

# ALASKA RETIREMENT MANAGEMENT BOARD

JANUARY 11,  
2019

## BOARD OF TRUSTEES MEETING

ALASKA STATE MUSEUM  
LECTURE HALL  
395 WHITTIER STREET  
JUNEAU, AK  
(907) 465-2901

TELECONFERENCE: 1-800-315-6338

ACCESS CODE: 12762#

## FRIDAY, JANUARY 11, 2019

- I. 2:00 pm Call to Order
- II. Roll Call
- III. Public Meeting Notice
- IV. Approval of Agenda
- V. Public/Member Participation, Communications, and Appearances  
(Three Minute Limit)
- VII. 2:10 Reports
  - 1. Committee Reports
    - A. Actuarial Committee, *Kris Erchinger, Chair*
  - 2. 2014-2018 Experience Study  
*Kris Erchinger, Chair, Actuarial Committee*  
  
Action: Relating to Acceptance of Experience Study  
Actuarial Assumptions  
Resolution 2018-19
- IX. Unfinished Business
- X. New Business
- XI. Other Matters to Properly Come Before the Board
- XII. Public/Member Comments
- XIII. Investment Advisory Council Comments
- XIV. Trustee Comments
- XV. Future Agenda Items
- XVI. Adjournment

*NOTE: Times are approximate and every attempt will be made to stay on schedule; however, adjustments may be made.*

# State of Alaska

## PERS, TRS, NGNMRS and JRS

### Retirement Systems

ACTUARIAL REVIEW OF THE JUNE 30, 2017  
EXPERIENCE STUDY





November 20, 2018

Mr. Bob Mitchell  
Chief Investment Officer  
State of Alaska  
333 Willoughby, 11<sup>th</sup> Floor  
Juneau, AK 99801

**Subject: Actuarial Review of June 30, 2017 Experience Study Conducted by Buck**

Dear Bob:

We have performed an actuarial review of the June 30, 2017 Experience Study for the State of Alaska PERS, TRS, NGNMRS, and JRS performed by Buck.

This report includes a review of:

- demographic assumptions and related recommendations;
- economic assumptions and related recommendations;
- post-retirement Healthcare assumptions and related recommendations;
- actuarial methods and related recommendations.

The results of the experience study become the basis for the assumptions used in determining contribution rates. Assumptions that are either too conservative or too aggressive could lead to future resource pressures that do not support the policies of the stakeholders. This review examines the recommendations and provides commentary with the perspective of maintaining the most appropriate set of assumptions that lead to a reasonable contribution rate. Although we have a few areas of professional disagreement, we have found the experience study to be generally consistent with the Actuarial Standards of Practice.

A major part of the review is a review of the experience data and the conclusions drawn from the data. In addition, we have conducted this review while keeping in mind the Actuarial Standards of Practice which all actuaries must follow. The Actuarial Standards of Practice that are applicable to this experience study include No. 4 (Measuring Pension Obligations and Determining Pension Plan Costs or Contributions), No. 6 (Measuring Retiree Group Benefit Obligations), No. 27 (Selection of Economic Assumptions for Measuring Pension Obligations), and No. 35 (Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations).

Sincerely,

Gabriel, Roeder, Smith & Company

A handwritten signature in black ink that reads "Leslie L. Thompson".

Leslie L. Thompson, FSA, FCA, EA, MAAA  
Senior Consultant

A handwritten signature in black ink that reads "Paul Wood".

Paul Wood, ASA, FCA, MAAA  
Consultant

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## **SECTION 1**

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### **EXECUTIVE SUMMARY**

# Executive Summary

Gabriel, Roeder, Smith & Co. (GRS) was engaged by the Alaska Retirement Management Board to conduct a review of the June 30, 2017 experience study performed by Buck for PERS, TRS, NGNMRS and JRS.

Although we have some areas of difference in professional judgement, we have found Buck's actuarial work is reasonable, appropriate, and accurate, as well as following generally accepted actuarial principles and practices. We also found that the experience study was reasonable and in compliance with Actuarial Standards of Practice. In summary, we found the overall set of recommendations for assumptions to be reasonable, with the following comments:

- Buck did not make a recommendation for the investment return assumption. Thus, we cannot provide comments on a Buck recommendation for that assumption.
- We have provided comments based on what we have seen relative to the investment return assumption. We do not purport to take the place of the retained actuary in making a recommendation; but rather, we provide a level of oversight for the recommendation on the investment return assumption.

This scope of this review is to review the work of Buck to the degree necessary for GRS to express opinions regarding the accuracy and/or reasonableness of the following:

- Demographic and economic assumptions;
- Proper application of the funding and asset smoothing method.

In the course of the review, GRS conducted a complete review of all data, but not a duplication of experience study data compilations.

The outstanding items which were not mentioned in the Buck experience study but which require consideration include:

- Dual Coverage Assumption for the retiree medical elections;
- Relative value between DCR and DB healthcare plans;
- DCR plan .2% per year decrease in costs;
- EGWP assumption on perpetual subsidy;
- Population growth assumption (for the roll forward contribution requirement and for the projections).

## **SECTION 2**

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### **ECONOMIC ASSUMPTIONS**



# Economic Assumptions

## General

These assumptions simulate the impact of economic forces on the amounts and values of future benefits. Key economic assumptions are the assumed rate of inflation, the assumed rate of investment return and assumed rates of future salary increases and total payroll growth.

## Inflation Assumption

The current inflation assumption is 3.12%. Buck recommends lowering the inflation assumption to a rate between 2.50% and 3.00%. We concur with lowering this assumption. Our work in this area has led us to recommend to our clients an inflation assumption no higher than 2.50%. While Buck does not reference other measures in their experience study report, we have reported that the Social Security Administration (another long-term retirement plan) has set their expectation for inflation at 2.60%. Further, in a closed plan we recommend considering long-term rates that are no longer than a 20-year horizon (rather than a more typical 30-year period). The model used by Buck estimates that under approach #1 (reversion to higher economic conditions that existed in the past), the 20-year inflation assumptions to be 2.86% and under approach #2 the 20-year inflation assumptions to be 2.56%. This would further cause us to lean closer to 2.50% for a recommended inflation rate assumption.

## Investment Return Assumption

The current assumption is 8.00%. Buck states that “we believe the current investment return assumption of 8.00% could be maintained. However, the ARMB may decide to adopt something less than 8.00% to reflect a margin for adverse deviation.”

Maintaining the 8.00% return assumption with the 2.50% to 3.00% recommended inflation assumption implies an assumption for the real return of 5.00% to 5.50%. We have found that these real returns, coupled with higher inflation, to be outside the bounds for representing a reasonable rate for our clients. We recommend a real return assumption in the range of 4.50% to 5.00% depending on their own specific asset allocation.

Approach #1 for GEMS and Building Block both indicate that very high real rates of return are achievable. However, the underlying assumption for approach #1 implies an overwhelmingly positive economic forecast which the models with which we work do not predict. Approach #2, which Buck has explained represents a “new normal”, shows expected real returns (for 20 years) at 4.48% to 4.51%. Applying those rates of return with Buck’s recommendation of inflation at 2.50% to 3.00% produces an assumption for investment returns of approximately 7.00% to 7.50%.

Buck presents 10, 20, and 20 year expected returns under various approaches and models. This information can be used to calculate implied expected rates of return for years one through ten, eleven through twenty, and twenty-one through thirty. The table below shows the implied return expectations.

<b>Implied Returns Based on Buck's Analysis</b>				
	<b>Approach #1</b>		<b>Approach #2</b>	
	<b>GEMS</b>	<b>Building Block</b>	<b>GEMS</b>	<b>Building Block</b>
Rates of Return for Years One Through Ten	7.59%	7.28%	5.85%	5.71%
Rates of Return for Years Eleven Through Twenty	9.44%	8.42%	7.46%	7.15%
Rates of Return for Years Twenty-One Through Thirty	9.71%	9.27%	7.64%	7.85%
Ten Year Average	7.59%	7.28%	5.85%	5.71%
Twenty Year Average	8.51%	7.85%	6.65%	6.43%
Thirty Year Average	8.91%	8.32%	6.98%	6.90%

If you look at the GEMS – Approach #1, the implied return for the first ten years is 7.59%, the implied return for the next ten years is 9.44%, and the implied return for the ten years after that is 9.71%. These implied returns, along with the results under Building Block – Approach #1, are much higher than most, if not all, investment consultants are anticipating. We believe this is further evidence that an 8.0% rate of return assumption cannot be supported.

Setting this assumption too high results in a tremendous amount of contribution risk down the road. The benefits promised must be paid through a combination of contributions and investment income. If actual returns going forward are much lower than anticipated, contributions rates will most certainly rise putting benefit security and plan sustainability at risk.

Basing a recommendation on the Buck data, the Buck models and accounting for the fact that these plans are closed produces a range for recommendation of 7.00% to 7.50%. We do not concur with Buck that the 8.00% could be maintained. It would appear, based on the Buck model, that the 8.00% could be maintained only if one believes in the underlying economic prosperity of Approach #1.

**Salary Increase Assumption**

In actuarial models, assumed rates of pay increase are often constructed as the total of several components:

Base salary increases -- base pay increases that include price inflation and general “standard of living” or productivity increases.

