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Virginia Commission on Employee Retirement Security & Pension Reform

Retirement Working Group Meeting # 1

October 17, 2016

Public Sector Retirement Systems Project

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Introduction

- July 11 presentation included 50-state and Virginia specific information on pension funding, benefits, and investments
- August 22 presentation covered additional research and analysis on the Virginia Retirement System (VRS), including preliminary feedback to questions raised by members of the Commission
- September 12 presentation addressed follow-up questions from commission members and identified a framework for potential recommendations for the Working Group's consideration
- Today's goal is to present recommendations for the Working Group to consider putting forth to the full Commission
- VRS has emphasized the importance of considering implementation issues and costs for all recommendations

Purpose of the Commission

- **Commission's purpose is to study, report, and make recommendations on:**
  - Financial soundness of all DB plans administered by VRS
  - Attributes of retirement plans for current and future state and local employees
  - Impact of and strategies for addressing anticipated retirements in the next 10 years
  - Elements of compensation and benefit packages to attract and retain and highly productive state workforce

- **Areas of study:**
  - Unfunded liabilities of state and local retirement plans and strategies for reducing those liabilities
  - Investment choices and products offered by VRS
  - Incentives for state and local employees to make voluntary contributions to retirement plans
  - Contributions by state and local government to retirement plans

Overview

- **Principles for Fiscal Sustainability & Retirement Security**
- **Summary of Recommendations**
- **Detailed Review of Recommendations**

Principles for Fiscal Sustainability

- Commit to fully funding and paying for pension promises
- Manage investment risk and cost uncertainty
- Follow sound investment governance and reporting practices

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Principles for Retirement Security

- Target sufficient contributions and savings to help put employees on a path to a secure retirement
- Invest assets in professionally managed, pooled investments with low fees and appropriate asset allocations
- Provide access to lifetime income in retirement

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Summary of Considerations and Recommendations

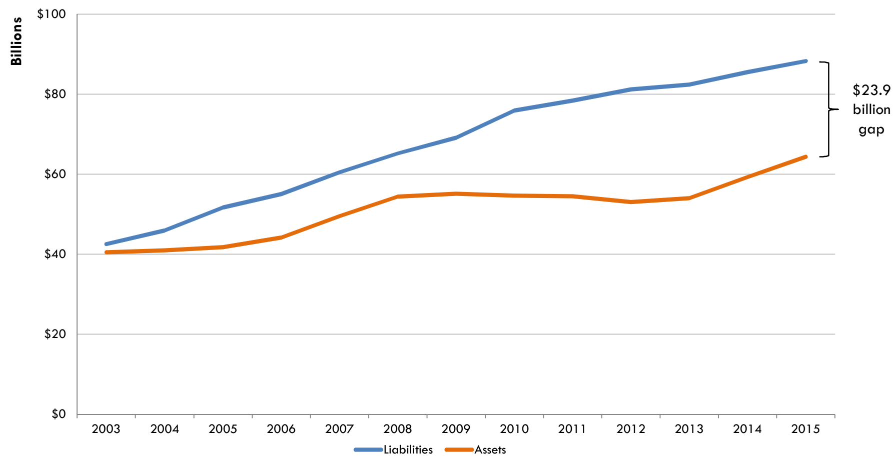
	Pew Recommendation	Current Status / Comments	Impact to the State
	Pension Funding (Page 8)		
1	**Adopt** a policy to regularly develop and report stress test analysis, including projections of pension costs, liabilities and debt reduction under different economic and investment. (RBA)	VRS currently performs some stress testing on an ad hoc basis. Pew's detailed recommendation is informed by the Society of Actuaries' Blue Ribbon Panel on Public Pension Funding and other state practices, tailored to Virginia. We also note that Commission members have also expressed interest in looking at the discount rate and the likelihood of meeting that assumption going forward.	Stress testing would inform policymakers on the fiscal impacts if investment returns are higher or lower than 7%, help to plan for uncertainty, and underscore the importance of fully funding pension promises.
	Benefit Plan Design (Page 17)		
2	**Adopt** VRS' suggested changes to the current hybrid plan, as reflected in HB 1072 (2016), modified to: (1) Provide workers with an "active choice" option to increase their contribution to the maximum level required to receive the full state match; and (2) Modify or provide an active choice to set the auto-escalation to 1% per year instead of 0.5% every 2 years.	The default savings rate of the hybrid plan is substantially lower than minimum standards and below the average for other state hybrid plans. The current auto-escalation formula extends over 20 years and is complex. Policymakers have identified increasing savings in the hybrid plan as a policy goal.	Would provide an immediate path to achieve a minimum standard level of retirement savings, maximize state match, preserve policymaker goals to raise replacement income for career workers, and make the split of employee and employer contributions in the DB plans more equitable across all tiers. Employer contribution rate (cost) would be slightly higher but more predictable.
3	**Provide** workers with access to an optional defined contribution plans based on the ORPPA plan.	There are currently optional defined contribution plans for higher education (ORPHE), political appointees (ORPPA), and school superintendents (ORPSS). Eight states have adopted optional DC plans *(see the Optional DC section for case study information on South Carolina, Indiana, and Utah)*.	Could provide added flexibility for the state in the workforce recruitment and retention context. State contribution rates would be higher than current actuarial cost, but fixed and predictable. VRS has emphasized importance of considering regulatory and implementation issues.
4	**Consider** adding a cost sharing provision that would make employee contributions - to the defined benefit (DB) component - variable within a limited range based on realized cost associated with upside and downside investment return scenarios.	Arizona, Iowa, South Carolina and Wisconsin currently have cost sharing provisions requiring employee contributions of 40%-50% of either total cost or cost increases. See also examples of contingent cost of living adjustment (COLA) increases in Maryland, Minnesota and Wisconsin.	Would provide the state with an additional "shock absorber" to manage investment risk and cost uncertainty. Could require higher employee contributions in the future in an environment where recent salary increases have been limited.
	Investment Transparency & Reporting (Page 50)		
5	**Adopt** a formal policy to continue providing the VRS investment policy online and including 20- and 25-year investment performance data in regular reporting. (RBA)	Investment policy statement online as of 2016 with 20- and 25-year investment performance data included in quarterly investment reports as of the June 30, 2016 report.	Provides stakeholders with increased transparency on investment strategies and performance. Although most states post an investment performance data online, few include data beyond 10 years.
6	**Adopt** a policy to regularly report performance and carried interest fees for private equity and other alternative investments. (RBA)	VRS is currently considering a reporting structure similar to the Institutional Limited Partners Association (ILPA) recommendations. VRS has narrowed the ILPA's suggested reporting template, which requires 40+ line-item disclosures for each fund, down to a manageable number of disclosures that it would then report in the aggregate.	Currently, only three states provide comprehensive fee disclosure on private equity. Improved disclosure in this area would make Virginia a national leader in this effort. VRS has also emphasized the importance of being able to work with top funds and managers.

Pension Funding

1	**Adopt** a policy to regularly develop and report stress test analysis, including projections of pension costs, liabilities and debt reduction under different economic and investment scenarios.

Virginia Retirement System

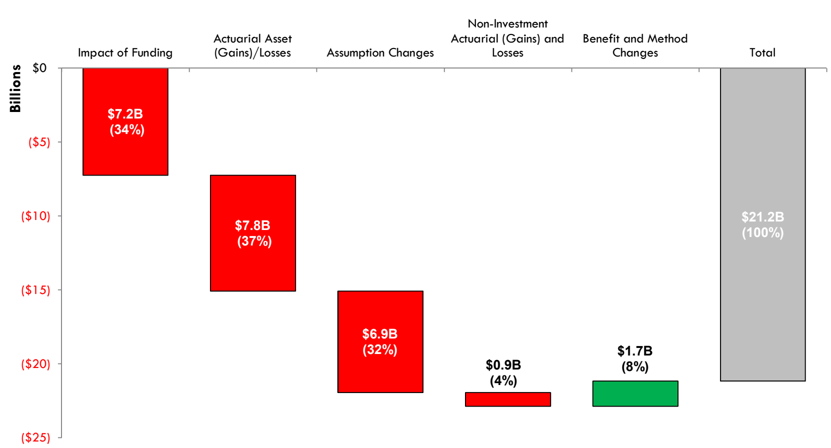
Assets & Liabilities: 2003 - 2015



Source(s): Comprehensive Annual Financial Reports (CAFRs), actuarial reports and valuations.

