Denver Employees Retirement Plan

2023 Preliminary Actuarial Valuation Results

July 21, 2023

What is the Denver Employees Retirement Plan?

Membership

What is its financial condition?

Liabilities, Assets and Funded Status

Contribution Requirements

How did it get here?

What happened since last year?

History and Trends

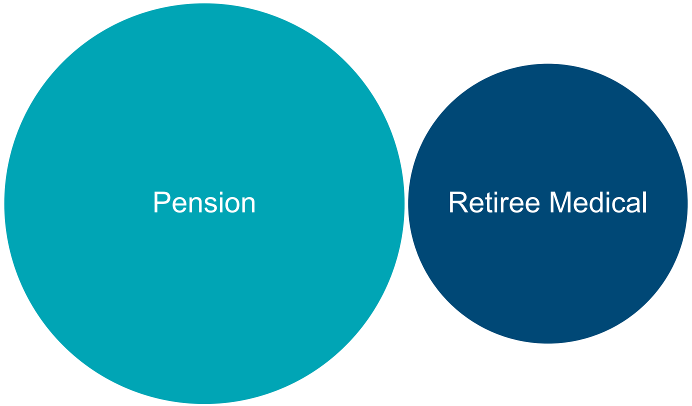
Where is it going?

What's Expected?

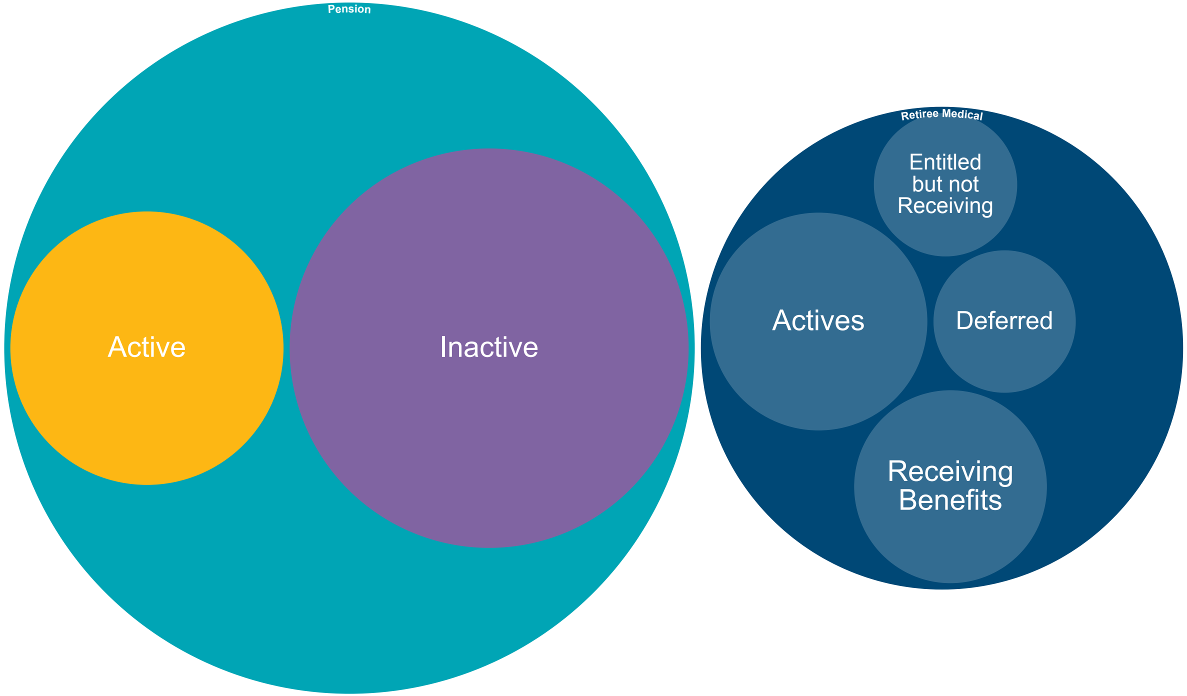
Lowering Assumed Rate of Return?

a **System** is designed to provide **pension** and **retiree medical** benefits to the **members** on behalf of the **City of Denver** and related agencies.

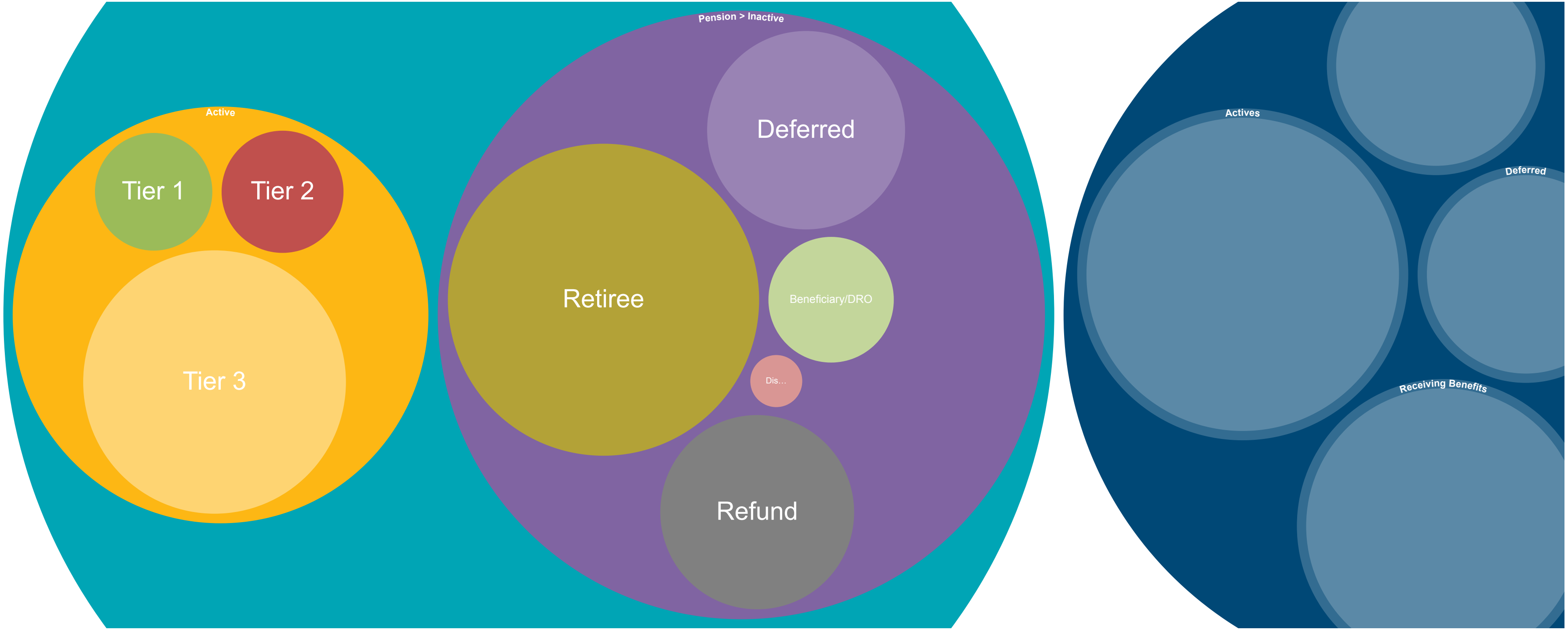
Who are the members? Let's take a closer look: As of January 1, 2023, the Pension Plan had over **27,000 total members**. The Retiree Medical counts were slightly lower (just under 24,000) since some retirees who are eligible to receive a monthly pension do not elect to participate in the medical plan.



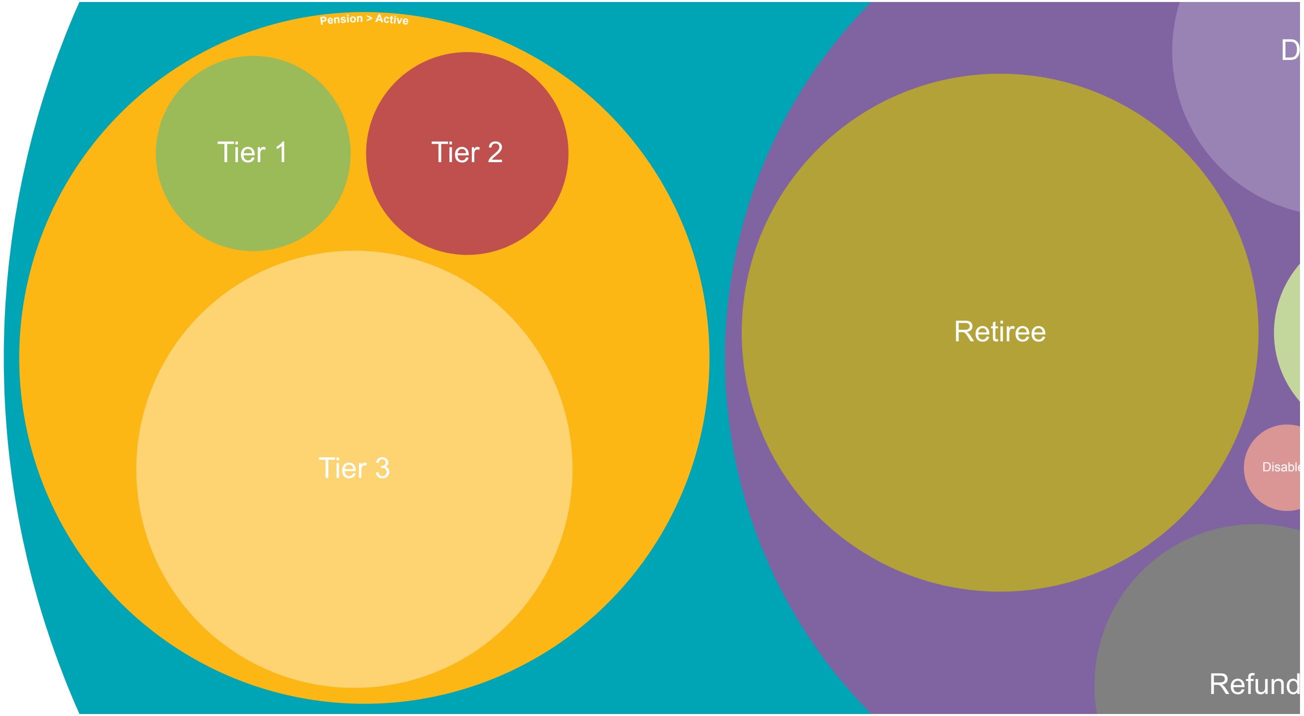
About a third of the pension members are **active** employees.



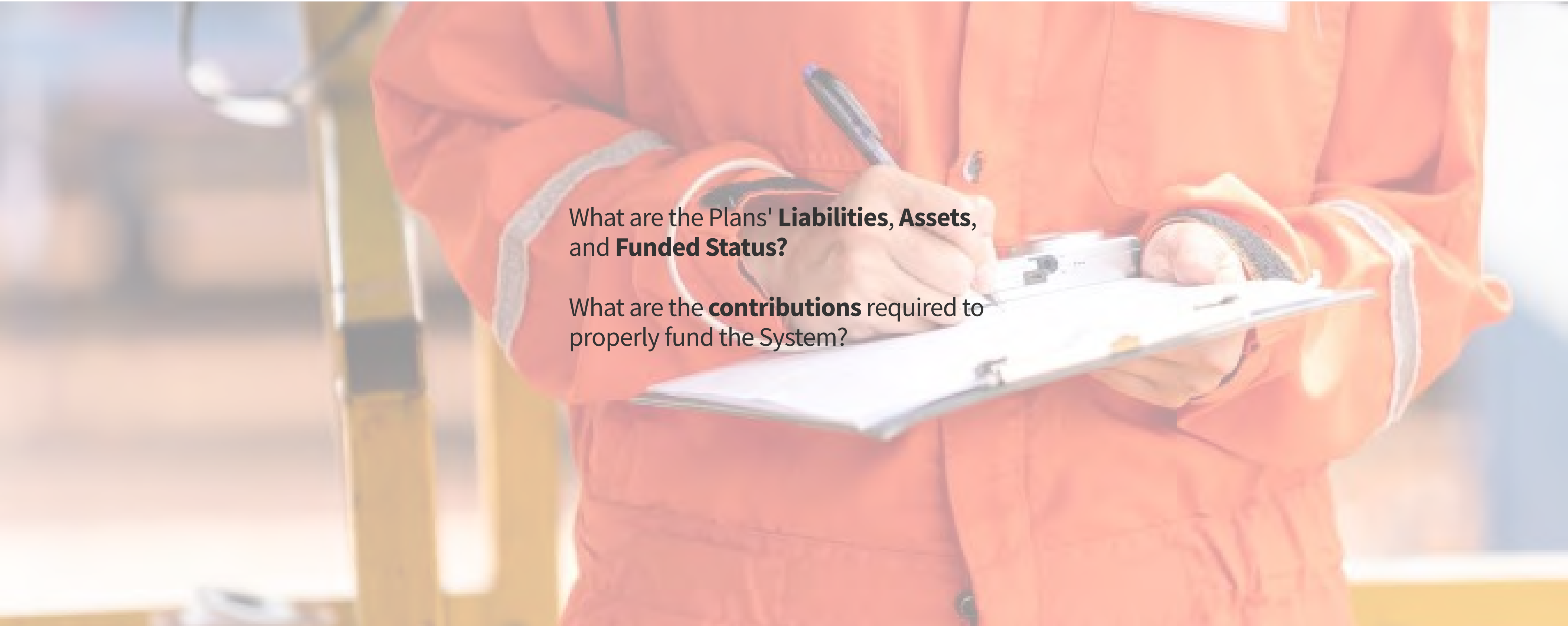
The **inactives** include the members **in pay status** - retirees, disabled members, or beneficiaries - as well as those eligible for a **deferred benefit** or **refund.**



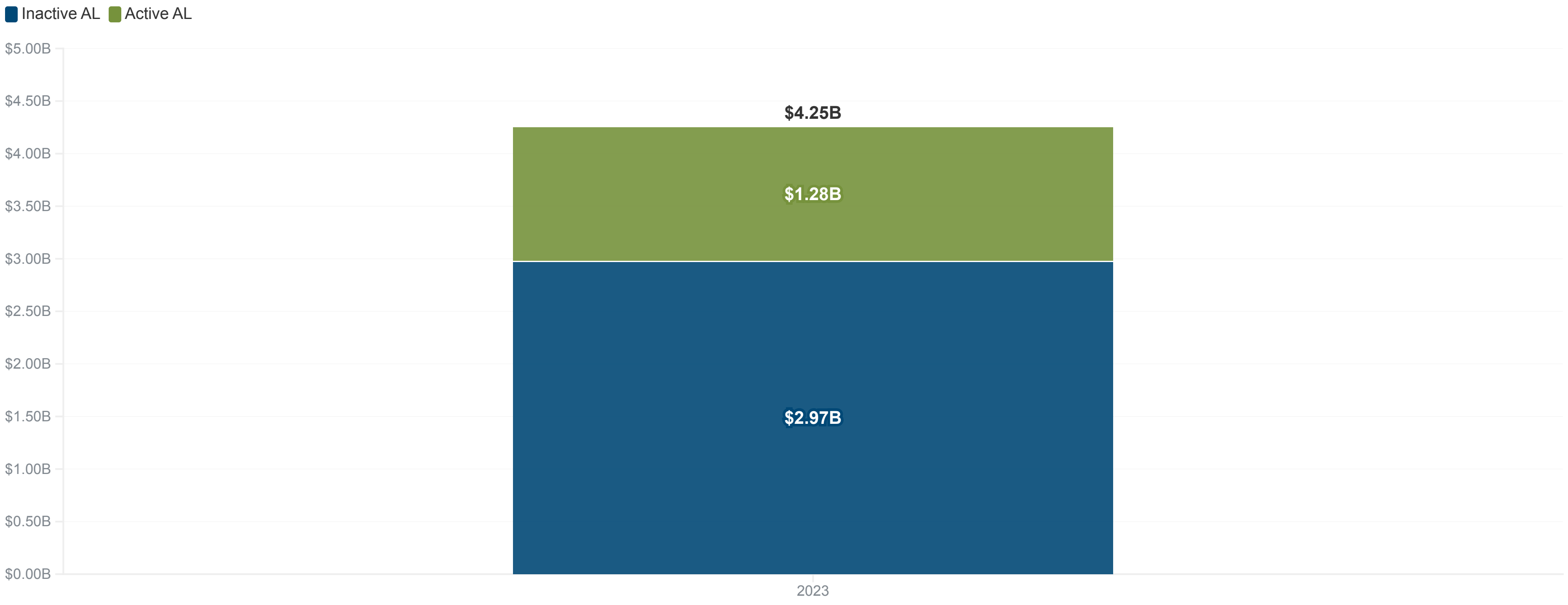
Over 70% of the actives are members of the newest tier (Tier 3). But the active Tier 3 liability is only 16% of the total DERP active pension liability.



