MILLIMAN REPORT

2020 Long-Term Services and Supports Trust Actuarial Study

Commissioned by the Office of the State Actuary

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EXHIBITS

I. OVERVIEW

The Office of the State Actuary (OSA) requested Milliman's help to provide actuarial analysis of the Long-Term Services and Supports (LTSS) Trust Program as an update to the 2018 independent feasibility study and actuarial modeling of public and private options for leveraging private resources to help individuals prepare for LTSS needs in the State of Washington. Updated actuarial analysis, to be conducted prior to the start of Washington's LTSS Trust Program, was requested not only to reflect the enacted program[1] but also provide additional modeling of alternative program features and risk management considerations regarding the premium assessment. To the extent details on program features were not included in the final law, we relied upon feedback from OSA and DSHS for the parameters to model. Additionally, future rulemaking and potential program modifications will be informed by this analysis.

Milliman was engaged by OSA as a contractor to perform this actuarial study, including the required modeling and actuarial analysis. The results of the actuarial study are to be shared with OSA and the Washington Department of Social and Health Services (DSHS) to collectively aid OSA's and DSHS's responsibilities in supporting the LTSS Trust Program.

Milliman utilized Actuarial Research Corporation (ARC) to inform portions of this analysis. We would like to recognize and thank Eddie Armentrout and his research team for their contributions.

SCOPE OF ENGAGEMENT AND WORK PROCESS

The scope of our engagement included the following main components:

- Estimate needed premium assessment based on the program features specified in the Revised Code of Washington (RCW) 50B.04 ("Baseline")
- Model alternative program features compared to Baseline
- Perform sensitivity testing on specified parameters
- Describe qualitative rate setting considerations and quantitatively illustrate select rate setting risks
- Provide final report summarizing the key results, methodology, and assumptions of the analysis

COMMENTS ON LTSS DEFINITION AND LONG-TERM ACTUARIAL PROJECTIONS

For the purposes of this report, we use the terms LTSS and long-term care (LTC) interchangeably. LTSS is a range of services and supports for individuals who need assistance with daily living tasks, such as bathing, dressing, ambulation, transfers, toileting, medication administration or assistance, personal hygiene, transportation, and other health-related tasks. Often, this type of assistance is needed by individuals who experience functional limitations due to age or to physical or cognitive disability. LTSS includes services provided in:

- Institutional settings: Includes skilled, intermediate, and custodial care provided in an institutional facility setting, such as a nursing home or dedicated wing of a hospital.
- Home and community-based settings (HCBS): Includes care provided in a person's own home or in a community-based setting, such as an assisted living facility or adult family home. Coverage includes both the services rendered and the room and board in a community-based setting.

The estimates provided throughout this report are prepared to assist in evaluating the feasibility of offering a new public LTC plan using design elements as requested by DSHS. **Any estimates around required program revenue are for feasibility purposes only and not intended, and should not be used, for setting the program premium assessment.**

This report includes estimates projected many years into the future. Actual expenses and related required revenue will inevitably vary from the estimates shown throughout the report. Examples of items that are difficult to project include the level of utilization of LTC services over time, duration of care needs, charge trends by site of care, emergence of new service and care modalities, wage growth and labor force participation, effectiveness of regulations and procedures

[1] Revised Code of Washington 50B.04 (2019). Retrieved October 12, 2020, from https://app.leg.wa.gov/RCW/default.aspx?cite=50B.04

to determine coverage and qualifications for benefits, migration patterns into and out of Washington, and future mortality. Section VI (methodology and assumptions) provides further background on our modeling.

Any reader of this report should possess a certain level of expertise and background in actuarial projections related to financing LTSS / LTC benefits to assist in understanding the significance of the assumptions used and their impact on the illustrated results. The reader should be advised by, among other experts, actuaries or other professionals competent in the area of actuarial projections of the type in this report, so as to properly interpret the estimates. The information included in this report should only be considered in its entirety. Please see Section VII for additional caveats and limitations regarding this report.

COMMENTS ON COVID-19

In preparing this study, we considered the potential impact of the emerging situation regarding the COVID-19 pandemic. Given the substantial uncertainty regarding the impact of COVID-19 on claims costs, including whether the pandemic will increase or decrease LTSS costs in the future, we did not make adjustments to the projections. At the time of publishing this report, it is not possible to predict the outcomes, particularly over the 75-year projection period of this study; however, the COVID-19 pandemic could have a material impact on future costs. Section V of this report presents sensitivities to pricing assumptions, including sensitivities to morbidity, mortality, and economic assumptions, all of which have been affected by COVID-19 in some capacity. Additional considerations related to pandemic risks and LTSS are discussed in a recent Milliman white paper.[2]

[2] Dalton, A.H. et al. (April 10, 2020). Pandemic Risk on Long-Term Care Insurance Reserves. Milliman White Paper. Retrieved July 24, 2020, from https://us.milliman.com/en/insight/pandemic-risk-on-ltc-insurance-reserves.

II. BASELINE RESULTS

Per direction of the Washington Legislature as passed in RCW 50B.04[3], the LTSS Trust Act will provide a public long-term care insurance benefit for workers, funded through a payroll deduction that would provide a limited long-term care insurance benefit. The LTSS Trust Program will be financed by a flat state premium assessment on all wages and self-employment income as applicable. Coverage is limited to workers and does not include spousal coverage. Funding is assumed to be pay-as-you-go for a social insurance program, although the program does include some measure of prefunding. This section summarizes the results of our analysis based on the program features as indicated in RCW 50B.04, along with additional clarifications of anticipated program parameters provided by OSA and DSHS.

RESULTS SUMMARY

We estimate the 2020 Baseline will require a level payroll premium assessment between 0.53% and 0.69% to cover program expenditures over the 75-year period 2022 through 2096. The premium assessments in this range vary depending on the allowable investment strategy for the program, as well as the participation rates as a result of the private market opt-out and self-employed opt-in features. It is worth noting that 0.58% is the maximum premium assessment allowed per RCW 50B.04.

Beyond the investment strategy and opt-in / opt-out features, the estimated payroll premium assessment is highly sensitive to the underlying projection assumptions used in the modeling. Section V includes additional details regarding sensitivity tests of the key assumptions. **Based on testing various key assumptions one at a time, we observe the premium assessment for the Baseline increasing or decreasing by roughly 50%.** The results of the testing should be taken into consideration when evaluating the feasibility of offering a new LTSS benefit program. A key step in rate setting includes evaluating the sensitivity of the program results under different conditions and the program's ability to adjust features when experience materializes differently from what was expected.

We use an initial 75-year window because this is a common period over which to evaluate a public program, such as that being modeled here. The 75-year window does not represent a recommended window. Other time horizons should also be considered when evaluating the needed program revenue. The required premium assessment is calculated such that the present value of income is equal to the present value of benefits, plus expenses, plus one year's outgo at the end of the 75-year period. Exhibit 3 includes the estimated yearly cash flows under the program for the Base Plan.

Impact of Investment Strategy

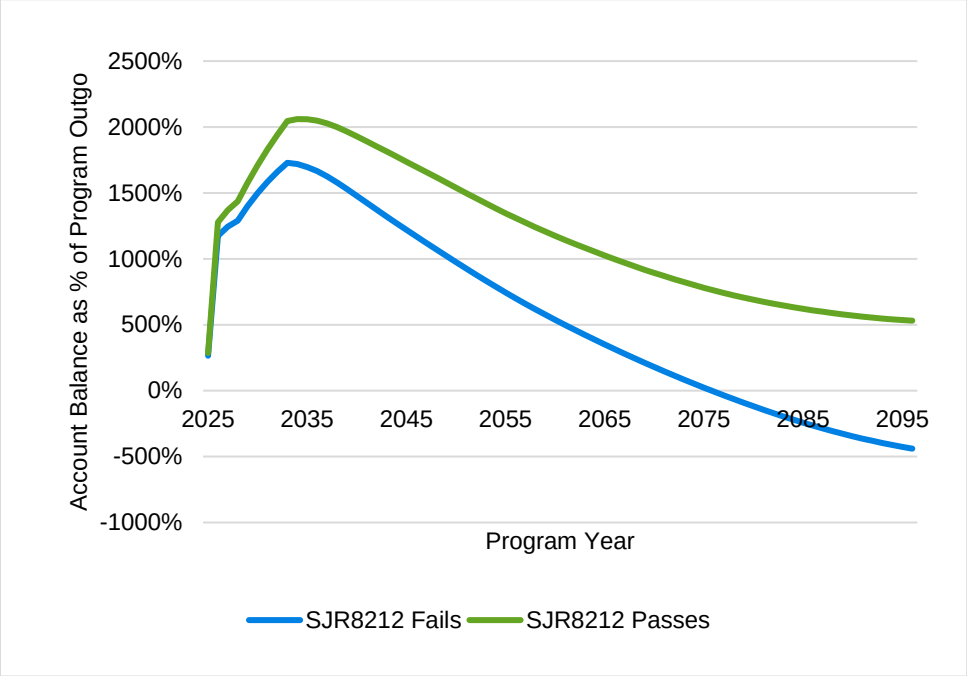
Senate Joint Resolution 8212 (SJR8212)[4] plays a significant role in the level of funding needed. We estimate a payroll premium assessment between 0.53% and 0.64% if SJR8212 passes and a payroll assessment between 0.64% and 0.69% if SJR8212 fails. Based on background provided by OSA, we assume investments only in Treasuries under the current law (i.e., SJR8212 fails), which we understand to be consistent with the investment approach currently anticipated. SJR8212 would allow flexibility to invest the Trust Account in stocks and other forms of investment. The passage of SJR8212 is contingent upon a statewide referendum which coincides with Election Day on November 3, 2020. More information on the modeled investment strategies is included in Appendix A.

Figure 1 shows the estimated account balance as a percentage of annual program outgo (which includes both benefit payment and administrative expenses) over the 75-year projection window under the *SJR8212 passes* and *SJR8212 fails* scenarios, assuming a 0.58% payroll premium is assessed (which is consistent with the maximum premium assessment to be charged for the program, as dictated by RCW 50B.04). When we calculate a 75-year level payroll premium assessment for the program, we ensure the rate is sufficient enough to maintain an account balance above $0. As seen in Figure 1, we project a 0.58% premium rate to be insufficient to keep the program solvent for 75 years if SJR8212 fails, as the program's account balance decreases below program outgo for this scenario. Alternatively, the 0.58% assessment is sufficient under the scenario where SJR8212 passes.

[3] RCW 50B.04 (2019). Retrieved October 8, 2020, from https://app.leg.wa.gov/RCW/default.aspx?cite=50B.04

[4] Senate Joint Resolution (2019). Retrieved September 23, 2020 from https://app.leg.wa.gov/billsummary?BillNumber=8212&Year=2019&Initiative=false

Figure 1: Account Balance as a Percentage of Annual Program Outgo under 0.58% Premium Assessment



Impact of Private Market Opt Out

Current legislation is designed to allow individuals to opt out of the program over the course of a window from October 1, 2021 through December 31, 2022 given they self-attest to owning private market long-term care coverage. Once an individual opts out of the LTSS Trust Program, they cannot opt back into the program at a later date. Any time choice or a voluntary aspect to participation is introduced into a program, unpredictability related to adverse selection can make rate setting challenging. Given this, we modeled three different participation scenarios related to the private market opt-out. We use the first participation scenario (20% Top Decile, 10% Second Decile Opt Out) for the purposes of creating a base plan as discussed in the section "Key Plan Features of Base Plan."

1. 20% Top Decile, 10% Second Decile Opt Out

   We assume 20% of the top decile of wage earners and 10% of the second decile of wage earners will opt out of the program. We assumed those individuals that opt out earned "average" wages for their decile (i.e., we did not assume the 20% that opted out of top decile were the top 20% of the top decile, but rather average wage earners for that decile). This equates to 3% of wage earners (responsible for approximately 10% of wages in 2022) opting out at the start of the program.

2. 45% of All Wage Earners Opt Out

   For the next two alternatives, we examined private market, stand-alone LTC insurance premiums and carved out individuals for whom it could be cheaper to purchase private market coverage than to pay a 0.58% payroll assessment at the start of the program. For this scenario, we looked at private market coverage with a $50 daily benefit maximum and no inflation protection. This coverage is intended to represent the "cheapest" available coverage in the private market, and be leaner (i.e., lower daily benefit and no inflation protection) than the coverage offered by the LTSS Trust Program.

   When projecting the number of individuals who may opt out of the program for this alternative, we compared private LTC market premium rates to the amount individuals would pay in the form of a payroll premium assessment. For example, if the annual premium available for a 60-year-old in the private market was approximately $420, we assumed individuals who made more than $72,400 ($420 / 0.58% = $72,400) would opt out of the program. We performed this comparison by age because private market coverage is issue age

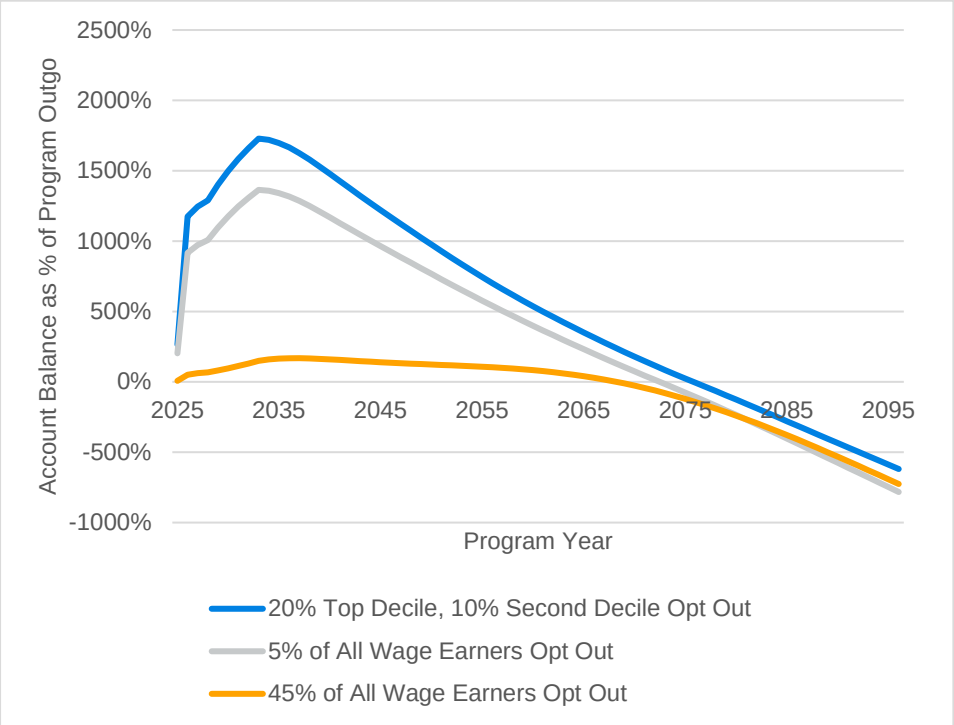
rated. We projected that approximately 45% of wage earners (responsible for approximately 75% of wages in 2022) would opt out at the start of the program under this alternative.

3. 5% of All Wage Earners Opt Out

   We also performed a test for private market, stand-alone LTC coverage with higher premiums (compared to the "45% of All Wage Earners Opt Out" alternative) using a $100 daily benefit maximum and annual 3% compound inflation protection. We carved out individuals for whom it could be cheaper to purchase this coverage than to pay a 0.58% payroll assessment at the start of the program. Under this alternative, we projected that approximately 5% of wage earners (responsible for approximately 25% of wages in 2022) would opt out at the start of the program.

Figures 2 and 3 below show the account balance as a percentage of annual program outgo over the 75-year window under the three private market opt-out scenarios described above. These graphs all assume that a 0.58% payroll premium is assessed. As seen in Figure 2, we project a 0.58% premium rate to be insufficient to keep the program solvent for 75 years under all private market opt-out scenarios if SJR8212 fails, as the program's account balance decreases below program outgo for each scenario.

