



Rate Stabilization Techniques

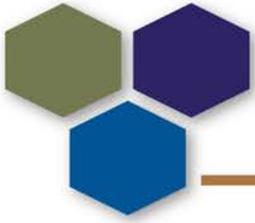
September 22-23, 2016

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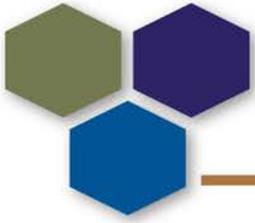
GRS

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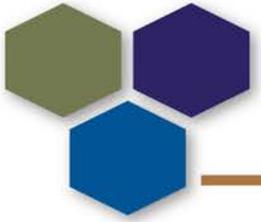
Today's Agenda

- ◆ Why have this discussion?
- ◆ Definition of a Funding Policy
- ◆ Definition of the Elements of a Funding Policy
- ◆ Goals of a Funding Policy
- ◆ Available Structures
- ◆ Example Comparison
- ◆ Next Steps

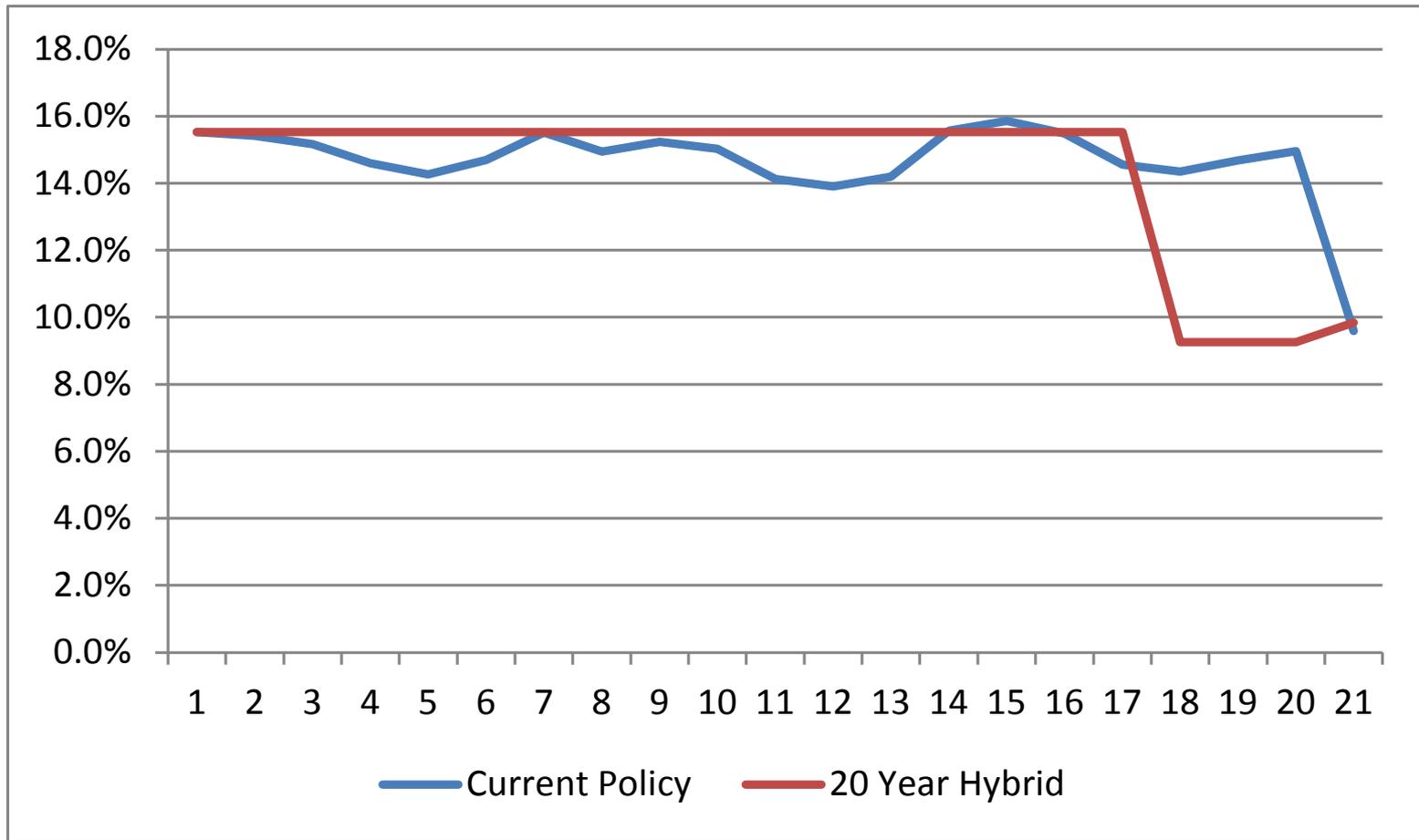


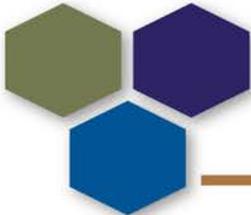
Why have this discussion?

- ◆ Included in the Board's overall strategic objectives
- ◆ Board has expressed an interest in techniques to further stabilize contribution rates
- ◆ Optimization of current structure
 - ▶ Meaning, based on the current structure, the contribution stability has been maximized. To get any further stability, will need another structure



Which pattern?





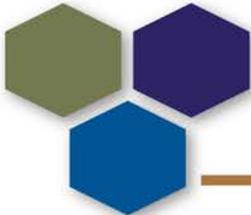
Funding Policy

- ◆ The “Funding Policy” of a Pension Plan is a systematic set of procedures used to determine the contributions which will be made in a specific year and series of years
- ◆ It is much broader in scope than most people think
- ◆ It must address how the contributions will be made for ongoing benefits as well as how to finance gains or losses as experience occurs
 - ▶ Consideration must also be made for the current Unfunded Actuarial Accrued Liability (UAAL)



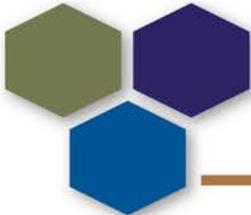
Elements of a Funding Policy

- ◆ **Actuarial Cost Method:** which allocates the total present value of future benefits to each year (Normal Cost) including all past years (Actuarial Accrued Liability or AAL)
- ◆ **Asset Smoothing Method:** which reduces the effect of short term market volatility while still tracking the overall movement of the market value of plan assets
- ◆ **Amortization Methods:** which determines the length of time and the structure of the increase or decrease in contributions required to systematically (1) fund any Unfunded Actuarial Accrued Liability or UAAL, or (2) recognize any Surplus, i.e., any assets in excess of the AAL
 - ▶ Level dollar vs Level Percentage of Payroll/Budget
 - ▶ For initial liabilities
 - ▶ For changes in assumptions
 - ▶ For changes in benefit provisions
 - ▶ For gains and losses (deviations from expectation) that naturally occur
- ◆ **Contribution stabilization techniques:** or “direct rate smoothing” in addition to both asset smoothing and UAAL/Surplus amortization
- ◆ **Procedures for Plans with lower funded ratios**
- ◆ **Surplus management**



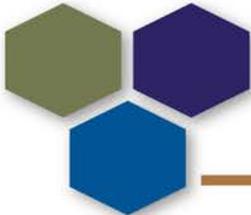
Current TMRS Policy

- ◆ TMRS does have a current funding policy
 - ▶ Current version recently approved by the Board
 - ▶ Guidelines defined in statute
 - ▶ Most details defined further by Board rules
- ◆ Employers must contribute the normal cost plus a closed amortization of any UAAL that exists or is created by Actuarial Losses
- ◆ Ad hoc benefit enhancements are amortized over a shorter period and on a level dollar schedule
- ◆ Small plans have accelerated schedules



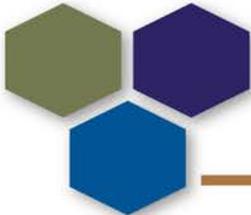
Actuarial Losses

- ◆ New liabilities (actuarial losses) are created by the following:
 - ▶ New base at inception (City joining TMRS)
 - ▶ Benefit increases granted that change the accrual for past service
 - ▶ Changes to assumptions or funding policies
 - ▶ Experience differing from expectations (assumptions)
- ◆ The current funding policy utilizes the process of “laddering” new losses over a closed amortization period
 - ▶ Loss from Year-1: 24 years remaining
 - ▶ Loss from Year-2: 23 years remaining
 - ▶ Loss from Year-3: 22 years remaining
- ◆ With the upcoming December 31, 2016 valuation, all new losses will be amortized over new periods not to exceed 25 years