An allowance for Merit, Promotion, and Longevity – This portion of the assumption is not related to inflation. In the context of a typical pay grid, pay levels are set out for various employment grades with step increases for longevity:

The base salary increase assumption reflects overall growth in the entire grid, and the Merit, Promotion, and Longevity pay increase assumption reflects movement of members through the grid, both step increases and promotional increases.

The current Base Salary Increase Assumption (also known as the wage inflation assumption) is 3.62%. The 3.62% is comprised of 3.12% for general inflation and 0.50% for productivity increases. Buck recommends a wage inflation assumption that is 0.25% above the inflation assumption. We concur with this recommendation.

As described above, the Merit, Promotion, and Longevity pay increase assumption represents pay increases due to movement through the pay grid. This is based on longevity and job performance. In most models, it is recognized that step increases and promotions are very rare late in careers. Thus, this allowance should trail away from relatively high levels for young or short service members to virtually nothing late in careers. We would expect that, as members approach retirement, this component would fade away. We concur that the new assumptions appear to be reasonable.

### **Payroll Increase Assumption**

The current payroll growth assumption is 3.62%. This is intended to represent the growth in annual payroll for the total population of the DB and DCR members. This rate is used to spread the cost of paying off the unfunded accrued liability over future payrolls. In practice that means the higher the payroll growth assumption the lower the first year amortization payment, because that amortization payment is assumed to grow as payroll grows. A zero percent payroll growth assumption will mean the amortization payment will not grow, because payroll is not growing. This is commonly referred to as level dollar amortization.

The current payroll growth assumption of 3.62% is comprised of 3.12% for general inflation plus 0.50%. Buck recommends changing the payroll growth assumption to be inflation plus 25 basis points. We concur with that recommendation. This implies that a 2.50% inflation assumption would lead to a 2.75% payroll growth assumption.

### **Population Growth Assumption**

Although a population growth assumption is not used in the actuarial valuation, it is used in the projections and in the determination of the contribution rate. The “roll forward “ procedure that was developed a few years ago to eliminate the lag in the rate increases makes an assumption about the growth in the population. In recent discussions the question was raised about the population growth being used and whether a separate one ought to be used for the roll forward, since the roll forward is a prediction of a shorter and “better known” period of time. Population growth is very important especially in times of a contracting workforce. If there is an expectation that the workforce may be contracting, it may be worthwhile to include a provision that addresses this issue. Buck has not addressed the population growth assumption in their experience study.

## **Summary**

For the slate of economic assumptions Buck has presented two alternative scenarios:

<b>Buck Suggestions</b>	<b>Assumed Investment Return</b>	<b>Assumed Inflation Assumption</b>	<b>Assumed growth in total payroll</b>
Current	<b>8.00%</b>	<b>3.12%</b>	<b>3.62%</b>
Approach #1	<b>7.75%</b>	<b>2.75%</b>	<b>3.00%</b>
Approach #2	<b>7.50%</b>	<b>2.50%</b>	<b>2.75%</b>

Buck has indicated their belief that all these scenarios would be reasonable. We do not concur. When accounting for the closed nature of the plans (a shorter horizon) and the data supplied on capital market expectations we do not believe the current set of assumptions is reasonable.

## **SECTION 3**

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### **DEMOGRAPHIC ASSUMPTIONS**

# Demographic Assumptions

## **Healthy mortality during active service and after termination**

We concur with the recommendation to move to RP-2014 tables with MP 2017 generational improvement (and with the various credibility adjustments).

## **Disabled mortality**

We concur with the recommendations to move to the RP 2014 disabled table with MP 2017 generational improvement (and with the various credibility adjustments).

## **Withdrawal from service before retirement (termination)**

We were originally concerned because Buck's annual gain/loss by source in the valuation had consistent losses. This would have implied that more termination liability was being generated than expected and we expected the assumptions to be changed in a way to accommodate this experience. However, Buck explained that their annual gain/loss by source for this category also included retirement. There is still an open issue of covering the losses for these "deferred" retirees (retirees who have left employment, but not applied for benefits). Thus we concur with this recommendation on the assumption.

We do question why Buck is raising the rates of termination for teachers at older ages.

## **Retirement**

The proposed rates look reasonable based on the data presented in the experience study report.

## **Disability**

The proposed rates look reasonable based on the data presented in the experience study report.

## **Withdrawal of contributions at termination**

The proposed rates look reasonable based on the data presented in the experience study report.

## **OTHER DEMOGRAPHIC ASSUMPTIONS**

### **Marriage**

We concur with the assumption recommendation. Buck is going to change the name of this assumption from marriage rates to "spousal coverage election rates". This assumption is impacted by dual coverages. We understand that initially Buck was going to alter the marriage assumption to account for dual coverage but that upon reflection they have decided against that approach.

### **Age difference between husbands and wives**

We concur with the recommendation.

### **Number of dependent children**

We concur with the recommendation.

### **Alaska residency for COLA**

We concur with the recommendation.

**Number of Unused Sick Days (TRS only)**

We concur with the recommendation.

**Part-time service earned during the year**

We concur with the recommendation.

**Occupational vs Non-occupational death and disability**

We concur with the recommendation.

**Rehires**

We concur with the recommendation.

## **SECTION 4**

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### **POST-RETIREMENT HEALTHCARE ASSUMPTIONS**



# Post-retirement Healthcare Assumptions

## **Healthcare Cost Trend Rates**

The proposed rates look reasonable based on the data presented in the experience study report. We were originally concerned over a statement that many “leave” the State when they retire, and we were concerned the 100% assumption may have been too high. Buck has indicated that the Aetna retiree census file showed 39% of the retirees participating in the plan do not have an address in Alaska. The current assumption is 100% of the participants who do not have to make a contribution will participate in the plan. Even though they have left Alaska, the data is indicating they are still participating, thus we concur with the 100% participation rate assumption for non-paying retirees. We concur with the recommendation on the other participation rates.

## **Morbidity (aging factors)**

The proposed rates look reasonable based on the data presented.

## **Participation Rates**

The proposed rates look reasonable based on the data presented.

## **HEALTHCARE ASSUMPTIONS NOT COVERED IN THE EXPERIENCE STUDY REPORT**

### **Dual coverage assumption**

This assumption is for estimating the number of retiree health care participants who are married to other retiree health care participants. In the power point presentations earlier this year Buck indicated they would assume 13% of retiring members would be dual participants (and not elect spousal coverage). In further clarification Buck indicated that they recommended a percent married assumption to be 10% lower than the current assumption, which is consistent with about 13% of the inactive population having dual coverage. They further stated that they did not want to alter this assumption on the pension side since the dual coverage issue does not affect pension liabilities. We recommend clarification on how the dual coverage assumption will be implemented.

### **Relative value between DCR and DB healthcare plans**

Buck makes an assumption that the DCR plan is less costly due to its underlying structure. The assumption is derived from Buck’s proprietary software. We concur with this approach.

### **DCR plan .2% per year decrease in costs**

We do not concur with this assumption. Historically there is no basis for this assumption. No basis was given in the valuation for this assumption.

### **Rx Drug Rebate**

In the PowerPoint presentations Buck reported that this assumption was based on a recent single year of data and we concur with the reasonableness of this assumption.

### **EGWP assumption**

We understand Alaska is expecting to move to an EGWP effective January 1, 2019. Buck had recommended waiting until they select an EGWP vendor and then obtain an updated estimate from that vendor. We concur with that approach. As for the method of valuing the EGWP subsidy, we feel Buck is not unreasonable in

their method of assuming the subsidy for EGWP will continue indefinitely. The law is unclear. However, we feel this should be mentioned that it is an assumption and has an inherent risk since if repealed the costs would immediately increase.

## SECTION 5

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### ACTUARIAL METHODS

# Actuarial Methods

## Funding Method

Buck proposes changing the method for developing costs for the post-retirement healthcare benefit be changed from a level dollar basis to a level percent of pay basis (I thought this was just for the normal cost-need to clarify). The basis for this proposal is to align these costs with the methods used for the accounting valuations performed under GASB 74 and GASB 75.

We do not find the proposed change unreasonable although we do not share the opinion that accounting and funding need to be in alignment. The valuations used to develop contribution rates now differ significantly from those used in accounting and alignment has lost much of its value. We do recommend the board be informed that this reduces the contribution requirements for the retiree health care plan.

## Asset Valuation Method

No change is recommended to the asset valuation method.

## Amortization Method

Buck is proposing changed to a “layered approach” for amortization. We concur with Buck that method be considered. We cannot comment on the legality of the approach, since the statutes state that the UAL should be amortized on a level percent of pay basis over a closed 25-year period.

