2025 Economic Experience Study

AUGUST 2025

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Letter of Introduction

2025 Economic Experience Study

August 2025

As required under the Revised Code of Washington (RCW) 41.45.030, our office (the Office of the State Actuary [OSA]) performed a study on the financial condition and long-term economic experience for the Washington State retirement plans administered by the Department of Retirement Systems (DRS). This report documents the results of our study of the long-term economic assumptions (referred to as the Economic Experience Study [EES]).

We provided a summary of the Report on Financial Condition to the Pension Funding Council (PFC) via email in August 2025. We will present our supporting analysis to the PFC in the fall of 2025, and we will post this presentation to our website when available.

This EES involves comparing actual economic experience with the assumption made and considering future expectations for these assumptions. Pursuant to statute, the study also includes a set of recommendations for these assumptions, made by the state actuary. The primary purpose of this study is to assist the PFC in evaluating whether to adopt changes to the long-term economic assumptions identified in RCW 41.45.035. This study may not be appropriate for other purposes. Please replace this publication with our next EES when available.

We encourage you to submit any questions you might have concerning this EES to our mailing address or our e-mail address at state.actuary@leg.wa.gov. We also invite you to visit our website for further information regarding the actuarial funding of the DRS plans.

Sincerely,

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SECTION ONE: Summary

Executive Summary

Pursuant to RCW 41.45.030 (2), the PFC may adopt changes to the long-term economic assumptions every two years by October 31. Any assumptions adopted by October 31, 2025, will impact contribution rates set for the 2027-29 Biennium. Please note that any changes adopted by the PFC are subject to revision by the Legislature.

Guided by applicable Actuarial Standards of Practice, OSA performed this EES to develop a recommendation for long-term economic assumptions. We recommend a set of economic assumptions, as opposed to individual recommendations, for consistency across the assumption set. As such, we recommend adopting these assumptions as a complete set.

The following table summarizes the state actuary's recommendations for the long-term economic assumptions. These recommendations include an increase to the inflation and General Salary Growth (GSG) assumptions from current statute. We also recommend an increase to the Investment Rate of Return assumption for the Law Enforcement Officers' and Fire Fighters' (LEOFF) Plan 2.

Summary of Economic Assumptions		
	Recommendation	Current Statute
Inflation	3.00%	2.75%
General Salary Growth	3.50%	3.25%
Investment Rate of Return	7.25%	7.25%*
Membership Growth for Plan 1 Funding**	1.00%	1.00%

**7.00% for LEOFF 2.*
***Applies to the amortization of PERS 1 and TRS 1 UAAL.*

For context, we summarized the economic assumptions amongst our "peer" retirement systems as well as the historically prescribed economic assumptions for the Washington State retirement systems. Please see **Appendices E and F** for additional details.

General Approach to Setting Economic Assumptions

We use the Actuarial Standard of Practice (ASOP) No. 27, titled *Selection of Assumptions for Measuring Pension Obligations*, to guide our process for selecting economic assumptions. Below are some of the key factors we considered as part of this process:

- **Time Horizon –** We considered the time horizon of the liabilities or salaries to which these assumptions apply. We did this by examining the actuarial duration of the relevant measurement as described in **Appendix D**. As a result of this analysis, we generally focused our assumptions on longer-term time horizons.
- **Relevance of the Data –** When evaluating relevant data, we considered whether historical experience may be an indicator of future trends. We also considered forecasts and

applicable external resources. We used our judgment to select assumptions based on our expectations for the future that reflected an appropriate level of precision.

- **Short-Term Volatility –** For purposes of this study, we recommend long-term economic assumptions that reflect average annual expectations over the applicable time horizon. However, when warranted, we may adjust certain assumptions as part of our annual Actuarial Valuation Report (AVR), which allows us to reflect short-term expectations that differ from the prescribed long-term assumptions. Ultimately, plan costs will be determined by actual experience.
- **Consistency –** We developed the recommended economic assumptions as a collective set, and we recommend considering them as such. Assumptions that are adopted individually may result in an inconsistent assumption set.

Impacts of Climate Change

We did not include an explicit adjustment for climate change in our economic assumption recommendations. Quantifying the impacts from future climate change remains an evolving and challenging space.

The American Academy of Actuaries has a joint committee on climate change that analyzes climate disclosures, climate impacts, and broader climate concerns. In their publication, *Climate Risks Pose Broad Impacts on Financial Security Systems*, they outline key climate-derived issues for pensions and retirement security. It includes items such as the potential for an economic downturn, changes to projected investment returns, and changes to migration patterns due to climate change. The article encourages actuaries to include actuarial disclosures on the uncertainties of using the current data, models, and assumptions given climate change. It also suggests modeling scenarios that extrapolate climate change trends into the future.

We will continue to monitor current best practices in our profession as it relates to climate change and may make explicit adjustments in the future. We will also consider the need for incorporating climate change scenarios into the current risk commentary on our website.

Experience Study and Recommended Assumptions

Following is a high-level summary for each assumption we studied.

For additional details on the development of these recommendations, please see the **Appendices**. Note that there is no corresponding Appendix for the Membership Growth for Plan 1 Funding assumption.

Inflation

What Is the Inflation Assumption and How Do We Use It?

The Inflation assumption represents the annual expected increase in the general price of goods in the Seattle-Tacoma-Bellevue (STB) region. This is the same region for which annual, post-retirement Cost-of-Living Adjustments (COLAs) for several DRS plans are based. We use this assumption to model the future COLAs for these plans. We also use the Inflation assumption as a component for other assumptions, such as GSG.

High-Level Takeaways

Over the medium- to long-term, we expect annual average national inflation to be in the range of 2.3% to 2.6%, and we expect inflation in the STB region to continue outpacing that of the national average by a margin of 0.3% to 0.7%. Combining these ranges and applying our professional judgment, we recommend increasing the Inflation assumption from 2.75% to 3.00%.

Data and Assumptions

We relied on historical inflation data from the Bureau of Labor Statistics (BLS) and on historical Federal Funds Rates and Treasury rates from the Federal Reserve. We also analyzed inflation forecasts from several sources including, but not limited to, the Congressional Budget Office (CBO), the Social Security Administration (SSA), the Washington State Economic and Revenue Forecast Council (ERFC), and the Washington State Investment Board (WSIB).

General Methodology

We developed our assumption by identifying and analyzing the components of inflation, namely national inflation and a regional adjustment for the difference between inflation in the STB region and national inflation. For each of these components, we considered historical data, current events, external inflation forecasts, and our expectations for the future. We then considered the relationship between the identified inflation components and applied our professional judgment to determine our Inflation recommendation. Please see **Appendix A** for the supporting analysis and additional details surrounding this assumption.

Recommendation

We recommend increasing the Inflation assumption from 2.75% to 3.00% for all plans.

General Salary Growth

What Is the GSG Assumption and How Do We Use It?

Assumptions about salary growth help us project salaries to determine the size of the members' future benefits and calculate contribution rates, which are collected as a percentage of payroll. The salary increases a member will receive over their career depend on both economic and demographic factors. Likewise, our total salary growth assumption consists of two parts.

- **Service-Based Salary (SBS) Increase –** We assume active members in each system will receive SBS increases in the future, as long as they remain active in their plan. This assumption includes increases in salary due to step (or merit increases), promotion, or overtime. This assumption captures the increases to salary applicable to the plan demographics. We assume this portion of salary increases to remain relatively consistent during economic swings.
- **General Salary Growth –** The GSG assumption is a combination of inflation and real wage growth (or productivity). It is the portion of salary increases due to economic factors. We assume this portion of salary increases to fluctuate during economic swings.

In this EES, we focus on salary growth related to economic factors, which is the GSG assumption. Please see the latest *Demographic Experience Study* for more information on the SBS growth rates.

High-Level Takeaways

Over the last 30 years, observed annual GSG for the combined retirement systems ranged from 1% to 7% with the average annual growth ranging between approximately 3.5% and 4.0% over summarized time periods exceeding ten years in length. Since our 2023 EES, we've observed higher inflation and GSG but lower observed real wage growth.

The national forecasts we rely on for real wage growth had minimal changes since our last study.

Our expected range for real wage growth did not change for this study but we did increase our recommendation for the Inflation assumption. As a result, we recommend an increase in the GSG assumption to 3.50% consistent with our recommended change to the Inflation assumption.

Data and Assumptions

In developing this assumption, we relied on historical data or forecasts from multiple sources – DRS, the BLS, the SSA, the Bureau of Economic Analysis (BEA), and the CBO – to inform our recommendation.

General Methodology

We developed our GSG assumption by identifying and studying two components: (1) inflation and (2) real wage growth. These components were reviewed both combined and independent of each other.

To address the inflation component, we analyzed inflation and formed a recommendation for this assumption in the **Inflation** section of this study.

To study the real wage growth component, we began by reviewing average annual salary growth over various historical periods, including a process to isolate salary increases due to economic factors. We then evaluated the historical real wage growth as the observed annual salary growth due to economic factors less actual inflation measured using the Consumer Price Index (CPI). In

addition to historical growth, we reviewed expectations for future real wage growth over the next ten years consistent with the duration of future salaries for active members in the DRS pension plans.

