

THE
PEW
CHARITABLE TRUSTS

APPLYING STRESS TESTING TO PENNSYLVANIA'S RETIREMENT SYSTEMS

**PENNSYLVANIA PUBLIC PENSION MANAGEMENT AND
ASSET INVESTMENT REVIEW COMMISSION
HARRISBURG, PA
JULY 30, 2018**

DAVID DRAINE, SENIOR OFFICER
STRENGTHENING PUBLIC SECTOR RETIREMENT SYSTEMS

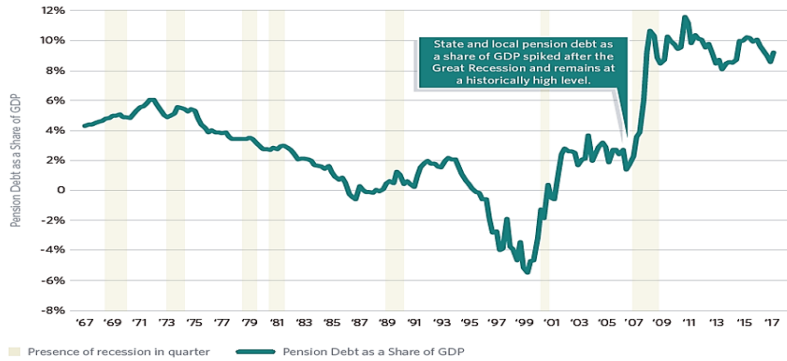
WHAT IS STRESS TESTING?

- Simulation technique used to assess the impact of different economic conditions on pension balance sheets and governmental budgets.
- Central to emerging actuarial reporting standards (Actuarial Standard of Practice No. 51.)
- Budget tool to help policymakers plan for the next recession and better manage economic uncertainty.

PUBLIC PENSIONS VULNERABLE TO NEXT ECONOMIC DOWNTURN

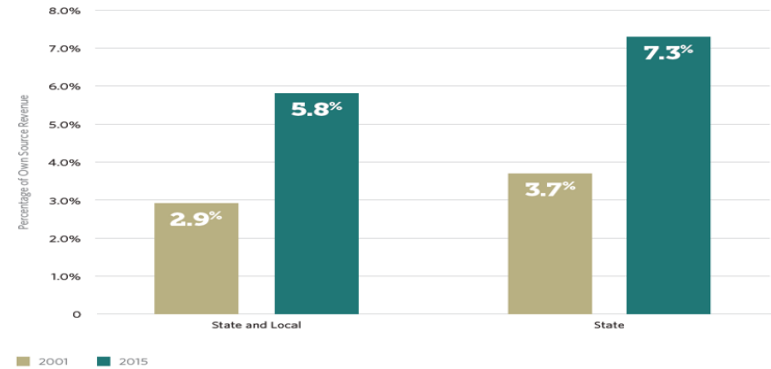
In aggregate, state and local pension systems have never been more exposed to market volatility, based on fiscal measures and economic outlook