## State of Alaska

### Summary of Current and Proposed Assumptions/Methods from 2017 Experience Study

Prepared by Buck for the December 12, 2018 Actuarial Committee Meeting

#### 1. Economic Assumptions

Assumption	Current	Proposed
Inflation Rate	3.12%	2.50% <sup>1</sup>
Real Rate of Return	4.88%	4.88% <sup>1</sup>
Investment Return <sup>2</sup>	8.00% net of all expenses	7.38% net of investment expenses
Payroll Growth Rate	Inflation + 50 bp (3.62%)	Inflation + 25 bp (2.75%)
Salary Increase Rates <sup>3</sup>	See Table 1	See Table 1
Trend Rates	See Table 2	See Table 2

#### 2. Demographic Assumptions

Assumption	Current	Proposed
Pre-Retirement Mortality - Healthy		
<ul style="list-style-type: none"> <li>• PERS and NGNMRS</li> </ul>	60% (male) and 65% (female) of post-termination healthy mortality rates	100% (male and female) of RP-2014 employee table with MP-2017 generational improvement
<ul style="list-style-type: none"> <li>• TRS and JRS</li> </ul>	68% (male) and 60% (female) of post-termination healthy mortality rates	100% (male and female) of RP-2014 white collar employee table with MP-2017 generational improvement
Post-Termination Mortality - Healthy		
<ul style="list-style-type: none"> <li>• PERS and NGNMRS</li> </ul>	96% of RP-2000, 2000 Base Year projected to 2018 with Scale BB	91% (male) and 96% (female) of RP-2014 healthy annuitant table with MP-2017 generational improvement
<ul style="list-style-type: none"> <li>• TRS and JRS</li> </ul>	94% (male) and 97% (female) of RP-2000, 2000 Base Year projected to 2018 with Scale BB, 3-yr setback for males and 4-yr setback for females	93% (male) and 90% (female) of RP-2014 white collar healthy annuitant table with MP-2017 generational improvement
Post-Retirement Mortality - Disabled	RP-2000 Disabled Retiree Table, 2000 Base Year projected to 2018 with Scale BB	RP-2014 disabled table with MP-2017 generational improvement
Retirement - Unreduced	See Table 3	See Table 3
Retirement - Reduced	See Table 4	See Table 4
Retirement – Deferred Vested	Earliest age eligible for unreduced retirement benefit	No change
Withdrawal - Select <sup>4</sup>	See Table 5	See Table 5
Withdrawal – Ultimate <sup>5</sup>	See Table 6	See Table 6
Disability <sup>5</sup>	See Table 7	See Table 7
Occupational-Related Death/Disability		
<ul style="list-style-type: none"> <li>• PERS</li> </ul>	50% (P/F), 70% (Others)	40% (P/F), 75% (Others)
<ul style="list-style-type: none"> <li>• TRS</li> </ul>	15%	No change

<sup>1</sup> Selected by the ARMB.

<sup>2</sup> For PERS, TRS and JRS. No change is being proposed to the 7% investment return net of investment expenses for NGNMRS.

<sup>3</sup> For PERS and TRS only. No changes are being proposed to the salary increase rates for JRS.

<sup>4</sup> For PERS DCR only. No changes are being proposed to the select withdrawal rates for all other plans.

<sup>5</sup> For PERS, TRS and NGNMRS. No changes are being proposed to the ultimate withdrawal rates for JRS.

Withdrawal of Contributions at Termination <sup>6</sup>		
• PERS	15% (P/F), 10% (Others)	10% (P/F), 5% (Others)
• TRS	5%	0%
Percent Covering Dependent Spouse at Retirement Without Dual Coverage <sup>7</sup>		
• PERS P/F	85% (male), 60% (female)	75% (male), 50% (female)
• PERS Others	75% (male), 70% (female)	65% (male), 60% (female)
• TRS	85% (male), 75% (female)	65% (male), 60% (female)
Age Difference	3 years older (male), 3 years younger (female)	No change (male), 2 years younger (female)
Alaska Residency		
• PERS P/F	65%	No change
• PERS Others	70%	No change
• TRS	60%	No change
Part-Time Service Earned During the Year		
• PERS P/F	1.00	No change
• PERS Others	0.65	0.75
• TRS	0.75	No change
Healthcare Participation - DB <sup>8</sup>		
• If System-Paid	100% when first eligible	No change
• If not System-Paid	10% when first eligible	20% when first eligible
Healthcare Participation - DCR	See Table 8	See Table 8
Healthcare Morbidity	See Table 9	See Table 9
Rehires <sup>9</sup>		
• Pension	14.23% (PERS), 18.49% (TRS)	18.77% (PERS), 15.57% (TRS)
• Healthcare	17.24% (PERS), 10.39% (TRS)	17.09% (PERS), 12.03% (TRS)
Number of Dependent Children <sup>8</sup>	Benefits valued only for members currently covering dependent children. Coverage for dependent children assumed through age 23 (for life if dependent child is disabled).	No change
Number of Unused Sick Days <sup>10</sup>	4.5 days for each year of service	No change
Active Population Growth <sup>11</sup>	0%	No change
Form of Payment <sup>12</sup>	100% elect lump sum (actives), 100% elect annuity (deferred vested)	70% of actives and deferred vested elect lump sum

<sup>6</sup> In all cases, the assumption is 100% if member is not vested at termination.

<sup>7</sup> Proposed assumption is set to include an allowance for future covered children. Applicable for healthcare benefits only (no change is being proposed for pension benefits).

<sup>8</sup> For PERS and TRS.

<sup>9</sup> For DB only. Percentages shown are loads to the Normal Cost.

<sup>10</sup> For TRS only.

<sup>11</sup> For PERS and TRS DB/DCR overall.

<sup>12</sup> For NGNMRS only.

### 3. Funding Methods

Method	Current	Proposed
Healthcare Normal Cost and Actuarial Accrued Liability	Level Dollar	Level % of Pay
Administrative Expenses <sup>13</sup>		
• PERS pension	None	4.9%
• PERS healthcare	None	7.9%
• TRS pension	None	5.1%
• TRS healthcare	None	10.0%
• PERS DCR ODD	None	0.5%
• PERS DCR RM	None	0.4%
• TRS DCR ODD	None	3.9%
• TRS DCR RM	None	1.5%
Unfunded Actuarial Accrued Liability (UAAL) Amortization Period <sup>14</sup>	25-year closed period established effective 6/30/14	For UAAL that exists on 6/30/18 prior to proposed assumptions/methods, no change to 25-year closed period that was established effective 6/30/14. For effects on UAAL at 6/30/18 due to proposed assumptions/methods, and all future years' changes in UAAL, separate 25-year closed periods. Level % of pay amortization is unchanged.

**Note:** The proposed change in UAAL amortization period can be made at any time. The change does not have to be made effective 6/30/18 in conjunction with the 2017 experience study.

<sup>13</sup> Percentages are loads to Normal Cost. The percentages shown above are different than the percentages shown in our 9/19/18 meeting materials for two reasons: (i) we are now using a more refined calculation versus an estimated approach used previously; and (ii) we have excluded ASO fees from the administrative expenses based on additional information provided to us since the 9/19/18 meeting. The percentages shown above are based on the average of administrative expenses paid from the trust in FY16 and FY17. For the 6/30/18 valuations, we will use the average of the amounts paid from the trust in FY17 and FY18.

<sup>14</sup> For PERS and TRS DB only. No changes are being proposed for all other plans.

**Note:** Tables 1 to 9 provide the detailed rates related only to the assumptions for which we are proposing changes based on the 2017 experience study.

**Table 1 – Salary Increase Rates (DB and DCR)**

Years of Service	PERS P/F		PERS Others		TRS	
	Current	Proposed	Current	Proposed	Current	Proposed
0	9.66%	7.75%	8.55%	6.75%	8.11%	6.75%
1	8.66%	7.25%	7.36%	6.25%	7.51%	6.25%
2	7.16%	6.75%	6.35%	5.75%	6.91%	5.75%
3	7.03%	6.25%	6.11%	5.25%	6.41%	5.25%
4	6.91%	5.75%	5.71%	4.75%	6.11%	4.75%
5	6.41%	5.25%	Age Based	4.25%	6.11%	4.25%
6	5.66%	4.75%	Age Based	3.75%	5.90%	3.75%
7	4.92%	4.25%	Age Based	3.65%	5.69%	3.65%
8	4.92%	3.75%	Age Based	3.55%	5.55%	3.55%
9	4.92%	3.65%	Age Based	3.45%	5.40%	3.45%
10	4.92%	3.55%	Age Based	3.35%	5.26%	3.35%
11	4.92%	3.45%	Age Based	3.25%	5.11%	3.25%
12	4.92%	3.35%	Age Based	3.15%	4.96%	3.15%
13	4.92%	3.25%	Age Based	3.05%	4.84%	3.05%
14	4.92%	3.15%	Age Based	2.95%	4.72%	2.95%
15	4.92%	3.05%	Age Based	2.85%	4.60%	2.85%
16	4.92%	2.95%	Age Based	2.75%	4.49%	2.75%
17	4.92%	2.85%	Age Based	2.75%	4.37%	2.75%
18	4.92%	2.75%	Age Based	2.75%	4.27%	2.75%
19	4.92%	2.75%	Age Based	2.75%	4.17%	2.75%
20+	4.92%	2.75%	Age Based	2.75%	4.07%*	2.75%

\* Current assumption for TRS is 3.97% at 21 years of service and 3.87% at 22+ years of service.