VRS Sources of Growth in Unfunded Liability (AVA)

2004-2015

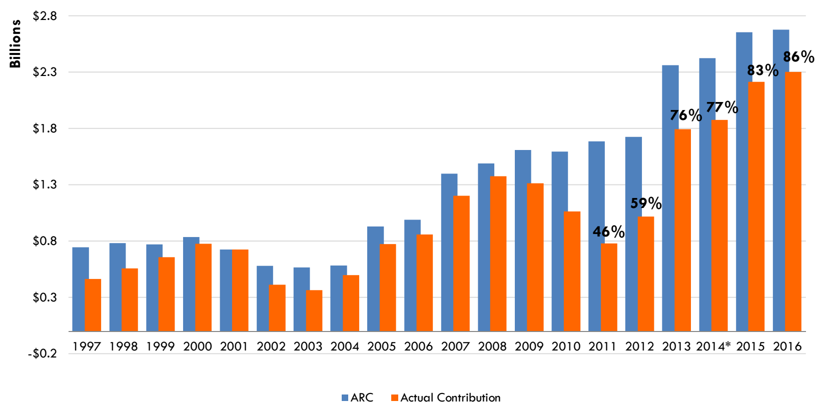


Note: Figures calculated using actuarial valuation of assets. VRS analysis from 1992 to 2015 indicates the sources of unfunded liability are ~44% due to underfunding and subsequent lost earnings on the missing contributions, ~40% due to the reduction in plan discount rate from 8% to 7% from 2005 to 2010, and ~16% due to unexpected investment experience, including investment losses over the past 25 years.

Source: Comprehensive Annual Financial Reports (CAFRs), actuarial reports and valuations.

Virginia ARC vs. Actual Contribution

VA ranked **43rd** among the states in percentage of ARC paid from 2003 – 2013, averaging 74%.



*Note: Starting in 2014, Virginia reported "actuarially determined contributions" or ADC instead of ARC.

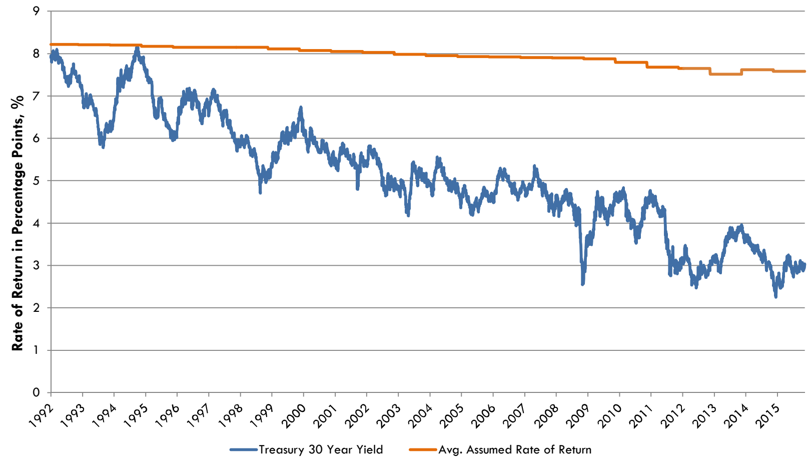
Source: Comprehensive Annual Financial Reports (CAFRs), actuarial reports and valuations.

Measuring and Managing Cost Uncertainty

- With interest rates at historically low levels, there is increased attention around both the level of risk in pension fund portfolios and the potential for unplanned costs if return targets are not achieved
- Public pension funds have taken steps to address these concerns by:
  - Increasing contributions
  - Modifying investment return targets and/or asset allocations
  - Implementing changes to benefit plan design
- Virginia has implemented policies in each of these areas and is considering additional measures
- Stress-testing investment returns and pension costs can further aid policymakers in their efforts to better understand and plan for cost uncertainty
  - See: Washington state, CALPERs, Society of Actuaries Blue Ribbon panel recommendations

Pension Fund Risk Premium at Historic High

US Public Fund Average Increasing Risk Premium – Plan's Assumed Rate of Return Remains Relatively Stable, While Bond Yields Have Declined



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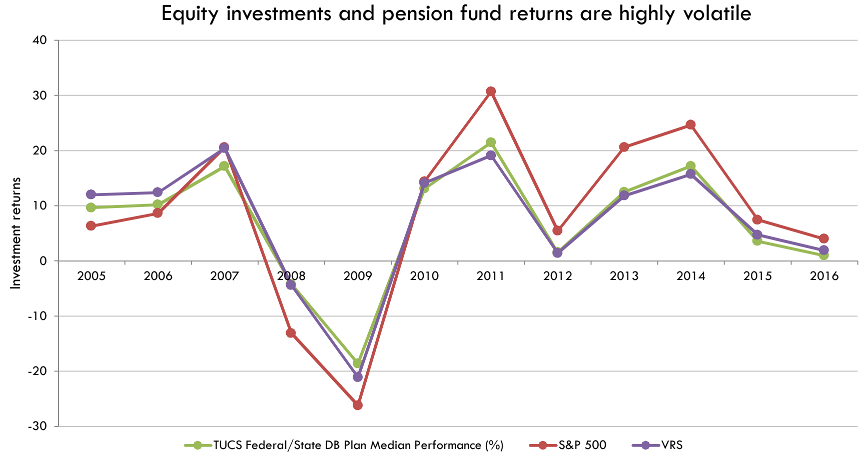
VRS - Average Annual VRS, Stock Market, and Pension Fund Returns

Equity investments and pension fund returns are highly volatile



Note: VRS data is reported *net of fees* while TUCS data is generally reported *gross of fees.*
Sources: VRS June 30th Investment Reports and the Wilshire®, Trust Universe Comparison Service®

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Sample Stress Testing Language
(under discussion w/ VRS)

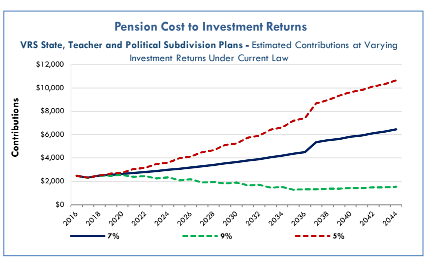
I. **Baseline Projections**
   1) Projections of assets, liabilities, pension debt, actuarial recommended contributions, net amortization, benefit payments, payroll, and funded ratio based on plan assumptions for the next 30 years;
   2) The expected contributions as a percent of payroll, the ratio of benefit payments to payroll, the ratio of funding liability to payroll, and the ratio of market value of assets to payroll

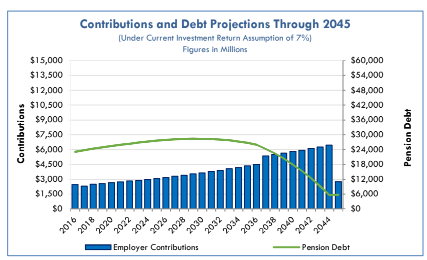
II. **Sensitivity Analysis**
   1) Estimates of the items listed in sub-paragraph 1(a) over a 20 year period assuming investment returns are 2 percentage points above plan assumptions, 2 percentage points below plan assumptions, and 3 percentage points below plan assumptions assuming:
      a. Employer contributions adjust based on current policy
      b. Employer contributions are held constant at the levels calculated for the Baseline Projections

