

# SAVA and LFC Joint Meeting



## Retirement System Overview for Legislators

March 14, 2024





- Pension Overview
- Risk Assessment Examples
  - Historical Trends
  - Maturity Considerations
  - Stress Testing
  - Sponsor-specific risks
- Active Management of Pensions and Risk

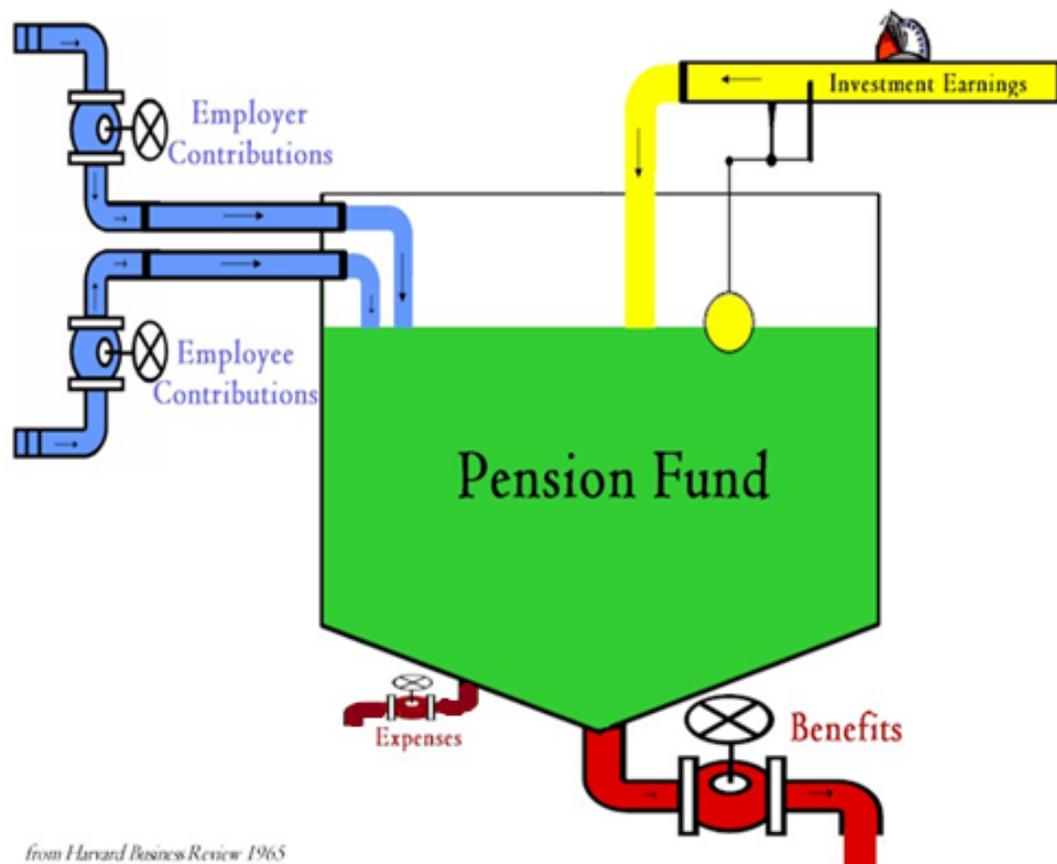


# Pension Overview

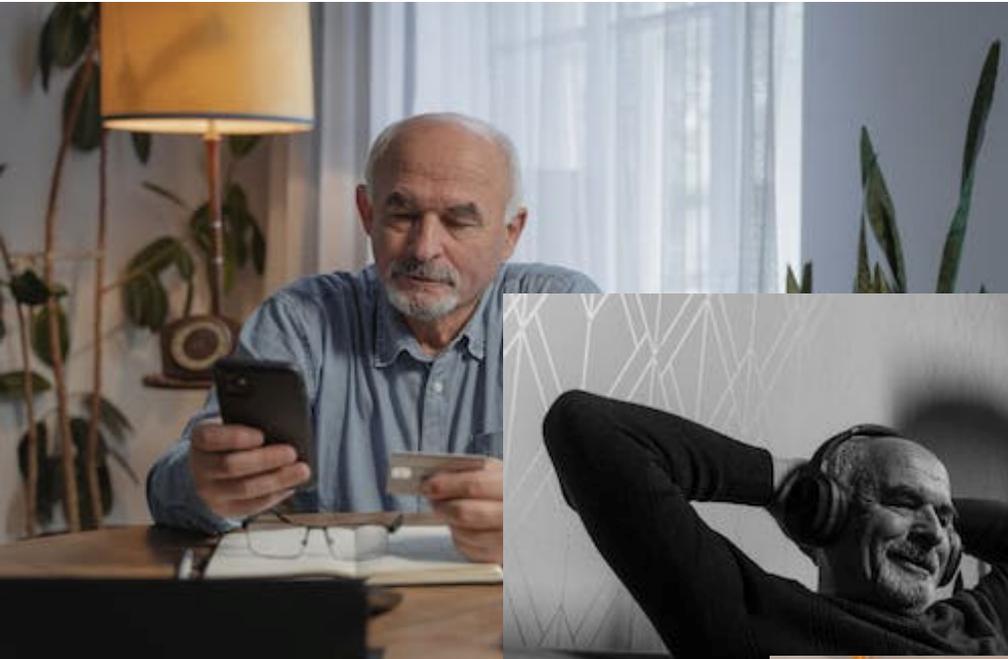
# Pension Overview: Static Valuation



$$C + I = B + E$$



# Dynamic Pension Reality





- System Board as fiduciaries focus is the System:
  - Act “solely in interest of the participants and their beneficiaries”
  - Make decisions for “exclusive benefit” of those in plan
- Legislators focused is the State as a whole with System as a component of that for budget and proposed legislation:
  - Responsible to plan members as well, but also to taxpayers as a whole
  - “Duty of loyalty”

# Risk Taking versus Bearing



Frequently, System (via Board) takes many risks related to pensions, while that risk is borne by the State (as taxpayers)

Varies by System whether risks related to benefit structure are made by the System or the legislating body



But the sponsor is who bears the risk typically

# Why State should care about Pension Risk



Relative size of pension to the budget as a whole and other items is typically very significant



Obligations for pensions are long-term, but not bonded like many long-term obligations



In Systems with fixed contributions, positive experience can lead to pressure to increase benefits, which increases the risks to the State from the System





To assess and manage, it's important to first define your objectives

## Contributions

- Magnitude
- Volatility
- Predictability

## Benefits

- Level
- Certainty
- Purchasing Power

## Workforce

- Recruitment
- Retention
- Retirement



# Risk Assessment

# Risks to Pension Systems



- Remainder of session will focus on ways to assess and manage pension risks
- But it is important to think about the likely causes of these “deviations from expectation” emerging
- Many, but most significant typically:
  - Investment risk
  - Contribution risk
  - Demographic risk

Actual vs.  
Expected





Risk assessment should include consideration of:

Historical trends,  
including gain/loss  
experience

Evaluation of maturity  
and other risk metrics

Stress testing and other  
projections such as  
scenario analysis and  
ruin conditions

Today's session will introduce these approaches  
rather than discussing in detail

