changes resulted in lowering the liabilities by approximately \$26 million.

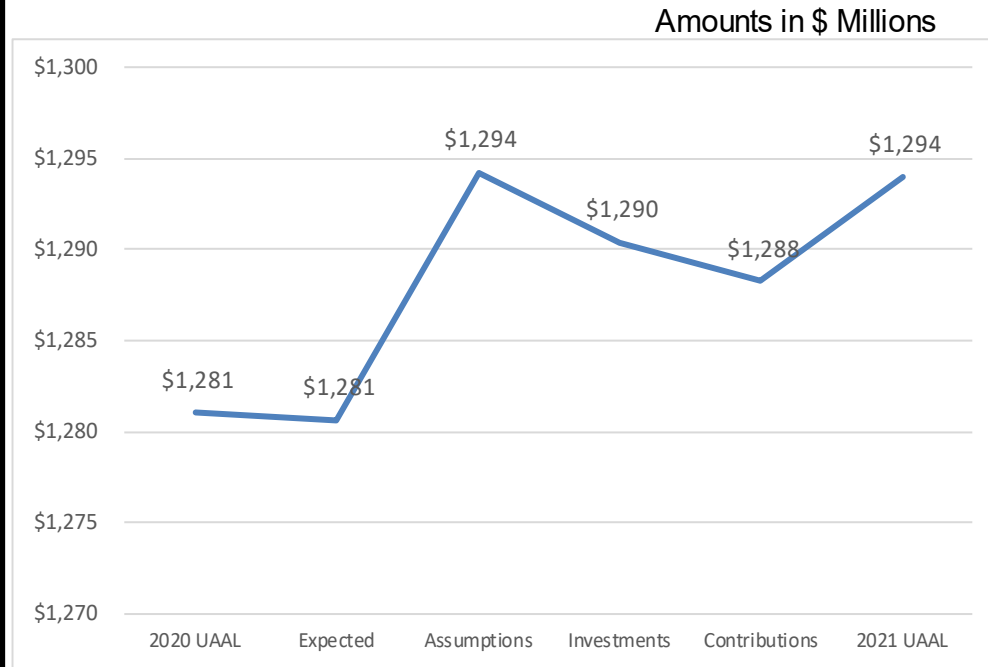
Change in UAAL due to FYE June 30, 2021 Plan Experience Health Insurance Credit - State



Change in UAAL by Source	
Expected	\$ 1
Assumptions	11
Investments	(5)
Contributions	(4)
Contributions - Add'l	(39)
All Else	(6)
Total	(42)

- The increases in liability associated with assumption and method changes from the experience study were more than offset by the investment gain, employer contributions, and an additional one-time contribution.
- All other changes, including the demographic changes, resulted in lowering the liabilities by approximately \$6 million.

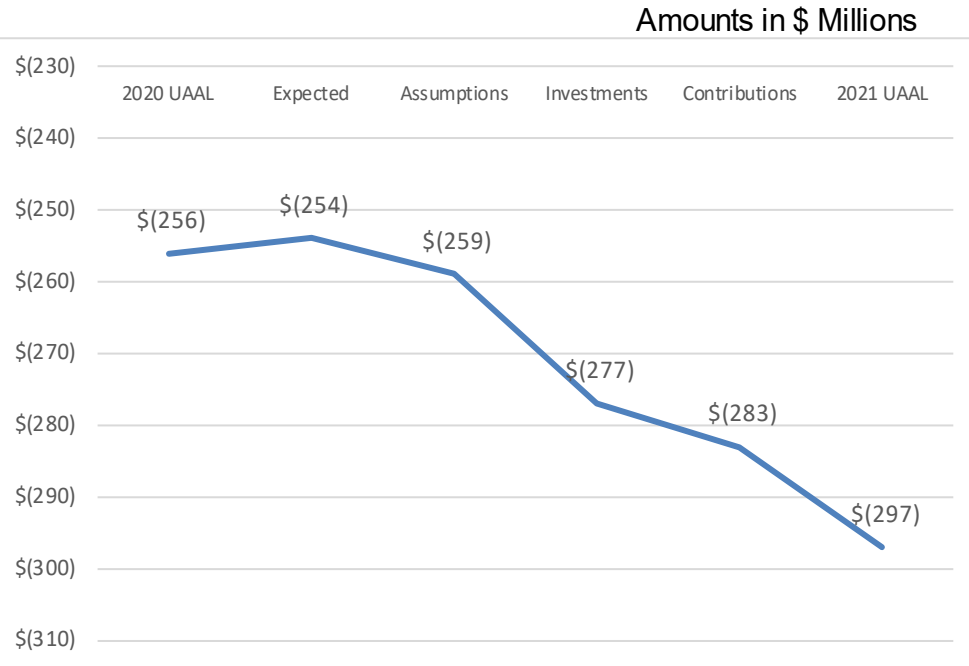
Change in UAAL due to FYE June 30, 2021 Plan Experience Health Insurance Credit - Teachers



Change in UAAL by Source	
Expected	\$ -
Assumptions	13
Investments	(4)
Contributions	(2)
All Else	6
Total	13

- Liabilities increased with assumption and method changes from the experience study, while normal cost decreased.
- Liability increases were partially offset by the investment gain and higher than anticipated employer contributions which lowered liabilities by approximately \$6 million.
- All other changes including the demographic changes resulted in increasing the liabilities by approximately \$6 million.
- Employer contribution rate would have been expected to decrease slightly but increased slightly instead due to payroll being flat.

Change in UAAL due to FYE June 30, 2021 Plan Experience VSDP



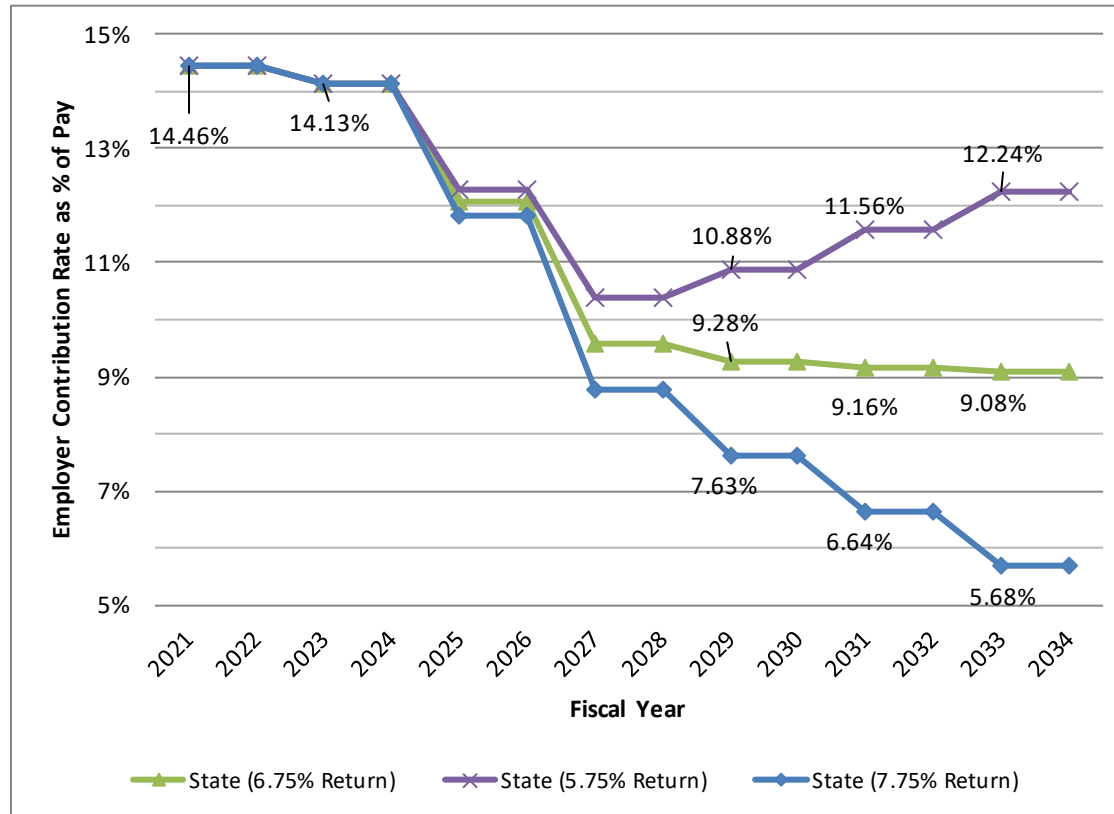
Change in UAAL by Source	
Expected	\$ 2
Assumptions	(5)
Investments	(18)
Contributions	(6)
All Else	(14)
Total	(41)

- There was a small decrease in liability associated with assumption and method changes from the experience study. The experience study caused an increase to the normal cost.
- There were additional decreases in liability associated with investment gains and higher than anticipated contributions.
- All other changes, including the demographic changes, resulted in lowering the liabilities by approximately \$14 million. Experience gains are to be expected in a disability plan due the nature of the benefit.
- An increase to the employer contribution rate was expected due to the experience study, but the rate actually decreased due to asset and experience gains.

Projection of Employer Rates and Funded Status

State Projected Employer Contribution Rates Including Defined Contribution Hybrid

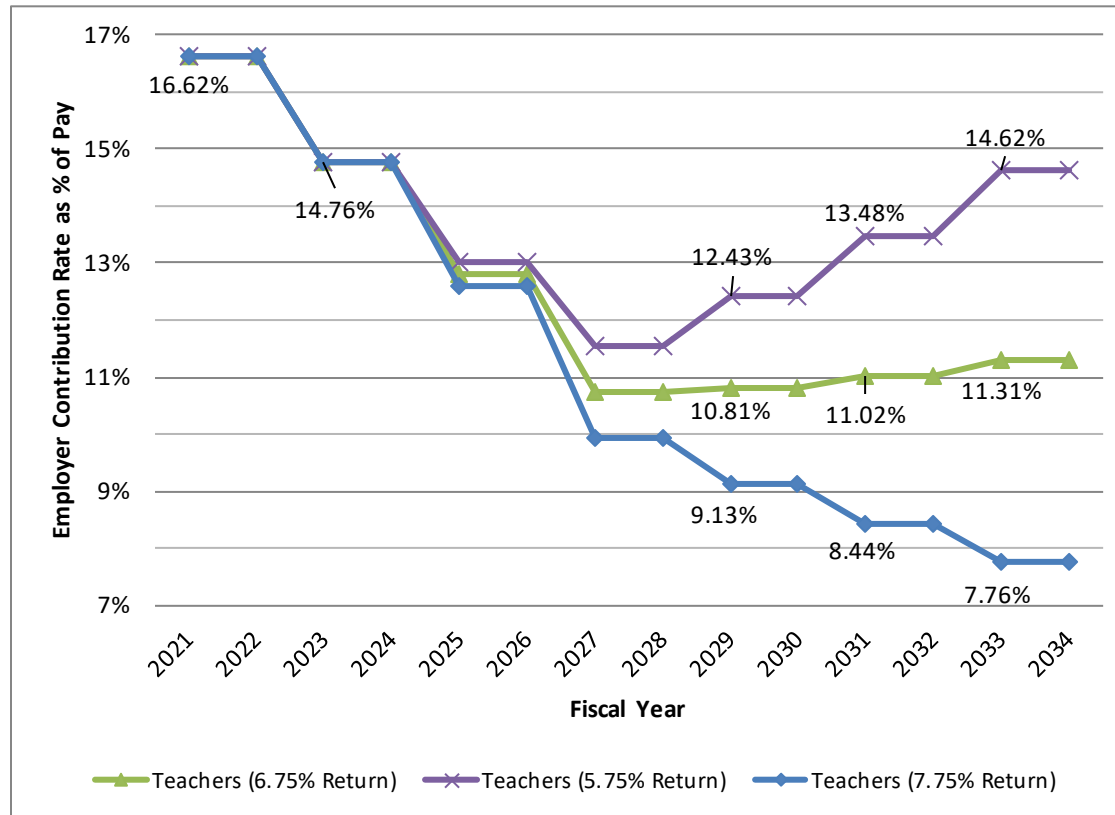
Investment Return Sensitivity



Assumes employer match to defined contribution portion of the Hybrid Plan of 2.28% for members in the Hybrid Plan, which is 1.06% of total payroll for 2021.
 Rates above are for alternative investment return scenarios only. Liabilities are calculated at 6.75% under all scenarios.

Teachers Projected Employer Contribution Rates Including Defined Contribution Hybrid

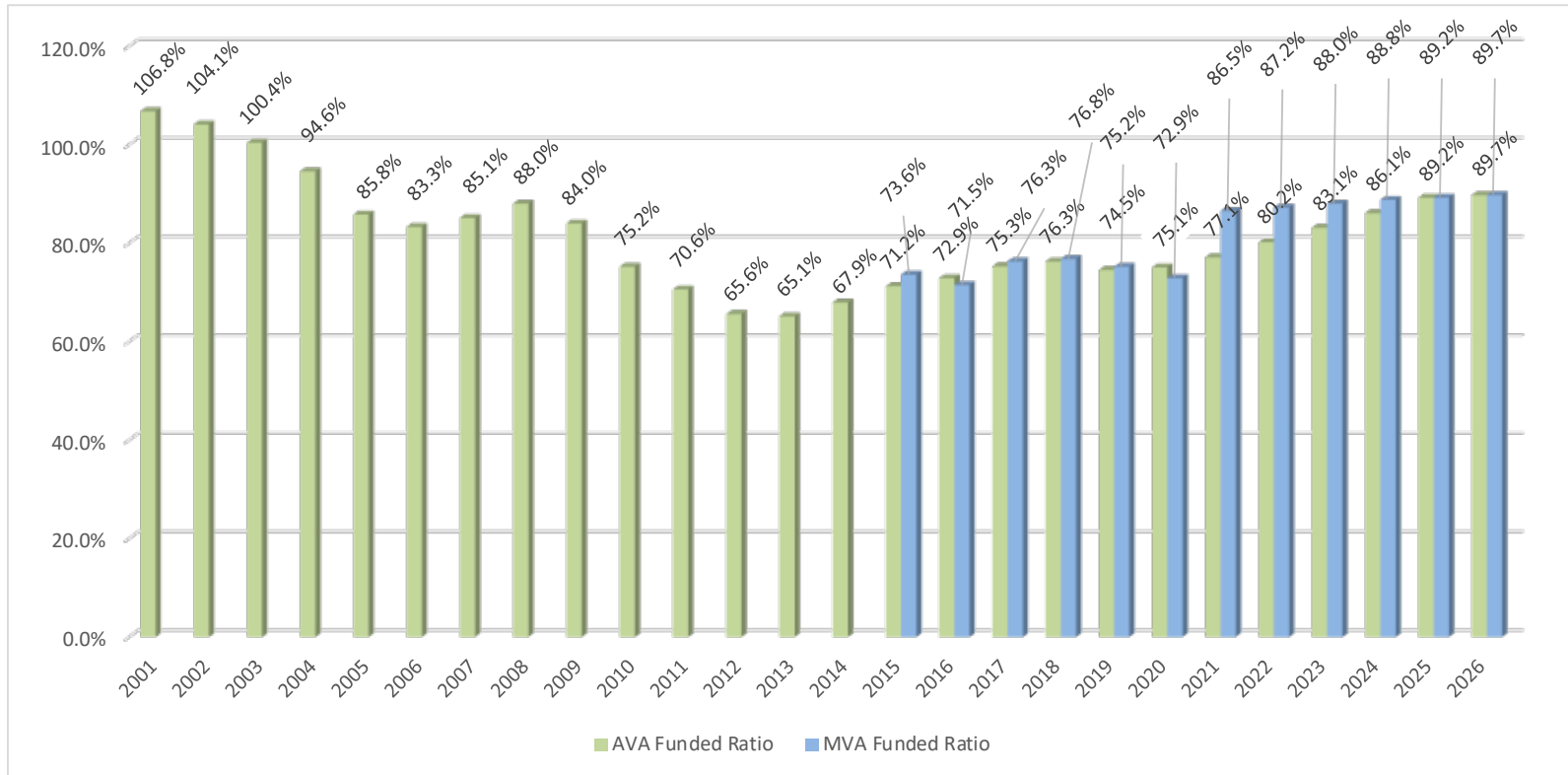
Investment Return Sensitivity



Assumes employer match to defined contribution portion of the Hybrid Plan of 2.12% for members in the Hybrid Plan, which is 0.81% of total payroll for 2021.

Rates above are for alternative investment return scenarios only. Liabilities are calculated at 6.75% under all scenarios.

Projected Funded Status State Employees Pension Plan



Notes and Assumptions:

AVA are actuarial value of assets (five-year smoothing) and MVA are market value of assets.