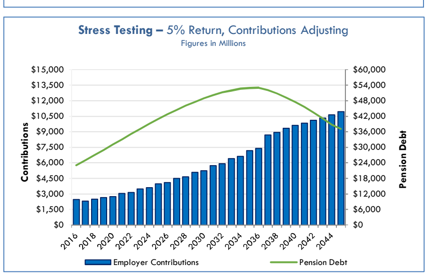
III. **Scenario Analysis (Asset Shock with Low Growth):**
   1) Estimates of the items listed in paragraph (1) if there is a one year loss on investments of 15%, followed by a 20 year period of investment returns 2 percentage points below plan assumptions assuming:
      a. Employer contributions adjust based on current policy
      b. Employer contributions are held constant at the levels calculated for the Baseline Projections

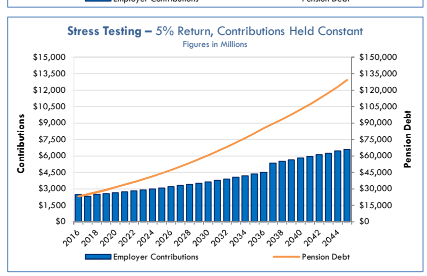
IV. **Projected assets, liabilities and pension debt for Baseline Projections assuming only 80% of the ARC is paid each year**

Stress Testing (continued)









Note: These results only contain estimates for the Virginia State Employees, Teachers, and Political Subdivision plans. State Police (SPORS), Virginia Law Officers (VaLORS), and the Judicial (JRS) plans are all excluded, as these plans comprise only 4% of VRS' total liability.

Benefit Plan Design

2	**Adopt** VRS' suggested changes to the current hybrid plan, as reflected in HB 1072 (2016), modified to: (1) Provide workers with an "active choice" option to increase their contribution to the maximum level required to receive the full state match; and (2) Modify or provide an active choice to set the auto-escalation to 1% per year instead of 0.5% every 2 years.

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Proposed Framework for Recommendations

- **Policy goals**
  - Limit near-term fiscal impact (during ramp to 100% ADC payments) and forecast long-term employer cost **and cost variation under different scenarios**
  - Achieve targeted improvement in replacement income for career workers
  - Increase savings rate for younger workers
  - Maximize value of annuities and other distribution options
  - Minimize complexity
- **Application of recent research and emerging practices on plan design**
  - "Active Choice" to address concerns that workers may have limited capacity to increase contributions out of take home pay*
  - Options and defaults for the distribution of DC balances
- **Measure budget and retirement security impacts**
  - Fiscal impact and alternate scenario assumptions included here are preliminary

** See Appendix from Pew's August 22 presentation for additional information*

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Plan Design Options

- **Improve Retirement Security Provided by the Hybrid Plan**
  - Policymakers in Virginia have expressed concern that workers are not saving enough for retirement in the current plan
  - Active choice and enhanced auto escalation policies can encourage additional savings
- **Offer an Optional DC to All Employees**
  - Currently only available to political appointees, school superintendents, and faculty and certain administrators of participating public higher education institutions
  - Optional DC plans can provide a portable benefit at a fixed cost to the state
- **Consider Policies to Share Risk Upside and Downside in the DB**
  - At least 19 states have policies that share risk, and sometimes gains, in their DB plan
  - Typically through variable employee contributions, variable COLAs, or both

Virginia Hybrid Has Low Default DC Contributions

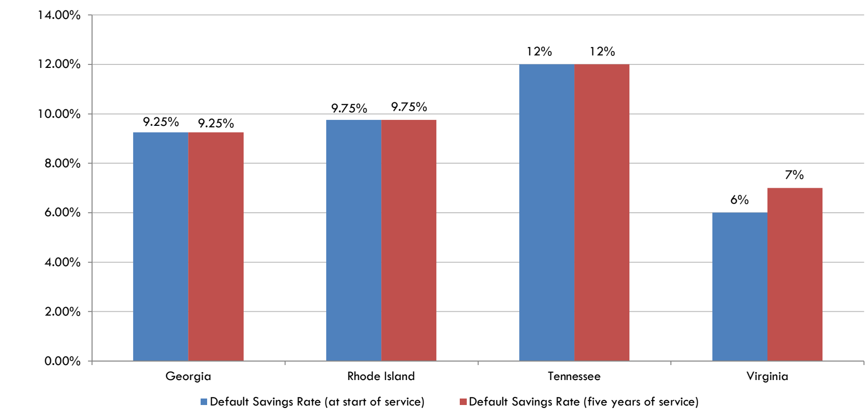
2% Employer/Employee Default, Other States From 5% to 8%

	DB Multiplier	Employee cont. to DB	Employer cont. to DC	Default employee cont. to DC	Number of investment options	Annuity offered for the DC
Georgia Employee's Retirement System	1%	1.25%	3% (3% matching, 0% mandatory)	5% (optional)	21	No
TN Consolidated Retirement System	1%	5%	5% (0% matching, 5% mandatory)	2% (optional)	26	No
Rhode Island Employee Retirement System (state and teachers)	1%	3.75%	1% (0% matching, 1% mandatory)	5% (mandatory)	23	Yes
Virginia Retirement System	1%	4%	3.5% (2.5% matching, 1% mandatory)	1% (mandatory)	22	Yes
Washington Department of Retirement Services	1%	None	None	5% (mandatory)	13	Yes
Federal Government Retirement System	1%	0.8%	5% (4% matching, 1% mandatory)	3% (optional)	10	Yes

*Note: VRS has 11 investment options plus a series of 12 target date funds. Note that the number here counts each target date fund separately. Additionally, VRS removed the emerging markets fund from their lineup effective on July 29th, 2016.
Source: Pew primer on hybrid plan design: www.pewtrusts.org/pensions; Original analysis and additional context initially provided in June 16, 2014 letter to the PA Senate Finance Committee

Mandatory Hybrid Plan Default Savings Rates

At Employment & 5 Years of Service



Notes: Rhode Island hybrid plan members who do not contribute to Social Security have a total savings rate of 13.75% instead of 9.75%. Interest rates on employee contributions to the DB component are as follows: Georgia 4%, Rhode Island 0%, Tennessee 5%, Virginia 4%. Under the Virginia hybrid plan, starting January 1, 2017, employee contributions will automatically increase by 0.5% every three years until reaching the maximum employee voluntary contribution of 4%. An employee with voluntary contributions of 4% receives a 2.5% matching employer contribution.

Inputs to Analytic Framework

- HB 1072 Fiscal Impact Statement
- Detailed projections of employer contributions for debt amortization, DB service cost (all tiers), and DC (hybrid)
- Behavioral assumptions – active choice and auto-escalation opt-out
- Actuarial model, including salary growth and turnover assumptions
- Provides a comprehensive assessment of fiscal impact over time

HB 1072 Original Proposal and Pew Modification

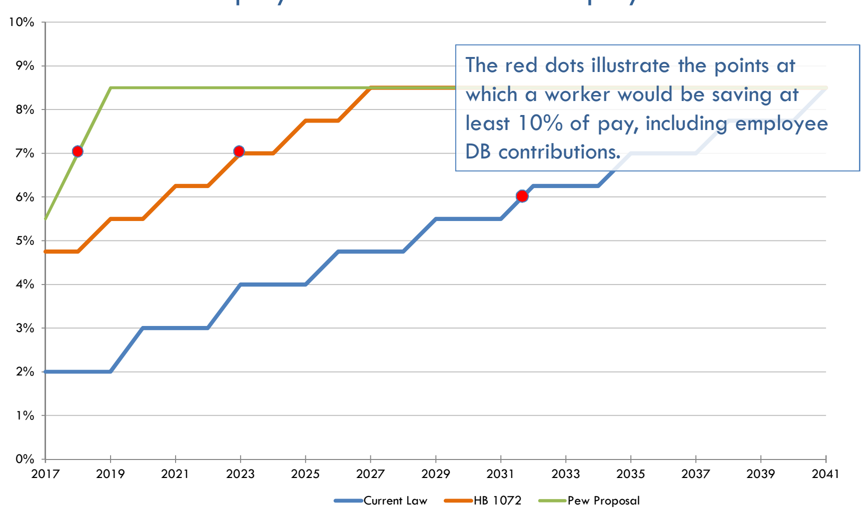
- **Original proposal would increase employee DC contributions initially and over time**
  - Workers would contribute 3% for their DB benefit and 2% to their DC account, compared to the current split of 4% and 1%. Employer base DC contributions increase from 1% to 2%
  - Auto-escalation policies would raise employee contribution rate to DC by 0.5% every two years—employees could opt out to keep contributions static
  - Maximum employer match to voluntary contributions would be reduced from 2.5% to 1.5%