Will also propose some questions for consideration  
in implementation

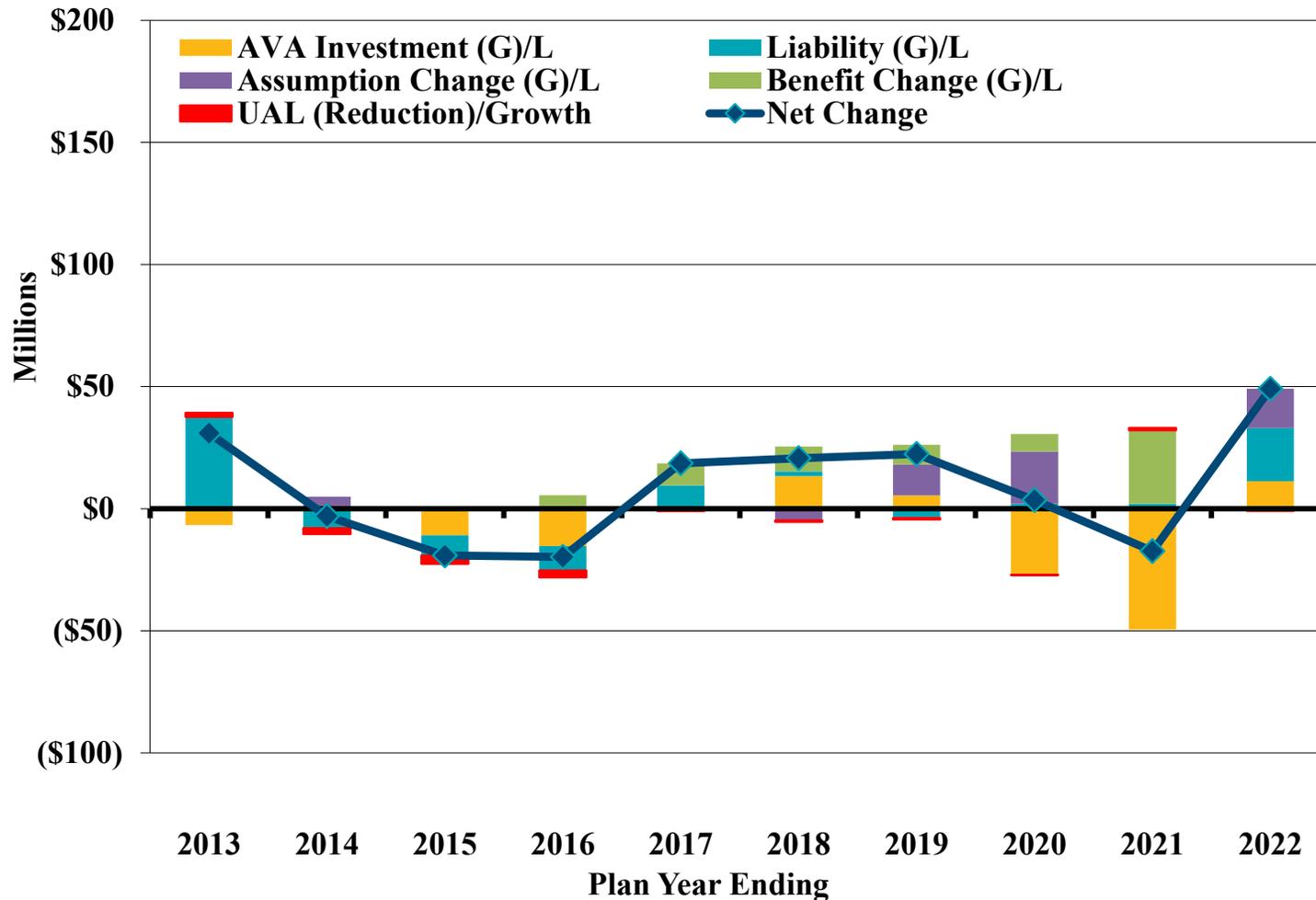


- Cheiron makes a tool available to look at items contained in the <https://publicplansdata.org> database
- This includes PERS and TRS for Montana
- Available at: <https://cheiron.us/cheironHome/content/resources/databases/public-plans-risk-metrics>
- Highlighting just a few of these today