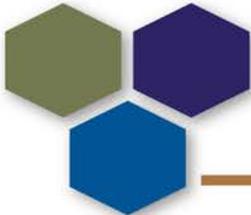
TMRS Statutes/Board Rule

- ◆ § 855.110(c) of the TMRS Act allows the Board of Trustees the authority to set, by rule, open or closed amortization periods up to a maximum of 25 years
- ◆ TMRS Rule §123.7(b)(2) allows the Board to extend the amortization period from twenty-five (25) years to a maximum of thirty (30) years for municipalities who experience an increase in contribution rates in excess of 0.5% as a result of actuarial changes
- ◆ TMRS Rule §123.7(b)(1) allows the Board to phase-in such increases over a reasonable period of time
- ◆ Finally, Rule § 123.7(d) allows the Board, after consultation with the System's actuary, to (a) change the amortization period from an open period to a closed period, (b) decrease the amortization period, (c) set different amortization periods for different types of benefit enhancements and/or (d) "ladder" the amortization of the unfunded liabilities



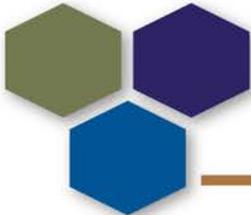
Goals of a Funding Policy

1. **Benefit Security:** The principal goal of a funding policy is that future contributions and current plan assets should be sufficient to provide for all benefits expected to be paid to members and their beneficiaries when due
2. **Intergenerational Equity:**
 - A. The funding policy should seek a reasonable allocation of the cost of benefits and the required funding to the years of service (i.e. demographic matching). This includes the goal that annual contributions should, to the extent reasonably possible, maintain a close relationship to both the expected cost of each year of service and to variations around that expected cost
 - B. The funding policy should seek a financing pattern which computes and requires contribution amounts which, expressed as a percentage of active member payroll, will remain approximately level from year to year and from one generation of citizens to the next generation
3. **Contribution volatility:** The funding policy should seek to manage and control future contribution volatility (i.e., have costs emerge as a level percentage of payroll) to the extent reasonably possible, consistent with other policy goals



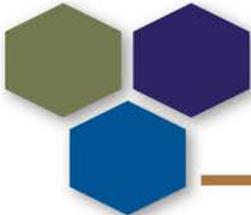
From CCA White Paper

- ◆ *“Policy objectives 2 and 3 reflect two aspects of the general policy objective of interperiod equity (IPE). The “demographic matching” goal of policy objective 2 promotes intergenerational IPE, which seeks to have each generation of taxpayers incur the cost of benefits for the employees who provide services to those taxpayers, rather than deferring those costs to future taxpayers. The “volatility management” goal of policy objective 3 promotes period-to-period IPE, which seeks to have the cost incurred by taxpayers in any period compare equitably to the cost for just before and after.*
- ◆ *These two aspects of IPE will tend to move funding policy in opposite directions. Thus the combined effect of policy objectives 2 and 3 is to seek an appropriate balance between intergenerational and period-to-period IPE, that is, between demographic matching and volatility management.”*



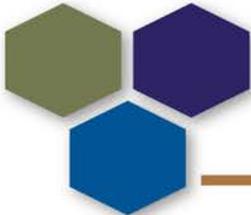
The reverse

- ◆ Intergenerational *inequity* -- willingly and purposefully making a generation pay for more than its fair share
 - ▶ Typically, refers to a (or all) future generation(s), but can mean the current one, as well



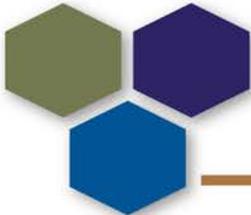
Simplified Goals of a Funding Policy

- ◆ The funding policy should consider benefit security, intergenerational equity, and contribution stability and predictability – and the balance among these three – when selecting a contribution allocation procedure
- ◆ Benefit security will be given preference over intergenerational equity and contribution stability, meaning policies that threaten benefit security will not be considered



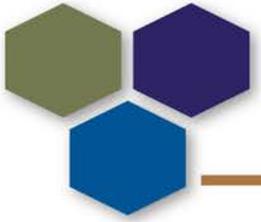
How we will analyze the components?

- ◆ **Benefit security:** likelihood of a decreasing funded ratio
- ◆ **Intergenerational equity:**
 - ▶ 1. Benefits should be fully accrued over an individual member's career and the rate of accrual should be level over the member's career
 - ▶ 2. Any current or new UAAL should be expected to be fully amortized over a reasonable amount of time. Preferably, the pattern does not create negative amortization. Will also consider if one generation is being "over-charged" compared to future ones
- ◆ **Contribution stability and predictability** – Expected average change in contribution rates
 - ▶ with focus on *increases* from one year to the next and *total increase* over a period of years

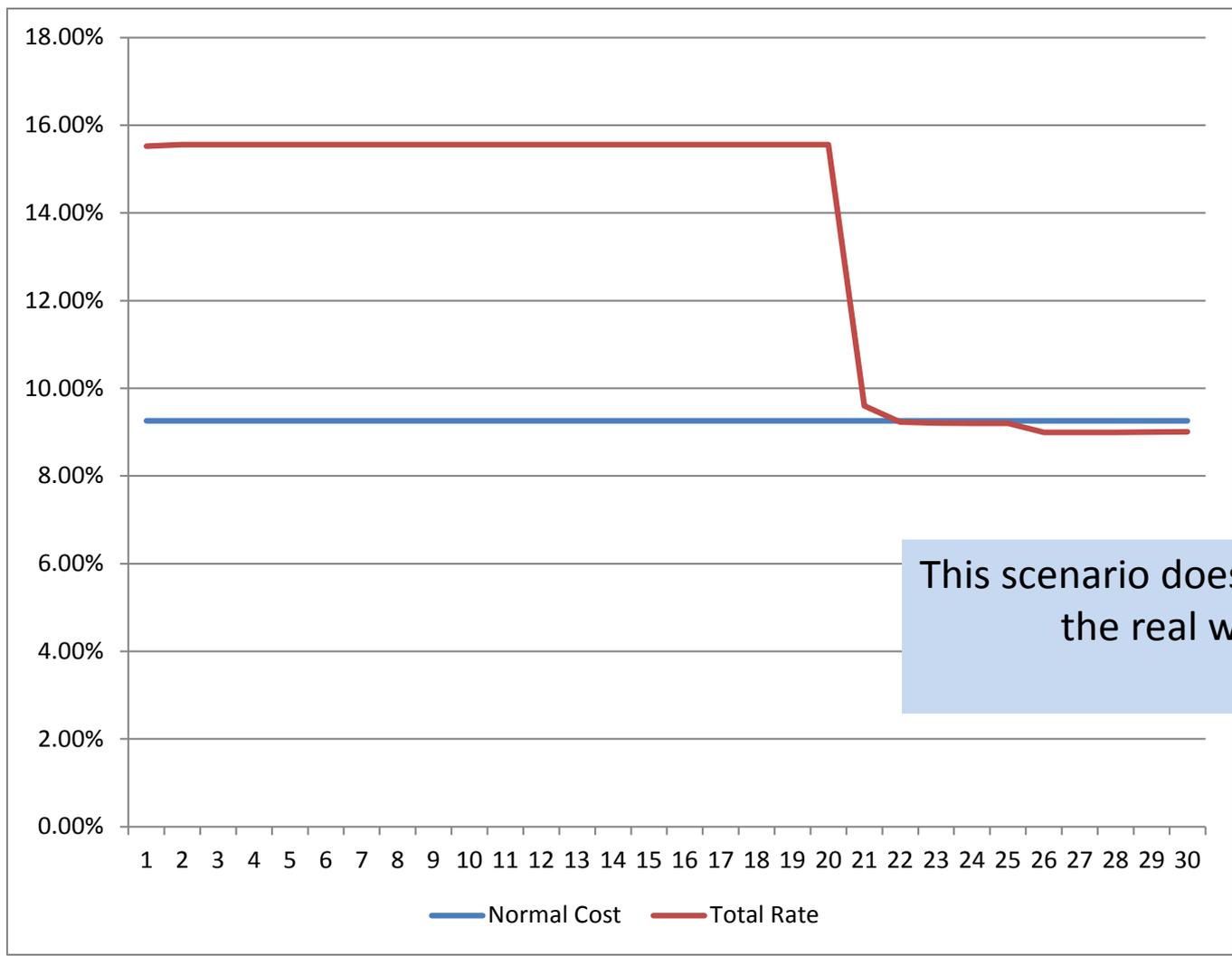


Current TMRS Policy

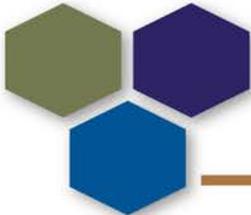
- ◆ It is important to point out that the current funding policy has been fully optimized based on the current structure
- ◆ Meaning, if the current structure is continued (annually determined contribution rates), the current elements have already been optimized to minimize contribution volatility to the extent possible, while balancing the other two objectives
- ◆ Current elements: EAN, level percentage of payroll financing, 25-year laddered amortization, 10-year asset smoothing with soft corridor, 3-year smoothing of individual salaries, 3-year smoothing of contribution payroll



Current Policy: Perfect Scenario



This scenario does not exist in the real world!