To finalize the recommended assumptions, we relied on our professional judgment. Please see **Appendix B** for the supporting analysis and additional details surrounding this assumption.

Recommendation

We recommend an increase in the GSG assumption from 3.25% to 3.50% for all plans.

Investment Rate of Return

What Is the Investment Rate of Return Assumption and How Do We Use It?

The Investment Rate of Return assumption represents the assumed annual return on assets used to help pay pension benefits. Consistent with current state funding policy, we also use the assumption to determine the present value of future benefit payments and salaries for members of the retirement systems. We then compute contribution rates using current assets, the present value of future benefit payments, and the present value of future salaries.

High-Level Takeaways

We observed an increase in WSIB's simulated returns for the Retirement Commingled Trust Fund (CTF) since our last EES (August 2023). This increase was primarily due to changes to WSIB's updated Capital Market Assumptions (CMAs) and a change to the model used to simulate future investment returns. The WSIB increased the expected rate of return for most of the asset classes, particularly cash and fixed income which both increased by 50 basis points. Overall, WSIB's simulated median 15-year annual returns for the CTF increased by 31 basis points since our last study.

Simulated CTF returns developed for asset allocation purposes are helpful when studying this assumption, but developing a recommendation requires additional consideration. The simulated CTF returns may require adjustments to reflect differing time horizons for future cashflows and to remain consistent with other assumptions used for pension funding. We also considered the sensitivity of the expected CTF returns to changes in the CMAs for the largest asset classes.

After taking these considerations into account and applying our expectations for the future, we found that OSA adjustments to WSIB simulated CTF returns were generally offsetting or unnecessary at this time.

We also considered, but do not recommend at this time, separate Investment Rate of Return assumptions for the open and closed plans.

Data and Assumptions

In developing this assumption, we consulted with and relied on investment data provided by WSIB.

General Methodology

We primarily relied on WSIB's expectations of future returns on the CTF and our professional judgment when setting this assumption. We reviewed WSIB's most recent CMAs, target asset allocations, and simulated investment returns. We also examined how our application of this information may differ from that of WSIB and the impact that would have on our assumption-setting. Please see **Appendix C** for the supporting analysis and additional details surrounding this assumption.

Recommendation

We recommend an Investment Rate of Return assumption of 7.25% for all plans.

Membership Growth for Plan 1 Funding

What Is the Membership Growth for Plan 1 Funding Assumption and How Do We Use It?

The Membership Growth for Plan 1 Funding assumption is used to project future payroll in the systems that fund the Public Employees' Retirement System (PERS) and the Teachers' Retirement System (TRS)[1]. Under current funding policy, the ten-year payroll estimate is used to calculate PERS and TRS Plan 1 "base" Unfunded Actuarial Accrued Liability (UAAL)[2] contribution rates and the 15-year payroll estimate is used to calculate the fixed contribution rates for funding any future benefit improvements not provided under current law.

This assumption will not impact the base UAAL contribution rates in the near-term as they are prescribed to be 0.00% through Fiscal Year (FY) 2029[3].

This assumption could impact the additional contribution rates charged for a future Plan 1 benefit improvement.

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[1] *Employers of PERS, the School Employees' Retirement Systems (SERS), and the Public Safety Employees' Retirement System (PSERS) members pay contributions towards the PERS 1 UAAL. We use the term "PERS" in reference to the combined membership growth of PERS, SERS, and PSERS. The Teachers' Retirement System Plan 1 UAAL is funded by TRS employers.*

[2] *"Base" UAAL contribution rates exclude the unfunded cost of any Plan 1 benefit improvements. Contribution rates for Plan 1 benefit improvements are collected in addition to the base UAAL contribution rates.*

[3] *Near-term contribution rates are prescribed under Engrossed Substitute Senate Bill 5357 (Chapter 381, Laws of 2025)*

The Membership Growth assumption is separate from our open plans' System Growth assumption. The System Growth assumption, which is not used to determine contribution requirements under an AVR, estimates long-term growth of the individual retirement plans. It was last updated during the *2022 Projection and Risk Assumptions Study*.

Analysis and Recommendation

While the base UAAL contribution rates are prescribed to be 0.00% in the near-term, a base UAAL contribution rate could emerge in the future under adverse plan experience. To estimate the potential impact of membership growth experience and understand how sensitive the results are to this assumption, we reviewed how base UAAL contribution rates from the 2023 AVR may change under a range of membership growth assumptions that varied from 0.75% to 1.25%. The observed change in calculated base UAAL contribution rates under this range was less than 1 basis point (<0.01%) in both PERS and TRS. This suggests that the UAAL contribution rates are not highly sensitive to changes in this assumption.

Based on the sensitivity test noted above, we concluded our prior assumption remains reasonable for use in calculating the base UAAL contribution rates and future Plan 1 benefit improvement contribution rates.

We recommend no change to the current assumption of 1.00% for both PERS and TRS.

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Actuarial Certification Letter
Economic Experience Study

August 2025

This communication documents the results of an Economic Experience Study (EES) of the retirement plans defined under Chapters 41.26, 41.32, 41.35, 41.37, 41.40, and 43.43 of the Revised Code of Washington (RCW). The primary purpose of this study is to assist the Pension Funding Council (PFC) in evaluating whether to adopt changes to the long-term economic assumptions identified in RCW 41.45.035. This study may not be appropriate for other purposes. Please replace this publication with our next EES when available.

We relied on participant data from our Actuarial Valuation Reports (AVRs) previously provided by the Department of Retirement Systems (DRS). We checked the data for reasonableness as appropriate based on the purpose of this experience study, but we did not audit the data. We relied on all data as complete and accurate. In our opinion, this data is substantially complete for purposes of this experience study.

We relied on target asset allocations, Capital Market Assumptions (CMAs), and return simulations from the Washington State Investment Board (WSIB) to help formulate expectations for future rates of annual investment return. We reviewed the information provided by WSIB for reasonableness and engaged with them about their methods and sensitivities of their model, as appropriate based on the purpose of this experience study.

Unless noted otherwise, this EES reflects the most recently available plan provisions and participant data. As part of our analysis, we also examined the most recently available historical and forecasted economic data, as of the time of our analysis (early 2025), from a variety of experts in the field. For more information on this data, please see the assumption **Appendices**.

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The recommendations in this experience study involve the interpretation of many factors and the application of professional judgment. We believe that the data, assumptions, and methods used in the underlying experience study are reasonable and appropriate for the primary purpose stated above. The use of another set of data, assumptions, and methods, however, could also be reasonable and could produce materially different results. Another actuary may review the results of this analysis and reach different conclusions.

In our opinion, all methods, assumptions, and calculations are in conformity with generally accepted actuarial principles and applicable standards of practice as of the date of this publication.

The undersigned, with actuarial credentials, meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. While this study is intended to be complete, we are available to offer extra advice and explanation as needed.

Sincerely,

Matthew M. Smith, FCA, EA, MAAA
State Actuary

Luke Masselink, ASA, EA, MAAA
Senior Actuary

SECTION TWO:
Appendices

APPENDIX A - Inflation Assumption

Methodology

We developed the Inflation assumption by identifying and analyzing two components of inflation – (1) national inflation and (2) a "regional adjustment" (i.e., the difference in inflation between the STB region and the national average).

As part of our analysis, we examined historical inflation data, Federal Reserve monetary policy, Treasury Inflation Protected Securities (TIPS) data, and inflation forecasts from external experts in the field. We analyzed each component with a roughly 8-year horizon in mind for the closed plans and a 20-year horizon in mind for the open plans, consistent with the average liability plan durations found in **Appendix D**.

We then considered the relationship between the two components and combined this information with our expectations for the future and our professional judgment to arrive at a recommendation for the Inflation assumption.

National Inflation Component

Historical Data

We began our analysis of the national inflation component by considering historical data. Specifically, we examined CPI data provided by the BLS. The CPI measures the change in price of a fixed basket of goods over time. This data is available for specific regions of the country and for various populations. For our national inflation analysis, we focused on the U.S. City average CPI for Urban Wage Earners and Clerical Workers (CPI-W), since the CPI-W serves as the index for calculating DRS plan COLAs.

The table below summarizes the geometric average inflation, based on the CPI-W, over various time periods. For comparison purposes, we also provide this data as of our last EES, which was conducted in 2023. For readers interested in the annual historical fiscal year CPI-W data, please see our Inflation Data webpage.

National CPI-W Geometric Averages		
	2025 EES*	2023 EES**
Last 25 Years	2.57%	2.44%
Last 20 Years	2.59%	2.50%
Last 15 Years	2.59%	2.37%
Last 10 Years	2.83%	2.44%
Last 5 Years	4.30%	3.79%

**Data extends through 2024.*
***Data extends through 2022.*

It should be noted though that average historical inflation levels by themselves are not strong predictors of future inflation. That is, we can't simply expect average inflation over the next 25 years to mirror inflation over the past 25 years. However, we can identify historical trends, apply our knowledge of the economic climates and government actions in place at the time, and use this information to gain insight into how inflation may react under similar conditions in the future. One such factor is the role that the Federal Reserve plays in managing inflation.

