



Guaranteed Education Tuition (GET)
Independent Actuarial Review
May 2022

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Washington Student Achievement Council and WA529 Committee
Olympia, WA

Ladies and Gentlemen:

We are pleased to present the enclosed report summarizing our findings and recommendations resulting from our independent actuarial review of the data, assumptions, and actuarial methods used by the Office of the State Actuary in their 2021 Experience Study, their 2021 Actuarial Valuation Report, and their 2021 GET Unit Price Setting Presentation for the Guaranteed Education Tuition (“GET”) program.

This report presents an executive summary followed by separate sections discussing in detail our findings, analyses, and recommendations. All comments and recommendations are intended to be constructive. Our purpose was to determine if the assumptions, actuarial methods, and valuation results were reasonable and to identify areas of possible improvement in the actuarial procedures.

We would like to thank the staff of both the Office of the State Actuary (“OSA”) and the GET for their cooperation. Their timely responses to our questions and requests for information were valuable assistance to us and greatly appreciated.

In preparing this report, we have relied on information (some oral and some in writing) supplied by OSA and GET. This information includes, but is not limited to, reports, contract data, and financial information. We have not audited or verified this information beyond the testing described in this report. If any of this information is inaccurate or incomplete, the results of this report may likewise be inaccurate or incomplete.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to factors such as, but not limited to, actual GET Program experience differing from that anticipated by the economic or demographic assumptions, the natural operation of the methodology used for these measurements, and changes in plan provisions, actuarial assumptions, or applicable law. Due to the limited scope of the actuarial assignment, we did not perform an analysis of the potential range of future measurements.

Milliman’s work is prepared solely for the use and benefit of the Washington Student Achievement Council (“WSAC”) for a specific and limited purpose. It is a complex, technical analysis that assumes a high level of knowledge concerning GET’s operations, and uses data provided by GET and OSA which Milliman has not audited.

Milliman’s work as summarized in this report was performed for the exclusive benefit of WSAC. To the extent that Milliman’s work is not subject to disclosure under applicable public records laws, Milliman’s

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The consultants who worked on this report are actuaries. This report is not intended to be a substitute for qualified legal counsel or accounting advice.

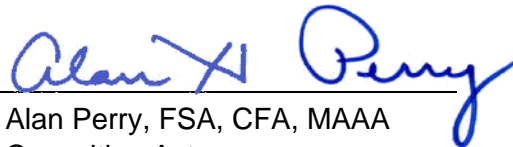
We are members of the American Academy of Actuaries and meet its Qualification Standards to render this actuarial opinion.

We look forward to having the opportunity to present this report and respond to questions regarding our review and recommendations.

Respectfully submitted,

A blue ink signature of Matt Larrabee, consisting of stylized, overlapping letters.

Matt Larrabee, FSA, EA, MAAA
Consulting Actuary

A blue ink signature of Alan Perry, with the first name 'Alan' and last name 'Perry' clearly legible.

Alan Perry, FSA, CFA, MAAA
Consulting Actuary

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1. Executive Summary

This report summarizes the results of our independent actuarial review (for reasonableness) of the data, assumptions, and methods used by the Office of the State Actuary (“OSA”) in its 2021 Guaranteed Education Tuition (“GET”) Experience Study, its 2021 Actuarial Valuation Report, and its 2021 GET Unit Price Setting Presentation.

In addition to the written reports prepared by OSA, we were provided with the June 30, 2021, contract data actuarial file sent to OSA by GET and several additional files with historical contract information that was used by OSA in their experience study.

OSA and GET staff were very helpful with timely responses to our questions and data requests.

By its nature, a review of another professional’s work product will tend to focus on those aspects where the reviewer believes some modification in current procedures would be desirable. Hence, a report such as this will devote the vast majority of the presentation to criticism that, even though intended to be constructive, may give the reader the impression that only problems were found. **Therefore, we would like to state clearly up front that we found the actuarial procedures and practices to be of a high quality and in compliance with all major aspects of the applicable actuarial standards.** While we will discuss several areas where we believe some modifications in current actuarial assumptions, methods, or reporting could potentially be beneficial, that discussion should be considered within the context of an overall favorable report concerning OSA’s work.

With respect to the 2021 Guaranteed Education Tuition Experience Study, we have the following comments:

- OSA proposes reducing the long-term tuition growth assumption from 5.0% to 4.0%. We believe this is a reasonable long-term assumption for a June 30, 2021, measurement date. Since that date, expectations for general price inflation have increased.
- OSA proposes to reflect a half-year adjustment to the reported first tuition use year for contracts that have not started redeeming units yet. This has the effect of reducing the number of units expected to be redeemed in the first year by half and adding an additional sixth year of tuition payouts. We believe this change is reasonable.
- OSA proposes to continue to assume that units are used uniformly over a five-year period. Coupled with the half-year delay to the start of usage assumption, this implies that units will be assumed to be redeemed at the rate of 10% in the first year, 20% in each of years two through five, and 10% in year six. We believe this is a reasonable assumption.

With respect to the 2021 Actuarial Valuation Report:

- OSA proposes to leave the investment return assumption at 4.75%. This is based on the 2021 capital market assumptions of the Washington State Investment Board (“WSIB”). Under Milliman’s June 30, 2021 capital market assumptions, the expected annualized geometric return for GET’s policy portfolio

is 4.75% for the next 15 years – but with lower expected returns in the early years and higher expected returns in the later years of the 15-year period.

- We matched detailed results with OSA for 11 sample contracts that represented a wide range of contract types.
- Our projection of the units projected to be redeemed each year under all contracts was very close to OSA's. Our estimates of the present value of tuition payouts, monthly contract payments, administrative expenses, and the resulting actuarial reserve matched OSA's calculated present values to well within acceptable tolerances.

With respect to the 2021 GET Unit Price Setting Presentation:

- Our estimate of the 2021-2022 unit price matched OSA's precisely.

2. General Approach of Review

Milliman was hired by the Washington Student Achievement Council (“WSAC”) to perform an independent actuarial review (for reasonableness) of the data, assumptions, and methods used by the Office of the State Actuary in its 2021 Guaranteed Education Tuition Experience Study report, its 2021 Actuarial Valuation Report, and its 2021 GET Unit Price Setting Presentation.

We were provided with the following information from GET staff:

1. An electronic copy of the 2021 Guaranteed Education Tuition Experience Study dated July 2021.
2. An electronic copy of the 2021 Actuarial Valuation Report dated November 2021.
3. An electronic copy of the 2021 GET Unit Price Setting Presentation dated September 15, 2021.
4. An Excel file with the active contract data for the 2021 actuarial valuation and 26 other Excel files containing additional contract information. These were the same files requested and received by OSA for their work in 2021 on these reports.