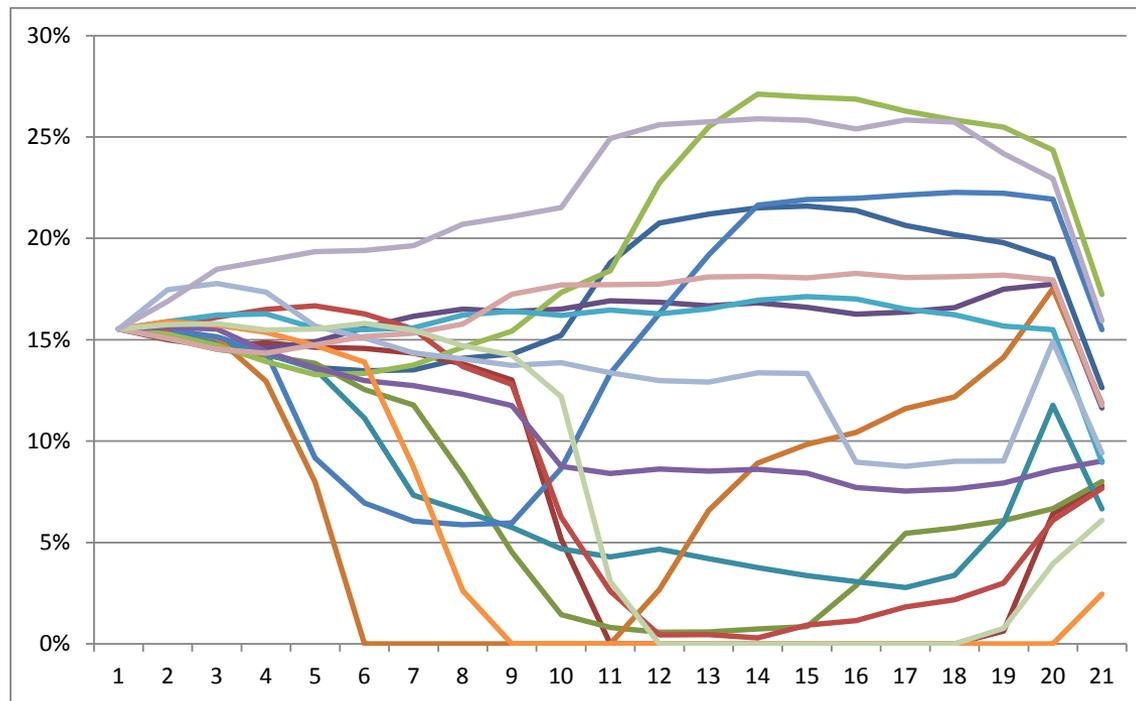
Expectations of Current Policy

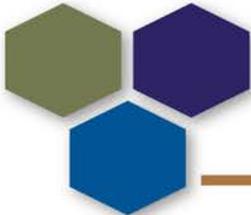
- ◆ The current policy will fully amortize the current UAAL over a closed amortization period
- ◆ The current policy will produce annual increases or decreases in the contribution rate, even under “normal” scenarios
- ◆ Over next ten years, the expected change in contribution rates from one year to the next has the following distribution:
 - ▶ 95%: +/- 3.10%
 - ▶ 75%: +/- 1.26%
 - ▶ 50%: +/- 0.59%
 - ▶ 25%: +/- 0.26%
 - ▶ 5%: +/- 0.03%

Simulated, assuming 10.65% annual standard deviation on investments and 0.38% annual standard deviation on change in contribution rate from liabilities

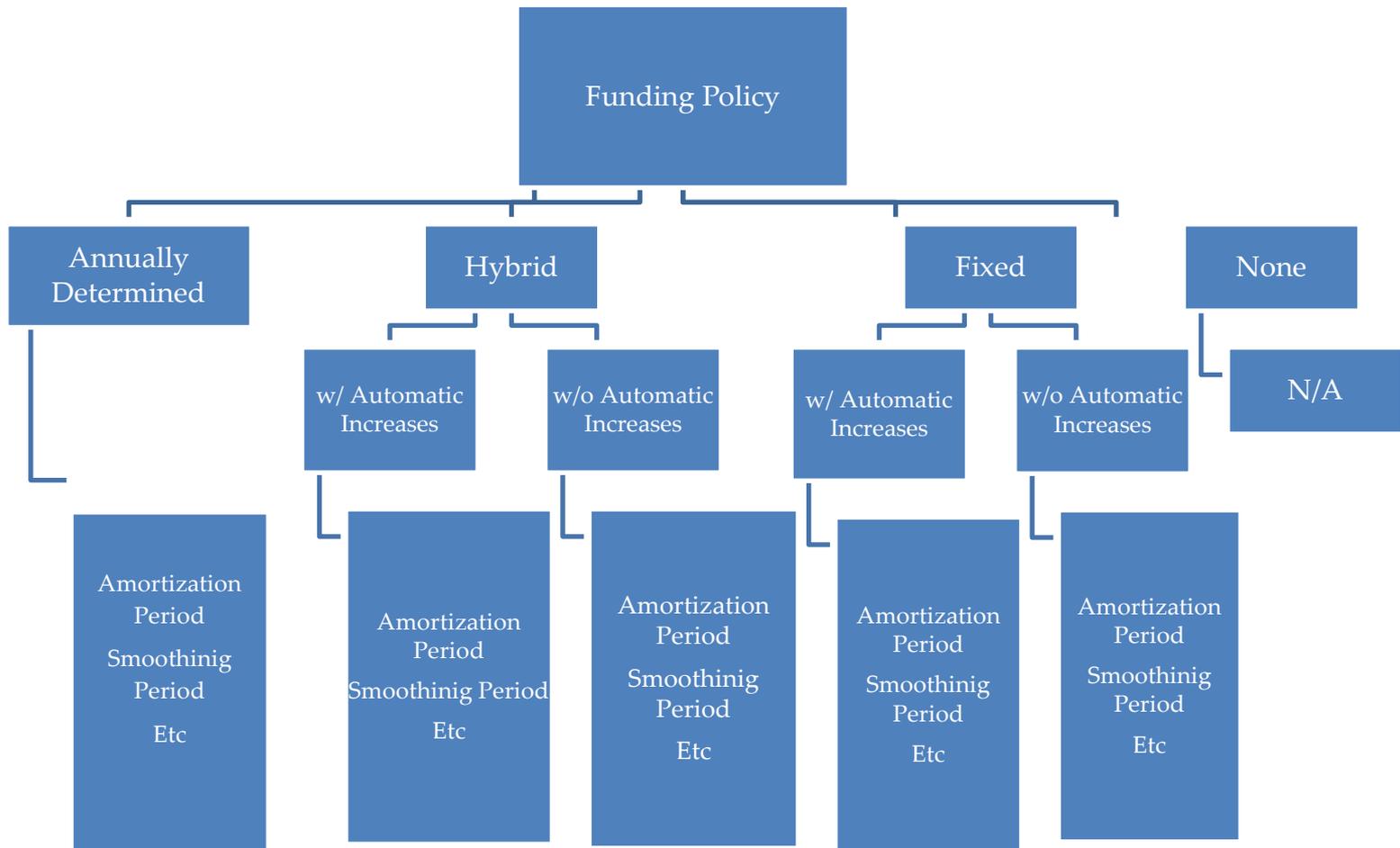
But we exactly met our assumption!