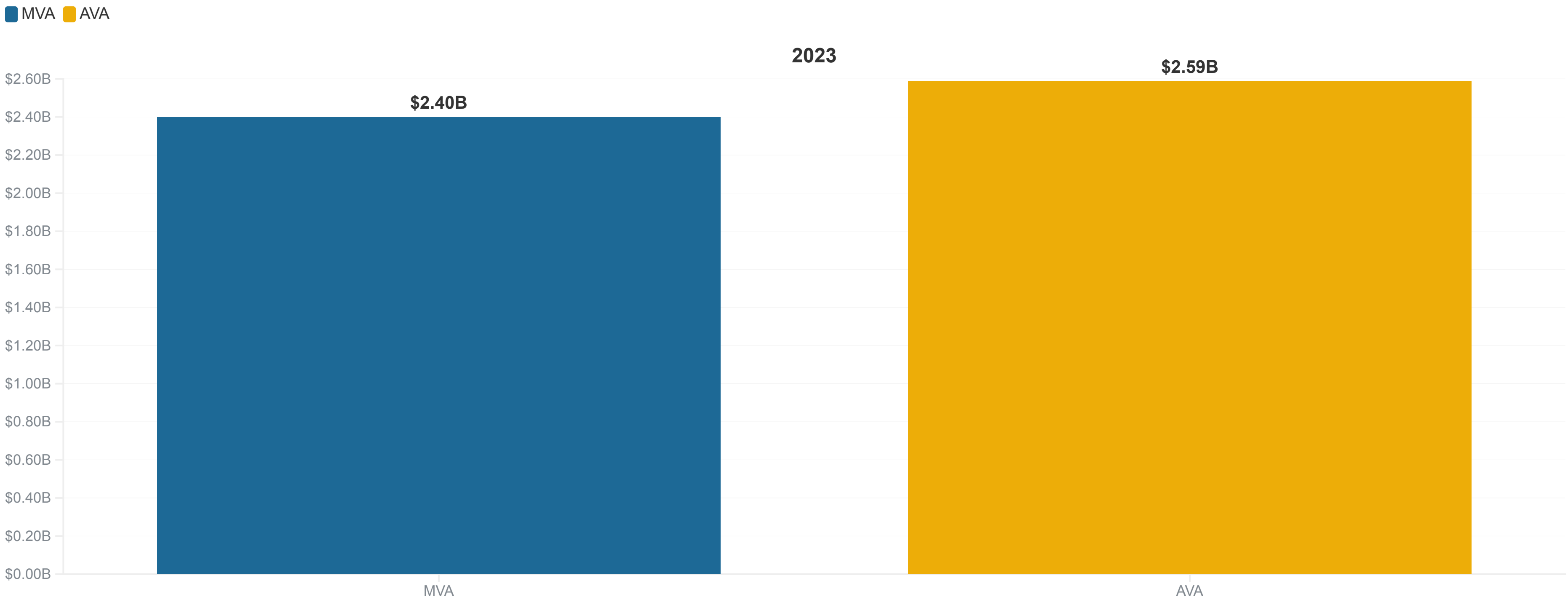
We next turn to the current condition of the both Pension and Retiree Medical Plans.



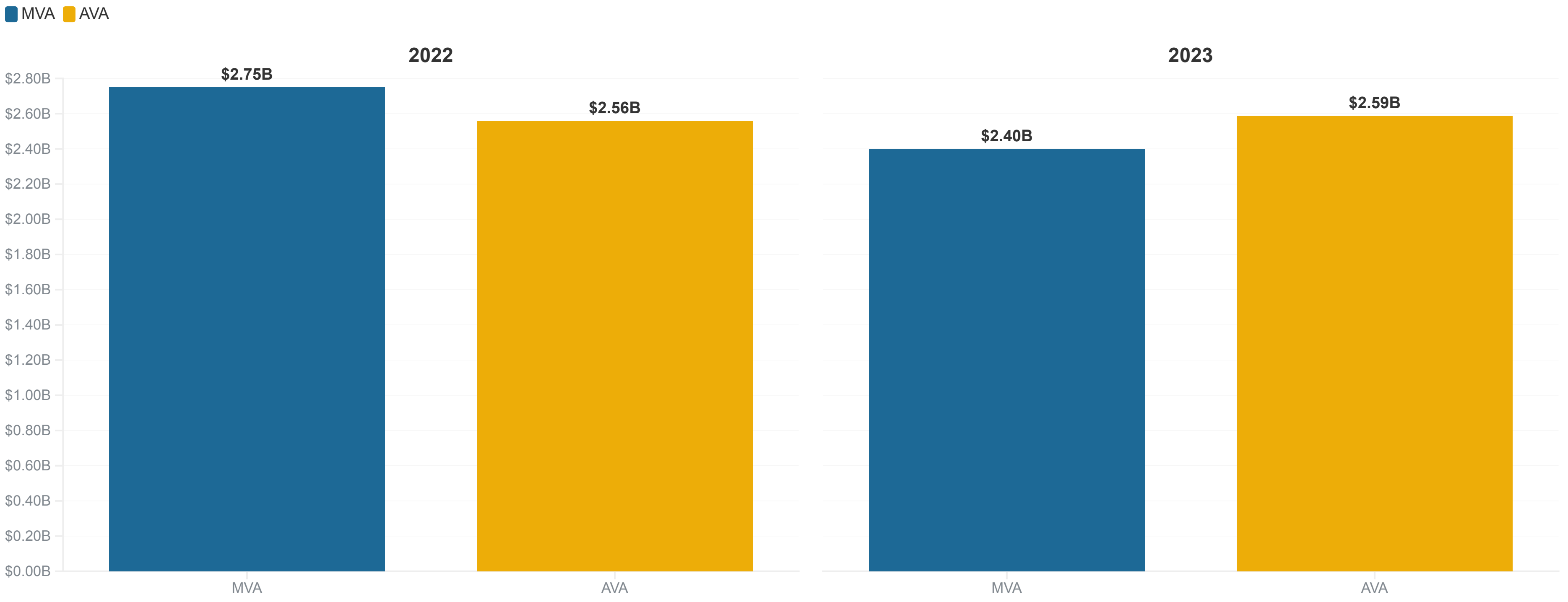
First, we show the value in *today's dollars* of all pension and retiree medical benefits for service earned as of January 1, 2023 for all current members, known as the **Actuarial Liability (AL),** or current funding target for the assets. 96% of DERP's liability comes from the pension plan.



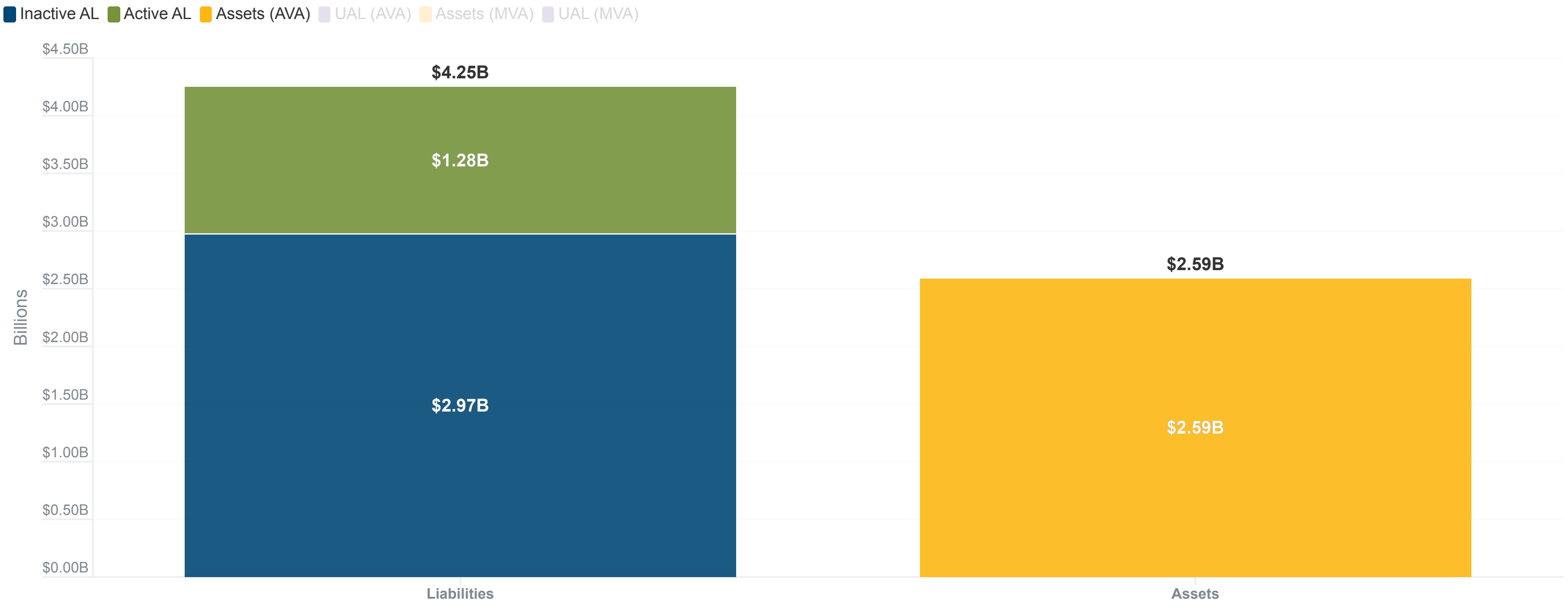
Next we turn to the assets of the Plans. The **Market Value of Assets (MVA)** can fluctuate significantly from year-to-year with rapid changes in investment markets. A smoothed value, the **Actuarial Value of Assets (AVA)**, is used to reduce volatility in the contributions and better understand trends in funded status.



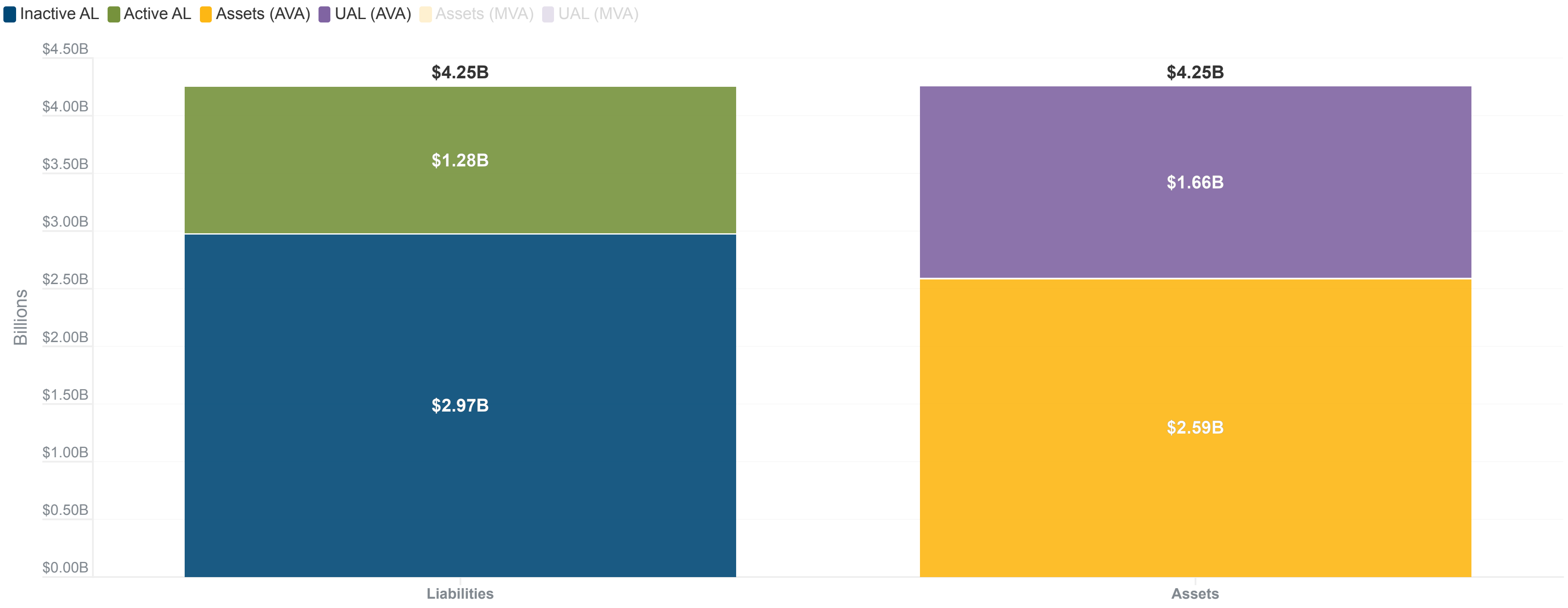
The return on the market value of assets was -9.2% during 2022, while the return on the actuarial value was 5.2%. Both exhibited losses since the returns were below the assumed return of 7.25%.



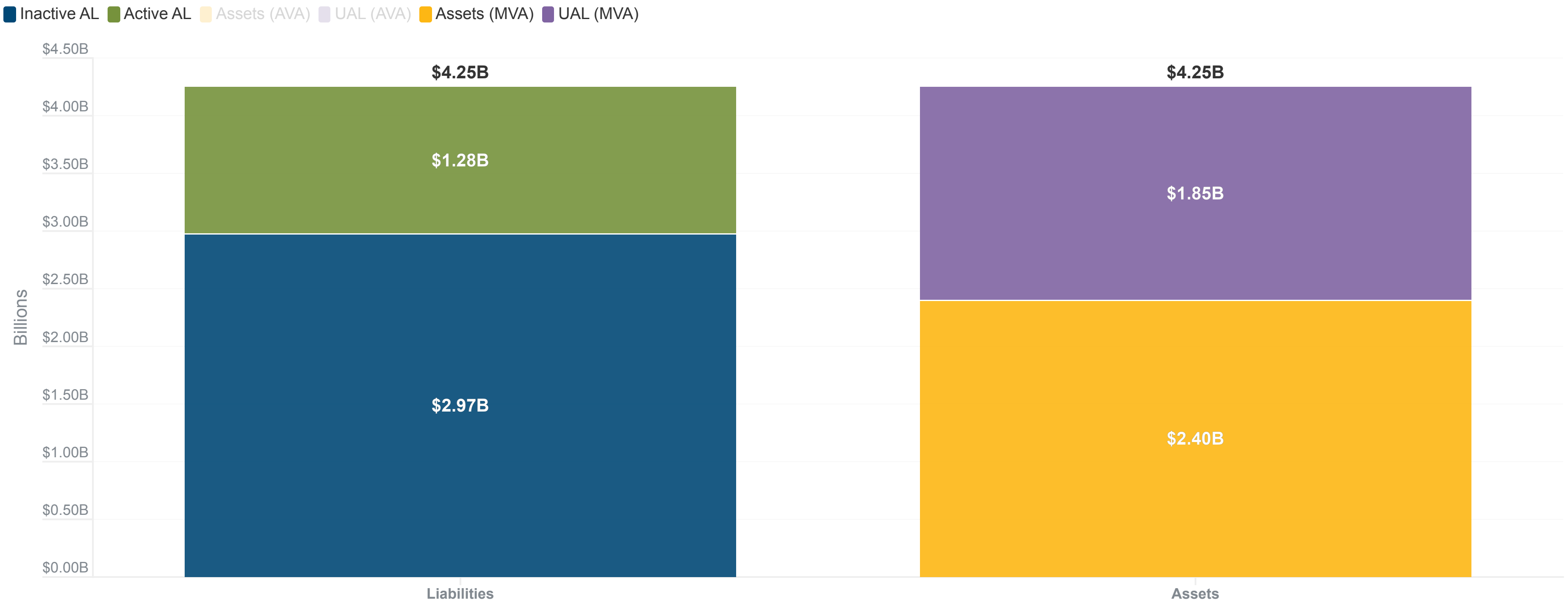
Next, we review the **Funded Status** of the Plans, where the **liabilities** are compared to the **assets**.



The **Unfunded Actuarial Liability (UAL)** of $1.66B is calculated by subtracting the Actuarial Value of Assets (AVA) from the Actuarial Liability. As of January 1, 2023 the **funded ratio** based on the AVA is **60.9%** compared to the last year's funded ratio of 61.2%.



On a **Market Value** basis, which is also what is used in the Plans' financial reporting (GASB). The unfunded liability on a market basis is higher, because there are deferred asset losses not yet reflected in the smoothed value of assets. As of January 1, 2023 the **funded ratio** based on the **Market Value of Assets** is **56.4%** compared to last year's funded ratio of 65.8%.