We downloaded several files from the GET website that contained program information and historical tuition and price information. And, finally, we downloaded GET asset information from WSIB’s website.

We selected 11 representative contracts (“sample lives”) from the active data file and sent them to OSA. OSA promptly provided us with detailed valuation results for individual contract we identified.

Key Steps to our Review

- | | |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step 1 | We reviewed the Experience Study report along with the data used in it and other data that we thought was relevant. |
| Step 2 | We loaded the active contract data and the valuation assumptions into Milliman’s prepaid tuition valuation model and developed our estimates of the obligations and the reserve. |
| Step 3 | We loaded the unit pricing assumptions into Milliman’s prepaid tuition pricing model and developed our estimate of the unit price. |

No Actuarial Standards of Practice (“ASOPs”) have evolved within the actuarial profession specifically addressing prepaid tuition programs. We used the guidance in the ASOPs applicable to retirement programs for purposes of conducting this review because these programs generally provide for payments with a high probability of occurrence at, or close to, some specific date.

The applicable Actuarial Standards of Practice include:

1. ASOP No. 4, *Measuring Pension Obligations and Determining Pension Plan Costs or Contributions*;
2. ASOP No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*;

3. ASOP No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*;
4. ASOP No. 44, *Selection and Use of Asset Valuation Methods for Pension Valuations*.

Please note that Milliman provided actuarial consulting to GET from 1997 through 2011. We produced actuarial valuation and pricing analyses reports over this time period.

3. 2021 Experience Study

Experience Study – Introduction

We reviewed the 2021 Guaranteed Education Tuition Experience Study produced by OSA. Our comments below on each of the actuarial assumptions follow the same sequence as presented in OSA's report.

Economic Assumptions

Two of the most important assumptions applied in the actuarial valuation and price setting are economic in nature: the annualized average rate of return projected to be earned by the investments and the projected annual growth rate of tuition and mandatory fees.

OSA does not include the investment return assumption in their Experience Study because the return assumption is reviewed every year and is based on updated capital market assumptions provided by the Washington State Investment Board ("WSIB"). WSIB manages the investment portfolio for GET. The investment return assumption is a critical part of the valuation and pricing process, and we provide comments about the 2021 assumption in page 12 of this report.

Expected Tuition Growth

OSA refined their tuition growth model as part of the Experience Study. Their report provides a very detailed analysis. They start by assuming that tuition increases will track increases to the total cost of instruction. They used a building block approach to break down the expected growth to the cost of instruction into four factors:

1. National Inflation
2. Regional Inflation Adjustment
3. Higher Education Inflation Adjustment
4. Higher Education Services Utilization

The first factor is general price inflation across the U.S. economy. The level of this factor in the future can be estimated from prices of U.S. Treasury securities and surveys of economists.

The second factor is the difference in local inflation relative to the national economy. This can be estimated by recent historical differences between local and national inflation.

The third factor is the difference in higher education inflation relative to general price inflation. This can be estimated by recent historical differences between the Higher Education Price Index (HEPI) and national inflation (CPI). The HEPI tracks the costs that universities incur, which are primarily driven by the wages of faculty and other employees.

The fourth factor is referred to by OSA as "utilization". This is a component that reflects increases to the cost of instruction due to the growth in utilization of public universities in Washington. OSA estimates this factor by looking at the projected growth in student enrollments.

OSA develops the following estimates of the four factors:

1. National Inflation	2.25%
2. Regional Inflation Adjustment	0.40%
3. Higher Education Inflation Adjustment	0.60%
4. Higher Education Services Utilization	0.75%

These add to 4.0%, which is OSA's long-term tuition growth assumption. This is a 1% reduction in the assumption from the previous year.

OSA also applies a short-term tuition growth assumption for up to four years. This is currently 2.7% and is based on the Current Law Tuition Policy. This Policy states that tuition growth can be no larger than the annualized average growth rate in the median hourly wage in Washington over the preceding 14-year period. OSA notes that this statutory Policy could be extended in which case annual tuition growth would be expected to remain under 4.0% for more than the following four years.

Conclusion:

We believe the 4.0% long-term assumption for the growth rate in the total cost of instruction (and tuition) is reasonable for a June 30, 2021, measurement date. The three inflation-based factors OSA identifies make sense to us. We use the same approach in our work. In our view, the "utilization" factor appears to be a catch-all term for multiple factors. These could include student population growth (since the tuition students pay do not cover all costs), changes to financial aid (e.g., tuition discounting), changes to faculty and staff productivity, and other factors.

We recommend that OSA and GET develop (or maintain) as many relationships with Washington higher education finance and operations representatives as possible. In our experience, these experts have provided us with more relevant information on the likely path of future tuition changes than the data we collect on general price inflation and higher education inflation experience from a year or two earlier. In the absence of such supplemental information, OSA's long-term model should at least track changes related to expected general price inflation (i.e., national inflation). General price inflation is expected to be the most significant factor driving future tuition growth. Expectations for general price inflation have increased since last June, so it may be the case that OSA will consider raising the long-term tuition growth assumption in 2022.

New Unit Sales Profile

The new unit sales profile defines the expected proportion of new unit sales across the different holding periods (essentially the age distribution of the beneficiaries). It is used for the price-setting analysis, but not for the actuarial valuation.

OSA looked at all unit sales (new and existing accounts) over the 2010-2020 period (noting that there were no sales in 2015 and 2016) and tabulated the number of years between the year of enrollment (year purchased) and the year of expected tuition redemption. OSA focused on 2018, 2019, and 2020 as being most representative of projected future sales and tabulated the distributions of units purchased by expected holding period.

We were able to roughly match OSA's 2018-2020 distribution using the same data. (OSA excluded a few contracts that we did not).

OSA then made some small adjustments based on judgment and also smoothed the rates. The average expected holding period decreased from 13.7 years to 12.2 years under the new sales profile.

Conclusion:

We believe the new unit sales profile is a reasonable assumption model for the distribution of future unit sales by holding period. This is an assumption model that should be revisited frequently. For example, the profile could be updated every year based on the average of the most recent three years of unit sales.

Redemption Rate

OSA performed a detailed analysis of the extent to which accounts start to use their units in a different year than their reported year and the extent to which contracts change their reported year. They concluded that, on average, the start year for usage is 0.69 years after the reported year. They selected a half-year increase (delay) to the customer reported benefit use year for contracts that have not yet started to redeem units.