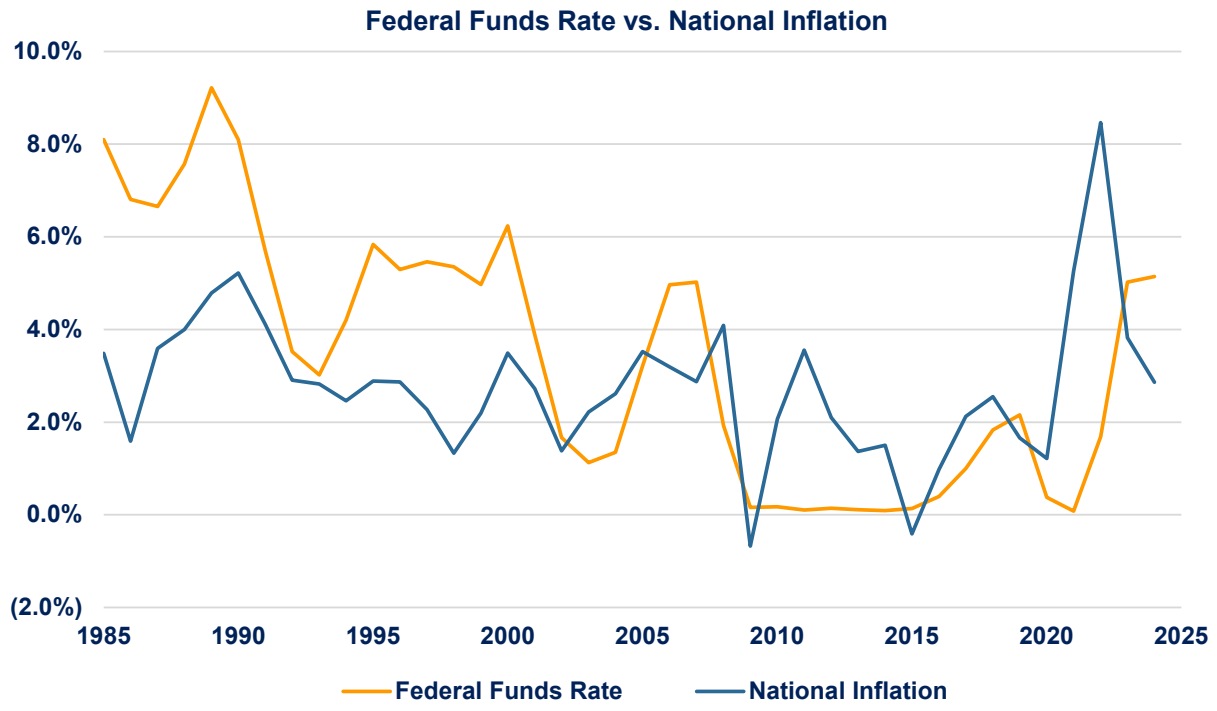
Federal Reserve Actions

The Federal Reserve attempts to manage inflation through the Federal Funds Rate (FFR), which represents the rate at which banks can borrow money. By adjusting this rate, the Federal Reserve can increase or decrease the amount of money in the economy, which in turn, can impact the level of inflation.

As of January 2012, the Federal Reserve adopted a "medium-term" inflation target of 2% per year, and up until the COVID-19 pandemic, inflation had generally been hovering around this target. However, the pandemic contributed to an economic period of great market uncertainty with global supply chain issues, robust government intervention, and high inflation. In response to this, the Federal Reserve reiterated their commitment to a medium-term 2% inflation target and steadily increased the FFR from near 0% in early 2022 to over 5% in 2023 in an attempt to curb high inflation. As of Spring 2025, the FFR is roughly 4.3%.[4]

[4]*Per the monthly Federal Open Market Committee statements and data from the Federal Reserve Bank.*

Given these actions by the Federal Reserve, we examined historical data to get a sense for how effective adjustments to the FFR have previously been in managing national inflation. The following graph compares the FFR and national inflation over the past 40 years.[5]



This graph suggests a strong, lagged relationship between the FFR and national inflation. We observe periods of high inflation being followed by increases in the FFR which help decrease inflation. As an example of inflation control in practice, the 1990s featured a strong economy which typically leads to higher levels of inflation. We observed an increase in the FFR during that decade which helped maintain inflation around the 3% level.

Most recently, we've seen the recovery from the COVID-19 pandemic bring with it the highest levels of national inflation experienced since the 1980s. To address this, the Federal Reserve once again raised the FFR. These actions appear to have contributed to a decrease in the rate of inflation, as the relationship between FFR and inflation suggested it would.

While inflation has decreased since 2022, when it was above 8%, it is still above the Federal Reserve's 2% target level. To gain some insight into how long this might persist, we examined inflation projections.

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[5]*Inflation in the table above is measured based on CPI-W index. However, the Federal Reserve tends to rely more heavily on the Personal Consumption Expenditures (PCE) index prepared by the BEA. The PCE has a broader scope than the CPI-W, since it includes goods and services consumed by households and nonprofit institutions serving those households. The PCE generally yields inflation values that are lower, but of a similar shape, as those produced by the CPI-W. For example, over the past 10 and 20 years, the annual geometric average inflation using PCE has been approximately 0.4% lower than that produced using the CPI-W.*

Breakeven Inflation (TIPS) and Forward Rates

Treasury Inflation Protected Securities are Treasury-issued bonds that are intended to mute the influence of inflation on the bond's maturity value by allowing the maturity value to fluctuate with changes in the CPI. As such, TIPS can be used to approximate annual inflation by subtracting the TIPS yield from the yield of a non-inflation adjusted Treasury security with the same maturity. The resulting inflation estimate is the "TIPS breakeven inflation rate," which is the level of inflation that causes the TIPS and nominal bonds to yield the same value. The following table compares these breakeven rates over a 10- and 30-year time horizon. As of 2024, both of these TIPS breakeven rates are roughly 2.3%.

TIPS Breakeven Inflation Rate*		
Year	10-Year Rate	30-Year Rate
2022	2.52%	2.35%
2023	2.28%	2.29%
2024	2.27%	2.26%

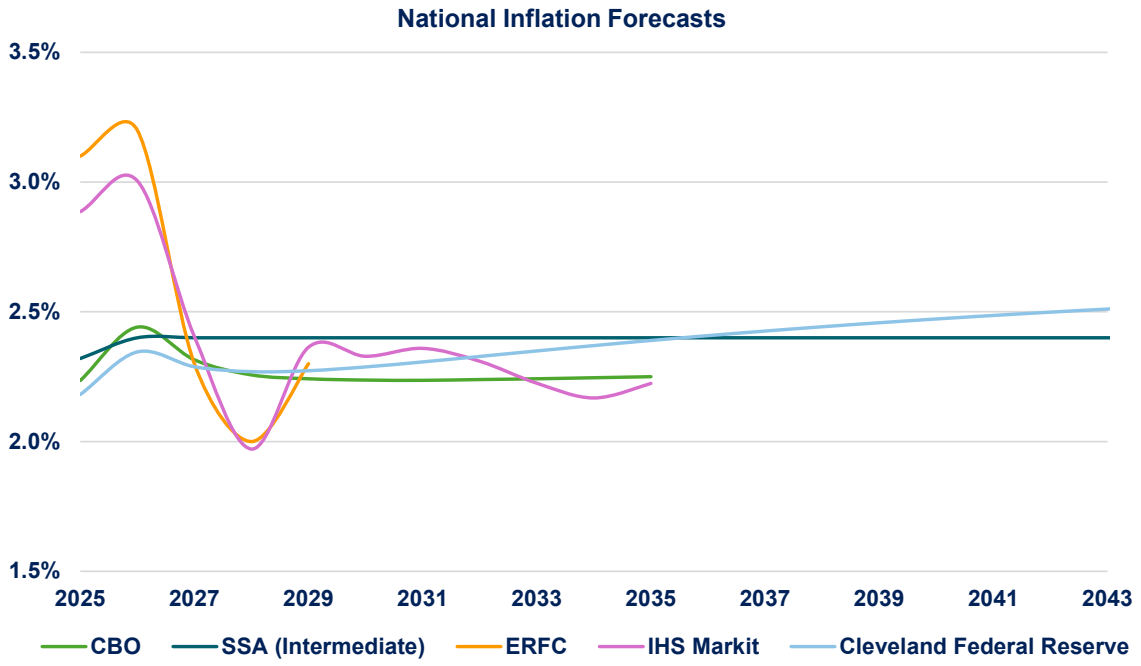
**Difference between nominal and TIPS bonds with the same maturity.*

It should be noted though that there are questions surrounding the accuracy of using a TIPS breakeven inflation rate to gauge future inflation. As noted by WSIB in their 2025 CMAs White Paper, the market mechanism that determines breakeven inflation can skew under dire economic scenarios in which investors prefer the safety of Treasuries over the illiquidity of TIPS. The TIPS breakeven rate can also experience large fluctuations due to the small size of the TIPS market relative to the bond market. Because of these limitations, we did not rely heavily on TIPS breakeven inflation rates in our assumption-setting, but we did consider them as an additional data point.

We also examined "five-year, five-year forward" inflation rates, which conveys inflation expectations over a five-year time horizon, beginning five years from now (i.e., average annual inflation six through ten years from now). This measure gives us another perspective on inflation by removing the noise associated with the immediate economic conditions. This measure has been roughly 2.3% from 2022 to 2024.