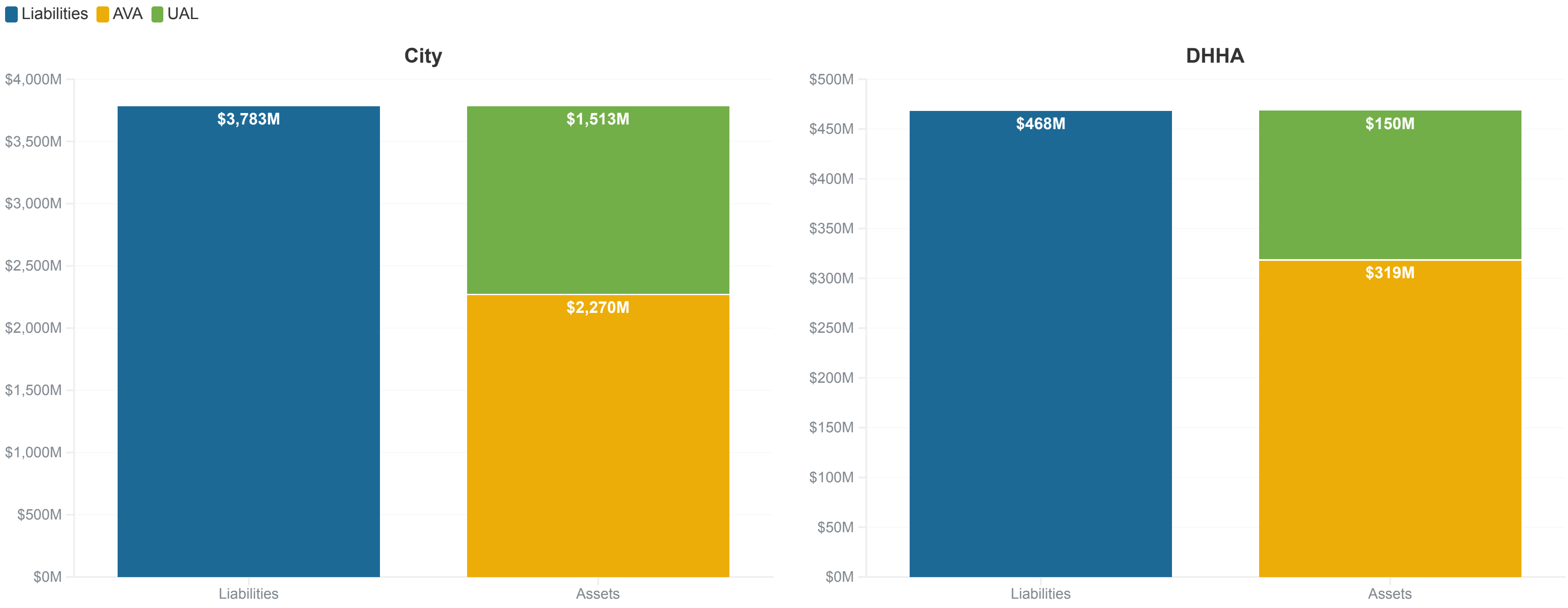


CHEIRON

DERP's UAL is allocated between the City and DHHA. The DHHA liability shown below excludes service prior to 1997 for calculating DHHA-based benefits.

The assets were allocated between each group based on the share of their liabilities as of January 1, 2022. Asset reserves were created for the City and the DHHA to maintain separate accounting based on each employer's contributions and benefit payments. The allocation of the Actuarial Value of Assets as of January 1, 2023 is shown below.

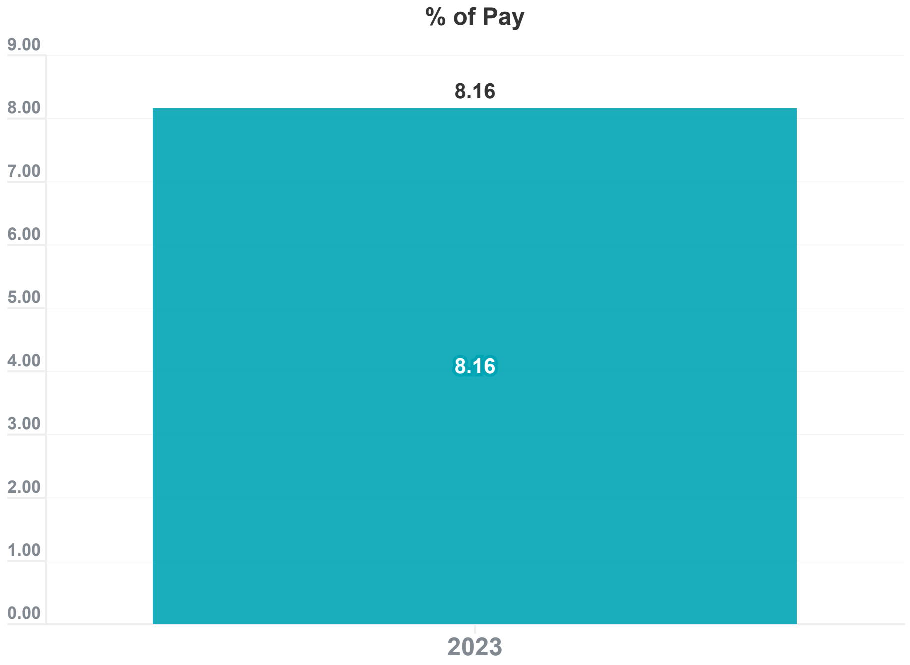
The net result is a UAL amount of $1,513M for the City and $150M for DHHA.

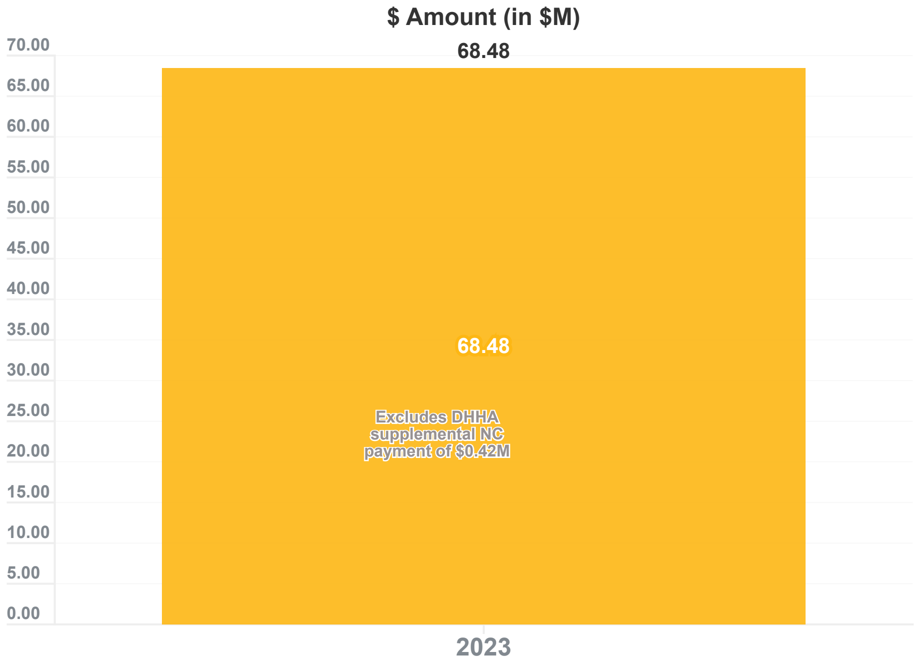


CHEIRON

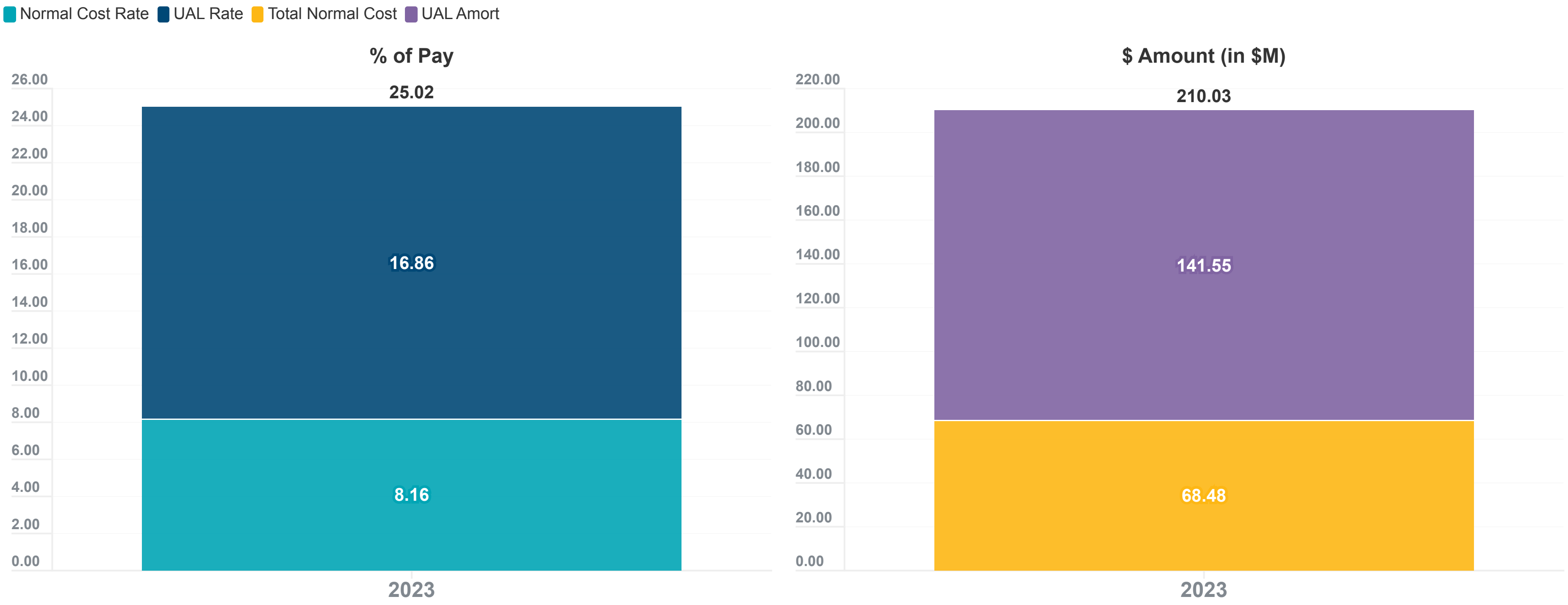
Next we review the **Actuarially Determined Contributions (ADC)**, shown below both as a *percentage of payroll* and a *dollar amount***.** The first component of the ADC is the **Normal Cost,** or the cost for active member benefits earned during 2023. There is also a small additional supplemental normal cost payment made by DHHA as a result of its being a closed group.

Normal Cost Rate · UAL Rate · Total Normal Cost · UAL Amort



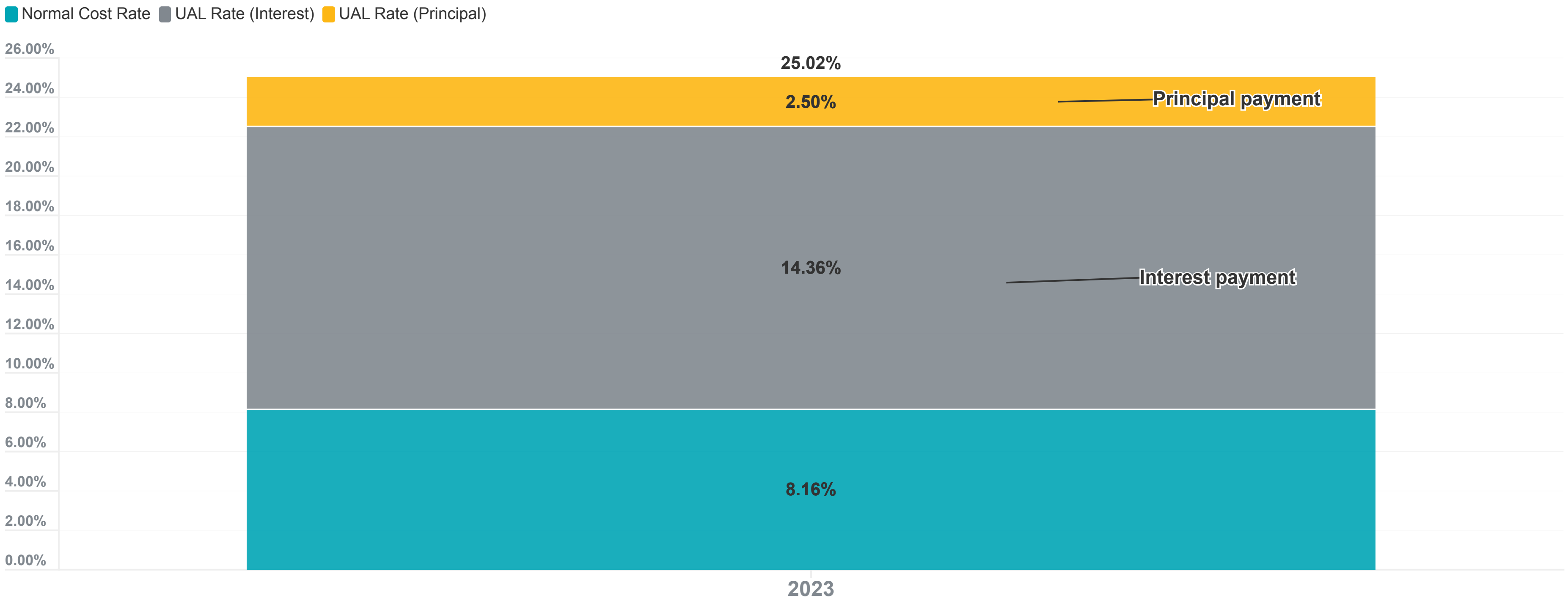


The other component of the ADC is the **Unfunded Liability Amortization** payment, or the amount necessary to pay off the UAL over the period of time designated in DERP's funding policy.

