Via Electronic Mail

March 9, 2022

Board of Trustees
Sacramento County Employees' Retirement System
980 9th Street, Suite 1900
Sacramento, California 95814

Members of the Board:

Cheiron is pleased to present the results of our actuarial audit of the Actuarial Valuation Report dated June 30, 2021 of the Sacramento County Employees' Retirement System (SCERS) and a review of the Actuarial Experience Study covering the period from July 1, 2016 to June 30, 2019, performed by Segal Consulting (Segal). We would like to thank Segal for providing us with information and explanations that facilitated the actuarial audit process and ensured that our findings are accurate and benefit SCERS.

Our report is being provided via an interactive online presentation, which can be found here:
https://presentation.cheiron.us/presentation/view/SCERSActuarialAudit?token=MVKD

In preparing our audit and review, we relied on information (some oral and some written) supplied by SCERS and Segal. This information includes, but is not limited to, actuarial assumptions and methods adopted by SCERS, the plan provisions, employee data, and financial information. All data, assumptions, methods, and provisions are the same as those outlined in Segal's June 30, 2021 Actuarial Valuation Report. We performed an informal examination of the obvious characteristics of the data for reasonableness in accordance with Actuarial Standard of Practice No. 23.

We hereby certify that, to the best of our knowledge, this report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

This report was prepared exclusively for the Sacramento County Employees' Retirement System for the purpose described herein. This report is not intended to benefit any third party, and Cheiron assumes no duty or liability to any such party.

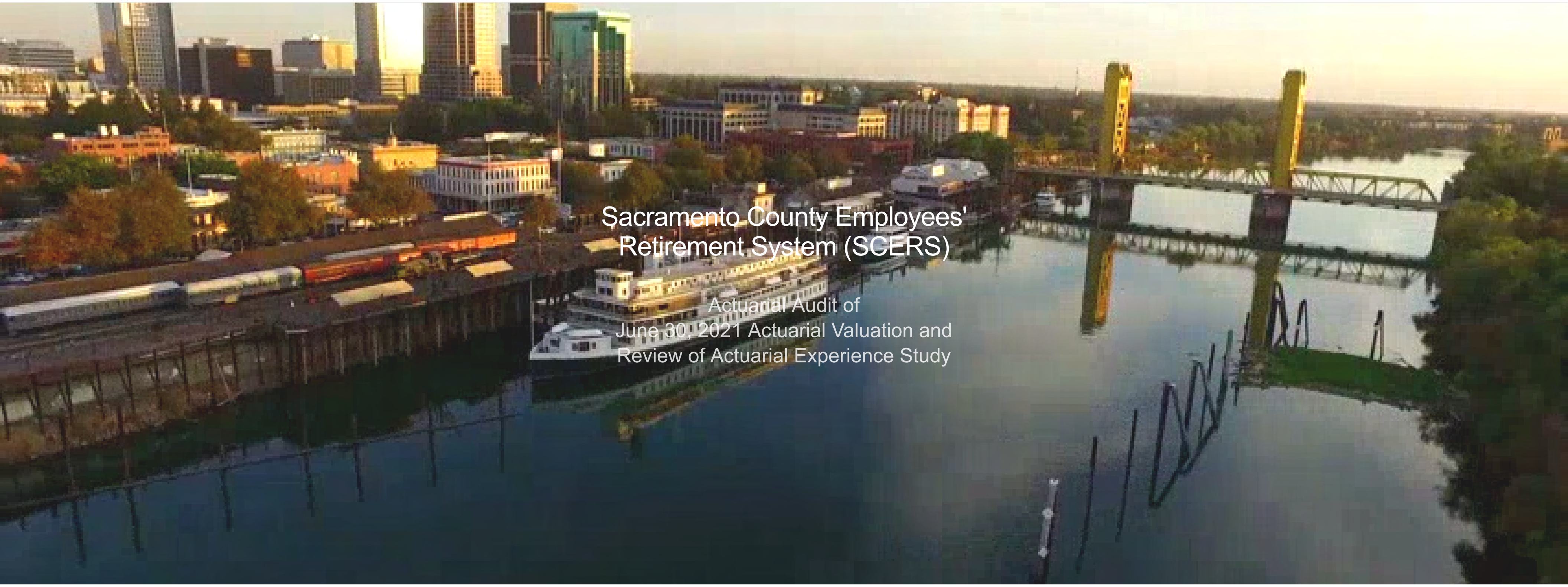
Sincerely,
Cheiron

Graham A. Schmidt, ASA, FCA, MAAA, EA
Consulting Actuary

Anne D. Harper, FSA, MAAA, EA
Principal Consulting Actuary

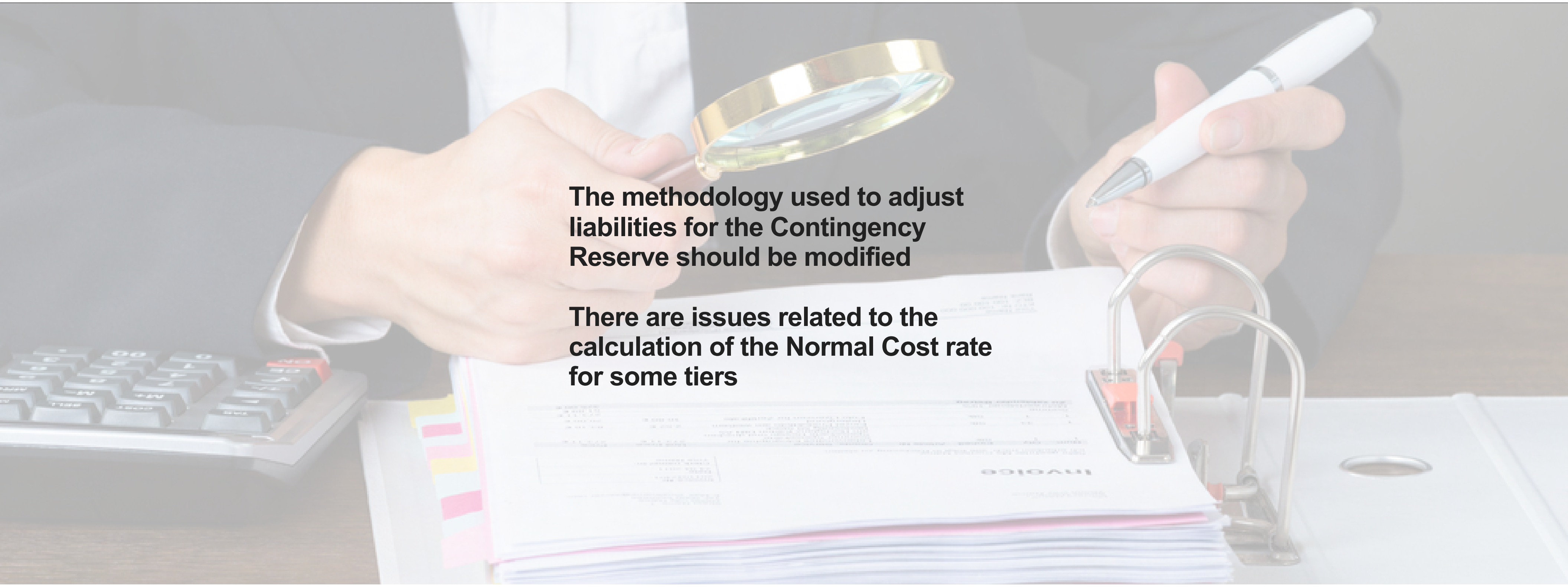
Celebrating 20 years

Welcome to Cheiron's presentation of the results of our actuarial audit for SCERS. Many of the exhibits in this presentation are interactive; clicking within the page can reveal additional details. Clicking on any underlined links within the presentation will open a website on a new tab in your browser. You may also jump to different pages or use the Table of Contents included in the navigation bar above.



Cheiron has performed a complete independent replication of the June 30, 2021 Actuarial Valuation and Review completed by Segal, including a review of the actuarial assumptions and methods. The main conclusions are:

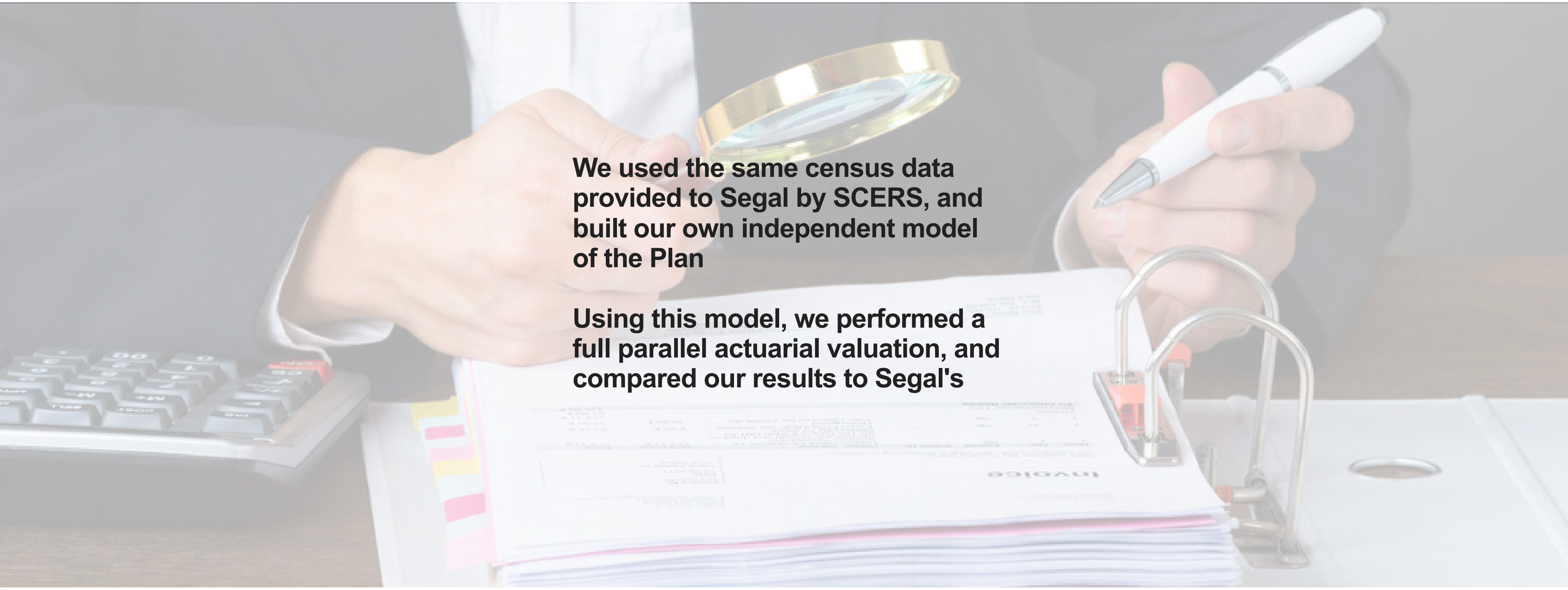
Our review did result in two primary findings.



The methodology used to adjust liabilities for the Contingency Reserve should be modified

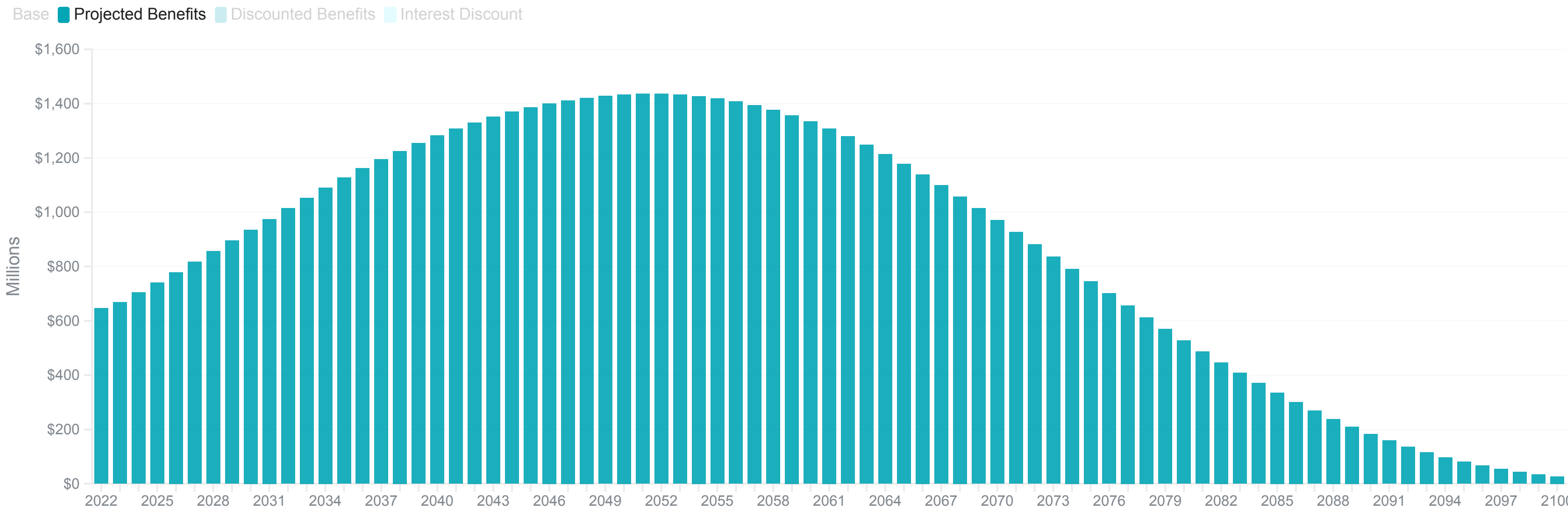
There are issues related to the calculation of the Normal Cost rate for some tiers

We first summarize the steps in our review of the results of the actuarial valuation.



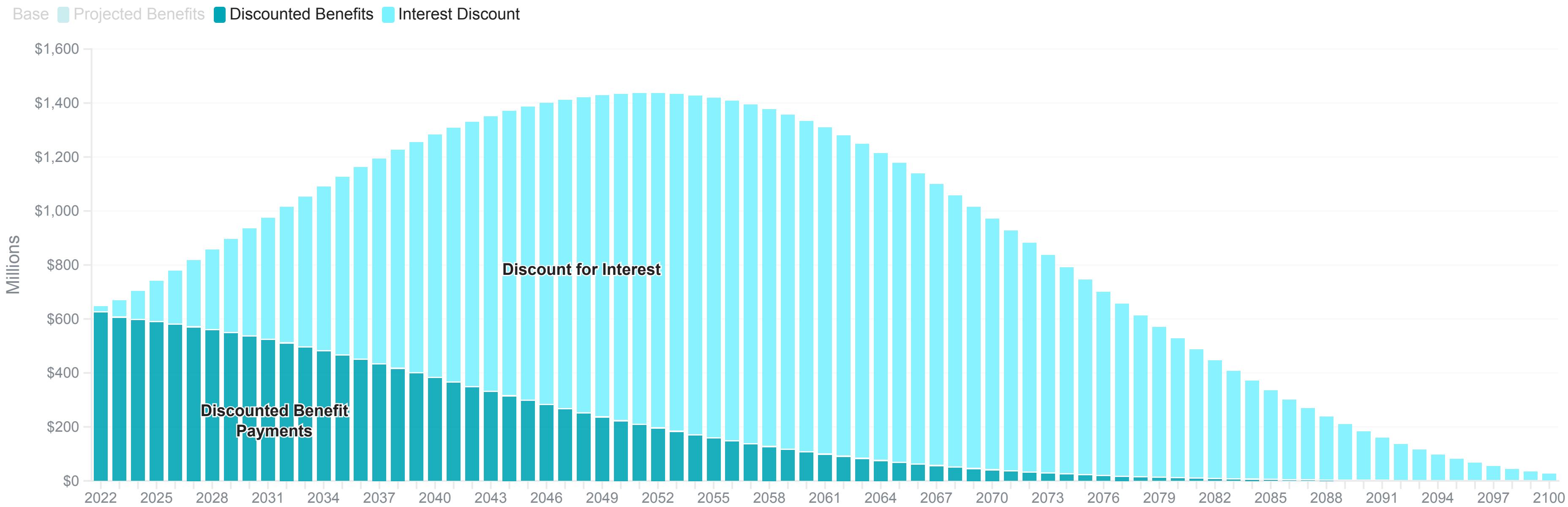
The actuarial valuation begins with the Actuary building a model to project the benefits expected to be paid to the current members (active and retired).

Projected Benefit Payments



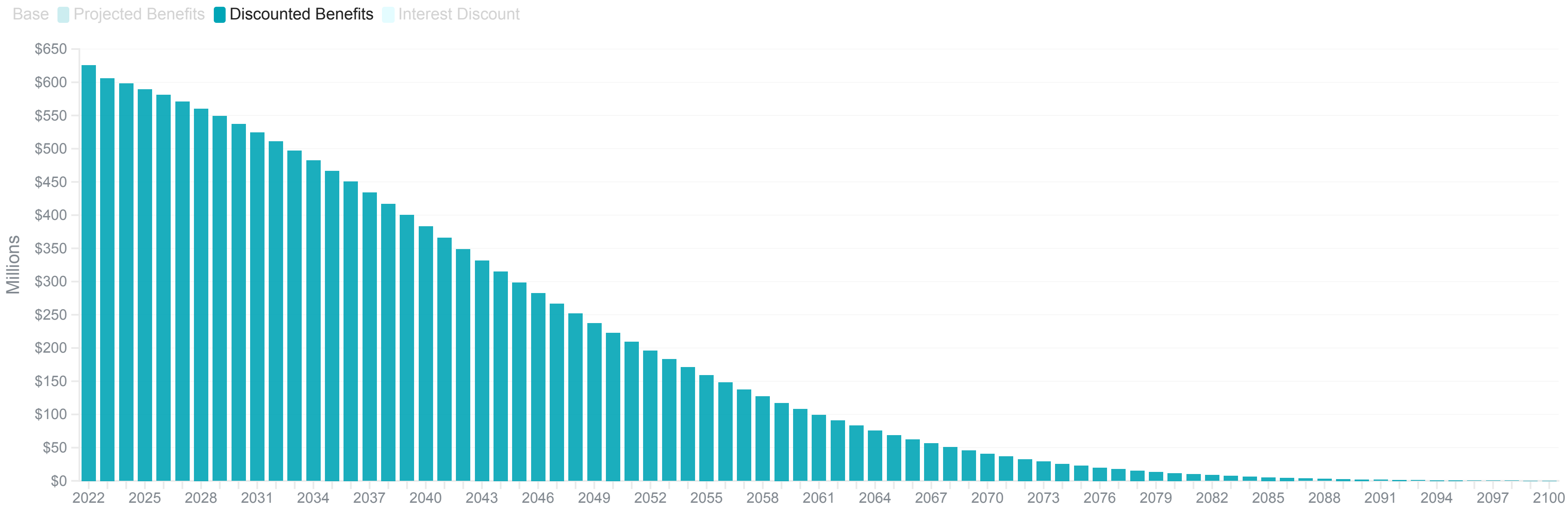
Next, an **interest discount** is applied based on the assumed rate of return on assets (6.75% for SCERS), which reduces the value of future benefits because of the **time value of money**.

Projected Benefit Payments



Reducing by the interest discount, leaves us with the **value in today's dollars**.