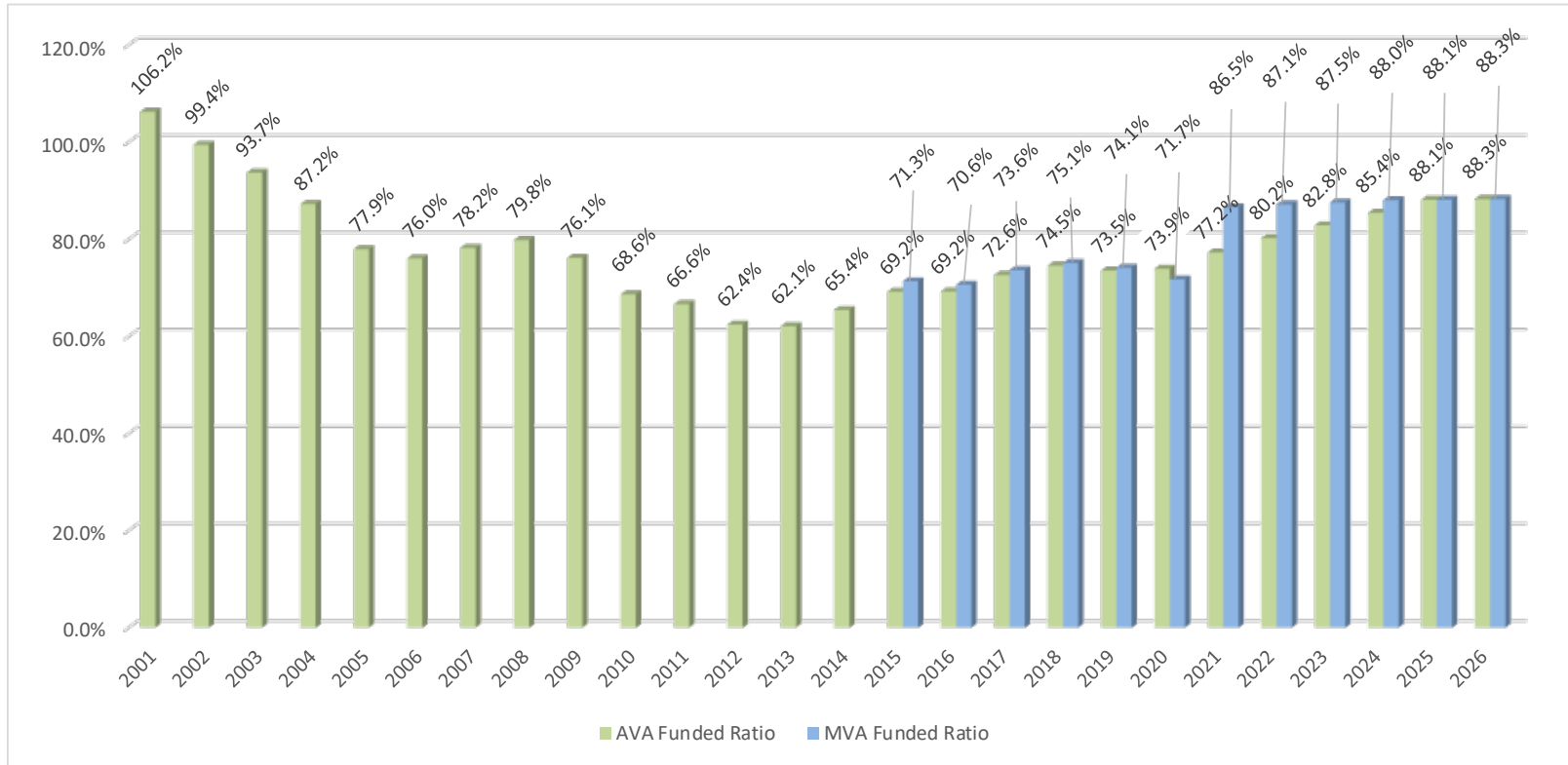
The AVA funded ratio, shown in light green, is used for funding purposes. The MVA funded ratio, shown in blue, is used for GASB 67 & 68 purposes. GASB 67 & 68 were first effective in 2015.

Projected years' investment returns assume 6.75% with 2.5% inflation rate.

Annual discount rates 8% from 2001-2004; 7.5% from 2005 – 2009; 7% from 2010 – 2018; 6.75% from 2019 on.

Projections for 2022-2026 assume 100% of future contributions are made.

Projected Funded Status Teachers Pension Plan



Notes and Assumptions:

AVA are actuarial value of assets (five-year smoothing) and MVA are market value of assets.

The AVA funded ratio, shown in light green, is used for funding purposes. The MVA funded ratio, shown in blue, is used for GASB 67 & 68 purposes. GASB 67 & 68 were first effective in 2015.

Projected years' investment returns assume 6.75% with 2.5% inflation rate.

Annual discount rates 8% from 2001-2004; 7.5% from 2005 – 2009; 7% from 2010 – 2018; 6.75% from 2019 on.

Projections for 2022-2026 assume 100% of future contributions are made.

THANK YOU!

Appendix

Detailed Results

Summary Rates for Pension Plans

Fiscal Years Ending June 30,	2019/2020	2021/2022	2023/2024
Actuarial Valuation date	June 30, 2017	June 30, 2019	June 30, 2021
Pension Plan	Board & General Assembly Approved	Board & General Assembly Approved	Submitted for Approval
State	13.52%	14.46%	14.13%
Teachers	15.68%	16.62%	14.76%
SPORS	24.88%	26.33%	29.98%
VaLORS	21.61%	21.90%	24.60%
JRS	34.39%	29.84%	30.67%
Political Subdivisions (Average rates)	7.60%	8.33%	TBD

Contribution rates for retirement systems are net of 5% and 4% member contribution rates for Plan 1 and 2 and Hybrid Plan, respectively.

Employer rate for Hybrid defined contribution component assumes employer match to DC portion of the Hybrid Plan based on DC rates for each individual employer observed during prior fiscal year.

TBD - Available at the November 2021 Board Meeting.

Summary Rates for OPEB Plans

Fiscal Years Ending June 30,	2019/2020	2021/2022	2023/2024
Actuarial Valuation date	June 30, 2017	June 30, 2019	June 30, 2021
OPEB Plan	Board & General Assembly Approved	Board & General Assembly Approved	Submitted for Approval
Group Life Insurance*	1.31%	1.34%	1.19%
Health Insurance Credit (HIC) Program			
▪ State Employees	1.17%	1.12%	1.04%
▪ Teachers	1.20%	1.21%	1.21%
▪ Participating Political Subdivisions**	0.32%	0.59%	TBD
▪ Constitutional Officers	0.38%	0.36%	TBD
▪ Social Service Employees	0.43%	0.38%	TBD
▪ Registrars	0.39%	0.39%	TBD
Virginia Sickness and Disability Program (VSDP)	0.62%	0.61%	0.56%
Virginia Local Disability Program (VLDP)			
▪ Teachers	0.41%	0.47%	TBD
▪ Political Subdivisions	0.72%	0.83%	TBD

* The contribution rate for GLI includes an adjustment of .34% for active group life insurance for the 2017 and 2019 valuation dates and an adjustment of .35% for the 2021 valuation date.

** Average of individual rates. The contribution rate includes the impact of HB 1513 (2020).

TBD - Available at the November 2021 Board Meeting.

Unfunded Liabilities



Unfunded Pension Liabilities (\$ in thousands)

System	Unfunded Liability Using Actuarial Value of Assets		
	2020	2021	
		Before Assumption Changes	After Assumption Changes
State	\$ 6,417,661	\$ 5,710,835	\$ 6,112,670
Teachers	\$ 13,278,662	\$ 11,145,625	\$ 12,021,814
SPORS	\$ 325,590	\$ 330,233	\$ 389,314
VaLORS	\$ 712,025	\$ 670,421	\$ 738,351
JRS	\$ 111,633	\$ 81,299	\$ 132,738
Total Statewide Systems	\$ 20,845,571	\$ 17,938,413	\$ 19,394,887
Locals Aggregate	\$ 3,441,151		Available at November
Total Fund	\$ 24,286,722		2021 Board Meeting

System	Unfunded Liability Using Market Value of Assets		
	2020	2021	
		Before Assumption Changes	After Assumption Changes
State	\$ 6,981,267	\$ 3,213,719	\$ 3,615,554
Teachers	\$ 14,385,554	\$ 6,253,529	\$ 7,129,718
SPORS	\$ 351,662	\$ 217,417	\$ 276,498
VaLORS	\$ 758,084	\$ 470,299	\$ 538,229
JRS	\$ 128,417	\$ 8,817	\$ 60,256
Total Statewide Systems	\$ 22,604,984	\$ 10,163,781	\$ 11,620,255
Locals Aggregate	\$ 4,076,749		Available at November
Total Fund	\$ 26,681,733		2021 Board Meeting

Unfunded Liabilities



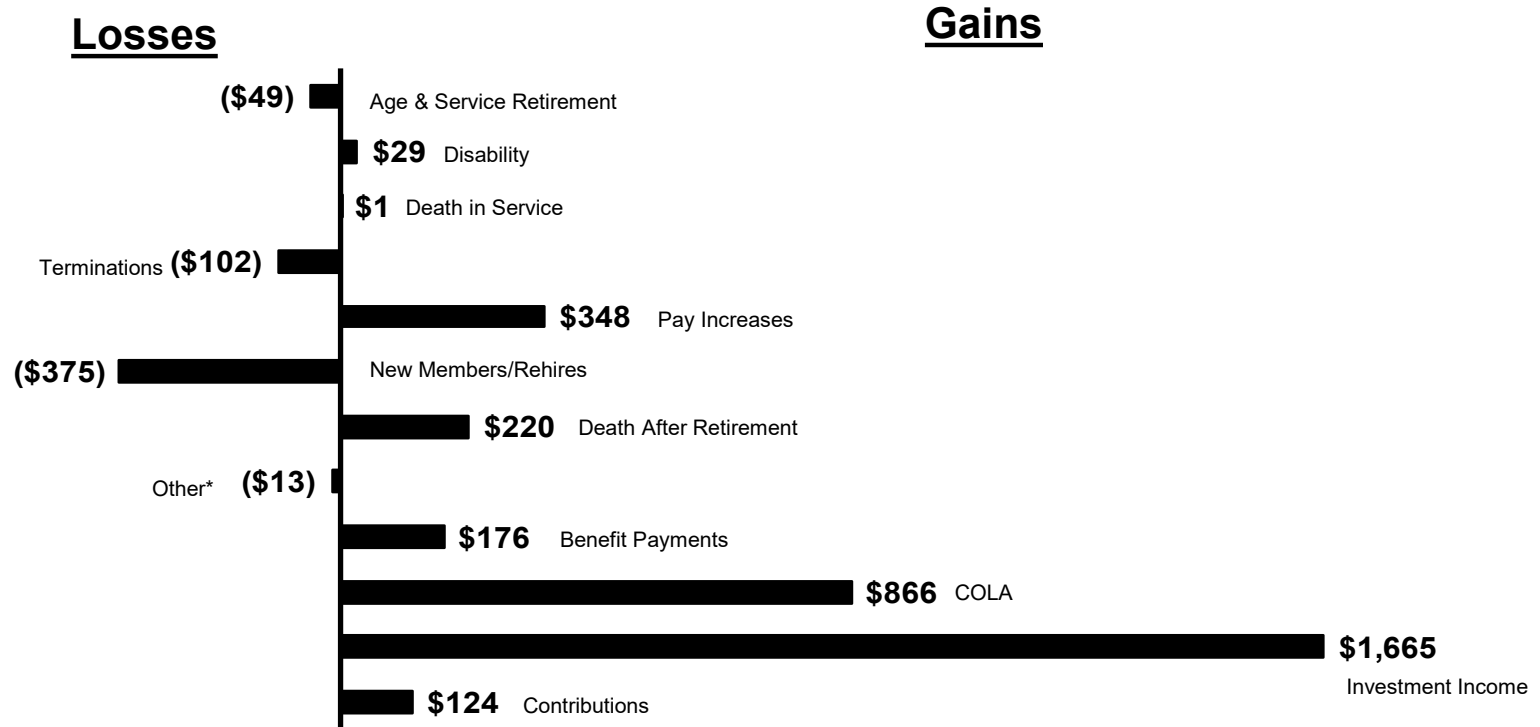
Unfunded OPEB Liabilities (\$ in thousands)

System	Unfunded Liability Using Actuarial Value of Assets		
	2020	2021	
		Before Assumption Changes	After Assumption Changes
Group Life	\$ 1,677,898	\$ 1,582,751	\$ 1,389,277
HIC State	\$ 894,542	\$ 841,227	\$ 852,591
HIC Teachers	\$ 1,280,589	\$ 1,280,412	\$ 1,293,999
VSDP	\$ (256,367)	\$ (292,733)	\$ (297,276)
HIC Locals	\$ 52,204	Available at November 2021 Board Meeting	
HIC Constitutional Officers	\$ 27,069		
HIC Social Services	\$ 12,646		
HIC Registrars	\$ 450		
VLDP Teachers	\$ 360		
VLDP Locals	\$ 327		

System	Unfunded Liability Using Market Value of Assets		
	2020	2021	
		Before Assumption Changes	After Assumption Changes
Group Life	\$ 1,728,029	\$ 1,304,864	\$ 1,111,390
HIC State	\$ 899,066	\$ 824,150	\$ 835,514
HIC Teachers	\$ 1,286,380	\$ 1,263,508	\$ 1,277,095
VSDP	\$ (241,350)	\$ (357,273)	\$ (361,816)
HIC Locals	\$ 52,204	Available at November 2021 Board Meeting	
HIC Constitutional Officers	\$ 27,069		
HIC Social Services	\$ 12,646		
HIC Registrars	\$ 450		
VLDP Teachers	\$ 447		
VLDP Locals	\$ 433		

Source of Change in UAAL Two Year Analysis

2019-2021 Gain/Loss Analysis for all Statewide Pension Plans (\$ Millions)



Losses are events which increase the UAAL more than expected while gains are events which decrease the UAAL more than expected.

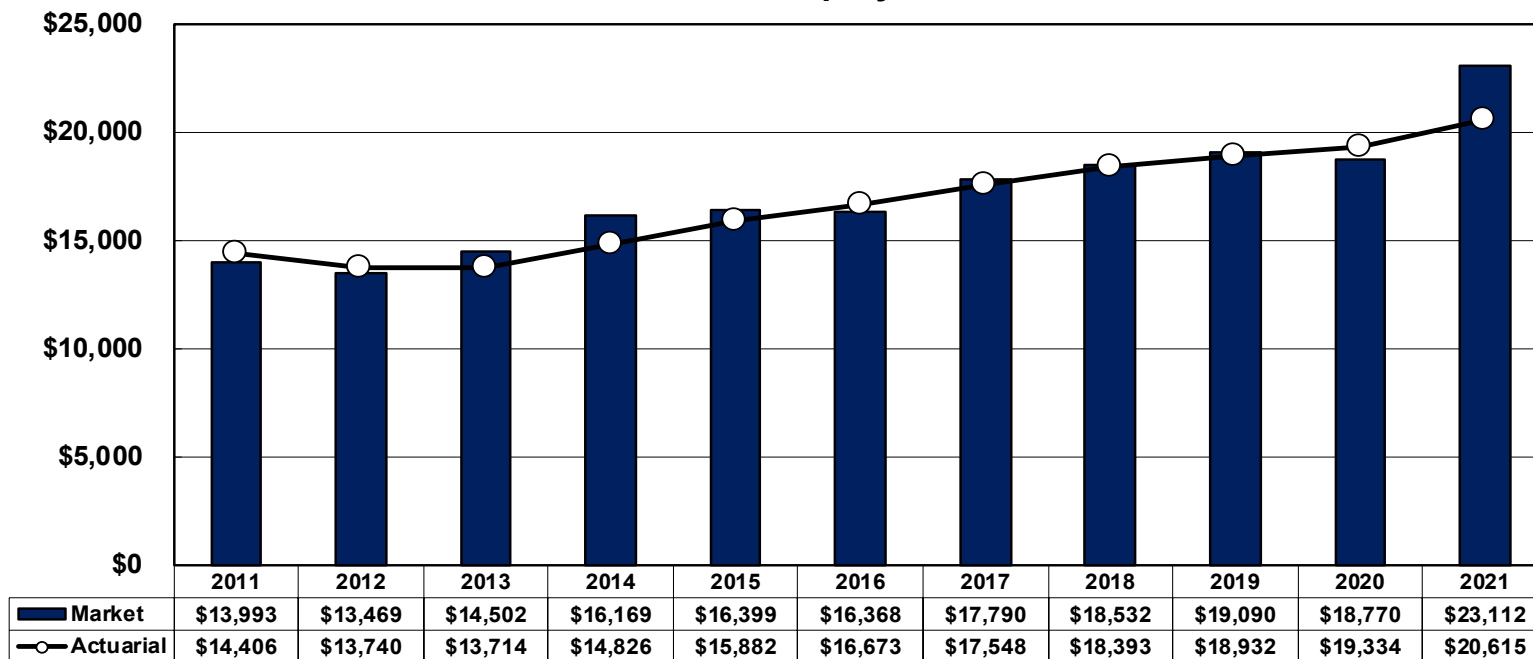
* e.g., data remediation, service purchase, demographic changes, etc.

- Losses were primarily due to new members and rehires but were offset by gains from greater-than-expected investment income and lower-than-expected inflation over the two-year period

Historical UAAL and Market Charts

Assets (\$ Millions)

State Employees



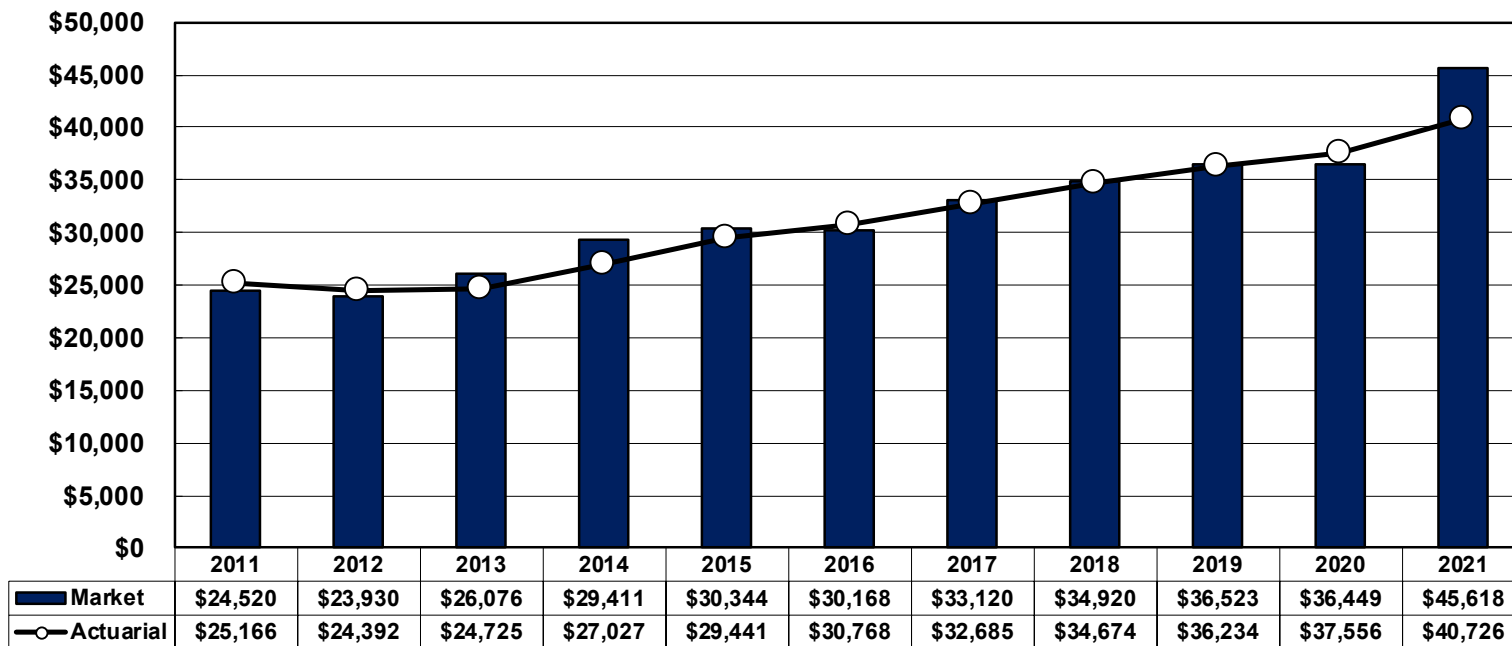
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Market Return	19.24%	1.12%	11.80%	15.69%	4.51%	1.90%	12.10%	7.50%	6.70%	1.40%	27.50%
Actuarial Return	2.87%	0.08%	3.70%	12.49%	10.58%	6.99%	8.64%	8.32%	6.60%	5.82%	10.51%

The reported net investment return for the year 2021 was 27.5% as reported by VRS.