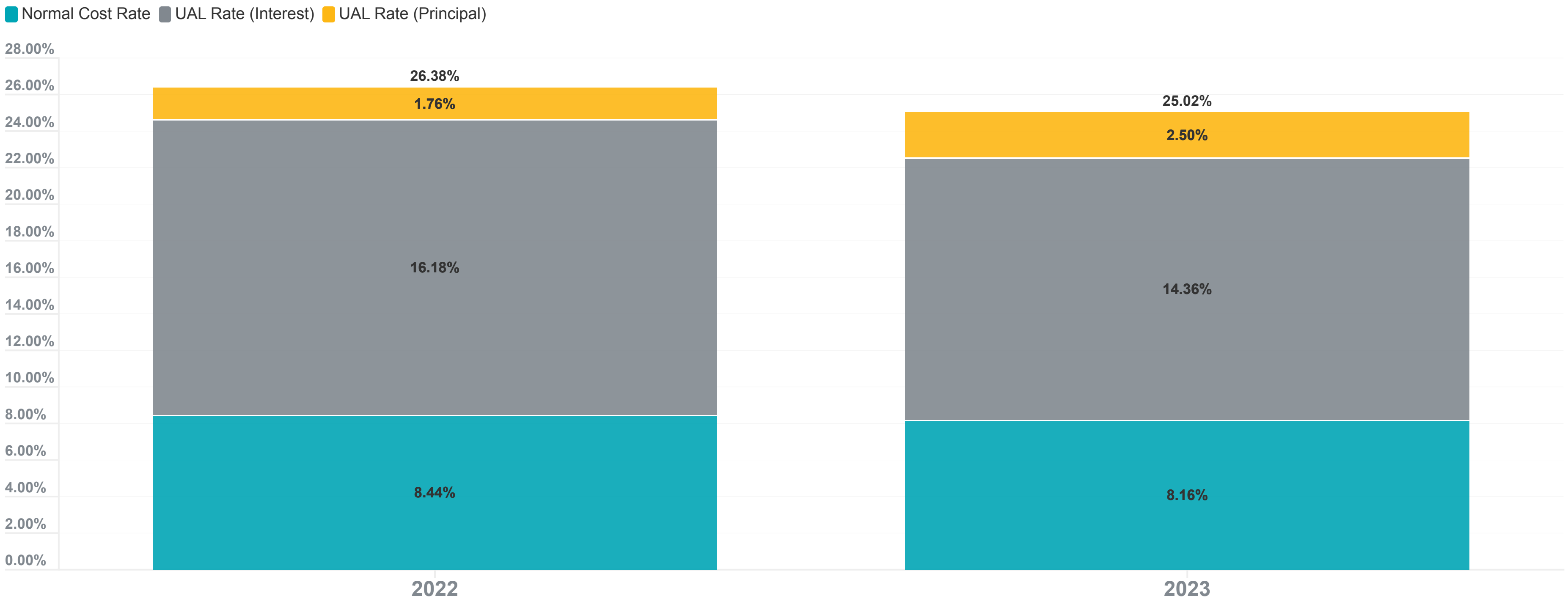


CHEIRON

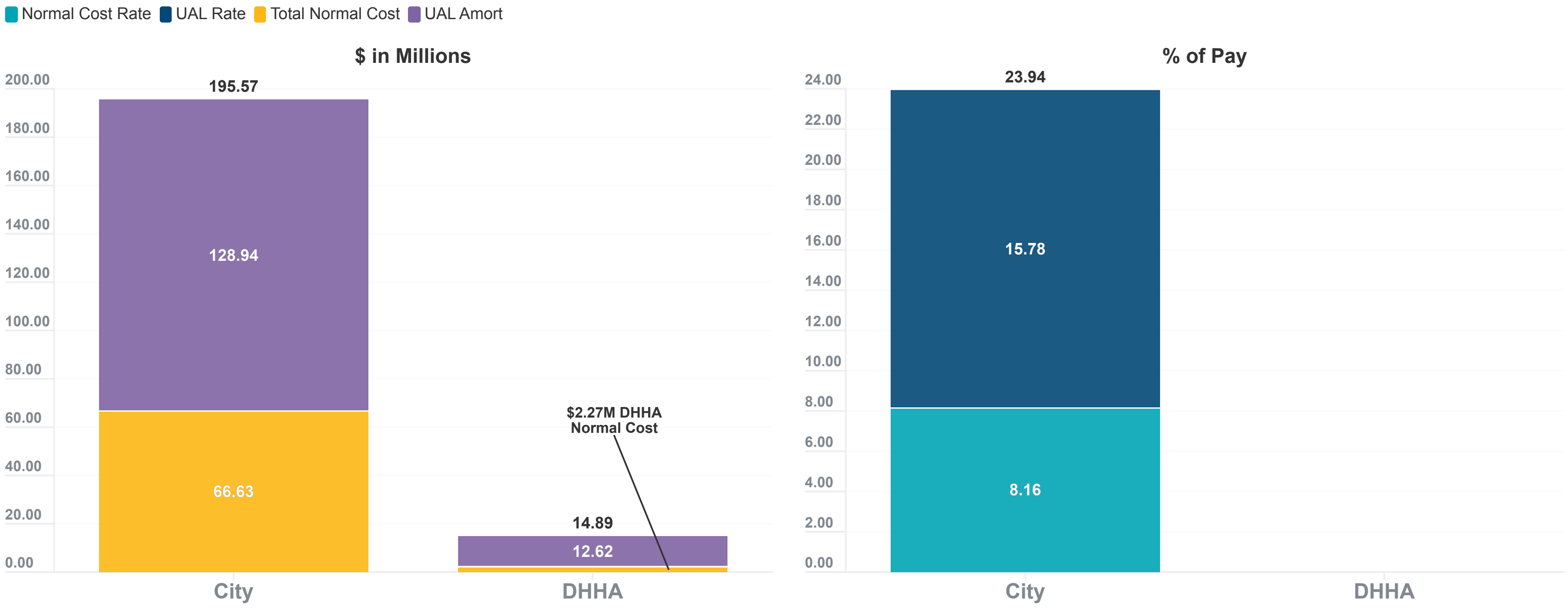
The UAL rate can be split into the payment made to cover the interest on the UAL, and a smaller payment towards the UAL principal.



The amount of UAL principal being paid increased from 1.76% of payroll in 2022 to 2.50% of payroll in 2023.

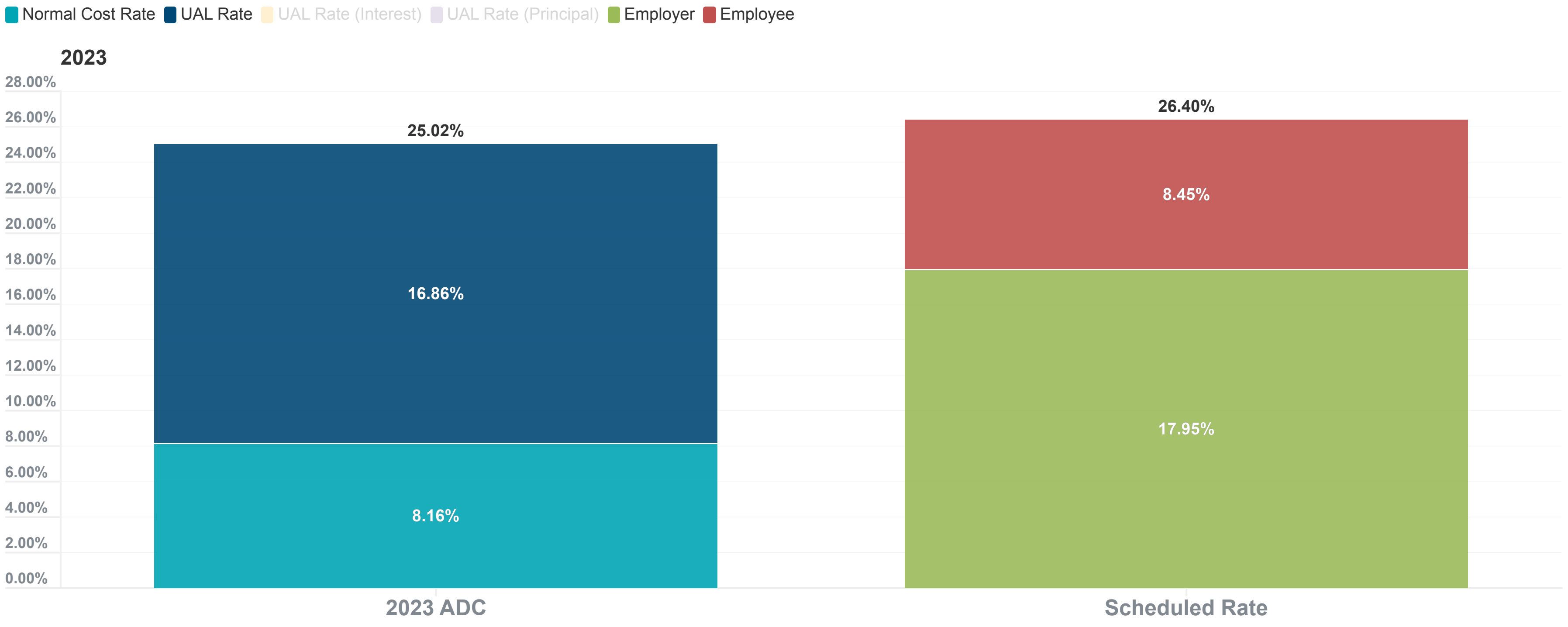


The ADC split between the City and DHHA is shown below. The DHHA payment includes the supplemental normal cost payment mentioned previously. The City payment is also shown as a percentage of payroll, but the DHHA is not, since DHHA is a closed group and their payroll is expected to shrink over time.

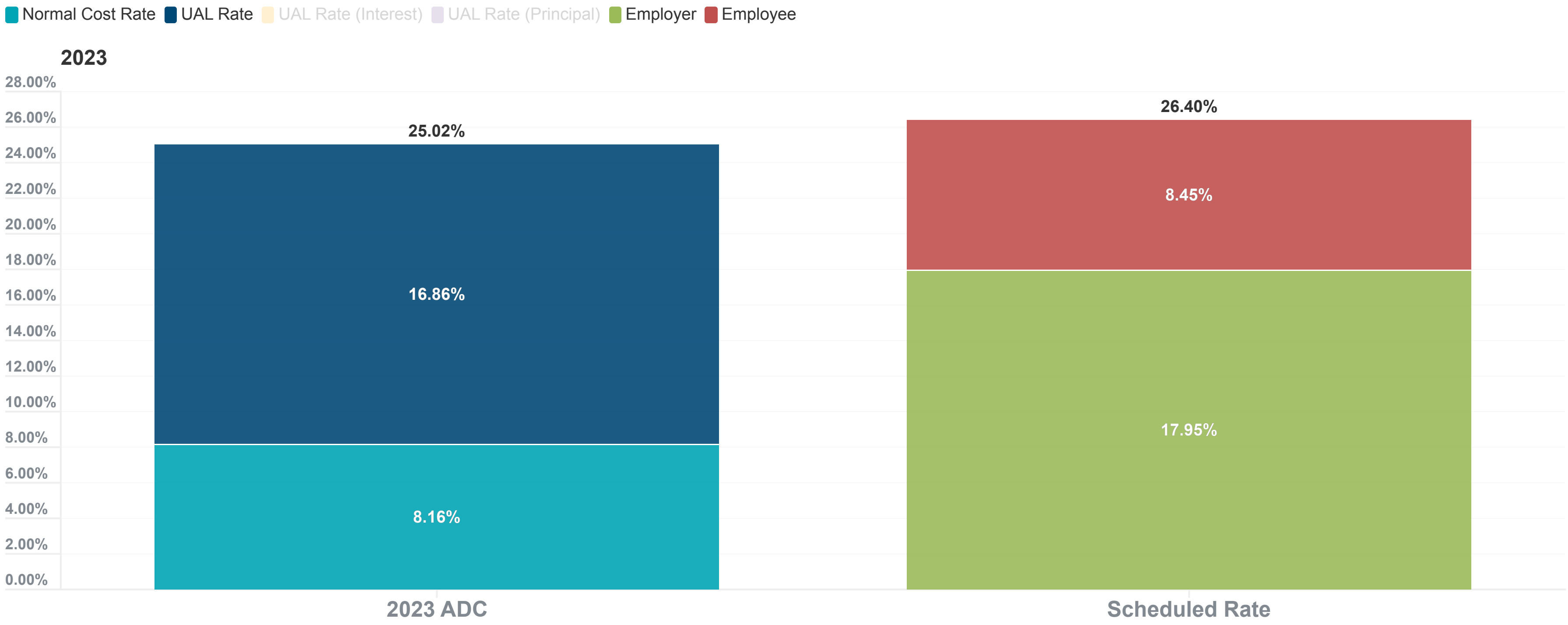


CHEIRON

The total ADC rate can be compared to the actual scheduled rates for the year: 8.45% for the members and 17.95% for the employers.



Comparing the two, we see that the ADC, at the current 7.25% assumed rate of return, is less than the total of the scheduled rates by 1.38% of pay for 2023.



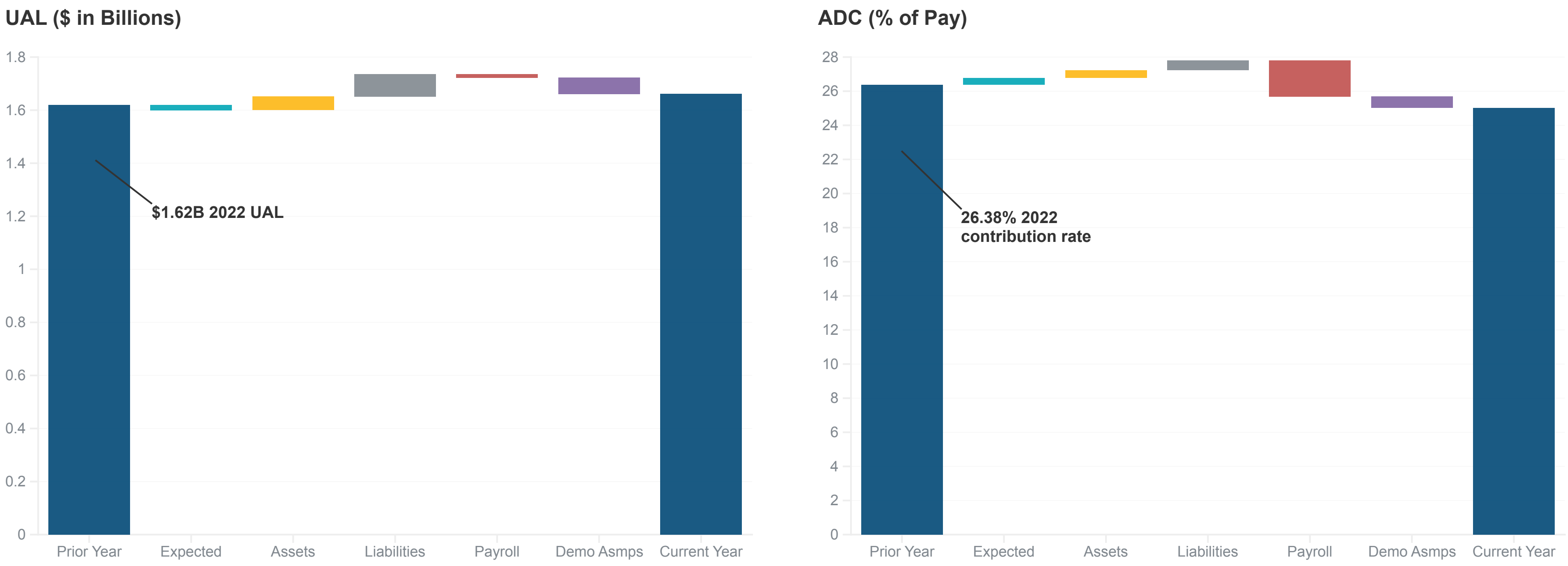
Now it's time to review how the Plans got to where they are today.

What happened to the System in the **past year?**

What are the **history** and **trends** over time?

First, we review the change in the Unfunded Actuarial Liability (UAL) and Actuarially Determined Contribution (ADC) rate over the past year.

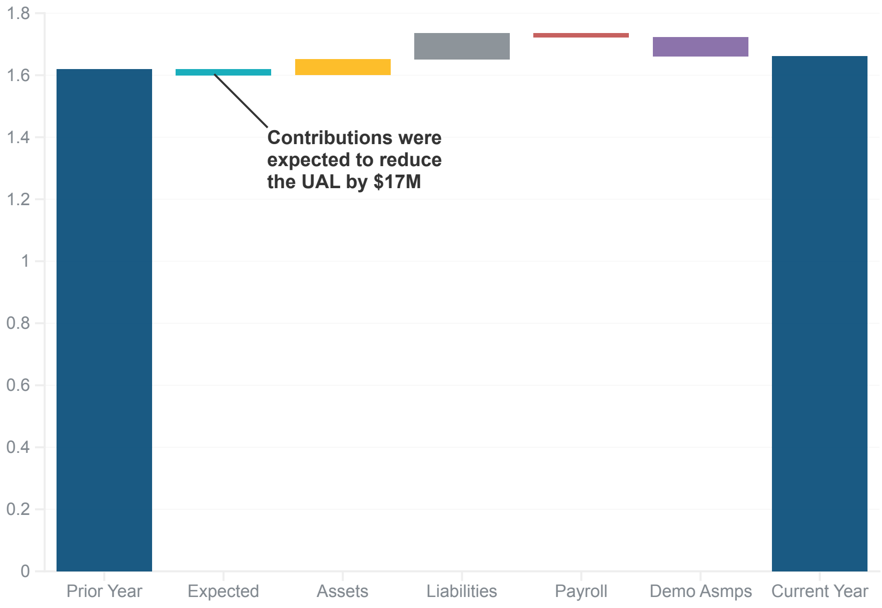
UAL and ADC Change by Source



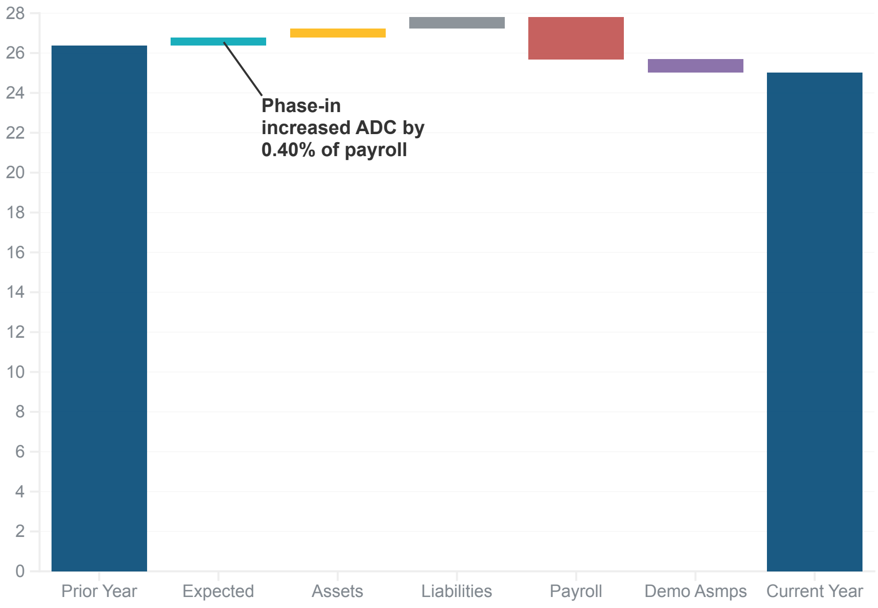
Contributions were expected to exceed the Normal Cost plus interest on the UAL, reducing the UAL, even though the payment for lowering the assumed rate of return to 7.25% was still being phased-in.