Inflation Forecasts

We then considered national inflation forecasts from experts in the field. We examined forecasts that were both short-term (i.e., five to ten years) and long-term (i.e., 15 to 20 years) in nature. The sources we used were the CBO[6], the SSA[7], the ERFC[8], IHS Markit[9], and the Federal Reserve Bank of Cleveland[10]. The following graph summarizes these inflation forecasts, with our key takeaways summarized beneath the graph. Please note that we gathered the most recently available forecasts as of the time of our analysis (early 2025).



- The average annual inflation of these forecasts over the next five, ten, and twenty years is roughly 2.4%, 2.3%, and 2.4%, respectively. The ultimate inflation rate for all forecasts ranges from 2.2% to 2.5%.
- Compared to their forecasts from two years ago, many of the experts increased their short-term inflation projections. However, looking out further, we noticed only a small change to their longer-term inflation forecasts. For example, the above inflation forecasts for 2033 are roughly within 0.1% of the experts' forecasts from two years ago.
- We also considered inflation expectations from WSIB. Per their 2025 CMAs White Paper, WSIB maintained their 2.5% 15-year annual average inflation assumption from their 2023 CMAs.

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[6]*CBO, "The Budget and Economic Outlook: 2025 to 2035," projections as of December 2024.*

[7]*SSA, "The 2024 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds," projections as of December 2023.*

[8]*ERFC, "Economic Forecast," projections as of March 2025.*

[9]*IHS Markit, projections as of February 2025.*

[10]*Federal Reserve Bank of Cleveland, "Inflation Expectations," projections as of March 2025.*

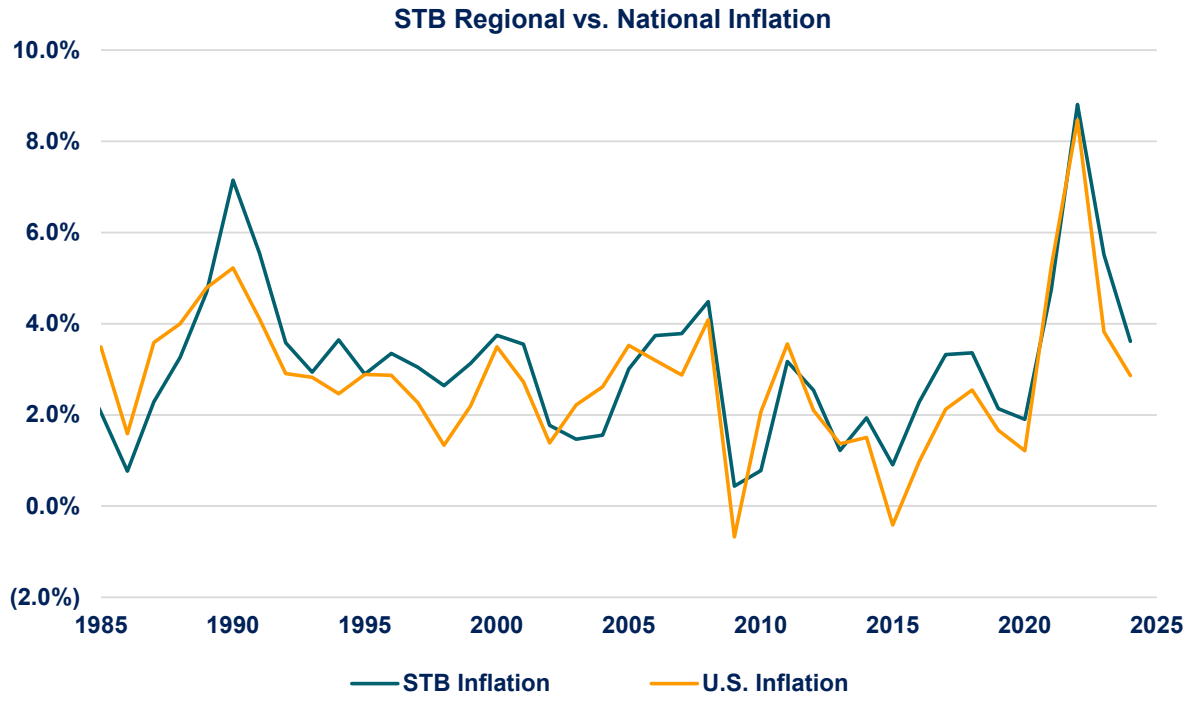
- ❖ Not all forecasters measure inflation using the same index. For example, the SSA uses CPI-W, while the CBO uses CPI-U (which is for All Urban Consumers). Each index measures inflation differently. However, in our opinion, it is acceptable to consider these various forecasts together, given the purpose for which we are using this data (i.e., to get a sense for future inflation).

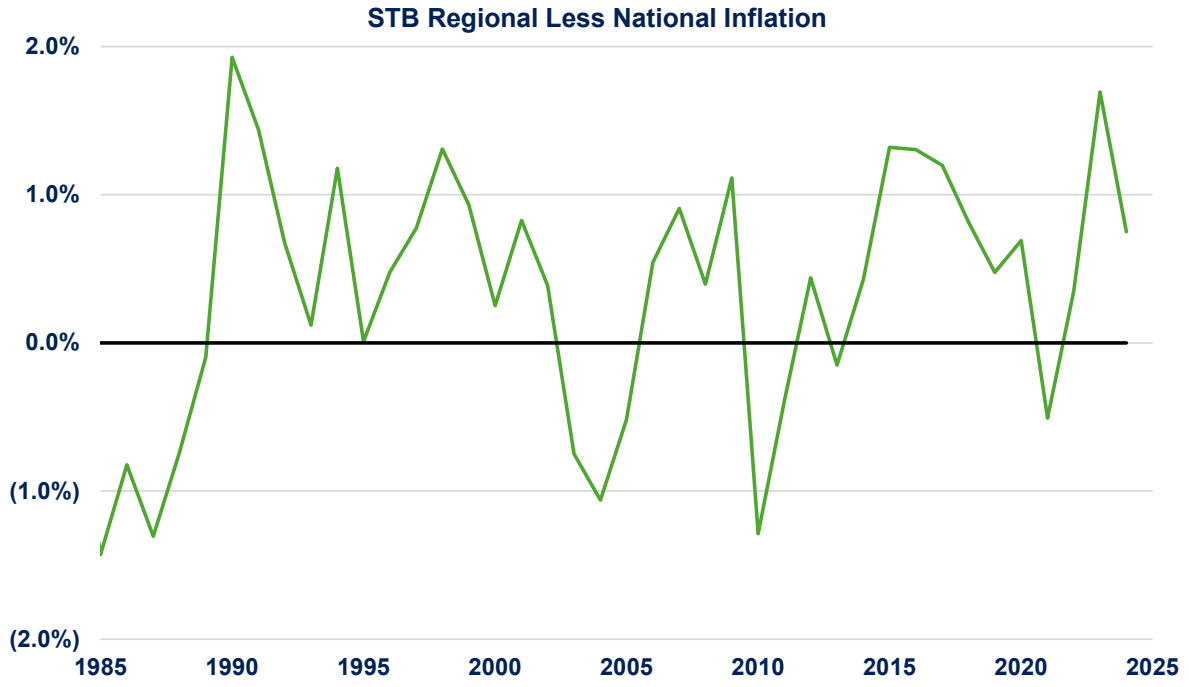
The historical data, Federal Reserve actions, and forecasts summarized above are all consideration items in our recommendation of an Inflation assumption. However, thus far, this analysis has been focused on national inflation. We must also account for STB regional adjustments for inflation.

Regional Adjustment Component

Similar to our approach for national inflation, we began our analysis of the regional adjustment component by looking at historical data. Specifically, we were interested in the annual difference between STB regional inflation and the U.S. City average inflation, as measured by the CPI-W.

The following graphs summarize this CPI-W data over the past 40 years. Based on this data, we observed annual regional inflation outpacing national inflation by an average of roughly 0.8% and 0.5% over the past 10 and 20 years, respectively. For readers interested in seeing the underlying annual inflation data, please see our Inflation Data webpage.





Just as we noted for our analysis of national inflation, historical regional inflation levels are products of their economic climates and, by themselves, are not strong predictors of future inflation. However, in our opinion, the relationship between national and regional inflation serves as a useful data point, since much of the volatility and uncertainty in regional inflation can be explained by national inflation.

We observe higher inflation in the STB region because the local economy grows differently than the overall national economy. The STB region features some of the world's largest companies (e.g., Boeing, Microsoft, and Amazon) and has historically experienced considerable residential growth, which has contributed toward regional price inflation.

Over time, one might expect this regional price inflation to decline. For example, high prices in the STB region may lead people to move to lower cost areas, which would decrease demand for STB goods and services, thus decreasing the cost of those goods and services. However, we have not yet seen this trend emerge in the data. In fact, STB regional inflation has been greater than the national average inflation for 15 of the past 20 years.