STATE AND LOCAL PENSION DEBT AS A SHARE OF GROSS DOMESTIC PRODUCT



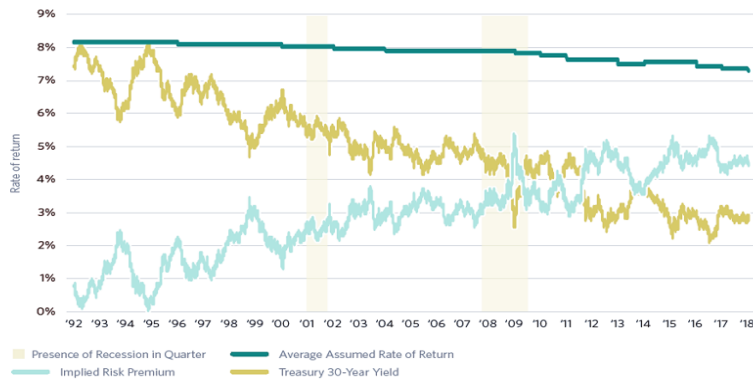
CONTRIBUTIONS AS A SHARE OF OWN SOURCE REVENUE

Budget Allocation to Pensions Doubled from 2001 to 2015



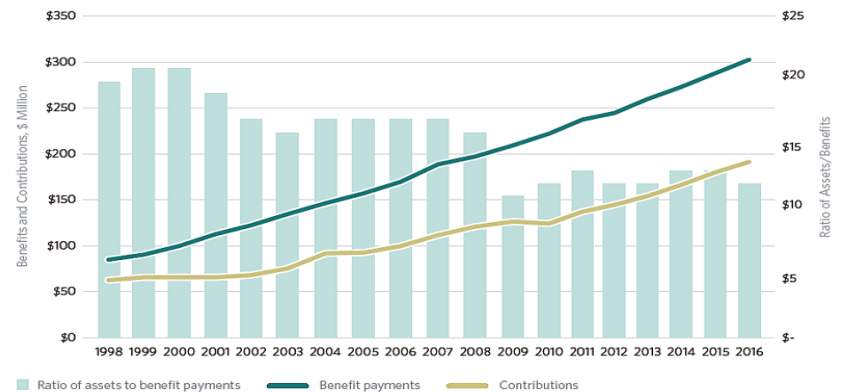
PENSION FUND RISK PREMIUM AT HISTORIC HIGH

Plan's average assumed rate of return remains relatively stable, while bond yields have declined