UAL and ADC Change by Source

UAL ($ in Billions)



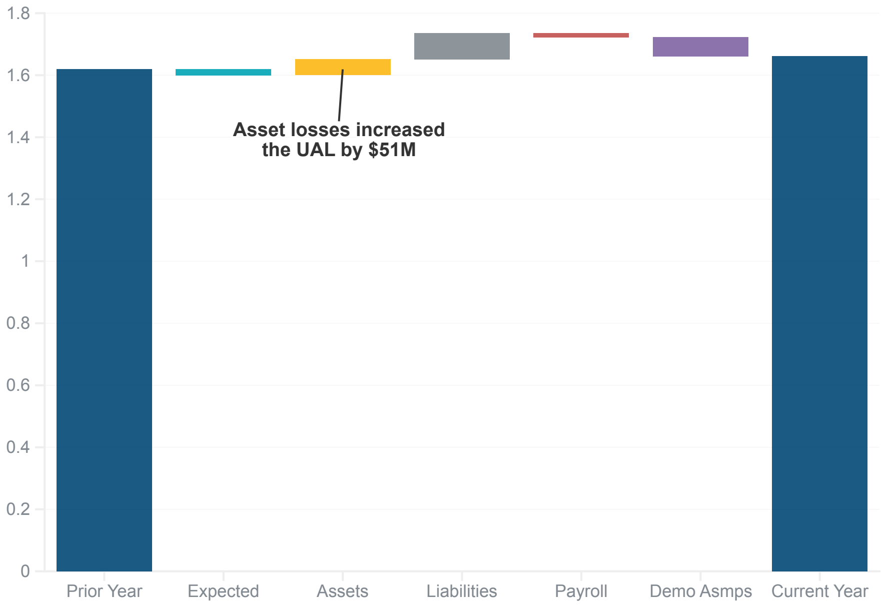
ADC (% of Pay)



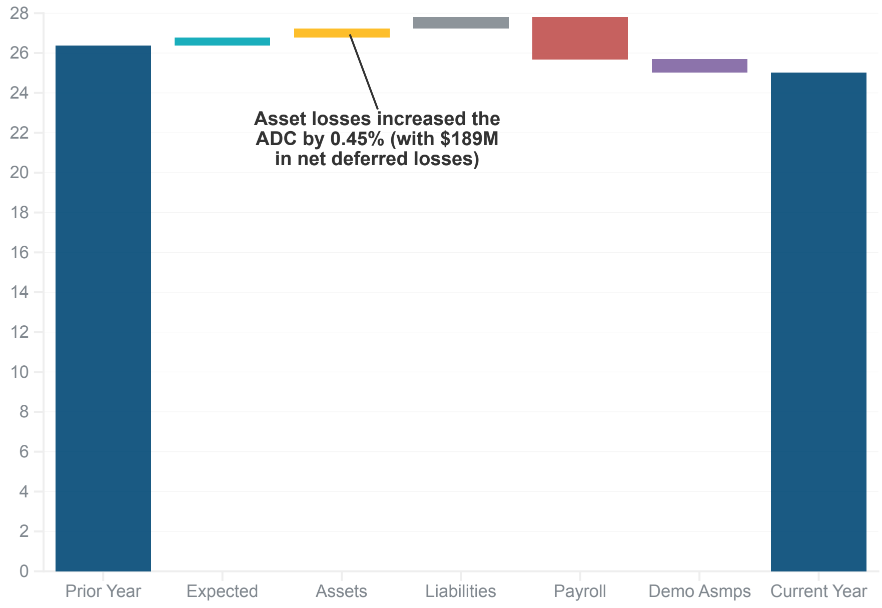
Assets returned less than than expected, - 9.2% on a market basis (net of investment and administrative expenses) and 5.2% on a smoothed basis - increasing the UAL and ADC.

UAL and ADC Change by Source

UAL ($ in Billions)



ADC (% of Pay)

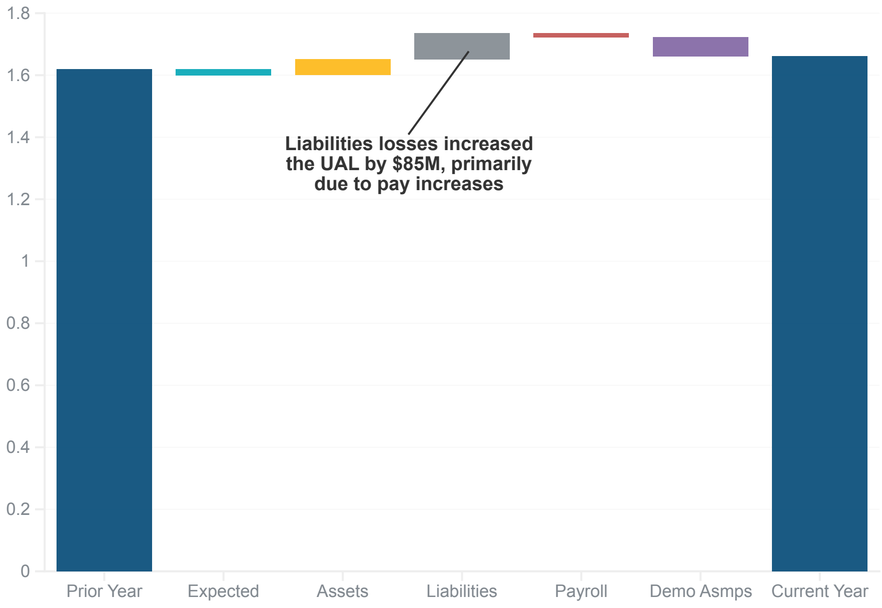


CHEIRON

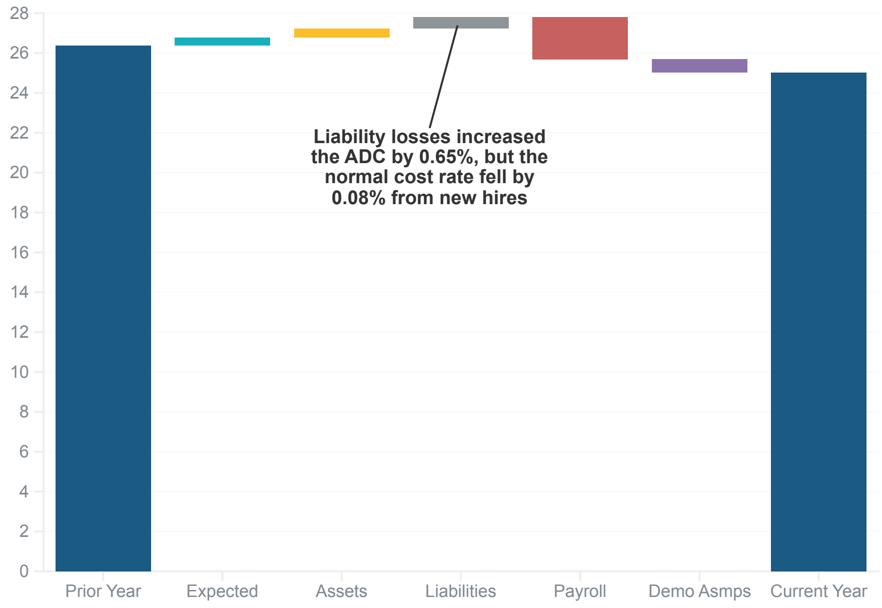
Liabilities were higher than expected, increasing the UAL and the UAL amortization payment. The impact on the ADC was offset by the continued decline in the Normal Cost rate caused by the transition to Tier 3 members.

UAL and ADC Change by Source

UAL ($ in Billions)



ADC (% of Pay)

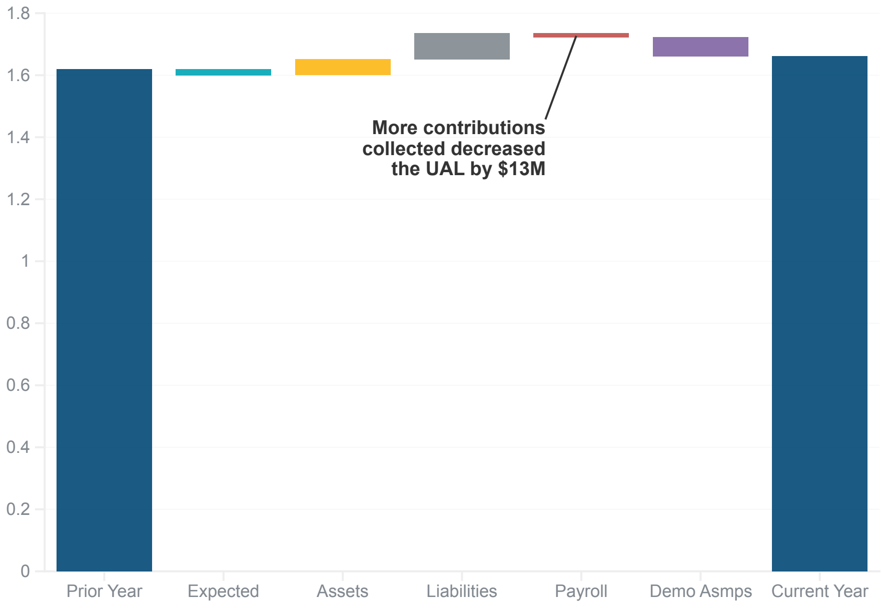


CHEIRON

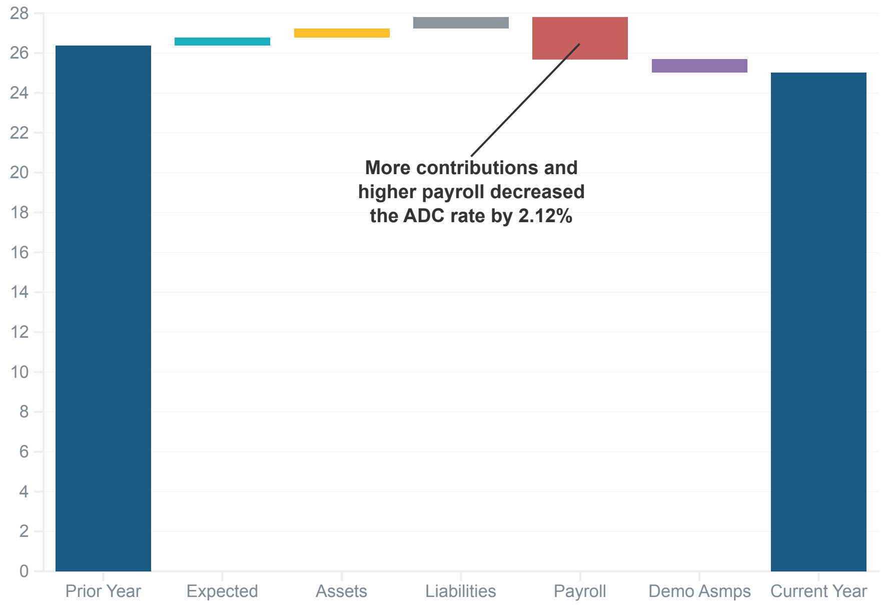
Payroll growth was extraordinary - almost 16% versus the 3.0% assumption - which resulted in more contributions being collected than anticipated and decreased both the UAL and ADC. The UAL payment decreased as a percentage of pay since the dollar payments are spread over a significantly larger payroll base.

UAL and ADC Change by Source

UAL ($ in Billions)

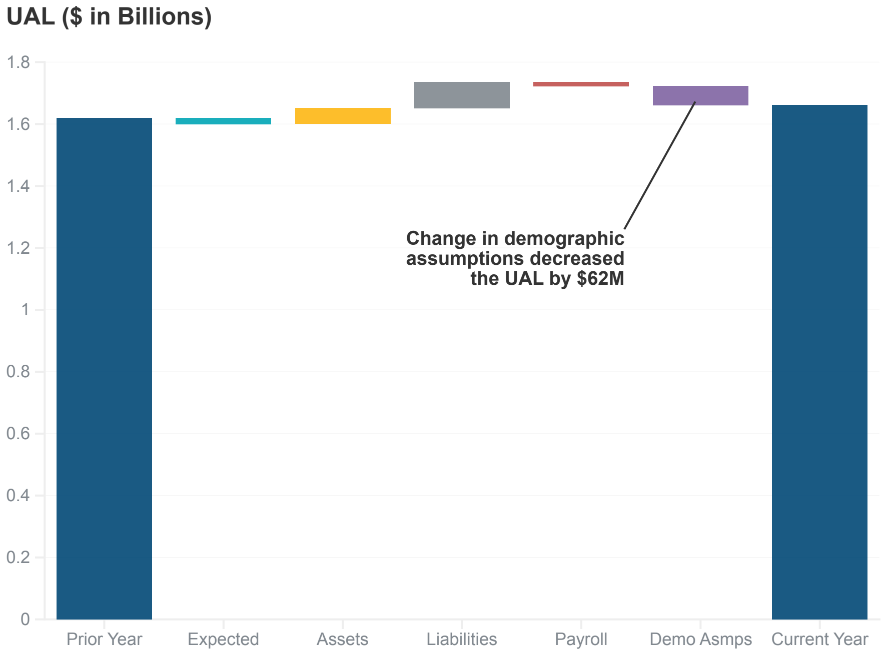


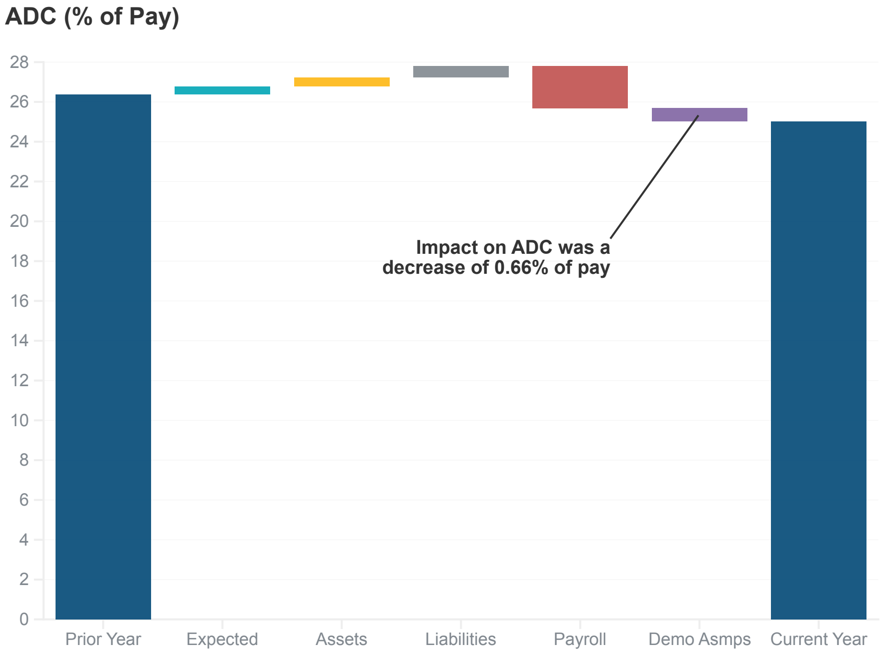
ADC (% of Pay)



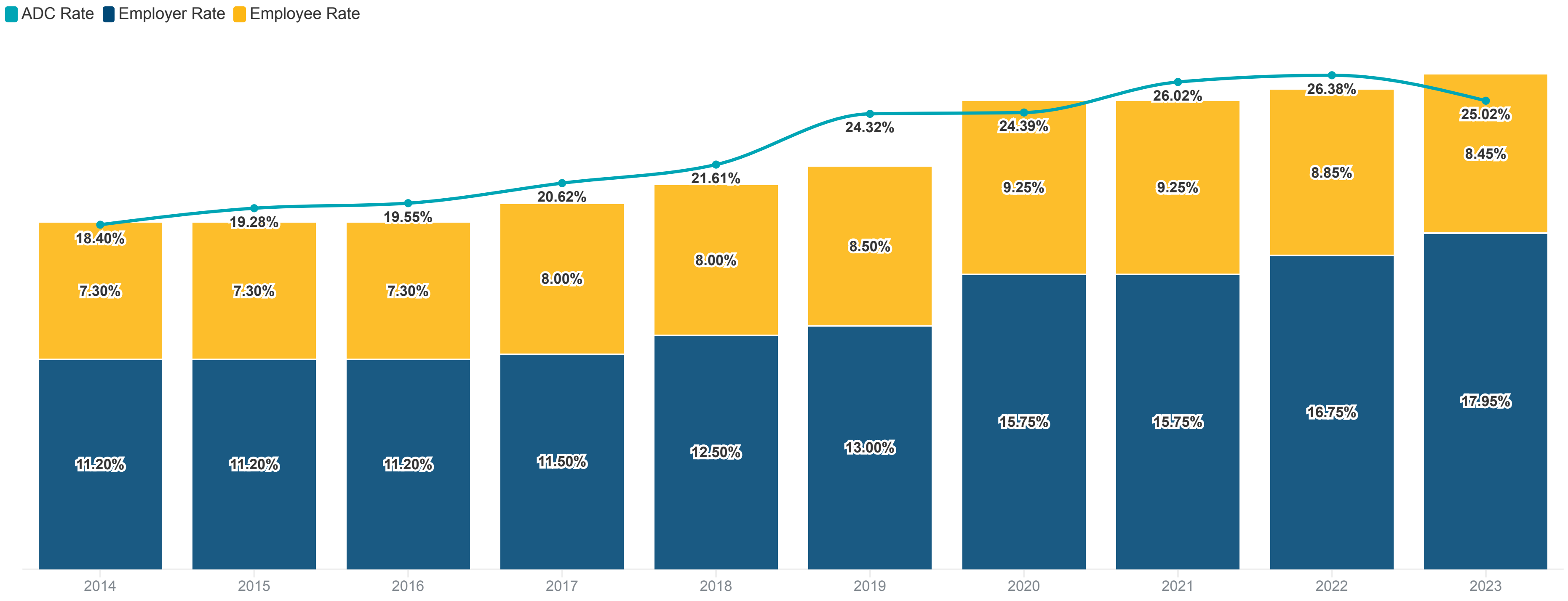
The demographic assumptions adopted at the May 2023 Board meeting decreased the UAL and ADC. Most notable was the impact of less optimistic improvements in mortality.