- **Pew's Proposed Modifications**
  - Workers would make an active choice at enrollment to immediately make the full contribution to maximize the employer match or select a lower rate
  - Auto-escalation would increase employee contribution rate by 1% annually

- **Modified HB 1072 Help Workers Save Faster**
  - Current policy takes 24 years to get workers to the full employer match. Original HB 1072 reduces that to 10 years; modified version to two years

Total DC Contribution Rates – Current, HB 1072, and Proposed

Includes Employee Contribution and Employer Match



Range of Employer Cost for Alternative Plan Designs

(Pew Analysis - State Plan Example)

Plan (Employee Contributions)	DB Employer Cost, as a percentage of affected payroll [a]	Range of DC Employer Cost, as a percentage of payroll (default – maximum)	Total
Current plan (4% DB, 1% DC)	1.2%	1.0% - 3.5%[b]	2.2% - 4.7%
HB 1072 proposed (3% DB, 2% DC)	2.2%	2.0% - 3.5%[c]	4.2% - 5.7%
Alternate proposal (1% DB, 4% DC)	4.2%	3.0%[d]	7.2%

Notes:
a. Represents the portion of total normal cost the employer needs to contribute because of the employee contribution that was diverted to the DC plan. May be slightly overstated to the extent that smaller future refunds of contributions would reduce the total normal cost of the plan.
b. Assumes 1% default and 3.5% maximum employer contribution.
c. Assumes 2% default contribution and 3.5% maximum employer contribution.
d. Assumes fixed 3% contribution (100% of first 2%, 50% of next 2%).

Source: Analysis by Pew Charitable Trusts and The Terry Group. Select data from 2015 VRS Report, "Cash Balance Retirement Plans" and HB 1072 Fiscal Impact Note.

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Preliminary Analysis of Long-Term Impact

(Pew Analysis - State Plan Example)

	Total Employer Cost as a Percentage of Payroll Projected Results in 30 Years*	
	75% of Member Retain Auto Escalation (25% Opt-Out)	50% of Members Retain Auto Escalation (50% Opt-Out)
Current plan (1% minimum DC by Employee, 24 years to max employer match with escalation)	3.1%	2.8%
HB 1072 proposed (2% minimum DC by employee, 10 years to max employer match with escalation)	4.9%	4.7%
Alternative (4% minimum DC by Employee)	7.2%	7.2%
HB 1072 proposed with Pew Modifications (2% minimum DC by employee, 3 years to max employer match with escalation)	5.1%-5.6%*	5.1%-5.6%*

***Assumes between 50% to 75% make the active choice to increase voluntary contributions to 3% (for total DC contributions of 5%) in order to maximize state match upon employment.**
Note: Results based on State Employees and Teachers Hybrid Plan Participants, combined.
Source: Analysis by Pew Charitable Trusts and The Terry Group. Select data from 2015 VRS Report, "Cash Balance Retirement Plans" and HB 1072 Fiscal Impact Note.

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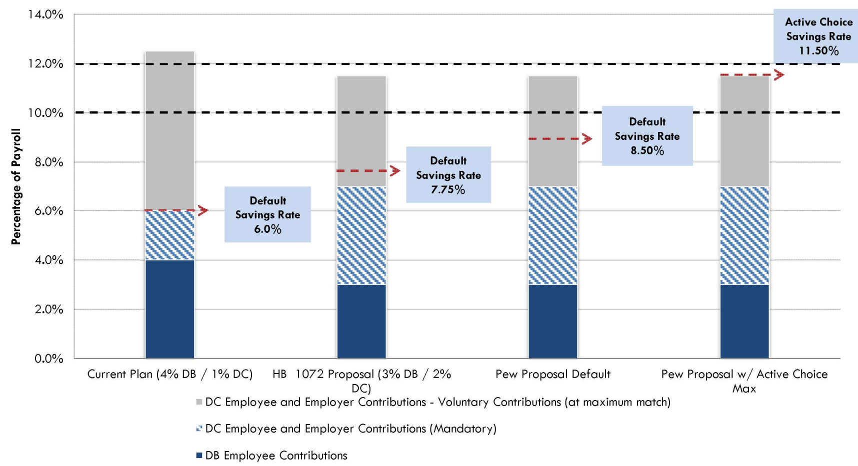
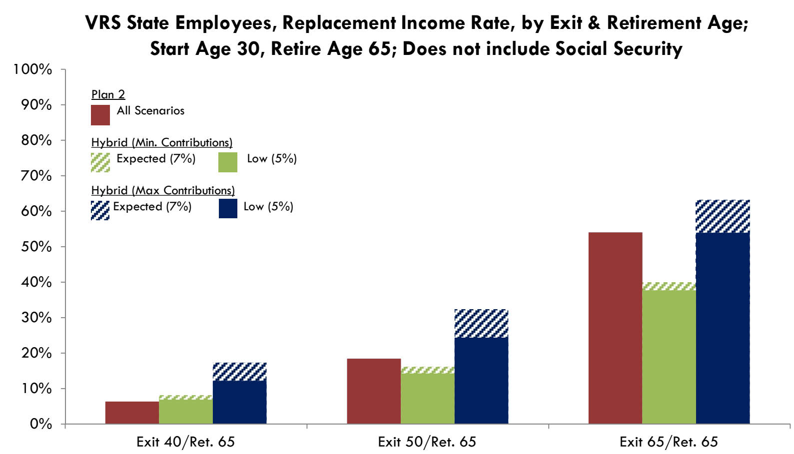
Savings Rate for Younger Workers in the Hybrid Plan

Default Rates Lower than Minimum Standards



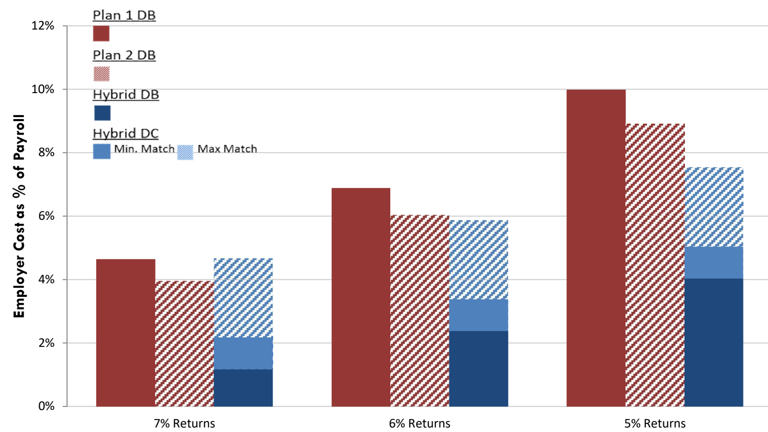
Source: The Pew Charitable Trusts based on HB 1072 Fiscal Impact Statement.