Diving into these regional differences further, we looked at the individual categories that make up the overall CPI-W data to get a sense for each category's weight and inflation, as well as how these metrics compare on a national versus regional basis. Over the last 20 years, one of the primary categories where regional inflation has outpaced national inflation was housing, and this category is also assigned the greatest weight in the CPI-W calculation (roughly 40%). Over the last 20 years, regional total inflation has outpaced national total inflation by 0.5%, but regional housing inflation has outpaced national housing inflation by 1.0%.

To gain additional insights as to how regional inflation might unfold moving forward, we tried researching local inflation forecasts. However, the few forecasts we found were short-term in nature and often covered only portions of the STB region.

Recommendation

We recommend an Inflation assumption of 3.00% for all plans, which represents an increase from the current assumption of 2.75%. We make this recommendation after considering the national inflation and regional adjustment information above, the relationship between these components, our expectations for the future, and our professional judgment. More specifically, below are the key takeaways that led us to this recommendation.

- **National Inflation –** We expect annual average national inflation over the medium- to long-term to be 2.3% to 2.6%. This is consistent with both the national inflation forecasts we examined which projected long-term annual average inflation of roughly 2.4% and WSIB's 15-year annual average inflation assumption which is 2.5%.
- **Regional Adjustment –** We expect the annual average STB regional inflation adjustment to be 0.3% to 0.7%. Over the past 10 and 20 years, annual STB regional inflation has outpaced the national average by 0.8% and 0.5%, respectively. We have no substantial reason to believe that this differential will materially diminish during the horizon over which we apply our Inflation assumption.
- **Uncertainty and Precision –** Uncertainty exists when setting our future Inflation assumption, and especially in the current volatile economic climate. This uncertainty extends to both the national inflation and regional adjustment components, and as such, we are cognizant of the precision of our Inflation recommendation.

- **Impact of Recent Tariffs –** In April 2025, a series of tariffs were announced on imports to the United States. At a high-level, these tariffs consist of a 10% baseline tax for most countries, with higher taxes for specific countries and goods. However, at the time of this writing, the magnitude, scope, and timing of these tariffs continues to evolve. This makes it difficult to assess the impact that these tariffs may have on future inflation. We believe these tariffs may increase the volatility of future inflation and may be more likely to lead to an increase in inflation rather than a decrease, but the degree and duration of these impacts is highly uncertain. Given these uncertainties, we did not consider tariffs to be a significant factor in our assumption-setting process.
- **Time Horizon –** We aim to set our Inflation recommendation consistent with the time horizon over which this assumption will be applied, which is represented by the plan liability durations (see **Appendix D**). The average duration is approximately 8 years for the closed plans and 20 years for the open plans. We considered separate Inflation assumptions for the closed and open plans, but we did not observe significant differences in the inflation forecasts over these plan durations. Therefore, we recommend a single Inflation assumption for all plans.
- **Short-Term Volatility –** In recommending an Inflation assumption, we focus on the longer-term horizons stated above. If actual, short-term inflation experience significantly differs from the prescribed long-term assumption, we can modify our one-year valuation assumptions to account for that experience, if warranted.

APPENDIX B - GSG Assumption

Methodology

We developed the GSG assumption by identifying and studying two components—inflation and real wage growth. The ASOP No. 27 – *Selection of Assumptions for Measuring Pension Obligations* defines inflation as "price changes over the whole of the economy," and real wage growth (productivity) is defined as "the change in the real value of goods or services per unit of work." We observed annual salary growth, inflation, and real wage growth over various historical periods to estimate historical national and Washington State ranges and trends. We also examined any changes in national real wage growth forecasts since our prior study.

We considered the population and time horizon over which we apply the GSG assumption. We target this assumption to be consistent with the duration of salaries for our open pension plans—approximately ten years. The GSG assumption is used across all plans, but we used the duration of open plan salaries because the vast majority of the active employee population exists in these open plans. Please see **Appendix D** for more information on the duration measure.

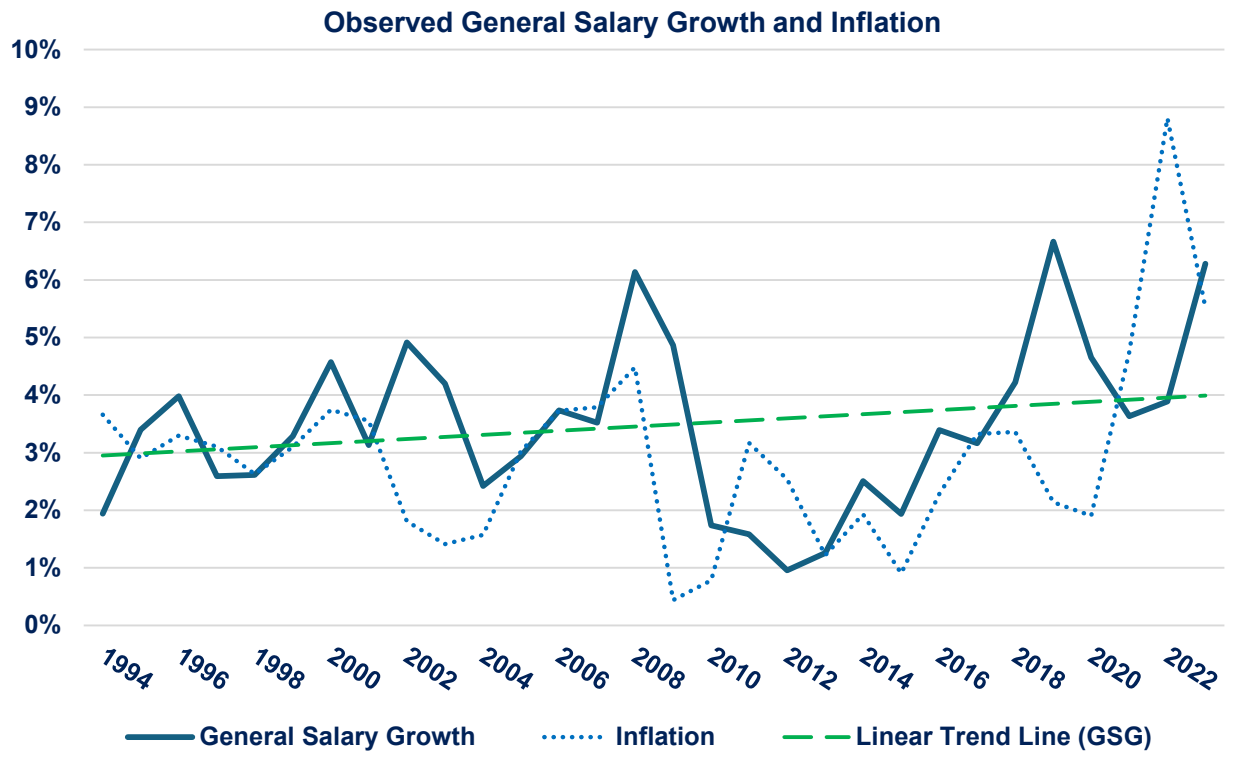
To estimate historical annual real wage growth, we deducted observed annual CPI growth (annual observed inflation) from average salary growth corresponding to each data source used in this study. We selected a CPI consistent with the regional source of the data – national or local. Under this methodology, we make a simplifying assumption that population demographics, e.g., average age and average service, will remain consistent year over year so the analysis remains independent from the SBS increase component of annual salary growth. In reality, this does not typically occur, but we expect our method provides a reasonable approximation for purposes of studying this assumption.

Analysis

We took the following steps to develop our GSG recommendation:

1. **Review of historical GSG.**

   We began our analysis by reviewing the historical trend in average annual salary growth for members in the DRS-administered open pension plans. Overall, we have observed GSG to be variable over the last 30 years. We also observed salary growth to have a lagged relationship with inflation, as employers appear to react to changes in inflation and cost of living with subsequent changes in employee salaries. There was a notable decline in salary growth following the Great Recession followed by a peak in 2019, which was mainly driven by increases to teachers' salaries, likely attributable to the McCleary Supreme Court decision. Then in the early 2020s, we observed the highest levels of inflation over this 30-year period, followed by a notable increase in salary growth.



On average, salary growth over the last ten years has been higher than the 30-year average. The following table summarizes the data from the previous graph over various time horizons. A comparison to the prior EES was added for context on how these averages have changed.

Estimated General Salary Growth Employees of DRS-Administered Open Plans			
Geometric Averages	Observed Growth of Avg Salary (a)	Observed Inflation (b)	Estimated Real Wage Growth (a-b)
2023 EES			
Last 10 Years (2012-2021)	3.23%	2.44%	0.79%
Last 20 Years (2002-2021)	3.41%	2.43%	0.98%
Last 30 Years (1992-2021)	3.43%	2.71%	0.73%
2025 EES			
Last 10 Years (2014-2023)	4.02%	3.47%	0.55%
Last 20 Years (2004-2023)	3.46%	2.97%	0.50%
Last 30 Years (1994-2023)	3.46%	2.95%	0.51%

The previous table is meant to summarize how GSG is trending, but we also reviewed its components (inflation and real wage growth) separately.

2. Review of inflation.

We studied inflation in depth and developed a recommendation of 3.00% for this assumption. As noted in the **Inflation** section, we apply that assumption to plan liabilities that have durations that range from approximately 10 to 20 years. When examining inflation as a component in GSG, we consider that open plan salaries have a duration closer to a 10-year period. In our opinion, a 3.00% Inflation assumption is reasonable for both purposes based on the limited differences we observed between current 10- and 20-year inflation forecasts. Please see the **Inflation** section of this study for details regarding the development of this assumption.