Note: To achieve a 6.75% AVA return in 2022 will require approximately an -9.86% MVA return

Assets (\$ Millions)

Teachers



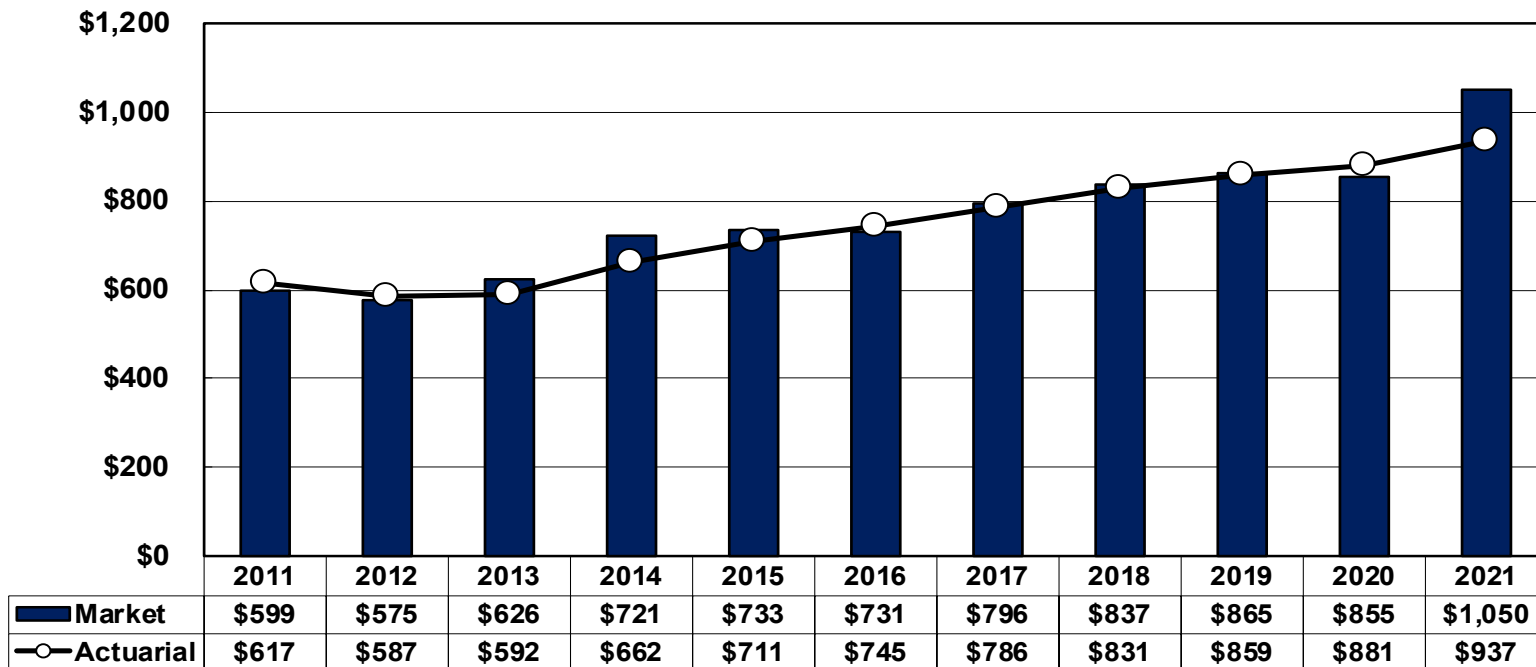
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Market Return	19.11%	1.16%	11.68%	15.62%	4.48%	1.90%	12.10%	7.50%	6.70%	1.40%	27.50%
Actuarial Return	2.93%	0.39%	3.92%	12.25%	10.40%	6.94%	8.54%	8.06%	6.61%	5.82%	10.45%

The reported net investment return for the year 2021 was 27.5% as reported by VRS.

Note: To achieve a 6.75% AVA return in 2022 will require approximately an -9.86% MVA return

Assets (\$ Millions)

State Police



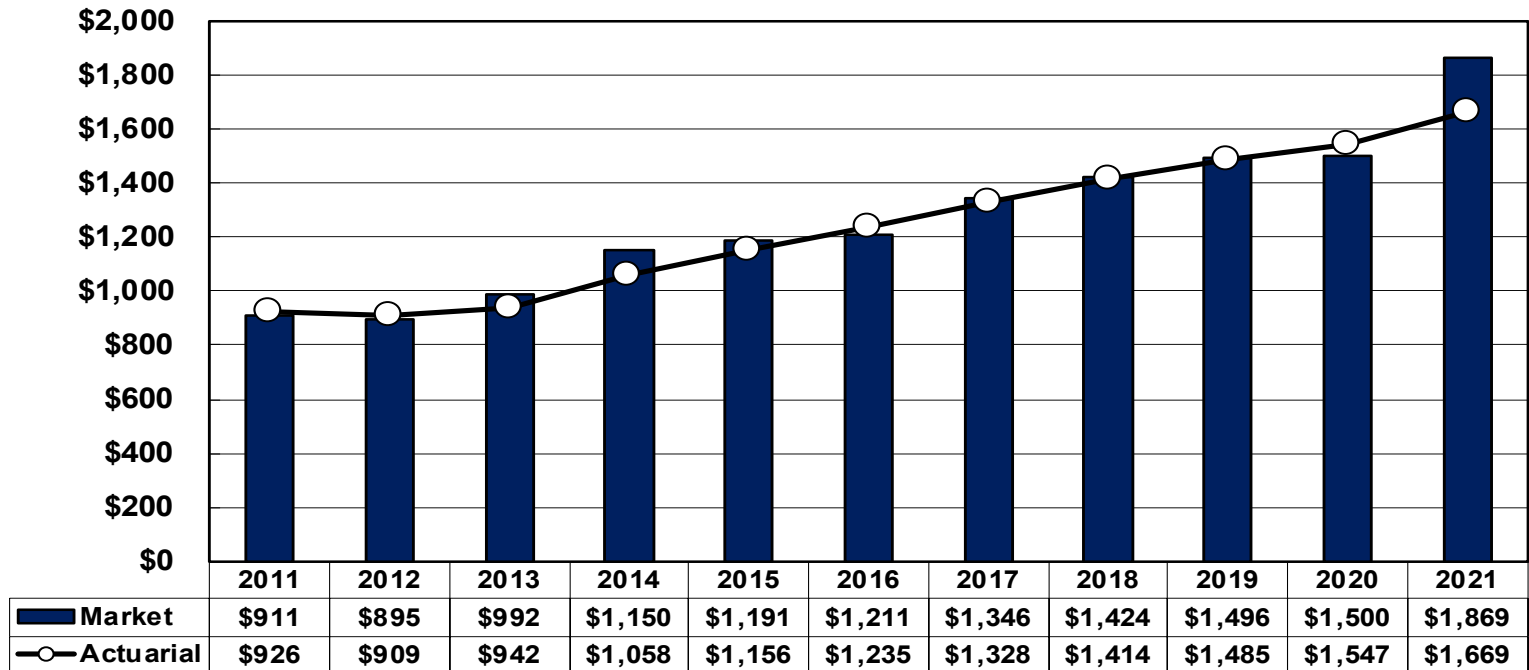
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Market Return	19.14%	1.13%	11.78%	15.74%	4.50%	1.90%	12.10%	7.50%	6.70%	1.40%	27.50%
Actuarial Return	2.82%	0.06%	3.72%	12.38%	10.46%	6.98%	8.57%	8.09%	6.59%	5.80%	10.45%

The reported net investment return for the year 2021 was 27.5% as reported by VRS.

Note: To achieve a 6.75% AVA return in 2022 will require approximately an -9.86% MVA return

Assets (\$ Millions)

Virginia Law Officers



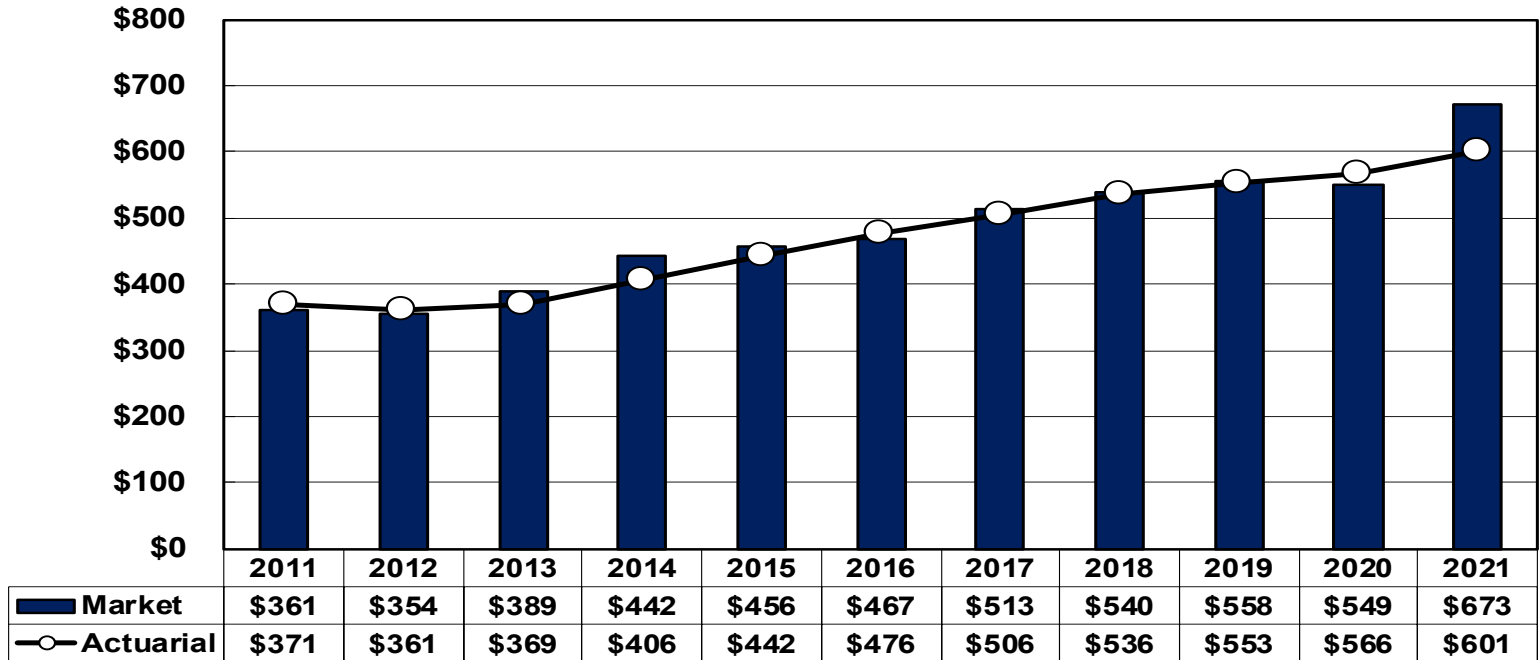
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Market Return	18.96%	1.21%	11.74%	15.72%	4.50%	1.90%	12.10%	7.50%	6.70%	1.40%	27.50%
Actuarial Return	3.28%	1.08%	4.43%	12.06%	10.30%	6.97%	8.48%	8.03%	6.63%	5.81%	10.41%

The reported net investment return for the year 2021 was 27.5% as reported by VRS.

Note: To achieve a 6.75% AVA return in 2022 will require approximately an -9.86% MVA return

Assets (\$ Millions)

JRS



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Market Return	18.90%	1.25%	11.80%	15.72%	4.50%	1.90%	12.10%	7.50%	6.70%	1.40%	27.50%
Actuarial Return	2.93%	0.44%	4.02%	12.21%	10.39%	7.00%	8.53%	8.07%	6.63%	5.83%	10.45%

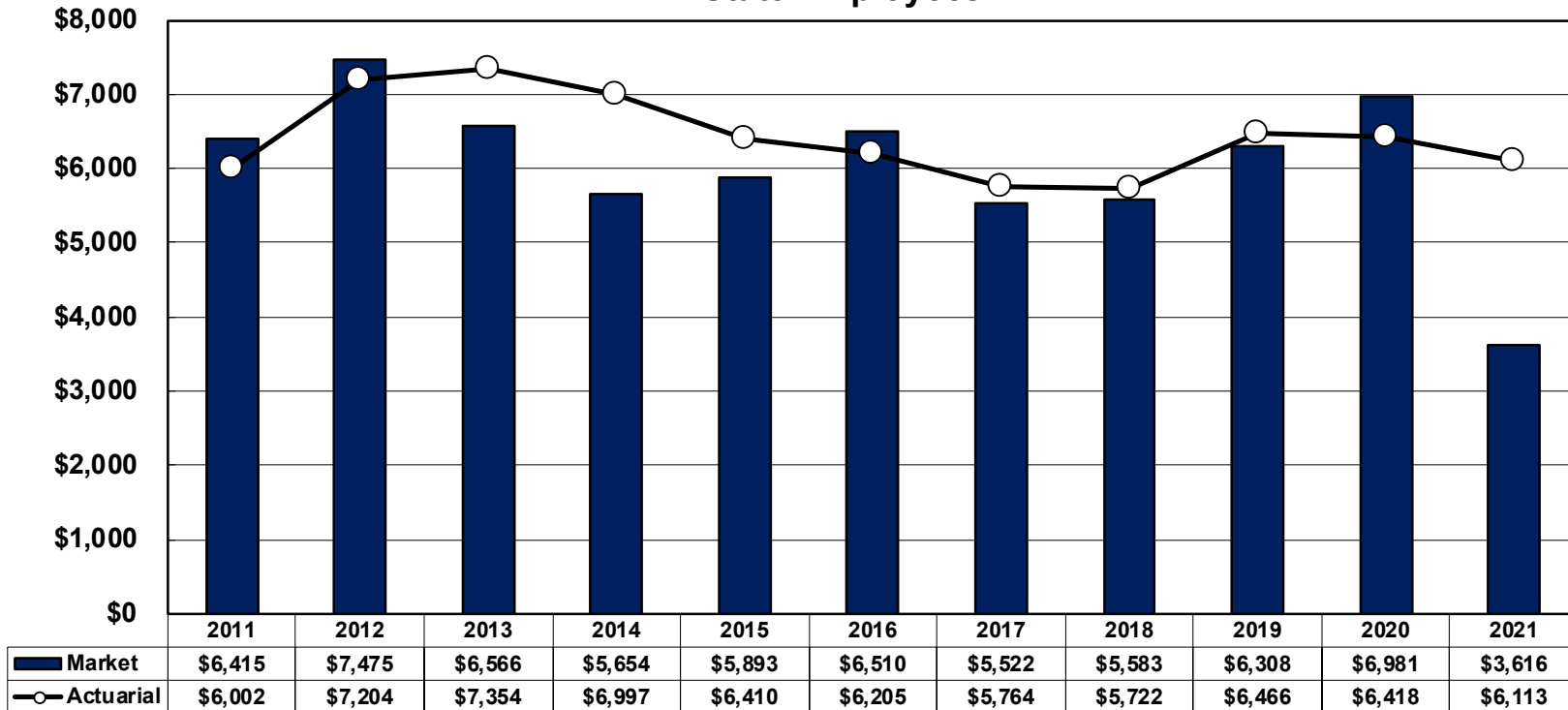
The reported net investment return for the year 2021 was 27.5% as reported by VRS.