UAL and ADC Change by Source

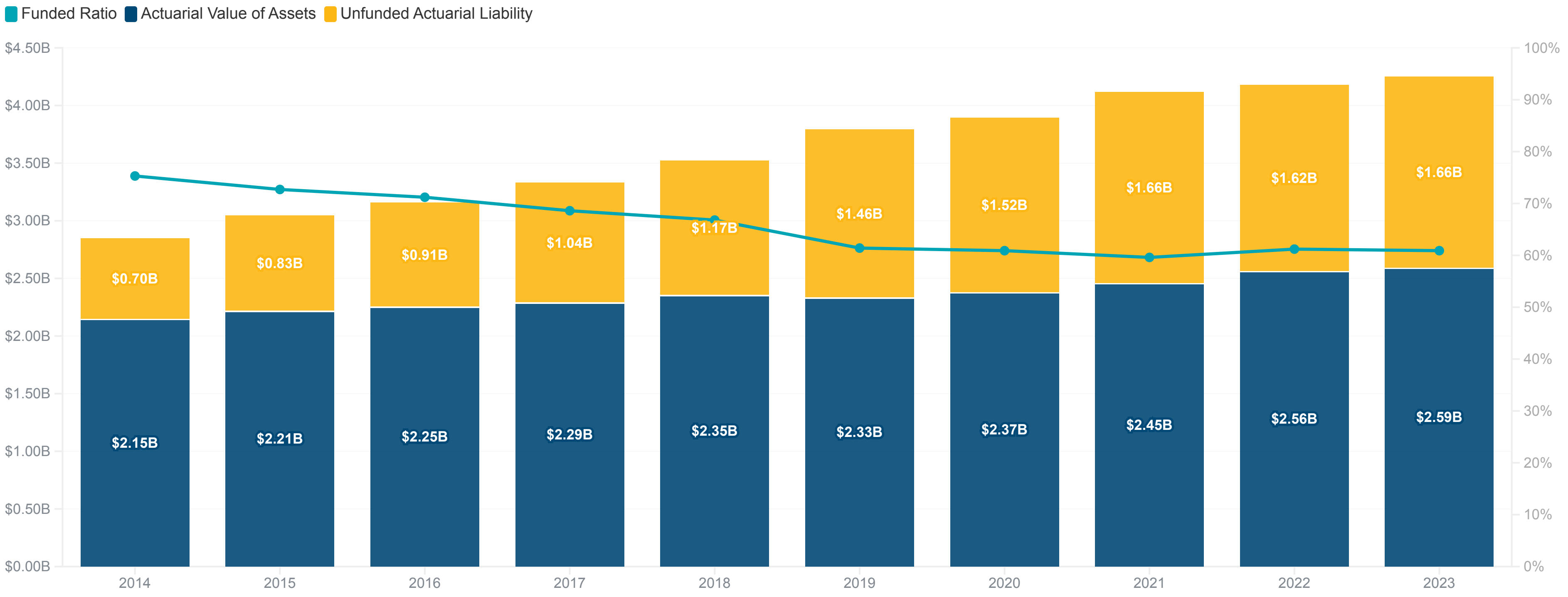




We next review the **history and trends** in the contributions. The ADC rates have increased over the past ten years as a result of investment experience and assumption/method changes. There were significant increases in the ADC in 2019 from actuarial method changes (changing the amortization and asset smoothing methods) and in 2021 as a result of reducing the discount rate. The actual scheduled rates have generally tracked the ADC rate, with a slight lag in most years.

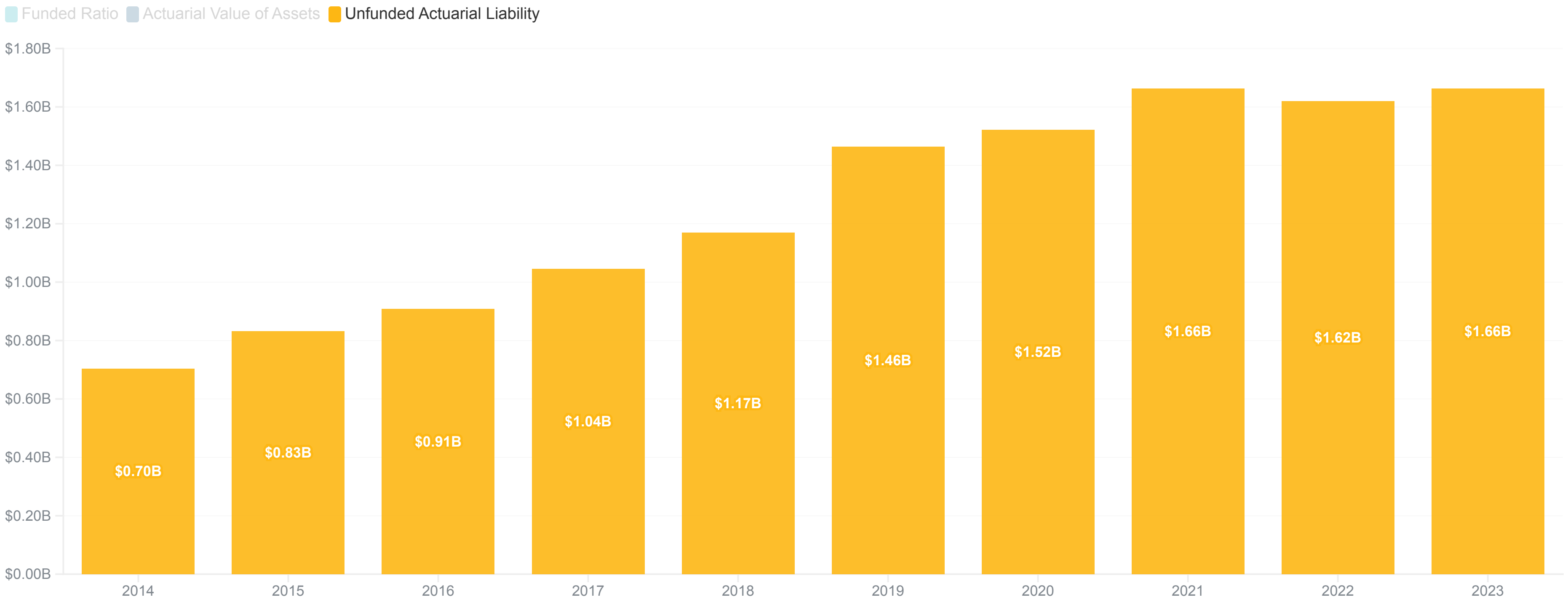


Next, we review the history of the unfunded liability over the past decade. The line shows the funded ratio, with the scale shown along the right-hand axis.

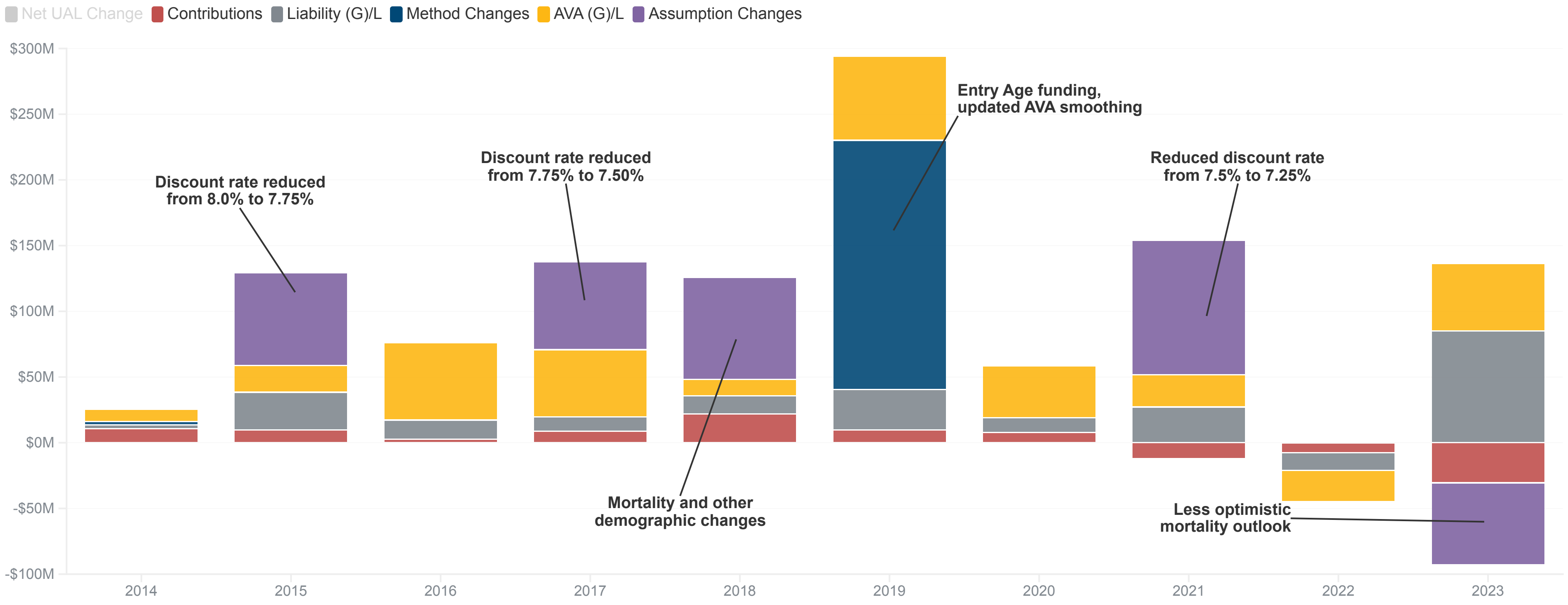


CHEIRON

Overall, the UAL increased by almost $1.0 billion over this period.

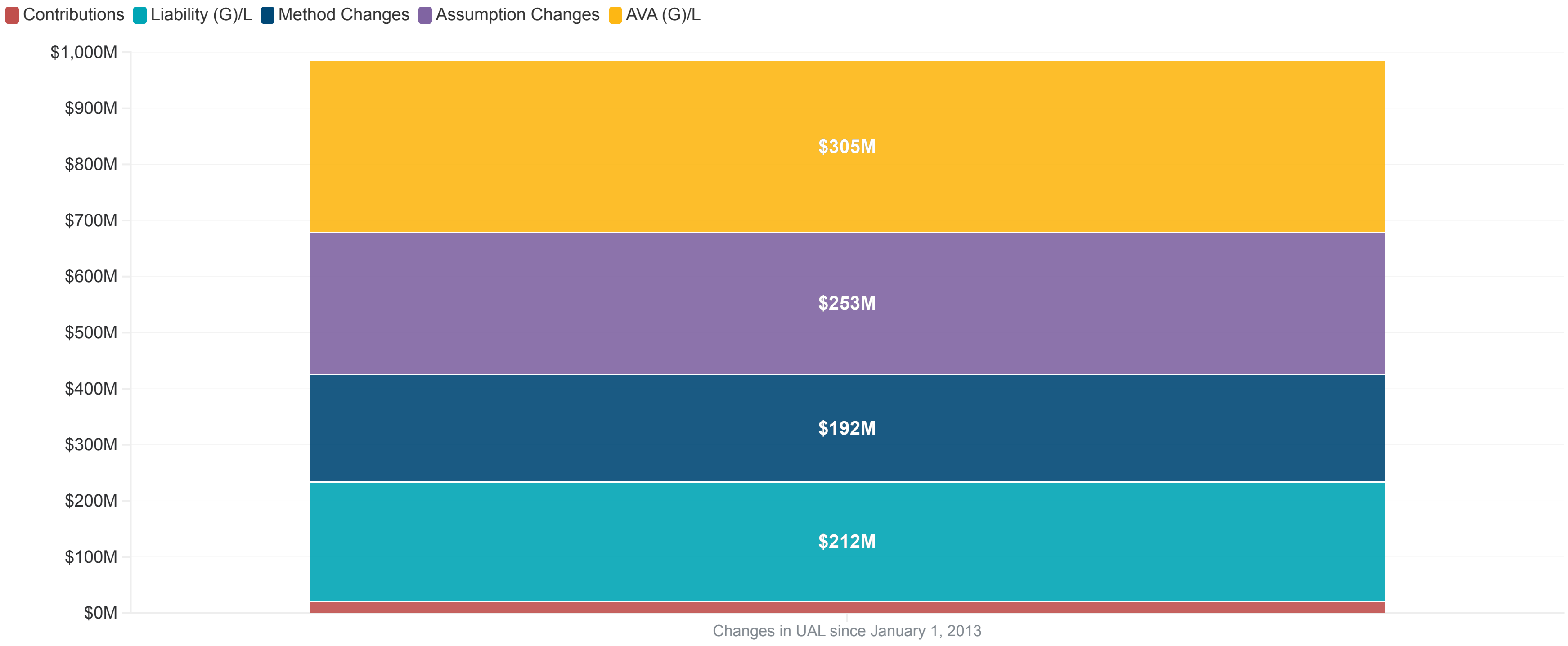


Reviewing the annual changes, the biggest events were the method changes in 2019 and the assumption changes in multiple years. We note that the assets and liabilities have both suffered losses in every year except in 2022. Beginning in 2021, the contributions began to exceed the "tread water" level (i.e. Normal Cost plus interest on the UAL).



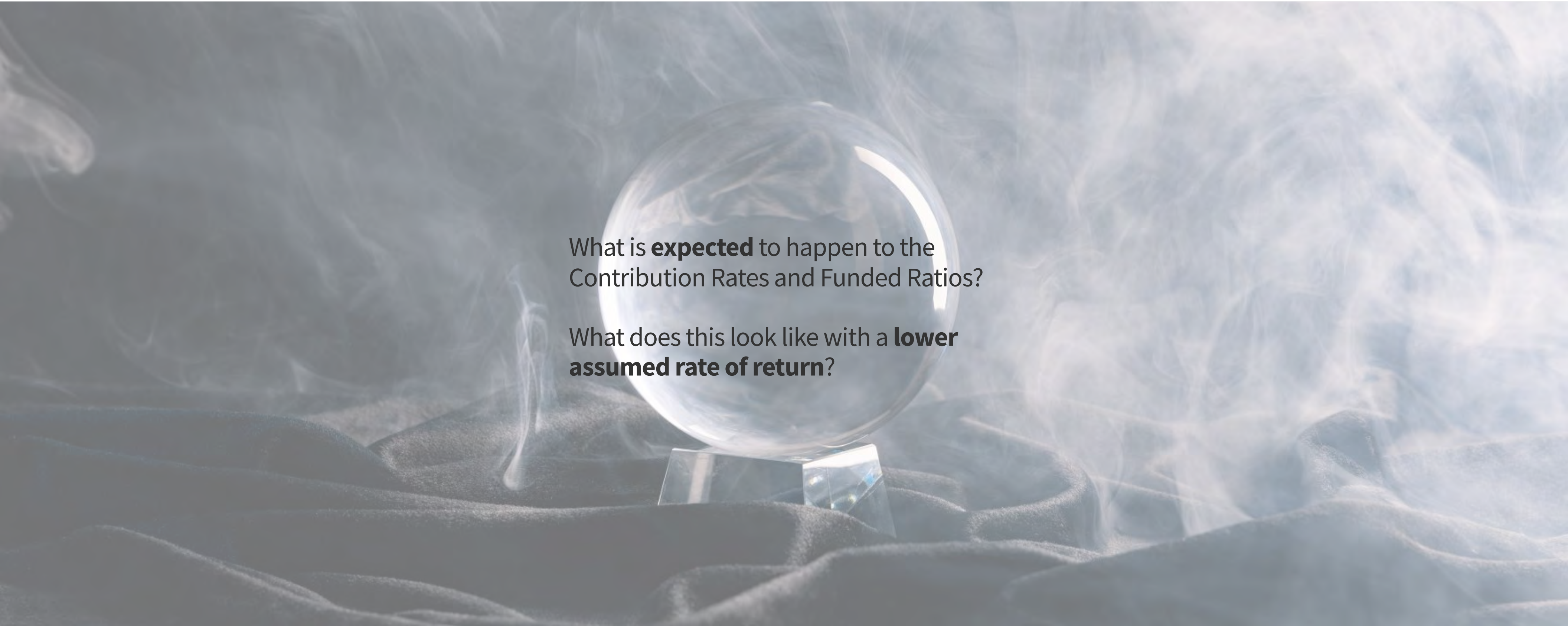
CHEIRON

This chart shows the UAL changes by source over all 10 years. Assumption changes and asset losses have had the largest impact on the UAL over the past decade.