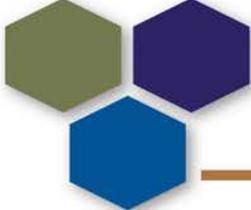
- ◆ The following are 17 simulated 20- year scenarios of contribution rates, each of which achieved a 6.75% compound return over the 20-year period
 - ▶ Liability growth exactly as expected each year (no additional volatility)
- ◆ On average, the “trough to peak” run up was 7.5% of payroll, with a range of 1.6% to 17.0%





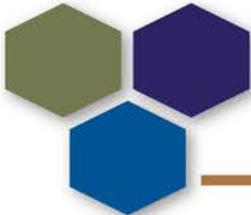
Decision Tree





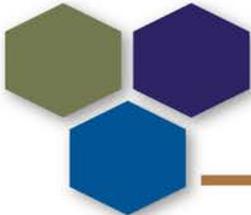
Entry Age Normal (EAN)

- ◆ We continue to find EAN to be the optimal accrual cost method
- ◆ Of all career accrual strategies, creates the highest asset balance at each point in time
 - ▶ Benefit Security
- ◆ Does the best job accruing the monies evenly throughout the member's career
 - ▶ Intergenerational Equity
- ◆ Produces the most stable contribution rate
 - ▶ Contribution Volatility

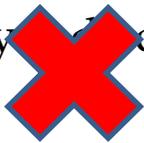


Funding Structures

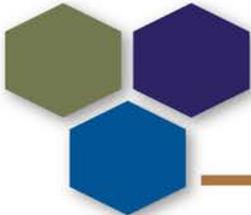
- ◆ **Annually Determined**
 - ▶ Contribution amount (as a rate of payroll or dollar amount) is determined (and changes) annually based on valuation results as of a specific date
- ◆ **Hybrid approaches with required/automatic minimums**
 - ▶ Combination approach that will behave like a fixed rate plan in most situations, but will have contributions increase as necessary based on an appropriate policy
- ◆ **Hybrid approaches without automatic minimums, with maximum limits, or with material delays for increasing the rates**
- ◆ **Fixed Rate**
 - ▶ Typically by statute or ordinance, a fixed contribution rate is set with no anticipation (and typically no easy avenue) for changes in the future. Instead of the amortization period determining the contribution, the contribution determines the amortization period
- ◆ **None**
 - ▶ Employer discretion



Funding Structures

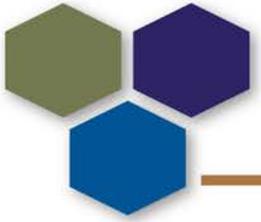
- ◆ Annually Determined
 - ▶ Contribution amount (as a rate of payroll or dollar amount) is determined (and changes) annually based on valuation results as of a specific date
- ◆ Hybrid approaches with required/automatic minimums
 - ▶ Combination approach that will behave like a fixed rate plan in most situations, but will have contributions increase as necessary based on an appropriate policy
- ◆ Hybrid approaches without automatic minimums, with maximum limits, or with material delays for increasing the rates
- ◆ Fixed Rate
 - ▶ Typically by statute or ordinance, a fixed contribution rate is set in advance (and typically no revenue) anticipation (and typically no revenue) the amortization period determines the contribution rate.  
- ◆ None
 - ▶ Employer discretion 

These structures do not provide adequate benefit security and will not be further analyzed in detail. Instead of analyzing the contribution, the contribution rate will not be further analyzed in detail.

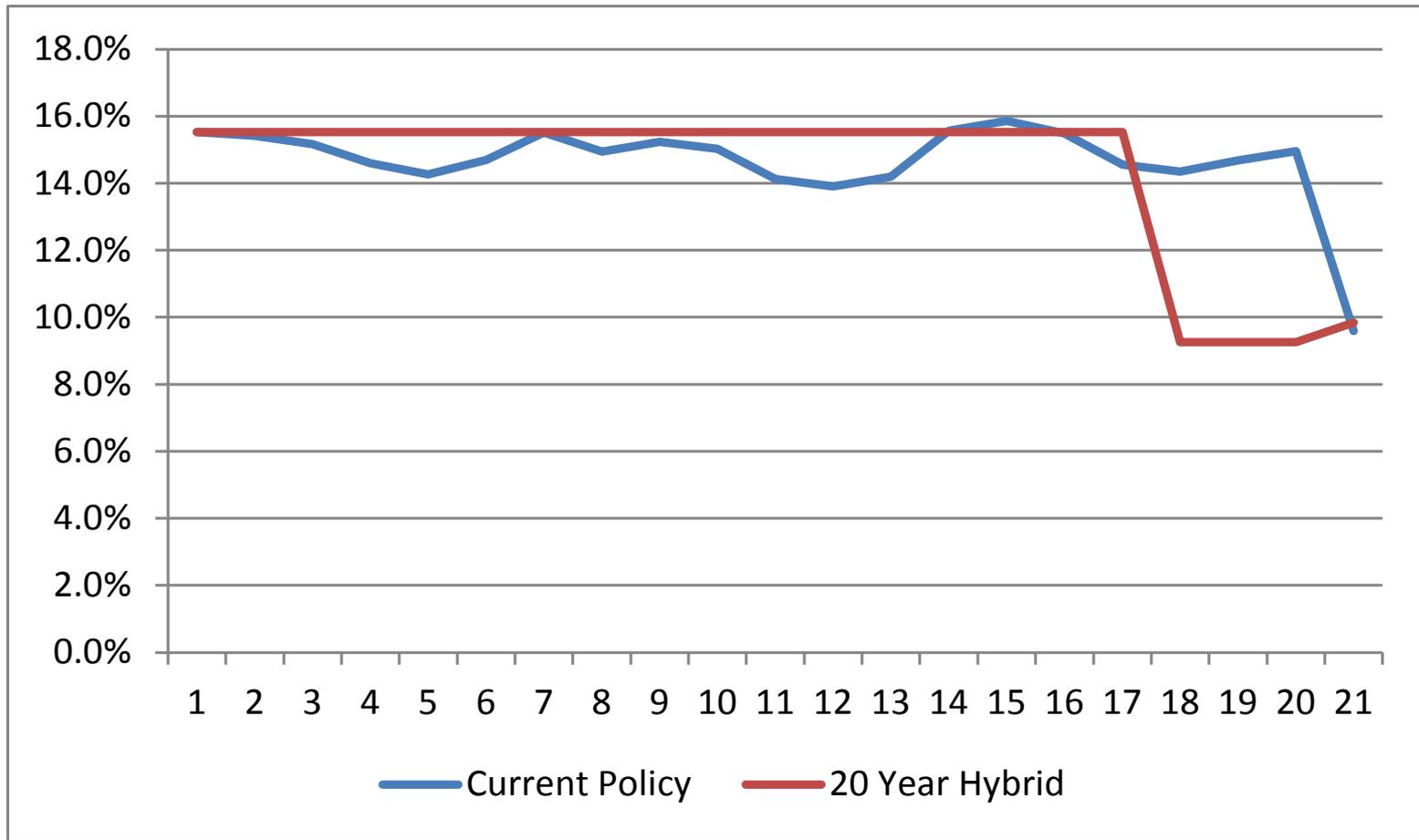


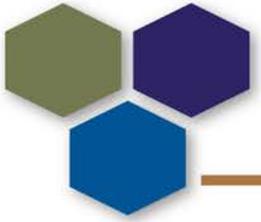
Hybrid Structures

- ◆ Hybrid approaches with required/automatic minimums
 - ▶ Combination approaches that will behave like a fixed rate plan in most situations, but will force contributions to increase as necessary based on an appropriate policy
 - ▶ Allows for smoothing more than just asset performance
- ◆ Simple Example:
 - ▶ Calculated Contribution equals the EAN normal cost plus a 20 year amortization of the UAAL
 - ▶ If plan is less than 100% funded, the Actual Contribution equals the greater of the Calculated Contribution or last year's Actual Contribution
 - Provides an appropriate floor to enhance benefit security
 - With amortization period ≤ 20 , this would always produce positive amortization, thus enhancing intergenerational equity
 - In most years the employer's contribution rate would not change, thus enhancing contribution rate stability
 - After a negative event, allows the amortization period to float, thus dampening contribution volatility and enhancing intergenerational equity by not forcing the current (next 5-10 years) taxpayers to bear all of the burden
 - ▶ If plan is greater than 100% funded, the Actual Contribution equals the Normal Cost