Then OSA looked at the unit redemptions by year once the redemptions begin. Using redemptions over the 2001-2021 period, they tabulated the redeemed units for each contract by the number of years since the reported first use year. Then they calculated the percentage of units that were redeemed each year starting with the reported use year. OSA found that about 33% of available units were used in the reported use year, 22% were used in the second year, 17% in the third, 13% in the fourth, 4% in the fifth, 2% in the seventh, and 1% or less in each of years 7 through 9. About 7% of units were used in year 10 or later. We were able to roughly match these usage percentages presented by OSA.

After performing this analysis, OSA decided to stay with their previous assumption that 20% of the units will be redeemed each year for five years starting with the reported use year. Combining this with the half-year adjustment for the start year, OSA is effectively assuming that 10% of the units will be redeemed in the reported use year, 20% of units will be redeemed in each of the next 4 years, and 10% of units will be redeemed in year six.

Conclusion:

We believe that OSA's redemption assumptions are reasonable and agree that, given current assumptions, applying a more complex set of redemption rates would not lead to a material impact on the measurement of the funded status. The benefit to using a more complex set of redemption rates (consistent with OSA's tabulations) would be a potentially more accurate year-by-year projection of the program's cash flows – including the cash flows in the tail years (years 7 and later) of contracts. That more complex assumption approach could potentially be helpful for investment management purposes and could also paint a clearer picture for management and others of the expected life of the program if unit sales were to permanently cease at some future

date. Also, if the difference between the long-term tuition growth assumption and the investment return assumption were to increase, the timing of actual benefit payouts on present values would become more material.

Miscellaneous Unit Change

In the recent past, OSA has not applied an assumption to reflect that some units will be refunded or cancelled before redemption.

OSA looked at the incidence of refund and rollover requests for already purchased units and the impact of changes to custom monthly contracts through payment defaults, conversions, and downgrades. Due to the relatively small number of such requests, the associated minimal impact on funded status, the fact that the refund benefit is equal to the tuition benefit, and the changing laws that have impacted refund and rollover behavior, OSA decided to continue to assume no refunds or rollovers take place.

In our experience, applying refund, rollover, and/or cancellation assumptions adds a significant layer of complexity to the valuation and pricing processes. In some states, refund benefits are less than tuition benefits and a high refund level would significantly reduce the program's present value liability. For those states, addition of such an assumption might allow for a justifiable reduction in the price of a unit or contract. This does not appear to be the case for the GET program.

Conclusion:

We believe that OSA's decision to continue to exclude an assumption for unit refunds, rollovers, and/or cancellations is reasonable. If the level of these sorts of actions from contract holders increase in the future, it may be appropriate to reconsider this assumption.

4. 2021 Actuarial Valuation Report

We were asked to review the 2021 Actuarial Valuation Report for reasonableness. We were provided with the following information from GET:

1. An electronic copy of the 2021 Actuarial Valuation Report dated November 2021.
2. The active contract actuarial data file as of June 30, 2021 that OSA received from GET.
3. A file with information on the additional units awarded and changes to monthly payment amounts for certain contracts under SB5430.

OSA's Valuation Report states that they did not reflect the WA529 Committee's September 2021 decision to retroactively reduce the unit price to \$114.01 for the 2019-20 and 2020-21 enrollment periods. Our work also does not reflect this change, and we think that first reflecting the effect of that change in the 2022 report is reasonable given the timing of the Committee decision, the timing of the issuance of the 2021 valuation report, and the modest impact the change will have on reported valuation results.

Contract Data

The active contract data file provided by GET to OSA contains the necessary information on each active contract – those contracts with units still outstanding (“in force”) - to perform the actuarial valuation. The data file includes the program year in which each contract was opened, the first year that units were expected to be used, the total number of units purchased under the contract, whether the purchase was a lump sum or an installment payment contract, the number of units redeemed to date, the number and amount of total monthly installment payments under the contract, and the number of future installment payments still owed under the contract.

After matching in the updated units from the SB5430 file, we matched the active contract count and the total units in force reported by OSA in the Valuation.

2021 Actuarial Data File	OSA	Milliman
Number of Active Contracts	67,820	67,820
Number of Units Outstanding	10,299,430	10,299,430

The last record in the active contract file was blank, so the effective total number of active contracts was 67,819.

Sample Life Testing

Before attempting to replicate the 2021 actuarial valuation, we selected 11 contracts from the full data file and asked OSA to provide us with individual valuation results for each contract. The 11 records covered a wide range of contract types including contracts with an expected year of first use in the distant

past, expected year of first use in the very recent past, and some with dates in the future. Some of the records had used some of their units already and others had not started to use units yet. We sent a file to OSA with the account data for the 11 contracts. These 11 records represent our “sample contracts” for detailed review. For each sample contract, we asked OSA to provide us with the expected number of units redeemed each year, the associated dollar amount of the tuition payouts, the present values of the payouts, the projected monthly contract payments, if any, and the present value of the monthly payments.

For each of the 11 sample contracts, OSA provided us with the expected number of units redeemed each year, the corresponding dollar amount of tuition payouts, the present value of the tuition payouts, the expected annual amount of contract payments for those contracts still making monthly payments, and the present value of the annual payments. Using the valuation assumptions for tuition increases, the investment return, and the timing of unit usage, we calculated these same values for each sample contract.

Two of the sample contracts (#1, #2) were large, with many purchased units. Those two sample contracts are scholarship contract accounts. They were selected for review due to their materiality and to see if any unique assumptions were applied in their modeling.

One of the sample contracts (#10) had a payout start year of 2043. OSA informed us that they restrict the payout start year to be within 22 years of the program year. For this contract, the restriction shifted the payout start year to 2036. We identified 457 contracts in the full data file that would be expected to fall under this restriction.

Another sample contract (#7) has 198 monthly payments remaining but an expected payout start year of 2022. This implies that the scheduled monthly payments will continue for several years after the tuition payouts are projected to be completed. With respect to this contract, OSA stated that “for model simplicity, and based on overall materiality, we assume that payments can be made after unit redemptions commence”. We identified 213 contracts in the full data file where scheduled monthly payments will not be completed before September of their projected payout start year.