Replacement Rate at Retirement by Length of Service



Source: The Pew Charitable Trusts

Sensitivity of Employer Contribution Rate to Investment Return Projections



Notes: DB cost estimates at 7% returns based on VRS normal cost rates used in development of the fiscal year 2017/2018 employer rates, forecasted results at 6% and 5% returns based on VRS and Pew calculations. DC expected costs within the Hybrid represent employer minimum and maximum employer matching payments based on employee voluntary DC contributions.

Benefit Plan Design

4	Provide workers with access to an optional defined contribution plans based on the ORPPA plan.

Considerations for an Optional DC

- Fiscal sustainability for a retirement plan depends on managing cost and risk. An optional DC can trade a slightly higher expected cost for a reduction in risk
- Retirement security for any plan depends on sufficient contributions coming in and access to appropriate ways to withdraw savings in retirement
  - Typical optional DC plans have between 7 and 9% employer contributions and 13 to 16% combined contributions
  - Investment options in a DC need to be appropriate, low-fee, and professionally managed.
  - Access to lifetime income in the form of annuities or systematic withdrawal options is important
- ORPPA offers a potential framework
  - Savings for worker who opt in meets minimum standards of savings rate in conjunction with Social Security
  - Access to index and lifecycle funds; administrative and investment fees are comparable to VRS or lower depending on asset allocation choices
  - Participants have access to annuities as well as partial lump sums

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Optional DC Plans in Virginia

- Only currently available to a subset of Virginia public employees.
- Three plans:
  - Optional Retirement Plan for Political Appointees (ORPPA)
  - Optional Retirement Plan for School Superintendents (ORPSS)
  - Optional Retirement Plan for Higher Education (OPRHE)
- New workers who choose the ORP typically have an employee contribution of 5% and an employer contribution of 8.5% for a combined contribution rate of 13.5%
  - Employees joining before July 1, 2010 have no employee contribution and a 10.4% employer contribution
- ORPPA and ORPSS are administered through VRS, OPRHE offers a VRS provider option as well as two external providers, Fidelity and TIAA

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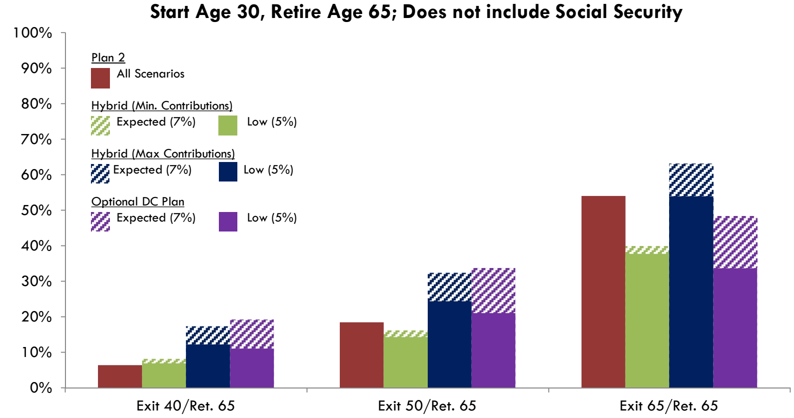
Replacement Rate at Retirement by Length of Service

Short- and Medium-term workers may benefit from optional DC

VRS State Employees, Replacement Income Rate, by Exit & Retirement Age; Start Age 30, Retire Age 65; Does not include Social Security



Source: The Pew Charitable Trusts

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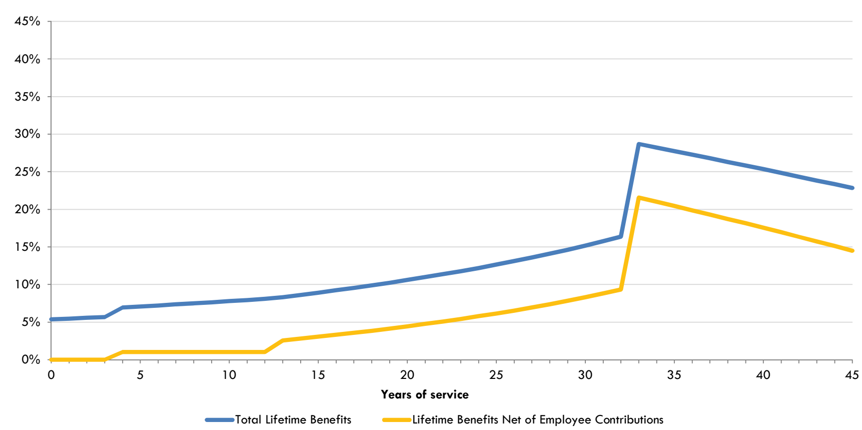
Lifetime Pension Benefits, as Percentage of Lifetime Salary

Virginia Retirement System, Hybrid Plan

General State Employees hired at age 25 in 2016, minimum employee contribution



Source: The Urban Institute

Note: The value of lifetime benefits and lifetime salary are discounted to the date of hire using an annual nominal discount rate of 5.7 percent. Employees assumed to contribute 1% of pay to their DC accounts. Estimates assume an annual inflation rate of 3.0 percent and that members who separate before vesting receive full refunds with interest on their plan contributions.

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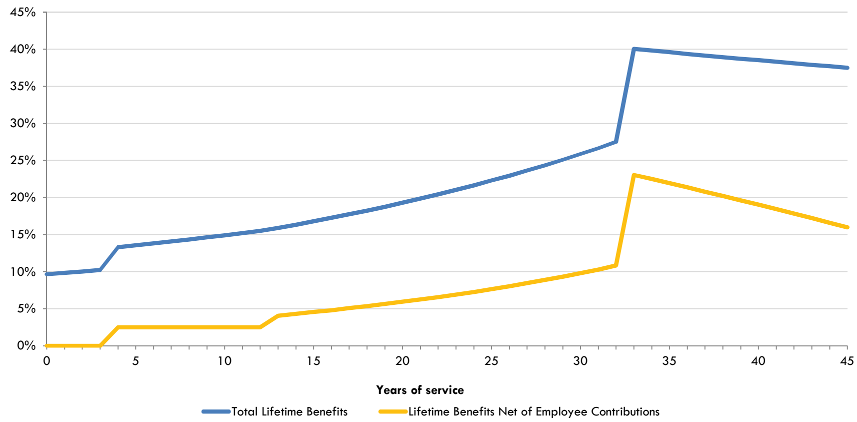
Lifetime Pension Benefits, as Percentage of Lifetime Salary

Virginia Retirement System, Hybrid Plan

General State Employees hired at age 25 in 2016, employee contributes 5% to DC



Source: The Urban Institute
Note: The value of lifetime benefits and lifetime salary are discounted to the date of hire using an annual nominal discount rate of 5.7 percent. Employees assumed to contribute 5% of pay to their DC accounts. Estimates assume an annual inflation rate of 3.0 percent and that members who separate before vesting receive full refunds with interest on their plan contributions.

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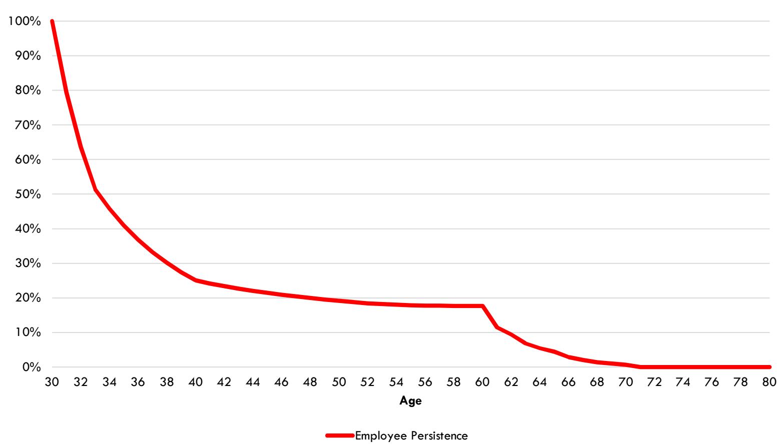
Attrition Curve – State Employees

Percent of Original Hires Remaining (expected)

Hire Age: **30**



Source: Attrition curve based on decrements for Plan 2 and Hybrid plan members as listed in the 2015 actuarial valuation.