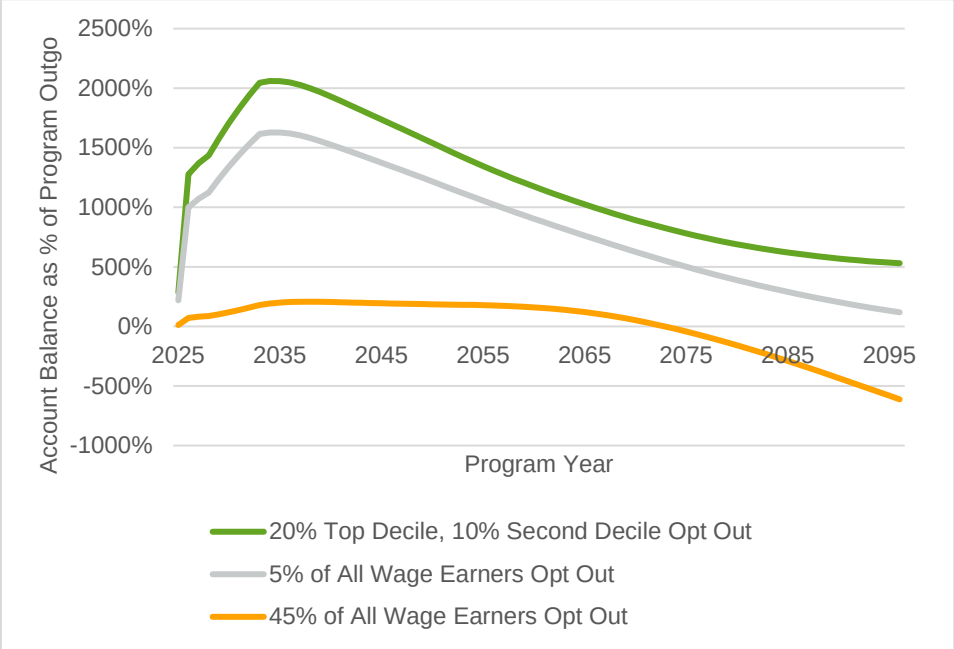
Figure 2: Account Balance as a Percentage of Annual Program Outgo under 0.58% Premium Assessment - SJR8212 Fails



Regardless of investment strategy, we expect the "45% of All Wage Earners Opt Out" scenario to be deficient. Under this scenario, we project a large percentage of individuals will opt out at the start of the program. Since it is the higher wage earners that we project to be opting out, we project this opt-out will carve out a larger percentage of wages than participants. Because a larger amount of program revenue is carved out compared to program benefit payments, the program would require a higher premium rate to maintain program solvency for the projection window.

While the opt-out is only available for a limited period of time at the beginning of the program, for the scenarios where a larger percentage of individuals end up opting out, the impact extends throughout the 75-year window. This is especially true for the *SJR8212 passes* scenario (as seen in Figure 3), where interest rates are higher, and the program is more dependent on prefunding to maintain program solvency. Since the interest rates are lower under the scenario where SJR8212 fails, prefunding is less prevalent and the impact of carving out a percentage of the population in the early years of the projection has less of an impact on program solvency over 75 years, as seen in Figure 2.

Figure 3: Account Balance as a Percentage of Annual Program Outgo under 0.58% Premium Assessment - SJR8212 Passes



While the level of individuals who choose to opt-out of the program is unknown, we "default" to the first participation scenario (20% top decile, 10% second decile opt out) for the purposes of creating a "Base Plan" throughout the remainder of this report. Please note, this participation scenario does not represent the most likely participation scenario. Instead, we create a "Base Plan" as a reference point to evaluate the incremental cost or savings associated with other plan alternatives or assumption sensitivities. For reference, Exhibit 2 (Grandfathered private market opt-out) also includes a test of the revised premium rate if only individuals who purchased coverage before December 31, 2019 are allowed the choice to opt-out.

Impact of Self-Employed Opt-In

Current legislation is designed to allow participation for self-employed individuals to be fully voluntary, where they are only enrolled after "opting in" to the program. Any time choice or a voluntary aspect to participation is introduced into a program, unpredictability related to adverse selection can make rate setting challenging. Given this, we modeled three different participation scenarios related to the self-employed opt-in. We use the second participation scenario (10% Wages, 100% Benefits) for the purposes of creating a base plan as discussed in the section "Key Plan Features of Base Plan."

1. 0% Wages, 100% Benefits

   We assume the program collects no premium assessments from self-employed individuals, but pays program benefits as if 100% of self-employed individuals opt into the program. This is the most conservative example and could be considered a "bound," since in reality if individuals opt into the program to receive benefits, they will have to contribute some level of premium assessment.

2. 10% Wages, 100% Benefits

   We assume the program collects premium assessments on 10% of wages from self-employed individuals, but pays program benefits as if 100% of self-employed individuals opt into the program. Since self-employed individuals will have the choice to opt in or out of the program, it is possible that this group will contribute less in premiums than the program will pay out to them in benefits. This is due to two factors:

a. Any time choice is introduced into a program, there is the potential for adverse selection. In this circumstance, self-employed individuals who are unhealthy may be more likely to opt into the program than healthy individuals.

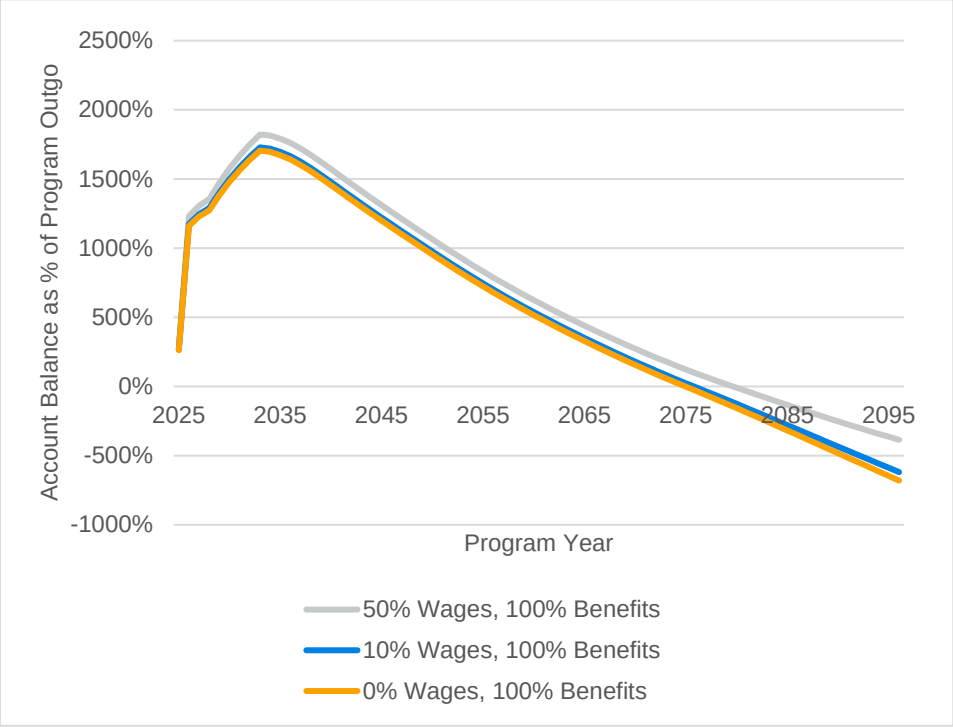
b. While the rest of the population will be mandated to contribute a payroll assessment each wage-earning year of the program, self-employed individuals could be selective about when they choose to participate and contribute a premium assessment. For example, they may choose to only opt in for the minimum years necessary to become vested (i.e., 10 years) instead of contributing for their full working life. If they elect to only contribute for a limited number of years, they may select which years to contribute based on how much they make in a year (i.e., they "participate" in the program in years where their wages are lower to contribute as little as possible to the program). The final structure and administration of the self-employed opt-in will dictate the extent to which self-employed individuals can control their contributions to the program.

3. 50% Wages, 100% Benefits:

We assume the program collects premium assessments on 50% of wages from self-employed individuals, but pays program benefits as if 100% of self-employed individuals opt into the program. Since this example assumes the program will be able to collect a larger amount of premiums from self-employed individuals than either of the other two examples, this is the example that leaves the account in the most sufficient position.

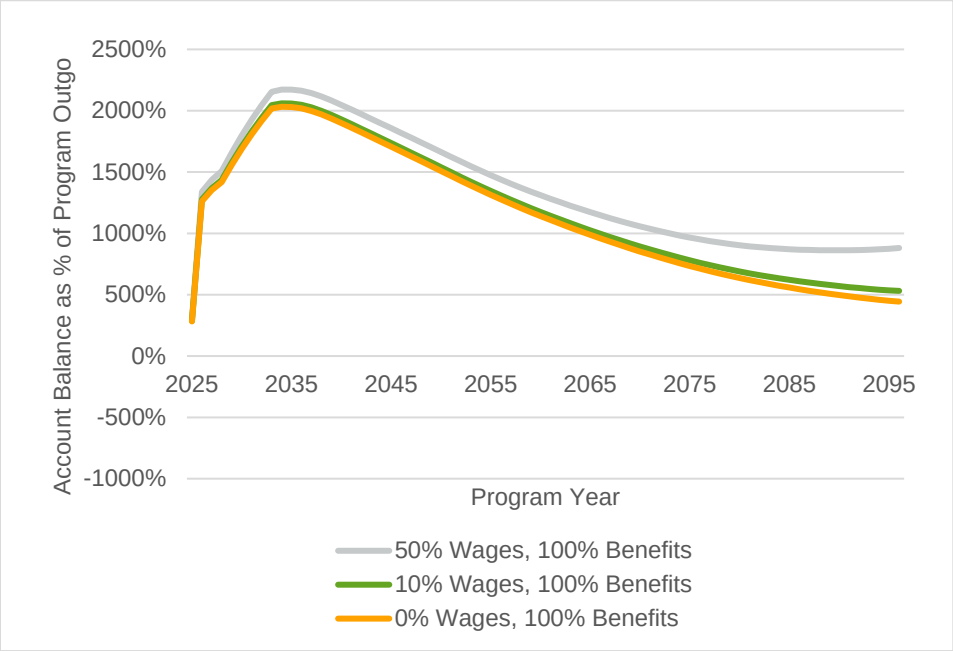
Figures 4 and 5 below show the account balance as a percentage of annual program outgo over the 75-year window under the three self-employed opt-in participation scenarios described above. These graphs all assume that a 0.58% payroll premium is assessed. As seen in Figure 4, we project a 0.58% premium rate to be insufficient to keep the program solvent for 75 years under all self-employed opt-in scenarios if SJR8212 fails, as the program's account balance decreases below program outgo for each scenario.

Figure 4: Account Balance as a Percentage of Annual Program Outgo under 0.58% Premium Assessment - SJR8212 Fails



Alternatively, as seen in Figure 5 if SJR8212 passes, we project a premium assessment of 0.58% to be sufficient to maintain the program's solvency for 75 years. We project the self-employed participation could have a large impact on the level of solvency. The more wages that are collected relative to benefit payments for self-employed individuals, the higher the projected account balance.

Figure 5: Account Balance as a Percentage of Annual Program Outgo under 0.58% Premium Assessment - SJR8212 Passes



While the level of self-employed individuals who choose to participate in the program is unknown, we "default" to the first participation scenario (10% Wages, 100% Benefits) for the purposes of creating a "Base Plan" throughout the remainder of this report. Note, this participation scenario does not represent the most likely participation scenario. Instead, we create a "Base Plan" as a reference point to evaluate the incremental cost or savings associated with other plan alternatives or assumption sensitivities. For reference, Exhibit 2 also includes a test of the revised premium rate if 100% of wages and benefits are included for self-employed individuals.

POPULATION COVERAGE EXPLANATION

This program is designed to provide a public long-term care insurance benefit for current, or future, program-eligible individuals (based on requirements below). Eligibility criteria are crucial assumptions in estimating the benefit payments from this program. It is important to understand the population eligible for benefits, given the following program specifications:

- Benefit age eligibility: The LTSS Trust Program provides benefits to individuals who are 18 and older. Given the vesting requirements, this does not have a large impact on the eligible population, as we do not expect individuals under age 18 to have worked long enough to vest.

- Disabled population: Individuals who were disabled prior to age 18 are not eligible to receive benefits under the program. These individuals typically receive benefits from other state-funded programs.

- Vesting requirements: To be eligible for benefits, individuals must pay the premium assessment for a specified number of years, known as the vesting period. Therefore, individuals who never work will not vest. Similarly, individuals who are already retired or nearing retirement will likely not be eligible to receive benefits under the program

- Individual coverage: The program does not allow spousal or other family member coverage. Only the vested individual is covered.

- Private market opt-out: Current legislation is designed to allow individuals to opt out of the program over the course of a window from October 1, 2021 through December 31, 2022 given they self-attest to owning private market long-term care coverage. Any time choice or a voluntary aspect to participation is introduced into a program, unpredictability related to adverse selection can make rate setting challenging. Given this, we present the Baseline premium rates under several different participation scenarios related to the private market opt-out.

- Self-employed opt-in: Current legislation is designed to allow participation for self-employed individuals to be fully voluntary, where they are only enrolled after "opting-in" to the program. As with the private market opt-out, any time choice or a voluntary aspect to participation is introduced into a program, unpredictability related to adverse selection can make rate setting challenging. Given this, we present the Baseline premium rates under several different participation scenarios related to the self-employed opt-in.

KEY PLAN FEATURES OF BASE PLAN

The 2020 Base Plan was modeled based off the features outlined below. To the extent details on program features were not included in the final law, we relied upon feedback from OSA and DSHS for the parameters to model. Tests regarding alternative plan variations compared with the 2020 Base Plan are discussed in Sections III of the report.

- Comprehensive covered services (similar to private market).
  - Institutional settings.
    - Includes skilled, intermediate, and custodial care provided in an institutional facility setting, such as a nursing home or dedicated wing of a hospital.
  - Home and community-based settings.
    - Includes care provided in a person's own home or in a community-based setting, such as an assisted living facility or adult family home.
- Minimum age requirement for participation of 18, disabled after 18.
  - Individuals are not eligible for program benefits until they turn age 18 and are not eligible for program benefits if they were disabled before age 18.
- Benefit eligibility (i.e., "benefit trigger").
  - Individuals who have vested can draw benefits once they require assistance with a minimum number of activities of daily living (ADLs) or severe cognitive impairment. RCW 50B.04 currently defines the benefit eligibility criteria as requiring assistance with at least three ADLs. Since this definition requires further clarification, for the purposes of this feasibility study we assumed the type and minimum number of ADLs considered by care setting will be consistent with the current definitions used under the State of Washington Medicaid program[5].
- Starting pool of benefit dollars of $36,500, indexing at 2.5% per year.
  - The pool of money can be used over an individual's lifetime. The pool of money grows each year tied to a consumer price index, which we assume to be 2.5% annually.
- No daily benefit cap.
  - In the absence of a daily benefit cap, we assume individuals will spend the average cost of care per day observed in the private market for receiving benefits.
- Reimbursement benefit structure.

[5] Medicaid Personal Care (MPC) and nursing facility care (NFC) eligibility requirements can be accessed at the following websites:
https://apps.leg.wa.gov/wac/default.aspx?cite=388-106-0210
https://apps.leg.wa.gov/wac/default.aspx?cite=388-106-0355

- Benefits are paid only as reimbursement for an individual's actual expenses incurred.

- Elimination period of 45 days.
  - Benefit payment commences following satisfaction of a one-time "deductible" period of 45 consecutive days during which the individual has a qualifying level of disability meeting the benefit eligibility trigger.

- Vesting by premium assessment payments in three of last six years, or 10 years total.
  - To be eligible for benefits, individuals must pay the premium assessment for a specified number of years, known as the vesting period. Vesting is considered satisfied if payroll premium assessment payments were made in three of the last six years, or in 10 total years during an individual's work history.

- No portability.
  - Only individuals living in the state of Washington are eligible for benefits.