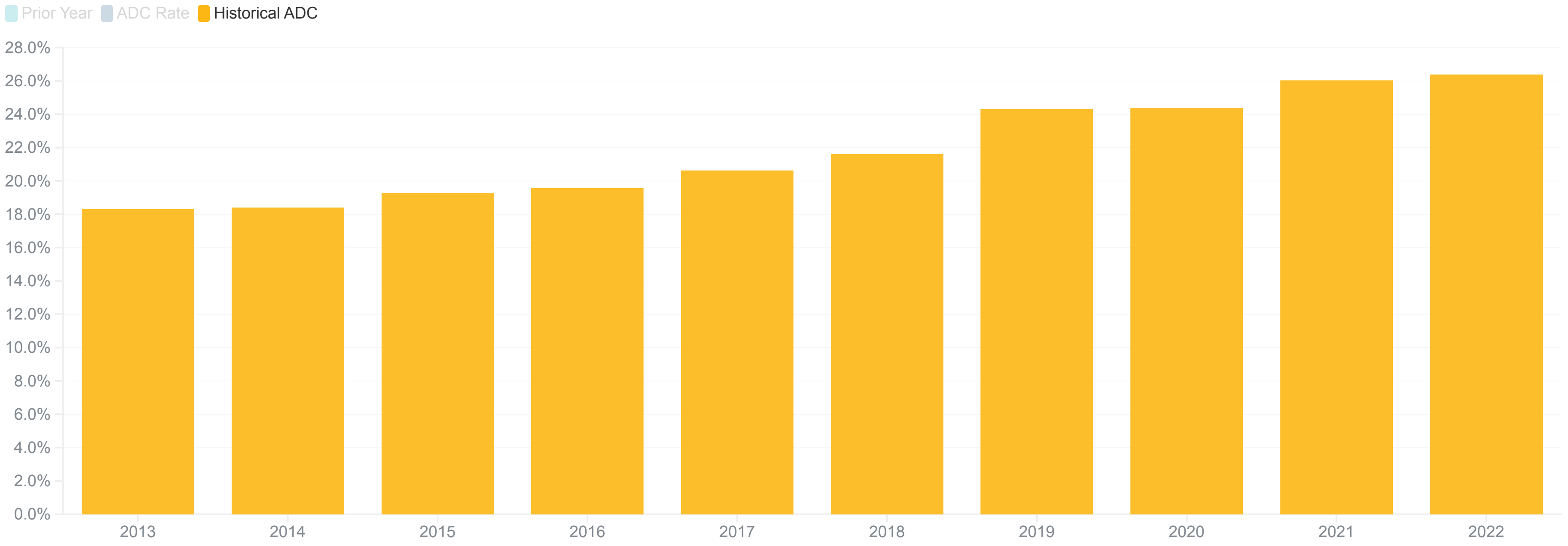
CHEIRON

Finally, and potentially most importantly, we turn our gaze forward.



First, we move from looking at the historical contributions

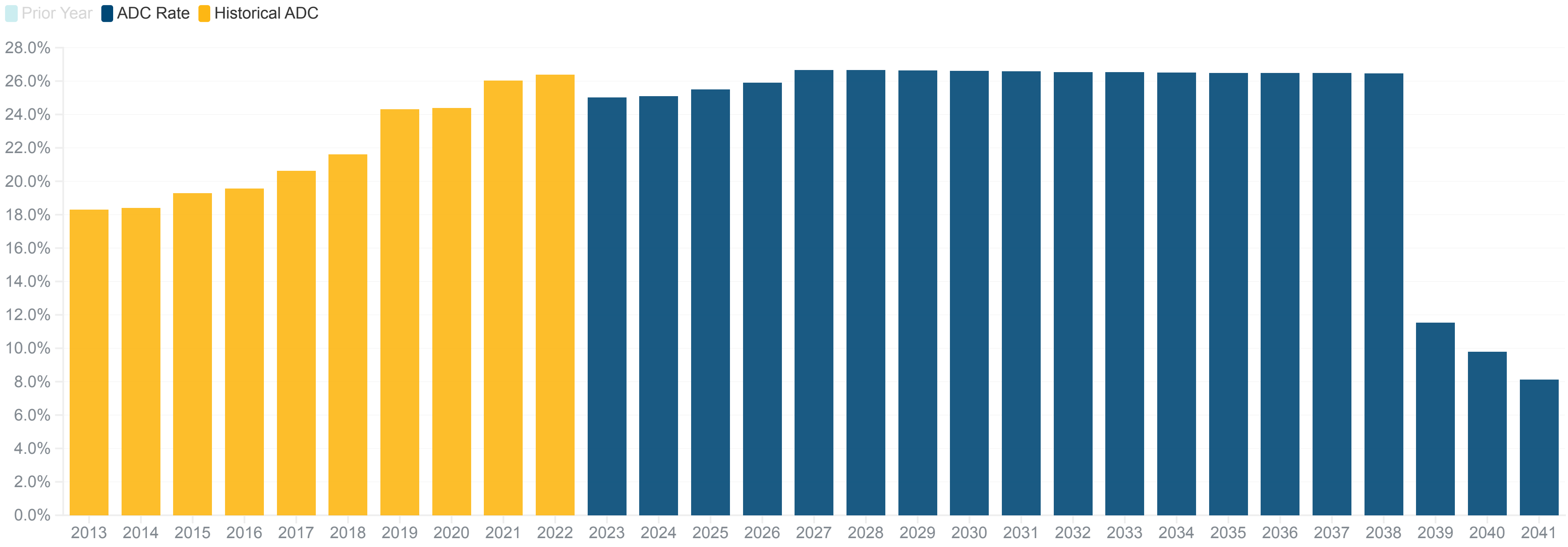
Historical



CHEIRON

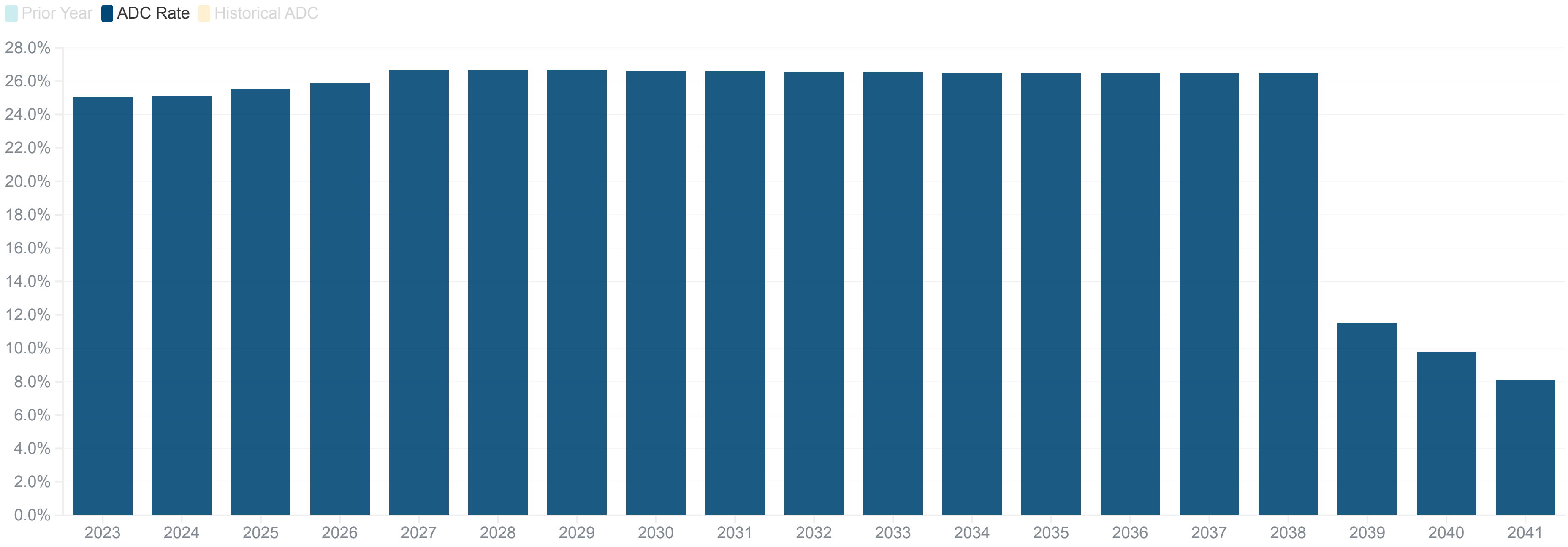
To looking at projections of the combined Plan contributions, assuming all assumptions are met (aka "the actuarial fantasy"), including a 7.25% return each year.

All



The rate is expected to increase gradually over the next four years, as the deferred investment losses are recognized. The contributions are expected to **drop significantly after 2038**, when the existing unfunded liability as of January 1, 2019 has been fully amortized.

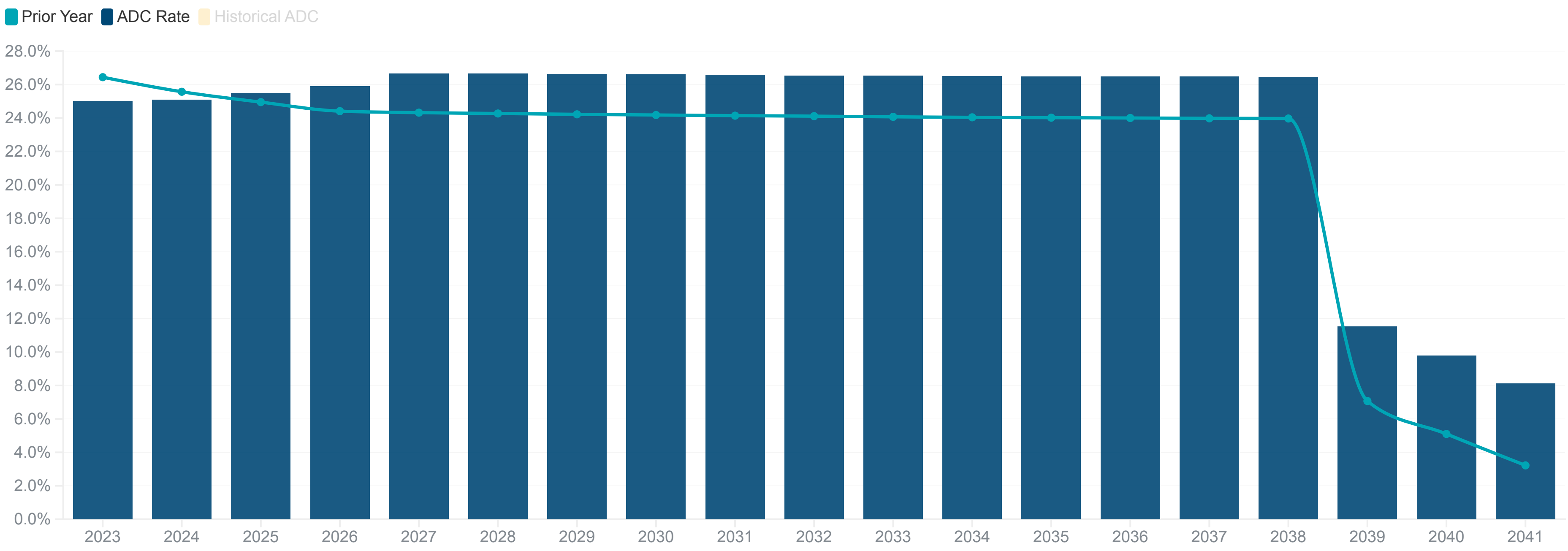
Projected



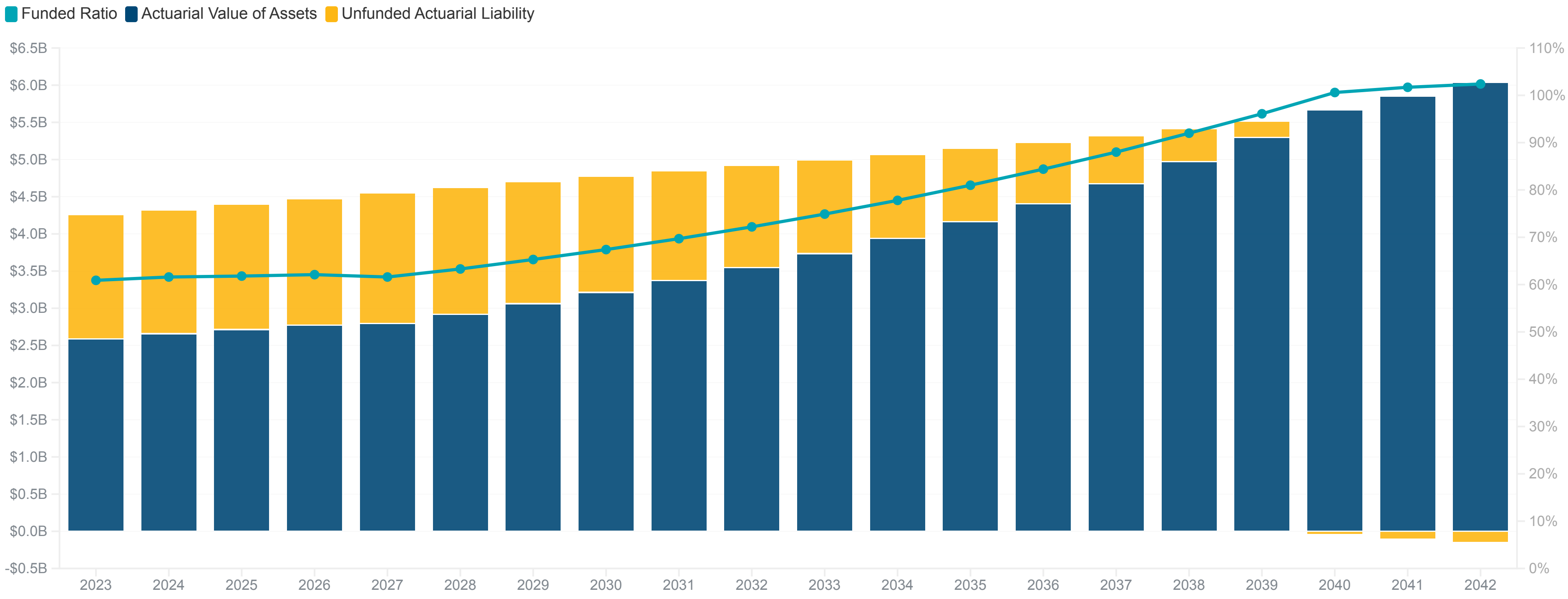
CHEIRON

For comparison, we show the projected contributions from last year's valuation. The contributions in the next two years have decreased due to payroll's impact on the UAL payments. Contribution increases are expected thereafter as a result of the current year asset losses.