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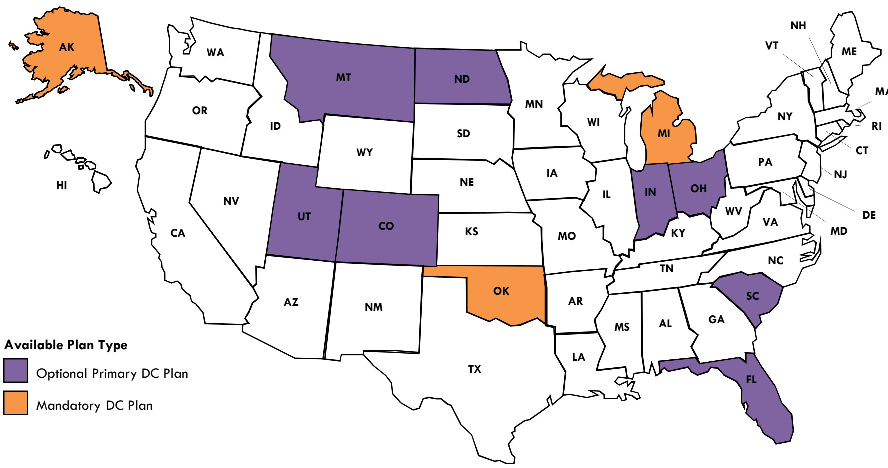
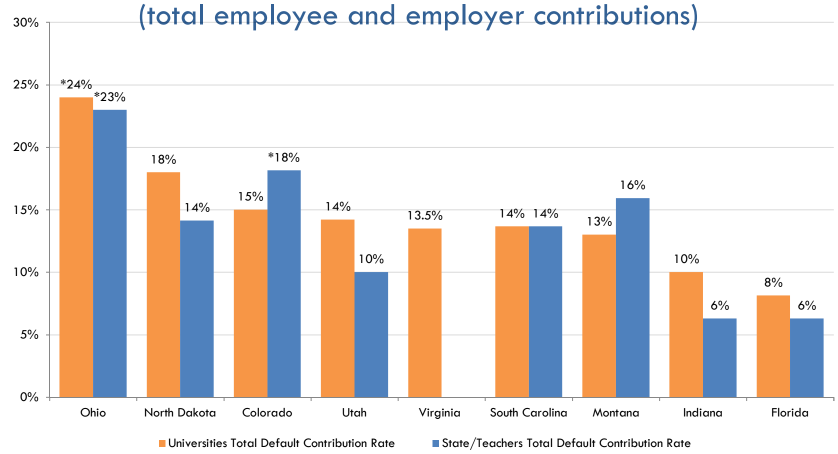
8 of the 45 States with University DC Plans Provide Employees with Similar Plans as a Primary Plan Option

3 states have mandatory DC plans for at least some workers.



Default Contribution Rates for University and State/Teacher Primary DC Plans

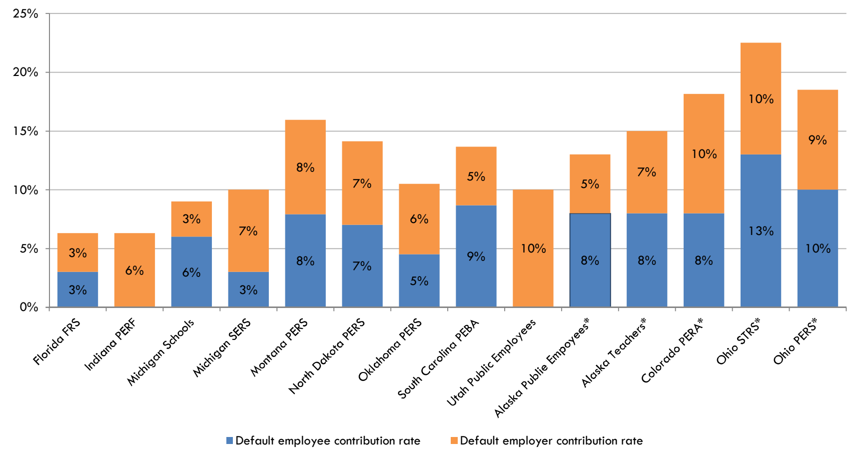
(total employee and employer contributions)



* Plan does not participate in Social Security.

Note: The following state/teacher plans are shown in this graph: Colorado PERA, Florida FRS, Indiana PERF, Montana PERS, North Dakota PERS, Ohio STRS, South Carolina PEBA, Utah Public Employees. Virginia's ORPHE total contribution rate is typically 13.5% although some employers contribute an additional 0.4% to employee accounts.

Default Employee and Employer Contributions to Primary DC Plans for State Employees and Teachers



* Plan does not participate in Social Security.

Note: Under Oklahoma PERS, if the employee contributes an additional 2.5% (7% total), they will receive an additional 1% employer contribution (7% total), resulting in a total contribution rate of 14%. Under Indiana PERF, the employer pays the employee's 3% contribution rate. The employer contribution rate will fall from 4.6% to 3.3% in FY 2017.

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New Member Elections in States That Offer Plan Type Choices

System	DB	DC	Hybrid
Colorado Public Employees' Retirement Association	88%*	12%	Not Offered
Florida Retirement System	75% - 84%*	16% - 25%	Not Offered
Indiana Public Retirement System	Not Offered	8%	92%*
Montana Public Employee Retirement Administration	97%*	3%	Not Offered
North Dakota Public Employees Retirement System	98%*	2%	Not Offered
Ohio Public Employees Retirement System/State Teachers Retirement System	87%*	7.4%	5.6%
South Carolina Retirement Systems	86 - 88%*	12 - 14%%	Not Offered
Utah Retirement System	Not Offered	20%	80%*

**Default plan if member does not make an active choice.*

Notes: Data for Colorado and North Dakota are new member elections between January 2010 and December 2010. Data for Montana are new member elections between July 2010 and June 2011. Data for Florida are based on new member elections between 2009 and 2015. Data for Ohio are new member between 2003 and 2008. Data for Utah is based on number of active employees in each plan as of December 2013.

Sources: Data for Colorado, Montana, and North Dakota are from the NIRS Report "Decisions, Decisions: Retirement Plan Choices of Public Employees and Employers." Data for Ohio, and South Carolina is from NBER study "Defined Contribution Savings Plan in the Public Sector: Lessons from Behavioral Economics." Data for Florida are based on the NIRS study, the NBER study, and Pew analysis of plan documents. Data for Utah, Indiana and South Carolina are reported numbers from a state employee in the state retirement system office.