Projected Benefit Payments



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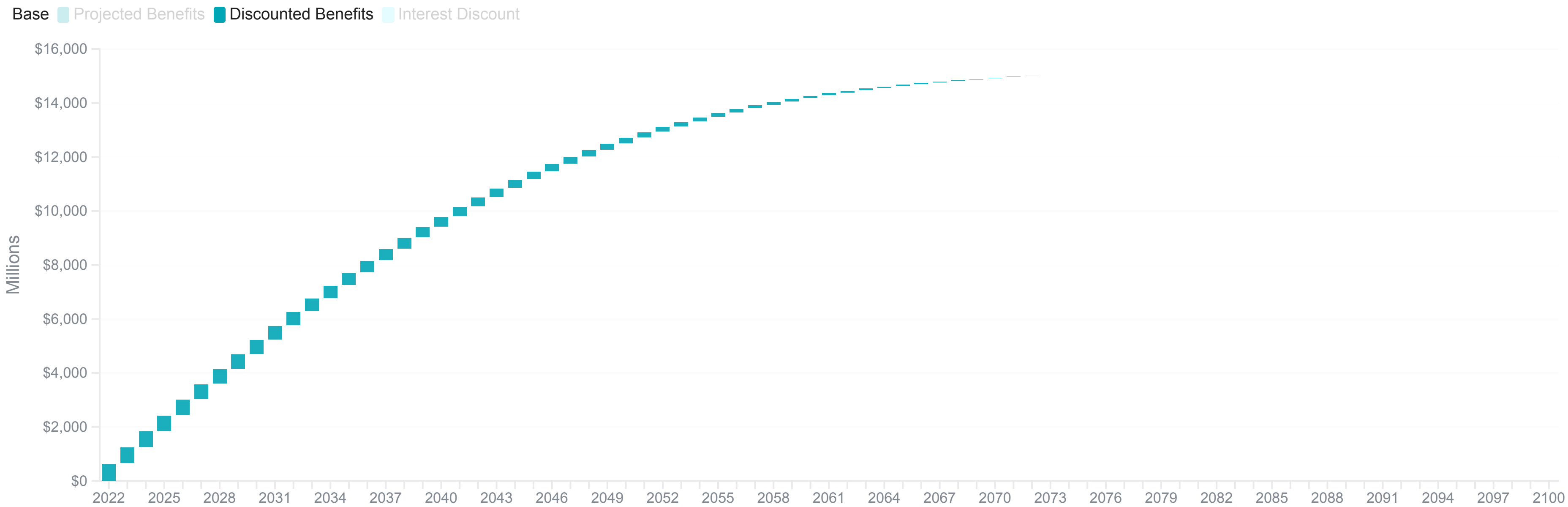
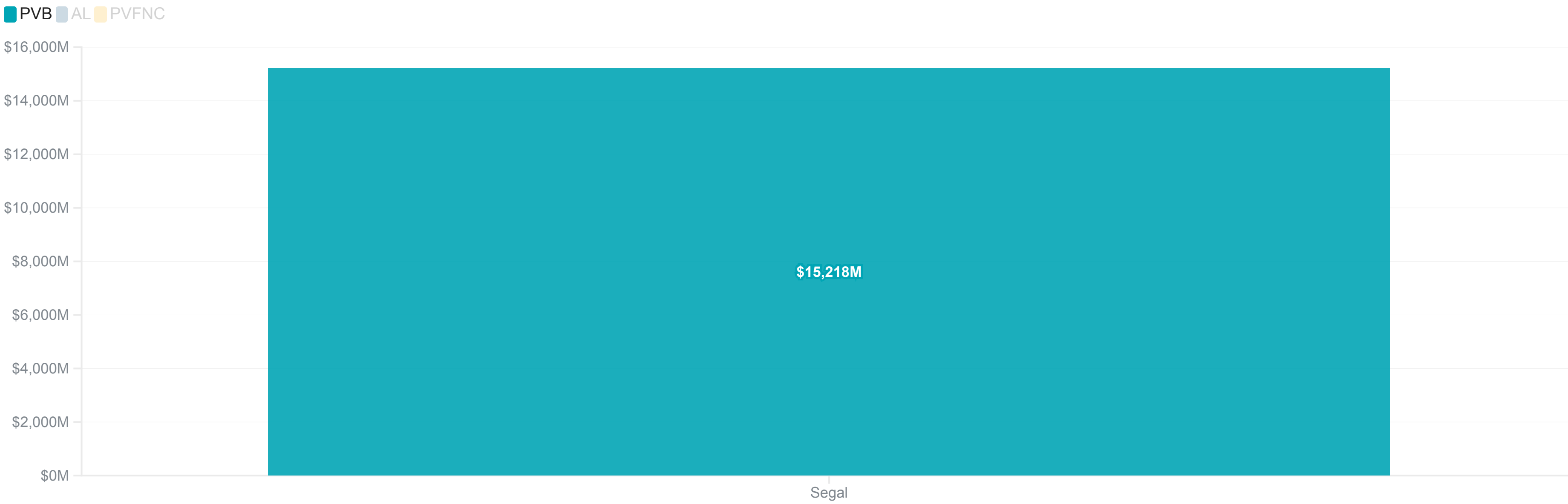
We add them together...

Projected Benefit Payments



..and express as a single sum, the **Present Value of Benefits (PVB)**. As of June 30, 2021, Segal calculated this amount to be $15.2 billion (prior to adjustment for special reserves).

Segal

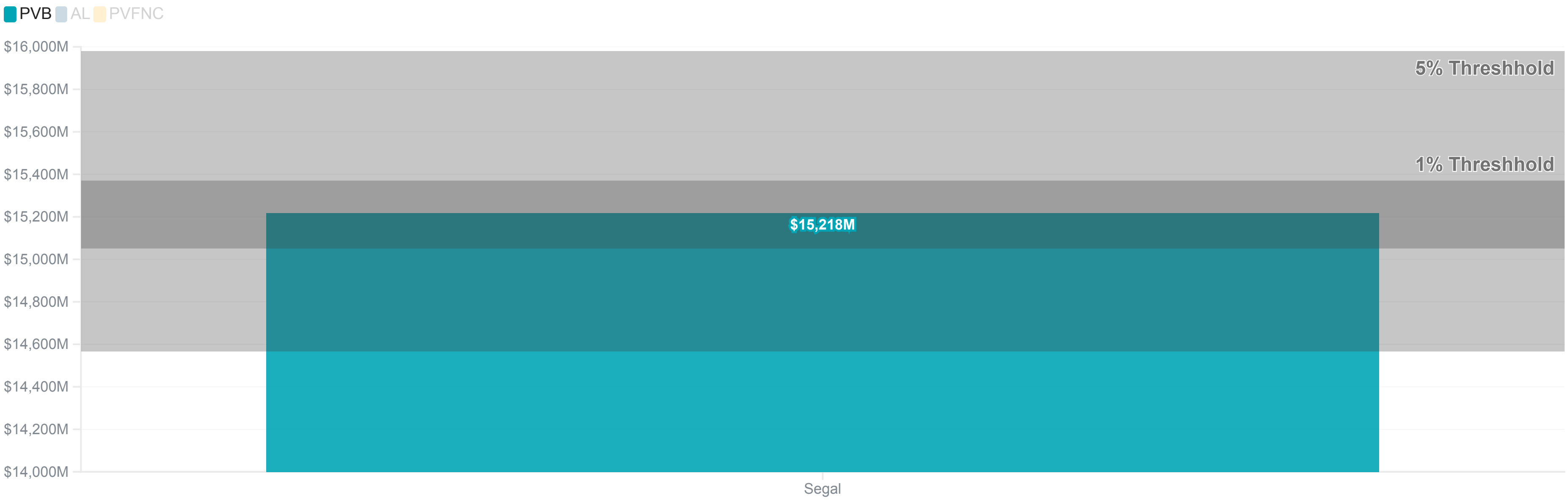


Generally for an actuarial audit, we target a 5% threshhold for differences. If our comparative results are outside of this margin, further research may be warranted.

Segal

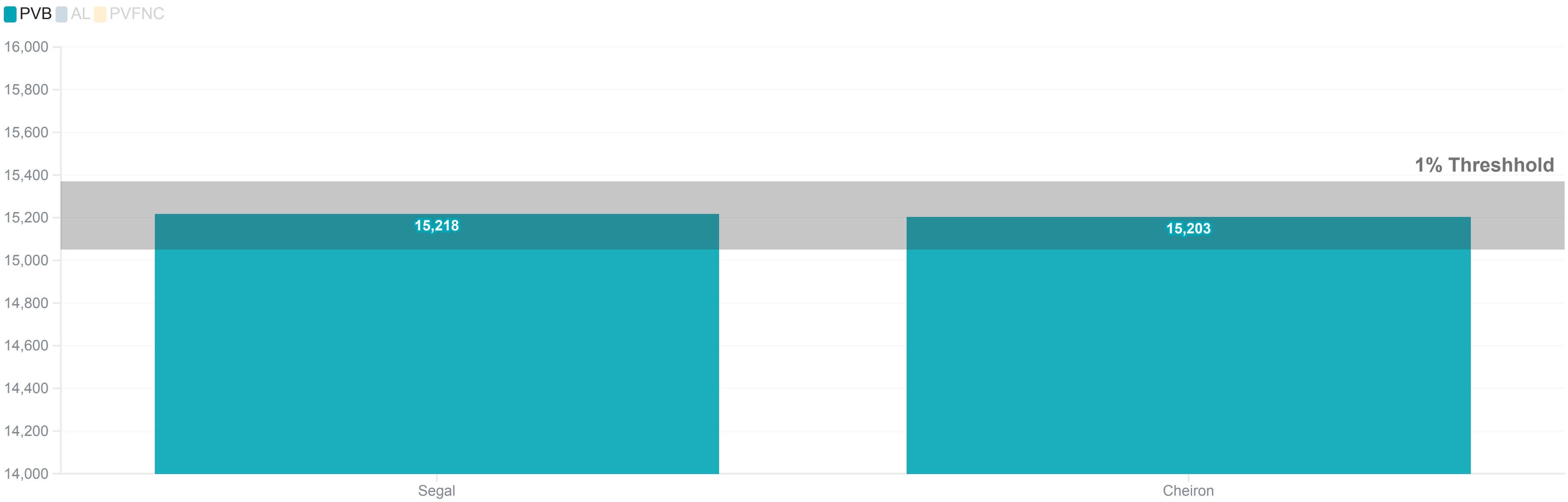
However, for some measures - such as the overall PV - we target a much tighter margin, in this case 1%. This ensures that the overall funding requirements and funded status are being measured appropriately, given the assumptions and methods being used.

Segal



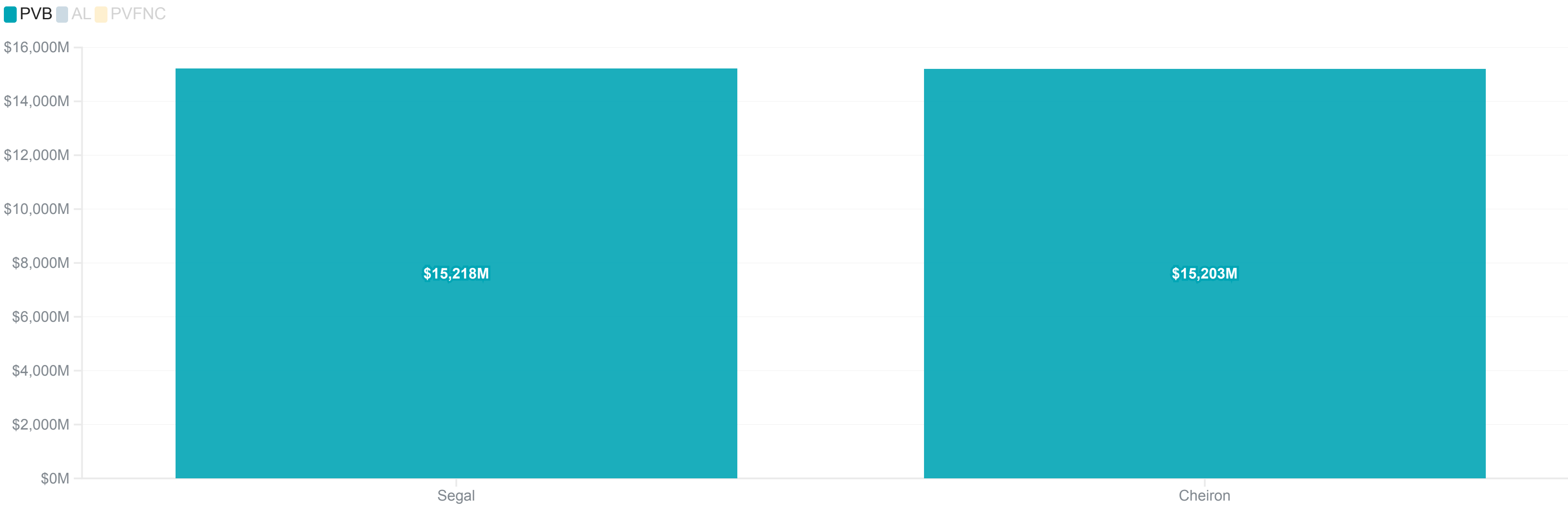
After building our own independent model of the benefits, we compared our results to Segal's. The key PVB measure is well within the 1% - within 0.1% in this case - therefore we are confident that the overall benefits are being modeled by Segal accurately.

All



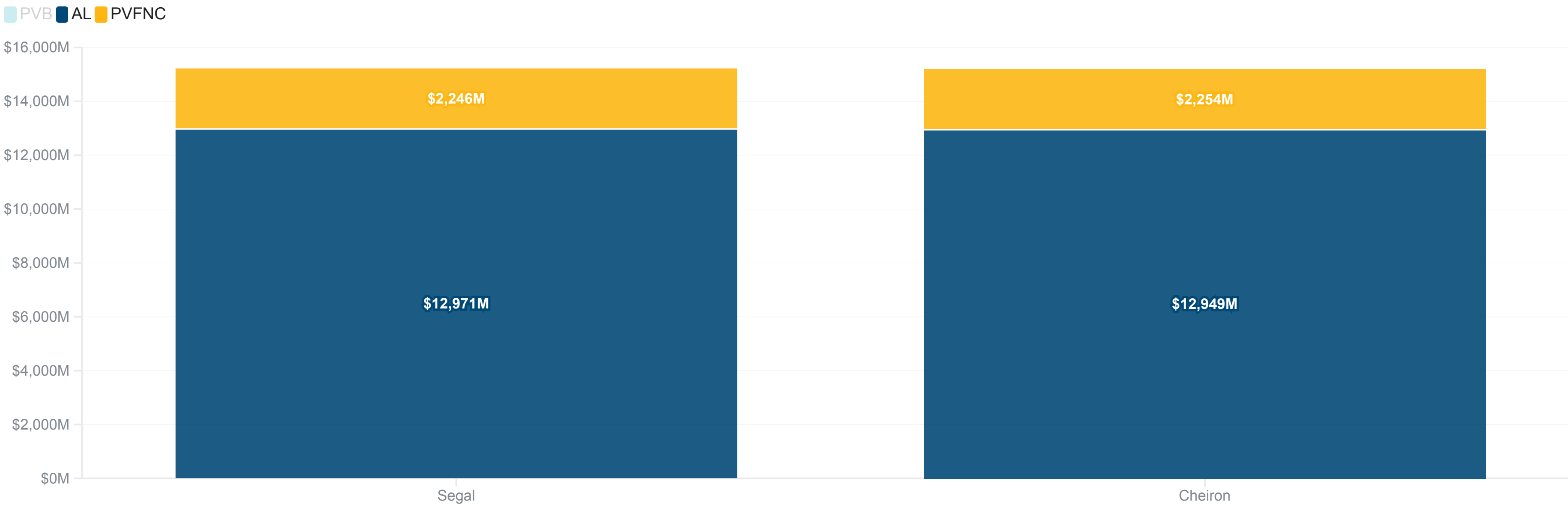
In addition to comparing the Present Value of Benefits

All



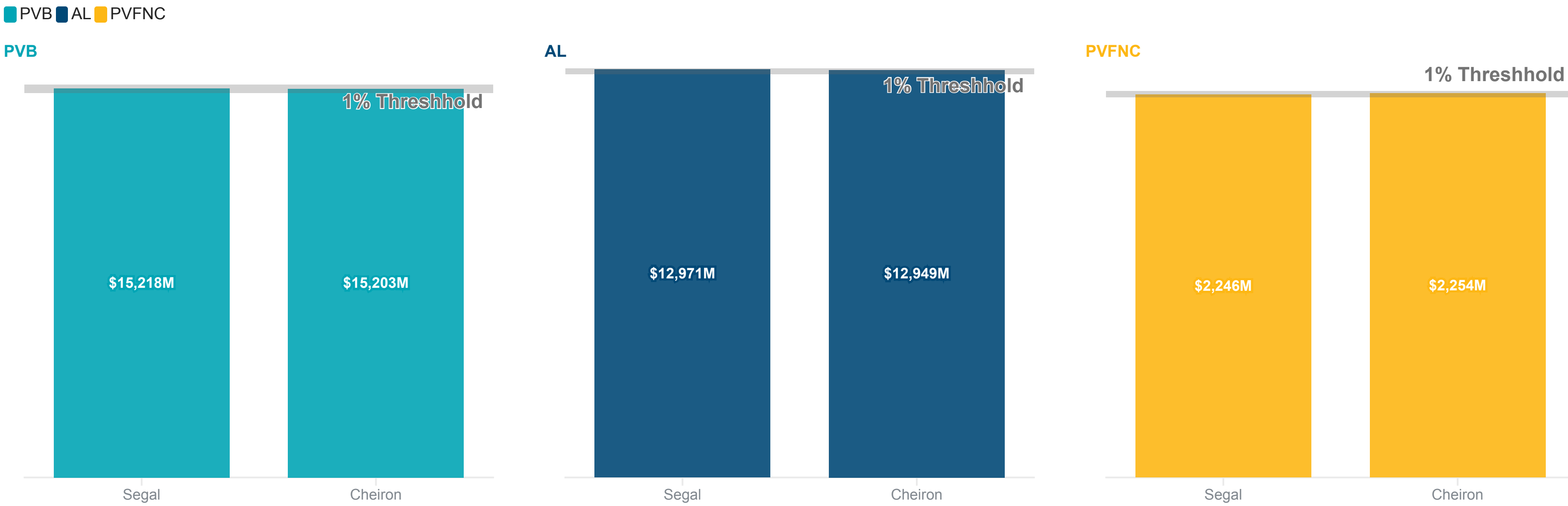
We also calculate and compare two other measures: the **Actuarial Liability (AL)** and the **Present Value of Future Normal Costs (PVFNC)**. The AL represents the cost allocated to the benefits earned based on prior service. The PVFNC is the value of benefits expected to be paid, but yet to be earned by the active members.

All

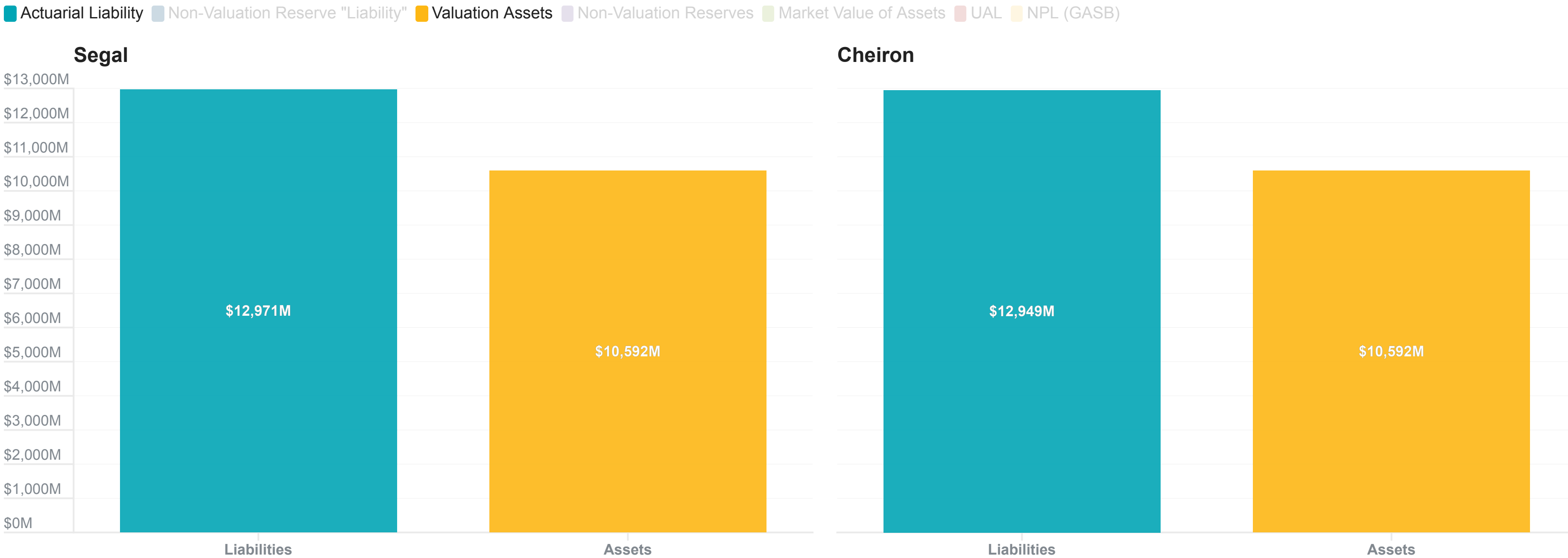


All measures fall well within our 1% target margin.