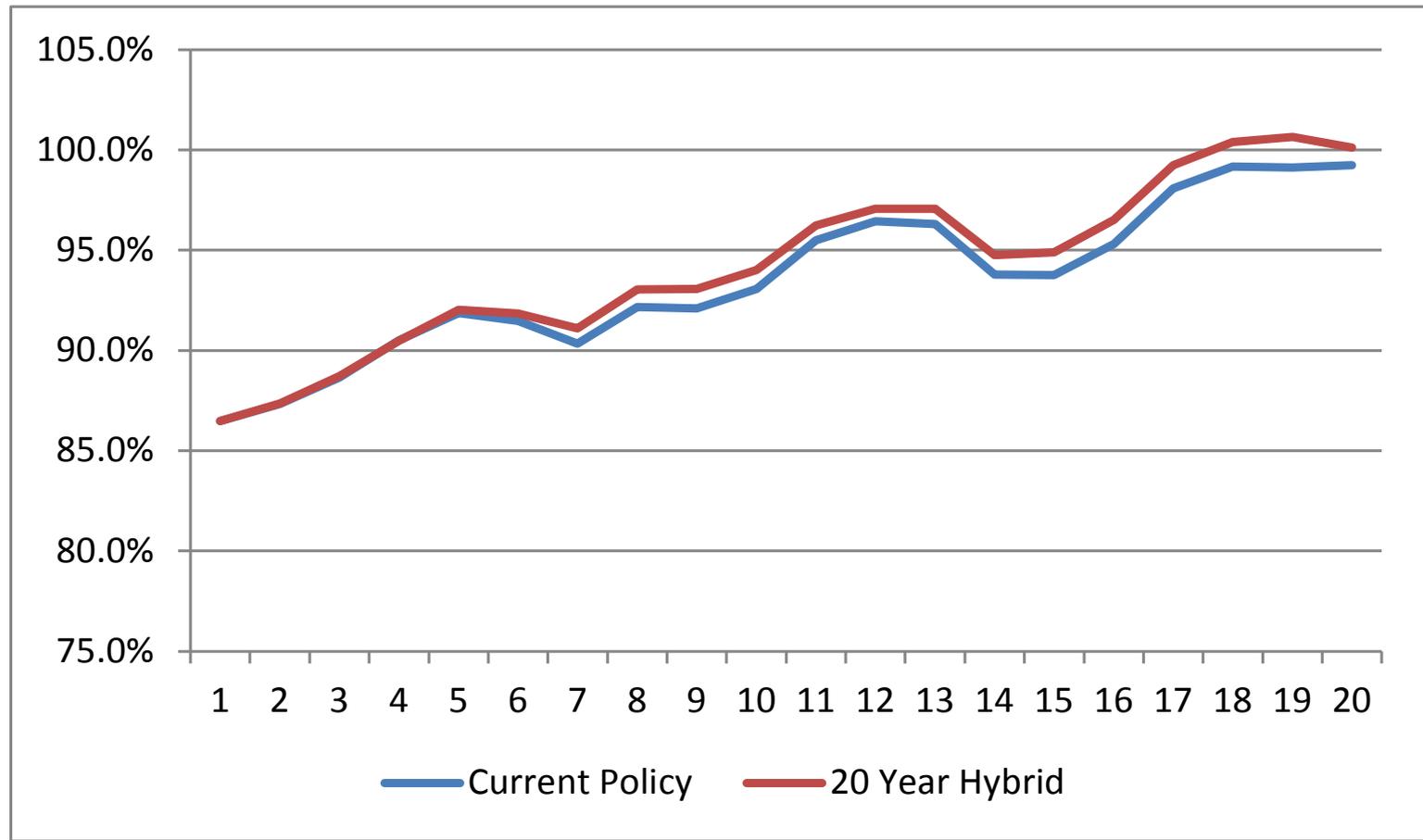


Contribution Rate Pattern



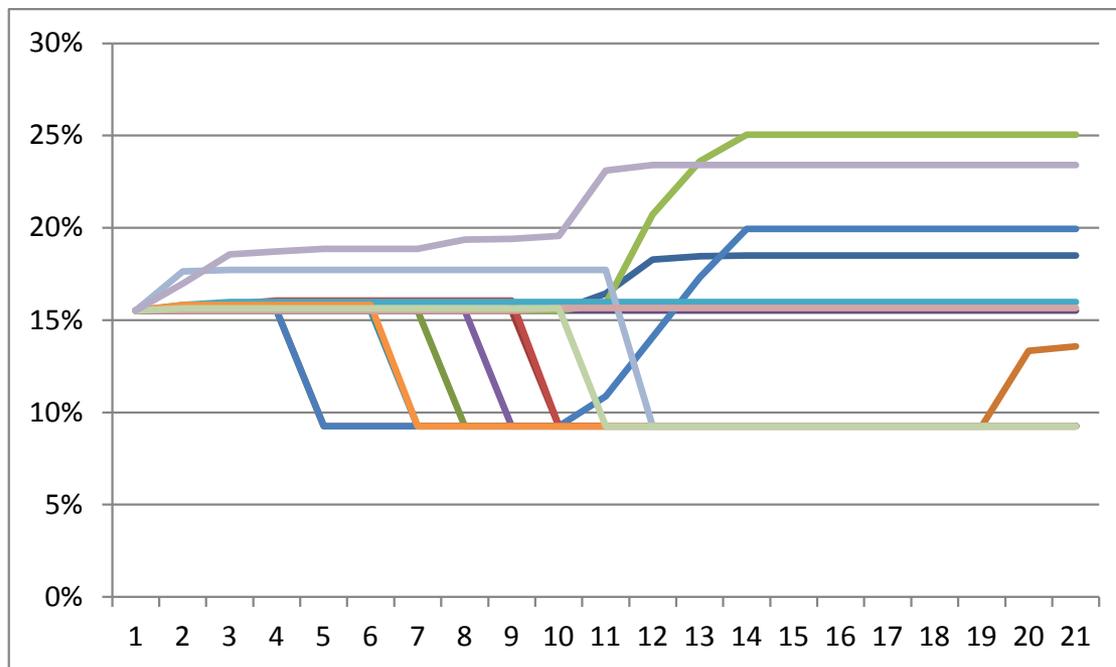


Funded Ratio Pattern

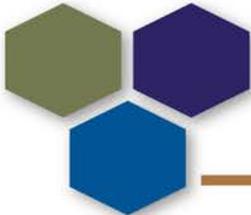


Back to the 17 @ 6.75% scenarios...

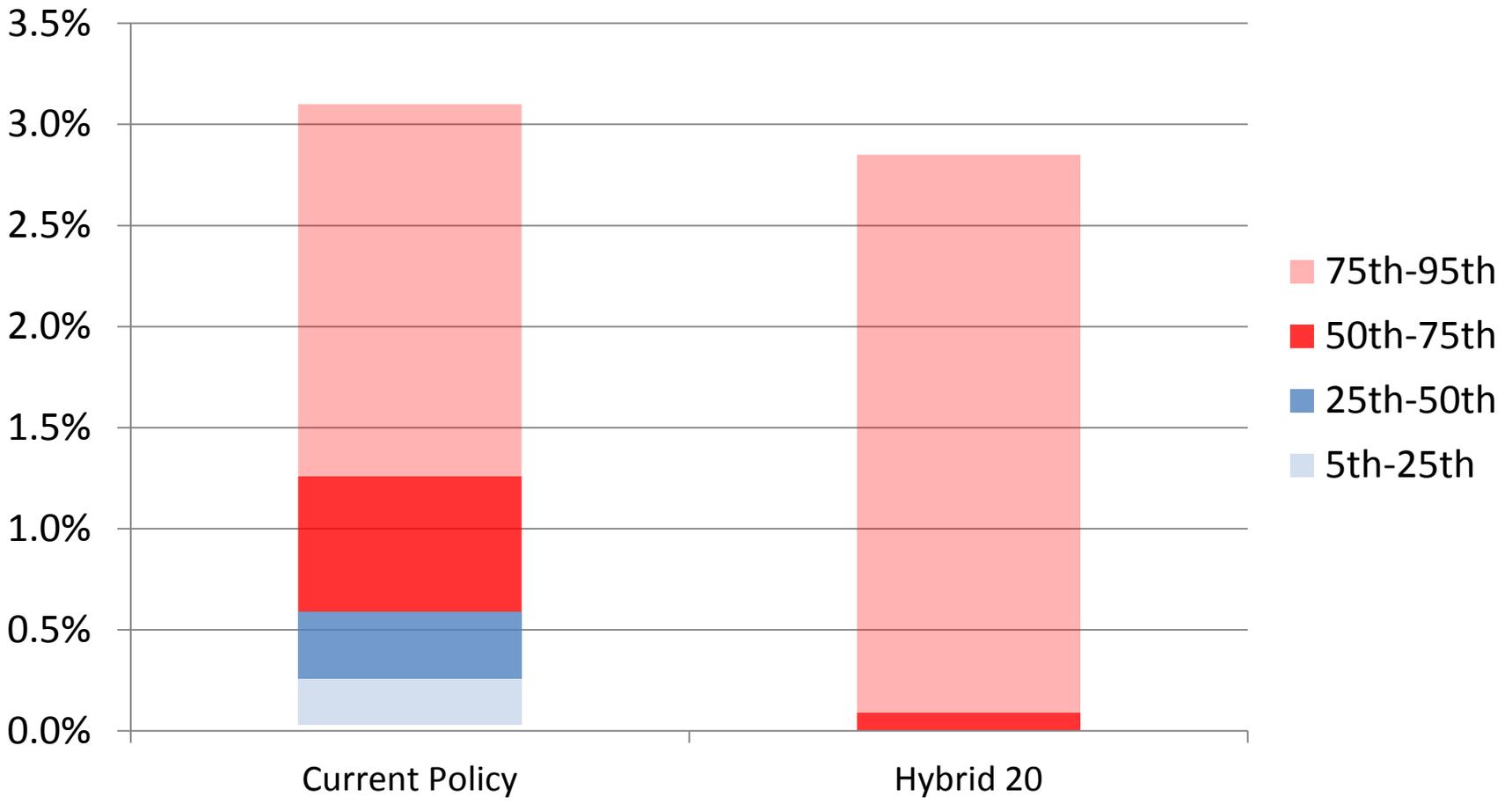
- ◆ Based on the Hybrid 20 policy
- ◆ The following are 17 simulated 20- year scenarios each of which achieved a 6.75% compound return over the 20-year period
 - ▶ Liability growth exactly as expected each year (no additional volatility)
- ◆ On average, the trough to peak run up was 2.3% (7.5%) of payroll, with a range of 0.00% (1.16%) to 10.7% (17.0%). 11 of 17 scenarios had a trough to peak of less than 0.50% (7 of 17 had no increase)



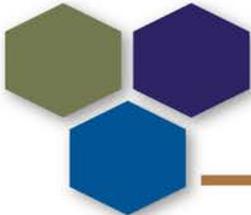
An important part of this is managing the surplus when over 100% funded. Just because overfunded now does not mean will always be.