# UAL History - Gain/Loss Analysis



### Changes in Unfunded Actuarial Liability (UAL) History



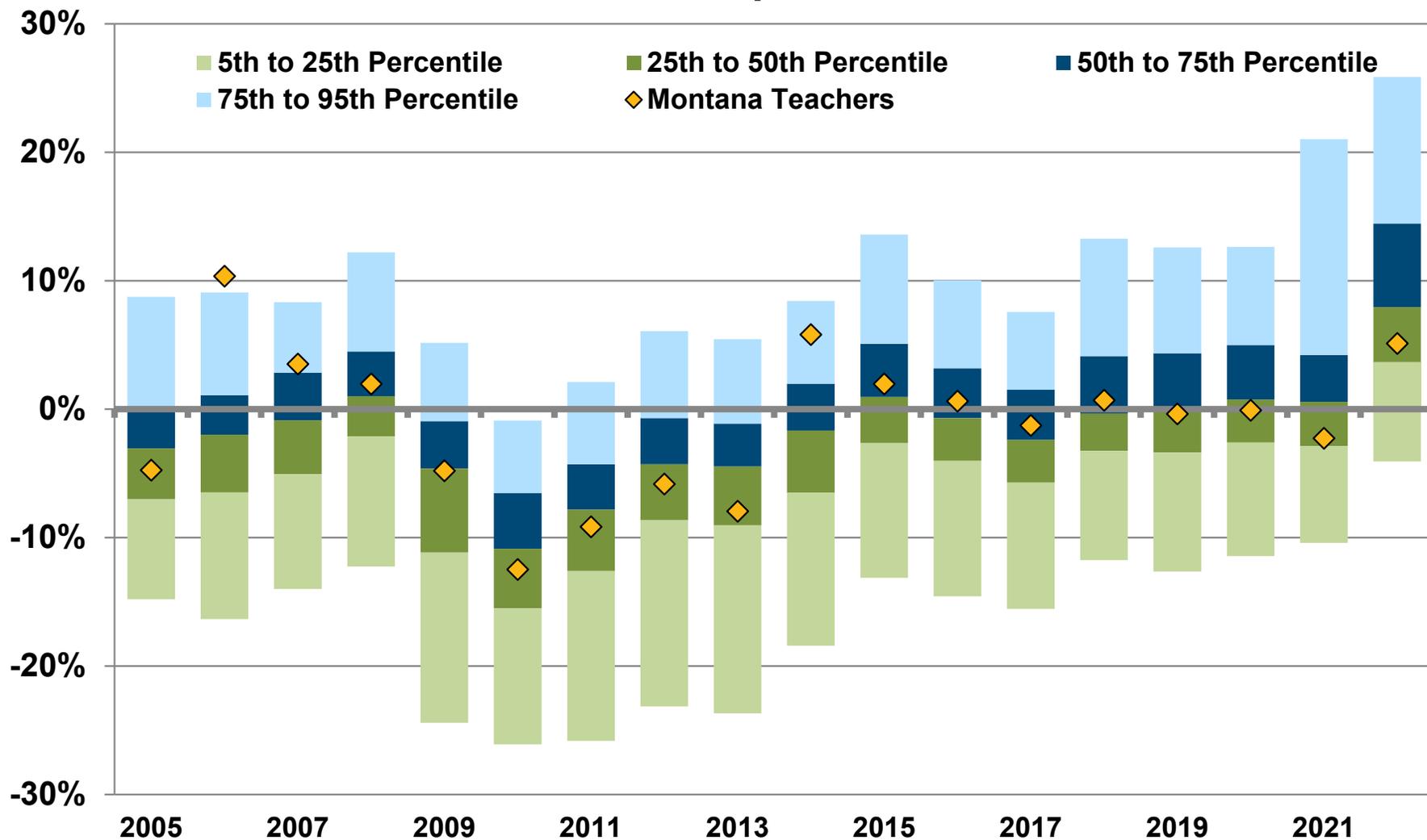
### Cumulative UAL Changes 2013-2022



# Unfunded Amortization History - TRS



## UAL Principal Rate

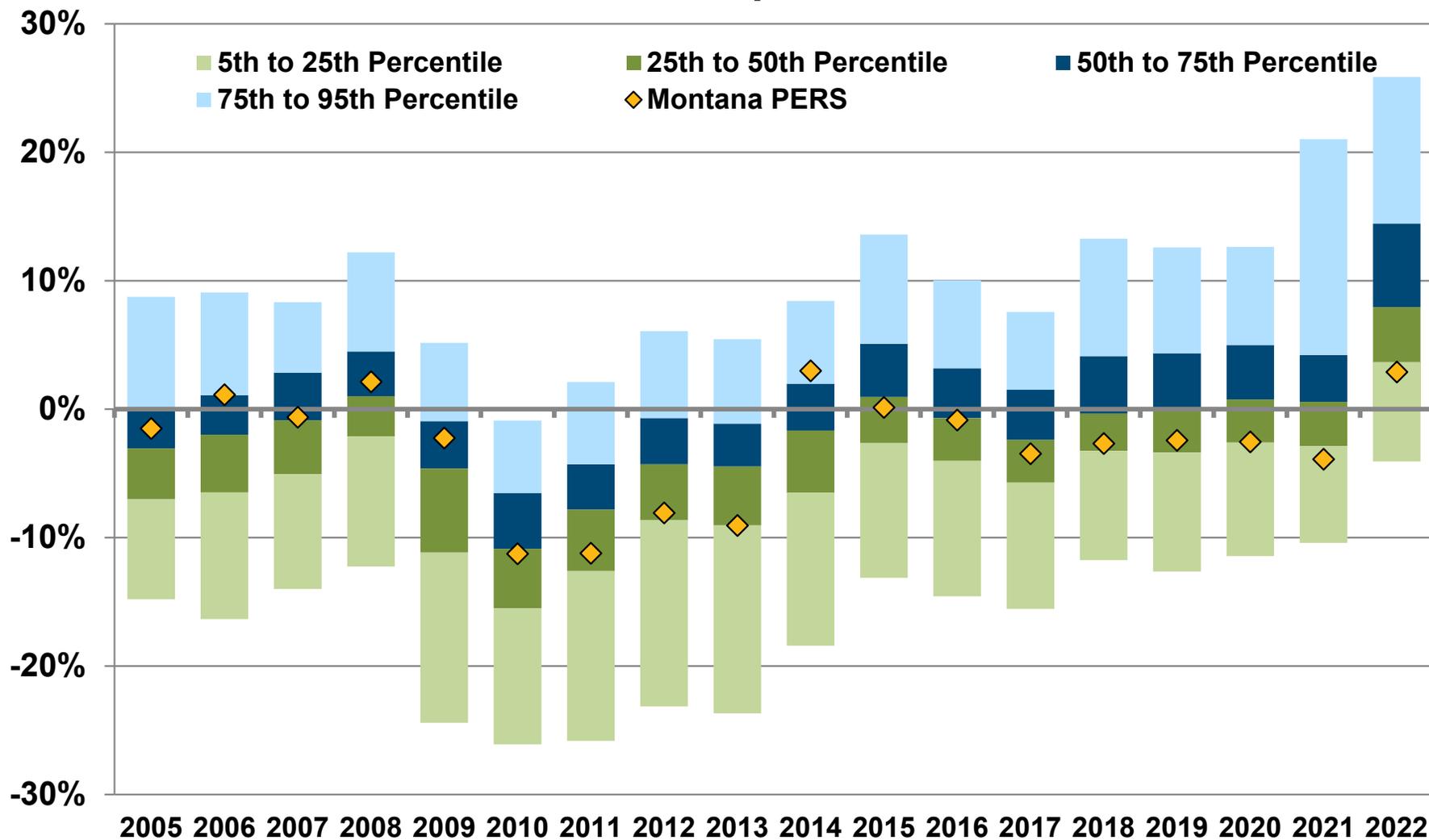


Survey Data from Public Plans Data as of 1/25/2024

# Unfunded Amortization History - PERS



## UAL Principal Rate



Survey Data from Public Plans Data as of 1/25/2024

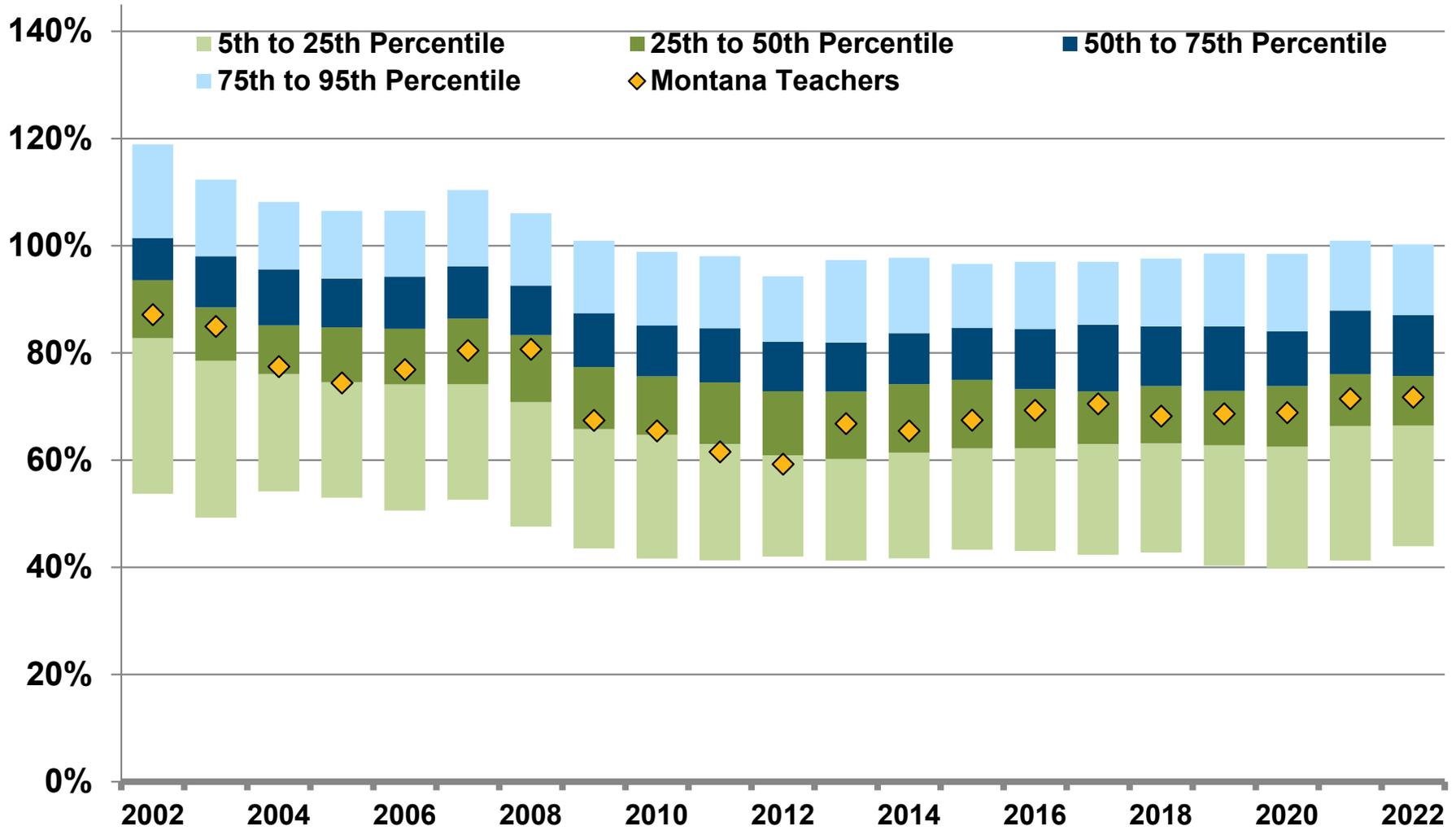


- What is the funded status of the System?
- What has been the historical trend of these values?
- Have there been events I should know about impacting that trend?
- What is the forecast for the future funded status?
- What are the most significant risks likely to impact that future forecast?

# Funded Ratio Trends Example



## AVA Funded Ratio



Survey Data from Public Plans Data as of 1/25/2024

# Member Support Ratio



- Equals the number of inactive members divided by active members
- “How many inactive members supported relative to the number of active members”
- Dependency ratio another name