- Program revenue source is payroll premium assessment on wages.
  - Financing for the program will come solely from premium assessment payments. There are no premiums required once an individual no longer receives wages.

- Administrative load of 3.5% of income and 3.5% of benefits
  - To cover the expenses of administering the program, administrative loads are applied to the program's expected income and benefit payments.

- Private Market Opt-Out
  - Current legislation is designed to allow individuals to opt out of the program over the course of a window from October 1, 2021 through December 31, 2022 given they self-attest to owning private market long-term care coverage. While the level of individuals who choose to opt-out of the program is unknown, for the purposes of creating a Base Plan we assume that 20% of the top decile of wage earners and 10% of the second decile of wage earners will opt out of the program. This assumption was determined by DSHS.

- Self-Employed Opt-In
  - Current legislation is designed to allow participation for self-employed individuals to be fully voluntary, where they are only enrolled after "opting in" to the program. While the level of individuals who choose to participate in the program is unknown, for the purposes of creating a Base Plan we assume that the program will collect 10% of self-employed wages, but 100% of benefits will be paid (as a proxy for adverse selection considerations). This assumption was selected through conversations with OSA and DSHS.

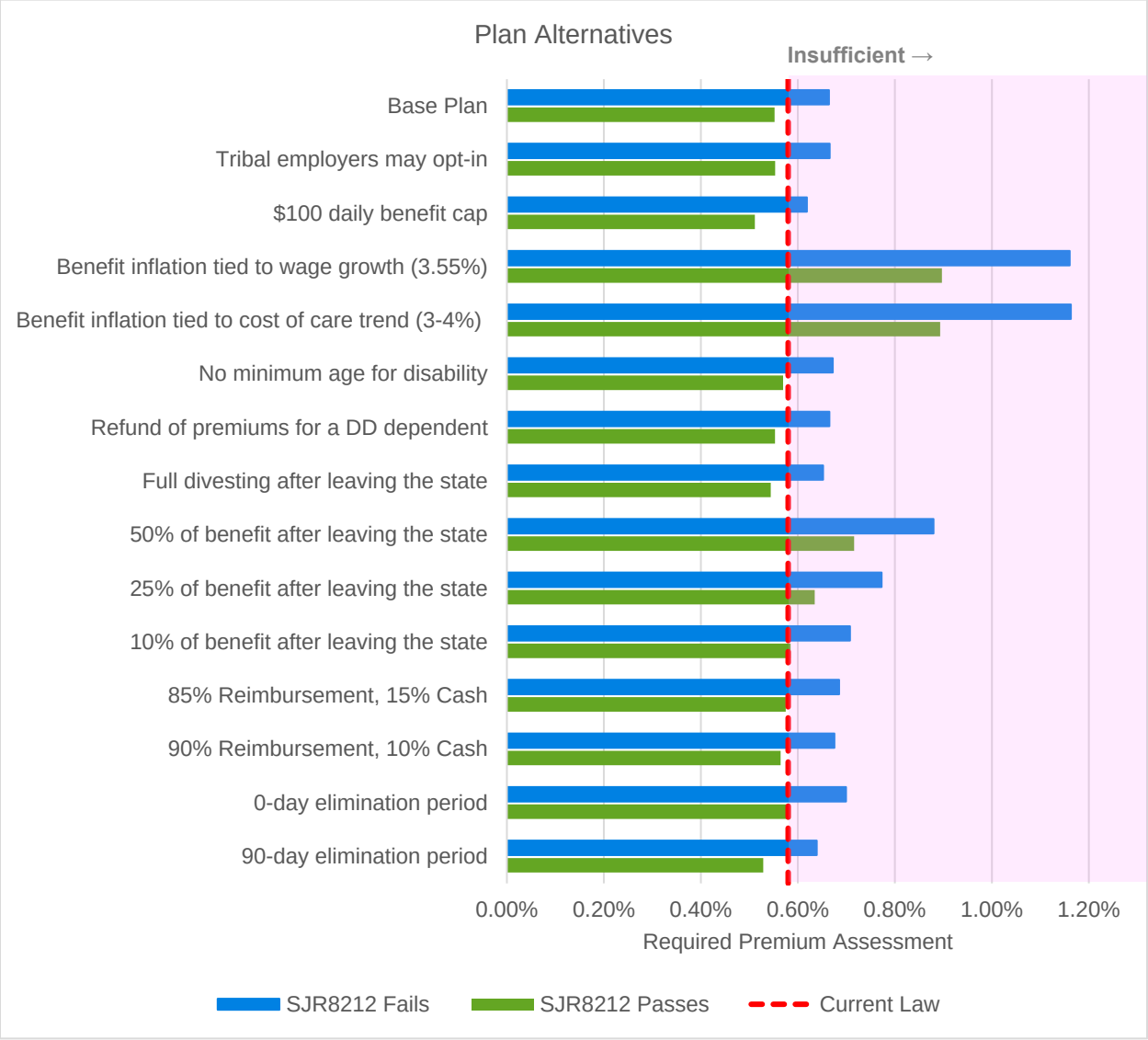
III. PLAN ALTERNATIVES

Figure 6 shows the additional design alternatives tested compared with the assumed 2020 Base Plan, as described in the prior section. A description of each test is provided in detail in the subsections below, as well as in Exhibit 1.

The bars shown in Figure 6 represent the payroll premium assessment required to fund the program over a 75-year window for different program alternatives. We calculate the required rates under both investment strategy scenarios, where the blue bars show the required rates if SJR8212 fails and the green bars represent the required rates if SJR8212 passes. The red line represents the premium assessment prescribed by current law of 0.58%. Bars that pass the red line represent alternatives where the current premium assessment of 0.58% is not sufficient to cover expected benefit payments for all 75 years of program window. The required premium assessments for each alternative are also included in Exhibits 2a and 2b.

It is worth noting that for every alternative shown in Figure 6, the 0.58% premium rate is not expected to be sufficient if SJR8212 fails (i.e., every blue bar passes beyond the red line). Conversely, for the majority of alternatives, we project the 0.58% payroll assessment would be sufficient if SJR8212 passes. The extent to which the 0.58% premium rate is sufficient (or the implied cushion or “margin” of the alternative) varies between alternatives. Additionally, there are several scenarios that would be deficient even if SJR8212 passes, specifically alternatives where the benefit inflation is increased (which has a large impact on the value of benefits over the lifetime of the program) and alternatives where portability is less restrictive for vested individuals who choose to move out of Washington.

Figure 6: Required Premium Assessment for Plan Alternatives



TRIBAL EMPLOYERS OPT-IN ALTERNATIVE

Under the Base Plan, tribal employers are excluded from the premium assessment and, thus, would not be eligible for coverage under the LTSS Trust Program. This test examines the impact of including 100% of these individuals in the premium assessment and benefits payout.

According to the Washington Indian and Gaming Association's 2019 report titled *The Economic & Community Benefits of Tribes in Washington*, there were nearly 31,000 individuals employed by tribal organizations in 2018. Because tribal employees make up a small proportion of total wage earners in Washington, this alternative has a negligible impact to the premium assessment compared to the Base Plan.

DAILY BENEFIT CAP ALTERNATIVE

A $36,500 pool of money (in 2025, indexed with inflation) is prescribed under the Base Plan, but program participants are not restricted to any daily benefit maximum cap. Therefore, we assume individuals will spend the average daily cost of care in Washington observed in the private market under the Base Plan. This alternative tests the impact of

capping the daily benefit allowance at $100, indexed with inflation—where the $100 cap is well below the average daily cost of care in either a facility or home setting.

Figure 7a:
Washington Office of the State Actuary
Plan Alternatives - SJR8212 Fails
Level Premium Assessment Required

Test	Level Premium Assessment Required	% Change from Base Plan
Base Plan	0.66%	N/A
$100 daily benefit maximum	0.62%	-0.05%

Figure 7b:
Washington Office of the State Actuary
Plan Alternatives - SJR8212 Passes
Level Premium Assessment Required

Test	Level Premium Assessment Required	% Change from Base Plan
Base Plan	0.55%	N/A
$100 daily benefit maximum	0.51%	-0.04%

REVISED COST OF CARE PROTECTION ALTERNATIVES

These alternatives calculate the premium assessment required if benefits are inflated differently. The Base Plan assumes that the $36,500 pool of money (as of 2025) will be inflated at a rate consistent with a Consumer Price Index (CPI), or general inflation – assumed to be 2.5%. The two tests shown below instead inflate benefits consistently with assumed future long-term wage growth (3.55%) and assumed future cost of care inflation (4% for care delivered in a facility setting and 3% for care delivered in a home setting).

As seen in Figure 6, changes to benefit indexing have the largest impact on the premium rate out of all the plan alternatives tested as part of this study. When the benefits are indexed at a rate lower than the rate of increase to wages, as we assume they are with the Baseline, the benefits are less “expensive” over time relative to the funding source. Increasing indexing to be more in line with wage growth (as with the tests presented in Figures 8a and 8b) causes the program benefits and revenues to grow faster, and ultimately makes the benefits more expensive over time relative to the funding source.

Additionally, as seen in Figures 8a and 8b below, the impact of changing the benefit inflation is different depending on whether SJR8212 passes or fails. In general, alternatives which significantly change the shape of the benefit payments as a percentage of the funding source (such as increasing the wage growth, which makes the benefit payments as percentage of the premium rate steeper) may affect the premium rates under the *if SJR8212 passes / fails* scenarios differently. The steeper the growth in benefit payments is, the more pre-funding is needed, if funding through a level premium rate. The *if SJR8212 passes* scenario is more effective at pre-funding since it produces a significantly higher interest rate.

Figure 8a:
Washington Office of the State Actuary
Plan Alternatives - SJR8212 Fails
Level Premium Assessment Required

Test	Level Premium Assessment Required	% Change from Base Plan
Base Plan	0.66%	N/A
Benefit inflation tied to wage growth (3.55%)	1.16%	0.50%
Benefit inflation tied to cost of care trend (3 to 4%)	1.16%	0.50%

Figure 8b:
Washington Office of the State Actuary
Plan Alternatives - SJR8212 Passes
Level Premium Assessment Required

Test	Level Premium Assessment Required	% Change from Base Plan
Base Plan	0.55%	N/A
Benefit inflation tied to wage growth (3.55%)	0.90%	0.35%
Benefit inflation tied to cost of care trend (3 to 4%)	0.89%	0.34%

MINIMUM AGE FOR ELIGIBILITY ALTERNATIVE

The Base Plan requires individuals to be age 18 or older before becoming benefit-eligible and receiving benefits. DSHS requested to consider two alternatives related to the minimum age for benefits as specified in language in the LTSS Trust Act:

1. No minimum age for disability: This alternative models the premium assessment impact of additionally covering intellectually and developmentally disabled individuals (i.e., individuals who were born with a disability or developed a disability before age 18), while the payout of any benefits would still be restricted until enrollees reach age 18. Since the same vesting requirements are still in place and we expect a relatively small percentage of the intellectually and developmentally disabled population to become vested, the impact to the premium rate for extending benefits to these individuals is estimated to be relatively small as shown in the figures below.

2. Refund of premiums for a developmentally disabled (DD) dependent: Under this alternative, if a vested individual with a developmentally disabled dependent becomes deceased, their premium would be refunded into a trust for the dependent. It is our understanding that the premiums are only eligible to be refunded if the vested individual does not receive LTSS services preceding death. We expect the impact of this refund to be very small as a result of:

    a. The low rates of healthy mortality for the cohort of people we expect may have a developmentally disabled dependent

    b. The low rate of having a developmentally disabled dependent

Figure 9a:
Washington Office of the State Actuary
Plan Alternatives - SJR8212 Fails
Level Premium Assessment Required

Test	Level Premium Assessment Required	% Change from Base Plan
Base Plan	0.66%	N/A
No minimum age for disability	0.67%	0.01%
Refund of premiums for a DD dependent	0.67%	<0.01%

Figure 9b:
Washington Office of the State Actuary
Plan Alternatives - SJR8212 Passes
Level Premium Assessment Required

Test	Level Premium Assessment Required	% Change from Base Plan
Base Plan	0.55%	N/A
No minimum age for disability	0.57%	0.02%
Refund of premiums for a DD dependent	0.55%	<0.01%

DIVESTING / PORTABILITY ALTERNATIVES

The portability / divesting alternatives consider whether individuals who leave the state of Washington will retain vesting in the LTSS benefit and for how long. For the Base Plan, only Washington residents are eligible for program benefits; however, we assume that if an individual returns to the Washington within five years of leaving, they will retain their vested status obtained through their previous Washington residency. This alternative testing considers the following divesting scenarios:

1. If a person leaves the state for any period of time, they are no longer eligible. This is similar to the Base Plan, where only individuals who are living in Washington are vested; however, it also assumes that an individual will immediately divest once they move out of the state. In other words, if they move out of Washington and then return to the state their prior vesting history will not be retained. Since this will allow fewer people to have access to benefits, the required revenue is less for this alternative.

2. If a person leaves the state for five years, they are no longer eligible. We did not have data available to determine the probability of leaving the state and returning within five years, as opposed to returning after five years. We estimate the level premium assessment required for this alternative would land somewhere between the bounds of the Base Plan and the "full divesting after leaving the state" alternative.

3. If someone has left the state, they can receive 50% of the baseline pool of money Since this alternative allows individuals who have migrated out of the state to retain some of their benefits (as opposed to the Base Plan, where only Washington residents are eligible for benefits), the revenue required is higher for this alternative, as well as the following two alternatives.

4. If someone has left the state, they can receive 25% of the baseline pool of money.

5. If someone has left the state, they can receive 10% of the baseline pool of money.

Figure 10a:
Washington Office of the State Actuary
Plan Alternatives - SJR8212 Fails
Level Premium Assessment Required

Test	Level Premium Assessment Required	% Change from Base Plan
Base Plan	0.66%	N/A
Full divesting after leaving the state	0.65%	-0.01%
Full divesting after leaving the state for 5 years	0.65% to 0.66%	N/A
50% of benefit after leaving the state	0.88%	0.22%
25% of benefit after leaving the state	0.77%	0.11%
10% of benefit after leaving the state	0.71%	0.04%

Figure 10b:
Washington Office of the State Actuary
Plan Alternatives - SJR8212 Passes
Level Premium Assessment Required

Test	Level Premium Assessment Required	% Change from Base Plan
Base Plan	0.55%	N/A
Full divesting after leaving the state	0.54%	-0.01%
Full divesting after leaving the state for 5 years	0.54% to 0.55%	N/A
50% of benefit after leaving the state	0.72%	0.16%
25% of benefit after leaving the state	0.63%	0.08%
10% of benefit after leaving the state	0.59%	0.03%

BENEFIT STRUCTURE ALTERNATIVES

Benefit structure alternatives consider the method in which benefit payments will be disbursed to recipients. The Base Plan assumes a reimbursement method is used, under which individuals are reimbursed for actual expenses incurred for approved services.

The two alternatives modeled here consider a more flexible "reimbursement with partial cash" benefit structure. In practice, this structure would allow the state of Washington more flexibility to provide and approve services, such as support for unpaid family caregivers, training and education, and others. As a proxy, to model this alternative, we blend the results for a reimbursement and cash benefit structure. The first alternative below uses an 85% / 15% blend, and the second alternative uses a 90% / 10% blend for reimbursement versus cash, respectively. Benefit utilization is higher when a cash benefit is offered, so adding a cash component to the benefit increases the revenue required to finance the program.