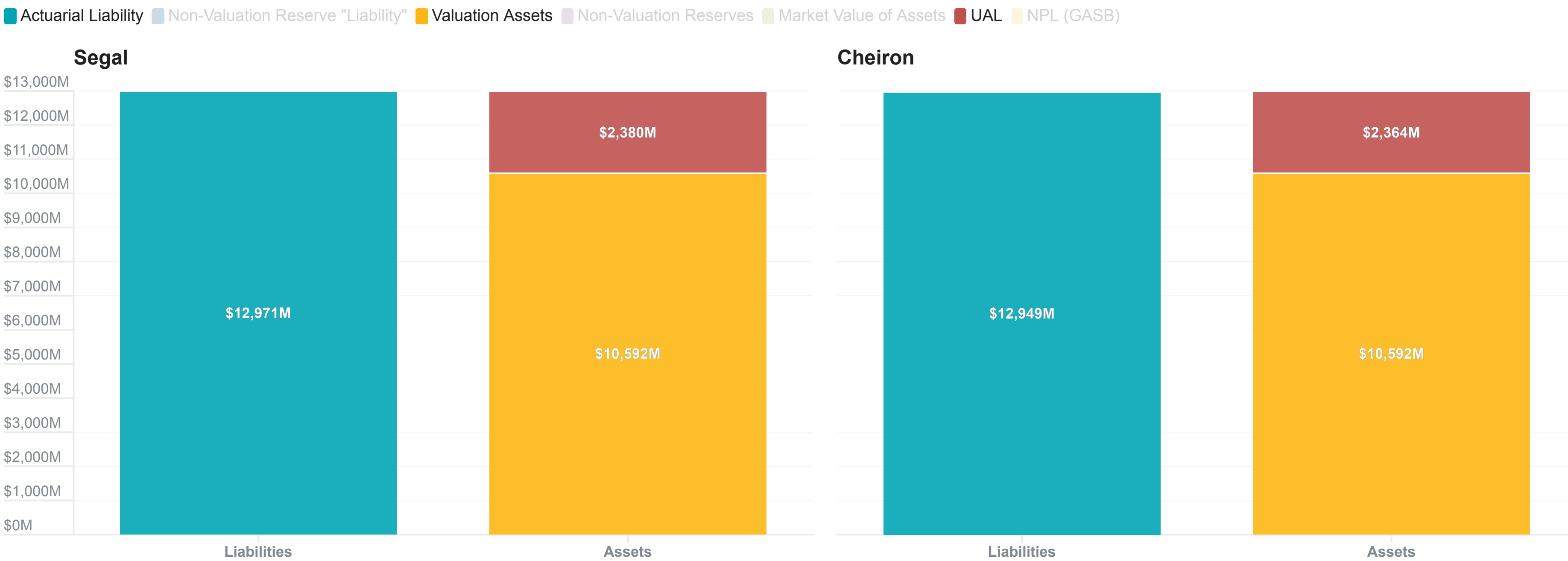
All



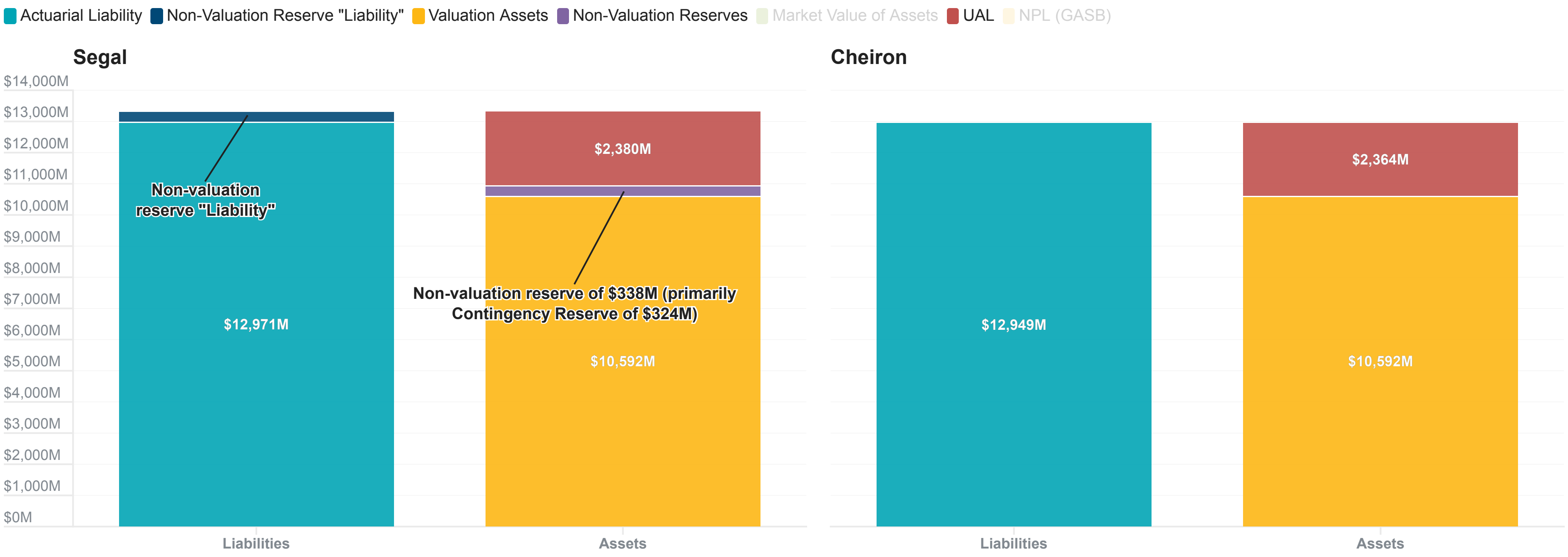
We next turn to a comparison of the funded status. For funding purposes, the liabilities are compared to the **Valuation Assets**, or the *actuarially-smoothed* value of the assets, minus any non-valuation reserves.



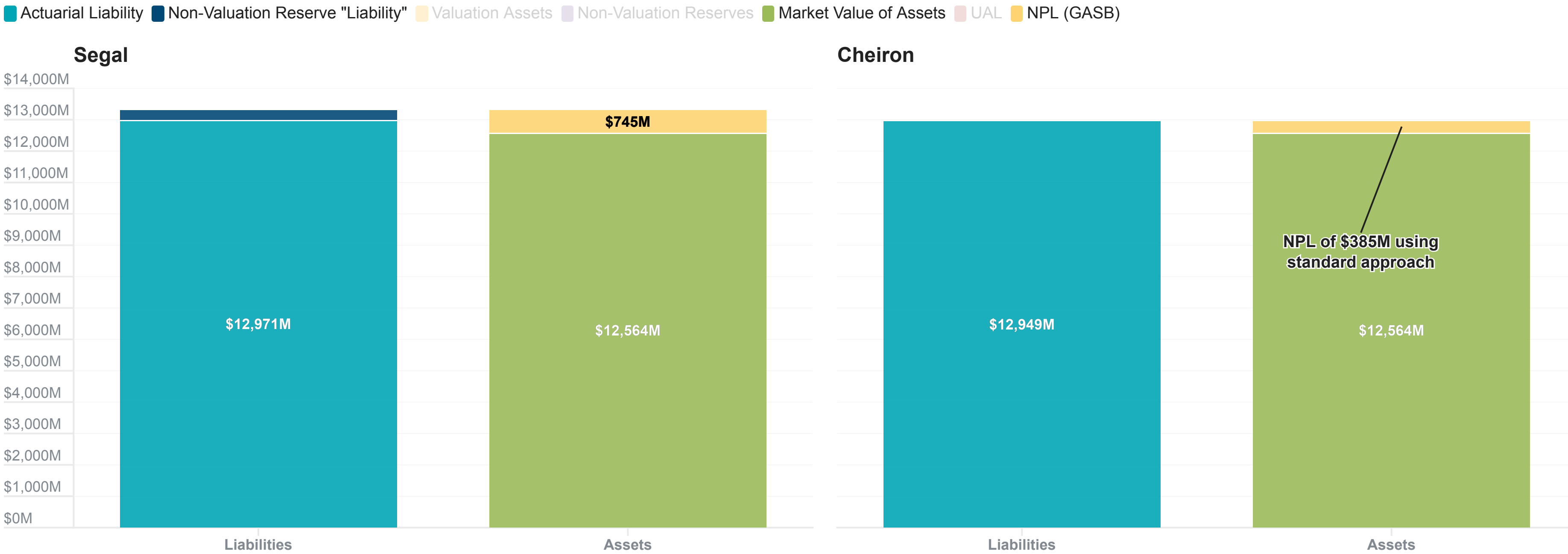
The difference between these numbers is the **Unfunded Actuarial Liability (UAL).** Our computed value is very close to Segal's: within $16M. However, Segal treats the non-valuation reserves in an unusual way, which results in our first audit finding.



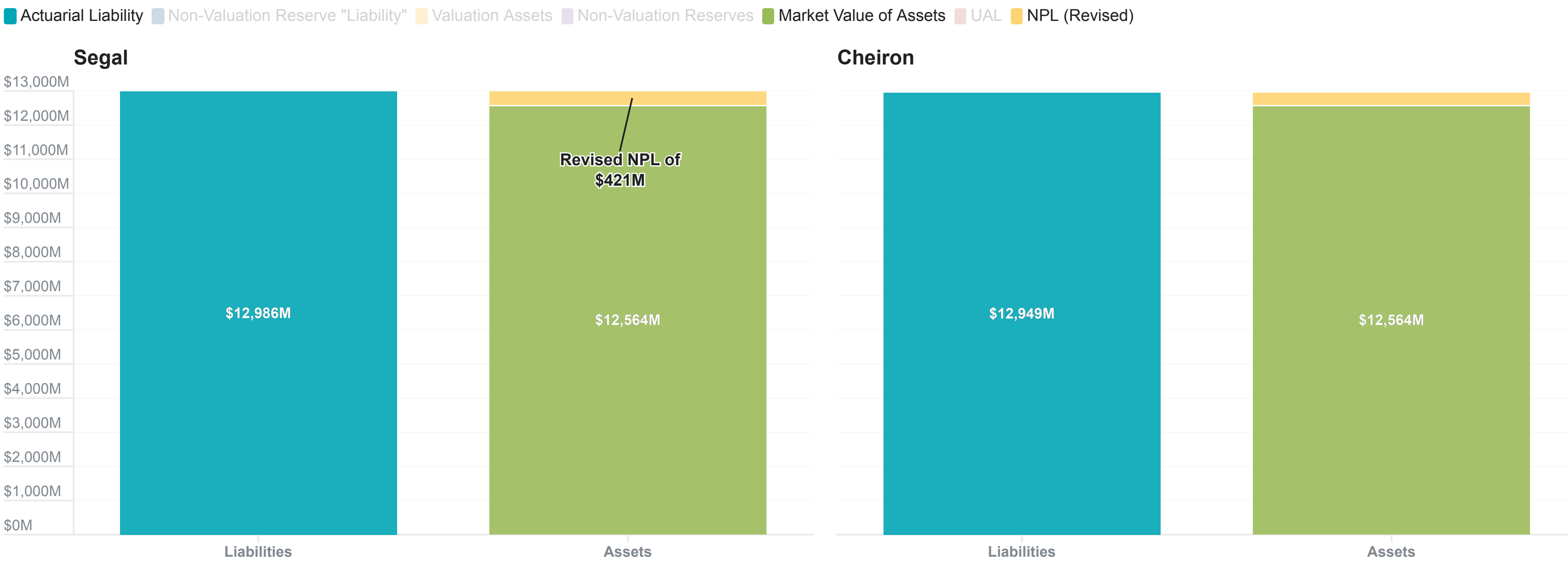
Typically for 1937 Act plans (and other plans) with **non-valuation reserves** - in particular a **contingency reserve** like that of SCERS - these reserves are ***deducted*** from the assets before comparing to the liabilities. However, in the current (and prior) valuation reports, Segal included the non-valuation reserves in the asset value, and ***added*** an equivalent "liability" to the AL. This treatment results in no change in the UAL, since the same amount is added to both the assets and liabilities.



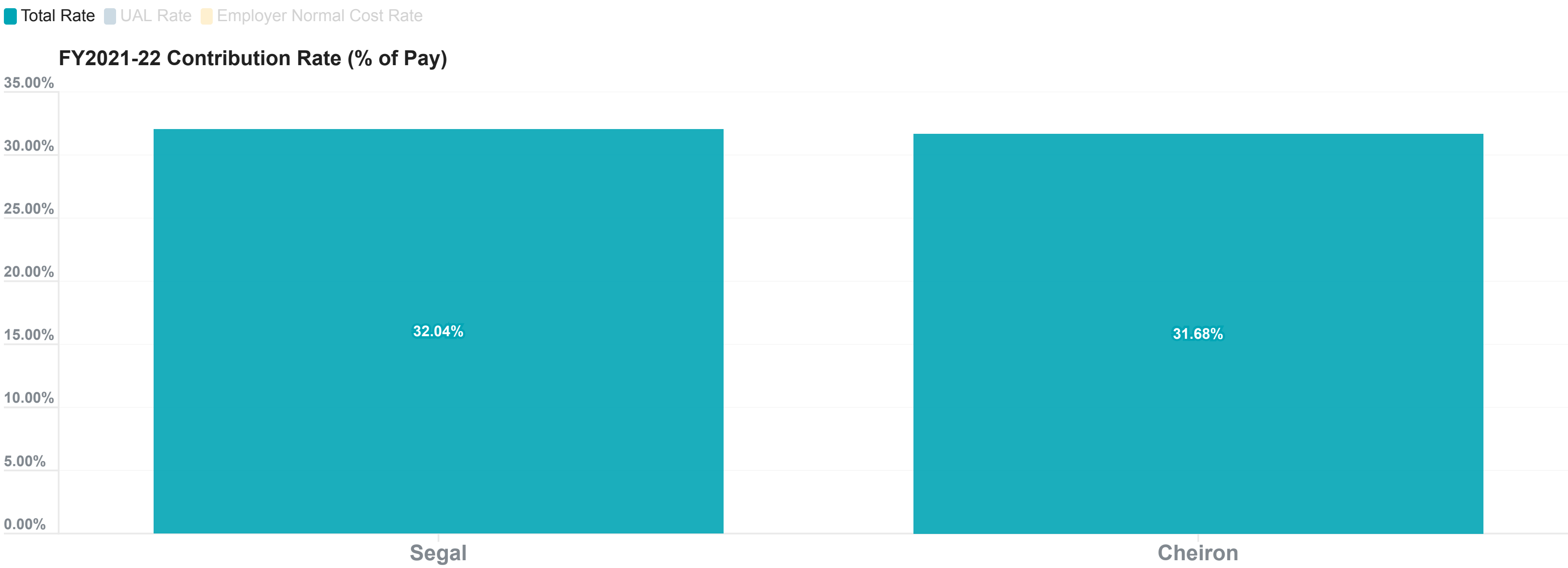
However, it does make a difference in the calculation of the unfunded liability that is used for government accounting (**GASB**) purposes - technically known as the **Net Pension Liability (NPL)**. GASB requires the use of the **market value of assets,** and all reserves must be included (unless they can only be used to provide specific non-valuation benefits). Here Segal's different approach *does* yield a significantly different result, as their NPL is higher by $360M (the value of the non-valuation reserves), or almost 50%.



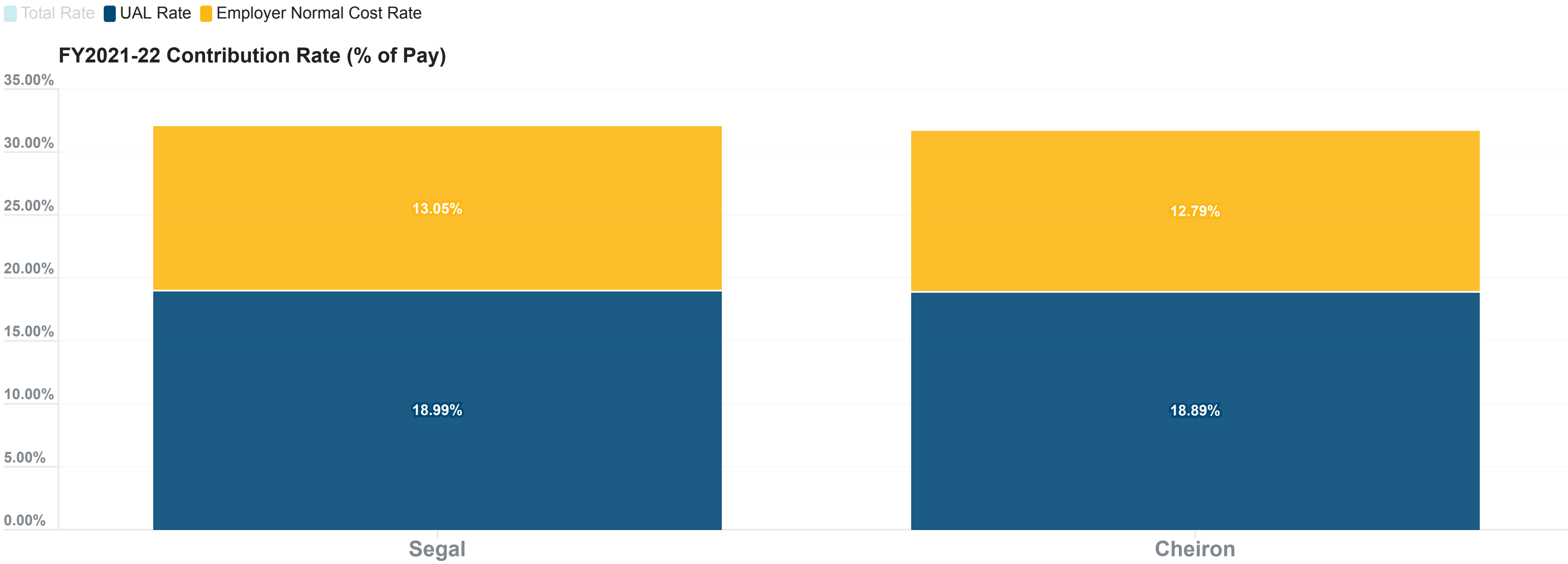
We notified Staff and Segal of this issue. It is our understanding that Segal confirmed that the methodology should be revised, and is in the process of reissuing the GASB 67 report using the standard approach.



We next turn to the **Actuarially Determined Contributions (the ADC)**. Based on the results discussed earlier, an employer contribution rate is calculated and compared. Again, the results are very close, within 0.4% of pay, which works out to a 1.1% relative difference.

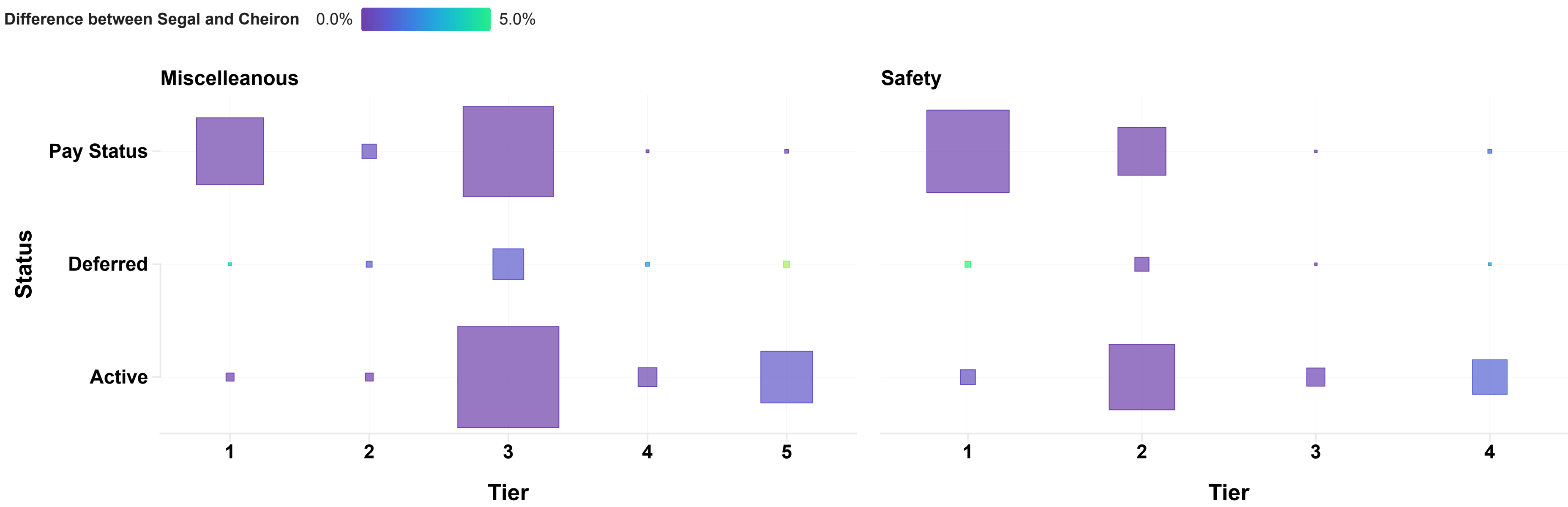


The overall employer rate is made up of two pieces: the employer's share of the **Normal Cost** (the cost assigned to this year's service) and the payment to **amortize the UAL** according to the Plan's funding policy. Both measures are also close (within 2%).