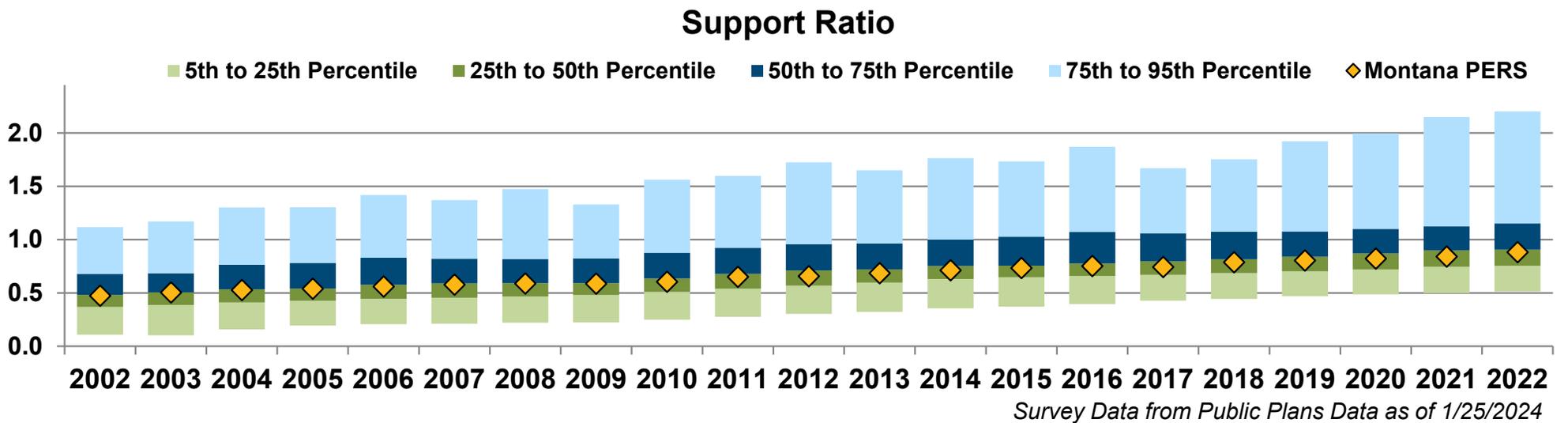
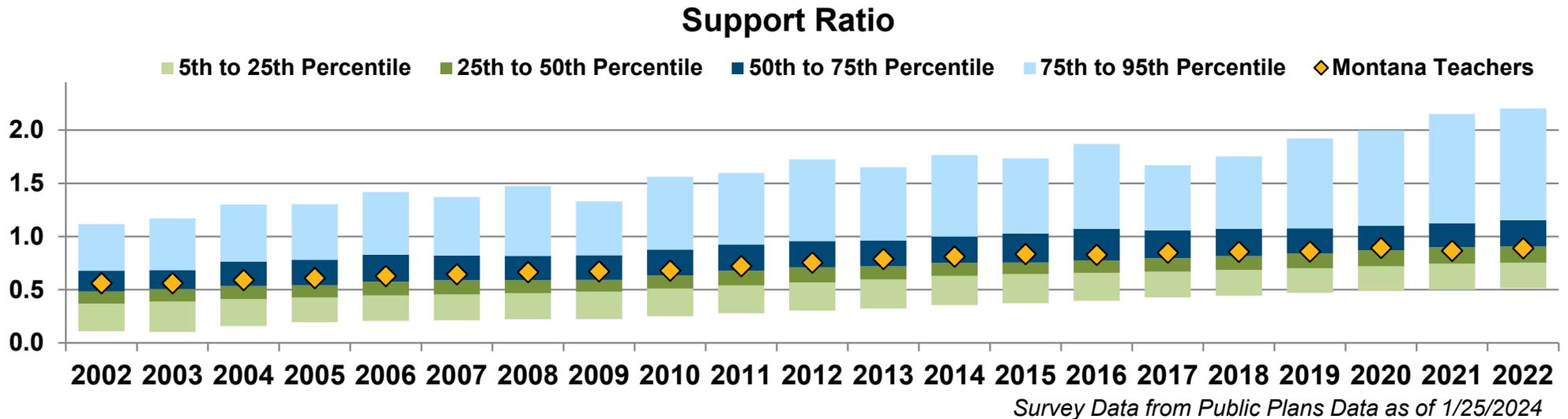


# Member Support Ratio Questions

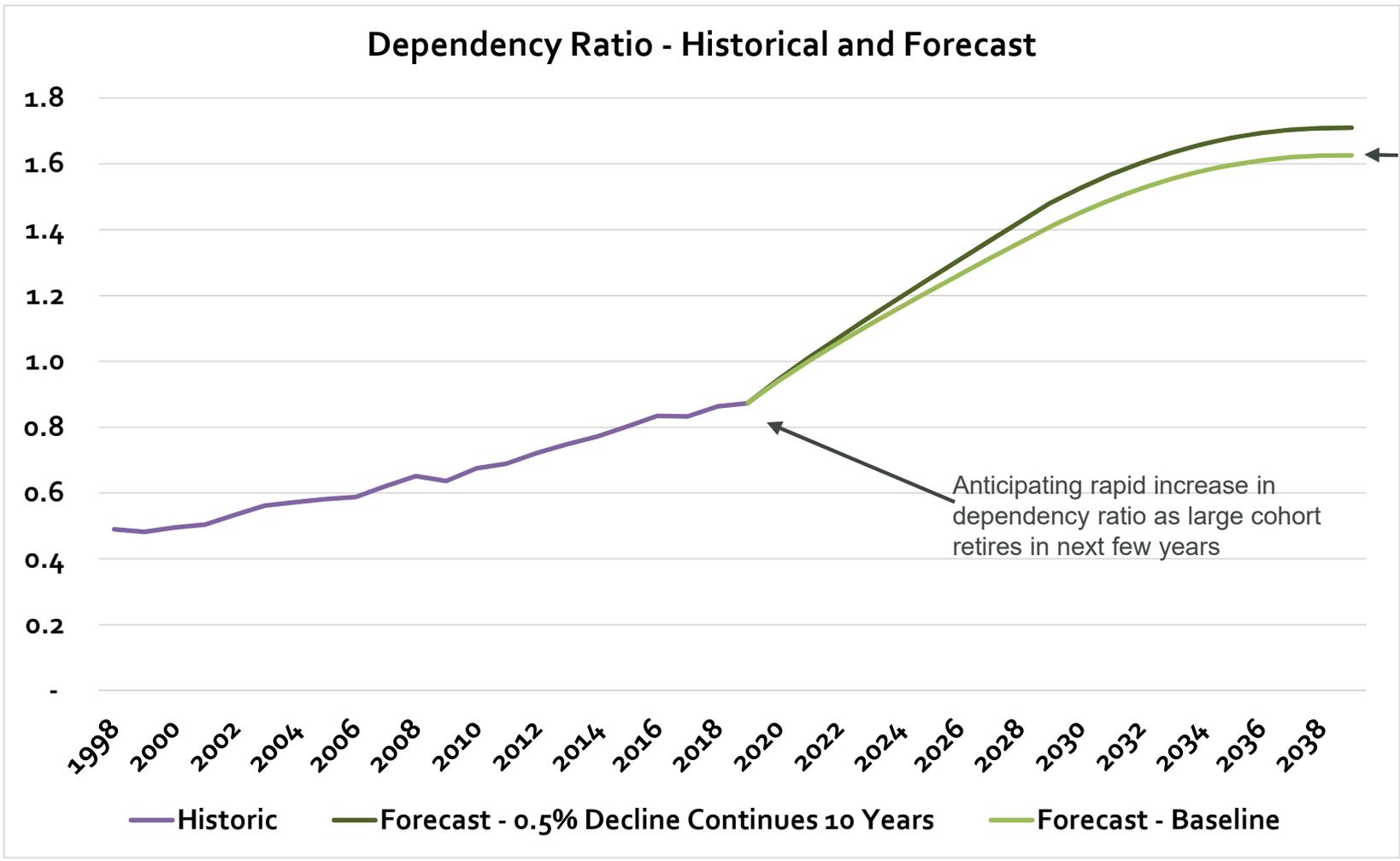


- What is the current support ratio?
- What has the recent trend of this ratio been?
- What does the projection of this ratio trend into the future look like?
- Are there significant risks I should know about that may impact those projections?