Figure 11a:
Washington Office of the State Actuary
Plan Alternatives - SJR8212 Fails
Level Premium Assessment Required

Test	Level Premium Assessment Required	% Change from Base Plan
Base Plan	0.66%	N/A
85% Reimbursement, 15% Cash	0.69%	0.02%
90% Reimbursement, 10% Cash	0.68%	0.01%

Figure 11b:
Washington Office of the State Actuary
Plan Alternatives - SJR8212 Passes
Level Premium Assessment Required

Test	Level Premium Assessment Required	% Change from Base Plan
Base Plan	0.55%	N/A
85% Reimbursement, 15% Cash	0.58%	0.02%
90% Reimbursement, 10% Cash	0.56%	0.01%

ELIMINATION PERIOD ALTERNATIVES

The elimination period is the number of days after becoming benefit-eligible that a beneficiary must wait before receiving benefits. It is analogous to a deductible on a medical insurance policy. During the elimination period, individuals are responsible for paying for LTSS needs out-of-pocket. Coordination of benefits with other private and public programs (such as Medicaid) would need to be further defined while implementing this program. For the purposes of this actuarial study, we assumed that individuals would be able to use resources, such as Medicaid and, in some instances Medicare, to pay for out-of-pocket costs during their elimination periods.

The Base Plan assumes a 45-day elimination period. The alternatives test the premium assessment impact of modifying the elimination period to be 0 days or 90 days. Changing the program elimination period helps illustrate the trade-off of program costs versus requiring individuals to pay more LTC costs up-front in the form of a deductible. The length of the period could be financially difficult for the low-income population that has paid enough premiums to vest in the benefit, but lacks sufficient resources to pay for necessary LTSS during the elimination period. Depending on care setting and severity of LTSS need, the costs of self-funding long-term care during the deductible period could be significant.

Figure 12a: Washington Office of the State Actuary Plan Alternatives - SJR8212 Fails Level Premium Assessment Required		
Test	**Level Premium Assessment Required**	**% Change from Base Plan**
Base Plan	0.66%	N/A
0-day elimination period	0.70%	0.04%
90-day elimination period	0.64%	-0.03%

Figure 12b: Washington Office of the State Actuary Plan Alternatives - SJR8212 Passes Level Premium Assessment Required		
Test	**Level Premium Assessment Required**	**% Change from Base Plan**
Base Plan	0.55%	N/A
0-day elimination period	0.58%	0.03%
90-day elimination period	0.53%	-0.02%

VESTING ALTERNATIVE

The current legislation defines the vesting requirement as paying the LTSS premiums:

a. A total of ten years without interruption of five or more consecutive years; or
b. Three years within the last six years.

It is our understanding that some in Washington have interpreted the above as meaning if anyone has ever satisfied this requirement they become permanently vested. In other words, if an individual contributes the LTSS premium for three years in a six year period, they are not just vested for the six years immediately surrounding the three years of contribution, but will remain vested for the remainder of the individual's life regardless of if they continue to earn wages or not. This interpretation is not consistent with how we modeled the vesting requirement, but we performed a test to see the impact of adjudicating the vesting requirement under this interpretation. Additionally, per OSA and DSHS' request, we modeled an alternative where the "3 of any 6" interpretation (as opposed to the "3 of the last 6" interpretation) is only applied to individuals born before 1960.

Figure 13a: Washington Office of the State Actuary Plan Alternatives - SJR8212 Fails Level Premium Assessment Required		
Test	**Level Premium Assessment Required**	**% Change from Base Plan**
Base Plan	0.66%	N/A
"3 of any 6 years" vesting requirement	0.67%	0.01%
"3 of any 6 years" vesting for those born before 1960 requirement	0.67%	<0.01%

Figure 13b:
Washington Office of the State Actuary
Plan Alternatives - SJR8212 Passes
Level Premium Assessment Required

Test	Level Premium Assessment Required	% Change from Base Plan
Base Plan	0.55%	N/A
"3 of any 6 years" vesting requirement	0.56%	0.01%
"3 of any 6 years" vesting for those born before 1960 requirement	0.56%	<0.01%

IV. RATE SETTING CONSIDERATIONS

Milliman's work, including the 2016 feasibility study, 2018 feasibility study, as well as the estimates in this 2020 study, are for feasibility study purposes only and not intended, and should not be used, for setting the program rate. When considering rate setting, one of the most important items that needs to be explored beyond feasibility studies is the appropriate level of cushion or "margin." In other words, an insurance program should consider how much additional premium or program funds should be set aside for situations where actual experience emerges differently than expected assumptions.

The following considerations can help serve as a starting point for determining the level of margin:

- Sensitivity and variability in key long-term assumptions
- Ongoing monitoring of the program and the program's ability to adjust
- Desired risk level and financial goals for the program

Additional factors may also be applicable. The level of margin should be examined in consideration of actuarial standards of practice.

ASSUMPTION SENSITIVITIES

When determining the appropriate level of margin for the program, it is important to understand the largest unknowns that could impact the future of the program. For Washington, these unknowns largely fall into two categories: uncertainty related to final program parameters, and uncertainty related to how actual experience will vary from long-term assumptions used in modeling.

While many of the program parameters are defined in RCW 50B.04, there is still uncertainty surrounding how several key program parameters will be defined and administered, including:

- Investment strategy
- Private insurance opt-out
- Self-employed opt-in
- Benefit eligibility trigger
- Elimination period

The first three parameters listed above are explored in Section II of this report, as variations of these program parameters dictate what we establish as the range of Baseline premium rates.

The required premium rate is also highly sensitive to the underlying projection assumptions used in the modeling. To the extent actual experience varies from the assumptions we have modeled, the account balance and required revenue to maintain program solvency will also vary. To understand the impact of the variance and impact of these assumptions, we model assumption sensitivities, which can be found in Section V of this report. The results of the testing should be taken into consideration when setting the rate for the LTSS Trust Program and determining the desired level of margin. The sensitivity of the program results under different conditions and the program's ability to adjust features when experience materializes differently from what has been expected is a key step to inform rate setting.

MONITORING AND ADJUSTING PROGRAM

One factor that will impact the appropriate amount of margin is the program's ability to monitor and adjust the program over time. If the program can closely monitor experience and easily react by adjusting benefits or revenue, less margin is likely needed. If levers, such as adjusting program benefits or the premium rate, are not available, a larger amount of margin is likely appropriate to handle adverse events.

Something the LTSS Trust Program should consider is the appropriate frequency of monitoring. Major LTC programs, such as CalPERS and the Federal LTC insurance program regularly report on experience and funded status of the program. The Federal program reports every six months and CalPERS provides a funded status report annually. The analyses typically include sensitivity to various assumptions, such as interest rates, morbidity, and mortality.

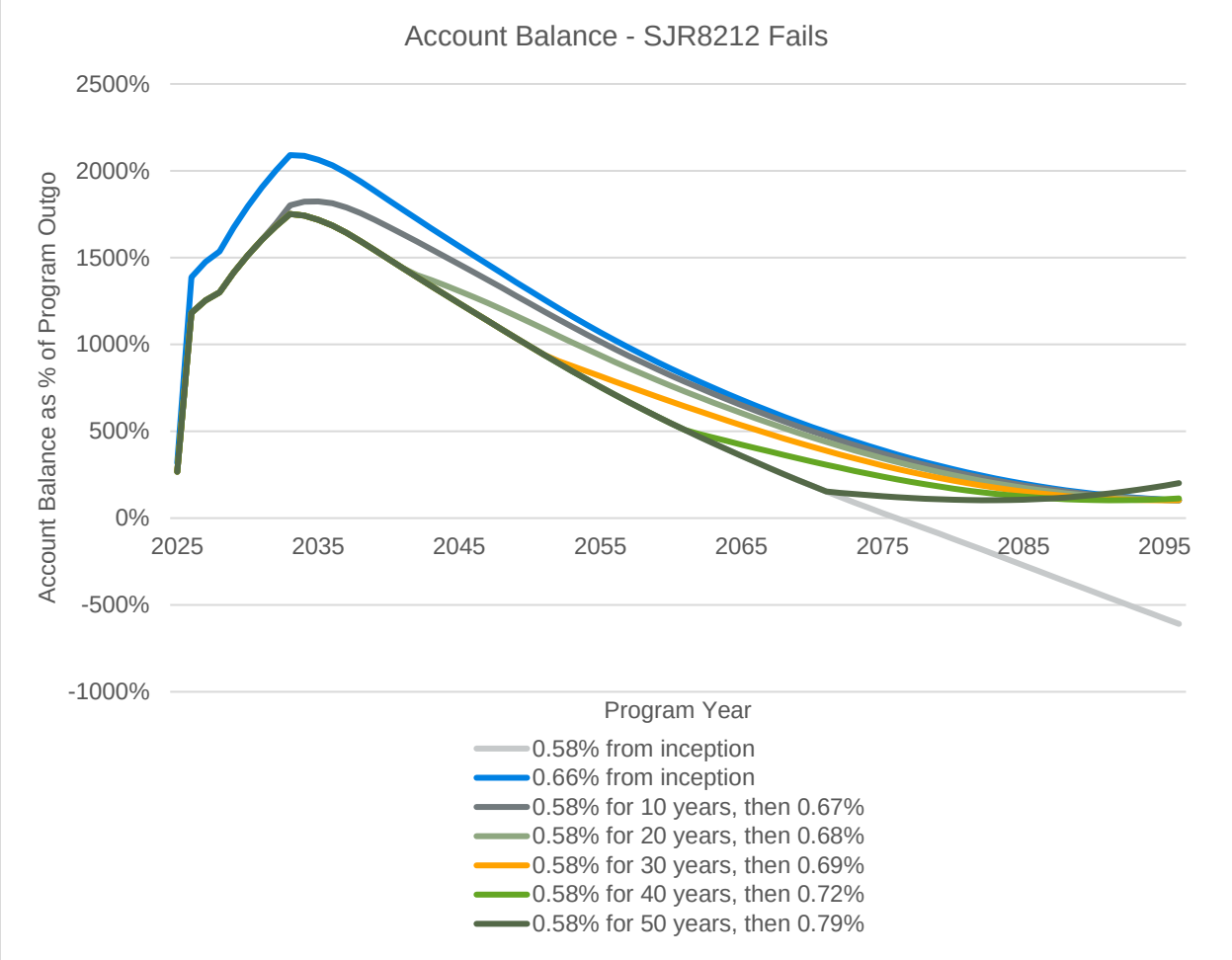
Monitoring the program more frequently will give the LTSS Trust Program the ability to react sooner to emerging experience. As shown in the Figures 14 and 15 below, the sooner the program reacts the less drastic of a reaction it will have to take. For this example, we assumed SJR8212 failed, but that the program began in 2022 with a premium rate of 0.58% consistent with current law. As described earlier in our report, note that under the SJR8212 scenario we

project a premium rate of 0.66% would be required to maintain program solvency over 75 years. The more years the program waits to "course correct," the higher the new premium rate is required to be to keep the program solvent through its remaining years. The values in Figure 14 are calculated over a 75-year period that ends in 2097. An alternative approach could examine the impact of a rolling 75-year period. A rolling 75-year period could yield different results depending on the long-term assumptions past year 2097.

Figure 14
Washington Office of the State Actuary
Assumption Sensitivities - SJR8212 Fails
Level Premium Assessment Required

Test	Future Premium Assessment Required
0.66% from inception	0.66%
0.58% for 10 years, then 0.67%	0.67%
0.58% for 20 years, then 0.68%	0.68%
0.58% for 30 years, then 0.69%	0.69%
0.58% for 40 years, then 0.72%	0.72%
0.58% for 50 years, then 0.79%	0.79%

Figure 15: Account Balance assuming SJR8212 Fails



DESIRED RISK LEVEL AND FINANCIAL GOALS

In order to determine the appropriate level of margin, it is also important for the program's stakeholders and advisers to determine its desired level of risk and establish the program's financial goals. As the program is structured as a pay-as-you-go social insurance plan (with some pre-funding), the level of conservatism used in setting benefits and premiums will impact cohorts differently. A more conservative approach to setting benefits relative to premiums may benefit later cohorts more than early cohorts. Similarly, a more aggressive approach to pricing may put more risk on later cohorts – if results are worse than priced for, later cohorts will receive less benefits or pay more premiums. It is our understanding that a broader discussion about financial goals and rate setting considerations will be an agenda item at the LTSS Trust Commission Meeting on October 20, 2020. Questions that the Commission may want to consider include:

1. What does "success" look like for the LTSS Trust Program?
2. What metrics can be used to evaluate the program's success on an ongoing basis?
3. How can consumers be confident that the program will indeed deliver what was promised? Should ensuring consumer confidence be a priority of the program?
4. How does the program ensure the funds invested are used appropriately?
5. How should the program interact with existing private insurance and public programs? How can this be evaluated?

Determining questions like the above will help determine the proper rate setting framework to implement and evaluate the program's financial goals.

V. MODELING ASSUMPTIONS SENSITIVITY TESTING

This section summarizes the testing of various key assumptions one at a time. Section VI below includes additional details regarding the assumptions used in our modeling.

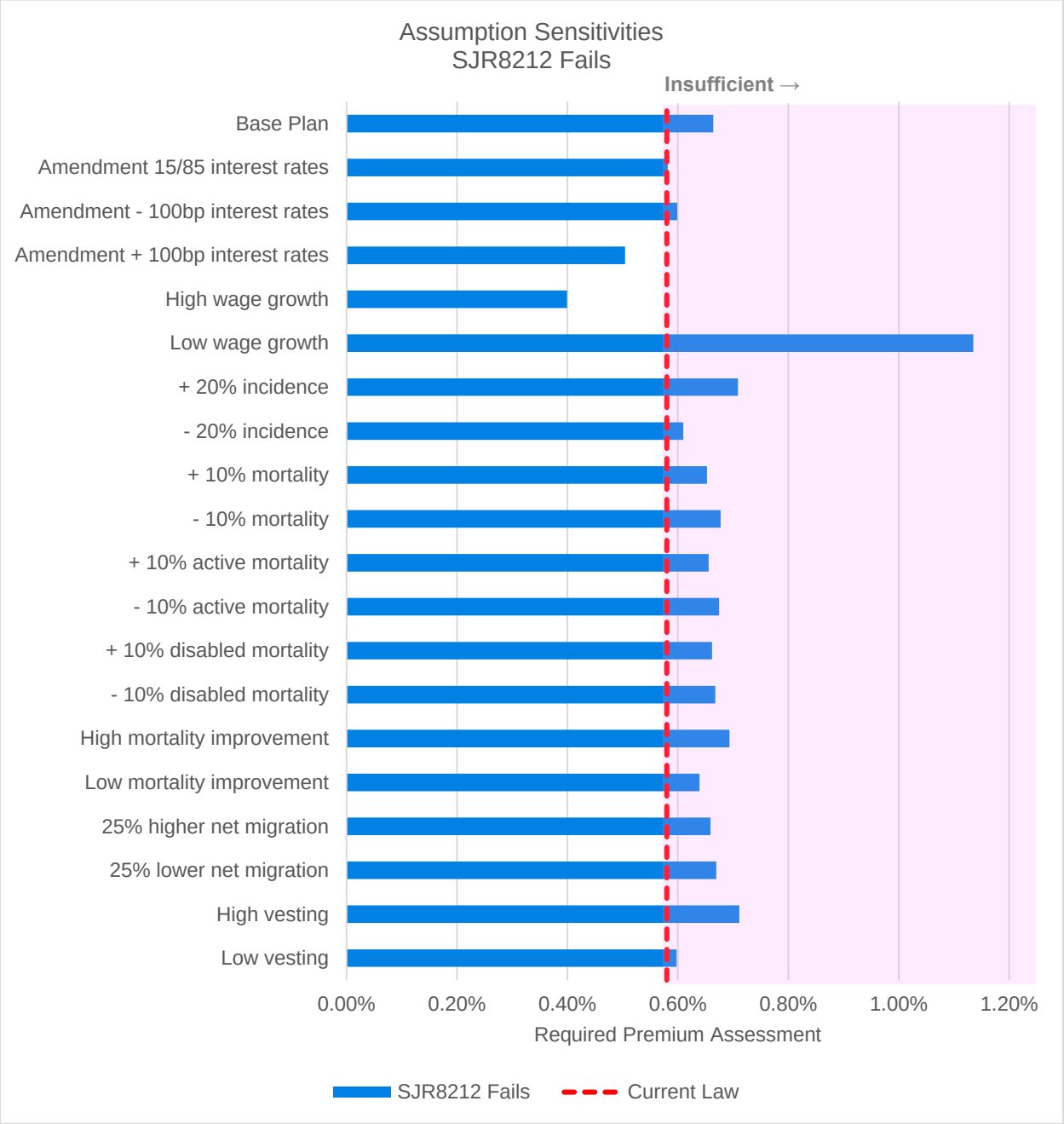
The estimated premium rate is highly sensitive to the underlying projection assumptions used in the modeling. The results of the testing should be taken into consideration when evaluating the feasibility of offering a new LTSS benefit program. The sensitivity of the program results under different conditions and the program's ability to adjust features when experience materializes differently from what has been expected is a key step to inform rate setting.