Note: To achieve a 6.75% AVA return in 2022 will require approximately an -9.86% MVA return

Unfunded Accrued Liability (\$ Millions)



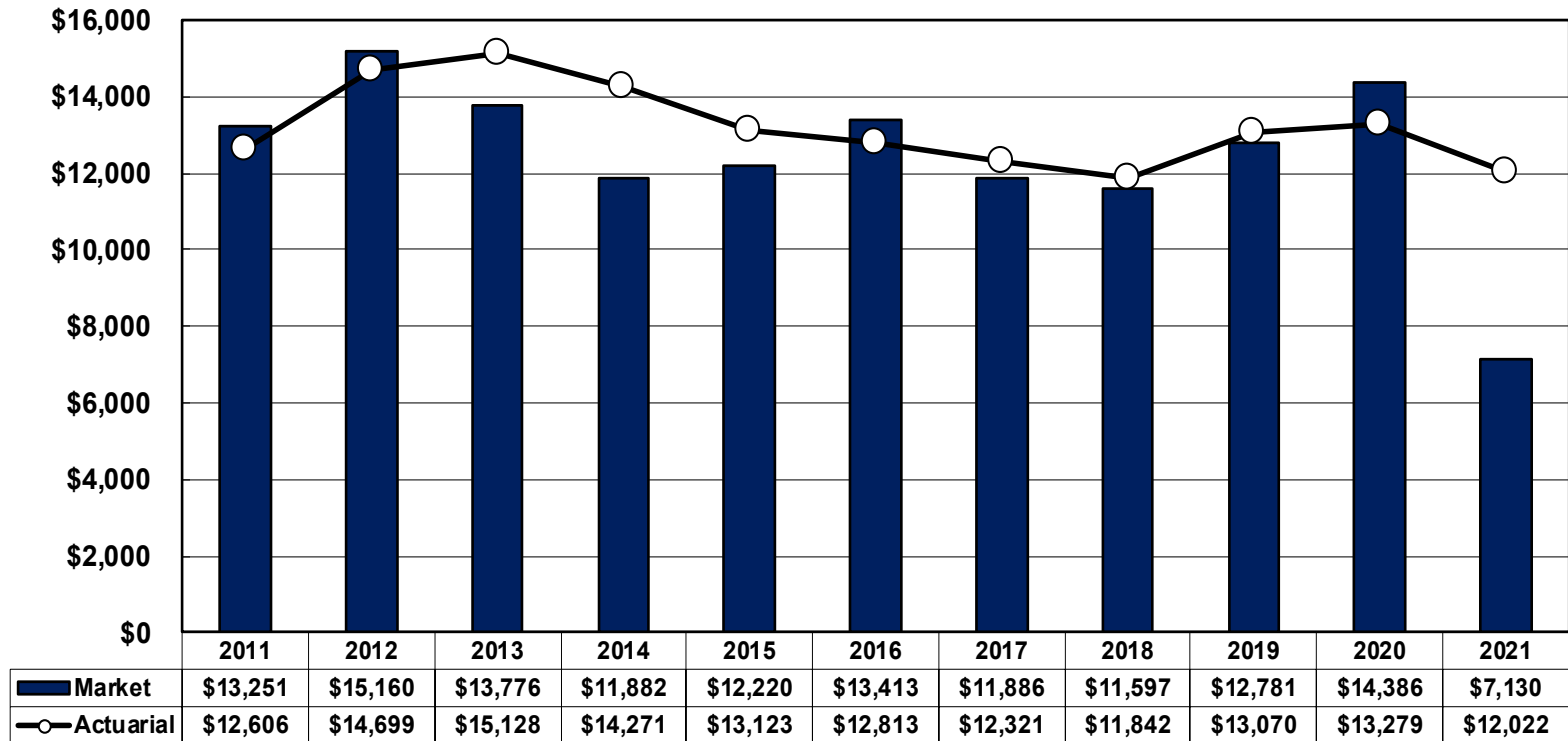
State Employees



Unfunded Accrued Liability (\$ Millions)



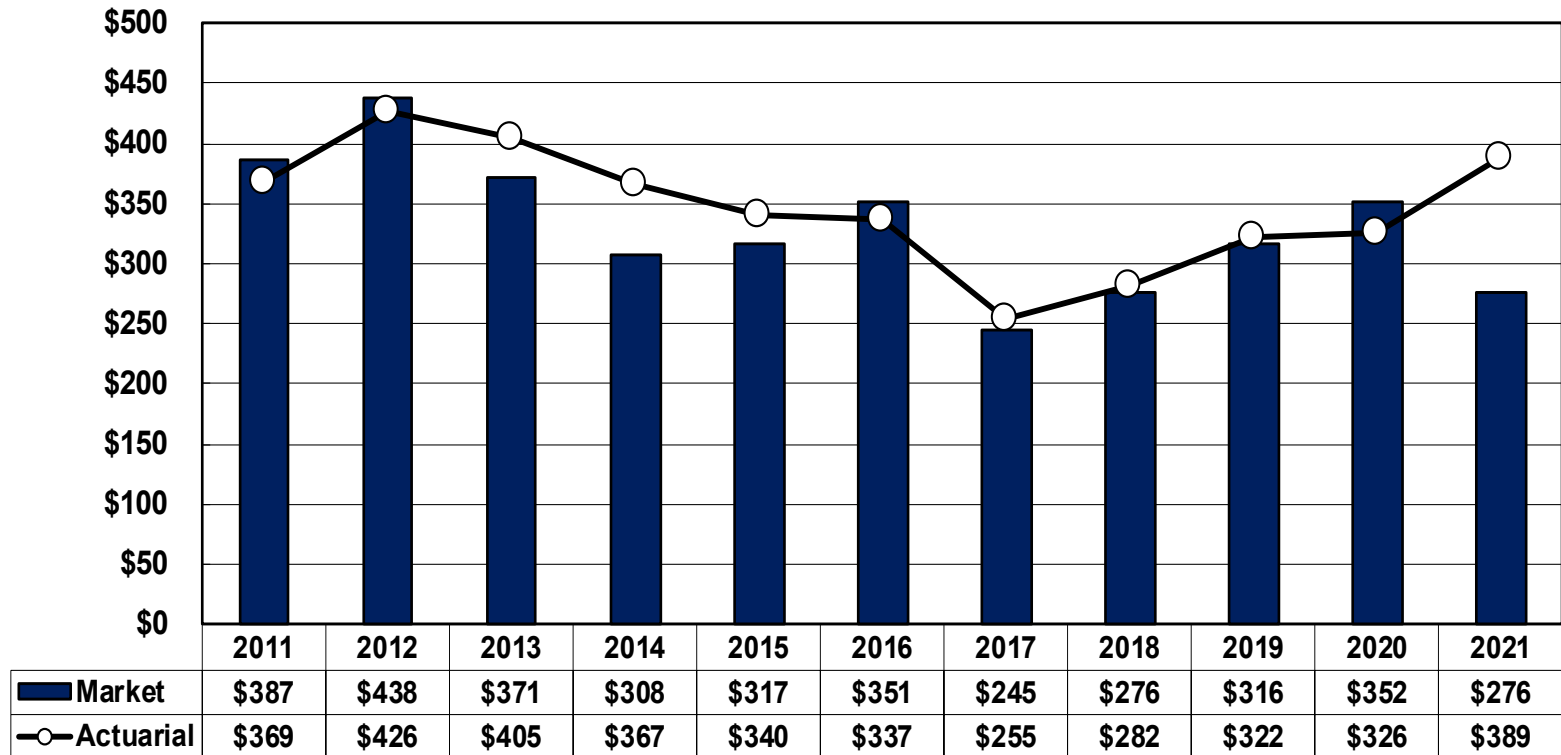
Teachers



Unfunded Accrued Liability (\$ Millions)



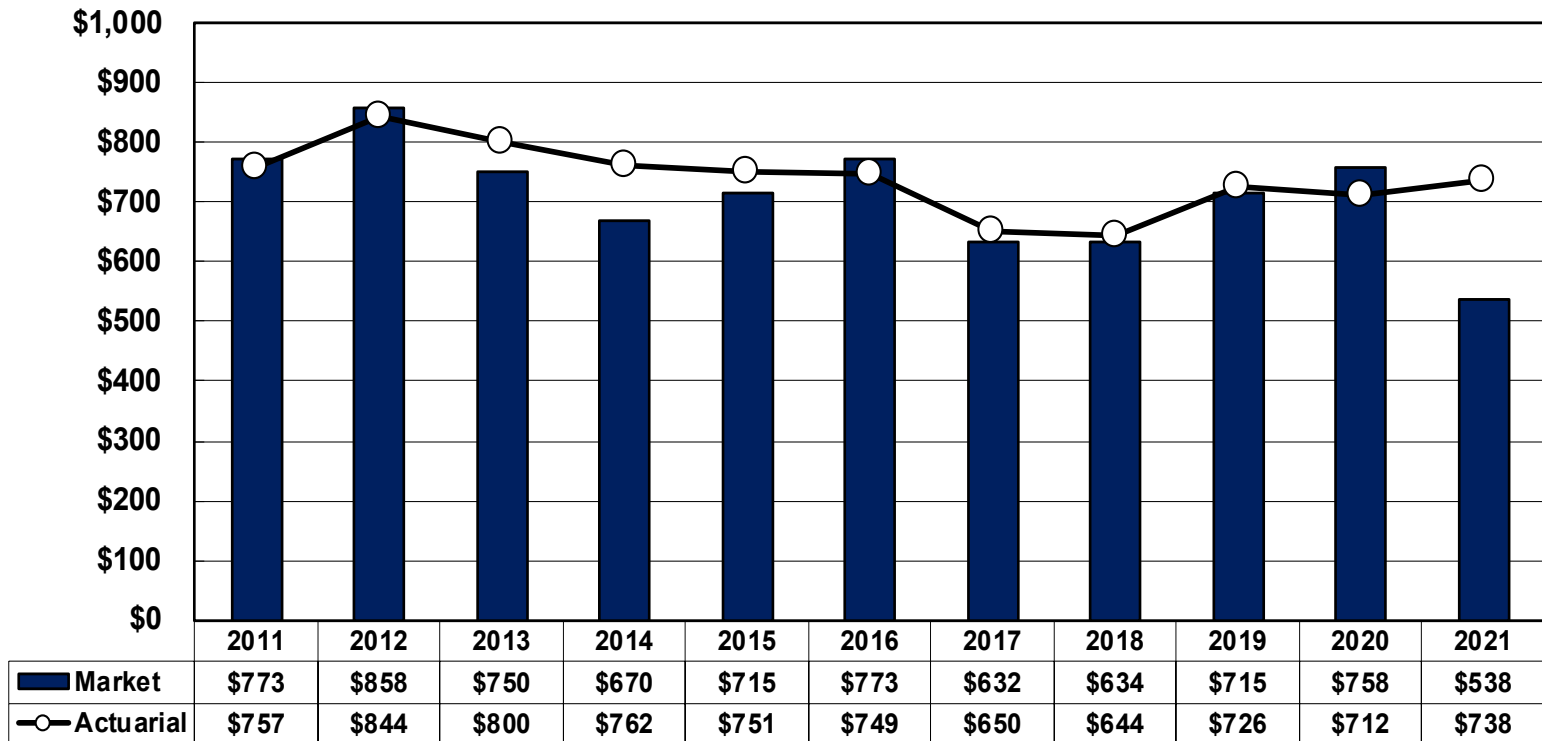
State Police



Unfunded Accrued Liability (\$ Millions)



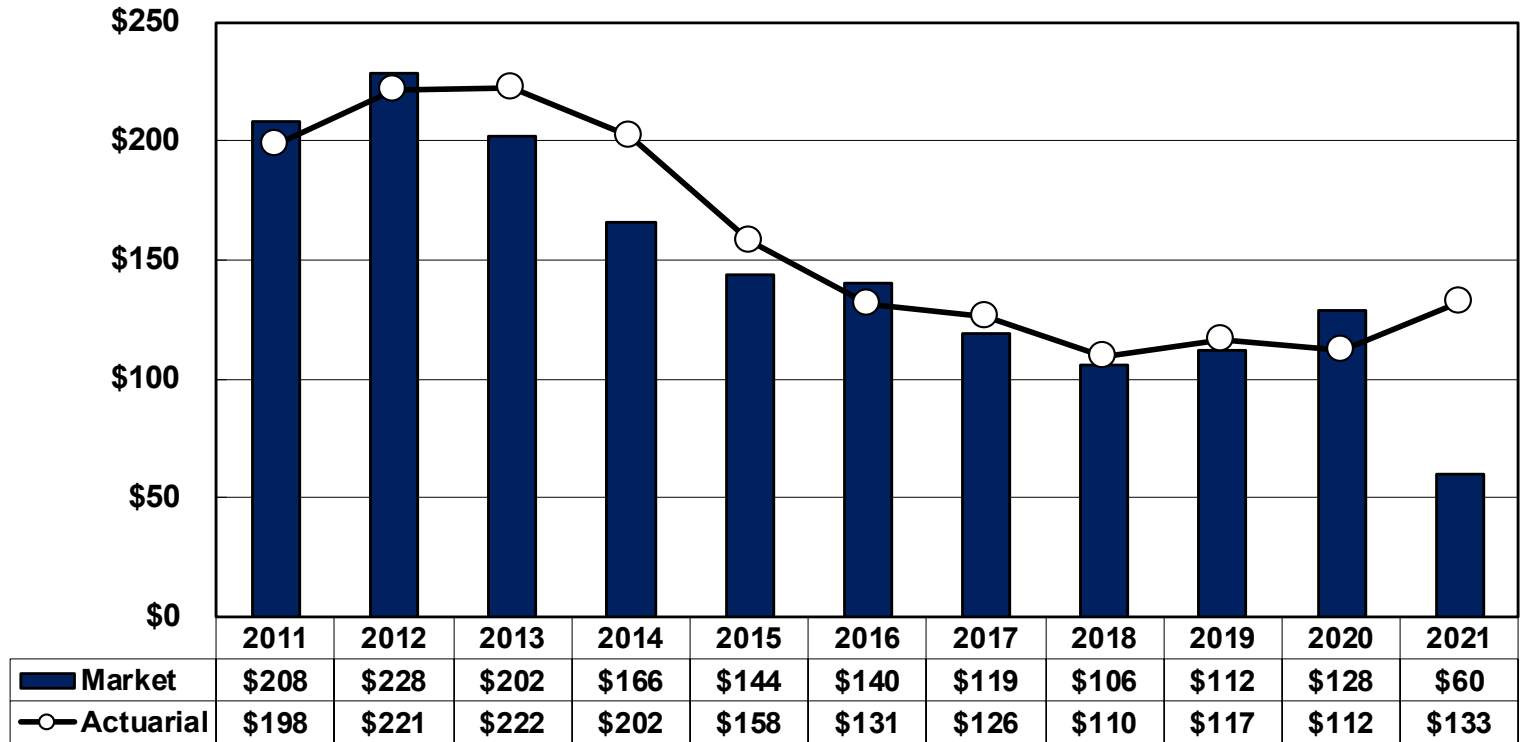
Virginia Law Officers



Unfunded Accrued Liability (\$ Millions)