Projected

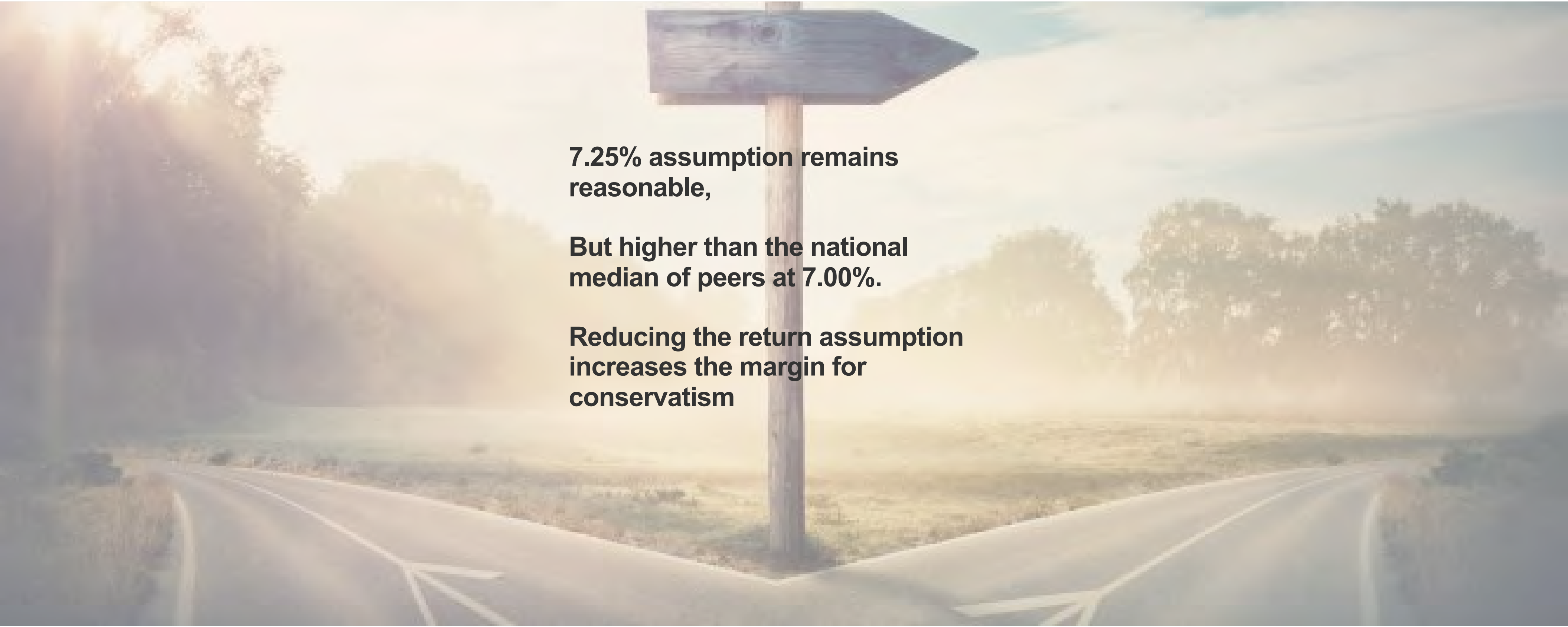


The baseline funded status projection shows that the funded ratio (shown in the line, with axis on the right side) is expected to remain between 61%-62% for the next four years, as deferred asset losses are recognized, and then climb by 2%-4% each year to full funding in 2040.

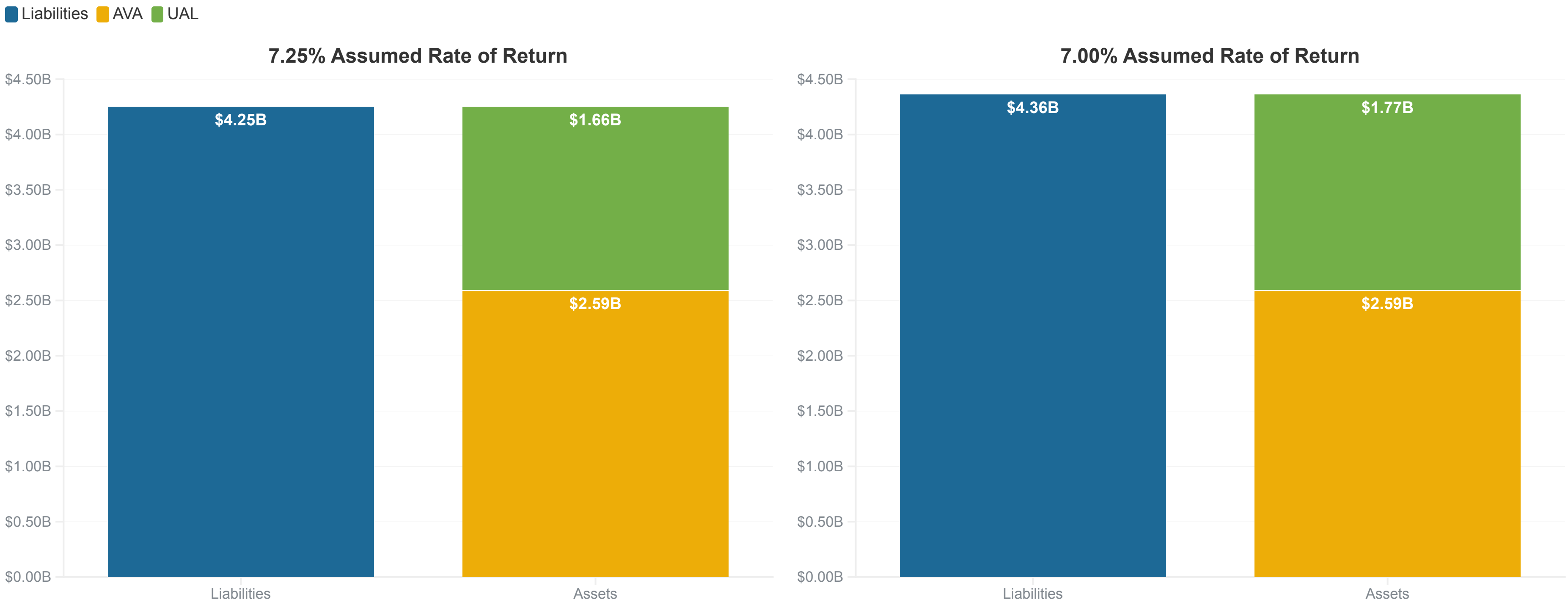


CHEIRON

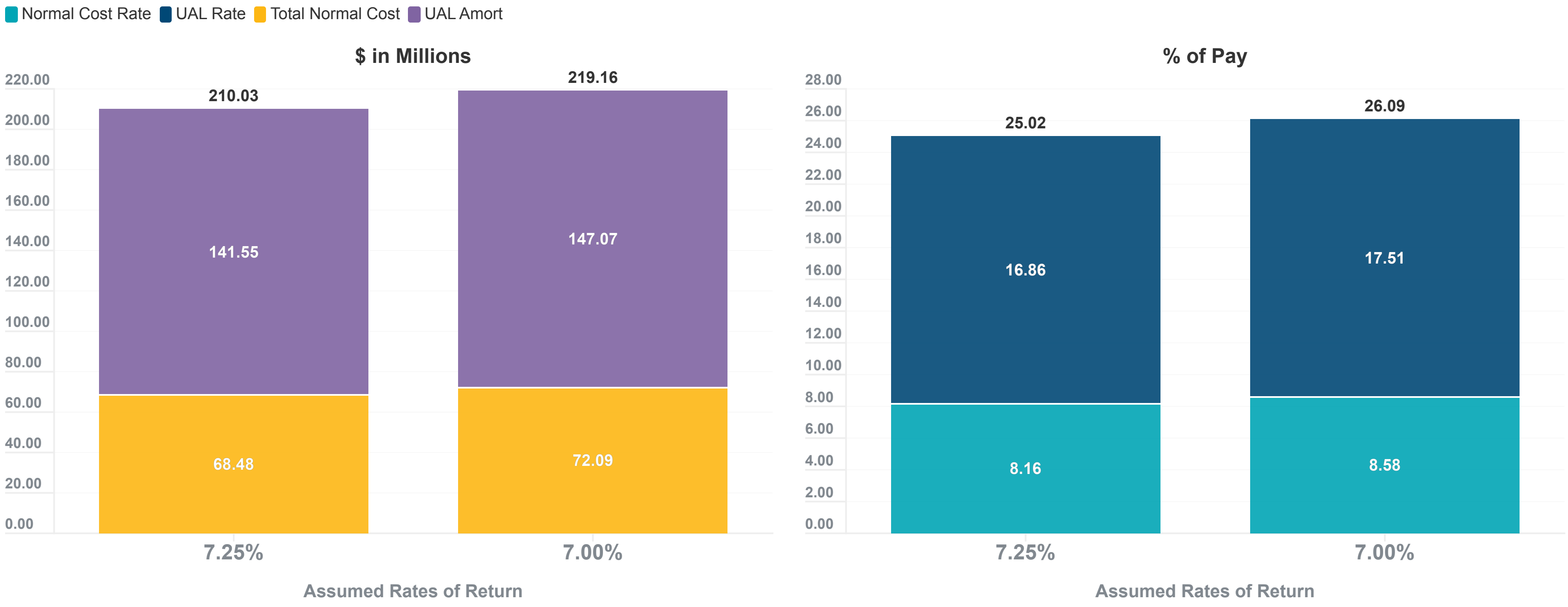
At its May 2023 meeting, the Board deferred the adoption of the assumed rate of return for the January 1, 2023 actuarial valuation until the July 21, 2023 meeting.



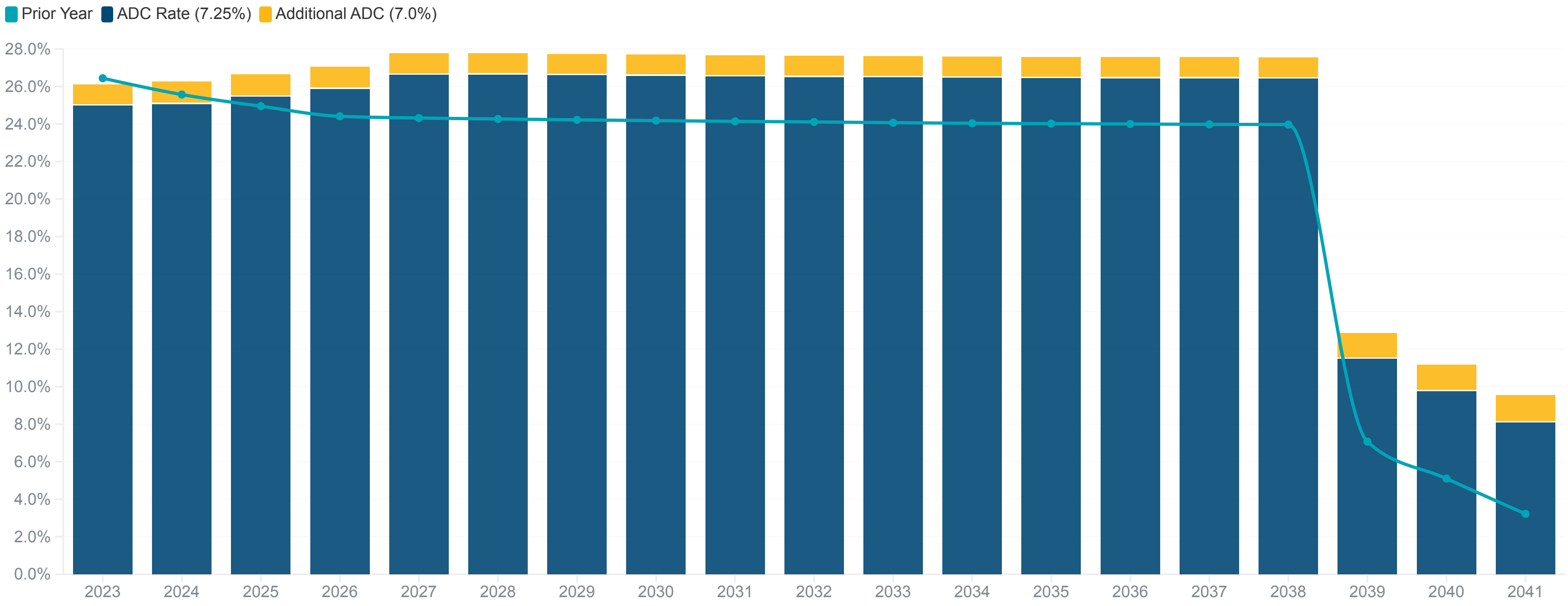
Lowering the assumed rate of return to 7.00% increases the Actuarial Liability and Unfunded Actuarial Liability by about $110 million. The **funded ratio** would decrease from **60.9% to 59.4%.**



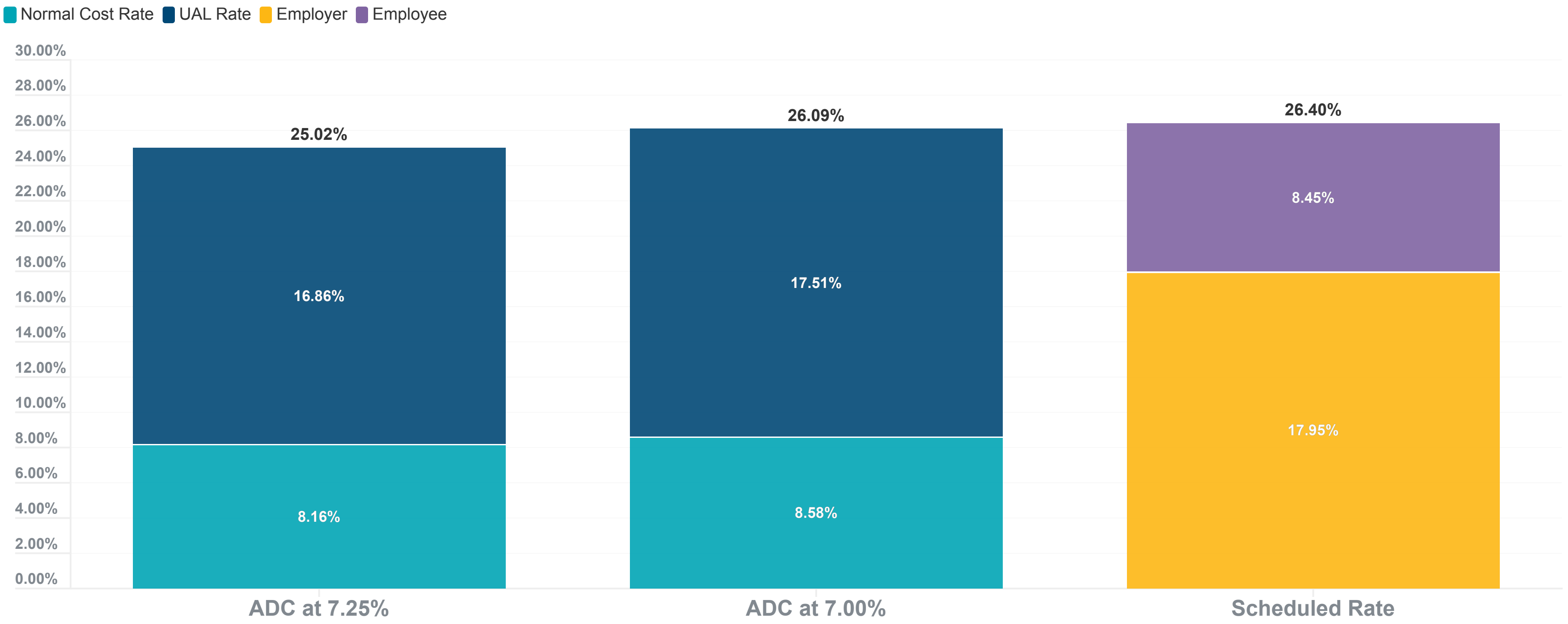
Both the normal cost and UAL payment increase at a 7.00% assumed rate of return. The total ADC increases about 1.07% of payroll, about $9 million based on projected payroll for 2023 of $840 million.



The incremental yellow bar shows the projected increase in the contribution rate (ADC) at a 7.00% assumed rate of return compared to 7.25%.



Even at a 7.00% assumed rate of return, the ADC would still be lower than the scheduled rate for the 2023 valuation, by about 0.30% of payroll.

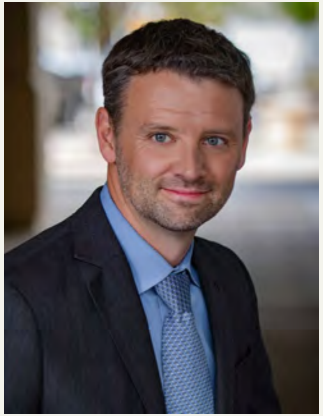


Denver Consulting Team

Click card for bio or to contact

Anne Harper
Principal Consulting Actuary

San Diego, CA



Graham Schmidt
Consulting Actuary

Lafayette, CA

Tim Hall
Associate Actuary

San Diego, CA

Certification

The purpose of this report is to present the preliminary results of the Denver Employees Retirement Plan Pension and Retiree Medical actuarial valuation as of January 1, 2023. This report is for the use of DERP and its auditors in preparing financial reports in accordance with applicable law and accounting requirements. Any other user of this report is not an intended user and is considered a third party.

In preparing our report, we relied on information (some oral and some written) supplied by DERP. This information includes, but is not limited to, the Plan provisions, employee data, and financial information. 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.

Future projections may differ significantly from the projections presented in this report due to such factors as the following: plan experience different from that anticipated by the assumptions; changes in assumptions; and changes in plan provisions or applicable law.

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.

Projections in this presentation were developed using R-Scan, a proprietary tool used to illustrate the impact of changes in assumptions, methods, plan provisions, or actual experience (particularly investment experience) on the future financial status of the Plan. We relied on Cheiron colleagues for the development of the model. R-Scan uses standard roll-forward techniques that implicitly assume a stable active population. Because R-Scan does not automatically capture how changes in one variable affect all other variables, some scenarios may not be consistent. Stochastic projections were also developed using R-Scan. The stochastic projections of investment returns assume that each future year's investment return is independent from all other years and is identically distributed according to a lognormal distribution. This assumption may result in an unrealistically wide range of compound investment returns over longer periods. The standard deviation used in the stochastic projection of investment returns was provided by the Plan's investment consultant.

This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. 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 for the Retirement Board of Denver 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.