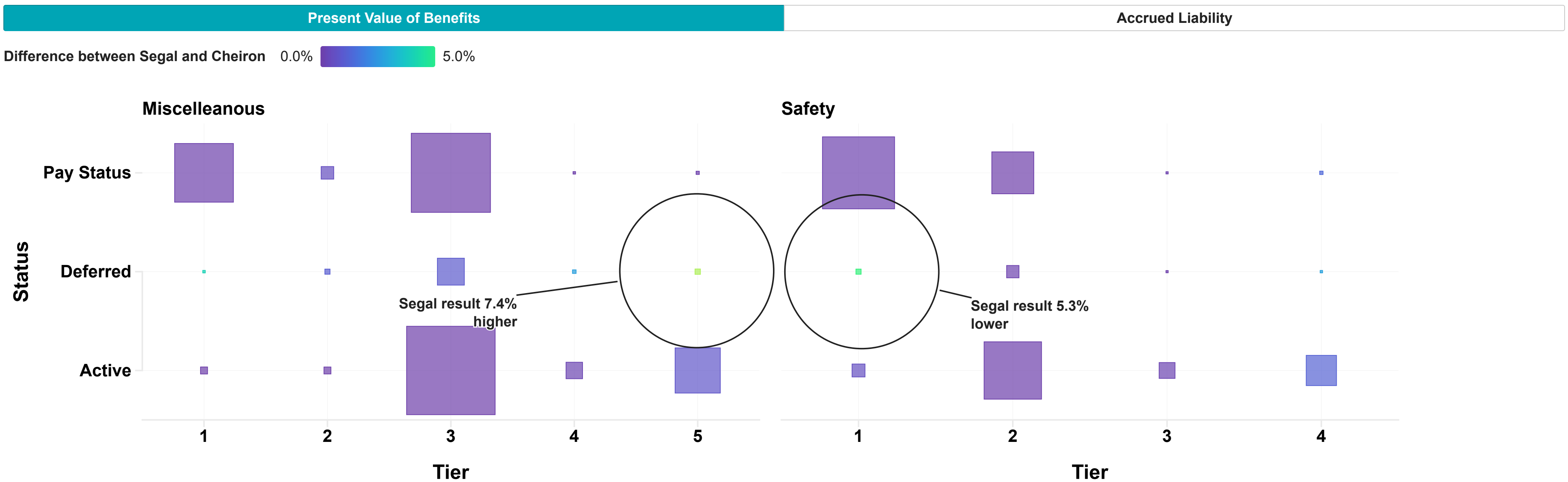


Within the valuation report Segal also breaks down the various liabilities by **Class**, **Tier**, and **Status**. We compare our results for each subgroup, using the 5% threshold for identifying areas where further research may be warranted. In the chart below, the size of the square correlates to the size of the liability, while the percentile differences between Cheiron's results and Segal's are indicated by color.

Present Value of Benefits | Accrued Liability

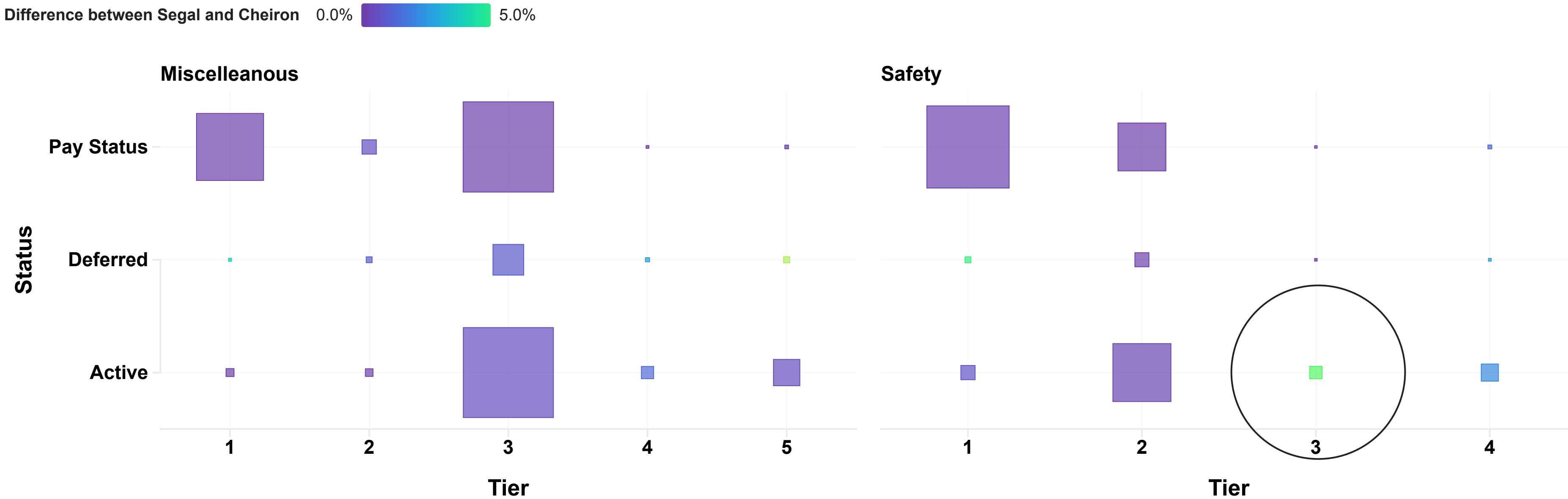


We note that there are only two small subgroups where the PVB comparison shows a difference greater than 5%: among the General Tier 5 and Safety Tier 1 Deferred Vested members. However, these are very small groups compared to the overall Plan: the net difference is less than $0.4M (out of an overall PVB of over $15B). As these differences have no material impact on the funding status or the contributions for any employers or members, we have no concerns with these discrepancies.

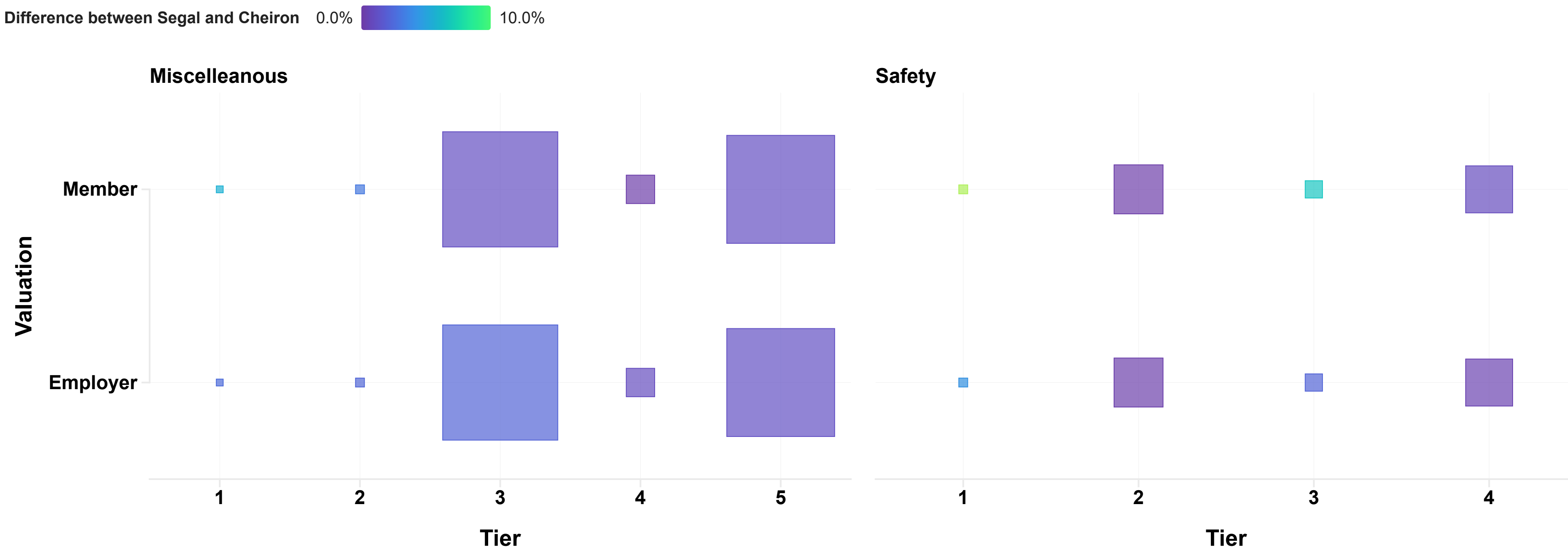


When we switch to a comparison of the AL, one additional subgroup falls outside the 5% threshold: Safety Tier 3 actives. However, as we will show on the next exhibit, our calculated contribution rate for this group is sufficiently close (within 2.3%) and again the impact on the overall funding status is minimal (a difference of less than $3.3M).

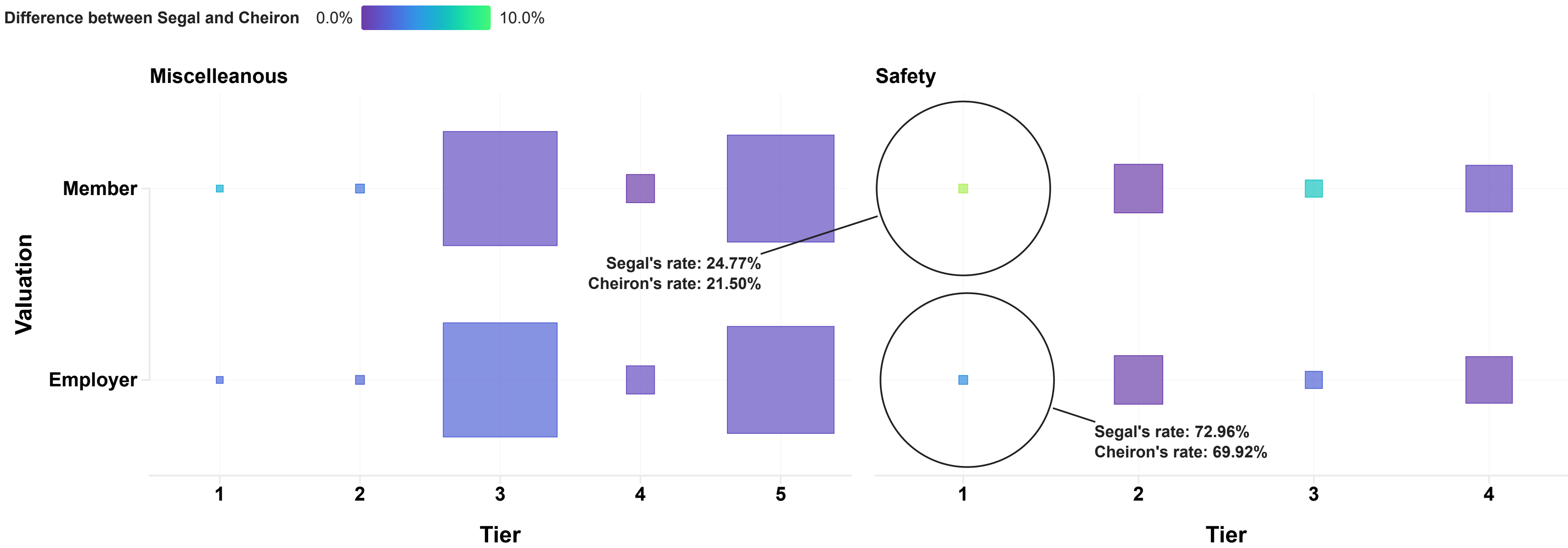
Present Value of Benefits | **Accrued Liability**



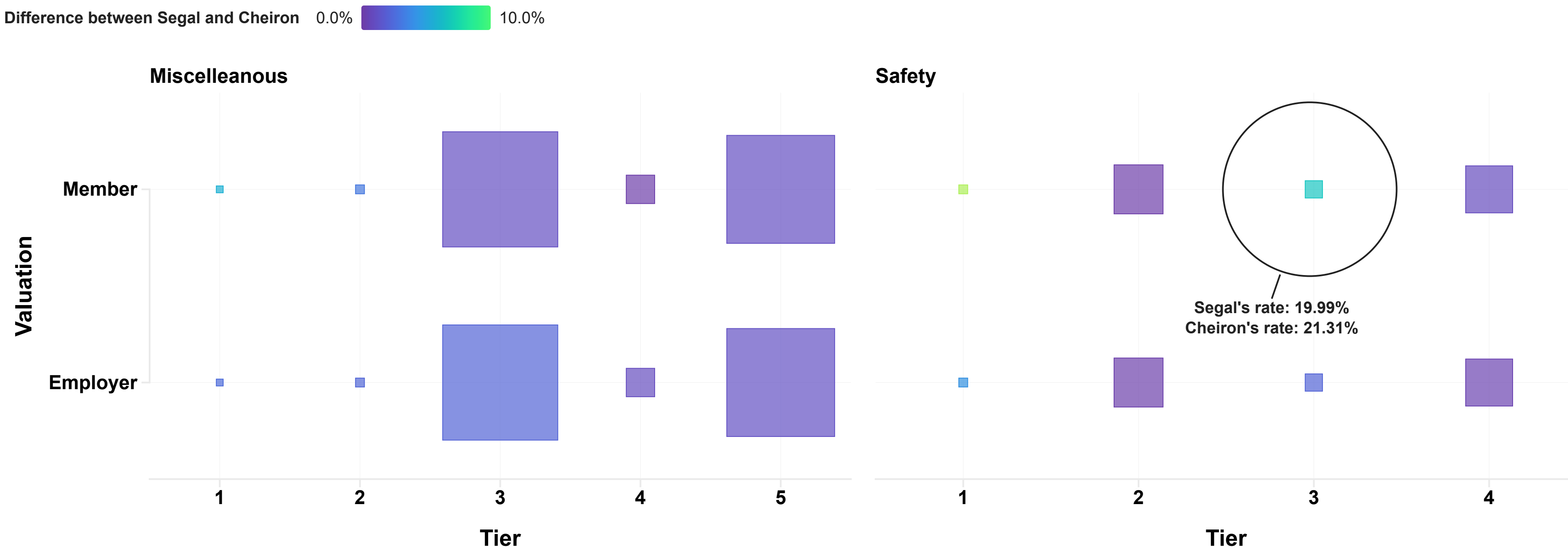
Finally, we turn to a comparison of the member and employer contribution rates for each subgroup. Here the boxes are sized by the active headcount. Note that we have expanded the color scale, as we have one group that is considerably outside the 5% margin.



Segal's calculated member rate for Safety Tier 1 is more than 3.25% of pay greater than Cheiron's, or more than 15% higher relative to ours. Segal's employer rate for this Tier is also more than 3% of pay higher than Cheiron's. After reaching out to Segal, they confirmed that there is an issue - related to how the 30-year contribution cut-off is incorporated in their Normal Cost rates - that requires additional review. However, we note that as of the valuation date this Tier only had 32 active members.



We note that there are two other subgroups - Miscellaneous Tier 1 and Safety Tier 3 - where the member rates are outside the 5% threshold. These populations are also quite small (headcounts of 19 and 121, respectively), and in the case of Safety Tier 3, we understand that many of these members had significant prior Miscellaneous service, which may contribute to the difference.



We next turn to the actuarial assumptions and methods. We reviewed Segal's recommended assumptions in the most recent Actuarial Experience Study, and in general found them to be reasonable and consistent with the **Actuarial Standards of Practice (ASOP)**. We also reviewed the Actuarial Methods and found them to be reasonable and consistent with the ASOPs and current guidance. We have several comments for consideration at the time of the next experience study.

We reviewed the economic assumptions recommended by Segal in the experience study. The primary recommendations are summarized below, and were adopted by the Board effective with the June 30, 2020 actuarial valuation and continue to be used in the June 30, 2021 valuation. We found Segal's recommended assumptions to be reasonable ***based on the information presented at the time of the experience study*** (published in May, 2020).

Discount Rate

Assumed annual return on investments (net of investment and administrative expenses)

Reduced from 7.00% to 6.75%

Inflation Rate

Price inflation; building block for other assumptions

Reduced from 3.00% to 2.75%

Wage Growth

Base (across-the-board) pay increases

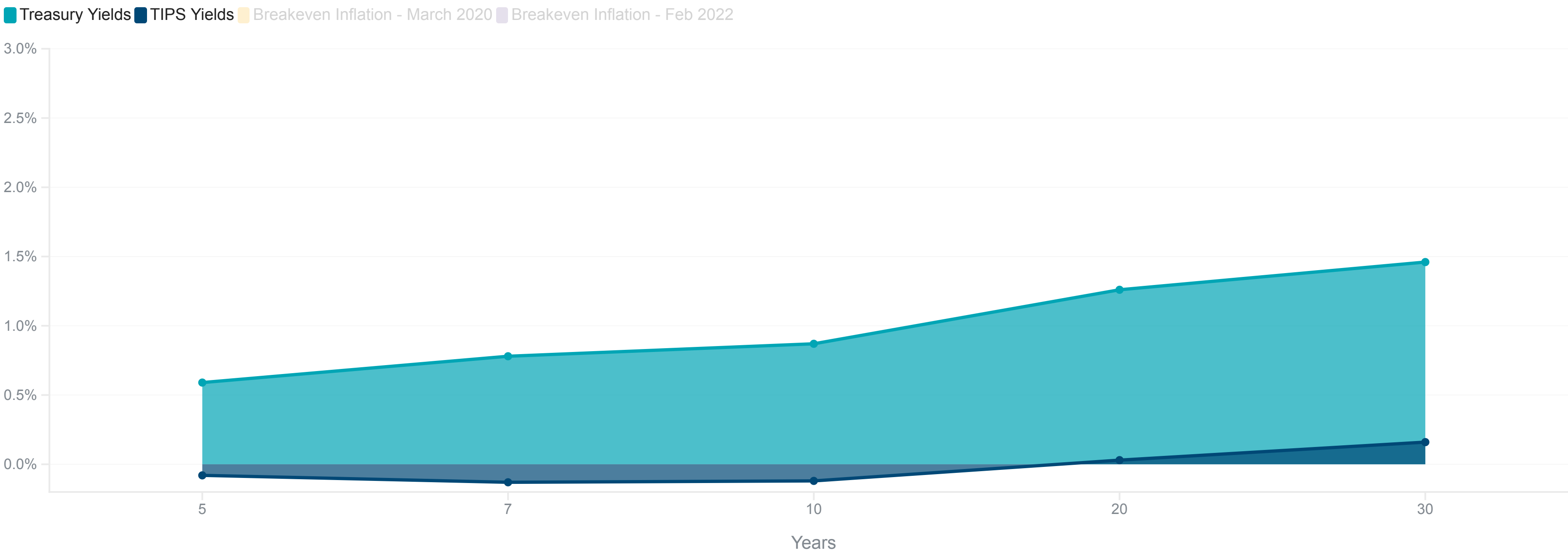
Reduced from 3.25% to 3.00%

COLA Rates

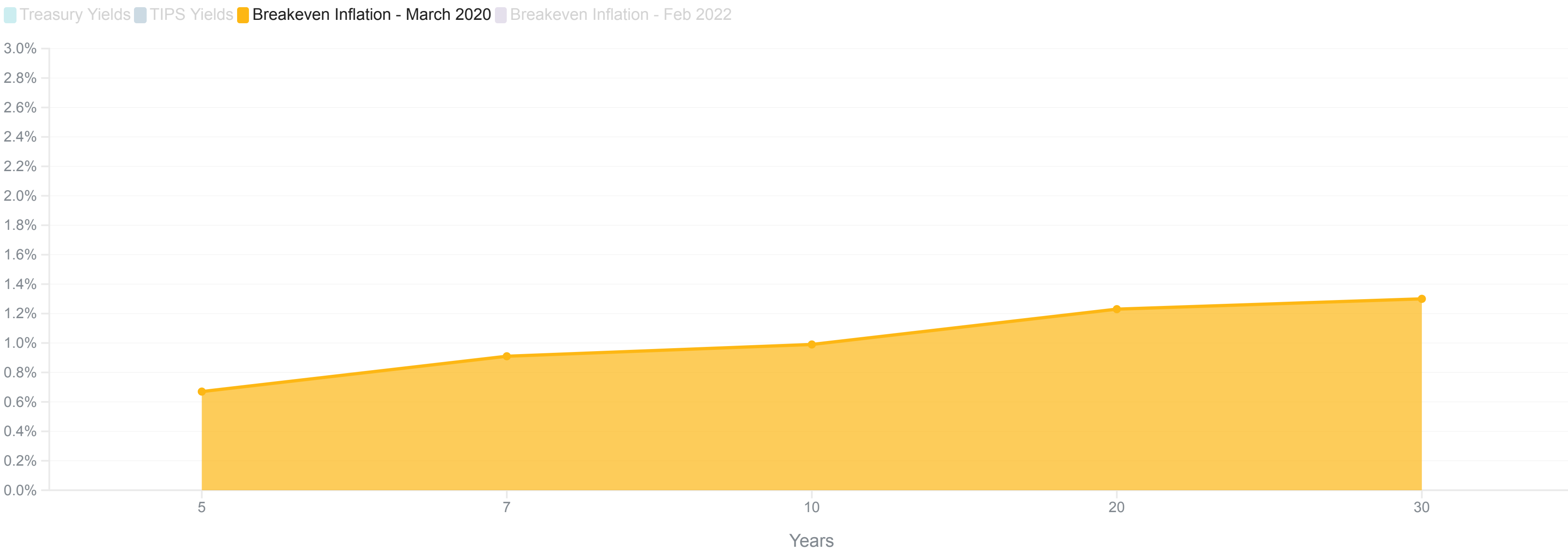
Annual growth in post-retirement COLAs (affected by banking / caps)

Reduced from 3.00% to 2.75% per year for Tier 1, and remain at 2.00% per year for all other Tiers with a COLA

Are the assumptions ***still*** reasonable? First, we review recent changes in inflation. In their experience study report one of the items Segal presented was the difference between TIPS (inflation-protected bonds) and regular Treasuries. The differences at various durations as of March 2020 are shown below.