JRS

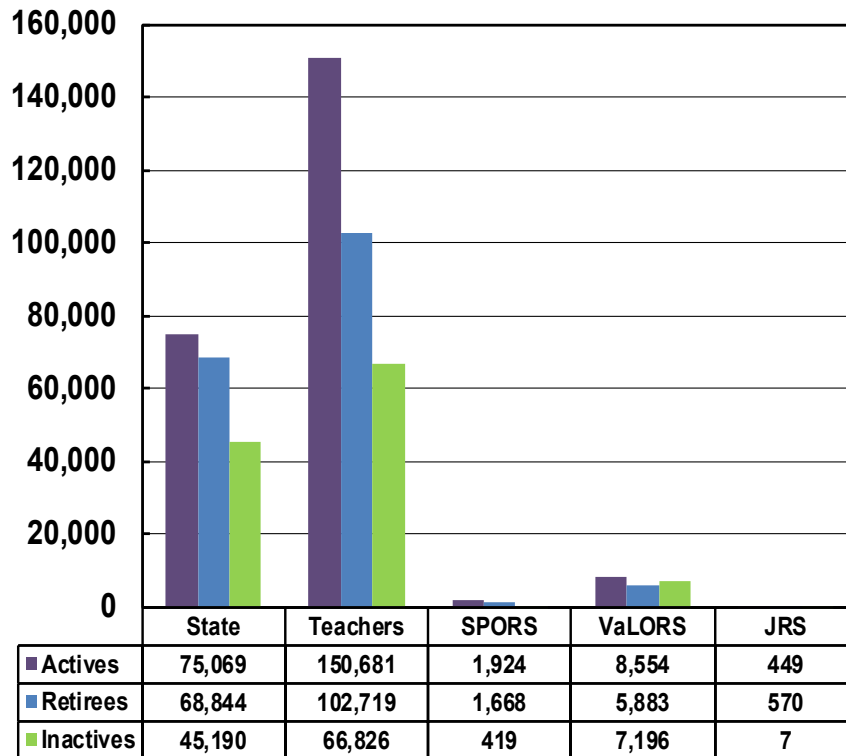


Membership Charts

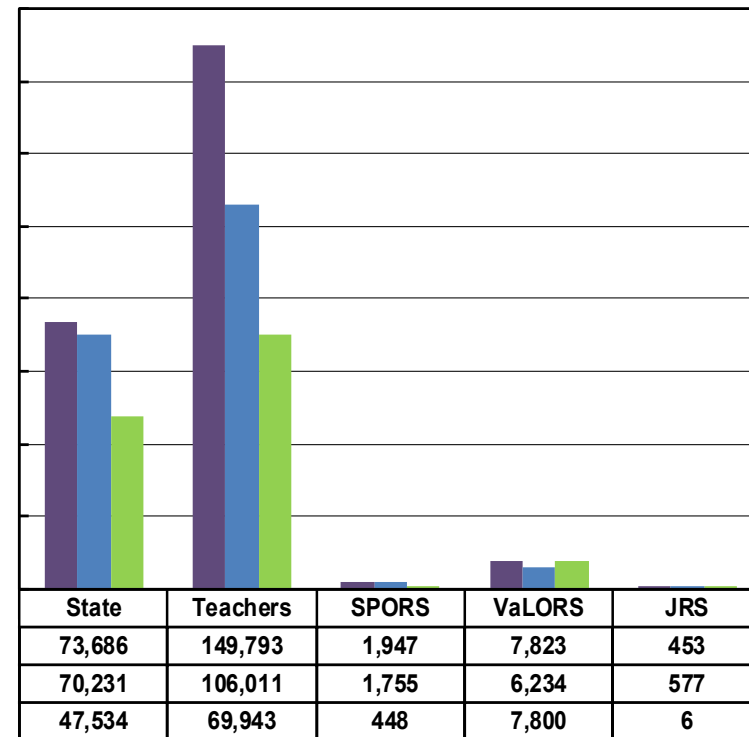
Membership



2020 Population by System



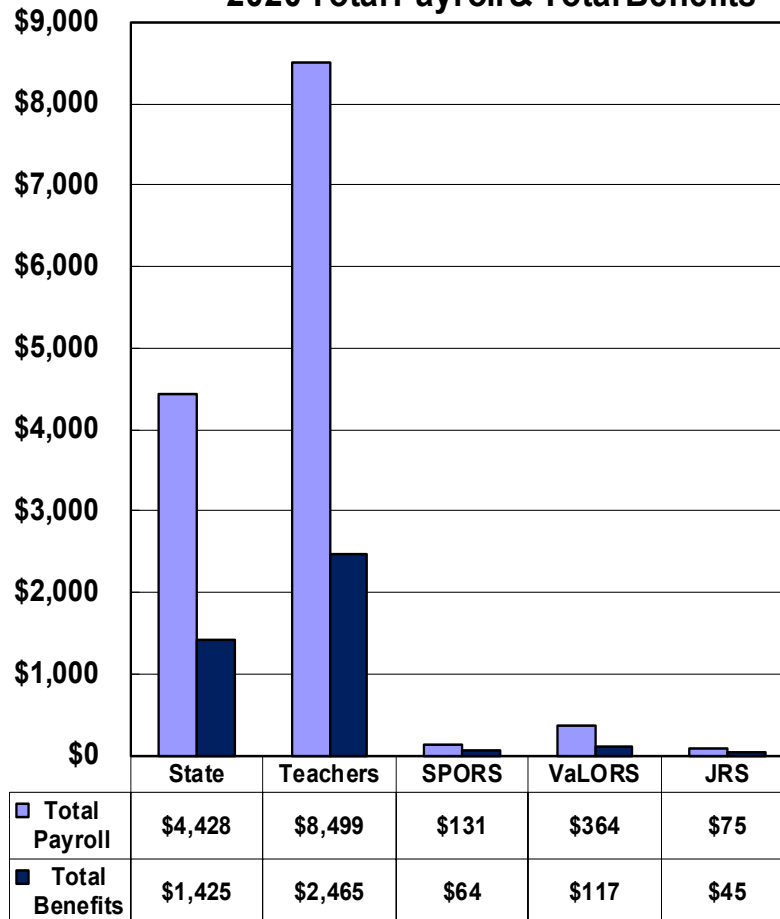
2021 Population by System



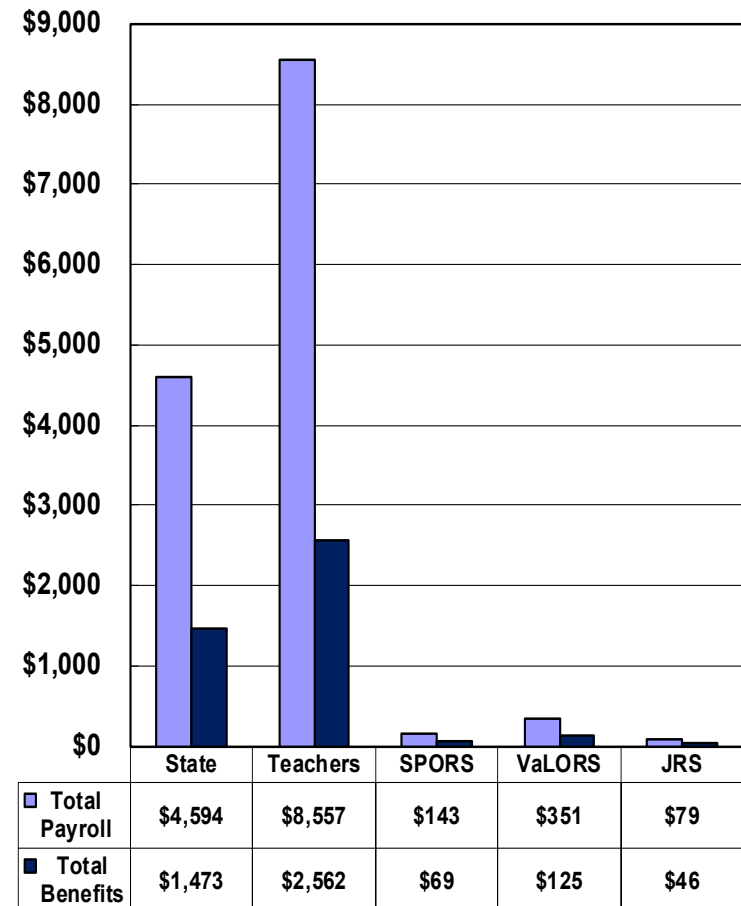
Annual Payroll & Retirement Benefits (\$ Millions)



2020 Total Payroll & Total Benefits



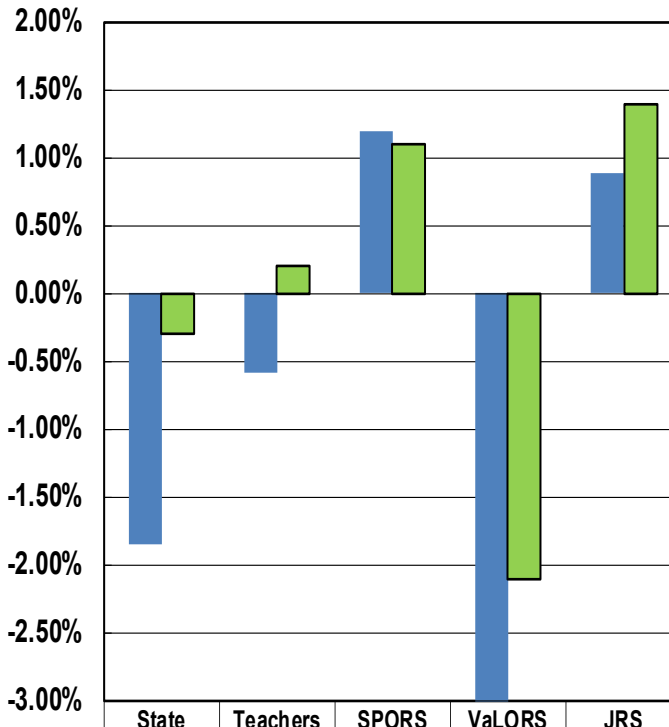
2021 Total Payroll & Total Benefits



Growth in Actives and Retirees

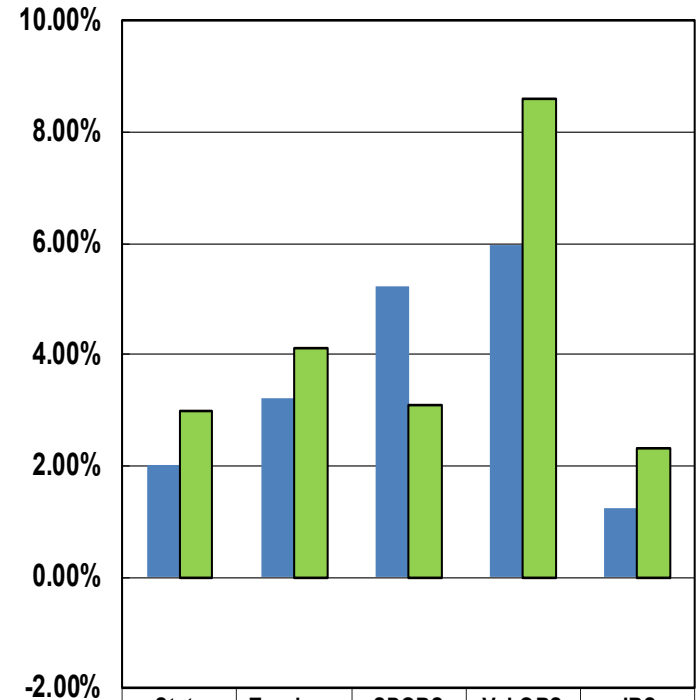


Growth in Actives



	State	Teachers	SPORS	VaLORS	JRS
Current Year	-1.84%	-0.59%	1.20%	-8.55%	0.89%
10-year Average	-0.30%	0.20%	1.10%	-2.10%	1.40%

Growth in Retirees

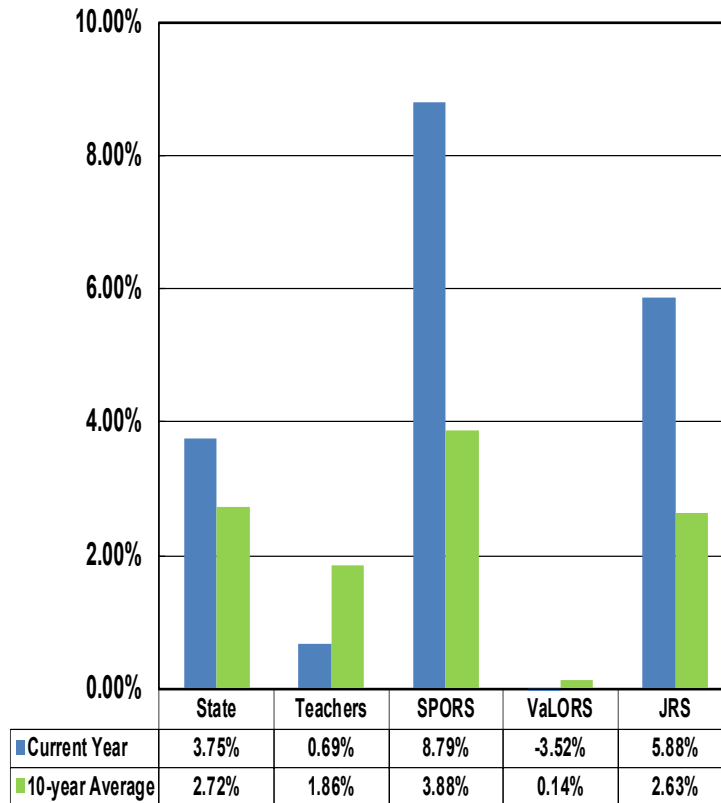


	State	Teachers	SPORS	VaLORS	JRS
Current Year	2.01%	3.20%	5.22%	5.97%	1.23%
10-year Average	3.00%	4.10%	3.10%	8.60%	2.30%

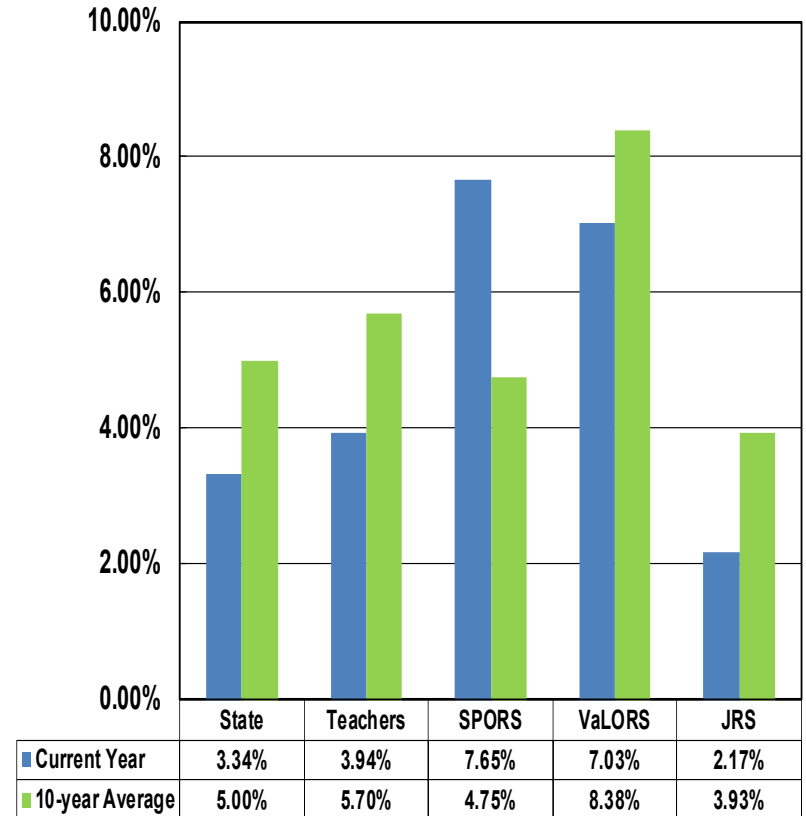
Growth in Payroll and Retirement Benefits



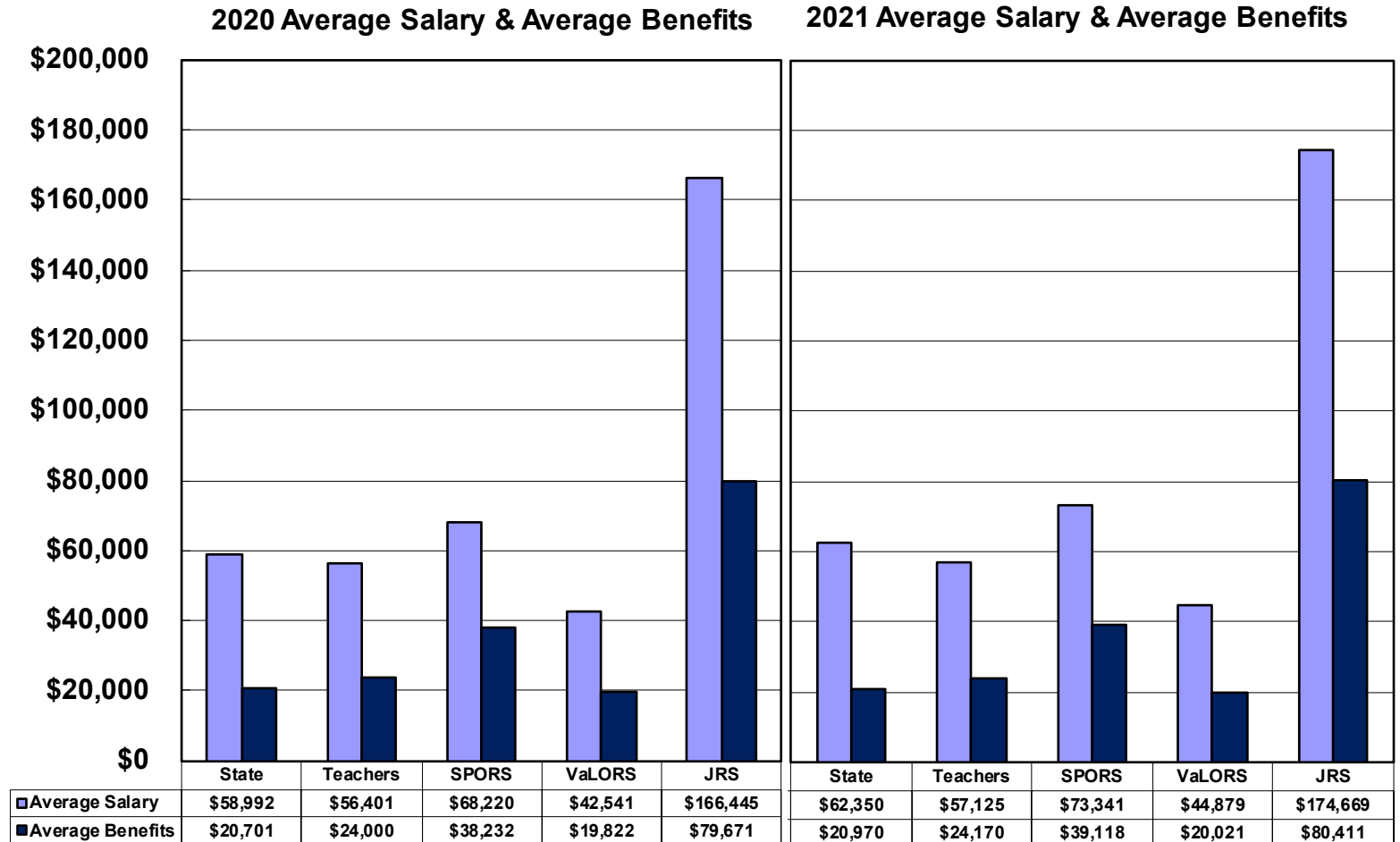
Growth in Payroll



Growth in Benefits



Average Salary & Average Retirement Benefits



Average Age, Service, Pay & Benefits



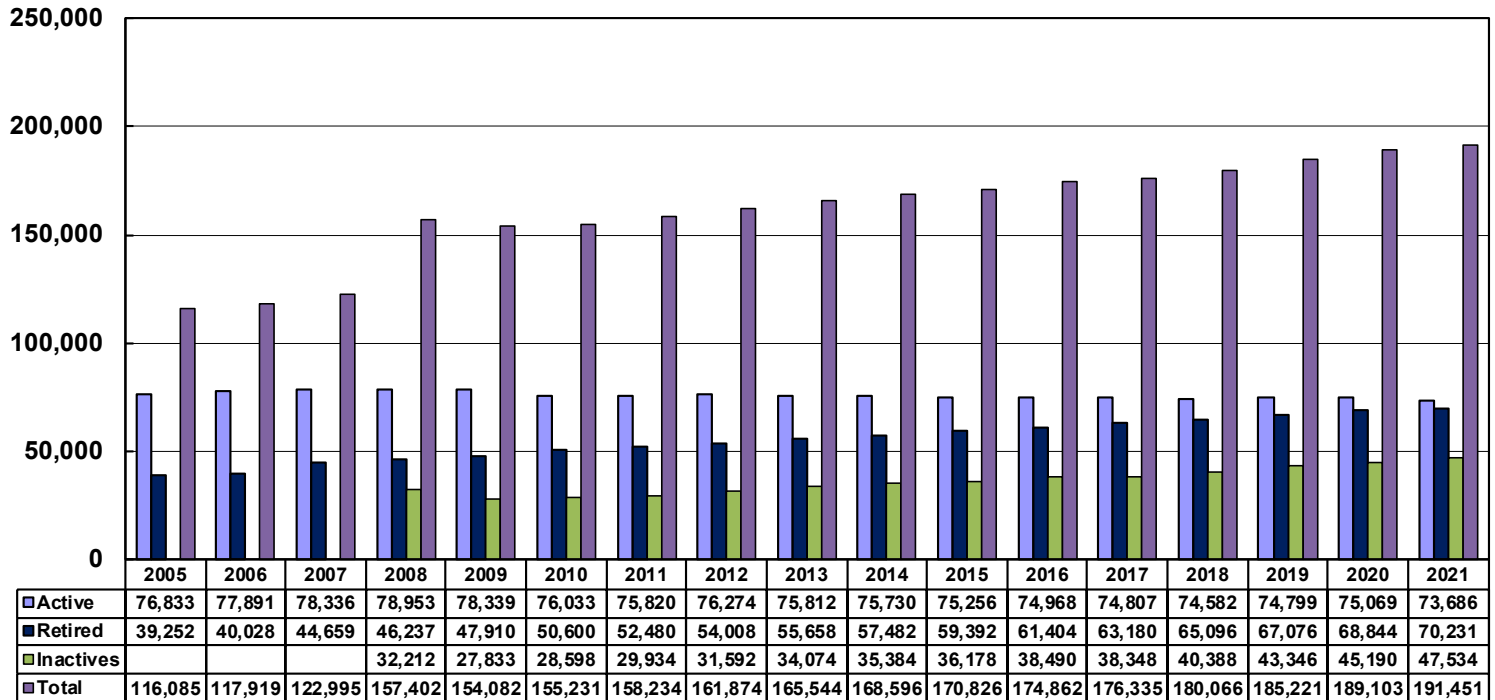
	June 30, 2021 Valuation				
	State	Teachers	SPORS	VaLORS	JRS
Actives:					
Average Age	47.8	45.0	40.3	40.1	58.2
Average Credited Service	11.5	11.7	13.4	8.4	9.4
Average Entry Age	36.3	33.3	26.9	31.7	48.8
Average Pay	\$62,350	\$57,125	\$73,341	\$44,879	\$174,669
Retirees in the Past Year:					
Average Age at Retirement	64.8	63.1	57.4	57.1	68.5
Average Service at Retirement	23.2	23.2	30.2	19.5	35.6
Average AFC at Retirement	\$61,711	\$61,965	\$88,012	\$48,128	\$163,492
Average VRS Benefit at Retirement as a Percent of Pay	40.5%	38.1%	51.3%	37.3%	60.5%
Average Benefit at Retirement	\$25,015	\$23,583	\$45,136	\$17,967	\$98,987
Average Social Security Benefit at Age 62 or Average Retirement Age if later	\$23,292	\$20,292	\$22,176	\$14,736	\$35,364