Like Figure 6 from Section III, the bars shown in Figure 16 represent the payroll premium assessment that would be required to fund the program over a 75-year window for different assumption sensitivities. The red line represents the premium assessment prescribed by current law of 0.58%. Bars that pass the red line represent alternatives where the current premium assessment of 0.58% is not sufficient to cover expected benefit payments for all 75 years of program window. The required premium assessments for each sensitivity are also included in Exhibit 4.

Since all bars in Figure 16 assume that SJR8212 fails, under the majority of sensitivities shown in this figure the 0.58% premium rate is not expected to be sufficient (i.e., most bars surpass the red line). Some sensitivities have a larger impact than others on the required premium assessment. For example, a relatively small change to wage growth has a large impact on program sufficiency, since an increase or decrease to wages directly impacts the premium rate.

While not shown in this figure, for the most part, the relative impact of each sensitivity will be similar under the scenario where SJR8212 passes.

Figure 16: Required Premium Assessment for Plan Alternatives – SJR8212 Fails



SENSITIVITY TESTING TO INTEREST RATES

The interest rate determines the level of interest earned on the program account balance. As the interest rate earned by the Trust account increases, the necessary revenue funded through premiums decreases. Alternatively, if interest rates decrease, less interest is earned on the invested funds, requiring increased funding through premiums. We perform four sensitivity tests related in investment earnings:

1. Amendment 15/85 interest rates: The *SJR8212 passes* scenario reflects a strategy of investing 30% in equities and 70% in fixed income. For this sensitivity, we instead assume a strategy of investing 15% in equities and 85% in fixed income.

2. SJR8212 Passes -100bp interest rates: For this sensitivity, we assume interest rates are 100 basis points lower than the *SJR8212 passes* scenario.

3. SJR8212 Passes: This is consistent with the Baseline described in Section II, assuming SJR8212 passes.

4. SJR8212 Passes +100bp interest rates: For this sensitivity, we assume interest rates are 100 basis points higher than the *SJR8212 passes* scenario.

Figure 17:
Washington Office of the State Actuary
Assumption Sensitivities - SJR8212 Fails
Level Premium Assessment Required

Test	Level Premium Assessment Required	% Change from Base Plan
Base Plan (2.3% ultimate)	0.66%	N/A
Amendment 15/85 interest rates (4.2% ultimate)	0.58%	-0.08%
SJR8212 Passes - 100bp interest rates (3.8% ultimate)	0.60%	-0.07%
SJR8212 Passes (4.8% ultimate)	0.55%	-0.11%
SJR8212 Passes + 100bp interest rates (5.8% ultimate)	0.50%	-0.16%

SENSITIVITY TESTING TO WAGE GROWTH

As wage growth increases, the premium rate necessary to fund program benefits decreases, and the premium base increases. It is possible that increased wages can result in price inflation, but this impact is ignored in the provided wage sensitivity analyses. The baseline growth in average annual wage is taken from the 2020 OASDI Trustees Report intermediate assumption, assumed to be 3.55% on an ultimate, long-term basis. Sensitivity runs are conducted using both the low-cost and high-cost Trustees Report assumptions (2.34% and 4.76% in the ultimate year, respectively).

Figure 18:
Washington Office of the State Actuary
Assumption Sensitivities - SJR8212 Fails
Level Premium Assessment Required

Test	Level Premium Assessment Required	% Change from Base Plan
Base Plan (3.6% ultimate)	0.66%	N/A
High wage growth (4.8% ultimate)	0.40%	-0.26%
Low wage growth (2.3% ultimate)	1.14%	0.47%

SENSITIVITY TESTING TO INCIDENCE

Incidence refers to the rate at which the population requires the use of LTSS. The level of incidence over the projection period will have a direct impact on the cost of financing a public LTSS benefit. If incidence rates decrease, fewer people will require LTSS and funding requirements will be lower. We ran sensitivities at +20% and -20% load to baseline incidence. As an example, for a 90-year-old male if the baseline incidence rate was 15%, we would test the impact of changing the incidence rate to 18% (15% x (1 + 20%) = 18%) and 12% (15% x (1 - 20%) = 12%).

Figure 19:
Washington Office of the State Actuary
Assumption Sensitivities - SJR8212 Fails
Level Premium Assessment Required

Test	Level Premium Assessment Required	% Change from Base Plan
Base Plan	0.66%	N/A
+ 20% incidence	0.71%	0.04%
- 20% incidence	0.61%	-0.05%

SENSITIVITY TESTING TO MORTALITY

Mortality refers to the death rate of the population. We applied separate mortality rates to the active (or "healthy") lives and disabled lives. Mortality rates have generally been decreasing by age over the last 100 years. As mortality rates decrease, the population is expected to survive longer. A population living longer will increase the demand for LTSS. We ran six sensitivities, increasing and decreasing mortality rates at each age by 10% for all lives, as well as tests where we only change the mortality for active lives and disabled lives.

Figure 20:
Washington Office of the State Actuary
Assumption Sensitivities - SJR8212 Fails
Level Premium Assessment Required

Test	Level Premium Assessment Required	% Change from Base Plan
Base Plan	0.66%	N/A
+ 10% mortality	0.65%	-0.01%
- 10% mortality	0.68%	0.01%
+ 10% active mortality	0.66%	-0.01%
- 10% active mortality	0.67%	0.01%
+ 10% disabled mortality	0.66%	0.00%
- 10% disabled mortality	0.67%	0.00%

SENSITIVITY TESTING TO MORTALITY IMPROVEMENT

We used the OASDI Report estimates of mortality improvement for their intermediate, low-cost, and high-cost scenarios. The intermediate mortality improvement of 0.78% per year represents the best estimate of mortality improvement going forward. The low-cost estimate (0.42%) and high-cost estimate (1.16%) represent extremes in the projected mortality improvement. As mortality improvement increases, the funding requirement for the program will increase as the expected life expectancy of the population, and need for LTSS, will increase.

Figure 21:
Washington Office of the State Actuary
Assumption Sensitivities - SJR8212 Fails
Level Premium Assessment Required

Test	Level Premium Assessment Required	% Change from Base Plan
Base Plan (0.78%)	0.66%	N/A
High mortality improvement (1.16%)	0.69%	0.03%
Low mortality improvement (0.42%)	0.64%	-0.02%

SENSITIVITY TESTING TO MIGRATION

As a state-run public program, state-to-state migration and net immigration to the state impact the population projections. The Baseline assumes a net annual migration consistent with projections from the Washington Office of Financial Management. We ran two sensitivities, with an increase and decrease of 25% to the net annual migration counts. Changes in net migration counts do not significantly impact the LTSS funding requirement.

Figure 22:
Washington Office of the State Actuary
Assumption Sensitivities - SJR8212 Fails
Level Premium Assessment Required

Test	Level Premium Assessment Required	% Change from Base Plan
Base Plan	0.66%	N/A
25% higher net migration	0.66%	0.00%
25% lower net migration	0.67%	0.01%

SENSITIVITY TESTING TO VESTING

To be eligible for benefits, individuals must pay the premium for a specified number of years, known as the vesting period. The Base Plan assumes vesting is satisfied by premium payments in three of the last six years or 10 total years during an individual's work history.

We ran two sensitivities on the vesting rates: first, increasing vesting rates by 5% to 10%, and second, decreasing vesting rates by 5% to 10%. As an example, under the Base Plan we assume 81% of 40-year-old males would be vested in 2030. Under the high vesting test we assume 89% will be vested (81% x (1 + 10%) = 89%), and under the low vesting test we assume approximately 73% of these individuals will be vested (81% x (1 – 10%) = 73%).

Figure 23:
Washington Office of the State Actuary
Assumption Sensitivities - SJR8212 Fails
Level Premium Assessment Required

Test	Level Premium Assessment Required	% Change from Base Plan
Base Plan	0.66%	N/A
High vesting	0.71%	0.05%
Low vesting	0.60%	-0.07%

SENSITIVITY TESTING TO CONSUMER PRICE INDEX

The Base Plan assumes the $36,500 pool of money (as of 2025) will be inflated at a rate consistent with a Consumer Price Index (CPI), or general inflation – assumed to be 2.5%. In Section III, we test alternatives assuming benefits are inflated using difference indices. In this section we test sensitivities under which CPI will be higher or lower than the 2.5% we assume in our base modeling.

It is plausible that if one assumption varies from what was used in our base modeling, other correlated assumptions may also vary, potentially by similar magnitudes. As an example of this, we also modeled the impact of increasing and decreasing both CPI and wage growth by 0.5%. Since these assumptions affect the premium assessment in opposite directions, testing both sensitivities at the same time yielded premium assessments relatively close to the Base Plan.

Figure 24:
Washington Office of the State Actuary
Assumption Sensitivities - SJR8212 Fails
Level Premium Assessment Required

Test	Level Premium Assessment Required	% Change from Base Plan
Base Plan (2.5% CPI)	0.66%	N/A
Low CPI (2%)	0.54%	-0.13%
High CPI (3%)	0.83%	0.17%
0.5% Lower CPI & Wage Growth	0.67%	0.00%
0.5% Higher CPI & Wage Growth	0.66%	-0.01%

VI. METHODOLOGY AND ASSUMPTIONS

We projected long-term care beneficiaries and costs using Milliman's modeling software, MG-ALFA®. The projection started with the current population of the state of Washington by age, sex, and region, and projected forward for 75 years. The projected Washington population is estimated based on the number of births, deaths, and net migrants in each future year.

To calculate the long-term care beneficiaries and costs for the projected population in each year, the model utilizes Milliman's proprietary Long-Term Care Guidelines (Guidelines) calibrated from an insured basis to the Washington population characteristics. The Guidelines provide frequencies, continuance curves, utilization assumptions, and claims costs developed from a large number of product designs, based on data from the past two decades. The Guidelines incorporate both private and public sector data sources. The Guidelines are updated triennially to reflect the most comprehensive and current information available in the market. The breadth of underlying data and the comprehensiveness of analysis put the Guidelines in position to be an unrivaled benchmark for LTC morbidity.

The projection is for the 75-year period 2025 through 2100. A 75-year projection has been established by the Social Security Administration (SSA) and the Centers for Medicare and Medicaid Services (CMS) as the standard projection period for determining the actuarial balance of a public insurance program. The 75-year period covers the expected lifetime of the vast majority of residents just entering their working ages. Thus, a 75-year projection period covers all the working years and all of the benefit years of those just beginning their participation. The model produces year-by-year cash flow projections, such that the value and scope of the program can be estimated for any of the years in the 75-year projection period. A projection period of at least 75 years is necessary to see the ultimate costs of the program, because it allows for a full career contribution period (so that the ultimate effects of the vesting rules can be modeled) and the full benefit period (so that the benefits paid over all retirement years based on a specified indexing option can be modeled).

The cash flow consists of income to the program from premiums, subsidies, and interest on any account. Outgo from the program consists of benefit payments for nursing home or home care services and administrative expenses. We projected each of these items on a year-by-year basis for 75 years.

DEMOGRAPHIC ASSUMPTIONS

The demographic assumptions relate to the projection of the population of Washington. For a pay-as-you-go public insurance program, the covered population is of fundamental importance in the estimation of costs. The income to the program depends on the number of contributors and the outgo of the program depends on the number of beneficiaries, most of whom are aged 65 or over. Estimates of the number of contributors and of the number of beneficiaries are based on the population projection.

The estimate of the resident population starts with the census count of the resident population for Washington by age and sex as of 2016. We use a 2016 starting population to build up a stable disabled population and appropriately reflect LTC prevalence at the time of first program payments (2025). The model projects the Washington population by estimating the number of births, deaths, and net migrants for each future year.

Starting population

The estimate of the 2016 starting population is from the American Community Survey (ACS) five-year data release files. This survey was used to tabulate state population estimates by age and sex and is the starting point for the Washington population projection.

Migration

Net migration to Washington is based on the State of Washington Office of Financial Management (OFM) "Forecast of the State Population" from December 2019. The relativities of state-to-state immigration and emigration, as well as immigration and emigration into and out of the United States, are tabulated from the American Community Survey (ACS) five-year data release files. The data files are used to calculate the distribution by age and sex of domestic and international net migration into and from Washington. Yearly totals of immigrants and emigrants are based on the relativities noted above. Individuals who emigrate are kept track of separately in the model. Such individuals who contributed to the program could be eligible for partial benefits outside of Washington as they divest from the program under certain plan alternatives. In most of the modeled plans, benefit credits are assumed lost once an individual leaves Washington. The model does not track the legal status of immigrants or emigrants.

Births

The number of births in Washington are estimated using the projected birth rates from the Centers for Disease Control and Prevention's (CDC's) National Vital Statistics Report on births. These birth rates are trended according to the fertility rate projection provided in the 2020 OASDI Trustees Report.

Deaths

We applied separate mortality rates to the active (or "healthy") lives and disabled lives.

- Active life mortality: Current and projected U.S. active life mortality rates by age and sex were calculated using multiple sources, including the Guidelines, 2020 OASDI Trustees Report (after backing out disabled life mortality), Society of Actuaries (SOA) 2012 Individual Annuity Mortality (IAM) table (after backing out disabled life mortality), and SOA Intercompany data.

- Disabled life mortality: Current and projected U.S. disabled life mortality rates by age, sex, duration, and care setting were calculated from Milliman's proprietary Guidelines.

The projected U.S. mortality rates were calibrated to Washington using the CDC's age-adjusted mortality rates by state. This data shows that Washington's mortality rates are 6% to 10% less than the national average.

Mortality improvement rates by age and sex were estimated from the 2020 OASDI Trustees Report. The Trustees Report mortality rates are projected through 2095.

As a final step, projected lives by calendar year were compared against the State of Washington Office of Financial Management projections from December 2019.

ECONOMIC ASSUMPTIONS

Economic parameters concerning trends in the labor force, wages, and costs of LTC services are of primary importance for the projection of the income and outgo of the LTC program. Because the program is financed by a payroll premium assessment, the labor force participation and wage level will directly affect annual program income. The index used to trend the daily benefit amount is important because it affects program liabilities in the future. The interest rate assumption is important because it affects the interest income earned by the Trust account balance (and the present value of the future benefit stream).

Labor force participation and unemployment

The U.S. labor force participation rates (LFPR) and unemployment rates (UR) by age and sex are from the 2020 OASDI Trustees Report. These rates are adjusted to Washington-specific levels using the ratio of Washington LFPR to U.S. LFPR, and Washington UR to U.S. UR. Washington-specific and U.S. employment data for this adjustment comes from the U.S. Bureau of Labor Statistics (BLS) Local Area Unemployment Statistics. This data is used to project the labor force and unemployment rate in each year of the projection period. The labor force is calculated in order to estimate the payroll assessment base in each year. The labor force calculations do not take into account workers' legal status.

Wages

Projections of U.S. average taxable earnings from 2018 to 2095 are found in the 2020 OASDI Trustees Report. Taxable earnings are the amount of covered earnings subject to the Social Security payroll tax. Taxable earnings for years after 2095 are projected using the five-year trend from 2091 to 2095. In order to estimate the Washington tax base, we adjust the average U.S. earnings to Washington-specific earnings by the ratio of the average wage in Washington over the average wage in the United States. We grade off the Washington-specific wage adjustment over 20 years, assuming that over time wages will approximate national average wages. Wage data for this adjustment comes from BLS Occupational Employment Statistics. We then convert the taxable earnings into covered earnings using the ratio of taxable earnings to covered earnings from the 2020 OASDI Trustees Report. Average covered earnings are multiplied by the labor force in a given year to determine the payroll assessment base in that year.