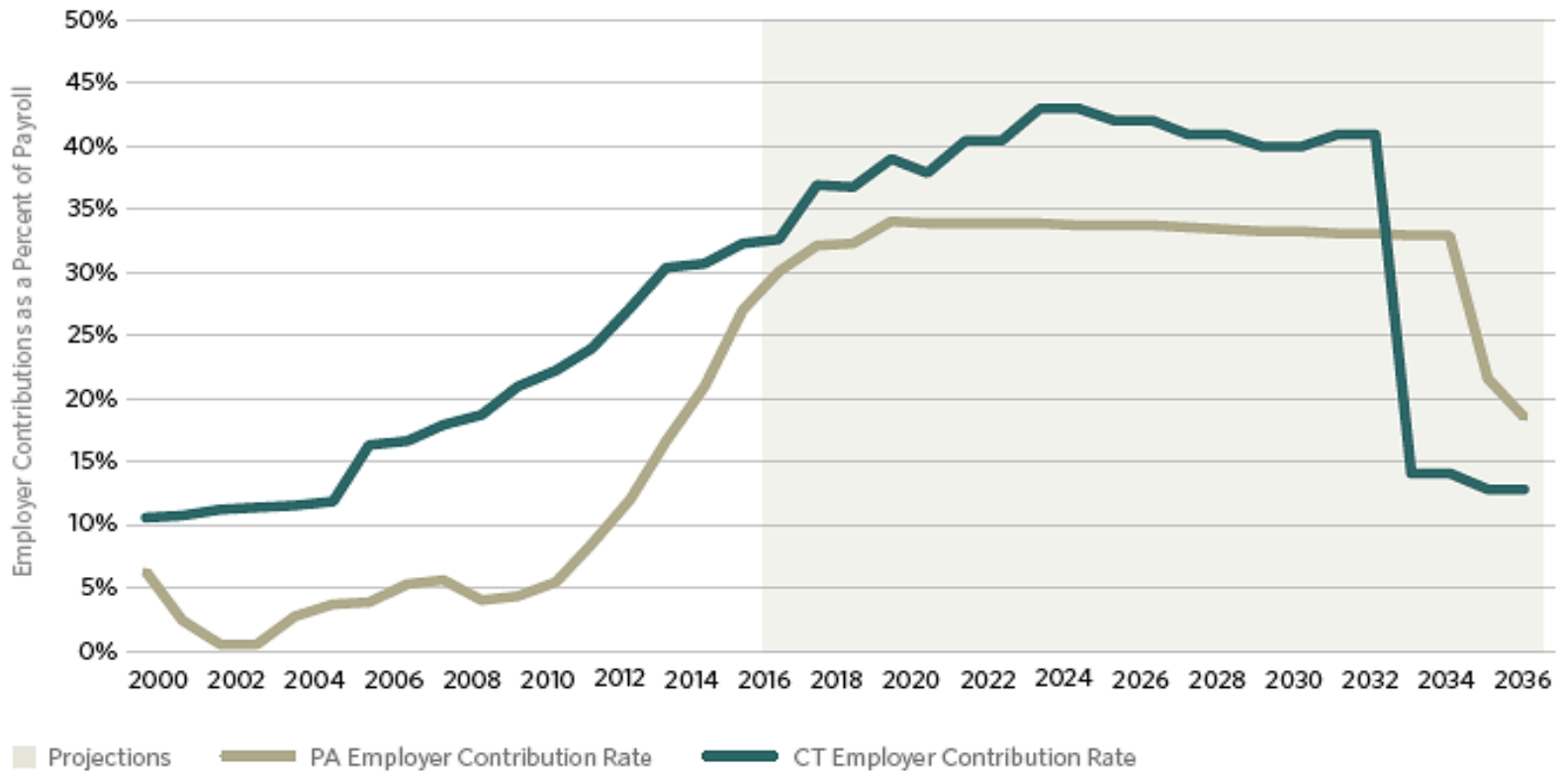
BENEFITS & CONTRIBUTIONS FOR STATE & LOCAL PLANS

Widening Operating Cash Flow Gap and Reduced Asset to Benefit Coverage