Average retirement age has been trending upward for many years. Average service at retirement is computed as the sum of the retirees' total VRS service at retirement divided by retiree headcounts. For JRS members, actual service at retirement is increased by a factor of 1.5, 2.0, 2.5 or 3.5 depending on age at appointment/election and date of appointment/election.

Total Membership



State Employees



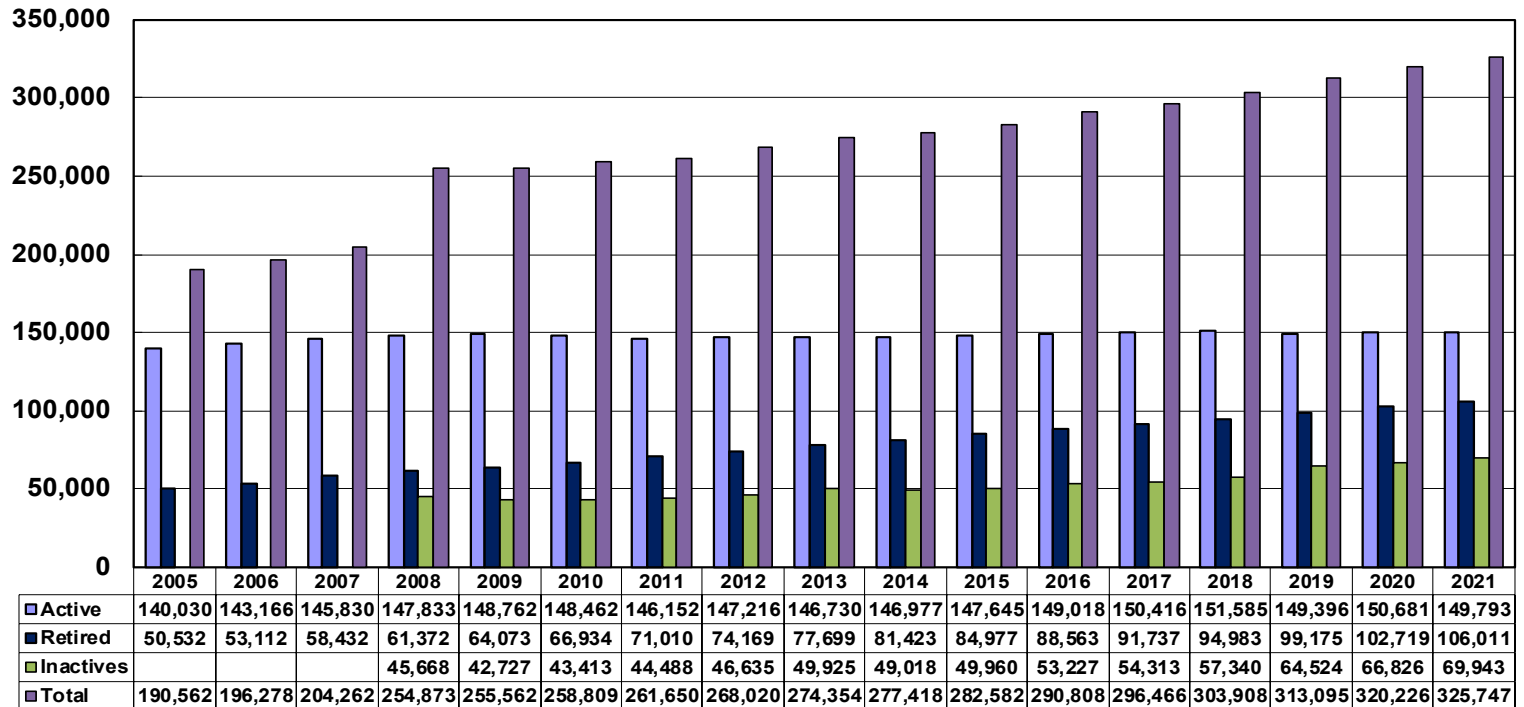
0.3% average annual decrease for active members since 2011; 1.8% decrease for 2021.
 3.0% average annual increase for retired members since 2011; 2.0% increase for 2021.
 2.0 actives per retiree 15 years ago; 1.0 actives per retiree now. As large plans mature, retiree population becomes larger portion of overall population.

“Retired” includes retirees, disabled retirees and beneficiaries.
 “Inactive” includes deferred vested and non-vested members with employee contributions in plan.
 “Inactive” data before 2008 is not available.

Total Membership



Teachers



0.2% average annual increase for active members since 2011; 0.6% decrease for 2021.

4.1% average annual increase for retired members since 2011; 3.2% increase for 2021.

2.7 actives per retiree 15 years ago; 1.4 actives per retiree now. As large plans mature, retiree population becomes larger portion of overall population.

“Retired” includes retirees, disabled retirees and beneficiaries.

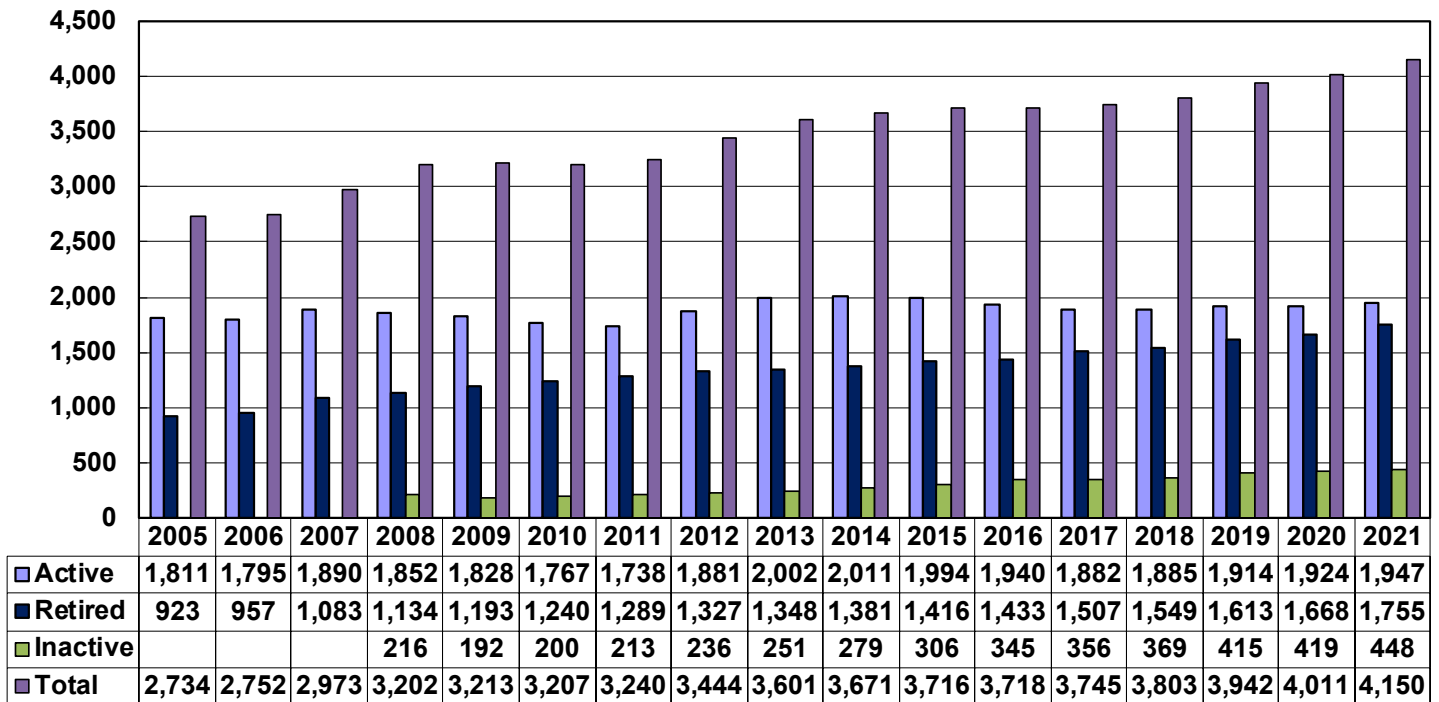
“Inactive” includes deferred vested and non-vested members with employee contributions in plan.

“Inactive” data before 2008 is not available.

Total Membership



State Police



1.1% average annual increase for active members since 2011; 1.2% increase for 2021.

3.1% average annual increase for retired members since 2011; 5.2% increase for 2021.

1.9 actives per retiree 15 years ago; 1.1 actives per retiree now. As large plans mature, retiree population becomes larger portion of overall population.

“Retired” includes retirees, disabled retirees and beneficiaries.

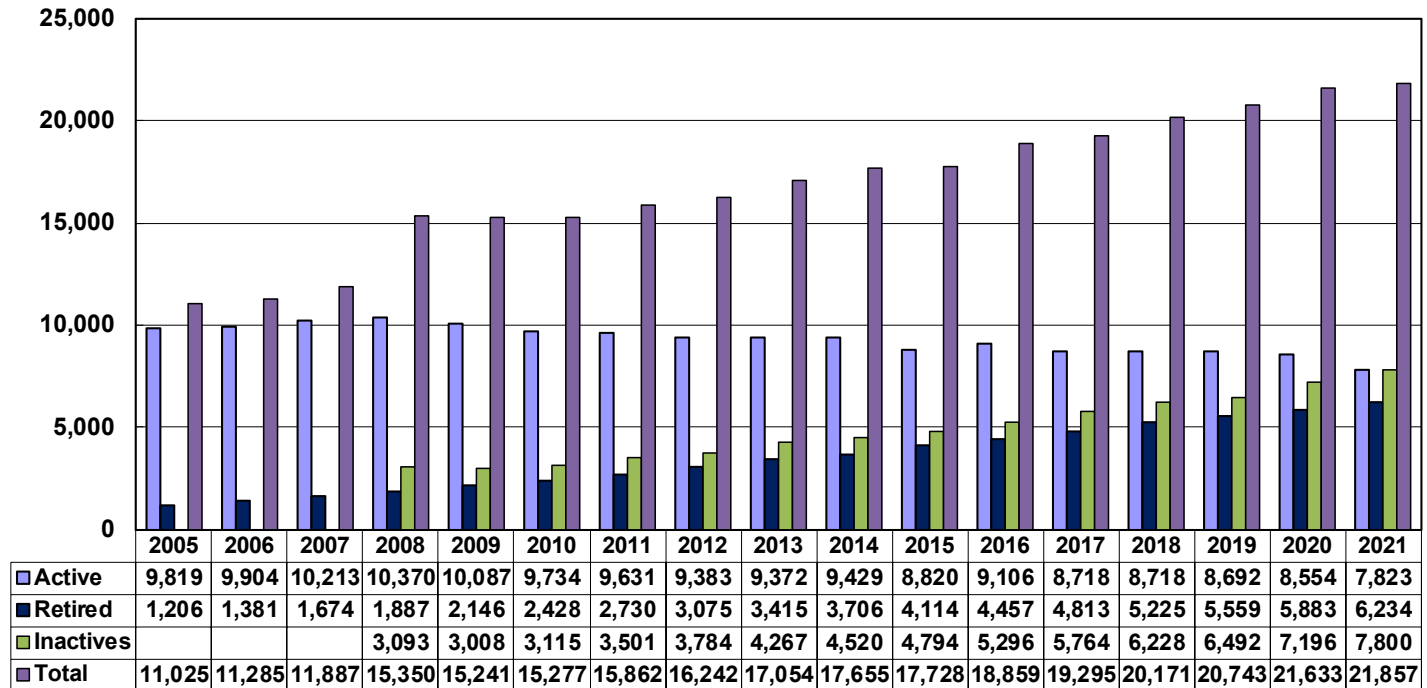
“Inactive” includes deferred vested and non-vested members with employee contributions in plan.

“Inactive” data before 2008 is not available.

Total Membership



Virginia Law Officers



2.1% average annual decrease for active members since 2011; 8.6% decrease for 2021.

8.6% average annual increase for retired members since 2011; 6.0% increase for 2021.

7.2 actives per retiree 15 years ago; 1.3 actives per retiree now. As large plans mature, retiree population becomes larger portion of overall population.

“Retired” includes retirees, disabled retirees and beneficiaries.

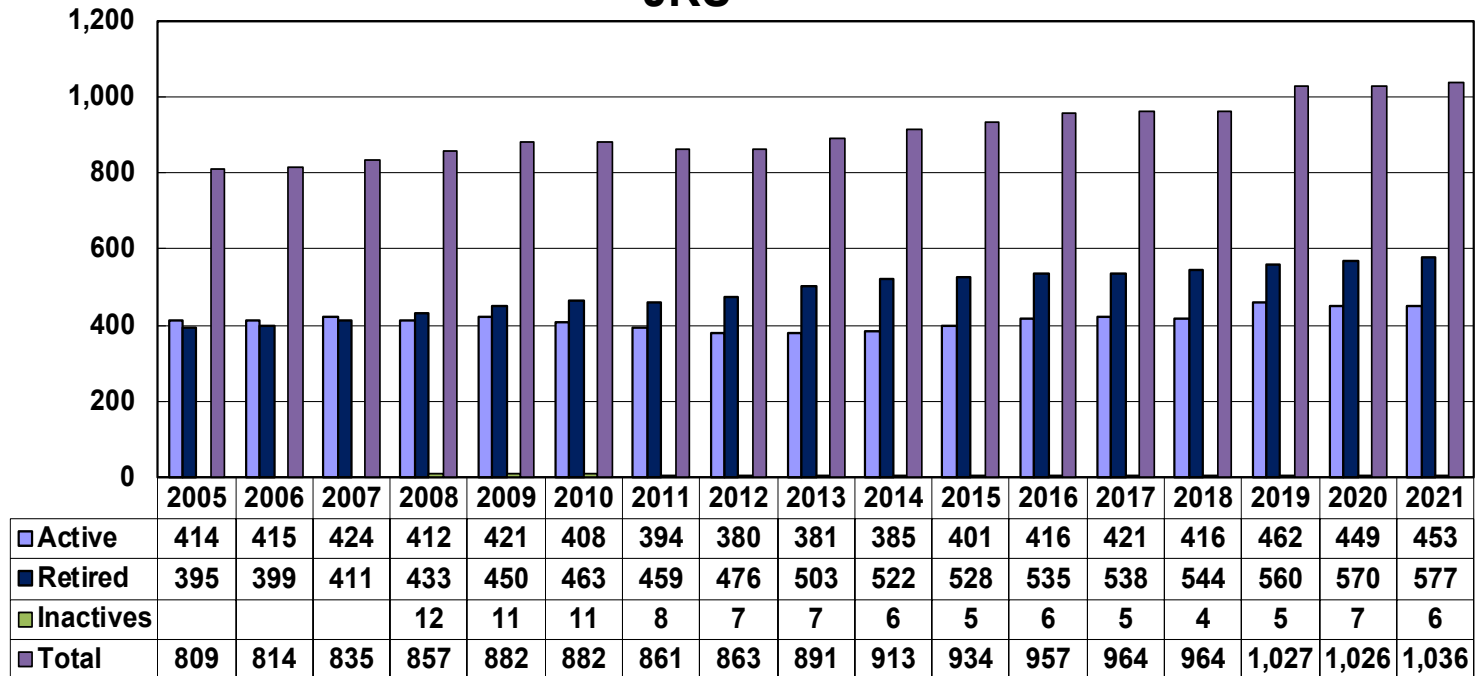
“Inactive” includes deferred vested and non-vested members with employee contributions in plan.