This is also known as the "break-even" inflation rate.



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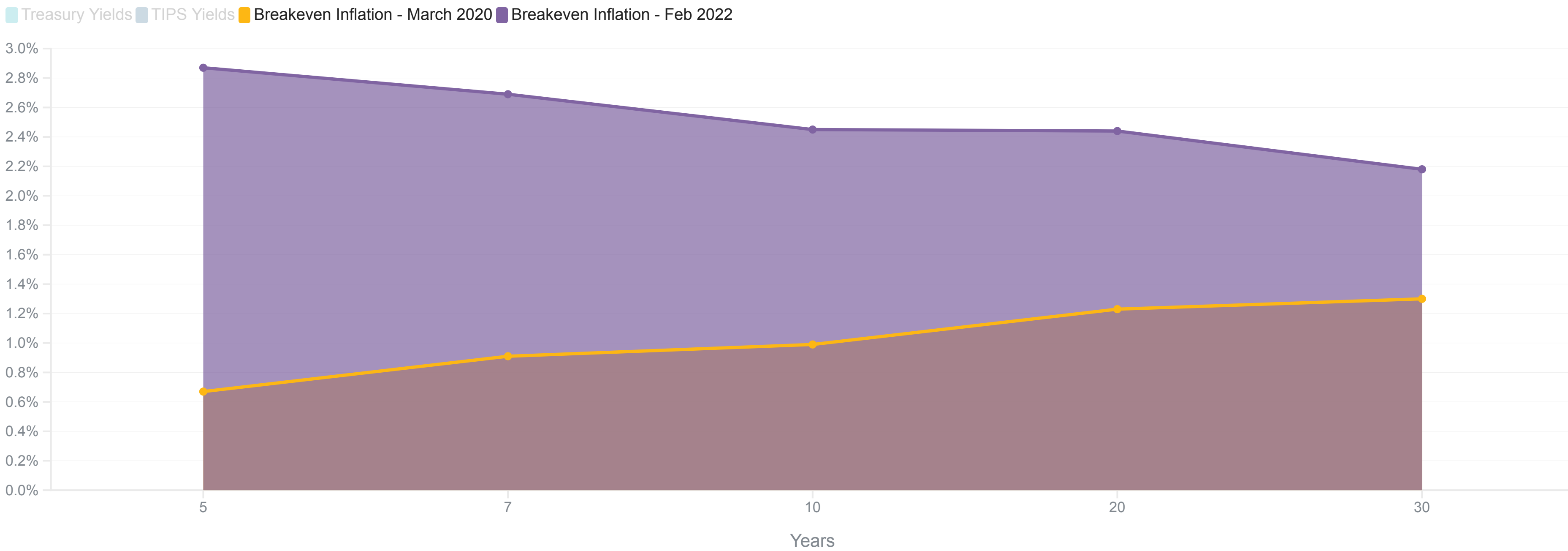
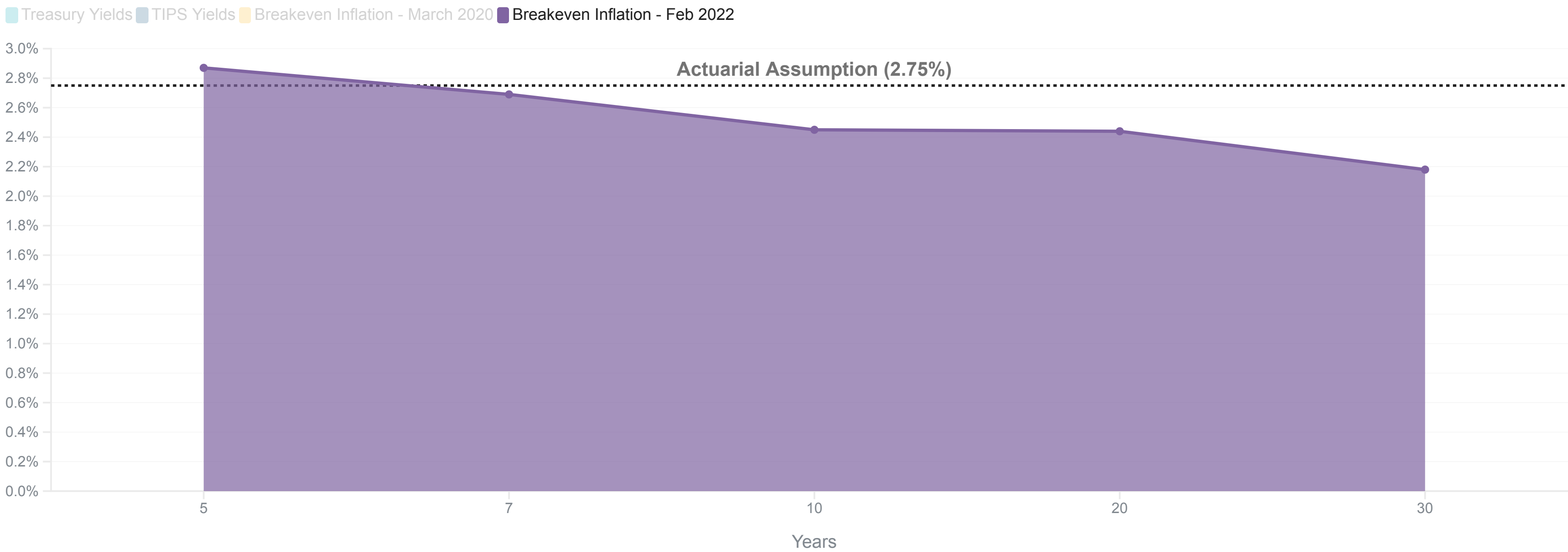
As of February 2022, current inflation has increased dramatically: to 7% year-over-year for the US CPI. The forward-looking expectations have also increased significantly, but are still well below recent levels.

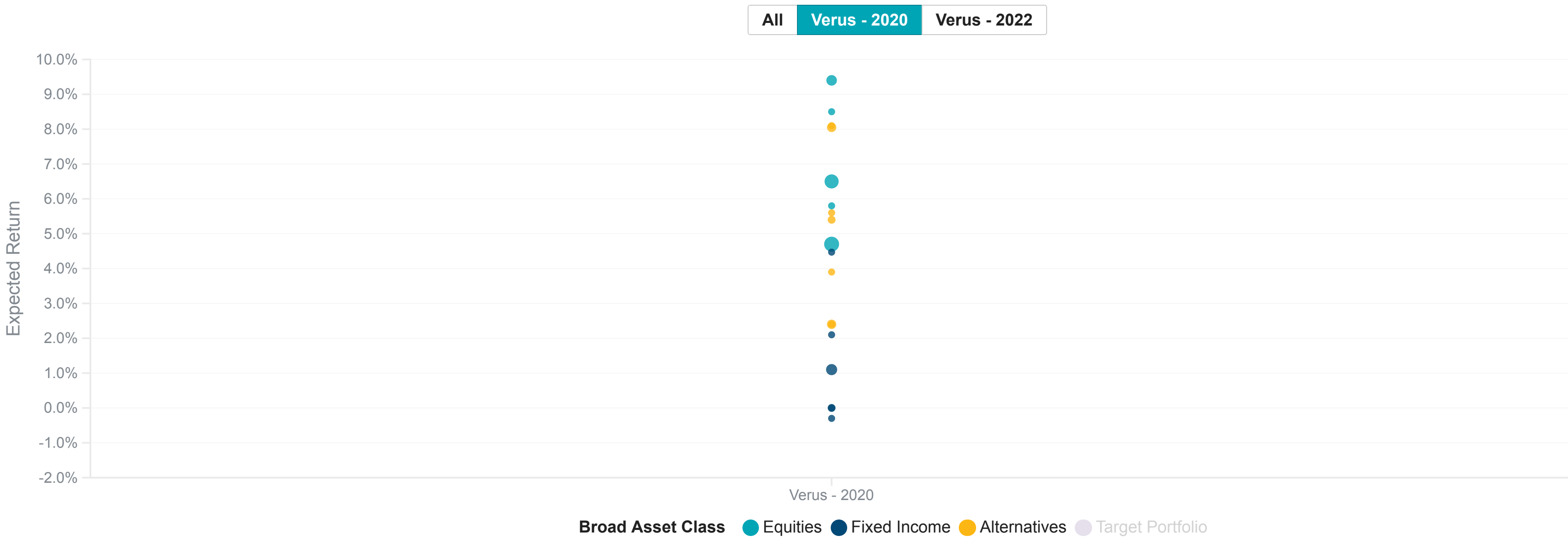


Based on these indicators, the decision to reduce the long-term inflation assumption from 3.00% to 2.75% is still reasonable.

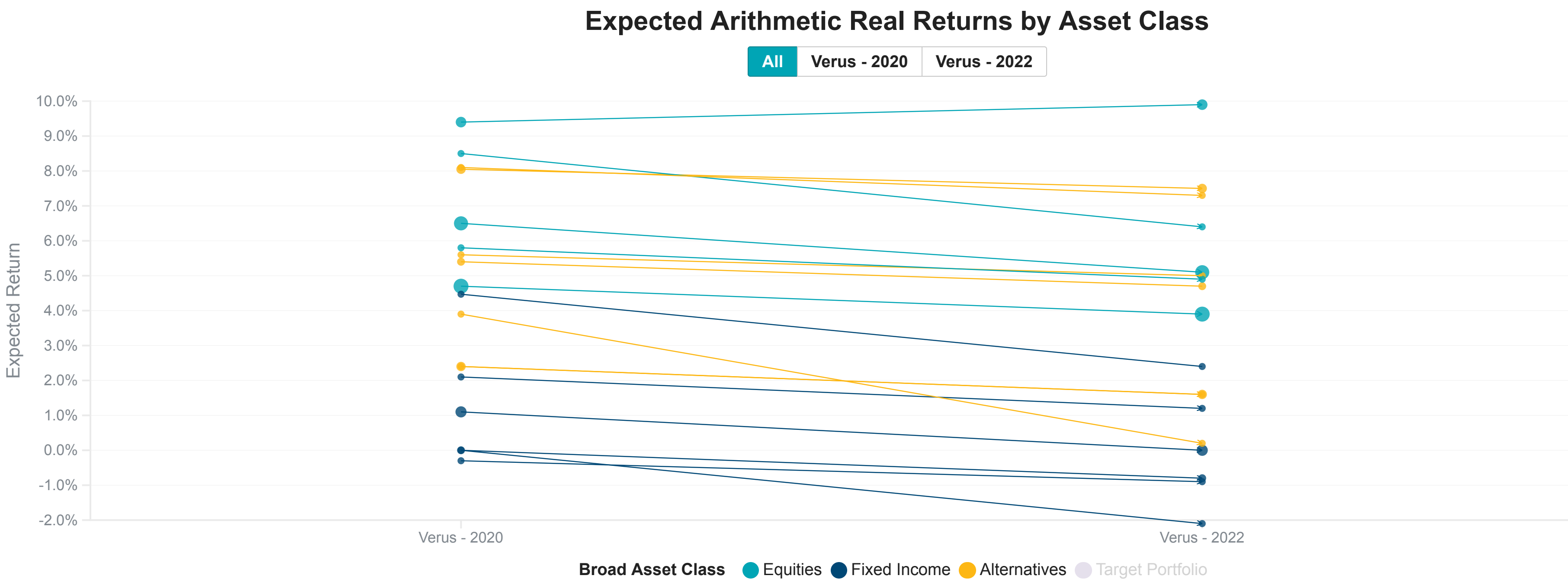


Next we turn to the Plan's assumed rate of return. This chart shows the 10-year capital market assumptions from Verus in 2020, specifically the **arithmetic real returns** - i.e. the annual expected returns *above inflation* - for each of the SCERS asset classes (with the dots sized by the relative allocation to that class).

Expected Arithmetic Real Returns by Asset Class



The expected returns for most classes have declined significantly since 2020.



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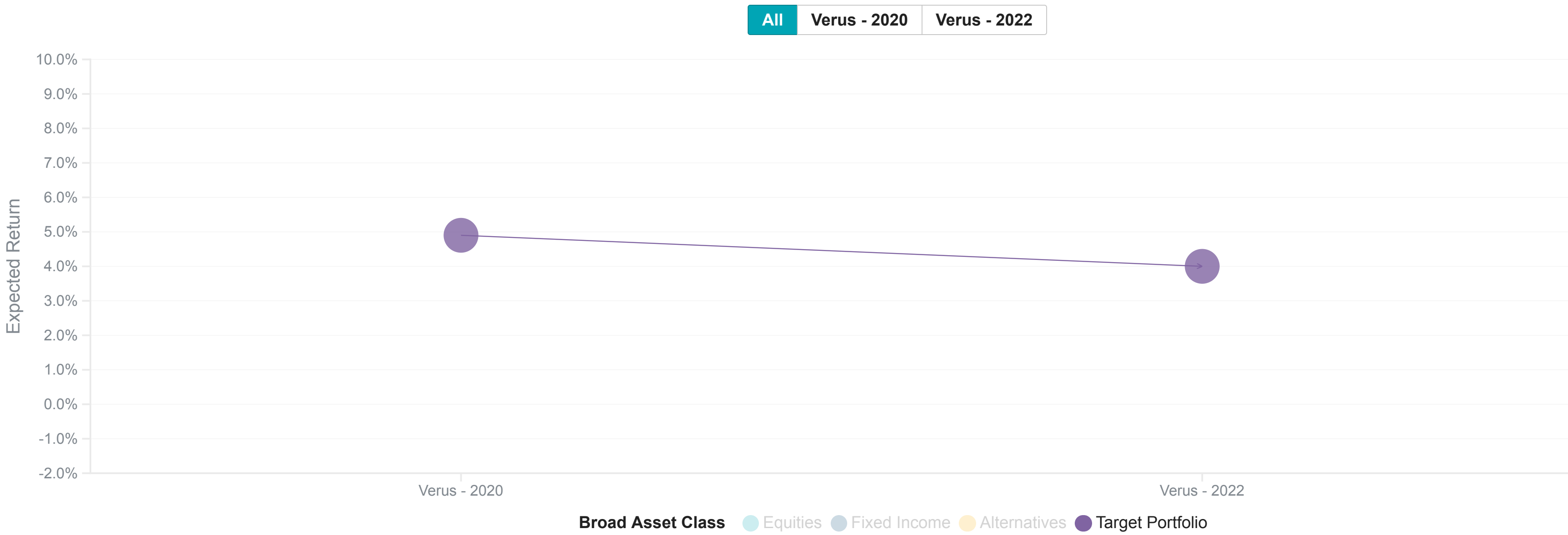
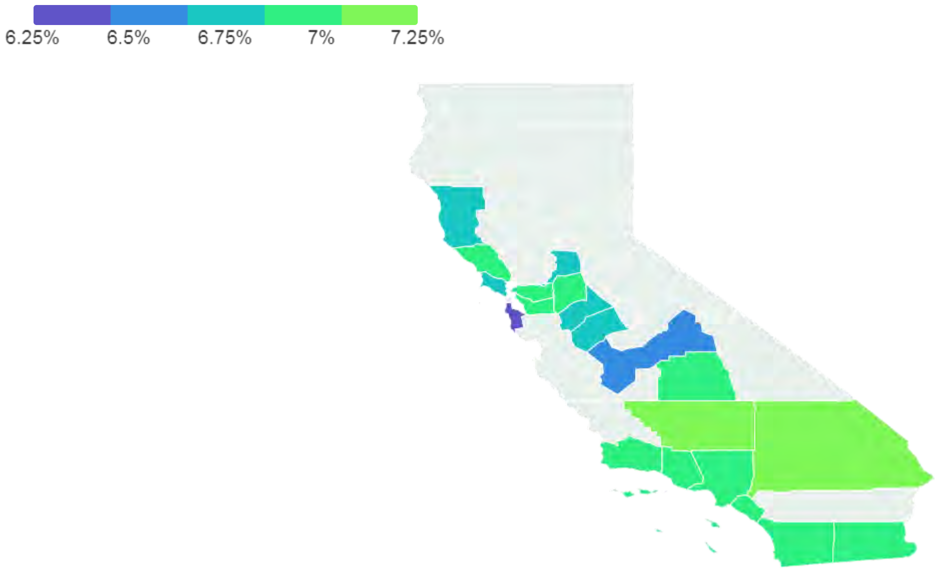
Verus' expected real return on the target portfolio has **declined by about 0.9%** over the past two years. However, adding the approximate expected real return (4.00%) to the Plan's inflation assumption (2.75%) produces a combined nominal return assumption that is still consistent with the assumption used in the current valuation (6.75%). However, this analysis does not include any adjustments for administrative and investment expenses. We believe the Plan should continue to monitor this assumption.