PENNSYLVANIA AND CONNECTICUT'S EMPLOYER CONTRIBUTION RATES OVER TIME

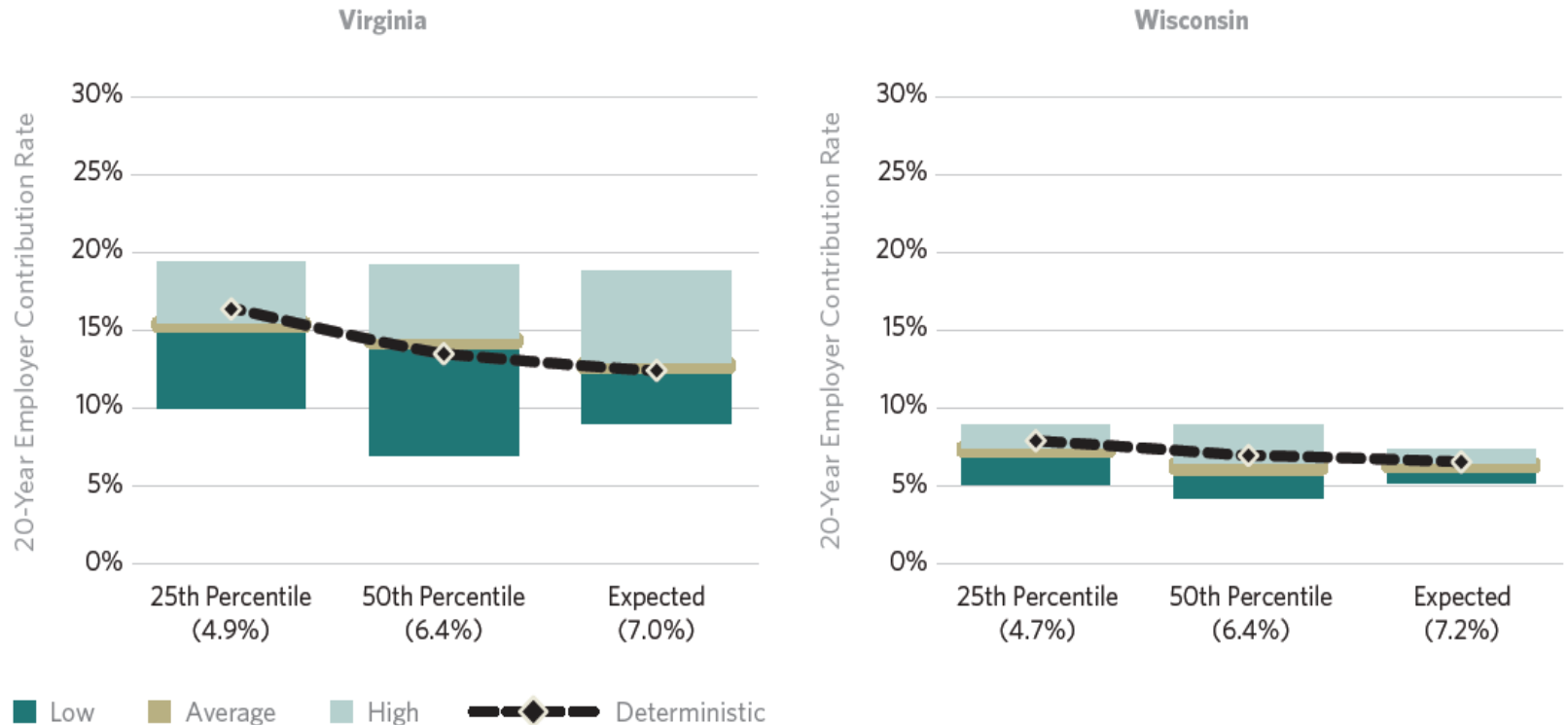
Under plans' assumed rates of return and the state policy contribution assumption