**Table 2 – Trend Rates**

**Current**

<b>Fiscal Year</b>	<b>Medical Pre-65</b>	<b>Medical Post-65</b>	<b>Prescription Drugs</b>	<b>RDS/EGWP</b>	<b>Retiree Contributions</b>
2018	8.0%	5.5%	9.0%	6.5%	8.0%
2019	7.5%	5.5%	8.5%	6.2%	7.6%
2020	7.0%	5.4%	8.0%	6.0%	7.2%
2021	6.5%	5.4%	7.5%	5.7%	6.8%
2022	6.3%	5.4%	7.1%	5.5%	6.5%
2023	6.1%	5.4%	6.8%	5.4%	6.3%
2024	5.9%	5.4%	6.4%	5.2%	6.0%
2025	5.8%	5.4%	6.1%	5.0%	5.9%
2026	5.6%	5.4%	5.7%	4.8%	5.6%
2027	5.4%	5.4%	5.4%	4.7%	5.4%
2028	5.4%	5.4%	5.4%	4.7%	5.4%
2029	5.4%	5.4%	5.4%	4.7%	5.4%
2030	5.4%	5.4%	5.4%	4.7%	5.4%
2031	5.4%	5.4%	5.4%	4.7%	5.4%
2032	5.4%	5.4%	5.4%	4.7%	5.4%
2033	5.4%	5.4%	5.4%	4.7%	5.4%
2034	5.4%	5.4%	5.4%	4.7%	5.4%
2035	5.4%	5.4%	5.4%	4.7%	5.4%
2036	5.4%	5.4%	5.4%	4.7%	5.4%
2037	5.4%	5.4%	5.4%	4.7%	5.4%
2038	5.4%	5.4%	5.4%	4.7%	5.4%
2039	5.4%	5.4%	5.4%	4.7%	5.4%
2040	5.4%	5.4%	5.4%	4.7%	5.4%
2041	5.2%	5.2%	5.2%	4.6%	5.2%
2042	5.1%	5.1%	5.1%	4.5%	5.1%
2043	5.0%	5.0%	5.0%	4.5%	5.0%
2044	4.8%	4.8%	4.8%	4.4%	4.8%
2045	4.7%	4.7%	4.7%	4.3%	4.7%
2046	4.5%	4.5%	4.5%	4.2%	4.5%
2047	4.4%	4.4%	4.4%	4.2%	4.4%
2048	4.3%	4.3%	4.3%	4.1%	4.3%
2049	4.1%	4.1%	4.1%	4.0%	4.1%
2050+	4.0%	4.0%	4.0%	4.0%	4.0%

**Table 2 – Trend Rates**

**Proposed**

<b>Fiscal Year</b>	<b>Medical Pre-65</b>	<b>Medical Post-65</b>	<b>Prescription Drugs/EGWP</b>	<b>RDS</b>	<b>Retiree Contributions</b>
2018	8.0%	5.5%	9.0%	4.7%	8.0%
2019	7.5%	5.5%	8.5%	4.7%	7.6%
2020	7.0%	5.4%	8.0%	4.7%	7.2%
2021	6.5%	5.4%	7.5%	4.6%	6.8%
2022	6.3%	5.4%	7.1%	4.6%	6.5%
2023	6.1%	5.4%	6.8%	4.6%	6.3%
2024	5.9%	5.4%	6.4%	4.6%	6.0%
2025	5.8%	5.4%	6.1%	4.6%	5.9%
2026	5.6%	5.4%	5.7%	4.6%	5.6%
2027	5.4%	5.4%	5.4%	4.5%	5.4%
2028	5.4%	5.4%	5.4%	4.5%	5.4%
2029	5.4%	5.4%	5.4%	4.5%	5.4%
2030	5.4%	5.4%	5.4%	4.5%	5.4%
2031	5.4%	5.4%	5.4%	4.5%	5.4%
2032	5.4%	5.4%	5.4%	4.5%	5.4%
2033	5.4%	5.4%	5.4%	4.5%	5.4%
2034	5.4%	5.4%	5.4%	4.5%	5.4%
2035	5.4%	5.4%	5.4%	4.5%	5.4%
2036	5.4%	5.4%	5.4%	4.5%	5.4%
2037	5.4%	5.4%	5.4%	4.5%	5.4%
2038	5.4%	5.4%	5.4%	4.5%	5.4%
2039	5.4%	5.4%	5.4%	4.5%	5.4%
2040	5.4%	5.4%	5.4%	4.5%	5.4%
2041	5.3%	5.3%	5.3%	4.5%	5.3%
2042	5.2%	5.2%	5.2%	4.5%	5.2%
2043	5.1%	5.1%	5.1%	4.5%	5.1%
2044	5.1%	5.1%	5.1%	4.5%	5.1%
2045	5.0%	5.0%	5.0%	4.5%	5.0%
2046	4.9%	4.9%	4.9%	4.5%	4.9%
2047	4.8%	4.8%	4.8%	4.5%	4.8%
2048	4.7%	4.7%	4.7%	4.5%	4.7%
2049	4.6%	4.6%	4.6%	4.5%	4.6%
2050+	4.5%	4.5%	4.5%	4.5%	4.5%

<b>Getzen Model Components of Ultimate Trend Rates</b>	<b>Current</b>	<b>Proposed</b>
Inflation	3.12%	2.50%
Real GDP	0.88% <sup>15</sup>	2.00%
Ultimate Trend Rate	4.00%	4.50%

<sup>15</sup> The real GDP growth rate of 0.88% has been used to set the ultimate trend rates since the 6/30/14 valuations.

**Table 3 – Retirement Rates (Unreduced)****PERS P/F**

<b>Age</b>	<b>Female</b>		<b>Male</b>	
	<b>Current</b>	<b>Proposed</b>	<b>Current</b>	<b>Proposed</b>
<47	0.060000	0.060000	0.080000	0.088000
47	0.150000	0.150000	0.080000	0.088000
48	0.150000	0.150000	0.130000	0.143000
49	0.150000	0.150000	0.130000	0.143000
50	0.150000	0.150000	0.150000	0.165000
51	0.150000	0.150000	0.150000	0.165000
52	0.150000	0.150000	0.185000	0.203500
53	0.150000	0.150000	0.185000	0.203500
54	0.250000	0.250000	0.185000	0.203500
55	0.200000	0.200000	0.250000	0.275000
56	0.150000	0.150000	0.250000	0.275000
57	0.150000	0.150000	0.250000	0.275000
58	0.150000	0.150000	0.250000	0.275000
59	0.150000	0.150000	0.250000	0.275000
60	0.250000	0.250000	0.300000	0.330000
61	0.200000	0.200000	0.250000	0.275000
62	0.300000	0.300000	0.250000	0.275000
63	0.500000	0.500000	0.250000	0.275000
64	0.500000	0.500000	0.200000	0.220000
65	0.500000	0.500000	0.200000	0.220000
66	0.500000	0.500000	0.250000	0.275000
67	0.500000	0.500000	0.500000	0.550000
68	0.500000	0.500000	0.500000	0.550000
69	0.500000	0.500000	0.500000	0.550000
70+	1.000000	1.000000	1.000000	1.000000

**Table 3 – Retirement Rates (Unreduced)**

**PERS Others**

Age	Female		Male	
	Current (rounded)	Proposed (rounded)	Current (rounded)	Proposed (rounded)
<50	0.10	0.11	0.10	0.11
50	0.35	0.39	0.30	0.33
51	0.35	0.39	0.33	0.36
52	0.35	0.39	0.33	0.36
53	0.35	0.39	0.33	0.36
54	0.35	0.39	0.35	0.38
55	0.30	0.33	0.30	0.33
56	0.20	0.22	0.20	0.22
57	0.18	0.20	0.20	0.22
58	0.18	0.20	0.20	0.22
59	0.18	0.20	0.20	0.22
60	0.21	0.23	0.20	0.22
61	0.20	0.22	0.20	0.22
62	0.20	0.22	0.20	0.22
63	0.20	0.22	0.20	0.22
64	0.20	0.22	0.20	0.22
65	0.26	0.29	0.23	0.25
66	0.26	0.29	0.25	0.28
67	0.22	0.24	0.20	0.22
68	0.22	0.24	0.23	0.25
69	0.22	0.24	0.25	0.28
70	0.22	0.24	0.25	0.28
71	0.22	0.24	0.25	0.28
72	0.25	0.28	0.25	0.28
73	0.25	0.28	0.25	0.28
74	0.35	0.39	0.25	0.28
75-79	0.50	0.55	0.50	0.55
80-89	0.50	1.00	0.50	1.00
90+	1.00	1.00	1.00	1.00

**Table 3 – Retirement Rates (Unreduced)****TRS**

<b>Age</b>	<b>Female</b>		<b>Male</b>	
	<b>Current</b>	<b>Proposed</b>	<b>Current</b>	<b>Proposed</b>
<45	0.03	0.03	0.03	0.03
45	0.05	0.05	0.05	0.05
46	0.08	0.08	0.05	0.05
47	0.08	0.08	0.05	0.05
48	0.08	0.08	0.05	0.05
49	0.08	0.08	0.05	0.05
50	0.13	0.14	0.05	0.05
51	0.12	0.13	0.08	0.08
52	0.12	0.13	0.15	0.15
53	0.13	0.14	0.15	0.15
54	0.14	0.15	0.15	0.15
55	0.16	0.17	0.20	0.20
56	0.16	0.17	0.17	0.17
57	0.16	0.17	0.15	0.15
58	0.16	0.17	0.20	0.20
59	0.22	0.23	0.20	0.20
60	0.22	0.23	0.25	0.25
61	0.22	0.23	0.18	0.18
62	0.20	0.21	0.18	0.18
63	0.20	0.21	0.18	0.18
64	0.25	0.26	0.18	0.18
65	0.20	0.21	0.30	0.30
66	0.20	0.21	0.25	0.25
67	0.20	0.21	0.25	0.25
68	0.25	0.26	0.25	0.25
69	0.25	0.26	0.35	0.35
70	0.25	0.26	0.30	0.30
71	0.35	0.37	0.30	0.30
72	0.35	0.37	0.30	0.30
73	0.35	0.37	0.30	0.30
74	0.35	0.37	0.30	0.30
75-79	0.50	0.50	0.50	0.50
80-84	0.50	1.00	0.50	1.00
85+	1.00	1.00	1.00	1.00