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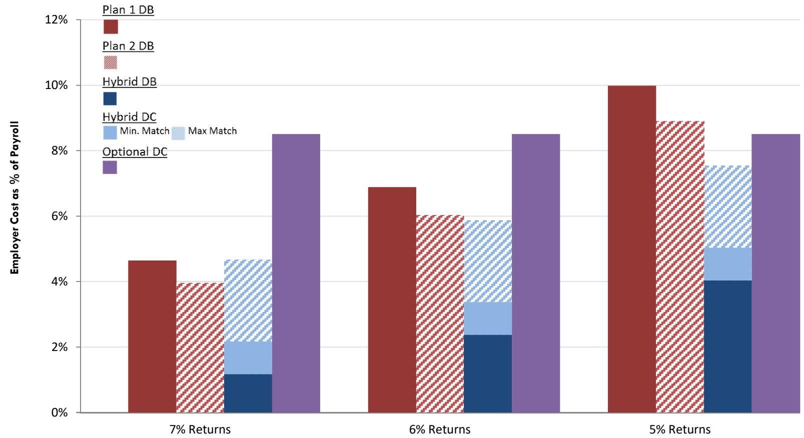
Example of VRS ORPHE

- Faculty and select higher education administrators at public higher education institutions can participate in an optional DC plan—ORPHE
- Among UVA faculty, 85% selected the DC and 15% chose the VRS plan (either DB or hybrid depending on when they joined)
- In 2009 the ORPHE plan was opened up on a portion of non-faculty UVA employees—so far 55% of those eligible chose the DC
- Benefit choices that allow workers to better match benefits to their needs can improve retirement security, recruitment, and retention but can potentially increase expected costs

Optional DC Only Plan Case Studies

- South Carolina has had a DC plan for university employees since 1987. In the early 2000s, the state opened up the plan to state employees and teachers, providing them a DC option essentially identical to the university plan
- Indiana has a long standing hybrid plan (since 1950s) and in 2013 used the existing DC component of the hybrid plan to provide state workers with a DC only plan option
- In 2011, Utah started offering new employees a choice between a hybrid and DC only plan. The DC only plan is distinct and separate from the university plan
- All three states indicated goal of offering optional DC plan was to provide a more portable plan for workers who do not expect to stay long term
- Indiana and South Carolina DC only plans both provide an annuitization option and Utah is considering adding one

Sensitivity of Employer Contribution Rate to Investment Return Projections



Notes: DB cost estimates at 7% returns based on VRS normal cost rates used in development of the fiscal year 2017/2018 employer rates, forecasted results at 6% and 5% returns based on VRS and Pew calculations. DC expected costs within the Hybrid represent employer minimum and maximum employer matching payments based on employee voluntary DC contributions.

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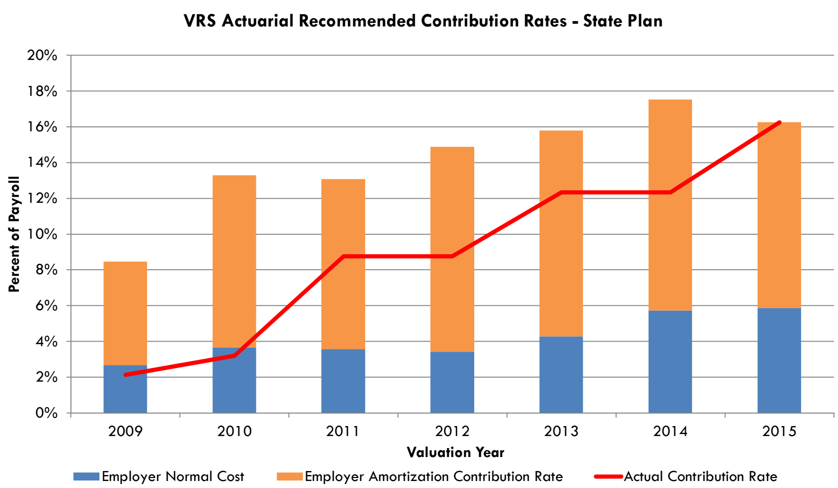
Most of the Recommended Contribution is to Pay for Unfunded Liabilities



Source: VRS Actuarial Valuations

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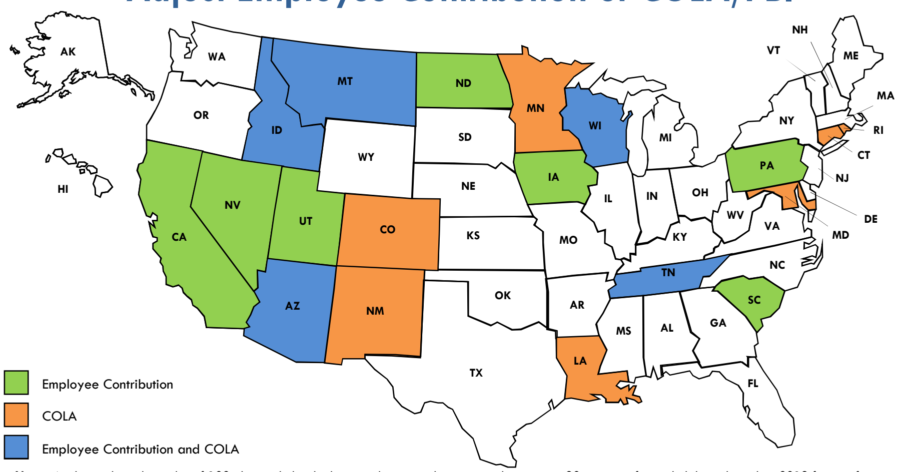
Guidelines to a Well-Designed DC Plan

- Sufficient contributions to enable adequate savings
  - Primary DC plans with Social Security have recommended combined minimum savings rates of 10 to 12%. Hybrid plans with a DB component require less from the DC benefit
- A limited number of appropriate, low-fee investments
  - Federal Thrift Savings Plan a good model
  - OPRPPA investments include target date funds with fees below 10 basis points as well as the option to invest through VRS with fees of under 60 basis points
- Access to annuities or other forms of lifetime retirement income
  - ORPPA includes annuities as well as partial lump sum distributions

Benefit Plan Design

3	**Consider** adding a cost sharing provision that would make employee contributions - to the defined benefit (DB) component - variable within a limited range based on realized cost associated with upside and downside investment return scenarios.

States with Formal Cost Sharing Mechanisms That Adjust Employee Contribution or COLA/PBI



Notes: Analysis is based on a list of 102 plans includes the largest plans in each state in order to cover 90 percent of state liabilities, based on 2013 figures, for up to four plans per state. In most cases, more than one plan per state is included. If a state is marked as having both employee contribution and COLA cost sharing mechanisms, the mechanisms could be in different plans or both could be in one plan.

Examples of Formal Cost Sharing Mechanisms

Cost-Sharing Mechanism	Participating Systems	Description
Employer-Employee Split	Arizona, Iowa, South Carolina, Wisconsin	• **AZ** – Employees contribute 50% of total cost • **IA** – Employees contribute 40% of total cost • **SC** – Employees contribute 50% of cost increases but Board may reduce contribution rate when funding level exceeds 90% • **WI** – Employees contribute 50% of total cost
Variable Benefits	Maryland, Minnesota, Wisconsin	• **MD** – COLA is capped at 2.5% if returns meet or exceed expectation and capped at 1% in downside scenarios • **MN** – COLA is capped at 2.5% if funding level is above 90% and capped at 1% when funding level is below 90% • **WI** – Post-retirement annuity + / - based on investment returns

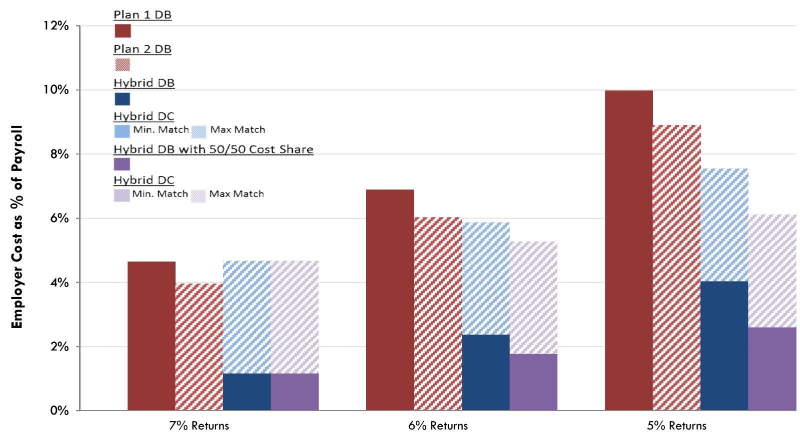
DB Cost Sharing Case Studies

- **Arizona** - Actuarial contribution rate is shared 50/50 between employer and employee; long-standing practice that shares risk evenly
  - In 2016 Arizona replaced gain-sharing COLA provisions in the Public Safety plan with a fixed, pre-funded COLA
- **Tennessee** - Hybrid plan with shock absorbers to keep DB costs stable
  - Shock absorbers include a contribution stabilization fund, increases to employee contributions, and reductions to COLAs
- **Utah** - Hybrid plan design with 1.5% multiplier. Employer contributes fixed 10% while employee contributions cover any costs above 10%
  - Workers can also choose a DC option - in both cases employer contributions are 10% of payroll
- **Wisconsin** - Retiree COLAs increase if investments outperform and are reduced or potentially clawed back if investments fall short. Employees choose whether to accept a lower but more stable COLA or a more variable COLA