The results of the sample contract testing for present value tuition obligations are shown in this table:

Sample	Payout Year	Total Units Purchased	Units in Force	Present Value of Tuition Payouts			Ratio of Milliman to OSA	
				OSA	Milliman		Approach 1	Approach 2
1	2015	19,495	19,495	\$ 2,078,093	\$ 2,077,907	\$ 2,077,868	99.99%	99.99%
2	2010	34,904	11,068	1,224,096	1,223,986	1,227,736	99.99%	100.30%
3	2021	800	800	85,279	85,271	85,270	99.99%	99.99%
4	2037	800	800	75,145	75,138	75,140	99.99%	99.99%
5	2039	800	800	74,073	74,066	74,068	99.99%	99.99%
6	2018	586	319	34,966	34,963	35,006	99.99%	100.11%
7	2022	300	300	31,548	31,545	31,545	99.99%	99.99%
8	2007	486	486	51,799	51,794	51,793	99.99%	99.99%
9	2034	383	383	40,068	40,064	40,065	99.99%	99.99%
10	2043	32	32	3,014	3,014	3,014	99.99%	99.99%
11	2030	461	461	45,504	45,500	45,501	99.99%	99.99%

The sample contract testing for the three contracts with remaining monthly payment obligations are shown here:

Sample	Payout Year	Monthly Payment Amount	Number of Payments Due	Present Value of Monthly Payments			Ratio of Milliman to OSA	
				OSA	Milliman		Approach 1	Approach 2
4	2037	\$ 730	191	\$ 98,564	\$ 98,564	\$ 98,581	100.00%	100.02%
5	2039	\$ 775	216	104,043	104,043	104,054	100.00%	100.01%
7	2022	\$ 265	198	36,709	36,709	36,721	100.00%	100.03%

For all 11 sample contracts, we exactly matched the start year for unit redemptions, the number of units to be redeemed each year, and the associated tuition payout for each year, but we differed slightly on the present value of the tuition payouts. To provide an independent analysis before asking OSA for details on their methodology, we tried two approaches to discount the future tuition payouts. Under “Approach 1”, we assumed that the tuition payouts each year were spread equally throughout the school year and discounted them as if they occurred at mid-year. In other words, we assume that units are redeemed (for a contract that has yet to redeem any units) at the rate of 10% in the reported first use year, 20% in each of the next four years, and the final 10% in the sixth year. We assumed units are redeemed, on average, at the mid-point of the school year (December 31). This approach closely matched OSA’s results.

Under “Approach 2”, we interpreted OSA’s one-half year delay in the start of usage year to mean that tuition will first be redeemed in the spring semester of the reported first use year and then in both semesters for the next four years followed by just the fall semester in the sixth year. We discounted the semester payouts as if they occurred on September 30 and March 31. This approach can lead to slightly different present values because, depending on the contract, it may push out the timing of the first year’s

payout by 3 months and shift the last year's payout forward by 3 months. We think both approaches are reasonable.

We also applied two approaches to determining the present value of the remaining monthly contract payments for those contracts with payments remaining. In Approach 1, we added together the monthly payments expected to be made in each year (July through June) and discounted the total as if it occurred at mid-year. This approach seemed to best match OSA's results.

In Approach 2 we discounted the future monthly payments individually with a mid-month timing. Unless a contract has a remaining number of monthly payments remaining that is exactly divisible by 12, there will be fewer than 12 payments in the final year of payments. The average timing of the last year's payments thus will be earlier than mid-year. This approach will lead to a slightly greater present value of monthly payments. We think both approaches are reasonable. We have used the annual approach for those prepaid programs where we are also applying cancellation assumptions to make the calculations simpler. But if no cancellations are assumed, the monthly approach is straightforward and would be expected to provide a slightly more accurate present value.

The last two columns in both tables above show the ratio of Milliman's calculated values to OSA's calculated values. **As can be seen, we closely matched all amounts calculated by OSA for all sample contracts.**

Program Assets

The WSIB-reported market value of investments of \$1,709 million as of June 30, 2021 shown in the Valuation Report matches the value shown in WSIB's 2021 Annual Report. The OSA includes an additional \$5 million held in the State Treasury Account for a total of \$1,714 million.

Investment Return Assumption

OSA selected 4.75% for the investment return assumption. This is unchanged from the previous year.

The Office of the State Actuary ("OSA") receives capital market assumptions from the Washington State Investment Board ("WSIB") each year. The assumptions include expected returns, standard deviations, and correlations for the asset classes in the GET portfolio. The expected returns represent expected arithmetic mean returns over a long-term horizon.

The expected arithmetic mean return for a portfolio of assets is the allocation-weighted average of the individual asset class expected arithmetic mean returns. Since actual rates of return on program assets exhibit significant variability ("volatility") from year to year, we recommend developing assumptions for the annualized return – also known as the geometric mean return – for purposes of discounting projected future benefit payments to a present value. Many actuaries prefer the median (or 50th percentile) of the distribution of the geometric mean return. This is the annualized rate of return that the actuary believes has a 50/50 probability of being realized over the projection period. The geometric mean return is always less than the arithmetic mean return, which is the expected return for a single year, due to the effects of volatility on annualized effective return over time. The geometric mean return is estimated from the

arithmetic mean, the standard deviation, and an assumed probability distribution. Milliman generally uses the lognormal distribution to estimate median geometric means. That approach is widely used in the investment industry.

The table below shows the development of the portfolio's expected median geometric mean return for different horizons using the capital market assumptions provided by WSIB (as shown in the Valuation Report), Milliman, and those reported in the 2021 Horizon Survey. Horizon Actuarial Services, LLC conducts an annual survey of investment advisory firms regarding their capital market assumptions. They ask the respondents to provide return and risk assumptions for each of the major asset classes used by institutional investors for both the short-term (up to 10 years) and longer term (20 years). For their 2021 Survey, they received 10-year capital market assumptions from 39 firms and 20-year capital market assumptions from 24 firms. Milliman provided our 10-year and 20-year capital market assumptions to the 2021 Horizon Survey.

The investment policy target asset allocation for GET, as reported in WSIB's 2021 Annual Report, is 60% fixed income and 40% global equity. GET's fixed income allocation is invested in WSIB's Bond Fund that is benchmarked to the Bloomberg Intermediate Credit Index. The equity is benchmarked to the MSCI All Country World Index. Milliman develops capital market assumptions for these two specific benchmarks. Since the Horizon Survey does not provide assumptions for the exact global equity and fixed income benchmarks used in the GET portfolio, Milliman mapped the GET investments onto the asset classes provided in the surveys.