**Table 4 – Retirement Rates (Reduced)**

**PERS P/F**

Age	Female		Male	
	Current	Proposed	Current	Proposed
<50	N/A		N/A	
50	0.087041	0.050000	0.087041	0.050000
51	0.085580	0.070000	0.085580	0.050000
52	0.072383	0.070000	0.072383	0.070000
53	0.076688	0.070000	0.076688	0.070000
54	0.075561	0.350000	0.075561	0.070000
55	0.077429	0.080000	0.077429	0.070000
56	0.077106	0.080000	0.077106	0.070000
57	0.076730	0.080000	0.076730	0.070000
58	0.076820	0.080000	0.076820	0.070000
59	0.200000	0.200000	0.200000	0.200000
60+	N/A	N/A	N/A	N/A

**PERS Others**

Age	Female		Male	
	Current	Proposed	Current	Proposed
<50	N/A	N/A	N/A	N/A
50	0.06	0.08	0.04	0.06
51	0.06	0.08	0.04	0.06
52	0.08	0.08	0.06	0.09
53	0.08	0.08	0.06	0.09
54	0.14	0.15	0.14	0.20
55	0.06	0.06	0.05	0.06
56	0.06	0.06	0.05	0.06
57	0.06	0.06	0.05	0.06
58	0.06	0.06	0.05	0.06
59	0.16	0.20	0.14	0.15
60+	N/A	N/A	N/A	N/A

**TRS**

Age	Female		Male	
	Current	Proposed	Current	Proposed
<50	N/A	N/A	N/A	N/A
50	0.08	0.10	0.08	0.10
51	0.08	0.10	0.08	0.10
52	0.08	0.10	0.08	0.10
53	0.08	0.12	0.08	0.10
54	0.16	0.12	0.16	0.10
55	0.08	0.08	0.08	0.15
56	0.08	0.08	0.08	0.10
57	0.08	0.08	0.08	0.10
58	0.08	0.08	0.08	0.10
59	0.16	0.08	0.16	0.10
60+	N/A	N/A	N/A	N/A

**Table 4 – Retirement Rates (NGNMRS)**

<b>Age</b>	<b>Current</b>		<b>Proposed</b>	
	<b>Male</b>	<b>Female</b>	<b>Male</b>	<b>Female</b>
<51	10%	10%	13%	13%
51-52	10%	10%	13%	13%
53	12%	12%	15%	15%
54	15%	15%	20%	20%
55	20%	20%	25%	25%
56	25%	25%	35%	35%
57	30%	30%	40%	40%
58	35%	35%	45%	45%
59	40%	40%	50%	50%
60	45%	45%	55%	55%
61-64	50%	50%	60%	60%
65+	100%	100%	100%	100%

**Table 5 – Withdrawal Rates (Select)**

**PERS DCR P/F**

Years of Service	Female		Male	
	Current	Proposed (rounded)	Current	Proposed (rounded)
0	0.17	0.21	0.18	0.19
1	0.13	0.16	0.14	0.15
2	0.11	0.14	0.10	0.11
3	0.10	0.13	0.09	0.09
4	0.09	0.11	0.08	0.08

**PERS DCR Others**

Years of Service	Female		Male	
	Current	Proposed (rounded)	Current	Proposed (rounded)
0	0.27	0.28	0.23	0.24
1	0.21	0.22	0.20	0.21
2	0.17	0.18	0.16	0.17
3	0.14	0.14	0.13	0.13
4	0.18	0.12	0.09	0.09



**Table 6 – Withdrawal Rates (Ultimate)**

**PERS P/F (5 or more years of service)**

Age	Female		Male		Age	Female		Male	
	Current	Proposed	Current	Proposed		Current	Proposed	Current	Proposed
20	0.080000	0.068000	0.040894	0.047000	45	0.033802	0.032800	0.019012	0.018100
21	0.080000	0.068000	0.040894	0.047000	46	0.033527	0.032500	0.019506	0.018500
22	0.080000	0.068000	0.040894	0.047000	47	0.033251	0.032300	0.020000	0.019000
23	0.080000	0.068000	0.038801	0.044600	48	0.032862	0.031900	0.023333	0.022200
24	0.080000	0.068000	0.036708	0.042200	49	0.032474	0.031500	0.026667	0.025300
25	0.080000	0.068000	0.034616	0.039800	50	0.032085	0.064200	0.030000	0.031800
26	0.080000	0.068000	0.032523	0.037400	51	0.031581	0.063200	0.040000	0.042400
27	0.080000	0.068000	0.030430	0.035000	52	0.030941	0.061900	0.040000	0.042400
28	0.078000	0.066300	0.028877	0.033200	53	0.030201	0.060400	0.040000	0.042400
29	0.076000	0.064600	0.027324	0.031400	54	0.060402	0.030000	0.040000	0.042400
30	0.074000	0.062900	0.025771	0.029600	55	0.060402	0.020000	0.040000	0.030000
31	0.072000	0.061200	0.024218	0.027900	56	0.060402	0.020000	0.040000	0.030000
32	0.070000	0.059500	0.022665	0.026100	57	0.060402	0.020000	0.040000	0.030000
33	0.063077	0.053600	0.021722	0.025000	58	0.060402	0.020000	0.040000	0.030000
34	0.056154	0.047700	0.020779	0.023900	59	0.060402	0.020000	0.040000	0.030000
35	0.049231	0.041800	0.019836	0.022800	60	0.060402	0.020000	0.040000	0.030000
36	0.042308	0.036000	0.018893	0.021700	61	0.060402	0.020000	0.040000	0.030000
37	0.035385	0.030100	0.017950	0.020600	62	0.060402	0.020000	0.040000	0.030000
38	0.035234	0.029900	0.017866	0.020500	63	0.060402	0.020000	0.040000	0.030000
39	0.035082	0.029800	0.017782	0.020400	64	0.060402	0.020000	0.040000	0.030000
40	0.034930	0.033900	0.017699	0.016800	65	0.060402	0.020000	0.040000	0.030000
41	0.034779	0.033700	0.017615	0.016700	65+	0.060402	0.020000	0.040000	0.030000
42	0.034627	0.033600	0.017531	0.016700					
43	0.034352	0.033300	0.018025	0.017100					
44	0.034077	0.033100	0.018519	0.017600					

**Table 6 – Withdrawal Rates (Ultimate)**

**PERS Others (5 or more years of service)**

Age	Female		Male		Age	Female		Male	
	Current	Proposed	Current	Proposed		Current	Proposed	Current	Proposed
20	0.136735	0.129900	0.095000	0.114000	45	0.045685	0.048000	0.039880	0.043900
21	0.136735	0.129900	0.095000	0.114000	46	0.043828	0.046000	0.039357	0.043300
22	0.136735	0.129900	0.095000	0.114000	47	0.041972	0.044100	0.038834	0.042700
23	0.128522	0.122100	0.090250	0.108500	48	0.041891	0.044000	0.038701	0.042600
24	0.120309	0.114300	0.085500	0.102600	49	0.041809	0.043900	0.038568	0.042400
25	0.112096	0.106500	0.080750	0.096900	50	0.041566	0.044500	0.038170	0.036300
26	0.103883	0.098700	0.076000	0.091200	51	0.041365	0.044300	0.037844	0.036000
27	0.095670	0.090900	0.071250	0.085500	52	0.041121	0.044000	0.037460	0.035600
28	0.091756	0.087200	0.069160	0.083000	53	0.040844	0.043700	0.037023	0.035200
29	0.087842	0.083400	0.067060	0.080500	54	0.057924	0.062000	0.043859	0.041700
30	0.083927	0.079700	0.064960	0.078000	55	0.057924	0.050000	0.043859	0.030000
31	0.080013	0.076000	0.062870	0.075400	56	0.057924	0.050000	0.043859	0.030000
32	0.076099	0.072300	0.060770	0.072900	57	0.057924	0.050000	0.043859	0.030000
33	0.072399	0.068800	0.058280	0.069900	58	0.057924	0.050000	0.043859	0.030000
34	0.068699	0.065300	0.055780	0.066900	59	0.057924	0.050000	0.043859	0.030000
35	0.064999	0.061700	0.053290	0.063900	60	0.057924	0.050000	0.043859	0.030000
36	0.061299	0.058200	0.050790	0.061000	61	0.057924	0.050000	0.043859	0.030000
37	0.057599	0.054700	0.048300	0.058000	62	0.057924	0.050000	0.043859	0.030000
38	0.056330	0.053500	0.046930	0.056300	63	0.057924	0.050000	0.043859	0.030000
39	0.055061	0.052300	0.045560	0.054700	64	0.057924	0.050000	0.043859	0.030000
40	0.053792	0.056500	0.044190	0.048600	65+	0.057924	0.050000	0.043859	0.030000
41	0.052523	0.055100	0.042820	0.047100					
42	0.051254	0.053800	0.041450	0.045600					
43	0.049398	0.051900	0.040930	0.045000					
44	0.047541	0.049900	0.040400	0.044400					