Considerations for DB Cost Sharing

- Formal mechanisms give more clarity to participating employees and employers than ad-hoc changes
- Unexpected costs can be shared through contributions or benefits; DC component of hybrid plan in Virginia already distributes risk to workers on the benefit side
- These policies in DB plans often involves gain-sharing as well. In Wisconsin COLAs go up if investments over perform and are decreased during investment shortfalls. In Arizona, employee contributions will drop if the plan is overfunded
- Cost sharing can be built into the DB portion of a side-by-side hybrid—examples include Tennessee and Utah

Impact of 50/50 DB Risk Split



Notes: DB cost estimates at 7% returns based on VRS normal cost rates used in development of the fiscal year 2017/2018 employer rates, forecasted results at 6% and 5% returns based on VRS and Pew calculations. DC expected costs within the Hybrid represent employer minimum and maximum employer matching payments based on employee voluntary DC contributions.

Investment Transparency & Reporting

5	**Adopt** a formal policy to continue providing the VRS investment policy online and including 20- and 25-year investment performance data in regular reporting.

VRS Investment Performance – As of June 30, 2016

	1-yr Return	3-yr Return	5-yr Return	10-yr Return	20-yr Return	25-yr Return
Virginia Retirement System *(Net of Fees)*	1.86%	7.26%	6.96%	5.61%	7.44%	8.30%
VRS Custom Benchmark	1.29%	6.59%	6.38%	5.07%	6.85%	7.90%
Wilshire TUCS Medians Below Reported Gross of Fees						
TUCS – All Public Funds	1.07%	6.83%	6.82%	5.93%	7.32%	8.36%
TUCS – Master Trusts (All Plans)	0.91%	6.20%	6.30%	5.67%	7.24%	8.35%
Market Indices						
70%/30% S&P 500 and Barclays Agg.	4.81%	9.48%	9.72%	7.00%	7.50%	8.67%
65%/35% MSCI World and Barclays Agg.	0.47%	6.10%	5.84%	5.01%	5.99%	6.93%

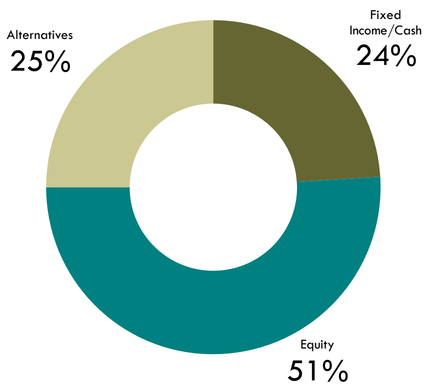
Sources: Wilshire®, Trust Universe Comparison Service® as provided by VRS.

Investment Transparency & Reporting

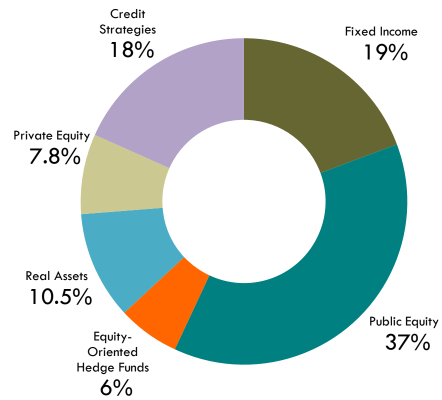
6 **Adopt** a policy to regularly report performance and carried interest fees for private equity and other alternative investments.

Investments – Asset Allocations (U.S. Avg. & VRS)

FY14 - US Average Asset Allocation



FY14 VRS Asset Allocation



Note: VRS classifies a total of 32% of assets in Alternatives.
Source: Comprehensive Annual Financial Reports (CAFRs), actuarial reports and valuations.

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Questions and Next Steps

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Appendix

Current Hybrid Auto-Escalation Schedule

Date	Employee **Mandatory** Contribution	Employer **Mandatory** Contribution	Employee **Voluntary** Contribution	Employer **Voluntary** Match	Total Contribution
1/1/2017	1.00%	1.00%	0%	0%	2.00%
1/1/2020			0.50%	0.50%	3.00%
1/1/2023			1.00%	1.00%	4.00%
1/1/2026			1.50%	1.25%	4.75%
1/1/2029			2.00%	1.50%	5.50%
1/1/2032			2.50%	1.75%	6.25%
1/1/2035			3.00%	2.00%	7.00%
1/1/2038			3.50%	2.25%	7.75%
1/1/2041			4.00%	2.50%	8.50%

Source: HB 1072 Fiscal Impact Note

HB 1072 Proposed Auto-Escalation Schedule

Date	Employee **Mandatory** Contribution	Employer **Mandatory** Contribution	Employee **Voluntary** Contribution	Employer **Voluntary** Match	**Total Contribution**
1/1/2017	2.00%	2.00%	0.50%	0.25%	4.75%
1/1/2019			1.00%	0.50%	5.50%
1/1/2021			1.50%	0.75%	6.25%
1/1/2023			2.00%	1.00%	7.00%
1/1/2025			2.50%	1.25%	7.75%
1/1/2027			3.00%	1.50%	8.50%

Source: HB 1072 Fiscal Impact Note

Pew Proposed Auto Escalation Schedule

Date	Employee **Mandatory** Contribution	Employer **Mandatory** Contribution	Employee **Voluntary** Contribution	Employer **Voluntary** Match	**Total Contribution**
1/1/2017	2.00%	2.00%	1.00%	0.50%	5.50%
1/1/2018			2.00%	1.00%	7.00%
1/1/2019			3.00%	1.50%	8.50%

Source: HB 1072 Fiscal Impact Note

Further Hybrid Options - Active Choice

- **Active Choice** - Requires new employees to affirmatively elect to participate in the plan or affirmatively select non-participation. It differs from both active enrollment – where employees are not enrolled in their plan unless they opt-in – and auto-enrollment – where employees participate by default unless they opt-out.

PARTICIPANT INFORMATION PLEASE SELECT ONE OPTION

☐ 1) **YES**, I would like to contribute 3% of my salary on a pre-tax basis to the Massachusetts Deferred Compensation SMART Plan to supplement my retirement benefit.*

☐ 2) **YES**, I would like to contribute ________% of my salary on a pre-tax basis to the Massachusetts Deferred Compensation SMART Plan to supplement my retirement benefit.*

☐ 3) **NO**, I do not wish to supplement my retirement benefit by contributing any portion of my salary to the Massachusetts Deferred Compensation SMART Plan at this time. I understand there is a ten year creditable service vesting period for members of the separate state retirement system and I am not contributing to Social Security as a state employee.

- Although Active Choice systems are less effective than pure opt-out/default systems, they still result in significant improvements in voluntary retirement participation.

- Research on private-sector 401(k) enrollments indicate that active choice systems result in a **28%** improvement over opt-in systems (opt-out systems show **more than 50%** improvement).

Sources: Carroll et al., **"Optimal Defaults and Active Decisions."** Quarterly Journal of Economics 124, 4 (Nov. 2009); Mass. SMART Plan New Member Enrollment Form

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