Capital Market Assumptions:

- Expected asset class arithmetic mean returns over different investment horizons
- Expected asset class standard deviations of annual returns
- Correlation coefficient between asset classes

	<u>Fixed Income</u>	<u>Global Equity</u>
<u>WSIB 2021 Assumptions:</u>		
Arithmetic Mean of Annual Return	3.50%	8.10%
Standard Deviation of Annual Return	5.70%	19.00%
Fixed Income / Global Equity Correlation		0.30
<u>Milliman June 30, 2021 Assumptions:</u>		
Arithmetic Mean of Annual Return Next 5 Yrs	1.20%	6.95%
Arithmetic Mean of Annual Return Next 10 Yrs	2.80%	7.05%
Arithmetic Mean of Annual Return Next 15 Yrs	3.40%	7.55%
Arithmetic Mean of Annual Return Next 20 Yrs	3.75%	7.85%
Standard Deviation of Annual Return	4.40%	17.80%
Fixed Income / Global Equity Correlation		0.22
<u>2021 Horizon Survey Average Assumptions:</u>		
Arithmetic Mean of Annual Return Next 10 Yrs	2.25%	7.76%
Arithmetic Mean of Annual Return Next 20 Yrs	3.38%	8.62%
Standard Deviation of Annual Return	5.52%	16.92%
Fixed Income / Global Equity Correlation		0.19
Policy Target Allocation	60%	40%

Capital Market Assumptions:

- Expected portfolio arithmetic mean return over different investment horizons
- Expected portfolio median geometric mean return over different investment horizons
- Expected portfolio standard deviation of annual returns

Expected Return and Risk for the Policy Portfolio

	<u>Portfolio</u>
<u>WSIB 2021 Assumptions:</u>	
Arithmetic Mean of Annual Return	5.34%
Median Geometric Return Next 10 Yrs	4.90%
Median Geometric Return Next 15 Yrs	4.87%
Standard Deviation of Annual Return	9.20%
<u>Milliman June 30, 2021 Assumptions:</u>	
Arithmetic Mean of Annual Return Next 5 Yrs	3.50%
Arithmetic Mean of Annual Return Next 10 Yrs	4.50%
Arithmetic Mean of Annual Return Next 15 Yrs	5.06%
Arithmetic Mean of Annual Return Next 20 Yrs	5.39%
Median Geometric Return Next 5 Yrs	3.20%
Median Geometric Return Next 10 Yrs	4.15%
Median Geometric Return Next 15 Yrs	4.75%
Median Geometric Return Next 20 Yrs	5.05%
Standard Deviation of Annual Return	8.15%
<u>Horizon Survey of Capital Market Assumptions - 2021 Edition</u>	
Arithmetic Mean of Annual Return Next 10 Yrs	4.45%
Arithmetic Mean of Annual Return Next 15 Yrs	5.48%
Median Geometric Return Next 10 Yrs	4.15%
Median Geometric Return Next 20 Yrs	5.15%
Standard Deviation of Annual Return	8.13%

Milliman's Capital Markets Committee develops capital market assumptions as of June 30 and December 31 each year. They also develop return forecasts for periods from 5 to 30 years. Due to the Federal Reserve's actions to keep interest rates at very low levels and the expectation that rates will be increasing over the next few years, Milliman's expected returns differ by the investment horizon (especially for fixed income asset classes). We included return forecasts for periods of 5, 10, 15, and 20 years. We believe that 10 and 15 years are the most appropriate investment horizons to consider for assessing the reasonability of GET's investment return assumption. More than 75% of the units currently in force are projected to be redeemed in the next 10 years and more than 90% of the units are projected to be redeemed within the next 15 years.

As the table shows, under WSIB's assumptions, the portfolio is expected to earn an annualized return of about 4.90% over the next 10 to 15 years. Under Milliman's assumptions, the portfolio is expected to earn about 4.75% over the next 15 years – this matches the assumption selected by OSA. But our assumptions call for lower expected returns of 3.20% for the next 5 years and 4.15% for the next 10 years. In other words, under Milliman's capital market assumptions, returns are expected to be lower than 4.75% in the early years, and it will take 15 years before we expect returns to be high enough to pull the annualized return up to 4.75%. This pattern of returns is expected to lead to investment losses in the early years – which could erode the funded status to the extent that any assets are sold to pay benefits before they've had the chance to catch up to the expected 4.75% growth trajectory.

Under the average of the capital market assumptions provided by the firms that responded to the Horizon 2021 Survey, the expected annualized return over the next 10 years is 4.15% - also below the 4.75% investment assumption – but the return is expected to be 5.15% over 20 years.

So, for investment periods of 15 or more years, we are all in close agreement that the expected annualized return is at or slightly above 4.75%.

Conclusion:

We believe that the 4.75% expected investment return assumption is a reasonable expectation as of June 30, 2021 for a portfolio that consists of 40% global equity and 60% intermediate credit fixed income. OSA and GET should be aware that returns are likely to be lower than 4.75% over the next few years. Actual returns will be heavily influenced by the path of bond yields over the next few years, and yields have already increased significantly since June 30, 2021.

Actuarial Valuation Results

Applying OSA's assumptions for the start year for unit redemptions and the percentage of units redeemed each year, we developed a projection of the total units expected to be redeemed each year in the future. The table below shows our results compared to those in the Valuation Report.

Projected Unit Redemptions				
FY	OSA	Milliman	Difference	
2022	686,281	686,669	388	
2023	807,600	807,630	30	
2024	860,408	860,353	(55)	
2025	906,871	906,844	(27)	
2026	956,254	956,181	(73)	
2027	892,250	892,100	(150)	
2028	773,234	773,124	(110)	
2029	729,828	729,828	--	
2030	665,313	665,313	--	
2031	580,871	580,871	--	
2032	486,799	486,799	--	
2033	397,231	397,231	--	
2034	319,752	319,752	--	
2035	258,923	258,921	(2)	
2036	215,063	215,061	(2)	
2037	182,513	182,512	(1)	
2038	157,131	157,132	1	
2039	133,641	133,642	1	
2040	109,454	109,455	1	
2041	81,705	81,705	--	
2042	53,422	53,422	--	
2043	29,671	29,671	--	
2044	12,498	12,498	--	
2045	2,673	2,674	1	
2046	<u>44</u>	<u>44</u>	--	
Total	10,299,430	10,299,430	0	

As can be seen above, the projections match very closely for each year and are well within acceptable tolerances.

The table below shows OSA’s results for the 2021 Valuation alongside those developed by Milliman. It appears that OSA may have rounded some of their values – so the match may be slightly better or worse than shown.