We assumed average increases in wages are the same as those assumed in the OASDI Trustees Report, with an ultimate wage trend of 3.55% per year.

Vesting

In order to become eligible for benefits, a worker must become vested (or in other words, become insured). To vest in the LTSS benefit, an individual must work and pay premiums for a specified number of years. We used the 2006 Social Security Earnings Public Use Microdata File to estimate the percentage of Washingtonians that would become vested by age, sex, and projection year. This data provides annual earnings information (i.e., a lifetime earnings profile) for a 1% random sample of all Social Security numbers issued before January 1, 2007.

Under the Baseline plans, individuals are fully vested if they work more than 500 hours per year for three of the last six years, or for 10 years total over their lifetimes. To find the percentage of the working population meeting these requirements, we observed the work histories of the random sample of data. For each age, the percentage of individuals who had recorded income for three of the previous six years or eight years total is tabulated. We used eight instead of 10 years in this tabulation because becoming insured under this program provides an added incentive to continue working for those who are almost insured. For each year of the program, we vary the number of years of work history to be included in this tabulation. For example, in year 10 of the program, we only considered work history for individuals going back 10 years to estimate vesting percentages. Because of this, the vesting percentages by age and gender vary in each program year. We used the American Time Use Survey to determine the percentage of workers who work more than 500 hours per year (approximately 95%) and applied this percentage to the vesting percentages by age, gender, and program year.

We observed that females' work histories changed significantly since the beginning of the data collection period in 1951, with the last five to 10 years of data approximating the male work history. As such, we set the female vesting percentages equal to the male vesting percentages.

We did not vary the vesting assumptions for individuals who migrated into Washington. This is a conservative assumption because we are implicitly assuming individuals are able to apply their work histories from other states to meet vesting requirements, which will not be allowed in practice. However, varying this assumption had a relatively low impact on results and seemed appropriate given that we do not know how many individuals moving into the state lived in Washington previously and would be moving into the state with some relevant work history.

For the minimum age of benefit alternatives, we also considered benefits for individuals with intellectual or developmental disabilities (IDDs). To determine the vesting rates for this cohort we reviewed employment data for the IDD population. Ultimately, we applied a 54% factor to our baseline vesting percentages to account for the fact that individuals in this population are less likely to have stable, continuous work history.

Interest rates

The interest rates used are based on our projection of future net investment earned rates (NIERs) rates under two scenarios: SJR8212 fails and SJR8212 passes. Under the current law, the NIER starts at 0.5% in 2022, grows to 2.3% by 2047, and remains at 2.3% for the remaining years of the projection. This reflects a strategy of investing only in Treasuries. Under Amendment SJR8212, the NIER starts at 3.4% in 2022, grows to 4.8% by 2047, and remains at 4.8% for the remaining years of the projection. This reflects a strategy of investing 30% in equities and 70% in fixed income (interim credit levels).

The NIER reflects expected investments returns on the Trust account balance net of investment expenses and the cost of defaults. More information on the modeled investment strategies is included in Appendix A.

MORBIDITY ASSUMPTIONS

To calculate the long-term care beneficiaries and costs for the projected population in each year, we utilized Milliman's proprietary Guidelines. The Guidelines provide frequencies, continuance curves, utilization assumptions, and claims costs from a large number of fully insured long-term care product designs sold over the past two decades. The Guidelines incorporate both private and public sector data sources, and are periodically updated to reflect the most comprehensive and current information available in the market. The first set of Guidelines was developed in 1992 and is updated regularly, with the most recent edition completed in 2017. The breadth of underlying data and the comprehensiveness of analysis put the LTC Guidelines in position to be an unrivaled benchmark for LTC morbidity of the fully insured population. We did not assume any morbidity improvement as part of our modeling.

Eligibility criteria

Frailty has traditionally been measured by a person's ability to perform activities of daily living (ADLs). As originally conceived by Katz in his paper "A Measure of Primary Sociobiological Functions," there were six ADLs: bathing, dressing, transferring, continence, toileting, and eating. Later, some researchers proposed mobility (i.e., the ability to get about inside of a house), and others the taking of medication, as additional ADLs. This original measure of frailty has been expanded to include cognitive ability in addition to physical abilities as indications of the need for long-term care services.

RCW 50B.04 currently defines the benefit eligibility criteria as requiring assistance with at least three ADLs. Since this definition requires further clarification, for the purposes of this feasibility study we assumed the type and minimum number of ADLs considered by care setting to be consistent with the current definitions used under the State of Washington Medicaid program[6].

Benefit utilization

The model assumes, in the absence of a daily benefit cap, that individuals will spend the average cost of care per day observed in the private market for receiving benefits by care setting. It is assumed that home care beneficiaries incur the average cost of care on roughly 70.5% of days.

For the minimum age of benefit alternatives, we also considered benefits for individuals with intellectual or developmental disabilities. We examined the prevalence by age and gender of intellectual or developmental disability among adults from an academic study[7] and calculated the incremental impact of providing benefits to the subset of these individuals that we assume would meet the vesting requirements. We assumed IDD individuals would utilize the entire benefit pool of money upon becoming vested. As an example, an IDD individual assumed to be vested in 2025 is modeled to receive the full pool of money of $36,500 in that year.

Incidence calibration

The Milliman Long-Term Care Guidelines incidence rates are representative of a fully insured population. A fully insured population will have different morbidity from the population under this program for a few reasons, including:

- Insured data may have inherent anti-selection as it reflects individuals who choose to purchase care and may have reason to believe they will need care in the future.
- Insured data reflects a higher-income population, which is generally composed of healthier lives with lower morbidity.
- Most individuals insured in the private market had to complete underwriting, ensuring they were relatively healthy at least when they first purchased coverage. There is no underwriting qualification associated with the public program in this study, although individuals will need to be at least healthy enough to satisfy vesting requirements.

We calibrated the incidence rates to a general population basis using a variety of data sources, including selection factors from the Guidelines and other industry general population prevalence studies. While general population data exists, morbidity data reflecting a “public option” program does not exist and was not used for this actuarial study. It is unknown how individuals will react to having a public benefit available.

PARTICIPATION AND ADVERSE SELECTION

Universal mandatory programs can be assured that the experience of the group will be average, because everyone will be in the program. Voluntary programs, however, are subject to anti-selection (i.e., those with the highest need of services will be most likely to enroll).

[6] Washington Administrative Code (2015). Retrieved October 15, 2020 from https://apps.leg.wa.gov/wac/default.aspx?cite=388-106-0210 and https://apps.leg.wa.gov/wac/default.aspx?cite=388-106-0210

[7] Durbin, A., et al. (June 20, 2019). Prevalence of intellectual and developmental disabilities among first generation adult newcomers, and the health and health service use of this group: A retrospective cohort study. Peer-reviewed academic study. Retrieved September 1, 2020, from https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0215804.

ADMINISTRATIVE EXPENSES

Given the administration structure of the program is unknown, we assumed administration expenses to be 3.5% of premiums and 3.5% of benefits consistent with the assumptions used in the 2016 and 2018 feasibility studies, our discussions with OSA and DSHS, and our high-level review of other government programs and programs offering LTC benefits. This assumption is intended to reflect the average, long-term administrative needs of the program and may not be consistent with how expenses will fluctuate on an annual basis.

VII. CAVEATS AND LIMITATIONS

This report was prepared for the internal use of the Washington Office of the State Actuary (OSA) and the Washington Department of Social and Health Services (DSHS) and it should not be distributed, in whole or in part, to any external parties without the prior permission of Milliman, subject to the following exception:

- This report shall be a public record that shall be subject to disclosure to the State Legislature and its committees, persons participating in legislative reviews and deliberations, and parties making a request pursuant to the Washington Public Records Act.

We do not intend this information to benefit or create a legal liability to any third party. This communication must be read in its entirety.

The information in this report provides actuarial modeling and analysis regarding the feasibility of policy options to finance long-term services and supports (LTSS) in the State of Washington. It may not be appropriate, and should not be used, for other purposes.

In completing this analysis, we relied on information provided by OSA, DSHS, and publicly available data, which we accepted without audit. However, we did review this information for general reasonableness.

Many assumptions were used to construct the estimates in this report. Actual results will differ from the projections in this report. Experience should be monitored as it emerges and corrective actions taken when necessary.

Guidelines issued by the American Academy of Actuaries require actuaries to include their professional qualifications in all actuarial communications. Chris Giese, Al Schmitz, Annie Gunnlaugsson, and Evan Pollock are members of the American Academy of Actuaries, and meet the qualification standards for performing the analyses in this report.

The terms of the Personal Service Contract with OSA, effective February 26, 2020, apply to this engagement.

EXHIBITS

Exhibit 1
Washington Office of the State Actuary
Modeling Specifications

Run Description	Covered Services	Minimum Age for Benefits	Benefit Eligibility	Daily Benefit Amount	Daily Benefit Index	Lifetime Maximum Benefit	Benefit Structure	Elimination Period (Calendar Days)	Vesting Requirements	Portability / Divesting Period	Program Revenue Source	Administrative Load / Cost	Wage Growth	Tribal Employers	Self-Employed Opt In	Private Market Opt Out
Baseline Runs																
Base Test	Comprehensive, Medicaid-approved services	18; Disabled after 18	Medicaid definition	None	WA-CPI	$36,500 starting in 2025	Reimbursement	45 days	3 of last 6 years, or 10 years total[1]	Must reside in Washington state	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	10% of earnings 100% of claims	20% of top decile opt out 10% of second decile opt out
Top 45% of wage earners opt out	Comprehensive, Medicaid-approved services	18; Disabled after 18	Medicaid definition	None	WA-CPI	$36,500 starting in 2025	Reimbursement	45 days	3 of last 6 years, or 10 years total[1]	Must reside in Washington state	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	10% of earnings 100% of claims	Top 45% of wage earners opt out
Top 5% of wage earners opt out	Comprehensive, Medicaid-approved services	18; Disabled after 18	Medicaid definition	None	WA-CPI	$36,500 starting in 2025	Reimbursement	45 days	3 of last 6 years, or 10 years total[1]	Must reside in Washington state	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	10% of earnings 100% of claims	Top 5% of wage earners opt out
Grandfathered private market opt-out	Comprehensive, Medicaid-approved services	18; Disabled after 18	Medicaid definition	None	WA-CPI	$36,500 starting in 2025	Reimbursement	45 days	3 of last 6 years, or 10 years total[1]	Must reside in Washington state	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	10% of earnings 100% of claims	Only those who had private LTC insurance policies as of 5/13/19 could opt out
Self-employed opt-in (0% of earnings 100% of claims)	Comprehensive, Medicaid-approved services	18; Disabled after 18	Medicaid definition	None	WA-CPI	$36,500 starting in 2025	Reimbursement	45 days	3 of last 6 years, or 10 years total[1]	Must reside in Washington state	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	0% of earnings 100% of claims	20% of top decile opt out 10% of second decile opt out
Self-employed opt-in (50% of earnings 100% of claims)	Comprehensive, Medicaid-approved services	18; Disabled after 18	Medicaid definition	None	WA-CPI	$36,500 starting in 2025	Reimbursement	45 days	3 of last 6 years, or 10 years total[1]	Must reside in Washington state	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	50% of earnings 100% of claims	20% of top decile opt out 10% of second decile opt out
Self-employed opt-in (100% of earnings 100% of claims)	Comprehensive, Medicaid-approved services	18; Disabled after 18	Medicaid definition	None	WA-CPI	$36,500 starting in 2025	Reimbursement	45 days	3 of last 6 years, or 10 years total[1]	Must reside in Washington state	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	100% of earnings 100% of claims	20% of top decile opt out 10% of second decile opt out
Plan Alternatives																
Tribal Employers Allowed to Opt-in	Comprehensive, Medicaid-approved services	18; Disabled after 18	Medicaid definition	None	WA-CPI	$36,500 starting in 2025	Reimbursement	45 days	3 of last 6 years, or 10 years total[1]	Must reside in Washington state	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	50% of wages 100% of claims	10% of earnings 100% of claims	20% of top decile opt out 10% of second decile opt out
Cap Daily Benefit Plus Add-ons	Comprehensive, Medicaid-approved services	18; Disabled after 18	Medicaid definition	$100 + ability to spend more on DME or home modification	WA-CPI	$36,500 starting in 2025	Reimbursement	45 days	3 of last 6 years, or 10 years total[1]	Must reside in Washington state	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	10% of earnings 100% of claims	20% of top decile opt out 10% of second decile opt out
Revised Cost of Care Protection Alternate 1	Comprehensive, Medicaid-approved services	18; Disabled after 18	Medicaid definition	None	Publicly Available Wage Index	$36,500 starting in 2025	Reimbursement	45 days	3 of last 6 years, or 10 years total[1]	Must reside in Washington state	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	10% of earnings 100% of claims	20% of top decile opt out 10% of second decile opt out
Revised Cost of Care Protection Alternate 2	Comprehensive, Medicaid-approved services	18; Disabled after 18	Medicaid definition	None	Cost of care patterns from private pay	$36,500 starting in 2025	Reimbursement	45 days	3 of last 6 years, or 10 years total[1]	Must reside in Washington state	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	10% of earnings 100% of claims	20% of top decile opt out 10% of second decile opt out
No Minimum Age for Disability	Comprehensive, Medicaid-approved services	18	Medicaid definition	None	WA-CPI	$36,500 starting in 2025	Reimbursement	45 days	3 of last 6 years, or 10 years total[1]	Must reside in Washington state	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	10% of earnings 100% of claims	20% of top decile opt out 10% of second decile opt out
Refund of Premiums for a DD Dependent	Comprehensive, Medicaid-approved services	18; Disabled after 18; Refunding premiums for a deceased qualified individual with a dependent who is an individual with a developmental disability	Medicaid definition	None	WA-CPI	$36,500 starting in 2025	Reimbursement	45 days	3 of last 6 years, or 10 years total[1]	Must reside in Washington state	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	10% of earnings 100% of claims	20% of top decile opt out 10% of second decile opt out
Full Divesting After Leaving the State for 5 Years	Comprehensive, Medicaid-approved services	18; Disabled after 18	Medicaid definition	None	WA-CPI	$36,500 starting in 2025	Reimbursement	45 days	3 of last 6 years, or 10 years total[1]	If a person leaves the state for 5 years they are no longer eligible	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	10% of earnings 100% of claims	20% of top decile opt out 10% of second decile opt out
50% of Benefit After Leaving the State	Comprehensive, Medicaid-approved services	18; Disabled after 18	Medicaid definition	None	WA-CPI	$36,500 starting in 2025	Reimbursement	45 days	3 of last 6 years, or 10 years total[1]	If someone has left the state they can receive 50% of daily benefit	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	10% of earnings 100% of claims	20% of top decile opt out 10% of second decile opt out
25% of Benefit After Leaving the State	Comprehensive, Medicaid-approved services	18; Disabled after 18	Medicaid definition	None	WA-CPI	$36,500 starting in 2025	Reimbursement	45 days	3 of last 6 years, or 10 years total[1]	If someone has left the state they can receive 25% of daily benefit	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	10% of earnings 100% of claims	20% of top decile opt out 10% of second decile opt out
10% of Benefit After Leaving the State	Comprehensive, Medicaid-approved services	18; Disabled after 18	Medicaid definition	None	WA-CPI	$36,500 starting in 2025	Reimbursement	45 days	3 of last 6 years, or 10 years total[1]	If someone has left the state they can receive 10% of daily benefit	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	10% of earnings 100% of claims	20% of top decile opt out 10% of second decile opt out
85% Reimbursement, 15% Cash	Comprehensive, Medicaid-approved services	18; Disabled after 18	Medicaid definition	None	WA-CPI	$36,500 starting in 2025	90% Reimbursement 10% Cash	45 days	3 of last 6 years, or 10 years total[1]	Must reside in Washington state	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	10% of earnings 100% of claims	20% of top decile opt out 10% of second decile opt out
90% Reimbursement, 10% Cash	Comprehensive, Medicaid-approved services	18; Disabled after 18	Medicaid definition	None	WA-CPI	$36,500 starting in 2025	85% Reimbursement 15% Cash	45 days	3 of last 6 years, or 10 years total[1]	Must reside in Washington state	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	10% of earnings 100% of claims	20% of top decile opt out 10% of second decile opt out
0-Day Elimination Period	Comprehensive, Medicaid-approved services	18; Disabled after 18	Medicaid definition	None	WA-CPI	$36,500 starting in 2025	Reimbursement	0 days	3 of last 6 years, or 10 years total[1]	Must reside in Washington state	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	10% of earnings 100% of claims	20% of top decile opt out 10% of second decile opt out
90-Day Elimination Period	Comprehensive, Medicaid-approved services	18; Disabled after 18	Medicaid definition	None	WA-CPI	$36,500 starting in 2025	Reimbursement	90 days	3 of last 6 years, or 10 years total[1]	Must reside in Washington state	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	10% of earnings 100% of claims	20% of top decile opt out 10% of second decile opt out
3 of Any 6 Year Period Vesting	Comprehensive, Medicaid-approved services	18; Disabled after 18	Medicaid definition	None	WA-CPI	$36,500 starting in 2025	Reimbursement	45 days	3 of any 6 year period, or 10 years total[1]	Must reside in Washington state	Payroll tax on covered earnings[2]	3.5% of income and 3.5% of benefits	3.6% ultimate	No participation	10% of earnings 100% of claims	20% of top decile opt out 10% of second decile opt out