**Table 6 – Withdrawal Rates (Ultimate)**

**TRS (8 or more years of service)**

Age	Female		Male		Age	Female		Male	
	Current	Proposed	Current	Proposed		Current	Proposed	Current	Proposed
15	0.037185	0.038300	0.031209	0.026500	40	0.036224	0.027500	0.030159	0.022600
16	0.037157	0.038300	0.031170	0.026500	41	0.036155	0.027500	0.030085	0.022600
17	0.037138	0.038300	0.031138	0.026500	42	0.036086	0.027400	0.030010	0.022500
18	0.037129	0.038200	0.031107	0.026400	43	0.035976	0.027300	0.029866	0.022400
19	0.037120	0.038200	0.031091	0.026400	44	0.035867	0.027300	0.029721	0.022300
20	0.036848	0.038000	0.030847	0.026200	45	0.035757	0.027200	0.029577	0.022200
21	0.036848	0.038000	0.030831	0.026200	46	0.035648	0.027100	0.029432	0.022100
22	0.036839	0.037900	0.030799	0.026200	47	0.035538	0.027000	0.029288	0.022000
23	0.036839	0.037900	0.030776	0.026200	48	0.035380	0.026900	0.029046	0.021800
24	0.036830	0.037900	0.030736	0.026100	49	0.035221	0.026800	0.028805	0.021600
25	0.036830	0.037900	0.030705	0.026100	50	0.035063	0.044200	0.028563	0.034300
26	0.036820	0.037900	0.030673	0.026100	51	0.034847	0.043900	0.028248	0.033900
27	0.036762	0.037900	0.030642	0.026000	52	0.034595	0.043600	0.027878	0.033500
28	0.041480	0.042700	0.030610	0.026000	53	0.034296	0.043200	0.027468	0.033000
29	0.046198	0.047600	0.030579	0.026000	54	0.059961	0.075600	0.046305	0.030000
30	0.050917	0.052400	0.030555	0.026000	55	0.059285	0.050000	0.045414	0.020000
31	0.055635	0.057300	0.030540	0.026000	56	0.058410	0.050000	0.044334	0.020000
32	0.060353	0.062200	0.030516	0.025900	57	0.057288	0.050000	0.043012	0.020000
33	0.055569	0.057200	0.030500	0.025900	58	0.056018	0.050000	0.041567	0.020000
34	0.050784	0.052300	0.030455	0.025900	59	0.054401	0.050000	0.039826	0.020000
35	0.046000	0.047400	0.030431	0.025900	60	0.052569	0.050000	0.037868	0.020000
36	0.041215	0.042500	0.030407	0.025800	61	0.050523	0.050000	0.035694	0.020000
37	0.036431	0.037500	0.030383	0.025800	62	0.048197	0.050000	0.033170	0.020000
38	0.036362	0.037500	0.030308	0.025800	63	0.045540	0.050000	0.030294	0.020000
39	0.036293	0.037400	0.030234	0.025700	64	0.042653	0.050000	0.027176	0.020000
					65+	0.066000	0.050000	0.054000	0.020000

**Table 6 – Withdrawal Rates (Ultimate)**

**PERS DCR P/F (5 or more years of service)**

Age	Female		Male		Age	Female		Male	
	Current	Proposed	Current	Proposed		Current	Proposed	Current	Proposed
20	0.085500	0.119700	0.048000	0.055200	45	0.078800	0.110300	0.049678	0.057100
21	0.085500	0.119700	0.048000	0.055200	46	0.078400	0.109800	0.049061	0.056400
22	0.085500	0.119700	0.048000	0.055200	47	0.078000	0.109200	0.048444	0.055700
23	0.085500	0.119700	0.049120	0.056500	48	0.077400	0.108400	0.052256	0.060100
24	0.085500	0.119700	0.050240	0.057800	49	0.076800	0.107500	0.056067	0.064500
25	0.085500	0.119700	0.051360	0.059100	50	0.076200	0.106700	0.059878	0.068900
26	0.085500	0.119700	0.052480	0.060400	51	0.075600	0.105800	0.063689	0.073200
27	0.085500	0.119700	0.053600	0.061600	52	0.075000	0.105000	0.067500	0.077600
28	0.085275	0.119400	0.053528	0.061600	53	0.076154	0.106600	0.069300	0.079700
29	0.085050	0.119100	0.053456	0.061500	54	0.077308	0.108200	0.071100	0.081800
30	0.084825	0.118800	0.053384	0.061400	55	0.078462	0.109800	0.072900	0.083800
31	0.084600	0.118400	0.053312	0.061300	56	0.079615	0.111500	0.074700	0.085900
32	0.084375	0.118100	0.053239	0.061200	57	0.080769	0.113100	0.076500	0.088000
33	0.084214	0.117900	0.053119	0.061100	58	0.081923	0.114700	0.078480	0.090300
34	0.084054	0.117700	0.052998	0.060900	59	0.083077	0.116300	0.080460	0.092500
35	0.083893	0.117500	0.052878	0.060800	60	0.084231	0.117900	0.082440	0.094800
36	0.083732	0.117200	0.052757	0.060700	61	0.085385	0.119500	0.084420	0.097100
37	0.083571	0.117000	0.052636	0.060500	62	0.086538	0.121200	0.086400	0.099400
38	0.082857	0.116000	0.052415	0.060300	63	0.087692	0.122800	0.107600	0.123700
39	0.082143	0.115000	0.052194	0.060000	64	0.088846	0.124400	0.128800	0.148100
40	0.081429	0.114000	0.051972	0.059800	65+	0.090000	0.126000	0.150000	0.172500
41	0.080714	0.113000	0.051751	0.059500					
42	0.080000	0.112000	0.051529	0.059030					
43	0.079600	0.111400	0.050912	0.058500					
44	0.079200	0.110900	0.050295	0.057800					

**Table 6 – Withdrawal Rates (Ultimate)**

**PERS DCR Others (5 or more years of service)**

Age	Female		Male		Age	Female		Male	
	Current	Proposed	Current	Proposed		Current	Proposed	Current	Proposed
20	0.150000	0.165000	0.109667	0.137100	45	0.071847	0.079000	0.061728	0.077200
21	0.150000	0.165000	0.109667	0.137100	46	0.068938	0.075800	0.060789	0.076000
22	0.150000	0.165000	0.109667	0.137100	47	0.066029	0.072600	0.059850	0.074800
23	0.150067	0.165100	0.109674	0.137100	48	0.065749	0.072300	0.061414	0.076800
24	0.150133	0.165100	0.109681	0.137100	49	0.065469	0.072000	0.062977	0.078700
25	0.150200	0.165200	0.109689	0.137100	50	0.065189	0.071700	0.064541	0.080700
26	0.150267	0.165300	0.109696	0.137100	51	0.064908	0.071400	0.066104	0.082600
27	0.150333	0.165400	0.109703	0.137100	52	0.064628	0.071100	0.067668	0.084600
28	0.144910	0.159400	0.107312	0.134100	53	0.066022	0.072600	0.067714	0.084600
29	0.139486	0.153400	0.104921	0.131200	54	0.067416	0.074200	0.067760	0.084700
30	0.134062	0.147500	0.102529	0.128200	55	0.068809	0.075700	0.067806	0.084800
31	0.128638	0.141500	0.100138	0.125200	56	0.070203	0.077200	0.067853	0.084800
32	0.123214	0.135500	0.097747	0.122200	57	0.071597	0.078800	0.067899	0.084900
33	0.117230	0.129000	0.093219	0.116500	58	0.074069	0.081500	0.070131	0.087700
34	0.111246	0.122400	0.088692	0.110900	59	0.076541	0.084200	0.072363	0.090500
35	0.105261	0.115800	0.084164	0.105200	60	0.079014	0.086900	0.074595	0.093200
36	0.099277	0.109200	0.079637	0.099500	61	0.081486	0.089600	0.076827	0.096000
37	0.093293	0.102600	0.075110	0.093900	62	0.083958	0.092400	0.079059	0.098800
38	0.090749	0.099800	0.072996	0.091200	63	0.095528	0.105100	0.082239	0.102800
39	0.088205	0.097000	0.070883	0.088600	64	0.107097	0.117800	0.085420	0.106800
40	0.085661	0.094200	0.068770	0.086000	65+	0.118667	0.130500	0.088600	0.110800
41	0.083117	0.091400	0.066657	0.083200					
42	0.080573	0.094300	0.064544	0.080700					
43	0.077664	0.085400	0.063605	0.079500					
44	0.074756	0.082200	0.062667	0.078300					