	(\$Millions)		Ratio of Milliman to OSA*
	OSA	Milliman	
Present Value of Unit Redemptions	\$ 1,062	\$ 1,062	100.01%
Present Value of Administrative Expenses	\$ 30	\$ 30	100.34%
Present Value of Future Obligations	\$ 1,092	\$ 1,092	100.02%
Present Value of Monthly Contract Payments	\$ 99	\$ 99	100.10%
Market Value of Assets on June 30, 2021	\$ 1,714	\$ 1,714	N/A
Present Value of Fund	\$ 1,813	\$ 1,813	100.01%
Reserve / (Deficit) on June 30, 2021**	\$ 722	\$ 722	99.99%
Funded Ratio on June 30, 2021	166.1%	166.1%	99.99%

* Ratios of Milliman results to OSA results are based on unrounded figures provided by OSA

** OSA’s \$722M reserve is calculated from unrounded obligations and fund present values

GET provides OSA with a projection of the administrative expenses, net of fee revenue, for the program over the next 25 years. These are the only expenses included in the valuation. We used these in our replication and matched OSA’s present value of Administrative Expenses quite closely. We used our “Approach 2” methods to calculate the present value of tuition and the present value of monthly contract payments. Both of the present values match very closely.

We note that OSA provides an additional measure of funded status using a smoothed actuarial value of assets. This is a common technique used by public pension plans to smooth their actuarially determined contributions and/or reported funded status. Since GET’s asset portfolio is 60% fixed income, the expected return developed every year by WSIB should generally move up and down with bond yields. The value of the fixed income assets will move in the opposite direction. In other words, when bond yields increase, the value of the portfolio is likely to fall. But the expected return on the portfolio is likely to increase, which will reduce the present value of the calculated liability. This correlation will help to stabilize the funded status. We believe that the funded status measured using the market value of the assets is more relevant than that measured using a smoothed asset value.

OSA also provided several measures of sensitivity to their best estimate results. These included measures of the funded status under higher and lower tuition growth assumptions, higher and lower investment return assumptions, and a scenario where they assume that future tuition increases are limited each year to the average annual percentage change in the median hourly wage for Washington

over the previous 14 years. For this scenario, we used OSA's projection for future tuition increases. We closely matched OSA's results for all sensitivity measures.

We were pleased to see that OSA expanded their actuarial valuation report since we last reviewed it in 2015. They added more detail throughout the report including the asset reconciliation, the gain/loss analysis, the contract data, and the administrative expenses

Conclusion:

We believe that the measure of the benefit obligations, assets, and funded status of the GET program presented in the 2021 Actuarial Valuation Report are reasonable based on the data and assumptions used. We were able to replicate the results very closely without additional assistance from OSA. This further supports our belief that the report contains all of the information that we would expect in an actuarial valuation of this type.

5. 2021 Unit Price Setting Presentation

Price-Setting Analysis

OSA has greatly simplified the pricing process since our last review in 2015. Currently, the price is simply the weighted average (weighting based on the expected number of units to be sold to each age group) of the present values as of June 30, 2021 of projected tuition payouts, plus a fixed expense amount, plus an additional 15% to contribute to the reserve. There are no assumptions applied for contract refunds or cancellations and no contract-specific expenses.

Using this information we calculated the present value of expected unit redemptions, the present value of expenses, and the amount representing an additional 15% reserve. The following table compares our results to the values in OSA's report.

2021-2022 Unit Price Analysis

Per Unit:	<u>OSA</u>	<u>Milliman*</u>	Ratio of Milliman to OSA
Tuition and Fees	\$ 96.56	\$ 96.56	100%
Expenses	<u>3.03</u>	<u>3.03</u>	100%
Tuition and Fees + Expenses	\$ 99.59	\$ 99.59	100%
15% Reserve	<u>14.94</u>	<u>14.94</u>	100%
Total Price (Prior to Rounding)	\$ 114.53	\$ 114.53	100%
Total Price (Rounded Down)	\$ 114.00		
Final Adopted 2021-22 Price	\$ 114.01		

**The \$96.56 present value of the tuition and fees component to the price developed by Milliman assumes that money is received for a lump sum purchase 2.5 years before the first tuition payout for a contract with a 2-year holding period, 3.5 years before the first tuition payout for a contract with a 3-year holding period, etc.*

Our understanding is that OSA's pricing analysis methodology specifically calls for rounding the calculated figure down to the nearest whole dollar amount. The \$114.01 final 2021-2022 price selected by the WA529 Committee equals the current unit payout value and is \$0.01 higher than the price after applying rounding under OSA's methodology.

The \$3.03 fixed expense component is developed by OSA by taking the present value of administrative fees from the previous year's actuarial valuation and dividing by the total units in force on that valuation date. Then they increase this per unit expense value by 4.75%, which is the investment return assumption. We think this is a reasonable approach to adding an expense charge to the unit price. It would make a little more sense to us to increase the previous year's per unit expense by the inflation assumption built into GET's expense projection instead of a year of interest.

As shown in the footnote, we are assuming that money is received for a lump sum purchase 2.5 years before the first tuition payout for a 2-year holding period contract. This appears to be the timing approach that OSA is using in its calculation methodology. Since the enrollment period runs from November 1 through as late as June 24, it may be the case that the OSA methodology's 2.5 years assumption is modestly longer than the average actual timing of a contract. In other words, the present value of tuition component could be increased with additional partial-year interest to reflect an average later purchase date.

OSA's pricing presentation also provided a risk analysis looking at the impact of three adverse scenarios on a single tuition payment due in 15 years: 1% higher tuition growth every year; 1% lower investment return every year; and the combination of the two. They show the projected value after 15 years of the assets and the tuition payout for a single unit (with the 15% reserve but without the expense component). They also show the projected funded status for the GET program as of June 30, 2021 if the tuition and investment return assumptions were changed to match the adverse scenarios. We closely matched the results for these risk analyses.

OSA might consider performing a risk analysis where they develop projections of the funded status of the GET program for each of the next 15 (or more) years that reflect new unit sales every year (an "open group" projection) to help gauge the reasonableness of the 15% reserve component in the pricing. We understand that this is a more complex and time-consuming approach.

Finally, OSA's approach to identifying the \$96.56 weighted tuition and fees level calculates a present value as of the June 30, 2021 actuarial valuation date. This is a reasonable approach, particularly in light of the addition of the 15% reserve contribution in the overall pricing methodology. When the next review of the overall pricing structure is performed, an alternative approach OSA could consider incorporating into its methodology is to calculate the present value as of a later date. The rationale for that approach is that the majority of lump sum payments for new contracts are received by GET in the latter half of the academic year following the valuation date.

Conclusion:

We believe that the \$114.53 initial unit price developed in 2021 was reasonable based on the assumptions used. Adopting \$114.01 as the final 2021-22 unit price implies a reserve component of 14.5%, instead of 15.0%.

6. Other Review Items

There were no other review items.