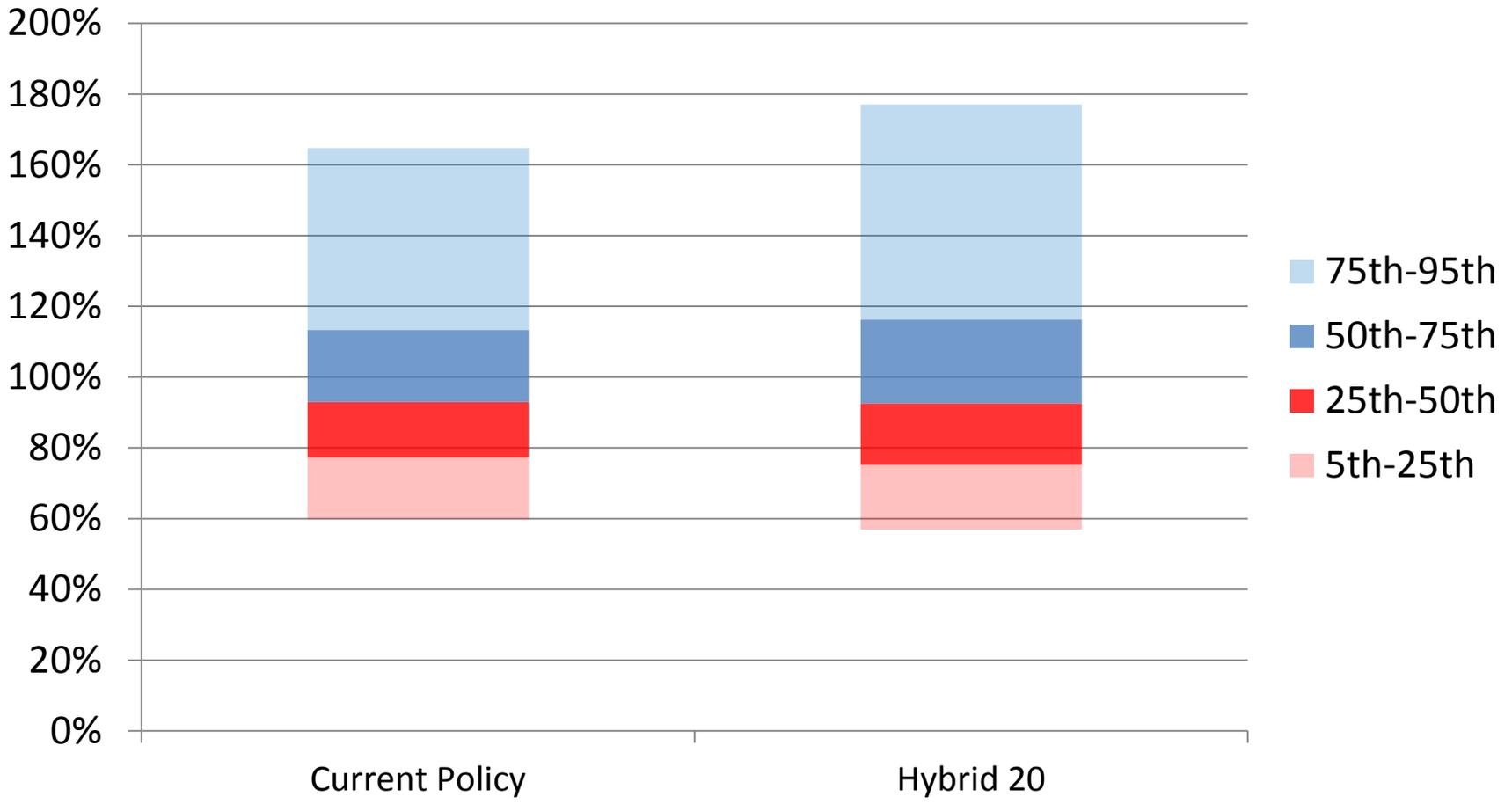
Annual Change in Contribution Rate for next 10 years



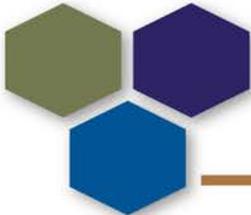
27 The above are illustrated portfolios based on risk/return characteristics of the target TMRS portfolio and the recent distribution of change in the contribution rate due to liability sources



Funded Ratio in Year + 20

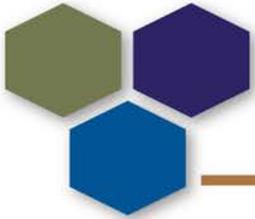


The above are illustrated portfolios based on risk/return characteristics of the target TMRS portfolio and the recent distribution of change in the contribution rate due to liability sources