# Support Ratio Historical Trends



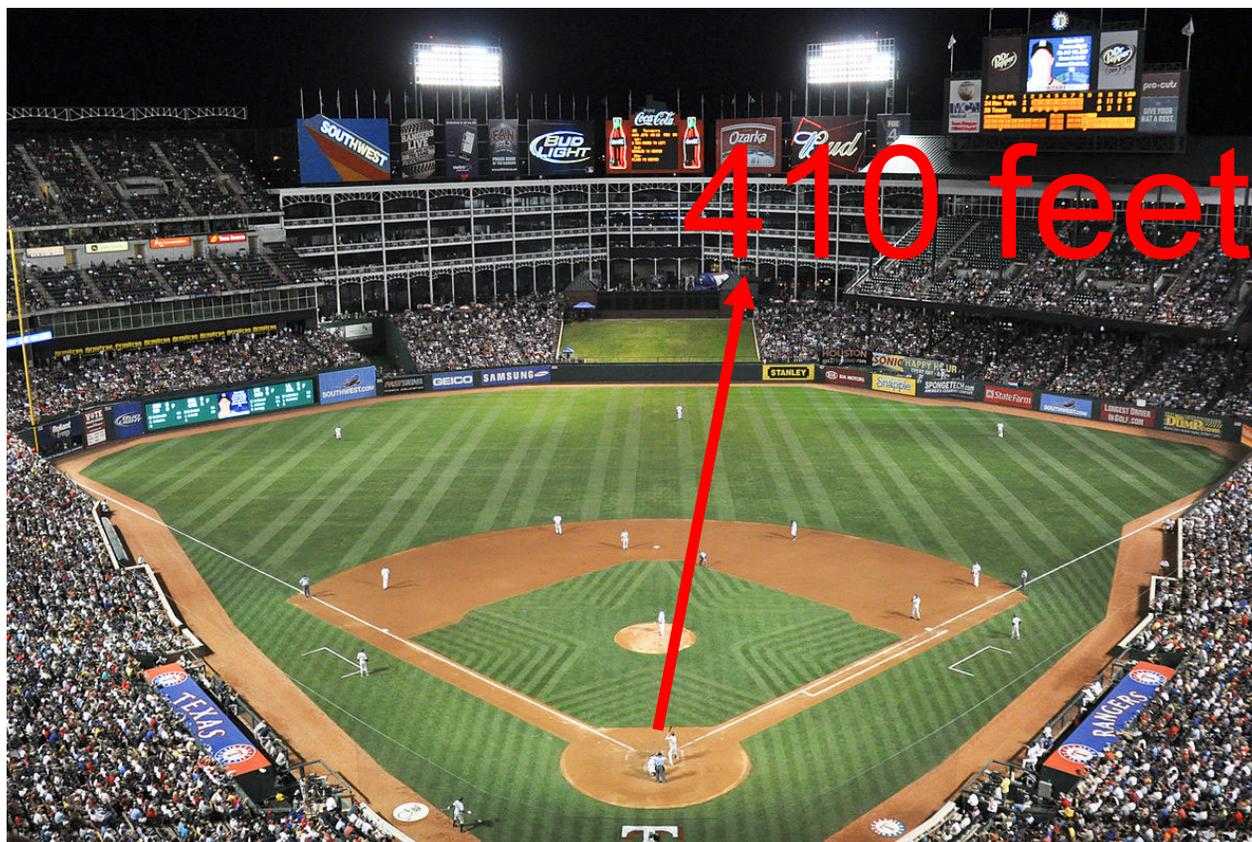
# Historical and Projection Example



Impact if last 15 years 0.5% per year decline in actives continues for next 10 years and then active population stays constant

Anticipating rapid increase in dependency ratio as large cohort retires in next few years

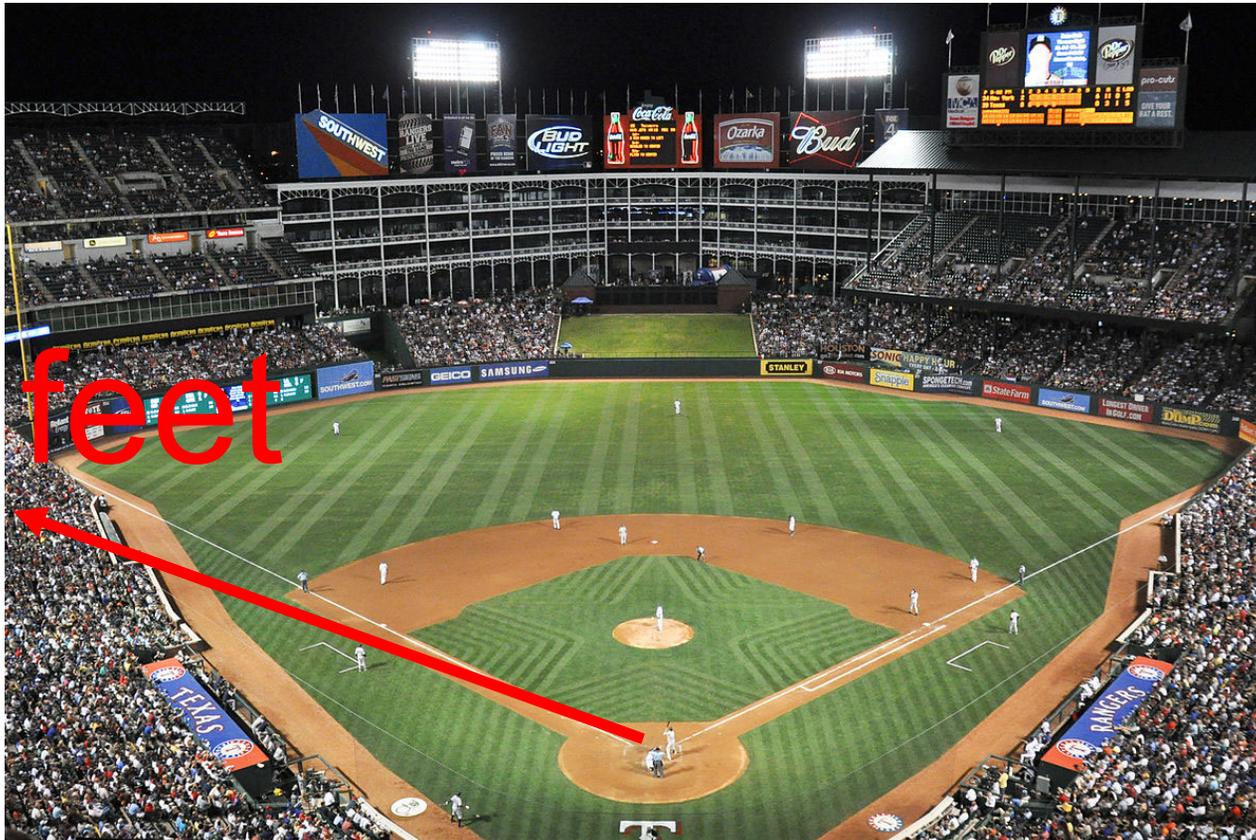
# Stress Testing Projections



# Stress Testing Projections



410 feet



# Stress Testing Introduction



Appropriate stress testing will vary by System being studied, when it is being studied, who is studying it, and for what purpose



Consider System and Sponsor characteristics



Recognize limited resources, prioritize!

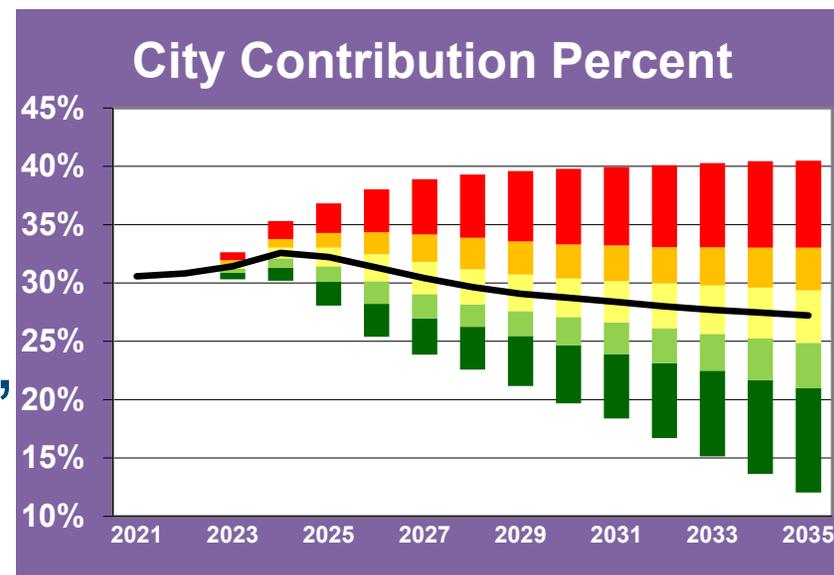
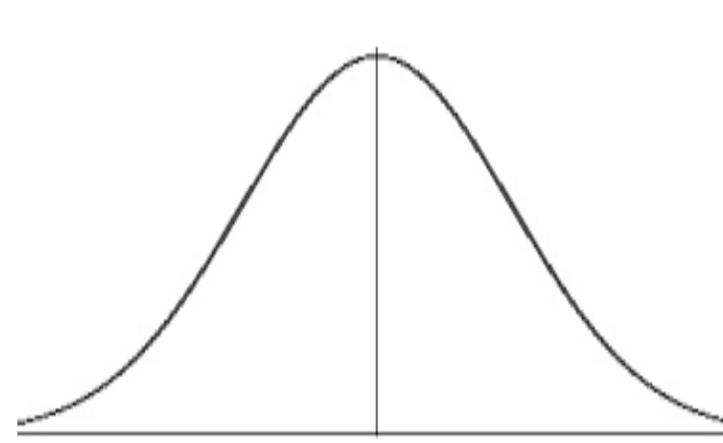