[1] *Without 5 years of interruption; to vest in a given year, a worker must work a minimum of 500 hours as an employee or earn at least the threshold of one year of vesting credits in the Medicare program.*

[2] *Covered earnings are earnings subjected to Medicare tax.*

Exhibit 2a
Washington Office of the State Actuary
Plan Alternatives - SJR8212 Fails
Level Premium Assessment Required

Test	Level Premium Assessment Required	Change from Current Law Premium Assessment of 0.58%
Base Plan	0.66%	0.08%
45% of all wage earners opt out	0.69%	0.11%
5% of all wage earners opt out	0.68%	0.10%
Grandfathered private market opt-out	0.66%	0.08%
Self-employed opt-in (0% wages, 100% benefits)	0.67%	0.09%
Self-employed opt-in (50% wages, 100% benefits)	0.64%	0.06%
Self-employed opt-in (100% wages, 100% benefits)	0.61%	0.03%
Tribal employers may opt-in	0.67%	0.09%
$100 daily benefit maximum	0.62%	0.04%
Benefit inflation tied to wage growth (3.55%)	1.16%	0.58%
Benefit inflation tied to cost of care trend (3-4%)	1.16%	0.58%
No minimum age for disability	0.67%	0.09%
Refund of premiums for a DD dependent	0.67%	0.09%
Full divesting after leaving the state	0.65%	0.07%
Full divesting after leaving the state for 5 years	0.65% - 0.66%	n/a
50% of benefit after leaving the state	0.88%	0.30%
25% of benefit after leaving the state	0.77%	0.19%
10% of benefit after leaving the state	0.71%	0.13%
85% Reimbursement, 15% Cash	0.69%	0.11%
90% Reimbursement, 10% Cash	0.68%	0.10%
0-day elimination period	0.70%	0.12%
90-day elimination period	0.64%	0.06%

Exhibit 2b
Washington Office of the State Actuary
Plan Alternatives - SJR8212 Passes
Level Premium Assessment Required

Test	Level Premium Assessment Required	Change from Current Law Premium Assessment of 0.58%
Base Plan	0.55%	-0.03%
45% of all wage earners opt out	0.64%	0.06%
5% of all wage earners opt out	0.58%	0.00%
Grandfathered private market opt-out	0.55%	-0.03%
Self-employed opt-in (0% wages, 100% benefits)	0.56%	-0.02%
Self-employed opt-in (50% wages, 100% benefits)	0.53%	-0.05%
Self-employed opt-in (100% wages, 100% benefits)	0.51%	-0.07%
Tribal employers may opt-in	0.55%	-0.03%
$100 daily benefit maximum	0.51%	-0.07%
Benefit inflation tied to wage growth (3.55%)	0.90%	0.32%
Benefit inflation tied to cost of care trend (3-4%)	0.89%	0.31%
No minimum age for disability	0.57%	-0.01%
Refund of premiums for a DD dependent	0.55%	-0.03%
Full divesting after leaving the state	0.54%	-0.04%
Full divesting after leaving the state for 5 years	0.54% - 0.55%	n/a
50% of benefit after leaving the state	0.72%	0.14%
25% of benefit after leaving the state	0.63%	0.05%
10% of benefit after leaving the state	0.59%	0.01%
85% Reimbursement, 15% Cash	0.58%	0.00%
90% Reimbursement, 10% Cash	0.56%	-0.02%
0-day elimination period	0.58%	0.00%
90-day elimination period	0.54%	-0.04%

Exhibit 3
Washington Office of the State Actuary
Cash Flows for Base Plan - SJR8212 Fails

Calendar Year	Discount Adjustment (3.55% Annually)[1]	Yearly Program Income Discounted to 2022 ($millions)		Yearly Program Outgo Discounted to 2022 ($millions)		Account Balance Discounted to 2022 ($millions)	Individuals		
		Payroll Taxes	Investment Income	Benefit Payments	Expenses		State Residents	Vested Individuals	New Beneficiaries
2022	0.965	$1,312	$7	$0	$46	$1,273	7,512,000	0	0
2023	0.930	$1,323	$13	$0	$46	$2,517	7,606,000	0	0
2024	0.897	$1,334	$25	$0	$47	$3,741	7,698,000	0	0
2025	0.865	$1,345	$35	$1,113	$86	$3,789	7,788,000	3,277,000	38,000
2026	0.835	$1,354	$44	$284	$57	$4,712	7,873,000	3,587,000	10,000
2027	0.805	$1,364	$57	$321	$59	$5,585	7,957,000	3,801,000	11,000
2028	0.776	$1,373	$72	$359	$61	$6,412	8,038,000	3,980,000	12,000
2029	0.749	$1,380	$89	$373	$61	$7,218	8,118,000	4,021,000	13,000
2030	0.722	$1,386	$107	$387	$62	$8,006	8,186,000	4,061,000	14,000
2031	0.697	$1,391	$127	$402	$63	$8,775	8,254,000	4,100,000	14,000
2032	0.672	$1,396	$150	$417	$63	$9,528	8,317,000	4,138,000	15,000
2033	0.648	$1,399	$174	$432	$64	$10,266	8,377,000	4,176,000	16,000
2034	0.625	$1,401	$197	$466	$65	$10,968	8,435,000	4,292,000	17,000
2035	0.603	$1,403	$218	$503	$67	$11,630	8,490,000	4,409,000	19,000
2036	0.581	$1,404	$235	$541	$68	$12,248	8,542,000	4,525,000	20,000
2037	0.561	$1,404	$246	$580	$69	$12,814	8,590,000	4,638,000	22,000
2038	0.541	$1,401	$254	$621	$71	$13,323	8,635,000	4,745,000	24,000
2039	0.522	$1,408	$260	$663	$73	$13,782	8,678,000	4,849,000	26,000
2040	0.503	$1,416	$261	$706	$74	$14,189	8,720,000	4,950,000	27,000
2041	0.485	$1,423	$268	$749	$76	$14,552	8,760,000	5,049,000	29,000
2042	0.468	$1,429	$283	$793	$78	$14,877	8,799,000	5,146,000	31,000
2043	0.451	$1,435	$298	$837	$79	$15,165	8,836,000	5,242,000	33,000
2044	0.435	$1,440	$313	$881	$81	$15,417	8,872,000	5,337,000	36,000
2045	0.420	$1,445	$327	$926	$83	$15,633	8,909,000	5,432,000	38,000
2046	0.405	$1,450	$339	$971	$85	$15,811	8,946,000	5,526,000	40,000
2047	0.391	$1,456	$349	$1,016	$87	$15,953	8,979,000	5,620,000	42,000
2048	0.377	$1,461	$357	$1,061	$88	$16,054	9,013,000	5,714,000	45,000
2049	0.363	$1,466	$361	$1,107	$90	$16,114	9,049,000	5,806,000	47,000
2050	0.351	$1,471	$363	$1,153	$92	$16,132	9,087,000	5,897,000	49,000
2051	0.338	$1,477	$363	$1,198	$94	$16,108	9,125,000	5,985,000	52,000
2052	0.326	$1,482	$362	$1,243	$95	$16,042	9,164,000	6,070,000	54,000
2053	0.315	$1,486	$360	$1,287	$97	$15,935	9,200,000	6,154,000	57,000
2054	0.303	$1,490	$358	$1,330	$99	$15,788	9,237,000	6,234,000	59,000
2055	0.293	$1,494	$354	$1,372	$100	$15,604	9,276,000	6,313,000	62,000
2056	0.282	$1,498	$349	$1,412	$102	$15,384	9,318,000	6,388,000	64,000
2057	0.272	$1,502	$344	$1,450	$103	$15,130	9,358,000	6,460,000	66,000
2058	0.263	$1,505	$338	$1,487	$105	$14,844	9,396,000	6,530,000	69,000
2059	0.253	$1,508	$331	$1,521	$106	$14,529	9,435,000	6,597,000	71,000
2060	0.244	$1,511	$324	$1,554	$107	$14,187	9,473,000	6,661,000	73,000
2061	0.236	$1,514	$316	$1,584	$108	$13,820	9,509,000	6,722,000	75,000
2062	0.227	$1,517	$307	$1,613	$110	$13,431	9,548,000	6,780,000	77,000
2063	0.219	$1,519	$298	$1,639	$111	$13,022	9,583,000	6,836,000	79,000
2064	0.211	$1,521	$289	$1,663	$111	$12,594	9,618,000	6,890,000	81,000
2065	0.204	$1,522	$279	$1,686	$112	$12,150	9,652,000	6,941,000	83,000
2066	0.197	$1,524	$269	$1,706	$113	$11,692	9,684,000	6,989,000	85,000
2067	0.190	$1,525	$258	$1,724	$114	$11,223	9,714,000	7,034,000	87,000
2068	0.183	$1,526	$248	$1,740	$114	$10,744	9,741,000	7,078,000	88,000
2069	0.176	$1,528	$237	$1,753	$115	$10,259	9,766,000	7,118,000	90,000
2070	0.170	$1,529	$226	$1,764	$115	$9,770	9,791,000	7,157,000	91,000
2071	0.164	$1,531	$215	$1,771	$116	$9,283	9,814,000	7,193,000	93,000
2072	0.158	$1,533	$204	$1,778	$116	$8,796	9,837,000	7,228,000	94,000
2073	0.153	$1,534	$193	$1,782	$116	$8,312	9,857,000	7,261,000	95,000
2074	0.147	$1,536	$182	$1,785	$116	$7,834	9,876,000	7,292,000	96,000
2075	0.142	$1,538	$171	$1,785	$116	$7,364	9,895,000	7,322,000	97,000
2076	0.137	$1,540	$161	$1,782	$116	$6,905	9,915,000	7,350,000	98,000
2077	0.132	$1,542	$151	$1,778	$116	$6,458	9,935,000	7,378,000	99,000
2078	0.127	$1,544	$141	$1,771	$116	$6,026	9,955,000	7,404,000	99,000
2079	0.123	$1,546	$131	$1,762	$116	$5,611	9,976,000	7,430,000	100,000
2080	0.119	$1,548	$122	$1,752	$116	$5,214	9,997,000	7,455,000	100,000
2081	0.114	$1,550	$113	$1,741	$115	$4,835	10,018,000	7,480,000	101,000
2082	0.110	$1,552	$105	$1,729	$115	$4,477	10,043,000	7,504,000	101,000
2083	0.106	$1,554	$97	$1,714	$114	$4,140	10,067,000	7,528,000	101,000
2084	0.103	$1,556	$90	$1,700	$114	$3,825	10,092,000	7,552,000	101,000
2085	0.099	$1,558	$83	$1,685	$113	$3,531	10,119,000	7,575,000	102,000
2086	0.095	$1,560	$76	$1,670	$113	$3,260	10,145,000	7,598,000	102,000
2087	0.092	$1,563	$71	$1,654	$113	$3,010	10,170,000	7,621,000	102,000
2088	0.089	$1,565	$65	$1,639	$112	$2,783	10,196,000	7,643,000	102,000
2089	0.086	$1,567	$60	$1,624	$112	$2,576	10,221,000	7,666,000	102,000
2090	0.083	$1,569	$56	$1,609	$111	$2,390	10,246,000	7,688,000	103,000
2091	0.080	$1,572	$52	$1,594	$111	$2,224	10,270,000	7,710,000	103,000
2092	0.077	$1,574	$48	$1,580	$110	$2,077	10,294,000	7,732,000	103,000
2093	0.074	$1,576	$45	$1,566	$110	$1,949	10,318,000	7,754,000	103,000
2094	0.071	$1,579	$43	$1,552	$110	$1,839	10,342,000	7,776,000	103,000
2095	0.069	$1,581	$40	$1,538	$109	$1,749	10,366,000	7,796,000	104,000
2096	0.066	$1,583	$39	$1,523	$109	$1,677	10,390,000	7,816,000	104,000

[1] *For illustration purposes used long-term growth rate of wages to discount all values to 2022.*

Exhibit 4
Washington Office of the State Actuary
Sensitivity Tests - SJR8212 Fails
Level Premium Assessment Required

Scenario	Level Premium Assessment Required	Change from Current Law Premium Assessment of 0.58%
Base Plan	0.66%	0.08%
SJR8212 passes (15% equity)	0.58%	0.00%
SJR8212 passes - 100bp interest rates	0.60%	0.02%
SJR8212 passes + 100bp interest rates	0.50%	-0.08%
High wage growth	0.40%	-0.18%
Low wage growth	1.14%	0.56%
+ 20% incidence	0.71%	0.13%
- 20% incidence	0.61%	0.03%
+ 10% mortality	0.65%	0.07%
- 10% mortality	0.68%	0.10%
+ 10% active mortality	0.66%	0.08%
- 10% active mortality	0.67%	0.09%
+ 10% disabled mortality	0.66%	0.08%
- 10% disabled mortality	0.67%	0.09%
High mortality improvement	0.69%	0.11%
Low mortality improvement	0.64%	0.06%
25% higher net migration	0.66%	0.08%
25% lower net migration	0.67%	0.09%
High vesting	0.71%	0.13%
Low vesting	0.60%	0.02%

APPENDIX A

PROJECTED FUTURE NET INVESTMENT EARNED RATES

APPENDIX A

PROJECTED FUTURE NET INVESTMENT EARNED RATES

This appendix discusses the key reliance items and assumptions used in projecting potential investment earnings for the Long Term Services and Supports (LTSS) Trust Program of the State of Washington.

INVESTMENT ASSUMPTIONS

The investment strategy assumes that positive cash flows purchase fixed income securities and / or equities according to the fixed proportion discussed below. Spreads are consistent with corporate bond equivalent (semi-annual) yield and are based on market conditions as of June 19, 2020. The tables included throughout this appendix reflect the June 19, 2020 interest rate environment.

We were requested to model three scenarios to examine potential investment returns supporting the Trust account:

1. "SJR8212 Fails" scenario

   Assumes investments in Treasuries only, which we understand to be consistent with the investment approach currently anticipated.

2. "SJR8212 Passes" scenario (70% fixed income, 30% equities)

   Passage of SJR8212 would allow additional flexibility to invest the Trust Account in stocks and other forms of investment. For this scenario we assume 70% is invested in fixed income and 30% is allocated for domestic and / or international common stock.

3. "SJR8212 Passes" scenario (85% fixed income, 15% equities)

   We also tested an alternative to the "SJR8212 Passes" scenario where 85% is invested in fixed income and 15% is allocated in equities.