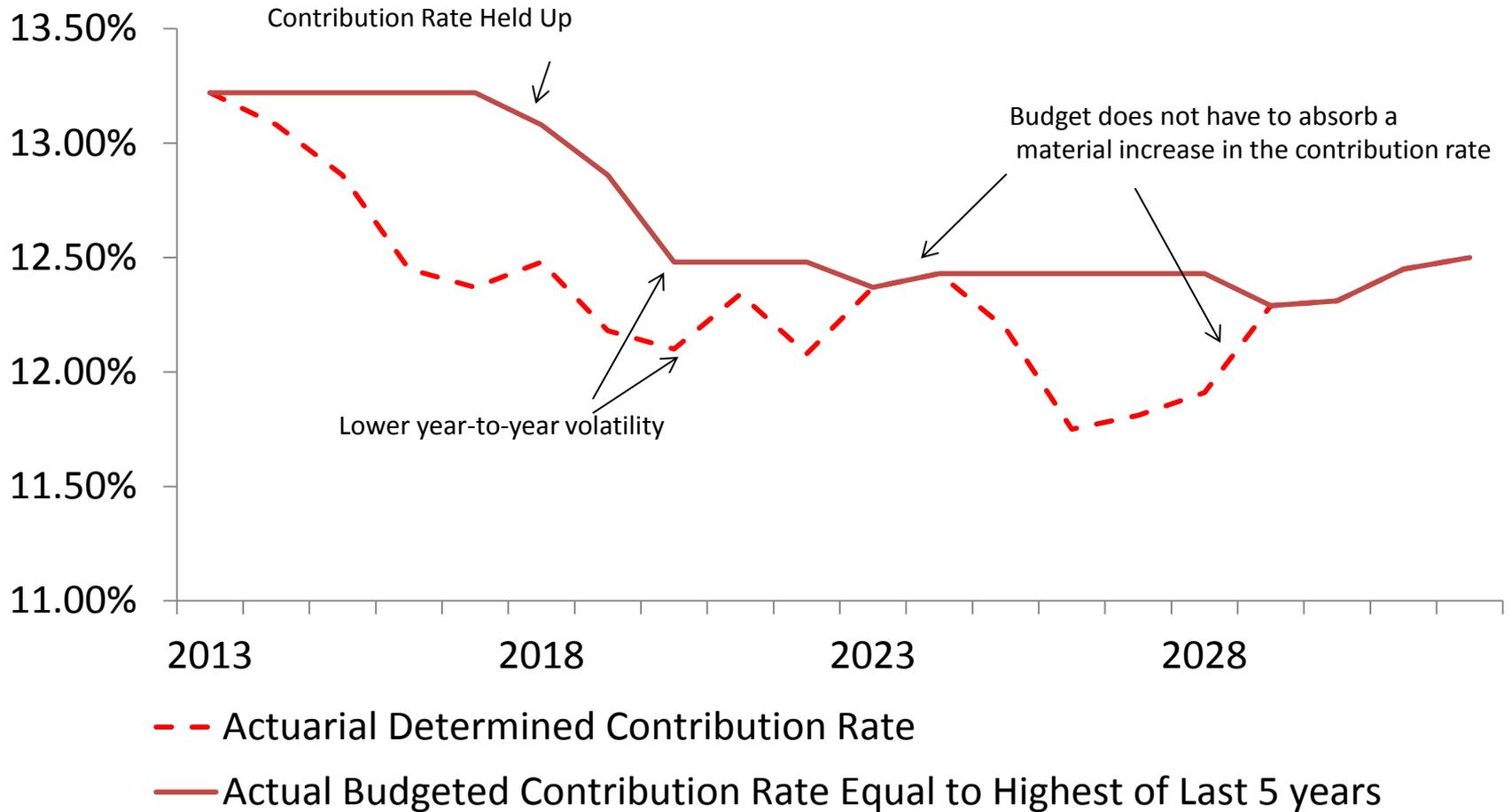


Other Example Contribution Rate Stabilization Techniques

- ◆ Longer amortization periods
 - ▶ Decreases benefit security
- ◆ +/- corridors: Rate stays the same until the actuarially determined rate reaches a certain level above or below, then the rate moves in that direction
 - ▶ + Corridors decrease benefit security and can impact intergenerational equity
 - ▶ Corridors have low volatility until hit, but can create substantial volatility when hit
- ◆ +/- limitations in a given year: rates can't go up or down more than X% in one year
 - ▶ + on this decreases benefit security
- ◆ Similar to current approach, but adopt a shorter look back period and always contribute the highest contribution rate determined during the period
 - Example, always contribute the highest rate from the last 5 valuations

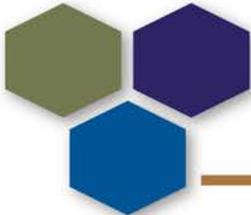


Another Illustrated Scenario

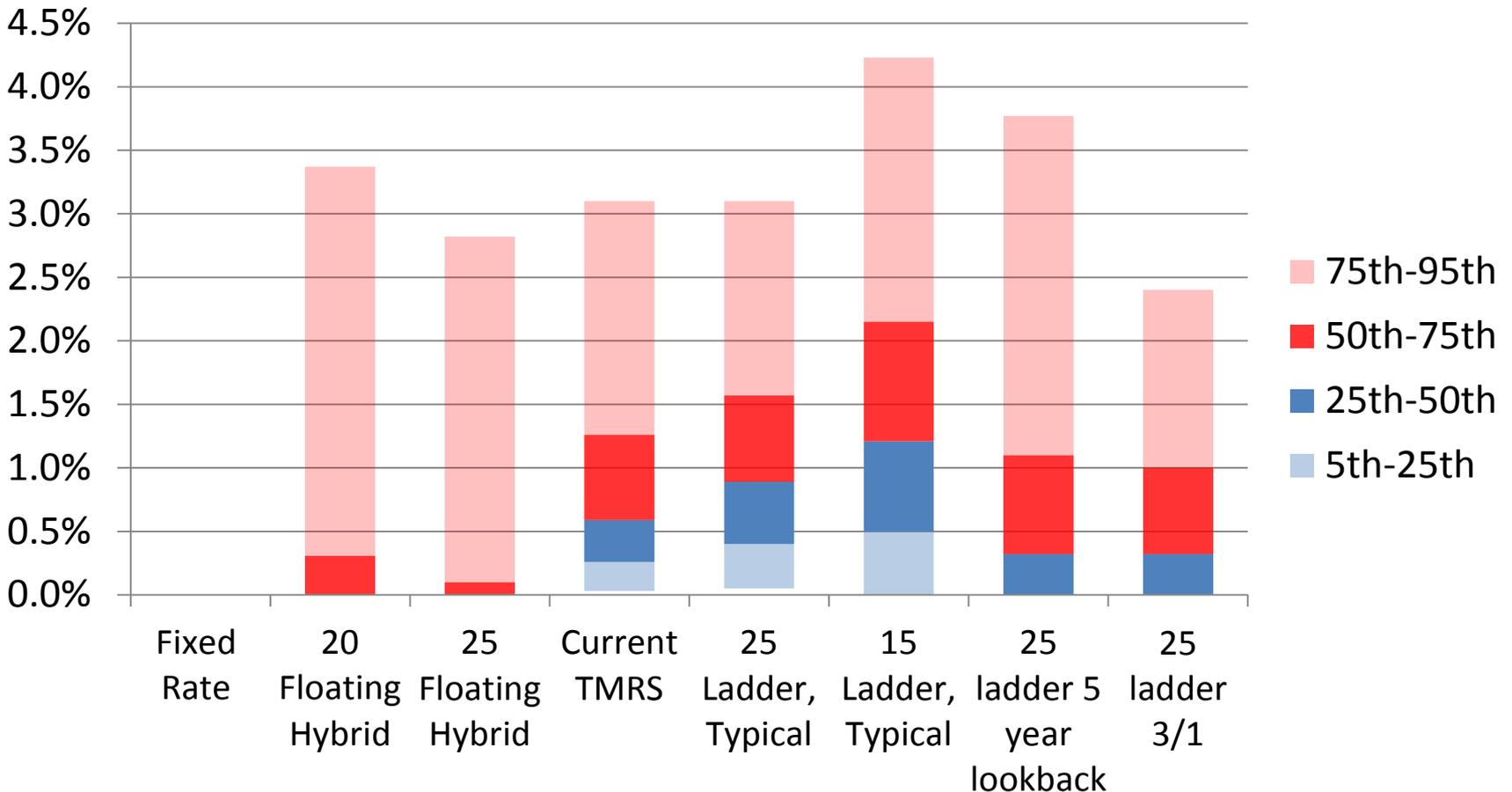


The above scenario is not a projection of expected results

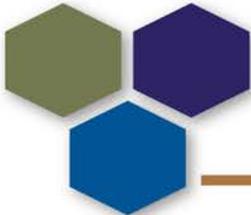
The year-to-year returns were randomly generated to illustrate the strategy



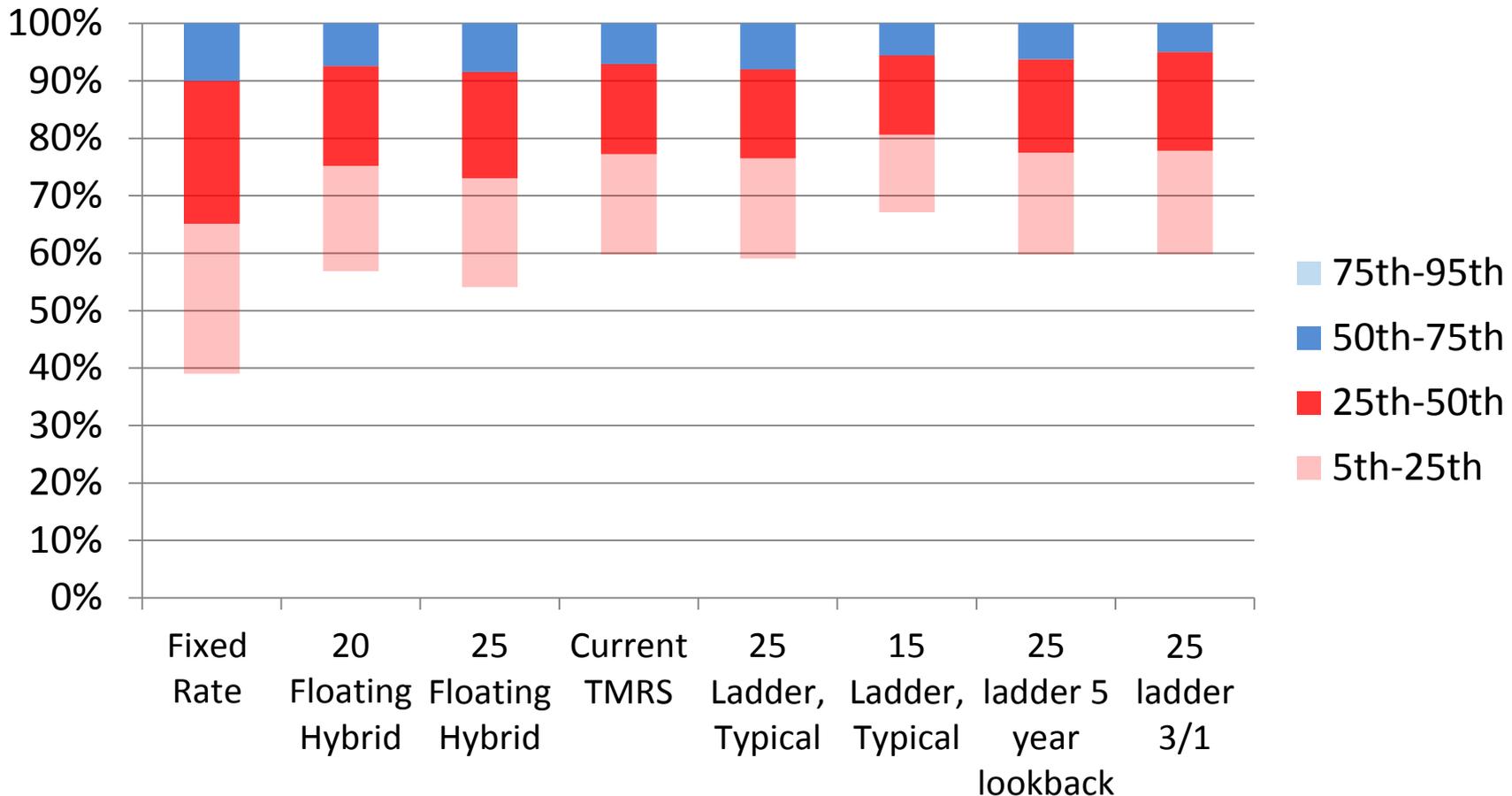
Annual Change in Contribution Rate for next 10 years