7. Suggested Improvements / Enhancements

In addition to our comments and recommendations highlighted throughout the report, we have the following suggested improvements:

- It would be helpful if in its future reporting that OSA provides additional detail regarding their assumptions as to the timing of tuition payouts. For example, is it assumed that all tuition payouts within a fiscal year (July 1 through June 30) occur at mid-year? Or is it assumed that tuition payouts occur in the fall and again in the spring? If so, on what average dates? When the report states that a half-year delay is applied to the tuition use start year, does that mean that the methodology assumes that 10% of the units will be redeemed in the spring of that year? Or does it mean that 10% of the units will be redeemed evenly throughout the fiscal year?
- We suggest that OSA disclose its calculation methodology for contracts with projected start years more than 22 years past the enrollment year and those with monthly payments scheduled to continue past the projected tuition use start year (as mentioned in the sample lives section).
- We present two potential report enhancements to consider below – one to the valuation report and another as part of the pricing analysis. These enhancements are not intended to replace the existing valuation and pricing processes and reports, but merely to supplement them. They are intended to provide additional information that we believe might help GET, OSA, and perhaps other stakeholders to better understand the funded status of the program and the contribution to the expected rate of return earned from purchasing a unit from each of the pricing components and the averaging process used to develop a single unit price for all contracts in a given enrollment window.

Actuarial Valuation – Potential Enhancement

In the table below, we show the results of a possible plan sensitivity exhibit that for illustration purposes replaces the 4.75% discount rate (equal to the 4.75% expected return on the asset portfolio) with the yield curve for high-quality corporate bonds as of June 30, 2021. Specifically, we used the published FTSE Pension Discount Curve for June 30, 2021. This is a set of spot rates (i.e., zero coupon rates) for maturities out to 30 years derived from AA-rated corporate bond prices on June 30, 2021. Each year's projected tuition payouts, expense payouts, and monthly contract payments are discounted at the yield curve's spot rate for that specific year.

Corporate defined benefit pension plans use these rates as a proxy for the yield on a portfolio of AA-rated bonds that would produce cash flows from coupon and principal payments that would exactly match the projected future benefit payments. Thus, with such a bond portfolio, the pension plan would theoretically be "immunized" from movements in bond prices in the future. So measured, the liability of the pension payments is equal to the market value of the bond portfolio. This typically higher measure of the pension liability is used for private-sector accounting disclosures.

There is generally a great deal of confusion about the meaning of a given funded status within the prepaid tuition and defined benefit pension worlds. In the case of GET, when OSA's valuation report states that the program has an actuarial reserve of \$722 million or that the funded ratio is 166%, this really means that on June 30, 2021, the program assets were worth \$722 million (or 66%) more than the amount of assets that OSA believes are needed to give GET a 50% chance of having enough money to pay all future projected obligations when due. It does NOT mean that GET has \$722 million more than needed to be 100% certain to be able to pay all obligations.

This approach of using the expected long-term return on a portfolio that includes higher-risk, return-seeking assets as the liability discount rate provides only one perspective in trying to determine how well funded the program really is. Of course, in the case of GET, the funded status is even more uncertain due to the difficulty with projecting future tuition levels.

Measuring the present value of obligations using the AA spot rate yield curve (or something similar) as that discount rate yield curve provides a good estimate of the amount of assets needed today to purchase a portfolio of high-quality fixed income securities that would be expected to provide all of the projected net payouts for all current contracts with units in force. In the middle column of the table we show the results of this approach based on the valuation assumptions for tuition growth (2.7% x 3 years, then 4.0%). The reserve drops to \$506 million, and the funded ratio drops to 138.3%.

What does this measure of the reserve mean? It means that GET can state that they are highly confident that as of June 30, 2021, it had \$506 million more than needed to cover tuition increases equal to 2.7% for the next 3 years and 4.0% every year thereafter.

Another possible use of this approach would be to apply it with a conservatively high projection of tuition growth (not the highest possible, but high by most measures). As an example (not a recommendation) we ran projected tuition payments using 6.0% tuition growth in all years, including the next 3 years. Under this measure, the reserve falls to about \$278 million with a funded ratio of about 118%. This measure means that GET can state that it is highly confident that as of June 30, 2021, it had \$278 million more than needed to cover tuition increases equal to 6.0% in all future years. Although we have not included

it here, it would be straightforward for OSA to use this approach to determine the maximum tuition growth rate that the program could currently endure (the tuition growth assumption that would drive the reserve to \$0) if all investments were in an immunizing portfolio.

	OSA GAVR	Immunization Portfolio Based on AA-Rated Corporate Spot Rates *	
		Current OSA Tuition Assumption	6% per Year Tuition Growth
Present Value of Unit Redemptions	\$1,062.0	\$1,285.2	\$1,514.5
Present Value of Administrative Expenses	30.0	36.6	36.6
Present Value of Total Obligations	\$1,092.0	\$1,321.8	\$1,551.1
Present Value of Monthly Contract Payments	\$99.0	\$113.8	\$113.8
Market Value of Assets on June 30, 2021	1,714.0	1,714.0	1,714.0
Total Program Assets	\$1,813.0	\$1,827.8	\$1,827.8
Reserve / (Deficit) on June 30, 2021	\$722.0	\$506.0	\$276.7
Funded Ratio on June 30, 2021	166.0%	138.3%	117.8%

* FTSE Pension Discount Curve as of June 30, 2021

Of course, GET and WSIB always have the option of moving to an immunized investment strategy. Such a strategy would likely include a mix of fixed income securities including U.S. Treasuries, high-quality corporate bonds, and asset-backed securities. A few other state prepaid tuition programs use this approach to immunize their projected tuition obligations.

Unit Price Setting – Potential Enhancement

In our work with other prepaid tuition plans, we frequently use internal rate of return (“IRR”) calculations to help program management determine whether a proposed unit or contract price is adequate but not excessive. The IRR represents a measure of the investment performance of a unit or contract over its lifetime and can be useful to compare to other investment options available to a potential contract holder. The IRR is the single annualized interest rate that equates the discounted present value of all contract payments with the discounted present value of all benefit payouts. The IRR can be thought of as the fixed interest rate earned on all payments from the time of the first payment until the last benefit payout has been disbursed under a contract.

During the pricing process, the best we can do is estimate prospective IRRs based on a given price and the expected tuition payouts projected to be made in the future. In other words, it is the expected investment yield on a lump sum purchase of a prepaid tuition unit. Monthly contract payments can be factored into an IRR calculation as well, but we have not done that in our analysis.

Using the same assumptions as applied by OSA in their pricing analysis, we show in the table below the present value of tuition (in blue) for each age group (holding period), the expected IRR for just the tuition component, the expected IRR for the tuition component plus the expense component, the expected IRR for the sum of the tuition, expense, and reserve components, and finally the expected IRR for the final \$114.01 unit price. At the bottom of the table, we show the weighted average of these values based on OSA’s new unit sales profile (the number of units expected to be purchased by each age group (or holding period)).