“Inactive” data before 2008 is not available.

Total Membership



JRS



1.4% average annual increase for active members since 2011; 0.9% increase for 2021.

2.3% average annual increase for retired members since 2011; 1.2% increase for 2021.

1.0 actives per retiree 15 years ago; 0.8 actives per retiree now. As large plans mature, retiree population becomes larger portion of overall population.

“Retired” includes retirees, disabled retirees and beneficiaries.

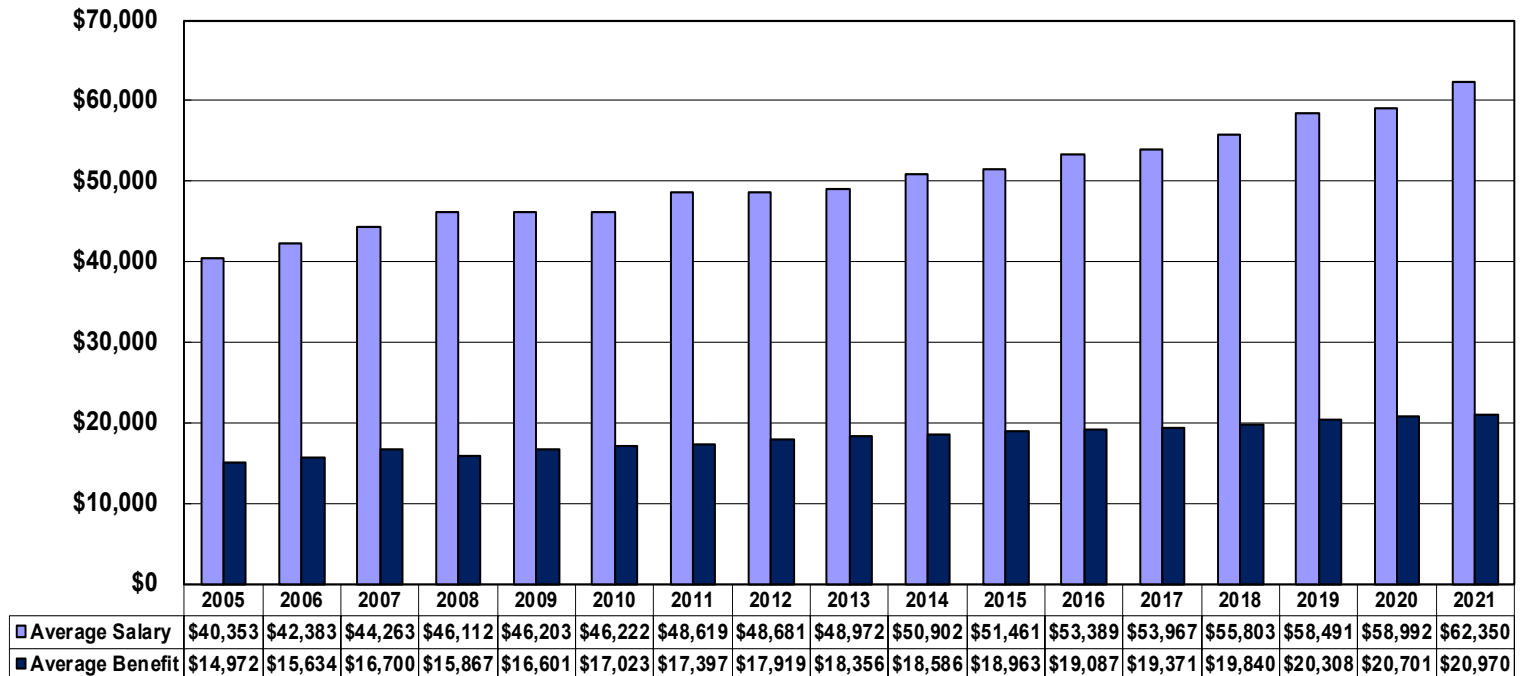
“Inactive” includes deferred vested and non-vested members with employee contributions in plan.

“Inactive” data before 2008 is not available.

Average Salary & Average Retirement Benefits



State Employees



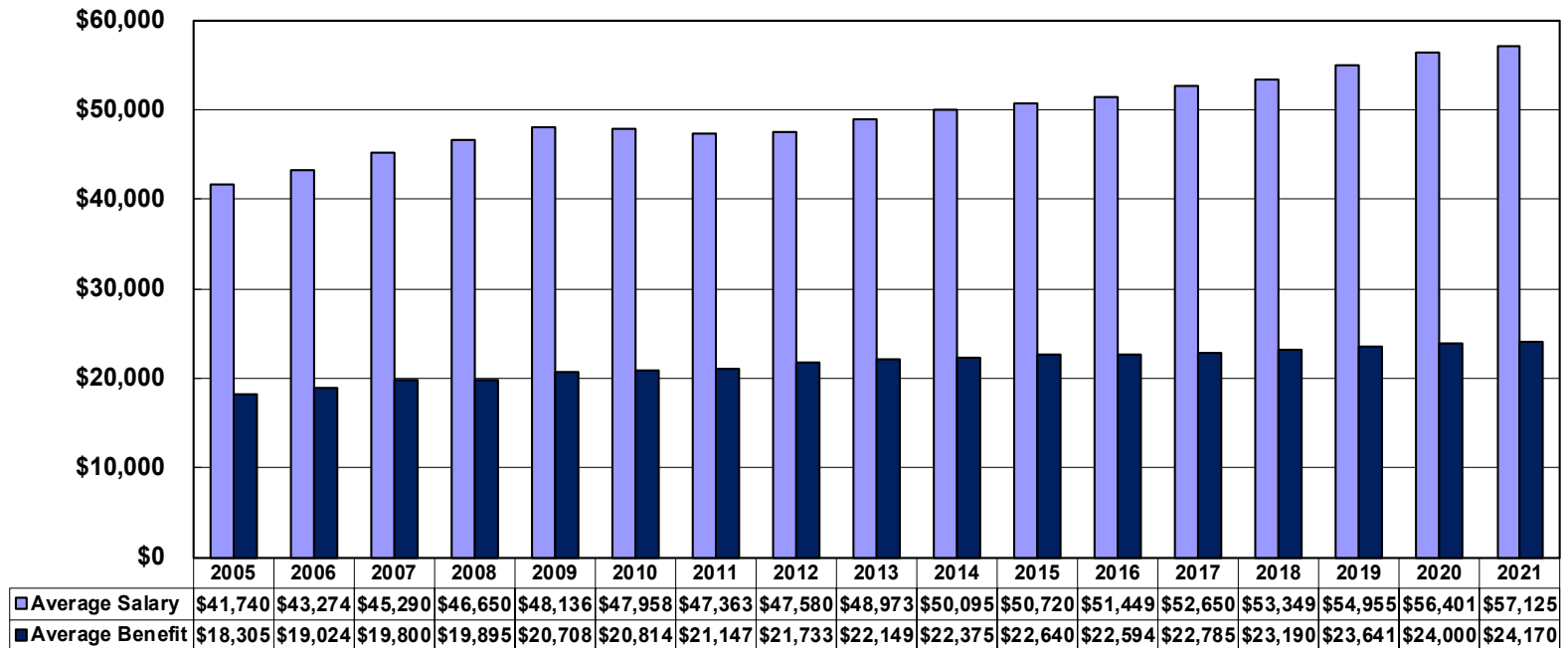
2.5% average annual increase in average salary since 2011; 5.7% increase for 2021.
 1.9% average annual increase in average benefit since 2011; 1.3% increase for 2021.

Average Benefit is average for all retirees.

Average Salary & Average Retirement Benefits



Teachers



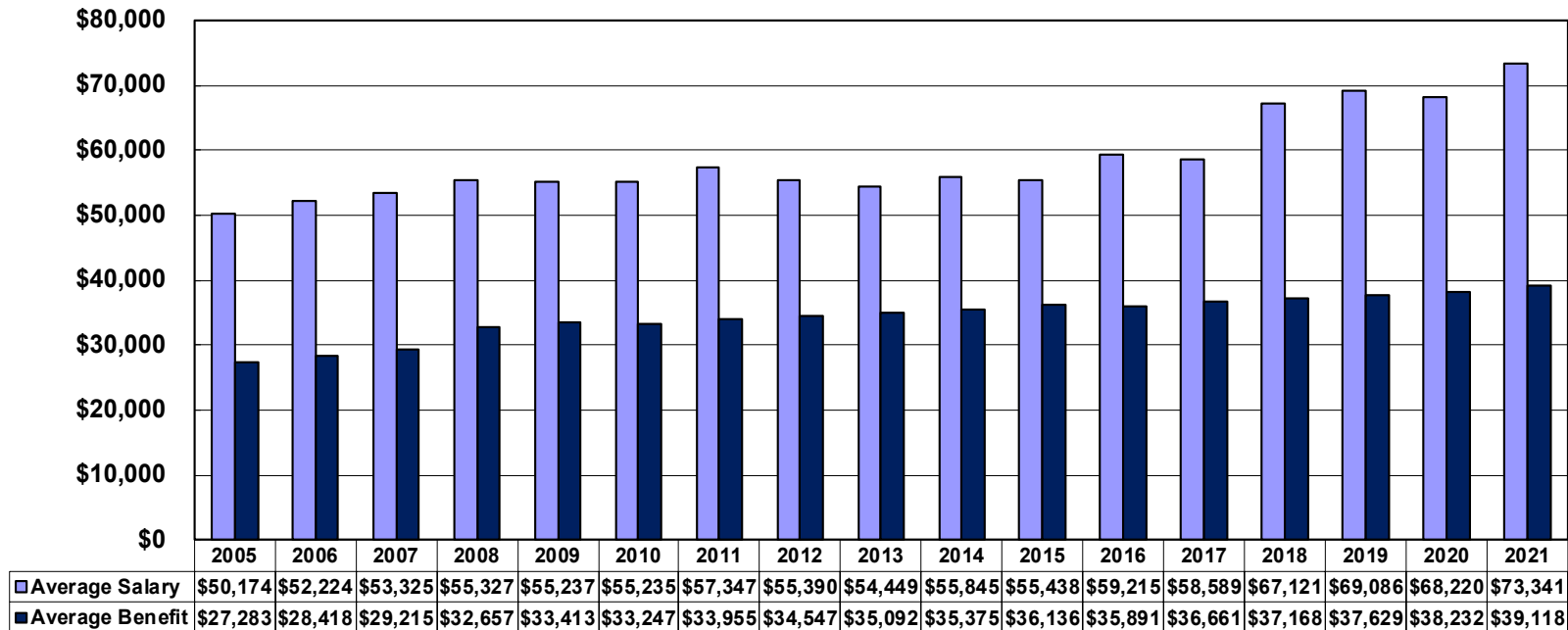
1.9% average annual increase in average salary since 2011; 1.3% increase for 2021.
 1.3% average annual increase in average benefit since 2011; 0.7% increase for 2021.

Average Benefit is average for all retirees.

Average Salary & Average Retirement Benefits



State Police



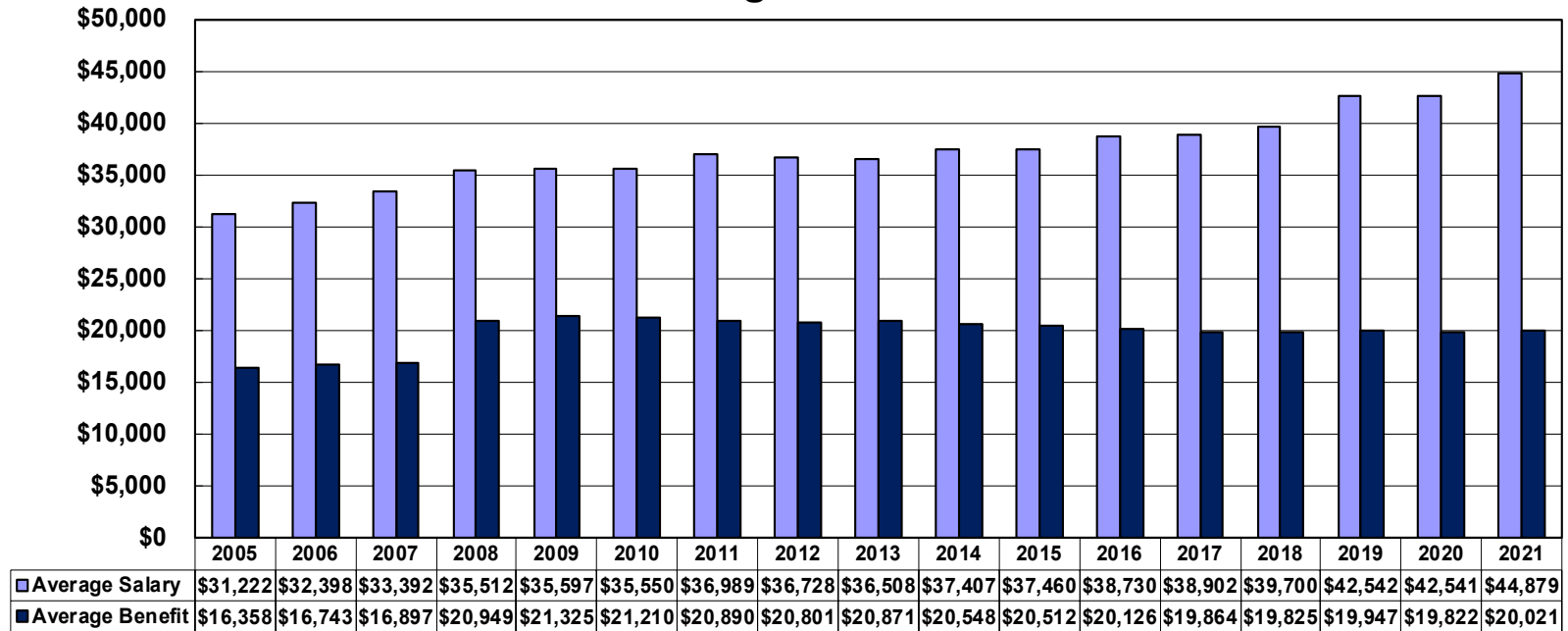
2.5% average annual increase in average salary since 2011; 7.5% increase for 2021.
 1.4% average annual increase in average benefit since 2011; 2.3% increase for 2021.

Average Benefit is average for all retirees.

Average Salary & Average Retirement Benefits



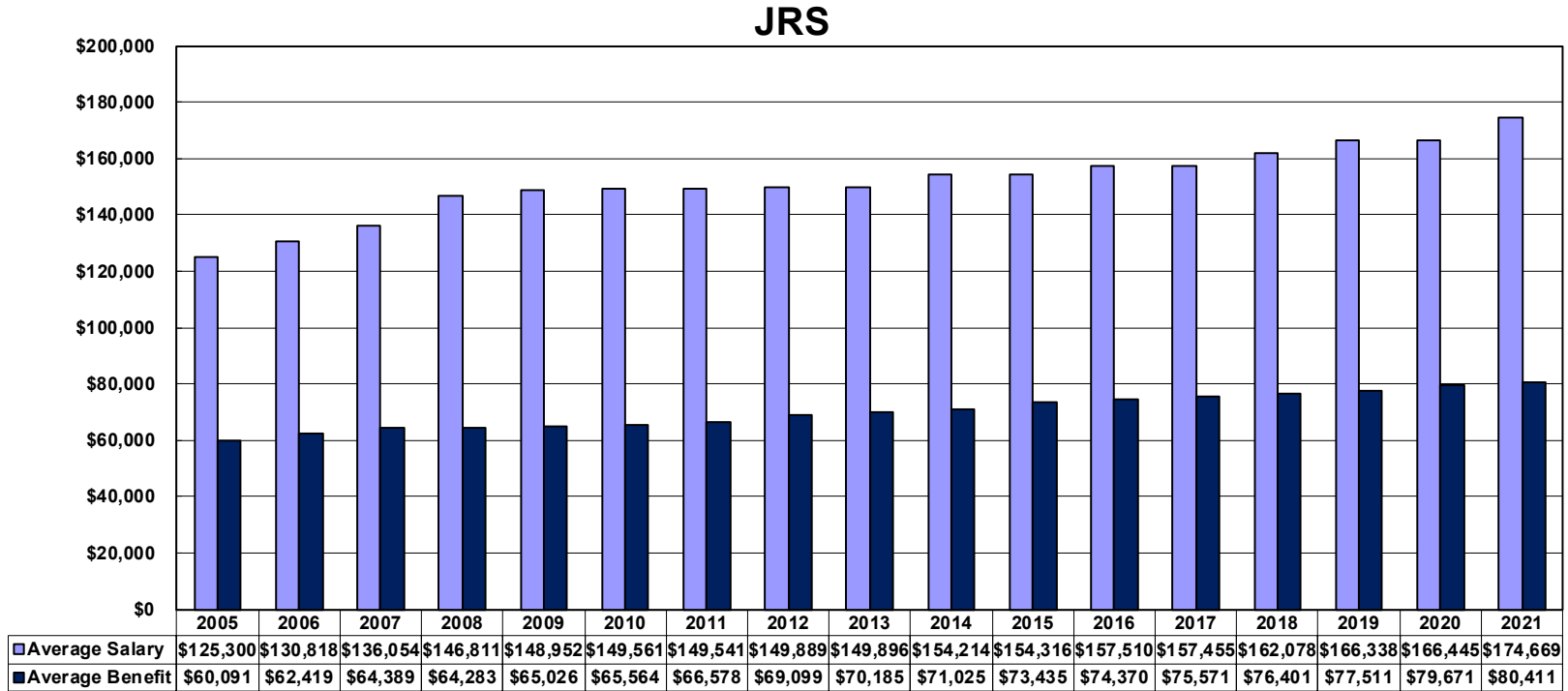
Virginia Law Officers



2.0% average annual increase in average salary since 2011; 5.5% increase for 2021.
 0.4% average annual decrease in average benefit since 2011; 1.0% increase for 2021.

Average Benefit is average for all retirees.