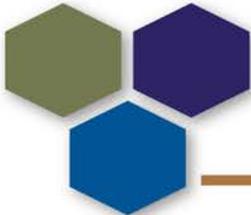
31 The above are illustrated portfolios based on risk/return characteristics of the target TMRS portfolio and the recent distribution of change in the contribution rate due to liability sources



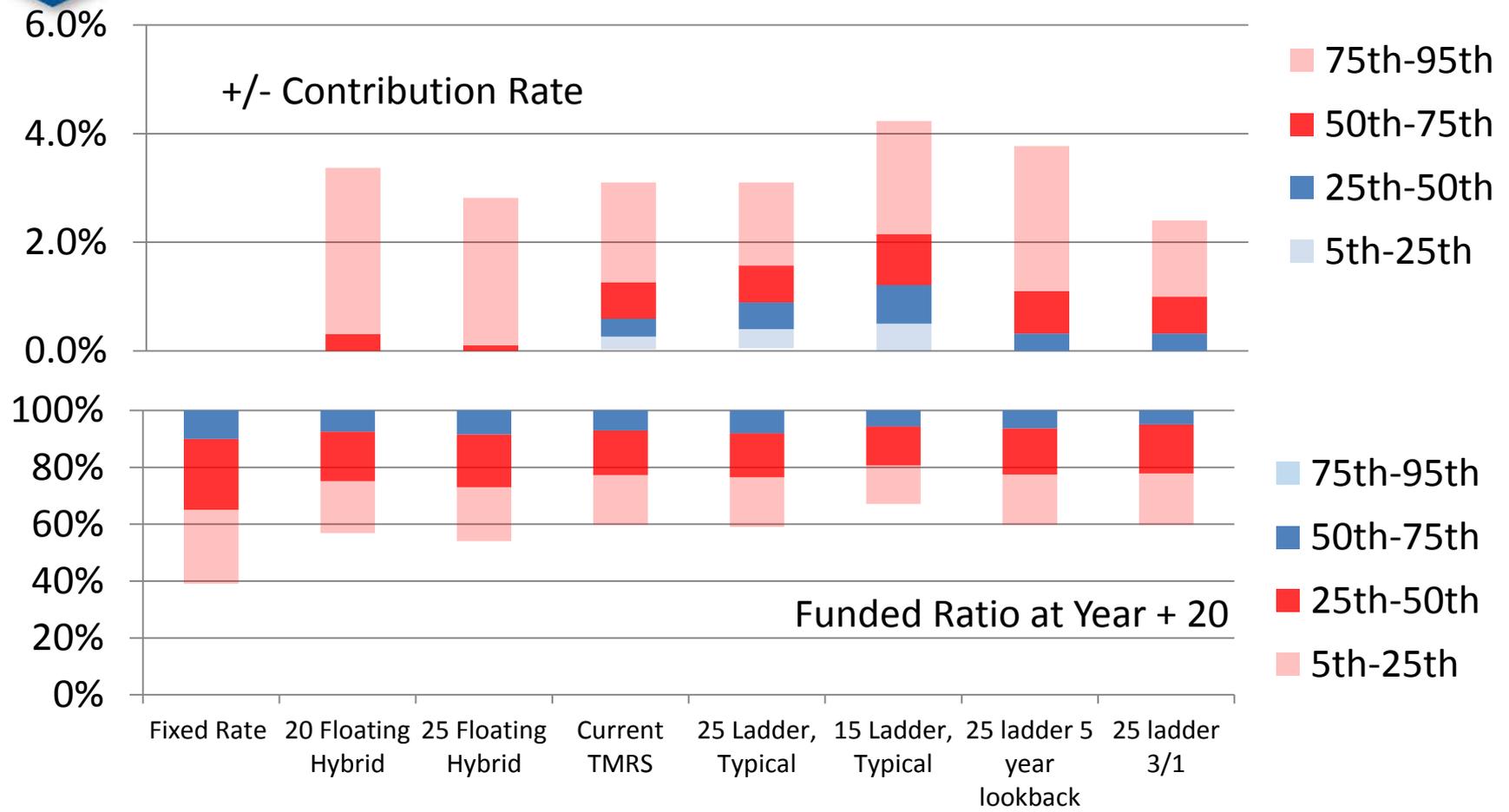
Funded Ratio in Year + 20



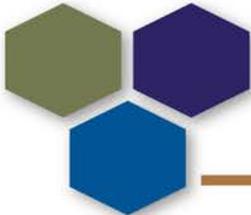
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Benefit/Cost Analysis

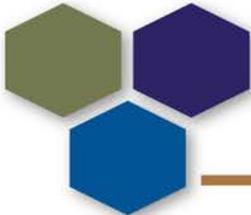


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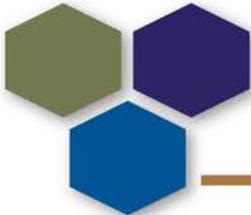
Surplus Management Techniques

- ◆ After the run up in the 90's followed by the lower market returns in the last decade, many Plans have realized that they would be in a better position today if “surpluses” from the 90's weren't spent on benefit enhancements and contribution decreases
- ◆ Individual employer plans can use their asset allocation to de-risk the Plan in times of surplus
- ◆ However, that is more difficult for a multiple employer System that has some plans that are “overfunded” and others that are “underfunded”
- ◆ Thus, the surplus management falls to the contribution strategies



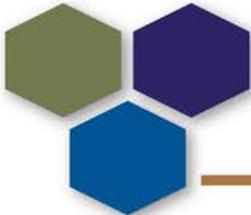
Surplus Management Techniques

- ◆ If a TMRS city has a surplus (UAAL less than zero), then its contribution requirement is decreased from the normal cost equal to a 25 year amortization of the current surplus
- ◆ There are 181 Plans in TMRS with a surplus, and 16 have eliminated their contribution requirement entirely
- ◆ While this is substantially better than, for example, allowing a City to offset its contribution by the entire surplus, this policy, by design, pushes a City's funded status back towards 100% and thus eliminating the surplus
- ◆ It also produces material annual contribution volatility
 - ▶ Higher asset balance will produce higher contribution volatility
 - ▶ With no UAAL or other bases to offset, there are limited tools to use to dampen volatility
- ◆ Several Plans have put policies in place to make the hurdle higher
 - ▶ For example, in the private sector and in Florida, the normal cost (new accruals) must always be contributed and no credit is given
 - ▶ In Utah, the credit does not begin until a Plan is 110% funded, basically acting like a reserve
- ◆ Our first choice would be the Florida policy, which would require the normal cost be contributed
 - ▶ Maximizes all three goals: Benefit security, Intergenerational Equity, and Contribution Stability
 - ▶ Can be done on a prospective basis so that current Cities with the surplus would not have an immediate increase in their rates



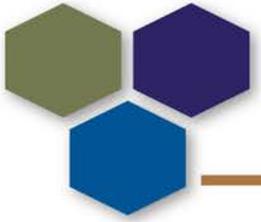
Sample Combination of Techniques

Funding Ratio	Funding Policy
<100%	Hybrid 20: Calculated Contribution equals the EAN normal cost plus a 20 year amortization of the UAAL Actual Contribution is the greater of the Calculated Contribution and last year's Actual Contribution
>100%	Actual Contribution equals the Normal Cost (Service Cost), but not allowed to decrease more than 1% per year



Next Steps

- ◆ Hopefully, the Board now has a better understanding of some available options for setting contribution policy
- ◆ GRS requests further guidance from the Board if it would like to see any further analysis, what types of structures, and the timeline to provide this information
- ◆ All strategies can be implemented prospectively, meaning causing no direct increase the first year due to a change in policy



Q&A