Expected Arithmetic Real Returns by Asset Class



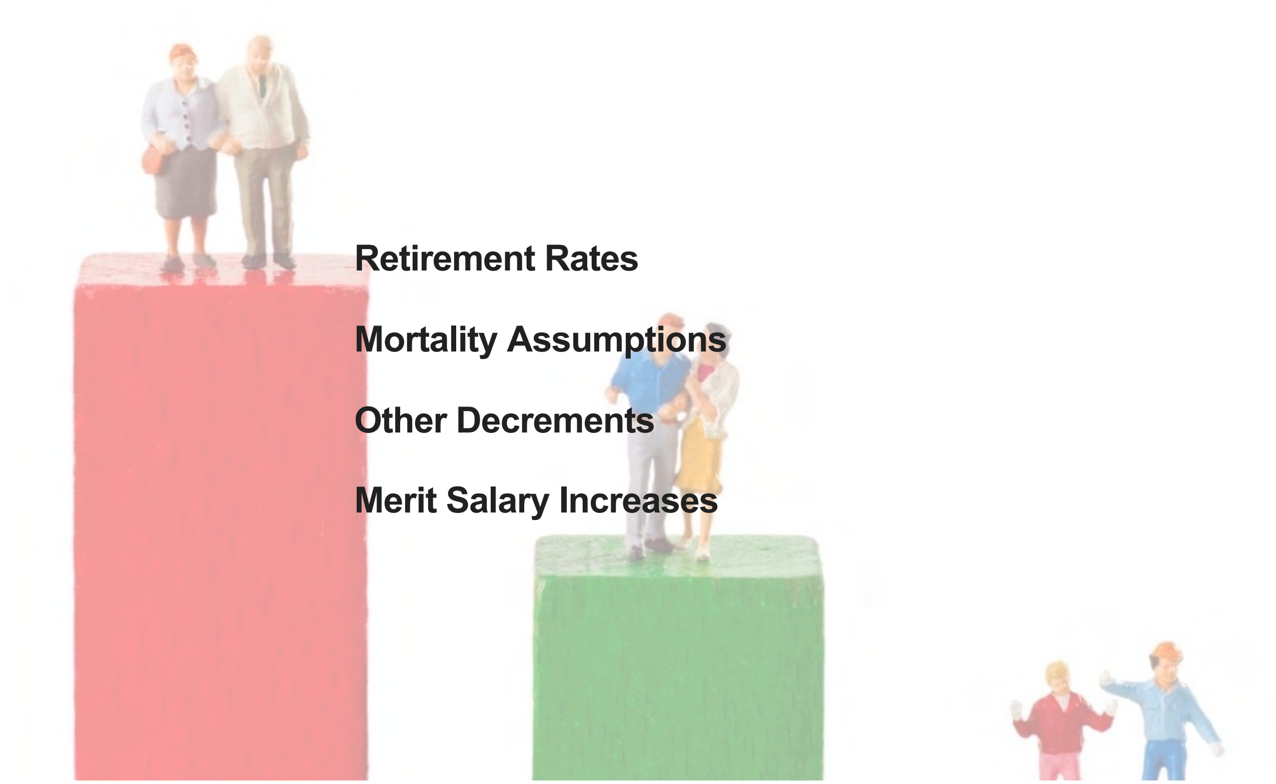
The reduction in the return assumption to 6.75% in 2020 is consistent with recent changes made by many public pension systems. The color-coded map below shows the current return assumptions for the 20 SACRS systems. Clicking on each County will provide additional details, including the most recent valuation date, other economic assumptions, and whether the discount rate is net of investment *and/or* administrative expenses.

SACRS Current Economic Assumptions (Click County for Details)



Source: Cheiron Survey

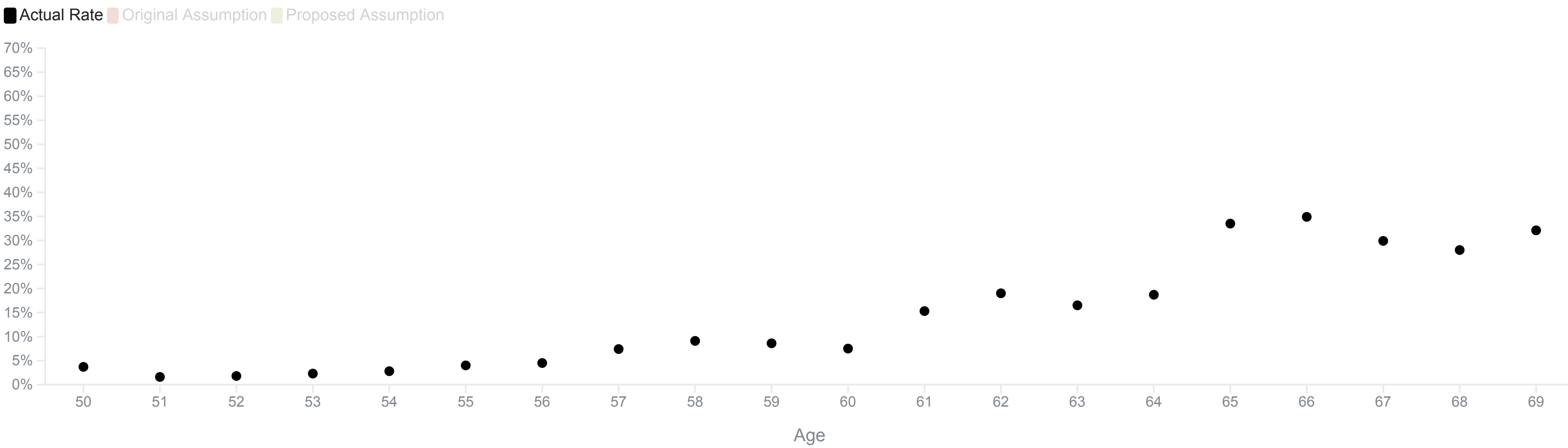
We next review the **demographic assumptions**. In general, we find the assumptions recommended by Segal in the experience study and used in current valuation to be reasonable, but we have several comments on specific assumptions.



For analyzing the *rates of decrement*- i.e., the rates of retirement, termination, disability and death - Segal uses a standard approach. First, they calculate the average percentage of active members leaving service for each cause over the past three years (or over a longer period, if there isn't much experience). Here we show the data shown in their report from 2016-2019 for Misc Tier 2 and 3 service retirements with less than 30 years of service.

Retirement Rates

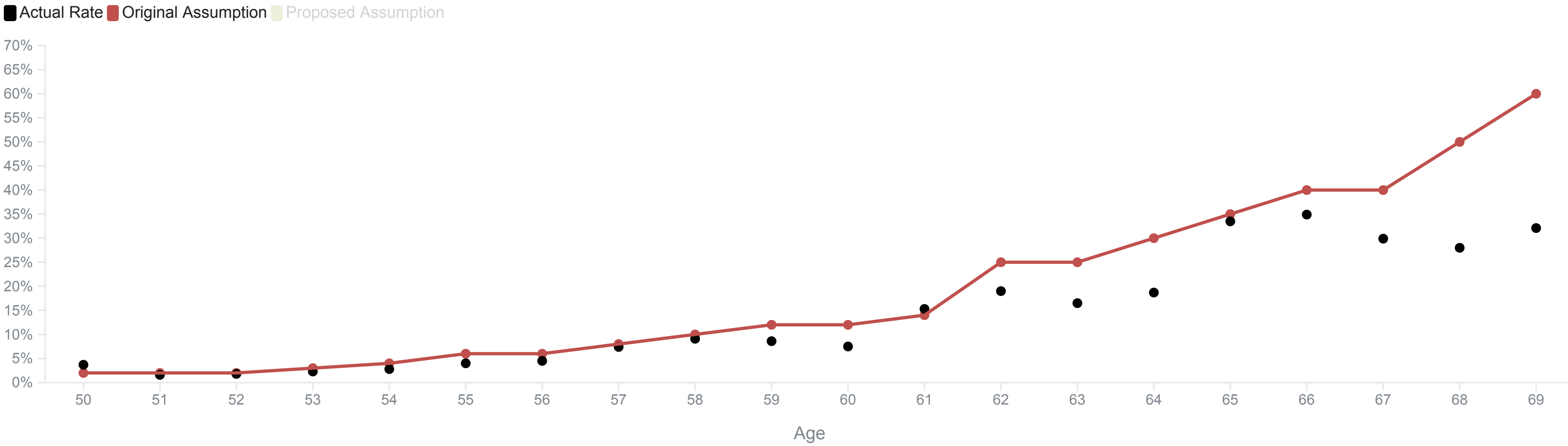
Misc Tiers 2 and 3 (< 30 YOS)



They compare the original assumption to the actual rates at each age,

Retirement Rates

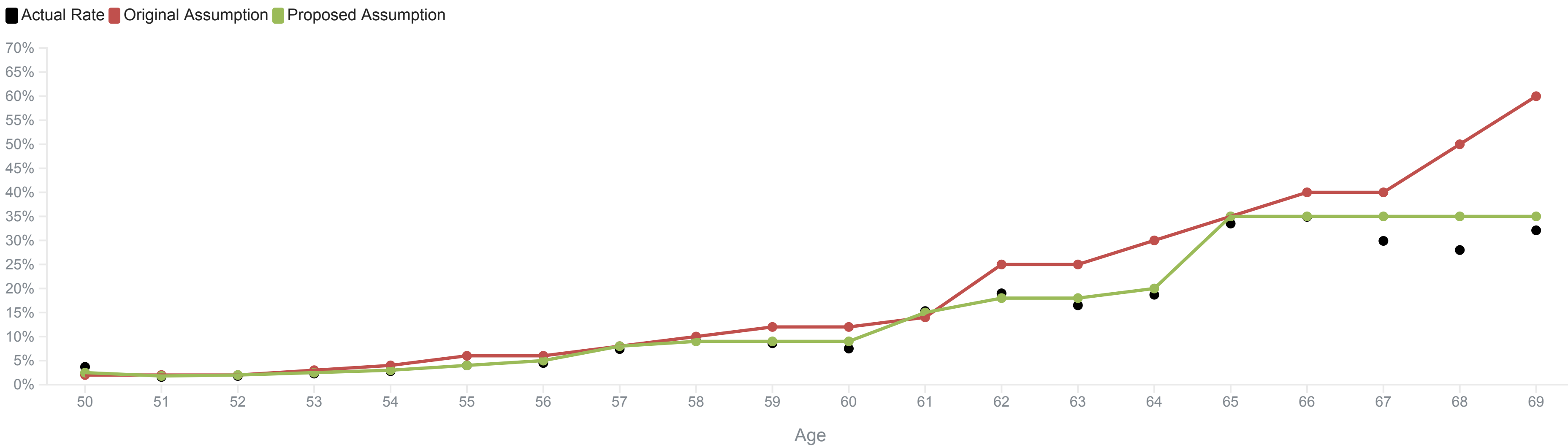
Misc Tiers 2 and 3 (< 30 YOS)



And then propose modifications to better match the data, applying professional judgement as necessary.

Retirement Rates

Misc Tiers 2 and 3 (< 30 YOS)



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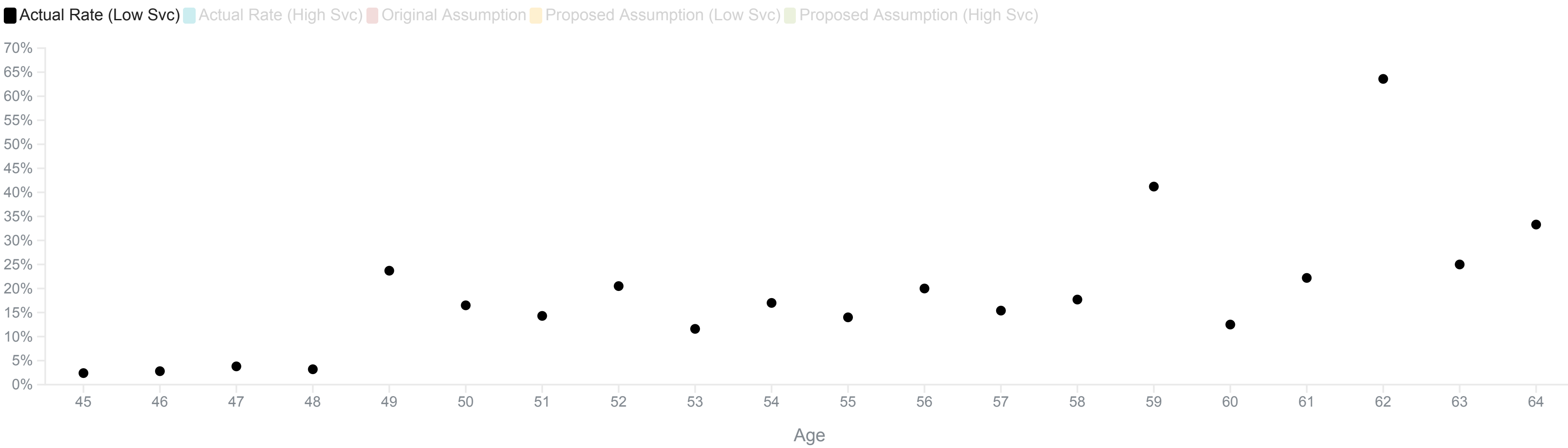
We generally agree with the recommendations in Segal's report. In particular, we agree with the recommendation to use different rates for some tiers at different service levels. Seen below are the actual rates for Safety Tiers 1 and 2 with low service levels (in this case, less than 25 years of service).

Retirement Rates

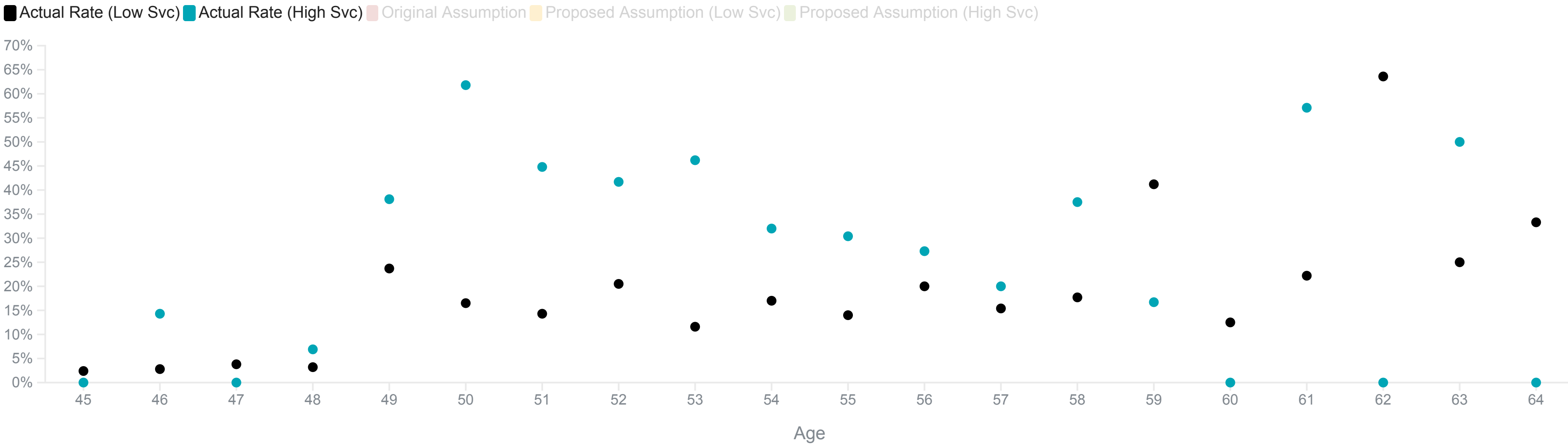
Safety Tiers 1 and 2



And here are the average rates of retirement at the same ages, but for those with 25 or more years of service. The rates are generally significantly higher for those with more service.

Retirement Rates

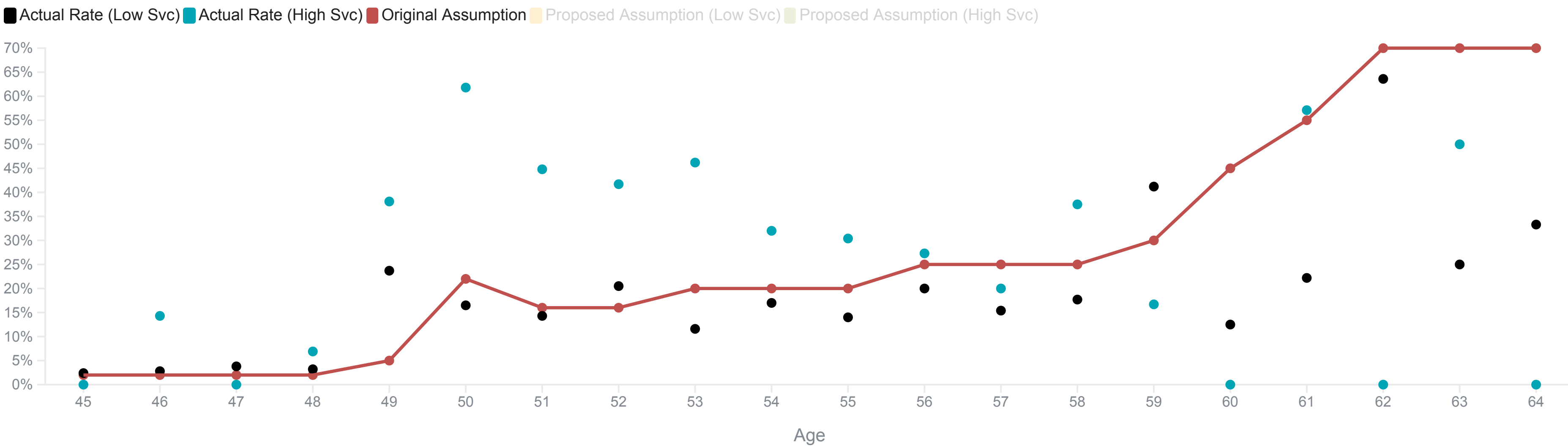
Safety Tiers 1 and 2



Therefore instead of recommending a single set of age-based retirement rates,

Retirement Rates

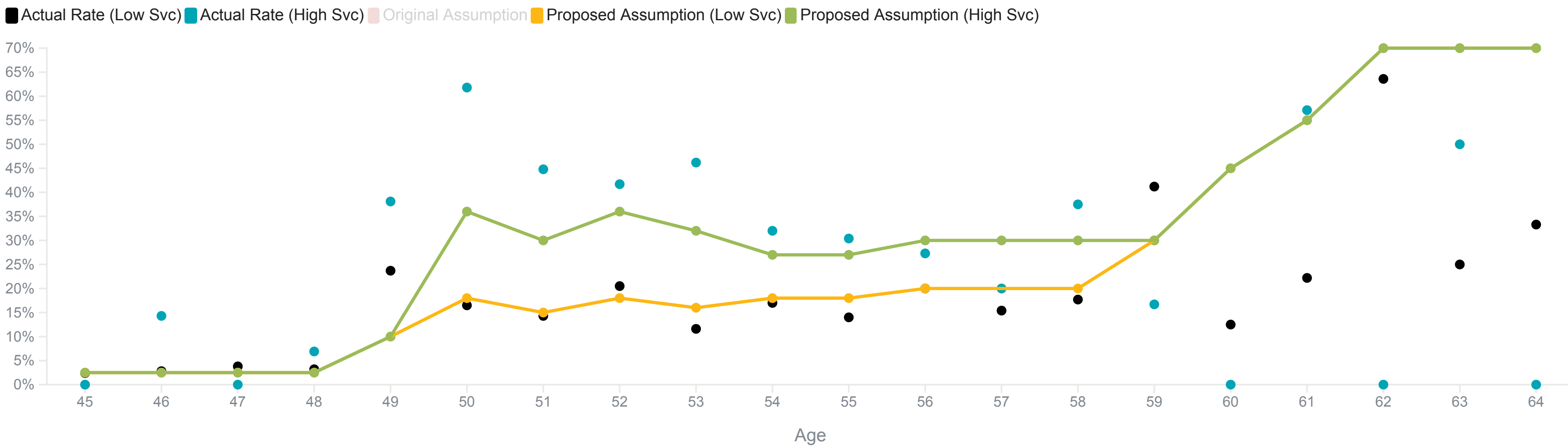
Safety Tiers 1 and 2



Segal modified their approach to use propose different rates for different service levels.