**Table 6 – Withdrawal Rates (Ultimate)**

**TRS DCR (5 or more years of service)**

Age	Female		Male		Age	Female		Male	
	Current	Proposed	Current	Proposed		Current	Proposed	Current	Proposed
20	0.066811	0.083100	0.062959	0.094100	45	0.064754	0.080900	0.060332	0.090500
21	0.066811	0.083100	0.062959	0.094100	46	0.064544	0.080700	0.059957	0.089900
22	0.066811	0.083100	0.062959	0.094100	47	0.064333	0.080400	0.059583	0.089400
23	0.066773	0.083100	0.062903	0.094100	48	0.063975	0.080000	0.059053	0.088600
24	0.066735	0.083100	0.062847	0.094100	49	0.063617	0.079500	0.058522	0.087800
25	0.066697	0.083100	0.062791	0.094100	50	0.063259	0.079100	0.057992	0.087000
26	0.066659	0.083200	0.062735	0.094100	51	0.062901	0.078600	0.057461	0.086200
27	0.066621	0.083300	0.062679	0.094000	52	0.062543	0.078200	0.056931	0.085400
28	0.066583	0.083200	0.062623	0.093900	53	0.061818	0.077300	0.055800	0.083700
29	0.066544	0.083200	0.062567	0.093900	54	0.061093	0.076400	0.054670	0.082000
30	0.066506	0.083100	0.062512	0.093800	55	0.060367	0.075500	0.053539	0.080300
31	0.066467	0.083100	0.062456	0.093700	56	0.059642	0.074600	0.052409	0.078600
32	0.066429	0.083000	0.062400	0.093600	57	0.058917	0.073600	0.051278	0.076900
33	0.066351	0.082900	0.062360	0.093500	58	0.060021	0.075000	0.051711	0.077600
34	0.066273	0.082800	0.062320	0.093500	59	0.061125	0.076400	0.052144	0.078200
35	0.066194	0.082700	0.062280	0.093400	60	0.062230	0.077800	0.052578	0.078900
36	0.066116	0.082600	0.062240	0.093400	61	0.063334	0.079200	0.053011	0.079500
37	0.066038	0.082500	0.062200	0.093300	62	0.064438	0.080500	0.053444	0.080200
38	0.065908	0.082400	0.062051	0.093100	63	0.066292	0.082900	0.057296	0.085900
39	0.065777	0.082200	0.061902	0.092900	64	0.068146	0.085200	0.061148	0.091700
40	0.065647	0.082100	0.061753	0.092600	65+	0.070000	0.087500	0.065000	0.097500
41	0.065516	0.081900	0.061604	0.092400					
42	0.065386	0.081700	0.061455	0.092200					
43	0.065175	0.081500	0.061081	0.091600					
44	0.064965	0.081200	0.060706	0.091100					

**Table 6 – Withdrawal Rates (Ultimate)**

**NGNMRS**

Age	Female		Male		Age	Female		Male	
	Current	Proposed	Current	Proposed		Current	Proposed	Current	Proposed
22	0.089621	0.170300	0.089621	0.134400	45	0.053593	0.101800	0.053593	0.080400
23	0.085762	0.162900	0.085762	0.128600	46	0.051041	0.097000	0.051041	0.076600
24	0.082654	0.157000	0.082654	0.124000	47	0.047548	0.090300	0.047548	0.071300
25	0.080193	0.152400	0.080193	0.120300	48	0.043086	0.081900	0.043086	0.064600
26	0.078275	0.148700	0.078275	0.117400	49	0.037790	0.071800	0.037790	0.056700
27	0.076794	0.145900	0.076794	0.115200	50	0.032580	0.061900	0.032580	0.048900
28	0.075648	0.143700	0.075648	0.113500	51	0.028500	0.054200	0.028500	0.042700
29	0.074735	0.142000	0.074735	0.112100	52	0.025530	0.048500	0.025530	0.038300
30	0.073955	0.140500	0.073955	0.110900	53	0.023415	0.044500	0.023415	0.035100
31	0.073215	0.139100	0.073215	0.109800	54	0.021825	0.041500	0.021825	0.032700
32	0.072431	0.137600	0.072431	0.108600	55	0.020670	0.039300	0.020670	0.031000
33	0.071529	0.135900	0.071529	0.107300	56	0.020130	0.038200	0.020130	0.030200
34	0.070452	0.133900	0.070452	0.105700	57	0.020205	0.038400	0.020205	0.030300
35	0.069165	0.131400	0.069165	0.103700	58	0.020760	0.039400	0.020760	0.031100
36	0.067656	0.128500	0.067656	0.101500	59	0.021810	0.041400	0.021810	0.032700
37	0.065945	0.125300	0.065945	0.098900	60	0.021810	0.045000	0.021810	0.035000
38	0.064121	0.121800	0.064121	0.096200					
39	0.062309	0.118400	0.062309	0.093500					
40	0.060618	0.115200	0.060618	0.090900					
41	0.059132	0.112400	0.059132	0.088700					
42	0.057884	0.110000	0.057884	0.086800					
43	0.056726	0.107800	0.056726	0.085100					
44	0.055397	0.105300	0.055397	0.083100					

**Table 7 – Disability Rates**

**PERS P/F**

Age	Unisex Current	Male Proposed	Female Proposed	Age	Unisex Current	Male Proposed	Female Proposed
20	0.000224	0.000179	0.000112	40	0.001027	0.000822	0.000514
21	0.000224	0.000179	0.000112	41	0.001068	0.000854	0.000534
22	0.000224	0.000179	0.000112	42	0.001108	0.000887	0.000554
23	0.000305	0.000244	0.000153	43	0.001221	0.000977	0.000611
24	0.000387	0.000310	0.000194	44	0.001333	0.001066	0.000666
25	0.000468	0.000374	0.000234	45	0.001446	0.001157	0.000723
26	0.000550	0.000440	0.000275	46	0.001559	0.001247	0.000780
27	0.000631	0.000505	0.000316	47	0.001671	0.001337	0.000836
28	0.000658	0.000526	0.000329	48	0.001828	0.001462	0.000914
29	0.000685	0.000548	0.000342	49	0.001985	0.001588	0.000992
30	0.000712	0.000570	0.000356	50	0.002142	0.001714	0.001071
31	0.000739	0.000591	0.000369	51	0.002299	0.001839	0.001150
32	0.000765	0.000612	0.000383	52	0.002456	0.001965	0.001228
33	0.000793	0.000634	0.000396	53	0.002868	0.002294	0.001434
34	0.000821	0.000657	0.000410	54	0.003280	0.002624	0.001640
35	0.000849	0.000679	0.000425				
36	0.000877	0.000702	0.000439				
37	0.000905	0.000724	0.000452				
38	0.000946	0.000757	0.000473				
39	0.000986	0.000789	0.000493				

**PERS Others**

Age	Female		Male		Age	Female		Male	
	Current	Proposed	Current	Proposed		Current	Proposed	Current	Proposed
20	0.000188	0.000376	0.000218	0.000327	40	0.000381	0.000762	0.000489	0.000734
21	0.000188	0.000376	0.000218	0.000327	41	0.000397	0.000794	0.000510	0.000765
22	0.000188	0.000376	0.000218	0.000327	42	0.000413	0.000826	0.000531	0.000797
23	0.000200	0.000400	0.000240	0.000360	43	0.000454	0.000908	0.000586	0.000879
24	0.000212	0.000424	0.000261	0.000392	44	0.000495	0.000990	0.000641	0.000962
25	0.000224	0.000448	0.000283	0.000425	45	0.000536	0.001072	0.000695	0.001043
26	0.000236	0.000472	0.000304	0.000456	46	0.000577	0.001154	0.000750	0.001125
27	0.000248	0.000496	0.000326	0.000489	47	0.000618	0.001236	0.000805	0.001208
28	0.000255	0.000510	0.000334	0.000501	48	0.000680	0.001360	0.000886	0.001329
29	0.000262	0.000524	0.000342	0.000513	49	0.000742	0.001484	0.000967	0.001451
30	0.000269	0.000538	0.000349	0.000524	50	0.000804	0.001608	0.001048	0.001572
31	0.000277	0.000554	0.000357	0.000536	51	0.000867	0.001734	0.001129	0.001694
32	0.000284	0.000568	0.000365	0.000548	52	0.000929	0.001858	0.001210	0.001815
33	0.000293	0.000586	0.000377	0.000566	53	0.001084	0.002168	0.001421	0.002132
34	0.000303	0.000606	0.000389	0.000584	54	0.001239	0.002478	0.001633	0.002450
35	0.000312	0.000629	0.000401	0.000602					
36	0.000322	0.000644	0.000413	0.000620					
37	0.000331	0.000662	0.000425	0.000638					
38	0.000348	0.000696	0.000446	0.000669					
39	0.000364	0.000728	0.000467	0.000701					