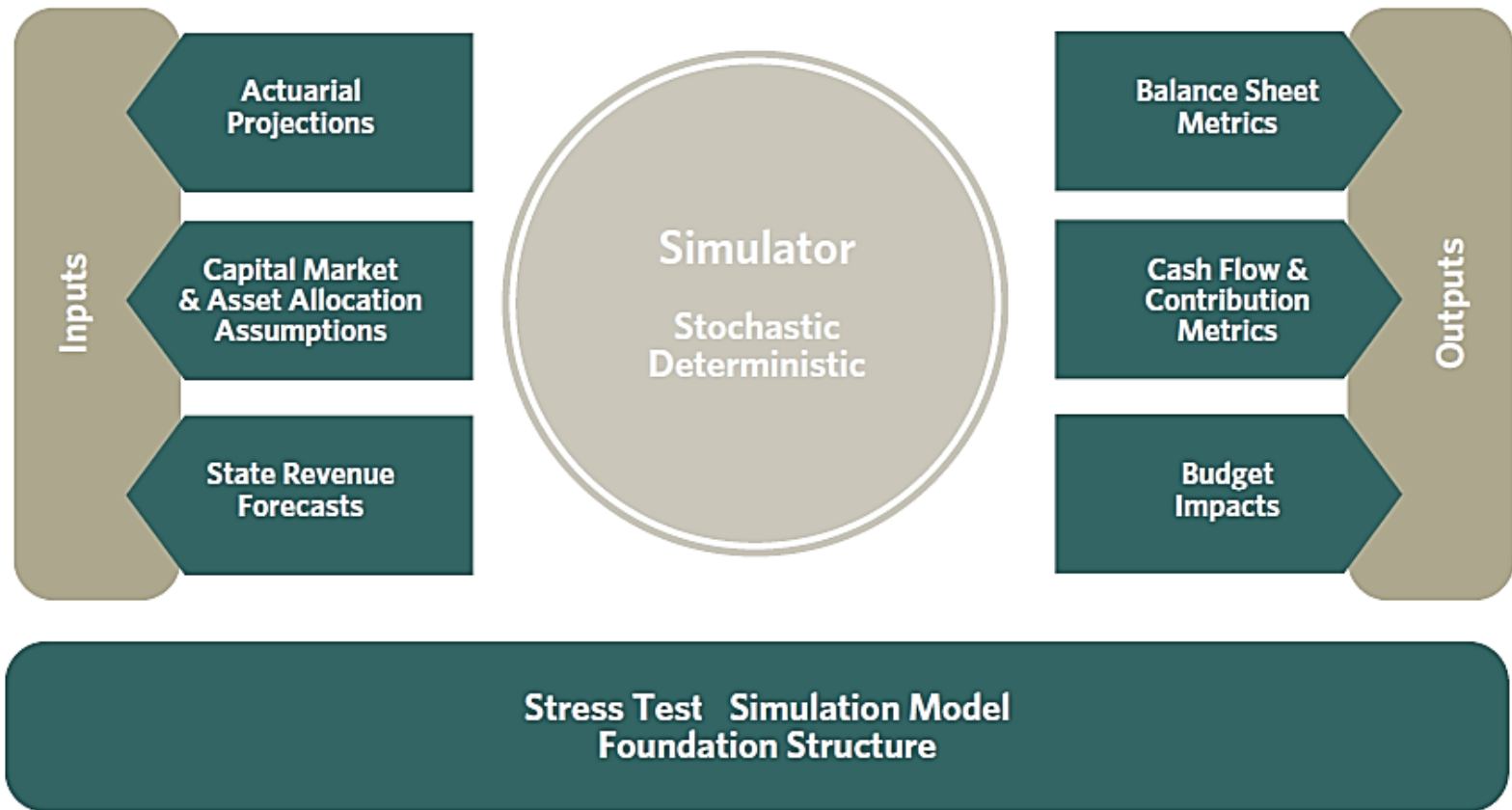
Source: The Pew Charitable Trust and The Terry Group, based on publicly available Comprehensive Annual Financial Reports (CAFR), actuarial reports and valuations, other public documents, or as provided by plan officials.