Retirement Rates

Safety Tiers 1 and 2



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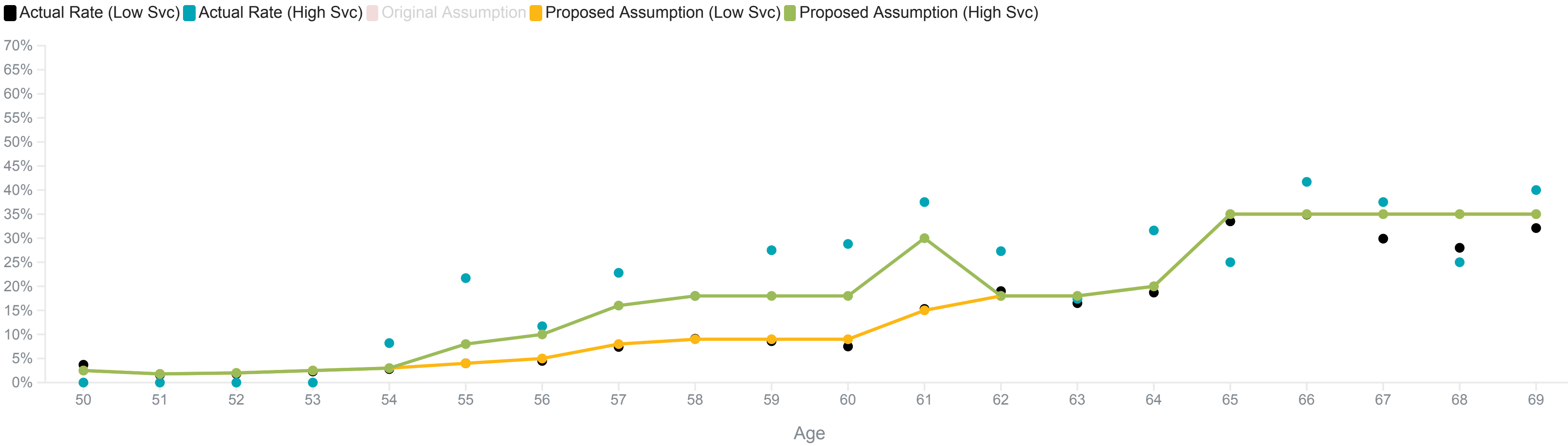
The same is true for Misc Tiers 2 and 3. We recommend that retirement rates at different service levels continue to be monitored, and if appopriate, apply different service-based rates for other tiers as well. *This approach of using different rates at different service levels was one of the primary recommendations from our last audit study.*

Retirement Rates

Misc Tiers 2 and 3



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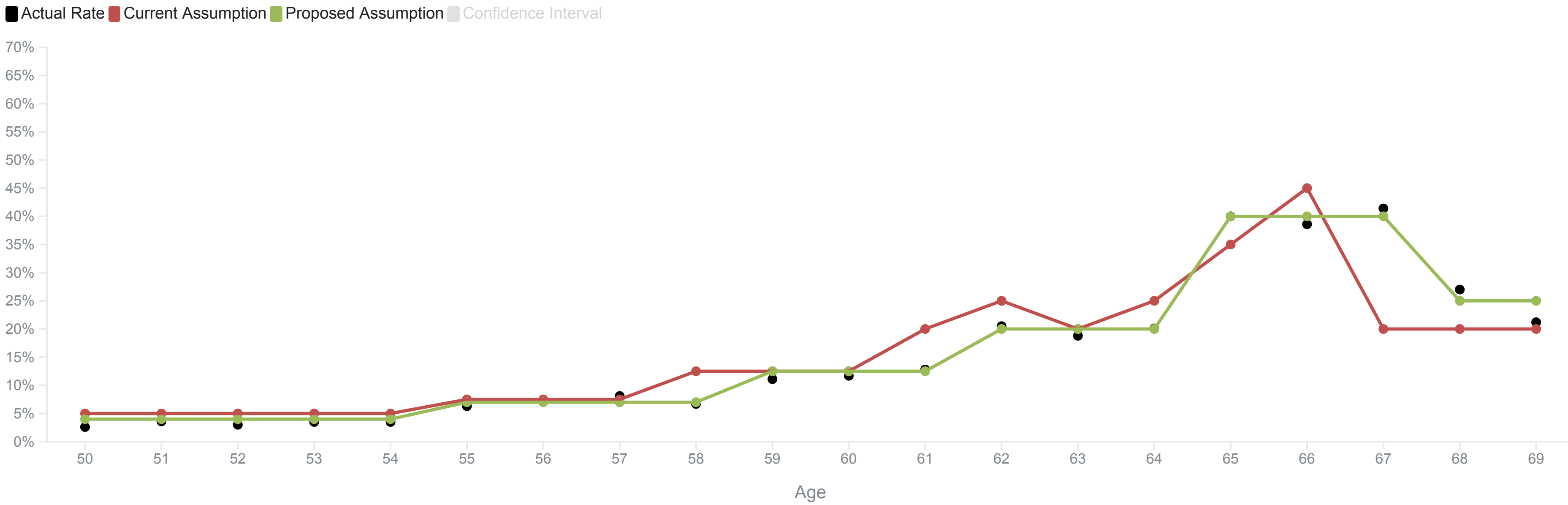
To help clients understand how robust their data is, we prefer to take a additional step in analyzing and presenting information on rates of retirement and other decrements in an experience study.

Retirement Rates



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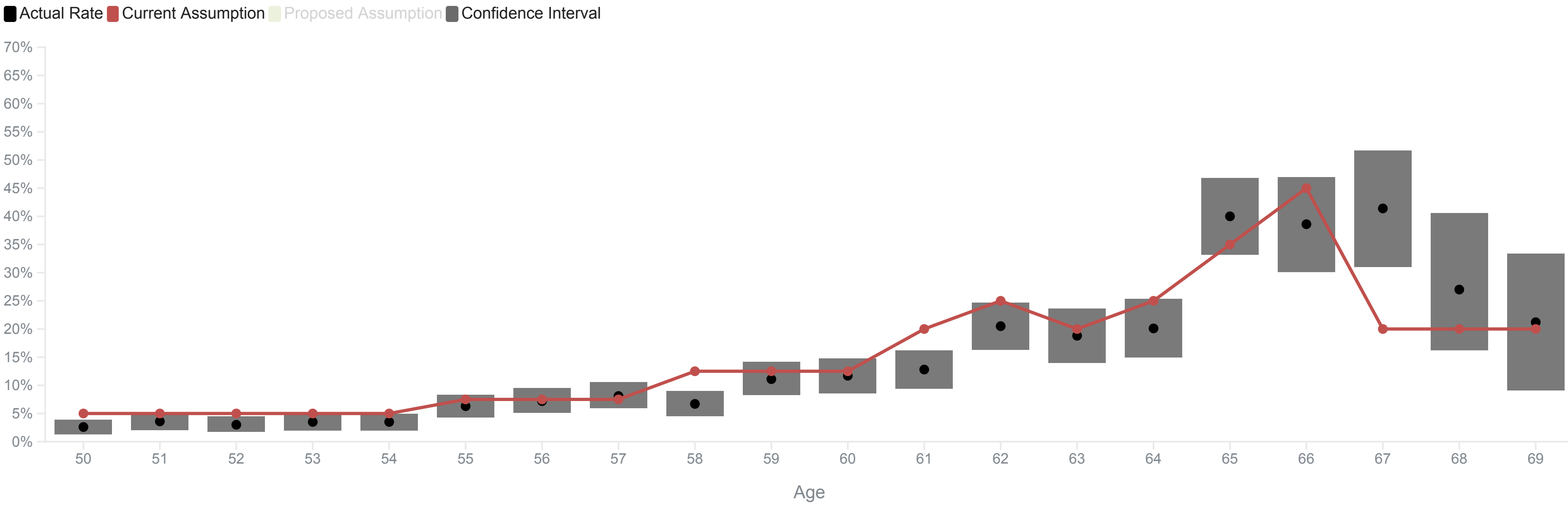
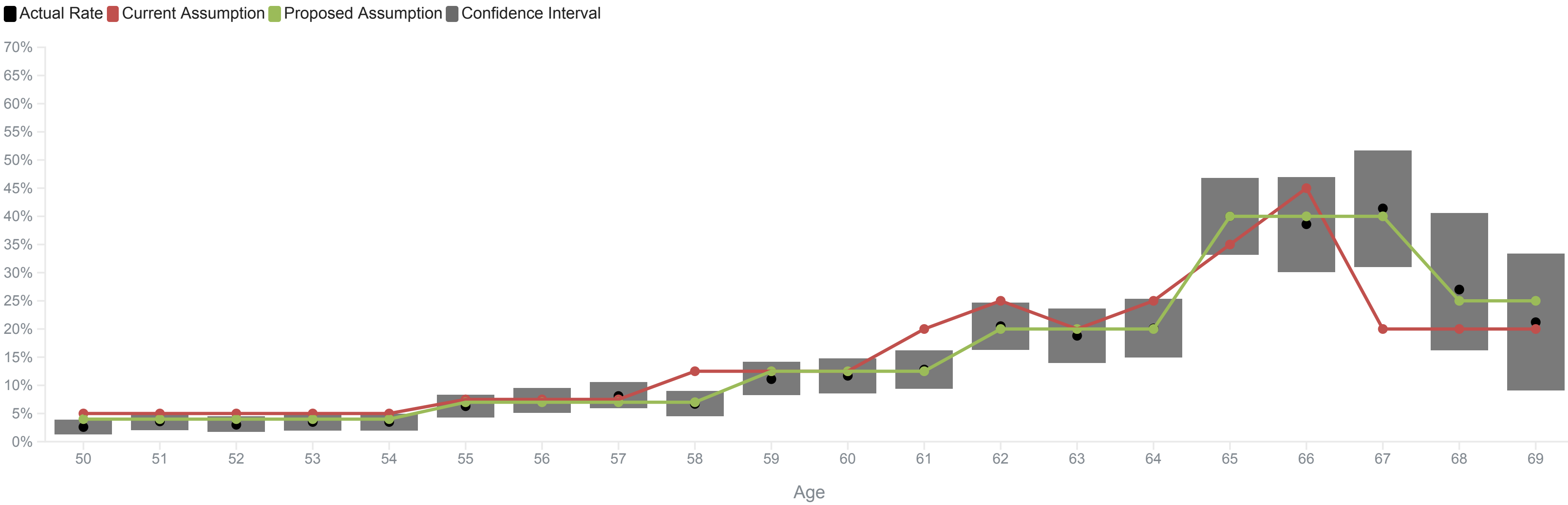
We add in a **confidence interval**, a statistical measure that indicates a range we expect the true value to lie within, based on the *credibility* of the data.

Retirement Rates



We generally propose a modified assumption if the actual rate falls outside the interval, though still applying professional judgement. We are showing a sample from one of our own recent experience studies, not SCERS, because Segal does not provide the information in their experience study report necessary to derive these statistics. We recommend including this information - specifically, the number of ***exposures*** and ***decrements*** - in future experience studies.

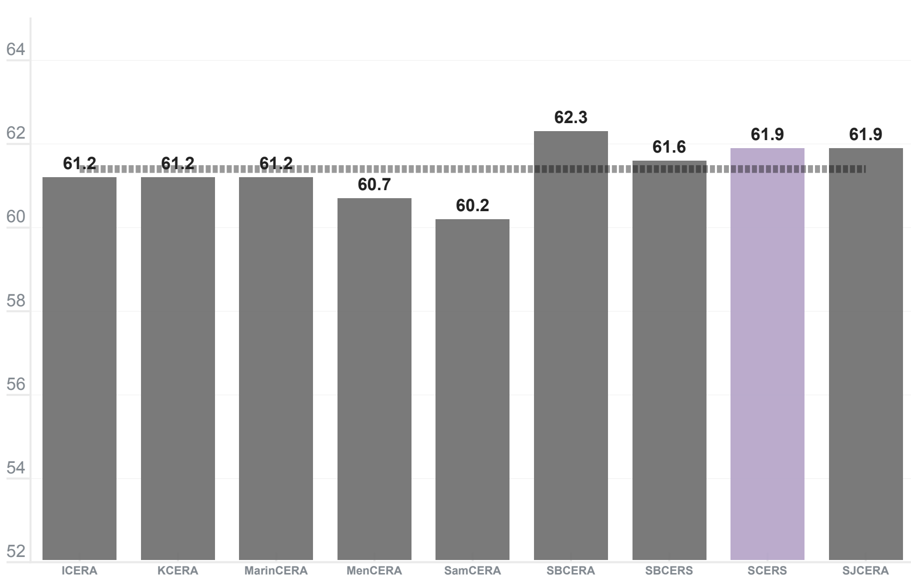
Retirement Rates



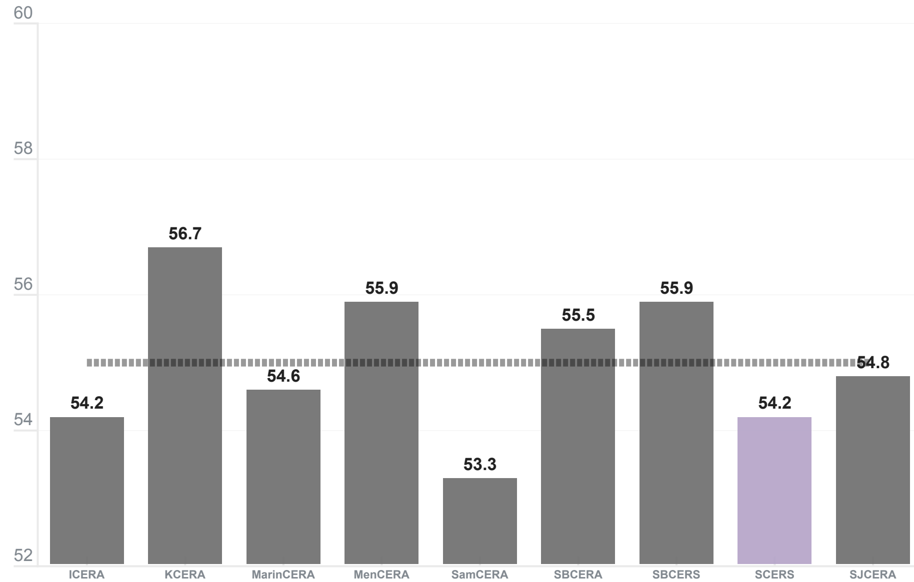
We thought it would be of interest to compare the SCERS assumptions to those of a sample of other '37 Act systems with similar benefit formulas. The average assumed retirement ages for the SCERS Miscellaneous and Safety members are relatively close to the averages across our sample of plans, as shown by the dotted lines.

Average Age at Retirement

Miscellaneous

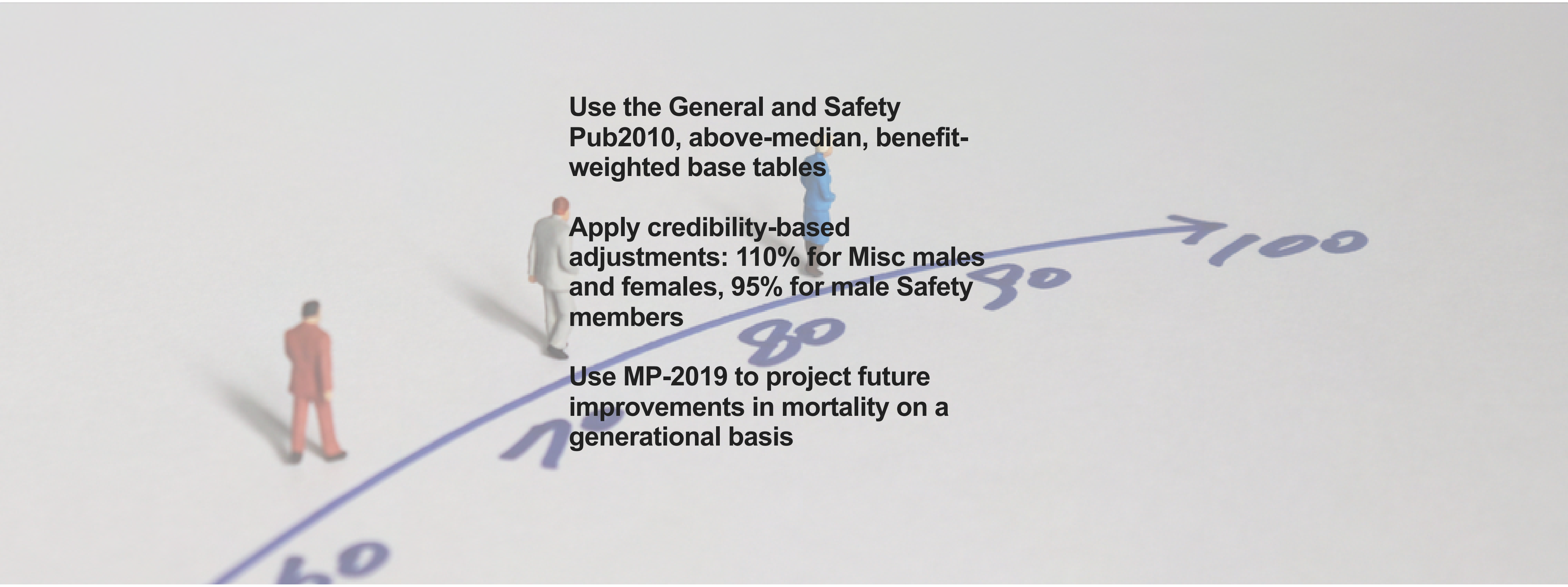


Safety



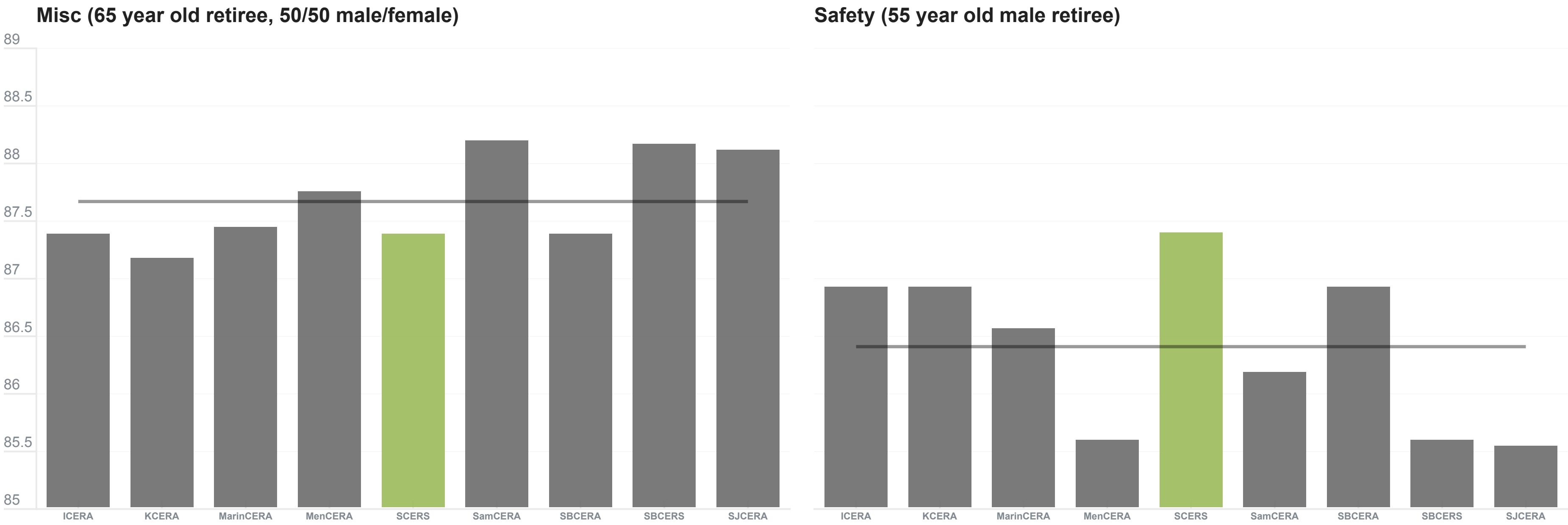
Source for assumptions: publicly available Actuarial Valuation Reports for 2021

Now we turn to the mortality assumptions. As part of the recent experience study, Segal made the recommendations shown below, all of which we agree with and strongly support. *We note that the use of benefit (not headcount) weighted mortality tables and making credibility-based adjustments to the base tables were among our primary recommendations in the last actuarial audit.*



Here we show how the SCERS mortality assumptions compare to those used by the same peer group. The charts show the expected future lifetime for a Miscellaneous retiree currently age 65 (blended 50/50 between the male and female assumptions) and a male Safety retiree currently age 55. The SCERS assumptions for the Miscellaneous members is roughly in line with the average for the group, but the Safety life expectancy is about one year higher than the average.