Equities are assumed to be invested in common stock. Historical S&P index economic average returns support the long-term equity assumption of 7.73% used in testing.

Please note, the weighted average maturity of the fixed income investment strategy is around six years. This is based on the fixed income portfolio noted in the Washington State Investment Board (WSIB) 2019 Capital Markets White Paper. For long-term care products, private insurance carriers typically invest in longer duration assets to better match the long duration of the liability products. Longer duration fixed income assets generally earn higher spreads compared to shorter maturity assets under a normal market environment.

Exhibits A.1, A.2, and A.3 present the summary of reinvestment strategies under the three tests described above.

SUMMARY OF YIELD PROJECTIONS BY INVESTMENT STRATEGY SCENARIO

The net investment earned rates (NIER) are projected using the investment strategies described above. Spreads of each asset type were assumed to be held constant throughout the projection. The underlying interest rate environment is the projected forward curve shown at the end of the memo.

Using the reinvestment assumptions stated above, the three investment scenarios result in the following projected annual investment yields if assets were purchased at the illustrated projection period:

APPENDIX A

PROJECTED FUTURE NET INVESTMENT EARNED RATES

Table A.1
State of Washington
Annual Investment Yields
SJR8212 Fails (Treasury Only)

	Projection Year					
	0	**10**	**20**	**30**	**60**	**75**
Interest Rate	0.42%	1.59%	1.98%	2.41%	2.41%	2.41%
Gross Spread	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Gross Yield (AEY)	0.42%	1.60%	1.99%	2.42%	2.42%	2.42%
Default Rate	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Investment Expense	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
Net Yield (AEY)	0.32%	1.50%	1.89%	2.32%	2.32%	2.32%

Table A.2
State of Washington
Annual Investment Yields
SJR8212 Passes (30% Equity / 70% Fixed Income)

	Projection Year					
	0	**10**	**20**	**30**	**60**	**75**
Interest Rate	0.42%	1.59%	1.98%	2.41%	2.41%	2.41%
Gross Spread	2.83%	2.76%	2.64%	2.51%	2.51%	2.51%
Gross Yield (AEY)	3.29%	4.41%	4.69%	4.99%	4.99%	4.99%
Default Rate	0.07%	0.07%	0.07%	0.07%	0.07%	0.07%
Investment Expense	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
Net Yield (AEY)	3.12%	4.24%	4.52%	4.82%	4.82%	4.82%

Table A.3
State of Washington
Annual Investment Yields
SJR8212 Passes (15% Equity / 85% Fixed Income)

	Projection Year					
	0	**10**	**20**	**30**	**60**	**75**
Interest Rate	0.42%	1.59%	1.98%	2.41%	2.41%	2.41%
Gross Spread	1.90%	2.06%	2.01%	1.94%	1.94%	1.94%
Gross Yield (AEY)	2.34%	3.70%	4.03%	4.40%	4.40%	4.40%
Default Rate	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%
Investment Expense	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
Net Yield (AEY)	2.15%	3.51%	3.85%	4.22%	4.22%	4.22%

Default Cost

Annual default costs are based on Moody's Data, and reflect long term default costs covering the period from 1920 through 2018. These costs reflect both the probability and severity of default. The default assumptions reflect annualized rates derived from cumulative experience from issue at a particular rating so that they reflect the tendency of ratings for any particular bond to move down over time.

APPENDIX A

PROJECTED FUTURE NET INVESTMENT EARNED RATES

Table A.4
State of Washington
Default Costs

Quality Rating	5-Year	10-Year
Government	0.00%	0.00%
AAA	0.01%	0.01%
AA	0.03%	0.04%
A	0.09%	0.12%
BBB	0.15%	0.19%
BB	0.71%	0.73%
B	2.72%	2.40%

For the reinvestment grids mentioned above, it was assumed that the allocations for AA, A, and BBB bonds are split evenly.

Investment Expenses

Investment expenses are included to cover portfolio management, accounting, and custodial costs as projected by investment accounting. The expense in this case is assumed to be an average of 10 bps on market value for all assets.

Treasury Yield Curve (Corporate Bond Equivalent)

The interest rate projections are based on the Constant Maturity Treasury yield curve as of June 19, 2020, used to determine the market spreads on reinvested assets.

Table A.5
State of Washington
Constant Maturity
Treasury Rates

Maturity	As of June 19, 2020
90-day	0.15%
1-year	0.18%
2-year	0.19%
3-year	0.22%
5-year	0.33%
7-year	0.53%
10-year	0.70%
20-year	1.23%
30-year	1.47%

Forward Interest Rate Curve

The interest rate scenario of all three projections is based on the 6-year tenor of the forward curve as of June 19, 2020, found in the table below. The fixed income weighted average maturity of each reinvestment strategy is around 6 years.

APPENDIX A

PROJECTED FUTURE NET INVESTMENT EARNED RATES

Table A.6
State of Washington
Treasury Forward Curve
As of June 19, 2020

Projection	Maturity						
Year	2	5	6	7	10	20	30
0	0.19%	0.33%	0.42%	0.53%	0.70%	1.23%	1.47%
1	0.24%	0.48%	0.55%	0.65%	0.81%	1.31%	1.55%
2	0.36%	0.67%	0.71%	0.78%	0.93%	1.40%	1.62%
3	0.50%	0.81%	0.85%	0.91%	1.06%	1.49%	1.70%
4	0.74%	0.95%	0.98%	1.04%	1.18%	1.57%	1.77%
5	1.04%	1.09%	1.11%	1.16%	1.31%	1.65%	1.83%
6	1.07%	1.16%	1.20%	1.25%	1.40%	1.71%	1.88%
7	1.06%	1.21%	1.26%	1.32%	1.49%	1.76%	1.93%
8	1.17%	1.32%	1.37%	1.43%	1.60%	1.83%	1.98%
9	1.27%	1.43%	1.48%	1.55%	1.72%	1.89%	2.03%
10	1.37%	1.54%	1.59%	1.66%	1.84%	1.95%	2.07%
11	1.49%	1.66%	1.71%	1.78%	1.89%	2.01%	2.12%
12	1.60%	1.78%	1.83%	1.90%	1.94%	2.06%	2.15%
13	1.72%	1.90%	1.95%	2.03%	1.99%	2.11%	2.19%
14	1.84%	2.03%	2.04%	2.06%	2.03%	2.15%	2.22%
15	1.97%	2.16%	2.11%	2.08%	2.06%	2.18%	2.24%
16	2.09%	2.15%	2.12%	2.08%	2.08%	2.21%	2.26%
17	2.22%	2.12%	2.10%	2.08%	2.10%	2.23%	2.27%
18	2.36%	2.08%	2.08%	2.07%	2.11%	2.24%	2.28%
19	2.13%	2.02%	2.04%	2.04%	2.11%	2.24%	2.28%
20	1.86%	1.95%	1.98%	2.01%	2.10%	2.24%	2.28%
21	1.92%	2.01%	2.03%	2.07%	2.16%	2.27%	2.30%
22	1.98%	2.07%	2.10%	2.13%	2.21%	2.30%	2.33%
23	2.04%	2.14%	2.16%	2.20%	2.26%	2.32%	2.34%
24	2.10%	2.20%	2.22%	2.26%	2.30%	2.35%	2.36%
25	2.17%	2.27%	2.28%	2.31%	2.33%	2.37%	2.38%
26	2.24%	2.32%	2.33%	2.35%	2.36%	2.38%	2.39%
27	2.30%	2.36%	2.37%	2.38%	2.38%	2.39%	2.40%
28	2.37%	2.39%	2.39%	2.40%	2.40%	2.40%	2.40%
29	2.41%	2.41%	2.41%	2.41%	2.41%	2.41%	2.41%
30	2.41%	2.41%	2.41%	2.41%	2.41%	2.41%	2.41%

APPENDIX A EXHIBITS

Exhibit A.1
State of Washington
Summary of Reinvestment Strategy - SJR8212 Fails Scenario (Treasury Only)
As of June 19, 2020

Asset Class	Rating	Allocation	Maturity	Duration	Treasury	Gross Spread	Gross Yield (AEY)	Investment Expenses	Expected Defaults	Net Yield (AEY)
Treasury	AAA	84.00%	5.0	5.0	0.33%	0.00%	0.33%	0.33%	0.10%	0.00%
Treasury	AAA	16.00%	10.0	9.7	0.70%	0.00%	0.70%	0.70%	0.10%	0.00%
Total		**100.00%**	**5.8**	**5.7**	**0.39%**	**0.00%**	**0.39%**	**0.39%**	**0.10%**	**0.00%**

Exhibit A.2
State of Washington
Summary of Reinvestment Strategy - ESJR 8212 Passes (30% Equity/70% Credit) Scenario
As of June 19, 2020

Asset Class	Rating	Allocation	Maturity	Duration	Treasury	Gross Spread	Gross Yield (AEY)	Investment Expenses	Expected Defaults	Net Yield (AEY)
Public Bond	AA	12.18%	5	4.9	0.33%	0.45%	0.78%	0.10%	0.03%	0.65%
Public Bond	AA	2.32%	10	9.3	0.70%	0.90%	1.61%	0.10%	0.04%	1.47%
Public Bond	A	12.18%	5	4.9	0.33%	0.65%	0.98%	0.10%	0.09%	0.79%
Public Bond	A	2.32%	10	9.2	0.70%	1.12%	1.83%	0.10%	0.12%	1.61%
Public Bond	BBB	12.18%	5	4.8	0.33%	1.17%	1.50%	0.10%	0.15%	1.25%
Public Bond	BBB	2.32%	10	9	0.70%	1.67%	2.38%	0.10%	0.19%	2.09%
Emerging Market	AA	4.24%	5	4.9	0.33%	0.45%	0.78%	0.10%	0.03%	0.65%
Emerging Market	AA	0.81%	10	9.3	0.70%	0.90%	1.61%	0.10%	0.04%	1.47%
Emerging Market	A	4.24%	5	4.9	0.33%	0.65%	0.98%	0.10%	0.09%	0.79%
Emerging Market	A	0.81%	10	9.2	0.70%	1.12%	1.83%	0.10%	0.12%	1.61%
Emerging Market	BBB	4.24%	5	4.8	0.33%	1.17%	1.50%	0.10%	0.15%	1.25%
Emerging Market	BBB	0.81%	10	9	0.70%	1.67%	2.38%	0.10%	0.19%	2.09%
Foreign Bond	AA	2.00%	5	4.9	0.33%	0.45%	0.78%	0.10%	0.03%	0.65%
Foreign Bond	AA	0.38%	10	9.3	0.70%	0.90%	1.61%	0.10%	0.04%	1.47%
Foreign Bond	A	2.00%	5	4.9	0.33%	0.65%	0.98%	0.10%	0.09%	0.79%
Foreign Bond	A	0.38%	10	9.2	0.70%	1.12%	1.83%	0.10%	0.12%	1.61%
Foreign Bond	BBB	2.00%	5	4.8	0.33%	1.17%	1.50%	0.10%	0.15%	1.25%
Foreign Bond	BBB	0.38%	10	9	0.70%	1.67%	2.38%	0.10%	0.19%	2.09%
Securitized	AA	1.19%	5	4.7	0.33%	2.22%	2.57%	0.10%	0.08%	2.39%
Securitized	AA	0.23%	10	8.7	0.70%	2.22%	2.94%	0.10%	0.10%	2.74%
Securitized	A	1.19%	5	4.6	0.33%	3.47%	3.84%	0.10%	0.08%	3.66%
Securitized	A	0.23%	10	8.3	0.70%	3.47%	4.21%	0.10%	0.10%	4.01%
Securitized	BBB	1.19%	5	4.6	0.33%	3.47%	3.84%	0.10%	0.17%	3.57%
Securitized	BBB	0.23%	10	8.3	0.70%	3.47%	4.21%	0.10%	0.20%	3.92%
Domestic Common Stock	N/A	30.00%	N/A	N/A	0.00%	N/A	7.73%	0.10%	0.00%	7.63%
Total		**100.00%**	**4.1**	**3.9**	**0.27%**	**0.68%**	**3.27%**	**0.10%**	**0.07%**	**3.10%**
Fixed Income Only		70.00%	5.8	5.5	0.39%	0.97%	1.36%	0.10%	0.10%	1.16%

Exhibit A.3
State of Washington
Summary of Reinvestment Strategy - ESJR 8212 Passes (15% Equity/85% Credit) Scenario
As of June 19, 2020

Asset Class	Rating	Allocation	Maturity	Duration	Treasury	Gross Spread	Gross Yield (AEY)	Investment Expenses	Expected Defaults	Net Yield (AEY)
Public Bond	AA	14.79%	5	4.9	0.33%	0.45%	0.78%	0.10%	0.03%	0.65%
Public Bond	AA	2.82%	10	9.3	0.70%	0.90%	1.61%	0.10%	0.04%	1.47%
Public Bond	A	14.79%	5	4.9	0.33%	0.65%	0.98%	0.10%	0.09%	0.79%
Public Bond	A	2.82%	10	9.2	0.70%	1.12%	1.83%	0.10%	0.12%	1.61%
Public Bond	BBB	14.79%	5	4.8	0.33%	1.17%	1.50%	0.10%	0.15%	1.25%
Public Bond	BBB	2.82%	10	9	0.70%	1.67%	2.38%	0.10%	0.19%	2.09%
Emerging Market	AA	5.15%	5	4.9	0.33%	0.45%	0.78%	0.10%	0.03%	0.65%
Emerging Market	AA	0.98%	10	9.3	0.70%	0.90%	1.61%	0.10%	0.04%	1.47%
Emerging Market	A	5.15%	5	4.9	0.33%	0.65%	0.98%	0.10%	0.09%	0.79%
Emerging Market	A	0.98%	10	9.2	0.70%	1.12%	1.83%	0.10%	0.12%	1.61%
Emerging Market	BBB	5.15%	5	4.8	0.33%	1.17%	1.50%	0.10%	0.15%	1.25%
Emerging Market	BBB	0.98%	10	9	0.70%	1.67%	2.38%	0.10%	0.19%	2.09%
Foreign Bond	AA	2.42%	5	4.9	0.33%	0.45%	0.78%	0.10%	0.03%	0.65%
Foreign Bond	AA	0.46%	10	9.3	0.70%	0.90%	1.61%	0.10%	0.04%	1.47%
Foreign Bond	A	2.42%	5	4.9	0.33%	0.65%	0.98%	0.10%	0.09%	0.79%
Foreign Bond	A	0.46%	10	9.2	0.70%	1.12%	1.83%	0.10%	0.12%	1.61%
Foreign Bond	BBB	2.42%	5	4.8	0.33%	1.17%	1.50%	0.10%	0.15%	1.25%
Foreign Bond	BBB	0.46%	10	9	0.70%	1.67%	2.38%	0.10%	0.19%	2.09%
Securitized	AA	1.44%	5	4.7	0.33%	2.22%	2.57%	0.10%	0.08%	2.39%
Securitized	AA	0.28%	10	8.7	0.70%	2.22%	2.94%	0.10%	0.10%	2.74%
Securitized	A	1.44%	5	4.6	0.33%	3.47%	3.84%	0.10%	0.08%	3.66%
Securitized	A	0.28%	10	8.3	0.70%	3.47%	4.21%	0.10%	0.10%	4.01%
Securitized	BBB	1.44%	5	4.6	0.33%	3.47%	3.84%	0.10%	0.17%	3.57%
Securitized	BBB	0.28%	10	8.3	0.70%	3.47%	4.21%	0.10%	0.20%	3.92%
Domestic Common Stock	N/A	15.00%	N/A	N/A	0.00%	N/A	7.73%	0.10%	0.00%	7.63%
Total		**100.00%**	**4.9**	**4.7**	**0.33%**	**0.82%**	**2.32%**	**0.10%**	**0.08%**	**2.13%**
Fixed Income Only		85.00%	5.8	5.5	0.39%	0.97%	1.36%	0.10%	0.10%	1.16%

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