**Table 7 – Disability Rates**

**TRS**

Age	Female		Male		Age	Female		Male	
	Current	Proposed	Current	Proposed		Current	Proposed	Current	Proposed
20	0.000560	0.000612	0.000560	0.000337	40	0.000703	0.000703	0.000703	0.000387
21	0.000563	0.000612	0.000563	0.000337	41	0.000718	0.000718	0.000718	0.000395
22	0.000565	0.000612	0.000565	0.000337	42	0.000733	0.000733	0.000733	0.000403
23	0.000574	0.000612	0.000574	0.000337	43	0.000770	0.000770	0.000770	0.000423
24	0.000583	0.000612	0.000583	0.000337	44	0.000806	0.000806	0.000806	0.000443
25	0.000593	0.000612	0.000593	0.000337	45	0.000843	0.000843	0.000843	0.000464
26	0.000602	0.000612	0.000602	0.000337	46	0.000879	0.000879	0.000879	0.000483
27	0.000611	0.000612	0.000611	0.000337	47	0.000916	0.000916	0.000916	0.000504
28	0.000611	0.000612	0.000611	0.000337	48	0.000975	0.000975	0.000975	0.000536
29	0.000612	0.000612	0.000612	0.000337	49	0.001034	0.001034	0.001034	0.000569
30	0.000612	0.000612	0.000612	0.000337	50	0.001093	0.001093	0.001093	0.000601
31	0.000613	0.000613	0.000613	0.000337	51	0.001152	0.001152	0.001152	0.000634
32	0.000613	0.000613	0.000613	0.000337	52	0.001211	0.001211	0.001211	0.000666
33	0.000622	0.000622	0.000622	0.000342	53	0.001356	0.001356	0.001356	0.000746
34	0.000631	0.000631	0.000631	0.000347	54	0.001501	0.001501	0.001501	0.000826
35	0.000641	0.000641	0.000641	0.000353					
36	0.000650	0.000650	0.000650	0.000357					
37	0.000659	0.000659	0.000659	0.000362					
38	0.000674	0.000674	0.000674	0.000371					
39	0.000689	0.000689	0.000689	0.000379					

**Table 8 – DCR Healthcare Participation Rates**

**If Retire Directly from Disability**

Age	Current	Proposed
<55	73.00%	75.0%
55	73.00%	75.0%
56	77.50%	77.5%
57	79.75%	80.0%
58	82.00%	82.5%
59	84.25%	85.0%
60	86.50%	87.5%
61	88.75%	90.0%
62	91.00%	92.5%
63	93.25%	95.0%
64	95.50%	97.5%
65+	94.40%	100.0%

**If Retire Directly from Employment (pre-age 65)**

Age	Current	Proposed*
55	40%	50%
56	50%	55%
57	55%	60%
58	60%	65%
59	65%	70%
60	70%	75%
61	75%	80%
62	80%	85%
63	85%	90%
64	90%	95%
65	N/A	100%

\* Proposed assumption is a combination of (i) the proposed service-based rates for retirement from employment at age 65+, and (ii) the proposed age-based rates for retirement from employment before age 65.

**If Retire Directly from Employment (age 65+)**

Years of Service	Current	Proposed
< 15	70.5%	75%
15-19	75.2%	80%
20-24	79.9%	85%
25-29	89.3%	90%
30+	94.0%	95%

**Table 9 – Healthcare Morbidity**

<b>Age</b>	<b>Current</b>		<b>Proposed</b>	
	<b>Medical</b>	<b>Prescription Drugs</b>	<b>Medical</b>	<b>Prescription Drugs</b>
< 45	2.0%	4.5%	2.0%	4.5%
45-54	2.5%	3.5%	2.5%	3.5%
55-64	3.5%	3.0%	2.5%	1.5%
65-74	4.0%	1.5%	3.0%	2.0%
75-84	1.5%	0.5%	2.0%	(0.5)%
85-94	0.5%	0.0%	0.3%	(2.5)%
95	0.5%	0.0%	0.0%	0.0%
96+	0.0%	0.0%	0.0%	0.0%

## **ALASKA RETIREMENT MANAGEMENT BOARD**

SUBJECT: Acceptance of Experience Analysis

ACTION:   X  

DATE: January 11, 2019

INFORMATION:           

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### BACKGROUND:

AS 37.10.220(a)(9) prescribes that the Alaska Retirement Management Board (Board) “review actuarial assumptions prepared and certified by a member of the American Academy of Actuaries and conduct experience analyses of the retirement systems not less than once every four years”.

In addition, under AS 37.10.220(a)(9), “the results of all actuarial assumptions prepared under this paragraph shall be reviewed and certified by a second member of the American Academy of Actuaries before presentation to the board”.

### STATUS:

Buck has completed the following experience analyses and the reports have been presented to the Board:

- (1) an experience analysis of the Public Employees’ Retirement System and Teachers’ Retirement System Defined Benefit Retirement Plans for the period July 1, 2013 to June 30, 2017;
- (2) an experience analysis of the Public Employees’ Retirement System and Teachers’ Retirement System Defined Contribution Retirement Plans for the period July 1, 2013 to June 30, 2017;
- (3) an experience analysis of the Judicial Retirement System for the period July 1, 2013 to June 30, 2017; and
- (4) an experience analysis of the National Guard and Naval Militia Retirement System for the period July 1, 2013 to June 30, 2017.

Gabriel Roeder Smith & Company (GRS), the Board’s actuary, has reviewed these experience analyses and has provided their report to the Board.

### RECOMMENDATION:

That the Alaska Retirement Management Board approves Resolution 2018-19, accepting the experience analyses prepared by Buck, as well as the assumption and method changes recommended therein, **and attached as Exhibit A, right hand column.**

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State of Alaska  
ALASKA RETIREMENT MANAGEMENT BOARD  
Relating to the actuarial experience analysis for the Public Employees' Retirement System,  
Teachers' Retirement System, Judicial Retirement System, and  
Alaska National Guard and Naval Militia Retirement System

Resolution 2018-19

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee to the assets of the State's retirement systems; and

WHEREAS, under AS 37.10.210-220, the Board is to establish and determine the investment objectives and policy for the funds of the Public Employees' Retirement System, Teachers' Retirement System, Judicial Retirement System, and Alaska National Guard and Naval Militia Retirement System; and

WHEREAS, AS 37.10.071 and AS 37.10.210-220 require the Board to apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the funds entrusted to it and treat beneficiaries thereof with impartiality; and

WHEREAS, AS 37.10.220(a)(8) requires the Board to coordinate with the retirement system administrator to conduct an annual actuarial valuation of each retirement system to determine system assets, accrued liabilities and funding ratios, and to certify to the appropriate budgetary authority of each employer in the system an appropriate contribution rate for normal costs and an appropriate contribution rate for liquidating any past service liability;

WHEREAS, AS 37.10.220(a)(9) requires the Board to conduct an experience analyses of the retirement systems not less than once every four years, except for health cost assumptions which shall be reviewed annually, and that the results of all actuarial assumptions prepared under this paragraph shall be reviewed and certified by a second actuary before presentation to the board;

NOW THEREFORE BE IT RESOLVED BY THE ALASKA RETIREMENT MANAGEMENT BOARD, that the Public Employees' Retirement System's, Teachers' Retirement System's, Judicial Retirement System's, and Alaska National Guard and Naval Militia Retirement System's Actuarial Experience Analysis as of June 30, 2017, as well as the assumption and method changes recommended therein, and attached as Exhibit A, right hand column, prepared by Buck be approved.

DATED in Juneau, Alaska this 11th day of January, 2019.

\_\_\_\_\_  
Chair

ATTEST:

\_\_\_\_\_  
Secretary

## ALASKA RETIREMENT MANAGEMENT BOARD 2019 Meeting Calendar

DATE	LOCATION	DESCRIPTION
February 11 Monday	Telephonic	Actuarial Committee
April 3 Wednesday	Juneau, AK	Actuarial Committee Audit Committee Defined Contribution Plan Committee
<b>April 4-5 Thursday-Friday</b>	<b>Juneau, AK</b>	<b>Board of Trustees Meeting:</b> <i>*Performance Measurement – 4<sup>th</sup> Quarter</i> <i>*Absolute Return Annual Plan</i> <i>*Conduent Draft Actuary Report/GRS Draft Actuary Certification</i> <i>*Capital Markets – Asset Allocation</i> <i>*Manager Presentations</i>
May 2 Thursday	Anchorage, AK or Telephonic	Actuarial Committee <i>*As necessary: follow-up/additional discussion/questions on valuations</i>
<b>May 3 Friday</b>	<b>Anchorage, AK</b>	<b>Board of Trustees Meeting</b> <i>*As necessary</i>
June 19 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Defined Contribution Plan Committee
<b>June 20-21 Thursday - Friday</b>	<b>Anchorage, AK</b>	<b>Board of Trustees Meeting:</b> <i>*Final Actuary Reports/Adopt Valuation</i> <i>*Adopt Asset Allocation</i> <i>*Review Private Equity Annual Plan</i> <i>*Performance Measurement - 1st Quarter</i> <i>*Manager Presentations</i>
September 18 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Defined Contribution Plan Committee Budget Committee
<b>September 19-20 Thursday - Friday</b>	<b>Anchorage, AK</b>	<b>Board of Trustees Meeting:</b> <i>*Set Contribution Rates</i> <i>*Audit Results/Assets – KPMG</i> <i>*Approve Budget</i> <i>*Performance Measurement – 2nd Quarter</i> <i>*Real Estate Annual Plan</i> <i>*Real Estate Evaluation – Townsend Group</i> <i>*Manager Presentations</i>
<b>November 7-8 Thurs.- Fri. (placeholder)</b>	<b>New York, NY</b>	<b>Board of Trustees Meeting: Investment Education Conference</b>
November 15 Friday (placeholder)	Telephonic	Audit Committee
December 11 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Defined Contribution Plan Committee
<b>December 12-13 Thursday-Friday</b>	<b>Anchorage, AK</b>	<b>Board of Trustees Meeting:</b> <i>*Audit Report - KPMG</i> <i>*Performance Measurement – 3rd Quarter</i> <i>*Manager Review (Questionnaire)</i> <i>*Private Equity Review</i> <i>*Manager Presentations</i>