Identify key outcomes, risks, and concerns

# Stress Testing Introduction



- Deterministic stress testing is based on one set of assumptions
- Stochastic testing expands to range of results
  - Demonstrates the likelihood of certain events under thousands of random return scenarios (contribution rates, funded status)
  - Thousands of trials



# Stress Testing Approaches Comparison



## Deterministic

- Advantages: simpler and easier to evaluate; can clearly convey directional trend of expectation
- Disadvantages: give no idea of volatility or uncertainty; little insights into risk/reward

## Stochastic

- Advantages: risk/reward tradeoffs with alternatives easier to tell; communicates information on volatility
- Disadvantages: complicated; takes time to run

Questions – often a good compromise

# Stress Testing Examples



## Stress Testing

Employee Contribution **18.70%**

Funding Policy **Fixed**

Discount Rate **7.30%**

Amort Type **Layers**

**2022 Baseline**

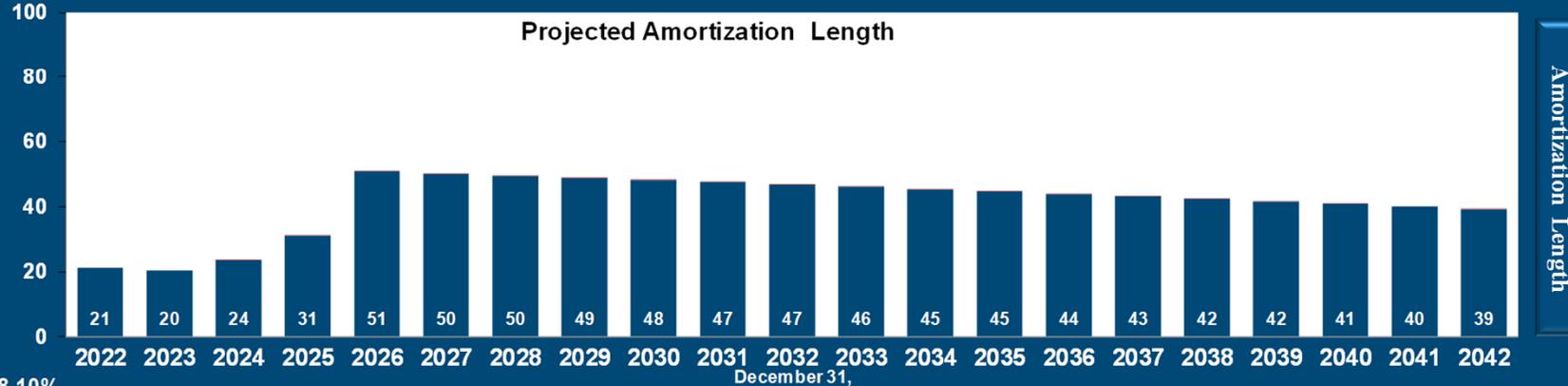
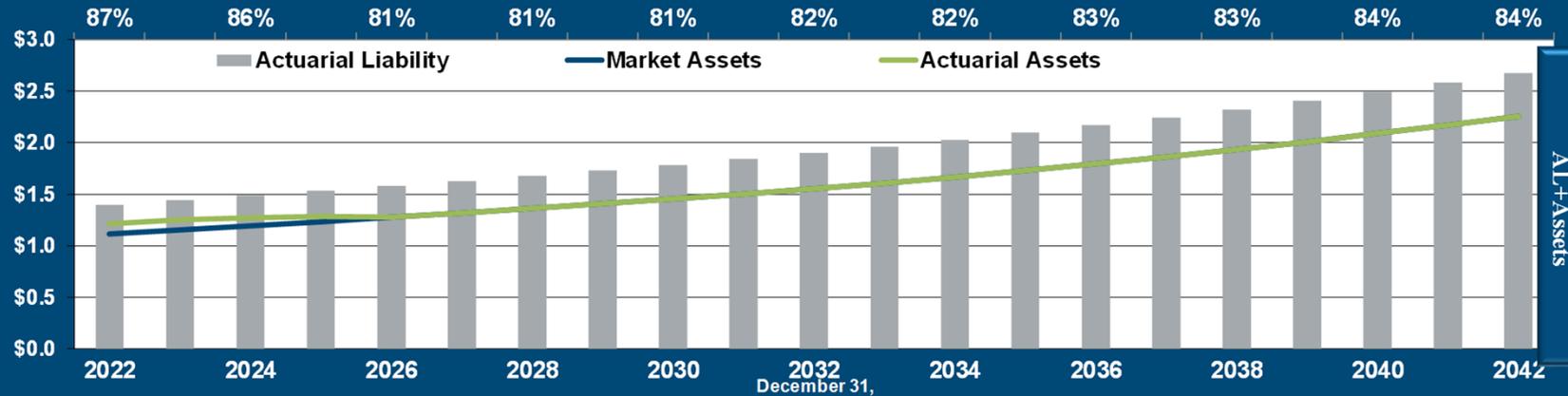
Amort Period **20**

Payroll Growth **2.50%**

Yrs to Fully Funded **> 40**

Baseline  
 Historical  
 2003

PYE	7.30%	Contr. %	25.00%
2023	7.30%	25.00%	25.00%
2024	7.30%	25.00%	25.00%
2025	7.30%	25.00%	25.00%
2026	7.30%	25.00%	25.00%
2027	7.30%	25.00%	25.00%
2028	7.30%	25.00%	25.00%
2029	7.30%	25.00%	25.00%
2030	7.30%	25.00%	25.00%
2031	7.30%	25.00%	25.00%
2032	7.30%	25.00%	25.00%
2033	7.30%	25.00%	25.00%
2034	7.30%	25.00%	25.00%
2035	7.30%	25.00%	25.00%
2036	7.30%	25.00%	25.00%
2037	7.30%	25.00%	25.00%
2038	7.30%	25.00%	25.00%
2039	7.30%	25.00%	25.00%
2040	7.30%	25.00%	25.00%
2041	7.30%	25.00%	25.00%
2042	7.30%	25.00%	25.00%
Avg	7.30%		