3. Review of historical real wage growth.

To evaluate a range for the real wage growth component and identify any historical trends, we examined DRS (Washington State) wage growth for the Plans 2/3 employees. We also considered national salary data, for state and local government, from BEA as a comparison point.

Estimated Real Wage Growth		
	Washington State*	National Measures**
Geometric Averages	DRS – Plans 2/3 Employees	BEA – State and Local Government
2023 EES		
Last 10 Years (2014-2023)	0.79%	0.92%
Last 20 Years (2004-2023)	0.98%	0.67%
Last 30 Years (1994-2023)	0.73%	0.74%
2025 EES		
Last 10 Years (2014-2023)	0.55%	0.48%
Last 20 Years (2004-2023)	0.50%	0.35%
Last 30 Years (1994-2023)	0.51%	0.59%

**Local inflation – STB Urban Wage Earners and Clerical Workers CPI.*
***National inflation – U.S. city average Urban Wage Earners and Clerical Workers CPI.*

Compared to our 2023 EES, each of the historical averages displayed above declined by at least 15 basis points due to the high inflation experienced in FY 2022 (8.8% STB inflation) and FY 2023 (5.5% STB inflation). As an example, we calculated -5% real wage growth for FY 2022. As displayed in our graph, we observe that salary growth typically lags inflation so our measurement of historical growth may not take into account a full economic cycle. Similar to the prior EES, we expect a range of 0.25% to 1.00% remains reasonable for the real wage growth component and takes into account the volatility of future annual wage growth.

4. **Expectations for future real wage growth**.

The last item we considered when studying real wage growth was expectations for the future. Such forecasts are not available for our covered populations. In absence of such information, we reviewed various national forecasts and analyses to inform this expectation and considered it in the context of the duration of salaries for the open plans. Specifically, we rely on reports from the CBO[11] and SSA[12].

The national forecasts are higher in some cases than what is displayed in the historical tables above because the forecasts have a broader definition of employee compensation which can include items such as employer provided health insurance, paid time off, retirement benefits, etc. Due to the inclusion of additional sources of employee compensation, beyond employee wages, we do not rely on these forecasts to set an assumption. Rather, we compare forecasts from national sources to evaluate assumption consistency and review whether the forecasts have significantly changed from our last study.

The CBO and SSA forecasts had modest changes in their forecasted ten-year average annual real wage growth since our 2023 EES.

Projected 10-Year Average Annual Real Wage Growth			
	2021	2023	2025
CBO	0.8%	0.7%	0.8%
SSA	1.5%	1.6%	1.6%

Note: National forecasts include additional sources of employee compensation beyond employee wages.

Other Considerations

Other factors may impact future salary growth of Washington State retirement system employees such as differences between public and private sector wages and associated impacts on recruitment and retention as well as the impact of Artificial Intelligence on productivity. Ultimately, we did not make explicit adjustments for these factors but acknowledge they may contribute to the uncertainty of future GSG.

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[11] *CBO, "The Budget and Economic Outlook: 2025 to 2035" contained the most recent forecast. Please see our prior EES for previous forecasts. To estimate real wage growth, we calculate the difference between the employment cost index and the CPI contained within the report.*

[12] *SSA, "The 2024 OASDI Trustees Report" contained the most recent forecast. Please see our prior EES for previous forecasts. We estimate real wage growth by averaging the real wage differentials over the first ten-year projection period.*

Recommendation

We recommended an increase to the Inflation assumption from 2.75% to 3.00% as discussed in the **Inflation** section of this study.

We did not develop a best estimate for real wage growth and instead chose to develop a range for this component since this component is not directly used in our assumptions. We determined a range of 0.25% to 1.00% remains reasonable for setting the real wage growth component for our open plans. While the historical real wage growth averages have shifted since our last study due largely to the 2022 inflation, we recognize that lagged salary increases may follow during a completed economic cycle that we have yet to observe in our data. Additionally, the updated national forecasts for real wage growth did not materially change from prior forecasts reviewed for this study.

In setting our recommendation for the GSG assumption, we combine our recommendation for inflation (3.00%) with our range for real wage growth (0.25% to 1.00%) and arrive at a **recommended GSG assumption of 3.50% for all plans**. This represents an increase from the current assumption of 3.25%.

APPENDIX C -
Investment Rate of Return Assumption

Capital Market Assumptions and Simulated Future Investment Returns

When studying the Investment Rate of Return assumption, we first review how the assets are invested and how they are expected to perform. The CTF assets are invested in a variety of asset classes, and WSIB sets targets for the percentage of those assets allocated to each class. The CMAs provide a summary of key investment statistics, such as the expected future return and volatility of the various asset classes in a portfolio, as well as the relationship between the asset classes (correlations). When the target asset allocations are combined with the CMAs, future investment returns for a portfolio can be simulated.

For plans whose assets are invested in the CTF, these CMAs, target allocations, and simulated returns fall under the purview of WSIB. The WSIB monitors these metrics closely and recommends changes to them as deemed appropriate by their staff. Their research and recommendations are documented in their biennial CMAs White Paper.

The first table below displays WSIB's CTF target asset allocation which is unchanged from our prior EES (August 2023). The second table summarizes WSIB's expected annual return and standard deviation for the CTF asset classes as of their last two CMAs White Papers (i.e., their 2025 and 2023 CMAs White Papers). Beneath the tables, we provide our key takeaways. For more information, including WSIB's asset class correlations, please see their 2025 CMAs White Paper.

WSIB CTF Target Asset Allocation	
	2025 & 2023 EES
Global Equity	30%
Tangible Assets	8%
Fixed Income	19%
Private Equity	25%
Real Estate	18%
Cash	0%
Total	100%

WSIB Capital Market Assumptions						
	Expected 1-Year Return*			Standard Deviation		
Asset Class	2025	2023	Difference	2025	2023	Difference
Global Equity	8.0%	8.1%	(0.1%)	18.0%	19.0%	(1.0%)
Tangible Assets	7.1%	7.0%	0.1%	12.0%	12.0%	0.0%
Fixed Income	5.1%	4.6%	0.5%	6.0%	6.0%	0.0%
Private Equity	11.0%	11.1%	(0.1%)	25.0%	25.0%	0.0%
Real Estate	7.4%	7.3%	0.1%	13.0%	13.0%	0.0%
Cash	3.0%	2.5%	0.5%	2.1%	2.0%	0.1%

**Reflects arithmetic returns. Geometric returns are lower but have similar differences between 2025 and 2023.*

- The one-year expected returns for Fixed Income and Cash are 0.5% higher than expected in the 2023 CMAs White Paper, which reflects WSIB's higher return expectations for cash. All other asset classes display modest and generally offsetting changes in their expected returns.
- There was a decrease in the standard deviation (volatility) for Global Equity. Otherwise, the one-year standard deviations had minimal to no change since the 2023 CMAs White Paper.

Using these metrics, WSIB simulates future annual CTF investment returns. They provided us 100,000 unique simulations from their model. The following table summarizes 15-year simulated future annual CTF returns by percentile using WSIB simulations. Fifteen years is the horizon over which WSIB primarily focuses their analysis for asset allocation purposes. Following the table, we provide our key takeaways. For more information on these simulations, including WSIB's modeling process, please see their 2025 and 2023 CMAs White Paper.

15-Year Simulated Annual Investment Returns*			
	2025	2023	Difference
Mean Return	**7.19%**	**7.06%**	**0.13%**
70th Percentile	9.13%	8.94%	0.19%
60th Percentile	8.22%	7.92%	0.30%
Median Return	**7.33%**	**7.02%**	**0.31%**
40th Percentile	6.42%	6.11%	0.31%
30th Percentile	5.44%	5.15%	0.29%

Note: Differences may not agree due to rounding. Figures are based on unique simulations and may differ slightly from those contained in the WSIB CMA White Paper.
**Displayed simulations vary based on the simulation model used. Consistent with WSIB CMA studies, the 2023 simulations rely on a downside log-stable distribution while 2025 figures rely on unique non-normal distribution simulations.*

- ❖ In 2025, WSIB staff introduced a new simulation model that is meant to better capture non-normal behavior in asset returns. Per the 2025 CMAs White Paper, the Non-Normal Distribution Simulation makes an adjustment to account for skewness and kurtosis in the distribution.
- ❖ The combination of CMA changes and a new simulation model mentioned above produced simulated returns that are higher than in WSIB's 2023 CMAs White Paper.
  - ◊ The median return represents the middle value for the simulations when the simulations are sorted, meaning half the values are above it and half are below it. This median return increased by 31 basis points since WSIB's 2023 CMAs White Paper and is approximately 7.3%.
  - ◊ The mean return represents the geometric average of all 15-year simulated returns. This mean return increased by 13 basis points and is approximately 7.2%.
- ❖ Using the simulations provided by WSIB, we also examined simulated returns over longer and shorter time horizons using the same target asset allocations, CMAs, and distribution method as described above that WSIB developed for a 15-year time horizon only. Consistent with the duration of the open retirement systems, the median annual investment return was 7.27% over a 20-year horizon and the mean annual investment return was 7.18%.
- ❖ These simulations require a few simplifying assumptions. One such assumption is that the target asset allocation and CMAs will remain constant throughout the projection period.