Average Salary & Average Retirement Benefits



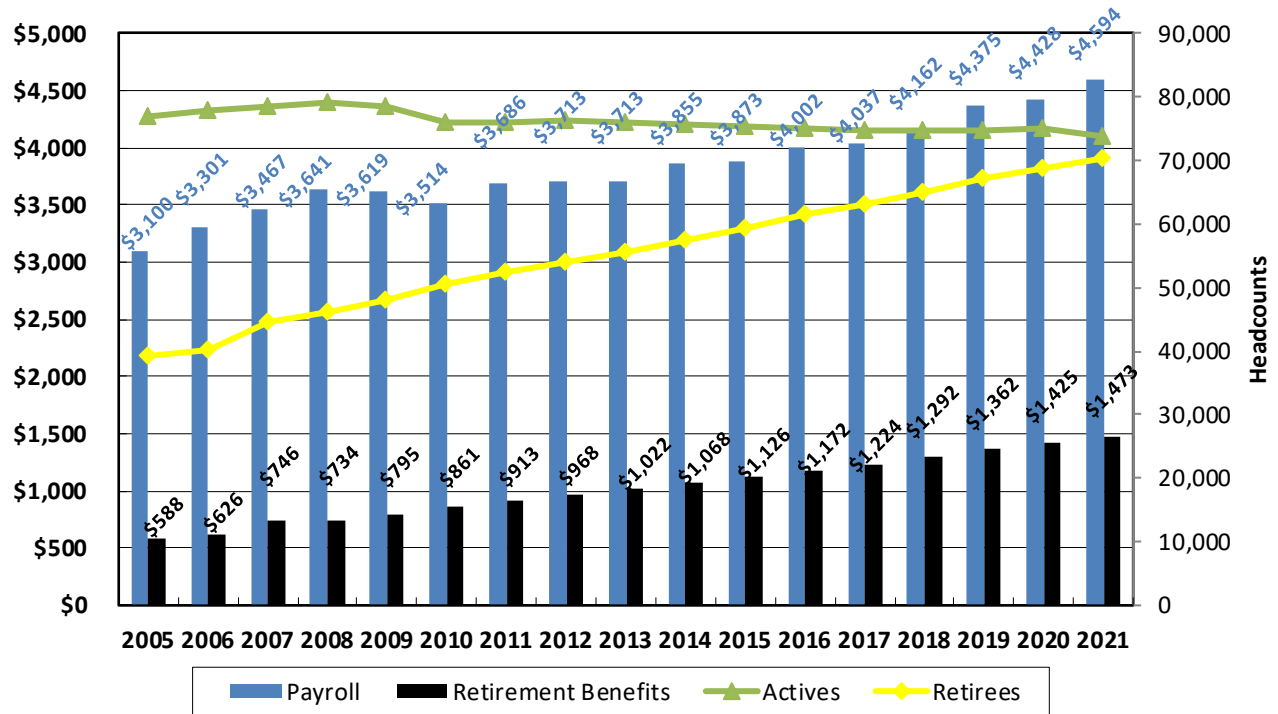
1.6% average annual increase in average salary since 2011; 4.9% increase for 2021.
 1.9% average annual increase in average benefit since 2011; 0.9% increase for 2021.

Average Benefit is average for all retirees.

Annual Payroll & Retirement Benefits (\$ Millions)



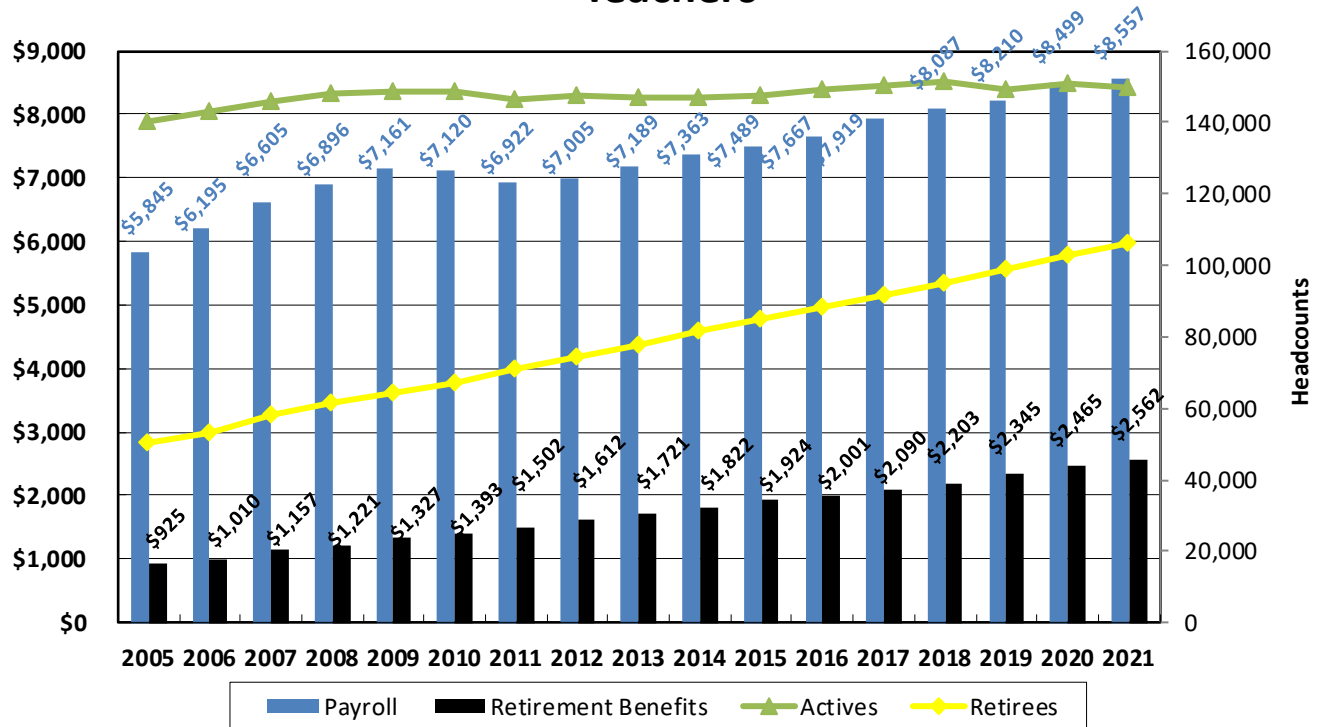
State Employees



Annual Payroll & Retirement Benefits (\$ Millions)



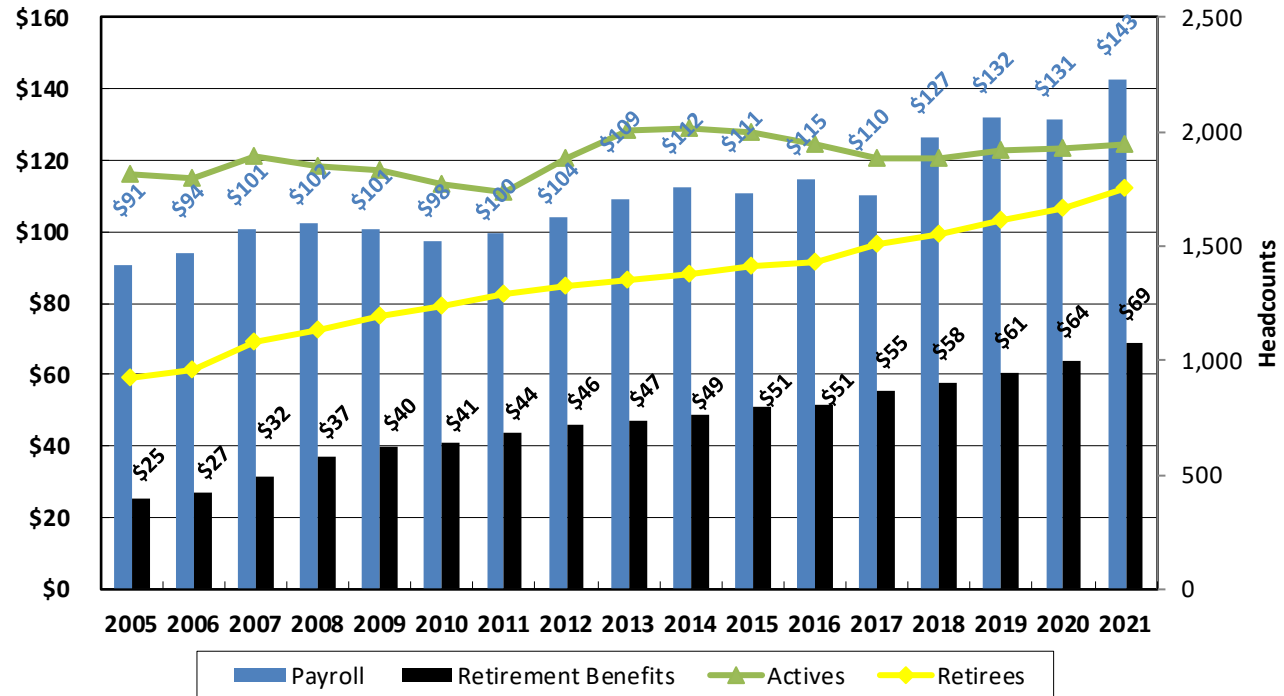
Teachers



Annual Payroll & Retirement Benefits (\$ Millions)



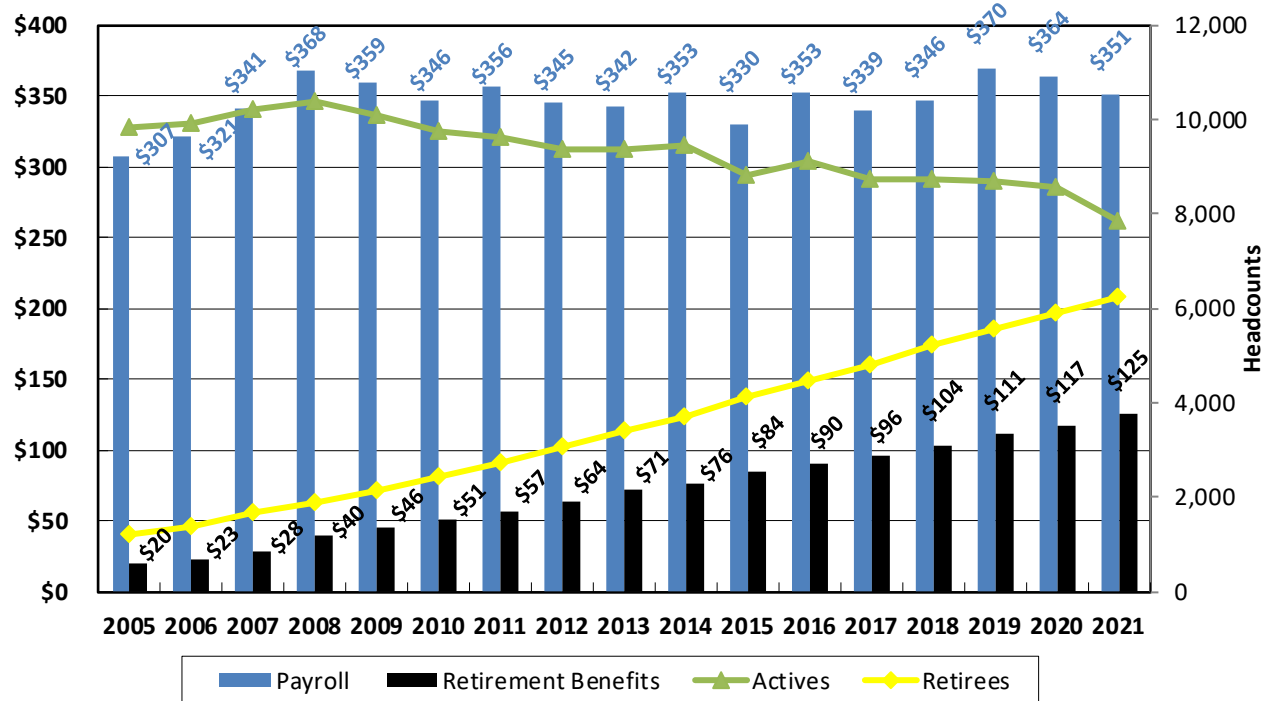
State Police



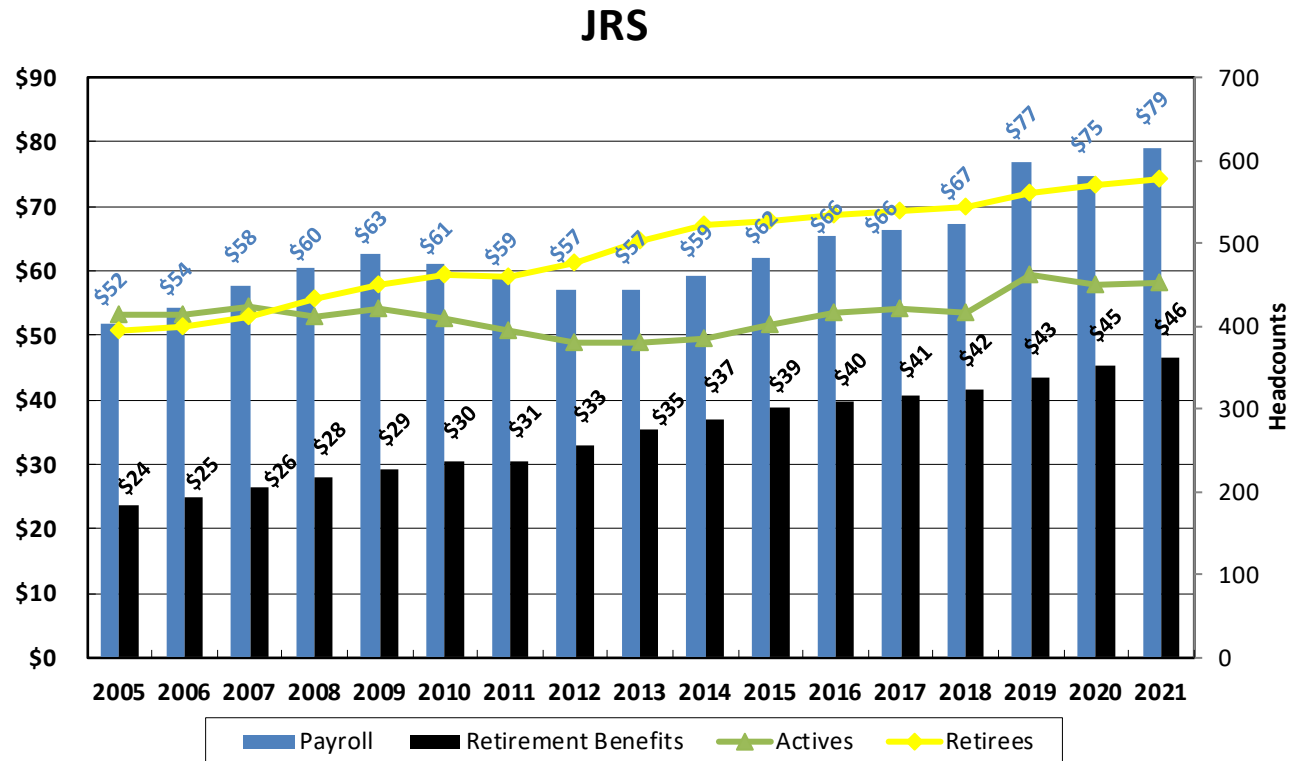
Annual Payroll & Retirement Benefits (\$ Millions)



Virginia Law Officers



Annual Payroll & Retirement Benefits (\$ Millions)



Valuation Process

- The actuary determines the amount of employer contributions to be made to each VRS System during each member's career that, when combined with investment return and member contributions, is expected to be sufficient to pay for the benefit of that System
- In addition, the annual actuarial valuation is performed to:
 - Determine the progress on funding
 - Explore why the results of the current valuation differ from the results of the valuation of the previous year
 - Satisfy regulatory and accounting requirements

Definition of the results developed in the actuarial valuation:

- **Actuarial Accrued Liability (AAL)** – The cost of benefits attributable to service accrued as of the valuation date for the System.
- **Actuarial Value of Assets (AVA)** – the value of the System's total assets used to develop Unfunded Actuarial Accrued Liability and the employer contribution towards it. The AVA is a smoothed value of assets where investment gains and losses which differ from the 6.75% assumed return are reflected over five years. Use of an AVA results in employer contributions which are less volatile than if the market value was used. For the Health Insurance Credit Political Subdivision and Special Coverage Code Plans, the AVA is equal to the market value of assets.
- **Unfunded Actuarial Accrued Liability (UAAL)** – the excess of Actuarial Accrued Liability (AAL) over Actuarial Value of Assets (AVA); the amount of liability to be funded with future contributions.
- **Funded Ratio** – the ratio of the AVA over AAL.
- **Net Actuarial Gain or Loss** – an increase (loss) or decrease (gain) in the UAAL due to actuarial experience different from expected.
- **Employer Contribution Rate** – the rate of pay developed to systematically pay off benefits accruing during the year, administrative expenses and the UAAL. Refer to components on the next slide.

The components of the employer contribution rates are as follows:

- **Employer Normal Cost Rate** - The ongoing annual cost of active employees accruing benefits under the plan, net of the member contribution rate.
- **Amortization Charge** - The amortization of, or payment towards, the unfunded actuarial accrued liability (UAAL) for the year. See next slide for more detail.
- **Administrative Expenses** - An estimate of the administrative expenses to be paid out of the trust in the upcoming fiscal year.
- **Additional Funding Contribution** - The additional contribution rate needed to allow for the use of the 6.75% investment return as the single equivalent investment return assumption for purposes of the GASB 67/68 statements.
- **Plan Surcharge** - The additional contribution rate applied to plans with low funding levels to bring the plan to a more sustainable funding position as determined by the Plan Actuary.
- **DC Contribution for Hybrid Members** - 1% mandatory employer contribution as well as an estimate of the employer match to the voluntary contributions made to the DC plan by Hybrid Plan members.