Compounded Avg. Return = 8.10%



# Stress Testing Examples



## Stress Testing

Employee Contribution **18.70%**

Funding Policy **Fixed**

Discount Rate **7.30%**

Amort Type **Layers**

**2022 Baseline**

Amort Period **20**

Payroll Growth **2.50%**

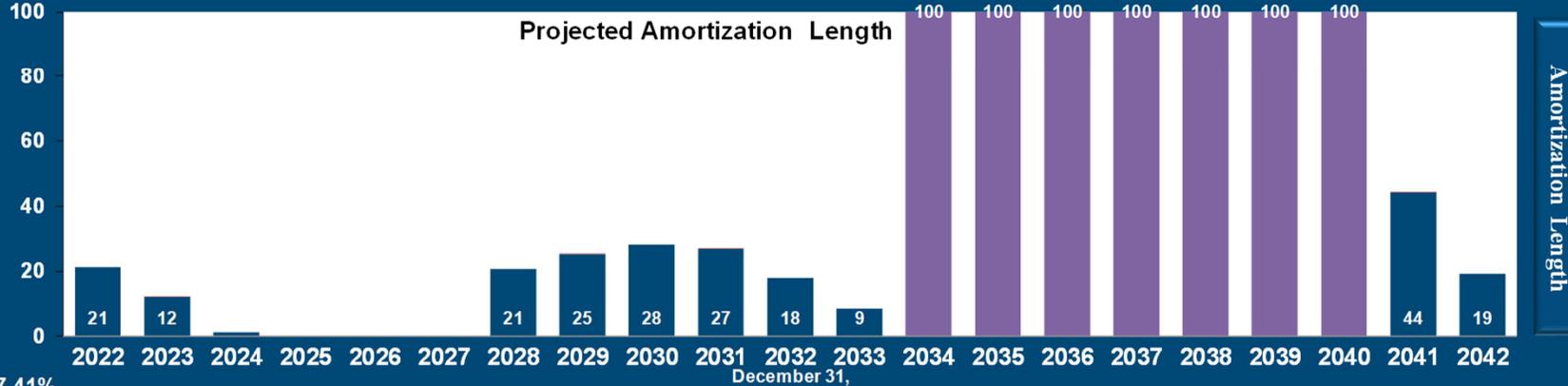
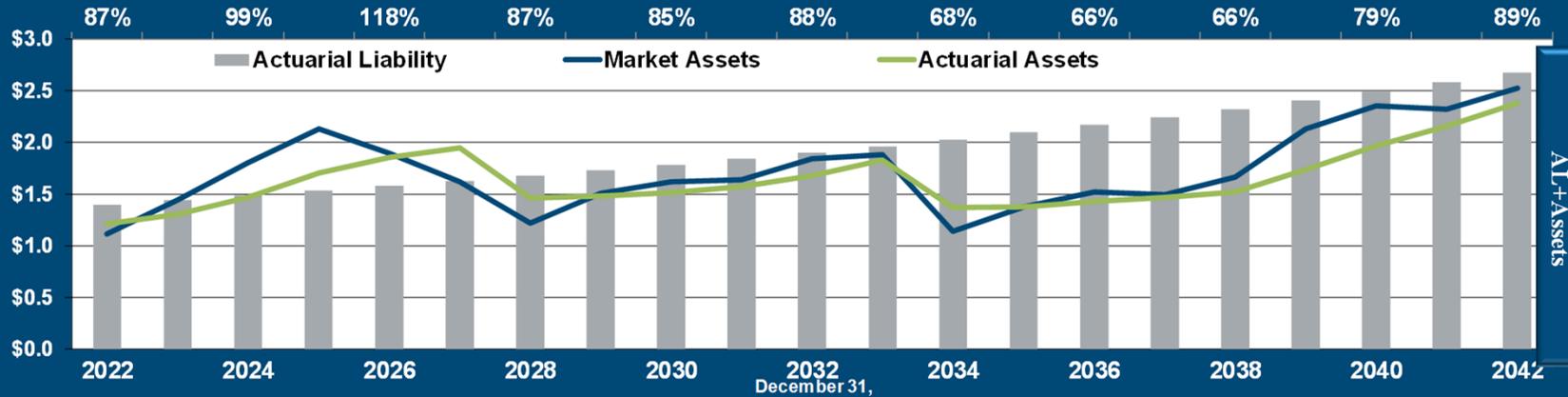
Yrs to Fully Funded **3**

Baseline

Historical

1997

PYE	Contr. %	25.00%
2023	33.36%	25.00%
2024	28.58%	25.00%
2025	21.04%	25.00%
2026	-9.11%	25.00%
2027	-11.88%	25.00%
2028	-22.10%	25.00%
2029	28.70%	25.00%
2030	10.88%	25.00%
2031	4.91%	25.00%
2032	15.79%	25.00%
2033	5.49%	25.00%
2034	-37.00%	25.00%
2035	26.46%	25.00%
2036	15.11%	25.00%
2037	2.11%	25.00%
2038	16.00%	25.00%
2039	32.39%	25.00%
2040	13.69%	25.00%
2041	1.38%	25.00%
2042	11.96%	25.00%
Avg	9.39%	



Compounded Avg. Return = 7.41%



# Stress Testing Examples



## Stress Testing



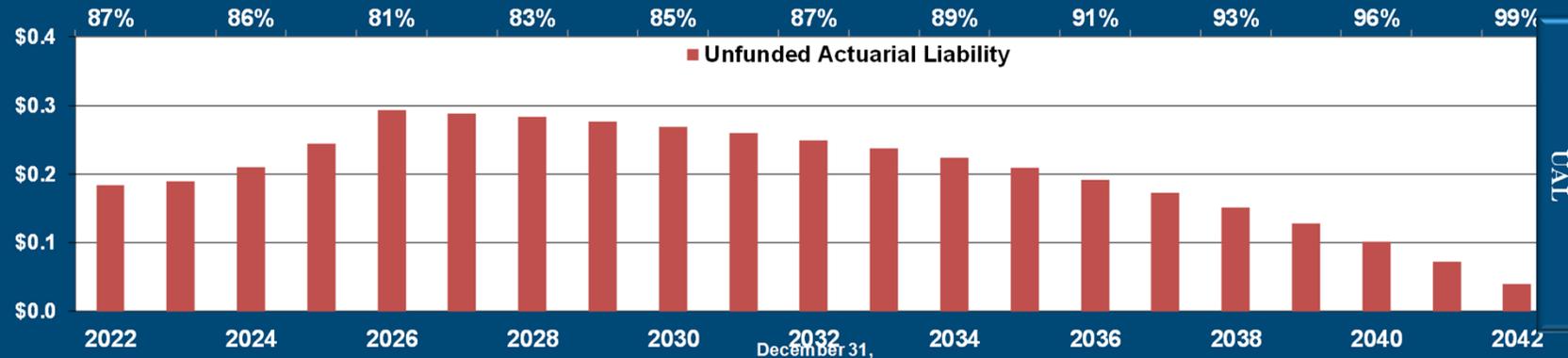
Employee Contribution **18.70%**

Funding Policy **ADC**  
 Amort Type **Layers**  
 Amort Period **20**

Discount Rate **7.30%**  
**2022 Baseline**  
 Payroll Growth **2.50%**  
 Yrs to Fully Funded **24**

Baseline  
 Historical  
**1997**

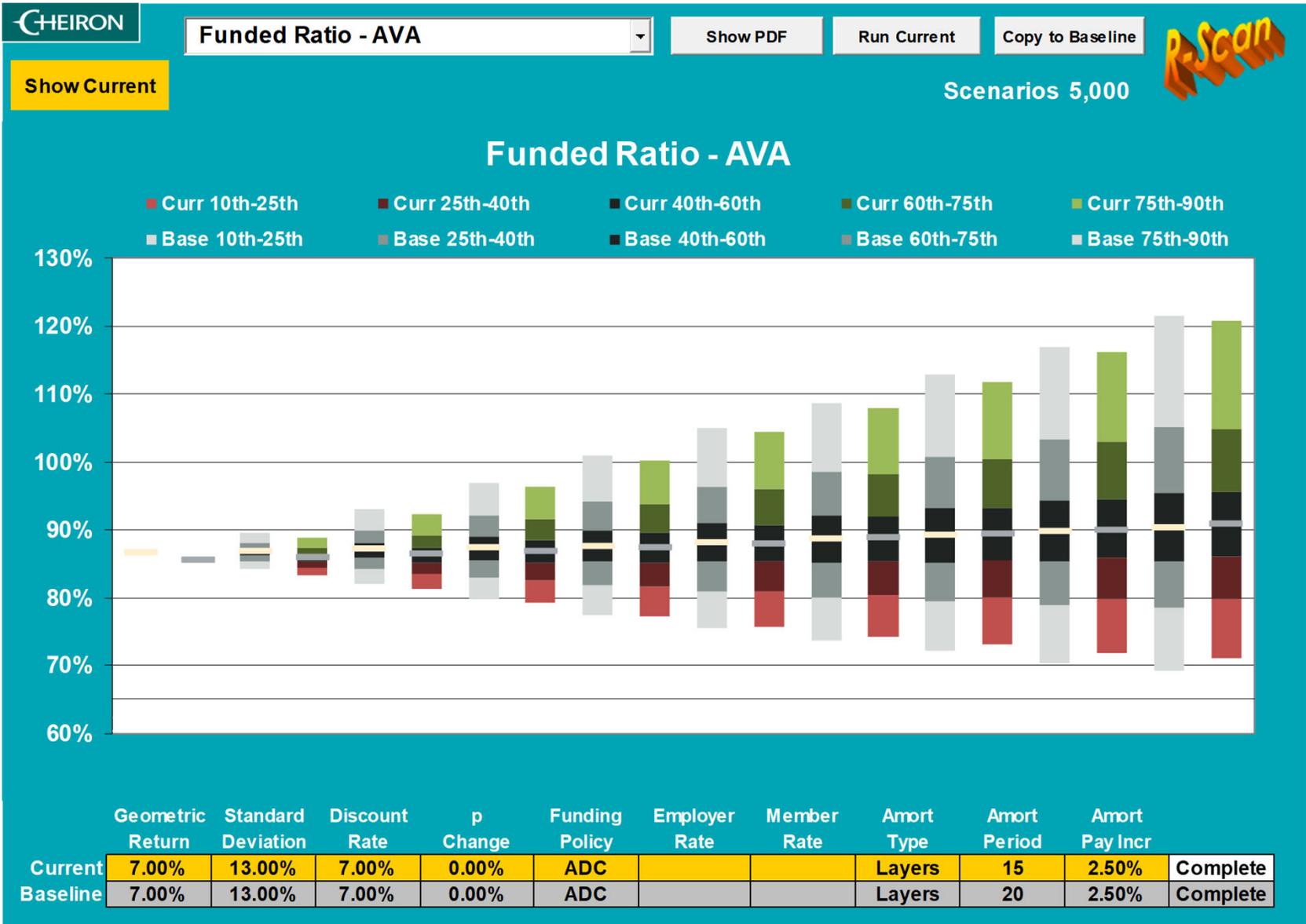
PYE	Contr. %
2023	7.30%
2024	7.30%
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2030	7.30%
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2036	7.30%
2037	7.30%
2038	7.30%
2039	7.30%
2040	7.30%
2041	7.30%
2042	7.30%
Avg	7.30%