Given WSIB's extensive research and expertise in this area, we used their median and mean investment return expectations, over the plan duration timeframe of the state retirement systems, as a starting point for our own investment return analysis. Before doing so however, we took steps to better understand WSIB's target asset allocations, CMAs, and simulated

returns. To that end, we examined the methodology used by WSIB to develop their CMAs, the input provided by WSIB's consultant pool, and how well the CTF's actual asset allocations have matched WSIB's target allocations historically. Based on our findings, we determined the use of WSIB's investment return expectations as a starting point for our own analysis is reasonable.

Sensitivity of the Simulated Returns and Use of Historical Data

As with any assumption, we recognize that the CMAs may not match actual future investment experience. Therefore, we considered the impact of changes to the CMAs on the median simulated CTF return using a first-principles model[13] we developed.

Using this model, we applied a +/- 1% change in the expected one-year return of the Private Equity and Global Equity asset classes, while keeping all other asset classes unchanged. We chose these two asset classes because they comprise 55% of the target asset allocation and have the greatest amount of uncertainty (i.e., standard deviation) around their expected return. The following table displays our estimated impact on the median simulated return. Note that we made no adjustment to the expected standard deviation of either asset class. We also did not make any adjustment to the correlations between CTF asset classes.

Estimated Median Return Sensitivity				
	Change in Private Equity Expected Return		Change in Global Equity Expected Return	
Base	-1%	+1%	-1%	+1%
7.3%	7.1%	7.6%	7.0%	7.6%

In addition to this sensitivity analysis, we also reviewed historical CTF investment returns over various historical time periods. However, we do not believe historical investment returns are a good predictor of future returns due to the evolving nature of the investment market, WSIB's CMAs, and the CTF target asset allocations. For readers interested in the historical CTF investment returns, please see our Return on Investment webpage.

Application of the Investment Rate of Return

With WSIB's investment statistics and simulations in hand, we next considered how our application of this information may vary from that of WSIB. We believe three main differences arise – the purpose of the analysis, the time horizon, and the need for consistency with other economic assumptions. We also consider the appropriate precision of this assumption.

[13] *This first-principles model takes user-provided CMAs, approximates the CTF return based on them, and then applies a corresponding ratio adjustment to WSIB's median simulated return. To assess the general operation of this model, we reviewed the output for reasonableness. This includes comparing the results to model results from prior years and considering how the use of different assumption inputs to the model produce different results. We believe the resulting outputs are reasonable for purposes of this sensitivity analysis, which is to provide a rough sense of the impact on simulated returns from changes to the CMAs. We are not aware of any known weaknesses or limitations of the model that have a material impact on the results. The use of the model for this analysis is appropriate given its intended purpose.*

Purpose

- ❖ We use the Investment Rate of Return assumption for purposes of retirement plan funding, per the goals outlined in RCW 41.45.010 which are aimed at "[providing] a dependable and systematic process for funding the benefits provided to [DRS] members and retirees." We apply this assumption in our modeling to project the future annual return on plan assets and to discount future benefit payments and member salaries back to today's value, all of which are then used to compute plan contribution rates.
- ❖ WSIB analyzes and sets their CMAs and asset allocations consistent with their mission of "maximizing investment return at a prudent level of risk for the exclusive benefit of [CTF] participants and beneficiaries."

Time Horizon

- ❖ We apply the Investment Rate of Return assumption over time horizons that reflect the liability durations of the DRS plans. This implies an average time horizon of roughly 7 years for the plans that are closed to new hires and roughly 20 years for the plans that are open to new hires. See **Appendix D** for more information on plan duration.
- ❖ WSIB sets their CMAs, asset allocations, and simulated returns to target a 15-year time horizon.

Consistency

- ❖ We are mindful of the relationship between the Investment Rate of Return assumption and the other economic assumptions we use for plan funding, namely Inflation.
- ❖ WSIB bases their investment return analysis on their own economic assumptions, which includes an annual average national inflation assumption of 2.50%. As mentioned above, WSIB focuses their assumptions over a different horizon (and in the case of Inflation, over a different geographic area) than we do for pension funding.

Precision

- ❖ Uncertainty exists when setting our future Investment Rate of Return assumption. Future investment returns are sensitive to a multitude of external factors. Given this, we are cognizant of the precision of our recommendation.

To address these differences, we considered making a few adjustments to WSIB's investment return simulations based on our professional judgment.

Adjustments We Analyzed

There are numerous factors that can influence our Investment Rate of Return assumption. Some of these factors include technological advances, the rate of productivity growth, a shift in population demographics, tariff policy, and the impact of increasing government debt. We are aware that WSIB has considered many such factors in the development of their CMAs and simulated returns.

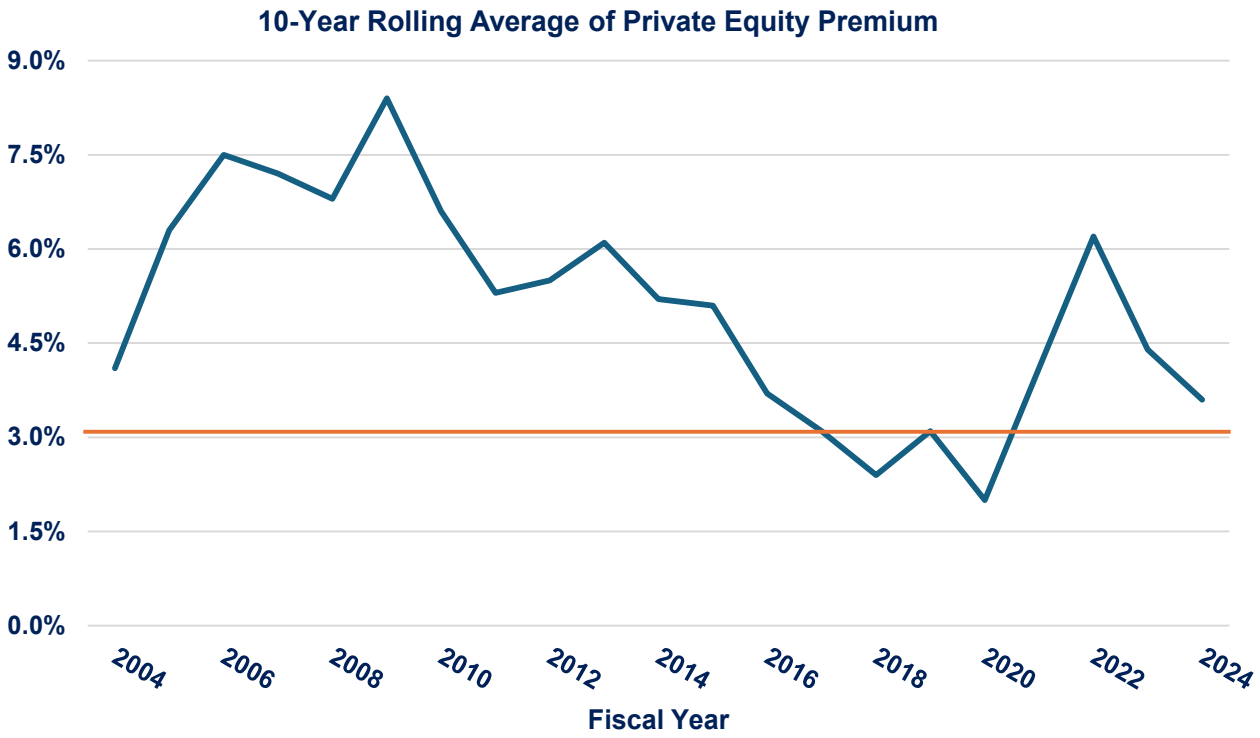
We analyzed adjustments to the private equity premium, mean reversion, and inflation. We chose these adjustments in light of the above differences between WSIB's and our application of the Investment Rate of Return. We focused on adjustments to the open plans because they involve applying WSIB's CMAs over a period beyond their intended 15-year time horizon. In our opinion, no adjustments are needed for the closed plans given their liability duration falls within WSIB's 15-year time horizon.

Private Equity Premium

WSIB develops their CMA expected return for Private Equity by taking their expected return for Global Equity and applying a private equity premium. As discussed in WSIB's 2025 CMAs White Paper, this private equity premium can be thought of as the compensation that comes from sacrificing liquidity and from the increased ability to exercise control with private equity investments.

WSIB assumes a private equity premium of 3.00% over a 15-year time horizon, but they also recognize that any premium in the range of 0.00% to 5.00% could also be considered reasonable. Given we are focused on a different time horizon (roughly 20 years for the open plans), we considered an adjustment to this private equity premium.

The following graph depicts the historical, realized private equity premium for the CTF on a ten-year rolling average basis.



Note: OSA calculated these 10-year rolling geometric averages using historical returns data, from WSIB, for the Private Equity and Global Equity asset classes. Our private equity premium estimate is the difference between the realized returns for these two asset classes. The Private Equity returns used in our estimate may include a quarterly lag.