Average Life Expectancy



Source for assumptions: publicly available Actuarial Valuation Reports for 2021

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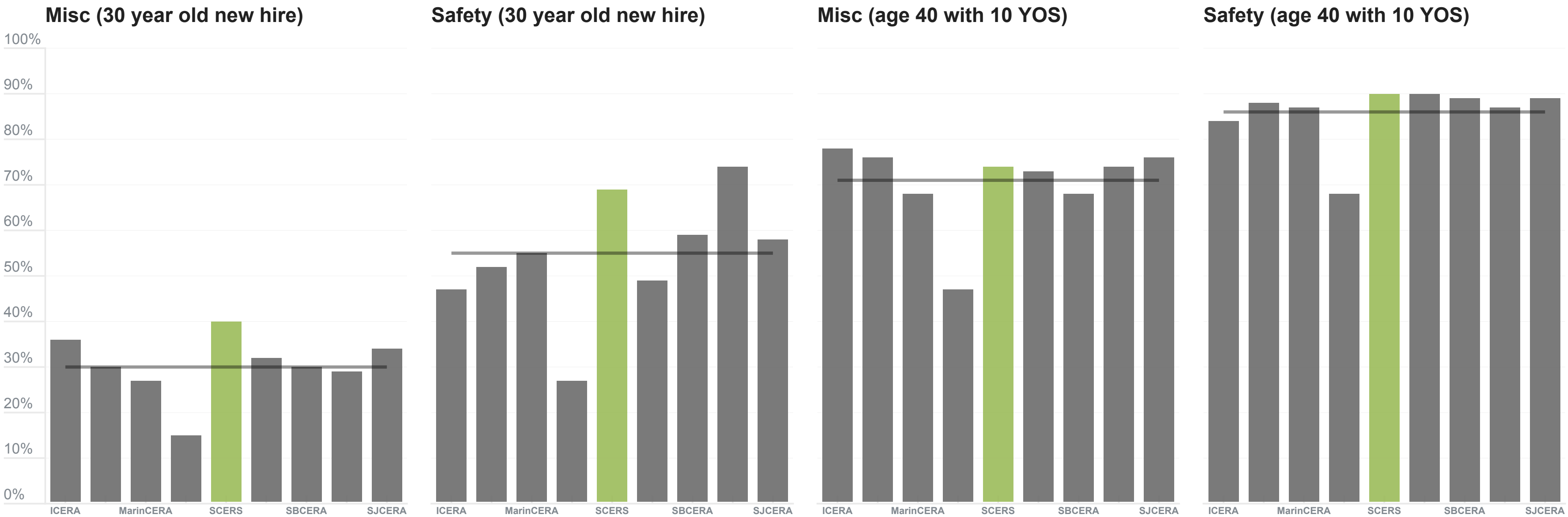
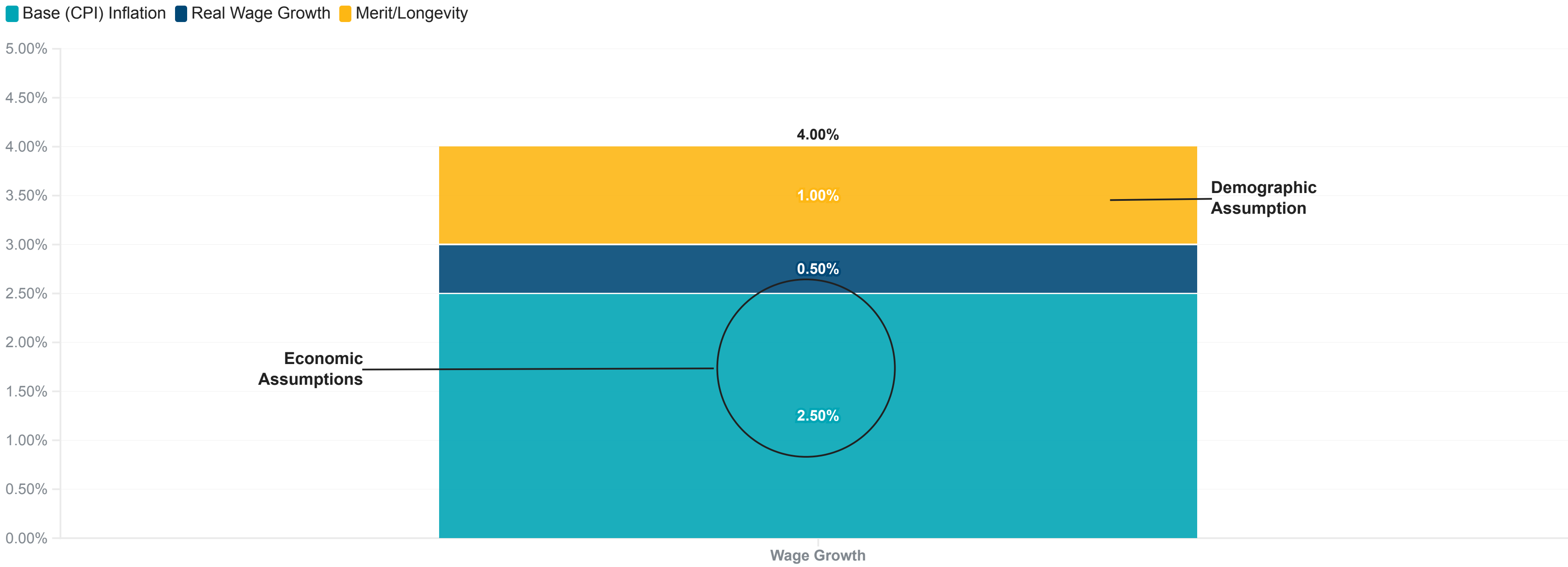
We also reviewed Segal's analysis of the other turnover rates - for **disabilities** and pre-retirement **terminations** - and found their recommendations to be reasonable. Similar to mortality, we show a comparison of SCERS to its peers. The charts below show the likelihood of a member - either a 30 year old new hire, or a 40 year old with 10 years of service - working until age 50, based on the overall turnover assumptions currently used by each plan. The SCERS members have a higher-than-average assumed likelihood of working until age 50, thus indicating lower rates of turnover.

Likelihood of Working Until Age 50



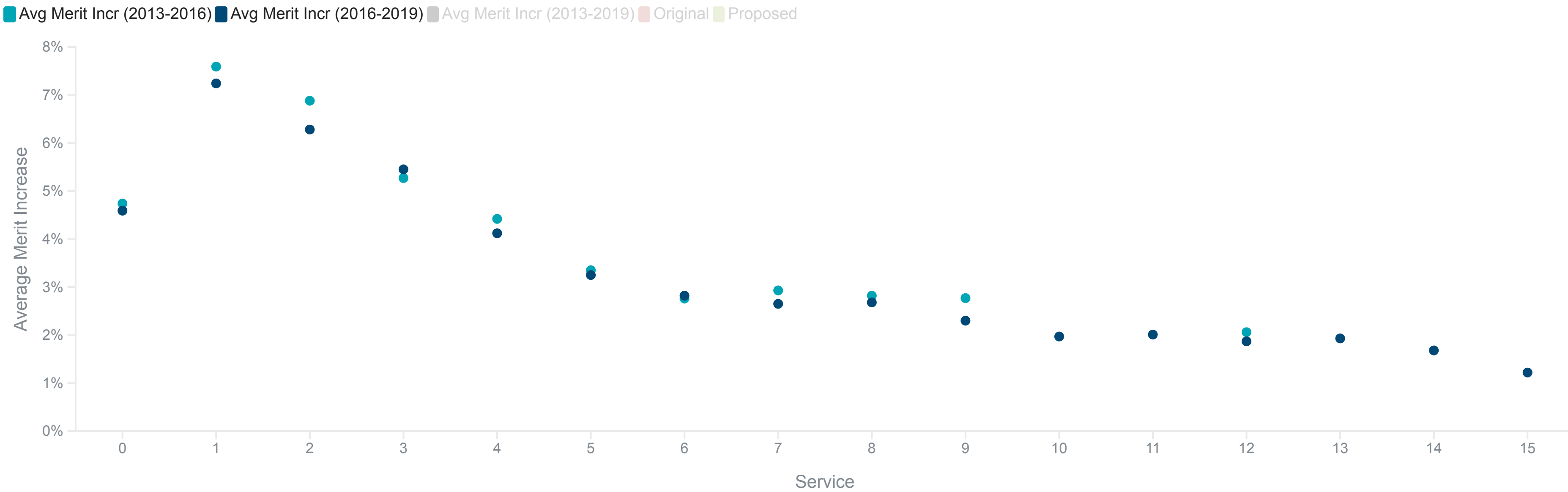
Source for assumptions: publicly available Actuarial Valuation Reports for 2021

Salary increases are made of three components: base inflation, plus "real" wage growth (for productivity or other reasons), plus increases in individual pay due to merit, promotion, and longevity. Inflation and real wage growth are considered economic assumptions, while the merit salary increases are considered a demographic assumption.



To analyze the merit salary assumption, Segal used a similar approach as for the retirement rates: comparing the average rates of increase at each service level (after backing out the average "base" wage increase). For our analysis, we compared the data from the most recent three-year period (2016-2019), as well as that from the prior experience study (2013-2016).

Miscellaneous



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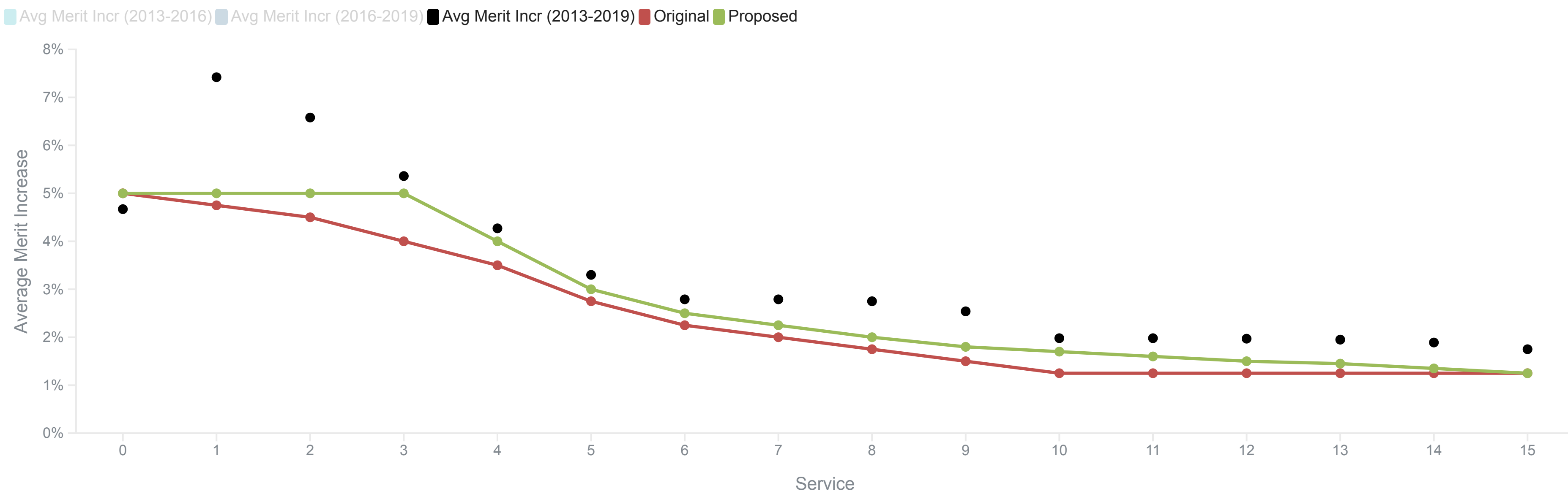
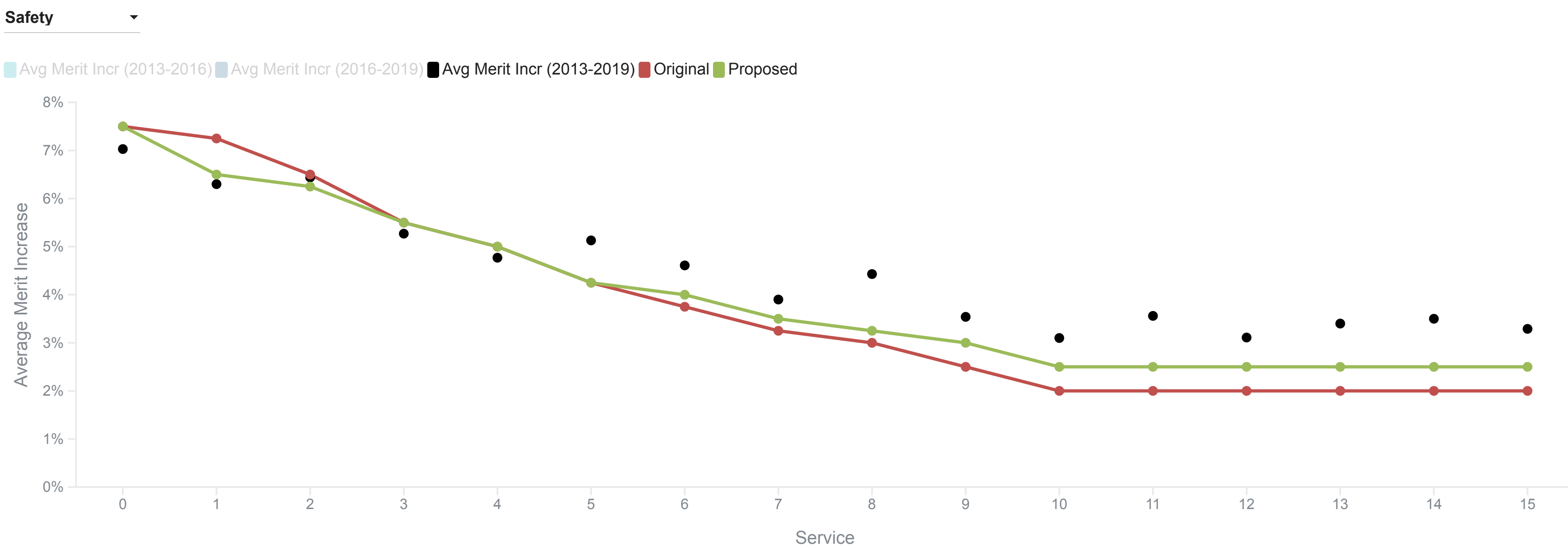
Based on the combined data, we agree with Segal's recommendations for the Miscellaneous members. However, we recommend continued monitoring of the merit increases in the next experience study. If trends from the last six years continue, we recommend increasing the rates to better align with actual experience.

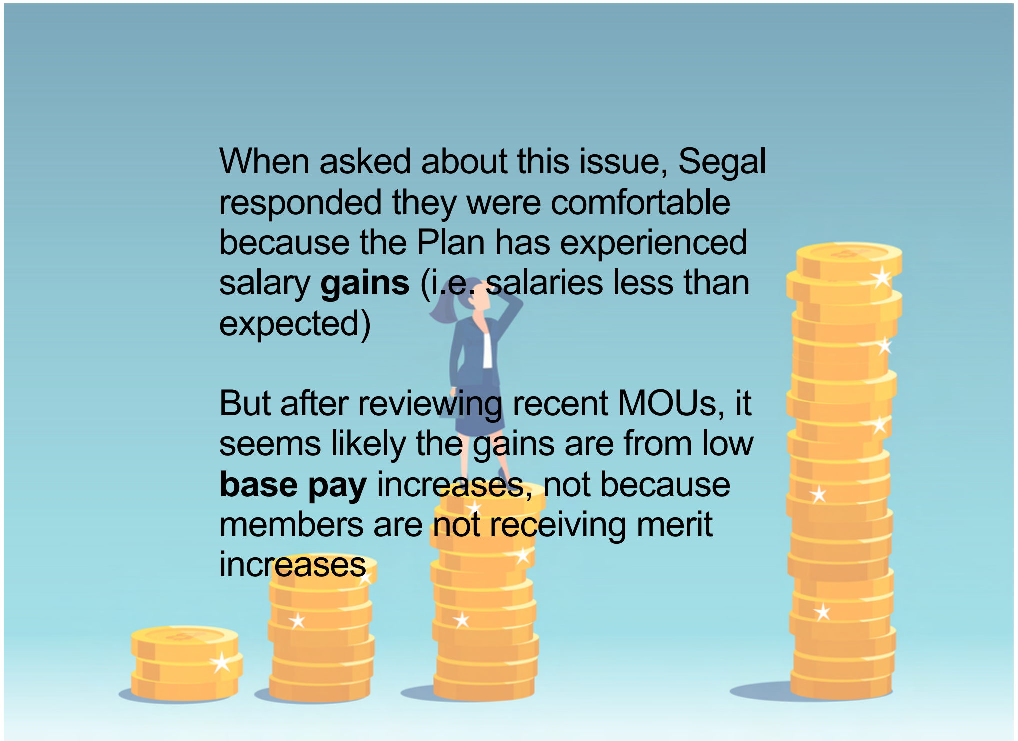
Miscellaneous



With a similar recommendation for the Safety members.



However, there is a discrepancy between the way Segal *analyzes* the merit assumption versus the way they *apply* it. Although Segal uses the assumption to project the members' salaries in all ***future*** years, they do not assume any merit increase in the ***current*** year salaries compared to las year - they only apply the base wage growth assumption. This is equivalent to assuming no one will receive a step increase or promotion in the current year. We recommend reconsidering this approach in future valuations, though it is not expected to have a significant impact.

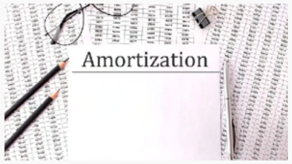


We also reviewed the Actuarial Methods used in the valuation. We found these methods to be reasonable and consistent with the Actuarial Standards of Practice and current guidance published by various organizations (such as reflected in this document from the Conference of Consulting Actuaries and this website from the Government Finance Officers Association). We provide commentary on each of the methods used in the valuation below.

Actuarial Cost Method

Under the Entry Age Normal Cost Method, the Normal Cost is calculated as the amount necessary to fund Member's benefits as a level percentage of total payroll over their projected working lives.

We concur with this methodology. It is a "Model Practice" based on the California Actuarial Advisory Panel (CAAP) and "Best Practice" according to the Government Finance Officers



Amortization Policy

Layered amortization bases over a level percentage of payroll.

The Unfunded Actuarial Liability as of June 30, 2012 is amortized over a closed period of 14 years as of June 30, 2021.

Subsequent closed layers: Gains or losses, assumption or method changes - 20 years; Plan amendments - 15 years; Retirement incentives - 5 years

Actuarial Value of Plan Assets

AVA is a modified market-related value. Market Value of Assets (MVA) is adjusted to recognize, over a seven-year period, difference between actual investment earnings and the assumed investment return. The AVA is limited to no less than 70% and no more than 130% of MVA.

In our opinion, this AVA method satisfies the Actuarial Standard of Practice No. 44

Cost-Sharing Methods

SCERS is a cost-sharing plan, assets of Plan are available to fund benefits of all members. Separate reserves or accounts are not maintained for the Miscellaneous and Safety groups. However with each valuation, Segal tracks and calculates the impact of changes in the UAL for both the Miscellaneous and Safety to develop their UAL payment. Special adjustments are made for the Courts and Districts.

Finally, we reviewed the census data file used by Segal in their valuation, and compared it to the "raw" data provided by SCERS.

We reviewed the edits made to the data, based on the data questions provided to SCERS by Segal and the SCERS responses

We find that the data used in the valuation is valid, complete, and contains the necessary data elements

We also reviewed the contents of the report for consistency with the Actuarial Standards of Practice and other guidance (such as this document on model disclosure elements from the California Actuarial Advisory Panel).

We find the actuarial valuation and experience study reports to be in compliance with *currently applicable* ASOPs and guidance

Future reports will need to be updated to incorporate recent changes in ASOP #4, which will require the disclosure of a "Low-Default-Risk Obligation Measure"

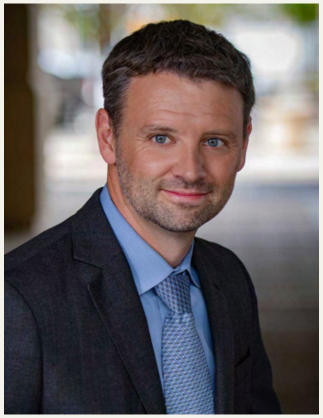
We would like to thank SCERS and Segal for providing us with assistance in completing the actuarial audit.

SCERS Consulting Team

Click card for bio or to contact

Anne Harper

Principal Consulting Actuary



Graham Schmidt

Consulting Actuary

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Certification

The purpose of this report is to present the results of the actuarial audit of the SCERS Actuarial Valuation Report dated June 30, 2021 and a review of the Experience Study covering the period from July 1, 2016 through June 30, 2019. This report is for the use of SCERS.

In preparing our presentation, we relied on information (some oral and some written) supplied by SCERS and Segal. This information includes, but is not limited to, the Plan provisions, employee data, and financial information. All data, assumptions, methods, and provisions are the same as those outlined in Segal's June 30, 2021 Actuarial Valuation Report. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23.

Cheiron utilizes ProVal actuarial valuation software leased from Winklevoss Technologies (WinTech) to calculate liabilities and project benefit payments. We have relied on WinTech as the developer of ProVal. We have a basic understanding of ProVal and have used ProVal in accordance with its original intended purpose. We have not identified any material inconsistencies in assumptions or output of ProVal that would affect this valuation.

To the best of our knowledge, this presentation and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this presentation. This presentation does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

This presentation was prepared for the SCERS Retirement Board for the purposes described herein. Other users of this presentation are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any other user.