Compounded Avg. Return = 7.41%



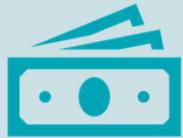
# Stress Testing Examples



# Additional Stress Test Considerations



Investment returns are universally significant



Funding policy also universally significant



Behavioral and other economic drivers should be considered

Mortality  
Retirement and other member behavior  
Inflation and COLAs  
Unique plan features

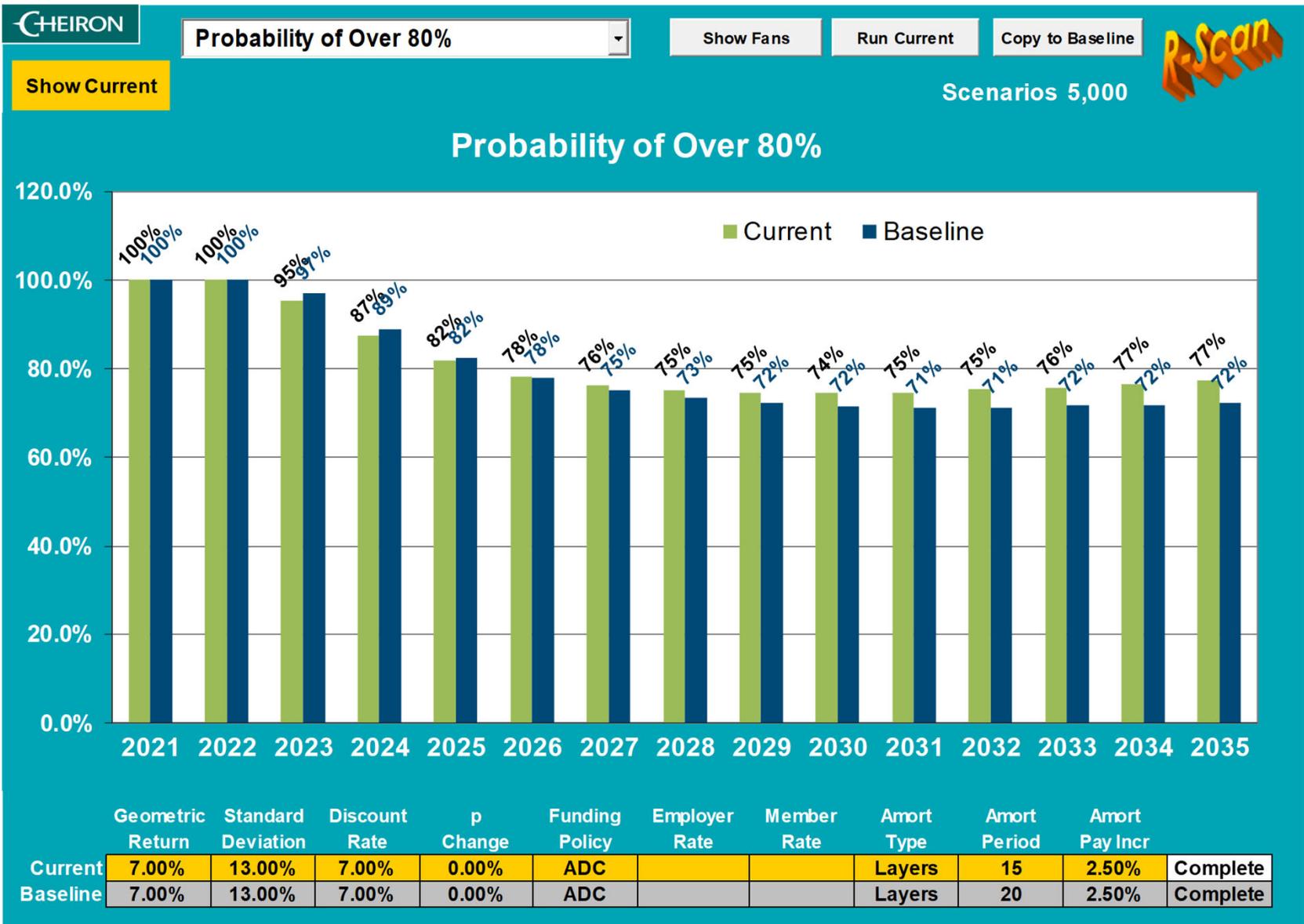


- Frequently developing graphs answering “questions” can be superior to the basic distribution graphs for decision useful information.
  - What is the chance that the contribution increases by more than 40% in the next five years?
  - By more than 10% in a given year?
  - Funded ratio drops below 80%?
- Need to think about specific System and Sponsor in selecting the risk questions.



- What conditions would represent problems or even ruin?
  - For the Sponsor (and taxpayers)?
  - For the member’s benefits?
- What variables are most significant in terms of possible drivers of deviations of experience from expectations?
  - Investment returns
  - Contributions received
  - Demographic assumptions
- Consider level and direction of questions

# Question Example



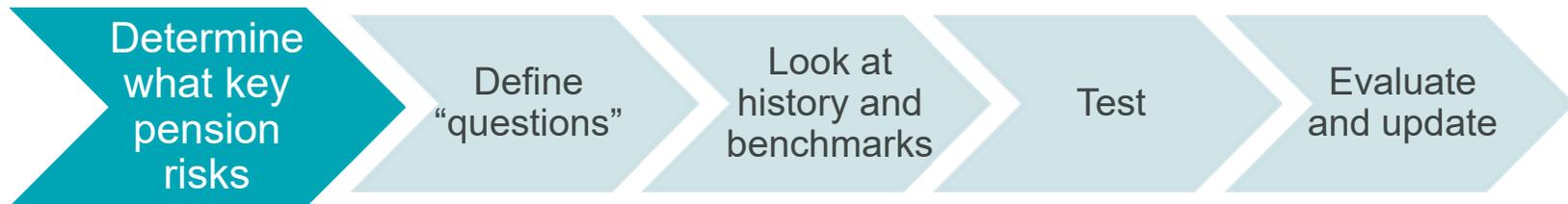
# Pension Risk Assessment



No universal answer

- appropriate assessment varies based on characteristics of System and State and purpose

General process can and should be followed



Recognize limited resources, prioritize!

Generally, start with deterministic and expand into stochastic and “questions”

# Sponsor Specific Pension Risk Assessment



Risks regarding System relative to economy/budget as a whole

Interactions of System with other parts of State operations (such as healthcare costs)

Interactions of conditions leading to contributions requirements and revenue

Consider implications of System “fiscal stress” on tax demands or other service cuts



# Active Management



- Once you've assessed your risk and have identified the most significant risks to your plan in terms of failing to meet your objectives and having “ruin” conditions occur, the next step is to consider approaches to manage these risks
- Approaches include
  - Actuarial methodologies
  - Policy changes
  - Plan design changes



- Asset smoothing parameters
  - Length of smoothing
  - Corridors
  - Rolling vs. closed period
- If funding based on an actuarially determined basis, amortization policy parameters, particularly layers and amortization pattern and basis
- Degree of conservatism in assumptions



- Funding policy: basis for determining sponsor contributions
- Investment policy changes such as duration matching and adjusting target allocations focused on reducing downside risk
- Actuarial equivalence basis for optional payment forms



- Risk-sharing provisions such as variable employee contributions and contingent COLAs
- Adjustments to benefits to better align benefits with the established objectives for offering the plan
  - Increased efficiency in terms of meeting these objectives
  - Reflecting demographic changes
  - Better aligning with intentional risk allocation

# Framework if Considering Benefit Changes