The first column shows the present value of tuition per unit for each of the holding periods. The weighted average is the \$95.56 shown in OSA’s report. It is interesting to see the “slope” of the price curve for this component of the price. Because the short-holding-period contracts will be paid out sooner, they don’t benefit from many years of projected investment returns exceeding projected tuition growth (based on the assumptions). So, the present value of tuition for those contracts is greater than \$96.56. The units with the longest holding periods have a present value of tuition below the \$96.56 average. If GET charged each holding period its actuarial present value, the tuition component of price would range from under \$92 to \$104. The observed slope is also impacted by the two-tiered tuition growth assumption.

The next column shows the expected IRR for each holding period for just the \$96.56 tuition component of the unit price. It shows the extent to which the averaging of the present values produces higher IRRs for the shorter holding periods at the expense of lower IRRs for the longer holding periods.

Holding Period	PV of Tuition per Unit	Estimated IRR for Each Price Component				State of Washington Municipal Bonds Yield to Worst on Equivalent Holding Period	
		Unit Price Components				June 30, 2021	April 1, 2022
		PV Tuition \$96.56	+ PV Expense \$99.59	+ 15% Reserve \$114.53	Round down \$114.01		
2	\$104.00	6.67%	5.97%	2.90%	2.99%	0.43%	2.01%
3	103.12	6.18%	5.60%	3.06%	3.15%	0.56%	2.06%
4	102.38	5.85%	5.36%	3.20%	3.27%	0.67%	2.08%
5	101.65	5.61%	5.19%	3.30%	3.37%	0.76%	2.13%
6	100.92	5.42%	5.05%	3.38%	3.44%	0.88%	2.19%
7	100.20	5.27%	4.94%	3.45%	3.50%	0.99%	2.25%
8	99.48	5.16%	4.85%	3.50%	3.54%	1.05%	2.31%
9	98.77	5.06%	4.78%	3.54%	3.58%	1.12%	2.37%
10	98.06	4.97%	4.72%	3.58%	3.61%	1.16%	2.39%
11	97.36	4.90%	4.67%	3.61%	3.64%	1.22%	2.44%
12	96.66	4.84%	4.62%	3.63%	3.67%	1.26%	2.47%
13	95.97	4.79%	4.58%	3.66%	3.69%	1.31%	2.50%
14	95.28	4.74%	4.55%	3.68%	3.71%	1.35%	2.54%
15	94.60	4.70%	4.52%	3.70%	3.72%	1.36%	2.55%
16	93.92	4.66%	4.49%	3.71%	3.74%	1.39%	2.57%
17	93.25	4.63%	4.46%	3.73%	3.75%	1.42%	2.60%
18	92.58	4.60%	4.44%	3.74%	3.76%	1.44%	2.61%
19	91.92	4.57%	4.42%	3.75%	3.77%	1.47%	2.63%
Weighted	\$96.56	4.94%	4.69%	3.59%	3.63%	1.21%	2.44%
Change in IRR			-0.25%	-1.10%	0.04%		

Note: The IRRs assume that units are purchased with a lump sum and tuition payments are received every 6 months starting 2.5 years later for the 2-year holding period contract, 3.5 years later for the 3-year holding period, etc.

Adding \$3.03 to each unit to cover administrative expenses partially flattens out the price slope. It reduces the IRR for the short holding periods significantly while having a lesser impact on the long holding periods. Interestingly, the average impact on IRR across all units is 0.25%. This suggests that GET is charging administrative expenses equal to 25 basis points per year, on average, which is on par with many other investment products.

Adding \$14.94 (15%) for the reserve component has a significant impact on all IRRs but is most pronounced for the short-holding-period contracts. On average, it is reducing expected IRRs by 1.10% but the range of effects on IRRs varies from 3.08% to 0.67%.

Finally, adopting a unit price of \$114.01 improved the average IRR by 0.04%.

The last two columns of the table show the yield (yield to worst) on general obligation municipal bonds for durations equivalent to each GET contract's holding period issued by the State of Washington as

reported by Bloomberg. The first column shows the yields on June 30, 2021, while the second column shows yields on April 1, 2022. As an example, the yield shown in the row for a GET contract holding period of 3 years is for State of Washington securities that mature in 5 years. The municipal bond used for comparison is two years longer than the GET contract since the typical GET contract on average pays out benefits approximately two years after the end of the holding period.

We are not aware of another investment that provides a similar benefit to a prepaid tuition contract, but state municipal bonds have two important features that make them a helpful benchmark for prepaid tuition investments. First, they are guaranteed by the state (as GET contracts are in Washington). Second, the holder does not owe federal tax on the earnings (same as all 529 products including GET units). The major difference between a GET unit and a Washington municipal bond of the same maturity is that the payments received under the GET contract are indexed to the highest public university tuition in Washington whereas the payments from the municipal bond are fixed and known with certainty (although the bonds can be called early). The payments under the GET contract may be higher than anticipated by the purchaser or lower, depending on the path of tuition.

Comparing the expected IRRs for a GET unit with the corresponding yields on municipal bonds of the same maturity could provide a useful measure to assess the level of pricing. If the expected IRR for the GET unit is higher than the corresponding bond yield, then GET might argue that the price is not excessive, because the purchaser is getting a competitive market yield with the added benefit of the tuition guarantee. On the other hand, if the expected IRR on the GET unit is substantially below the bond yield (or the yield on one or more other relevant investment choices), then perhaps the WA529 Committee could consider lowering the price.

Note in the table that yields on municipal bonds increased significantly from June 30, 2021 to April 1, 2022. Also note that the expected IRR at the \$114.01 unit price is a little more than 1% higher than the April 1, 2022 bond yield for each holding period. Looking at how this spread changes from year to year could help the Committee to offer similar value from year to year.

The graph below shows some of the information provided in the table above, with a focus on the projected IRR using 2021 actuarial valuation assumptions for two different lump sum unit prices: \$96.56, which is weighted (across all holding periods) present value of only tuition and fees, and \$114.01, which was the final price. Yields for State of Washington municipal bonds over periods equivalent to the holding periods of the respective GET contracts are also shown. The IRRs for 11-year holding period GET contracts and equivalent State of Washington bonds are highlighted. This was done since contracts with 11-year holding periods are representative of system-average contracts.

As can be seen, under the 2021 valuation assumptions the uniform (as a dollar amount) addition of the expense and reserving load to the lump sum price causes the projected IRR for GET contracts (blue line) to take a parallel shape to the yields of equivalent State of Washington Bonds (green lines).