PROJECTED IMPACT OF VOLATILITY OF COSTS FOR VIRGINIA AND WISCONSIN

Funding policy has a significant impact on the range of required contributions

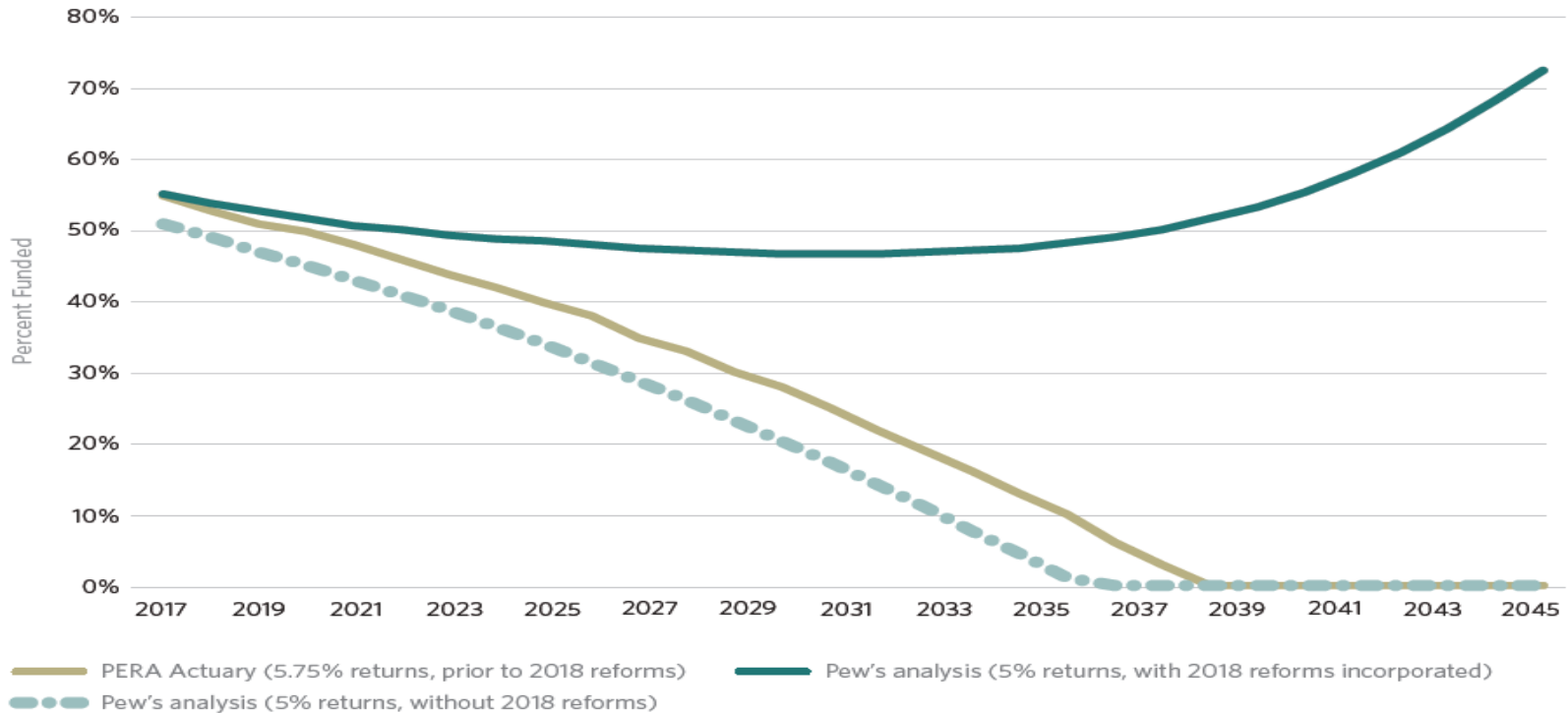


STRESS TESTING SIMULATION MODEL FOUNDATION STRUCTURE



COLORADO'S PROJECTED FUNDED STATUS BEFORE AND AFTER PENSION REFORMS

Funded Status for PERA's State Division, Under Lower than Expected Investment Returns



Notes: Projections based on Colorado's Public Employees Retirement Systems (PERA) 2016 valuation. Reform projections do not include changes to the definition of payroll as outlined in the final legislation as we anticipate the effect on fiscal impact to be minor. Additionally, our model simplified the risk sharing features to be fully on in low return scenarios. Finally, a 20% take-up rate for the DC plan was assumed. Sources: The Pew Charitable Trusts and the Terry Group

PENNSYLVANIA'S IFO USES STRESS TESTING

Using risk analysis to assess potential policy changes allows policymakers to consider the full impact of pension legislation.

Table 8: Potential New Employee Risk Reduction for Fiscal Years 2018-19 to 2049-50

ARR Reduction	Cash Flow			Present Value at 3.6%			Present Value at 7.25/7.5%		
	PSERS	SERS	Total	PSERS	SERS	Total	PSERS	SERS	Total
100 basis points	\$4,196	\$2,294	\$6,490	\$1,884	\$1,040	\$2,924	\$926	\$494	\$1,420
200 basis points	8,392	4,589	12,981	3,768	2,079	5,847	1,853	988	2,841

Notes: Amounts in millions. Present value as of June 30, 2018. ARR is the assumed rate of return. Basis point reduction is applied to the ARR for the respective system.