While the observed private equity premium has been volatile, the overall trend since 2009 has mostly been a downward one, suggesting the gap between private and global equity returns was closing. We expect the general downward trend will continue in the long-term as the private equity market continues to mature and evolve. With an increasing number of investors joining the private equity market year over year, competition for and efficiency of private equity investments can be expected to increase further, driving down future private equity returns and private equity premiums.

Therefore, when we extend WSIB's CMAs past their intended 15-year time horizon and closer to the duration of liabilities in our open plans, we expect the CTF will experience lower annual private equity premiums during that time horizon than assumed by WSIB. All else being held equal, the lower the assumed private equity premium, the lower the simulated CTF annual investment return.

Mean Reversion

When developing their CMAs, WSIB considers the impact of asset class returns potentially reverting back to their average historical price-to-earnings/income levels over time. This adjustment is also known as "mean reversion", and it is perhaps most prominent in the equity asset classes.

In WSIB's most recent CMAs White Paper, they noted that both US and non-US equities had elevated price-to-earnings ratios, relative to their historical averages, at the end of 2024. Given this, WSIB assumes in their current CMAs that mean reversion will reduce the annual expected return in the equity asset classes. We analyzed WSIB's mean reversion adjustments and considered how those adjustments could change over different time horizons.

When we extend WSIB's CMAs past their intended 15-year time horizon and closer to the duration of liabilities in our open plans, we expect the CTF will experience a smaller annual mean reversion adjustment than assumed by WSIB in the next 15 years. All else being held equal, the smaller the assumed mean reversion adjustment, the higher the simulated CTF annual investment return.

Inflation

When setting an Investment Rate of Return assumption, we must consider the consistency of common components across our entire set of economic assumptions. For example, we use inflation as a standalone assumption in our post-retirement COLA modeling, but we also use a component of inflation – national inflation – as a factor for other assumptions, like the Investment Rate of Return.

As noted in the **Inflation** section, we recommend an annual Inflation assumption of 3.00% for the STB region. However, in the development of their 2025 CMAs, WSIB applied an annual average national inflation assumption of 2.50%. Per our analysis in the **Inflation** section, we expect national average inflation to be lower than that of the STB region and to be in the range of 2.3% to 2.6% over the long-term. Given WSIB's 15-year national inflation assumption of 2.50% falls within this range, we determined an inflation adjustment to WSIB's simulated returns was not necessary at this time.

Adjustments We Implemented

The three adjustments we analyzed generally offset each other or were unnecessary. Therefore, we ultimately determined that no explicit adjustments to WSIB's simulated returns were needed for these specific considerations.

Recommendation

Based on the analysis and considerations above, along with our professional judgment, **we recommend a 7.25% Investment Rate of Return assumption for all plans**, which represents a 0.25% increase in the current LEOFF 2 assumption and is consistent with the current statutory assumption for all other plans.

APPENDIX D - Retirement Plan Duration

Selecting reasonable economic assumptions requires consideration of the time horizon over which the assumptions will apply. For example, when setting a GSG assumption, we consider the average expected future working lifetime of active members. Meanwhile, when setting an Investment Rate of Return assumption, we consider both the members' average expected future working lifetimes and their life expectancy post-retirement.

Duration is an actuarial measurement used by our office to determine a relevant time horizon over which to forecast the economic assumptions contained in this study. Duration represents an average length of plan liabilities or salaries, measured in today's dollars. As an example, consider a plan with a liability duration of 15 years. We would expect about half of this plan's liability, measured in today's dollars, to be paid in benefit payments before 15 years and the other half to be paid after 15 years.

We estimate liability duration by taking the ratio of various Present Value of Future Benefits (PVFB) measured at different discount rates. Below is an example of the formula used to determine the duration as of the 2023 AVR, when the statutory discount rate was set at 7%. We perform the same calculation using the Present Value of Future Salaries to determine salary duration.

$$\text{Liability Duration} = \left(\frac{\text{PVFB Discounted 6\% Annually}}{\text{PVFB Discounted 7\% Annually}} - 1 \right) \times 100$$

The table below summarizes our plan duration estimates. We split these estimates based on whether the plan is open or closed to new hires. For purposes of this analysis, the closed plans consist of PERS, TRS, LEOFF, and the Washington State Patrol Retirement System (WSPRS) Plans 1, and the open plans consist of all other DRS-administered plans found in the AVR. The liability duration is measured across active and inactive members, whereas the salary duration is measured just across active members (i.e., those members earning a salary).

Duration Summary for Open and Closed Plans										
	Historical Duration					Projected Duration				
	2015	2017	2019	2021	2023	2025	2027	2029	2031	2033
Duration of Liabilities										
Open Plans	21.4	20.9	20.8	21.2	21.3	20.9	20.6	20.3	20.1	19.9
Closed Plans	9.1	8.9	8.4	8.4	8.0	7.6	7.3	7.0	6.7	6.4
Duration of Salaries										
Open Plans	7.8	7.9	8.2	8.4	8.5	8.6	8.6	8.6	8.6	8.7

Note: Historical duration values are based on their respective AVRs. Projected duration values are based on projections as of our 2023 AVR (see our 2023 Valuation Projections Model webpage for more information).

We observed a difference in duration between the closed and open plans because the membership of closed plans is generally older, and older members have shorter expected future lifetimes than younger members. Duration will also vary by individual plan, as each plan has a distinct demographic make-up. However, after review, we believe grouping the plans into open and closed populations provides a reasonable duration target for each plan.

The open plans have a liability duration of roughly 21 years and a salary duration of roughly 8 to 9 years. The closed plans have a current liability duration of roughly 8 years. We do not provide salary durations for the closed plans, as most of their populations are already retired and their remaining actives are expected to have short future working lifetimes.

APPENDIX E -
Peer Retirement System Economic Assumptions

Economic Assumptions for Public Plans Outside Washington			
Plan Name	**Inflation***	**General Salary Growth**	**Investment Return**
Washington 2025 EES Recommendations	**3.00%**	**3.50%**	**7.25%**
Washington Currently Prescribed Assumptions	**2.75%**	**3.25%**	**7.00% LEOFF 2 7.25% Other Plans**
Alaska PERS & Teachers	2.50%	2.75%	7.25%
California PERS	2.30%	2.80%	6.80%
California Teachers	2.75%	3.50%	7.00%
Colorado PERA	2.30%	3.00%	7.25%
Florida Retirement System	2.40%	3.50%	6.70%
Idaho PERS	2.30%	3.05%	6.30%
Iowa PERS	2.60%	3.25%	7.00%
Missouri State Employees	2.25%	2.75%	6.95%
Ohio PERS	2.35%	2.75%	6.90%
Oregon PERS	2.40%	3.40%	6.90%
Wisconsin Retirement System	2.40%	3.00%	5.40%
Selected Public Plans Outside WA – Average	**2.41%**	**3.07%**	**6.77%**
Selected Public Plans Outside WA – Minimum	**2.25%**	**2.75%**	**5.40%**
Selected Public Plans Outside WA – Maximum	**2.75%**	**3.50%**	**7.25%**

Note: Data gathered from the National Association of State Retirement Administrators (NASRA) as of June 2025. This data reflects the assumptions prescribed by each plan, which may not match the actuary's recommended assumption. There may also be a timing lag between the date of valuation and when the assumptions were actually last studied.
**Selected public plans outside Washington primarily use a national inflation assumption rather than a regional assumption. We expect inflation in the STB region to be higher than the national average.*

APPENDIX F - Historical Economic Assumptions for Washington State Pension Systems

Historical Economic Assumptions for Washington State Pension Systems				
Valuation Years	**Inflation**	**General Salary Growth**	**Investment Return**	**Membership Growth for Plan 1 Funding**
1989 - 1994	5.00%	5.50%	7.50%	0.75% TRS 1.25% PERS
1995 - 1997	4.25%	5.00%	7.50%	0.90% TRS 1.25% PERS
1998 - 1999	3.50%	4.00%	7.50%	0.90% TRS 1.25% PERS
2000 - 2008	3.50%	4.50%	8.00%	0.90% TRS 1.25% PERS
2009 - 2010	3.50%	4.50% LEOFF 2 4.00% Other Plans	8.00%	0.90% TRS 1.25% PERS
2011 - 2012	3.00%	3.75%	7.5% LEOFF 2 7.9% Other Plans	0.80% TRS 0.95% PERS
2013 - 2014	3.00%	3.75%	7.5% LEOFF 2 7.8% Other Plans	0.80% TRS 0.95% PERS
2015	3.00%	3.75%	7.5% LEOFF 2 7.7% Other Plans	0.80% TRS 0.95% PERS
2016	3.00%	3.75%	7.5% LEOFF 2 7.7% Other Plans	1.25% TRS 0.95% PERS
2017 - 2020	2.75%	3.50%	7.4% LEOFF 2 7.5% Other Plans	1.25% TRS 0.95% PERS
2021 - 2023	2.75%	3.25%	7.00%	1.00% TRS/PERS
2024	2.75%	3.25%	7.00% LEOFF 2 7.25% Other Plans	1.00% TRS/PERS

Note: Values represent prescribed assumptions, which may not necessarily match OSA's recommended assumptions.

2025 Economic Experience Study

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