A01354 and A01558 to SB 1

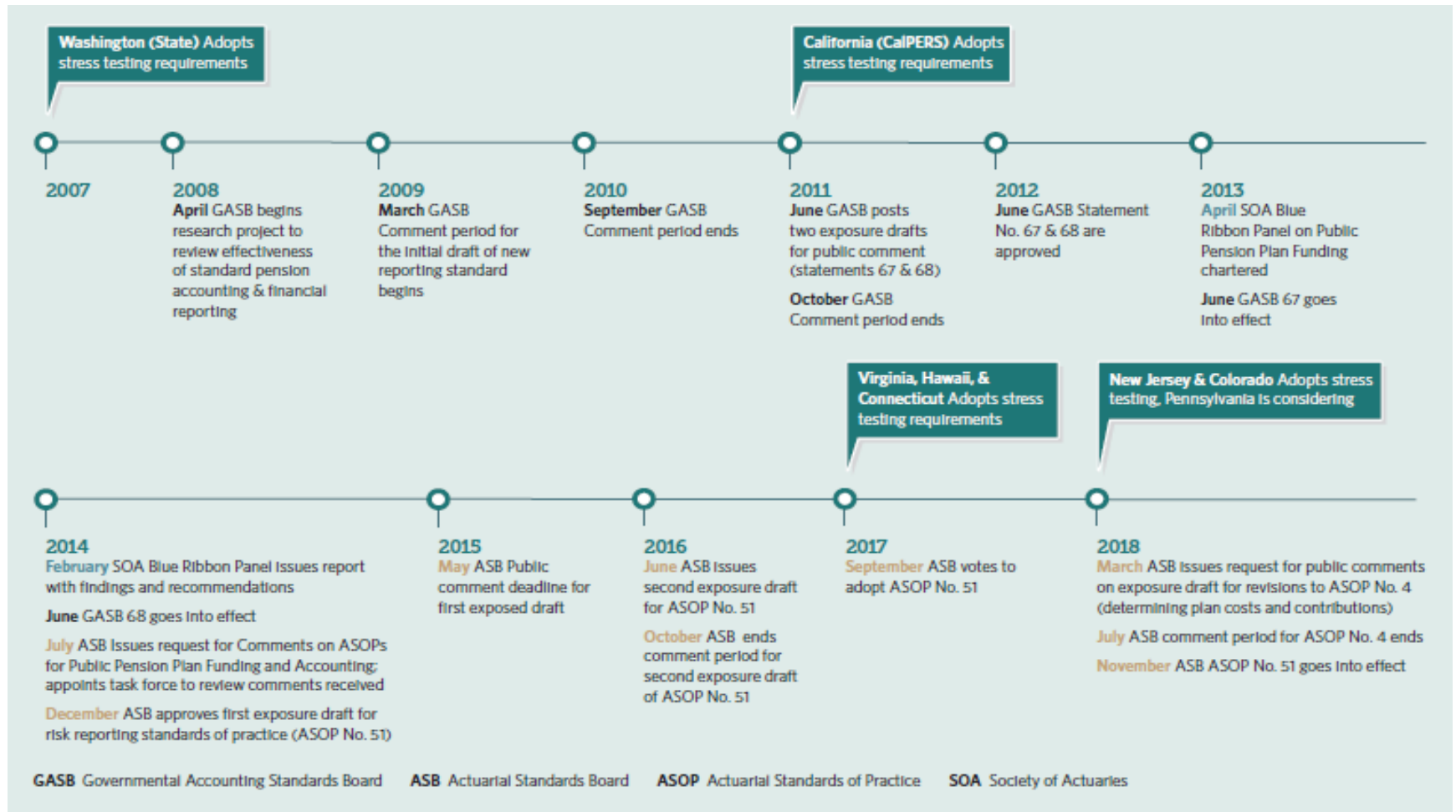
16

Independent Fiscal Office

Notes: Pennsylvania Independent Fiscal Office Actuarial Note for Amendments 01354 and 01558 to Senate Bill 1; June 3, 2017.

RISK REPORTING DEVELOPMENTS FOR PUBLIC PENSIONS

Recent changes in reporting standards have led to increased momentum among states in adopting stress testing.



WHY IS STRESS TESTING IMPORTANT FOR STATES?

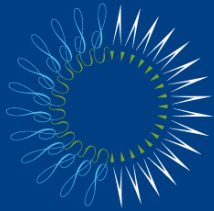
- Pensions risk reporting is coming - Actuarial Standard of Practice (ASOP) No. 51 goes into effect this November.
- State budgets are more vulnerable to the next recession.
- Provides a scorecard to assess current and proposed funding policies, based on a range of possible market outcomes.

Ultimately...

What gets Measured gets Managed!

IMPLEMENTING STRESS TESTING

- Primary focus is on *investment* and *contribution risks* (e.g. ASOP No. 51)
- Build on existing reporting requirements (e.g. GASB) and analyses (e.g. Asset/Liability studies), BUT...
- Incorporates **revenue** and **budget** components.
- Develop report with budget officials and broader audience in mind.
- Establish a standardized approach that is both accessible and extensible.



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