ALASKA RETIREMENT MANAGEMENT BOARD

June 16-17, 2022

BOARD OF TRUSTEES MEETING

Alaska Retirement Management Board

Board of Trustees Meeting

Thursday, June 16, 2022

Call In (Audio Only): 1-907-202-7104	**Code:** 595 699 071#

I. **9:00 AM** **Call to Order**

II. **Roll Call**

III. **Public Meeting Notice**

IV. **Approval of Agenda**

V. **Public/Member Participation, Communications, and Appearances**
(Three Minute Limit)

VI.
A. Approval of Minutes – March 17-18, 2022
B. Approval of Minutes – May 4, 2022

VII. **9:15 AM** **Staff Reports**

A. Liaison Report
Alysia Jones, Board Liaison

Action: *ARMB 2023 Meeting Calendar*

B. Fund Financial Presentation
Ryan Kauzlarich, Assistant Comptroller, Division of Treasury
Kevin Worley, Chief Financial Officer, Division of Retirement & Benefits

C. Retirement & Benefits Division Report
1. Buck Consulting Invoices
2. Member Statistics
3. Legislative Summary
4. BEARS Project Update

Ajay Desai, Director, Division of Retirement & Benefits
Kevin Worley, Chief Financial Officer, Division of Retirement & Benefits
Kris Humbert, BEARS Project Manager, Division of Retirement & Benefits

D. Treasury Division Report
Pamela Leary, Director, Division of Treasury

E. CIO Report
Zachary Hanna, Chief Investment Officer

F. Legal Report
Ben Hofmeister, Assistant Attorney General, Dept of Law

VIII. **10:00 AM** **Trustee Reports**

A. Chair Report, *Bob Williams*

B. Committee Reports

1. Audit Committee, *Michael Williams, Chair*
2. DC Plan Committee, *Bob Williams, Chair*
3. Operations Committee, *Dennis Moen, Chair*
4. Actuarial Committee, *Allen Hippler, Chair*
5. Alaska Retiree Health Plan Advisory Board, *Lorne Bretz, ARMB Member*

BREAK @ 10:30 am (10 MINUTES)

IX. 10:40 AM Actuarial Action Items
Allen Hippler, Chair, Actuarial Committee

10:40 – 10: 55 **A. Certification of FY 2021 Review Reports & Valuations**

Action: *Board Acceptance of GRS Certification for FY2021 PERS, TRS, NGNMRS, JRS & DC Plan Evaluations*

Action: *Board Acceptance of Buck FY2021 Valuations for PERS, TRS, NGNMRS, JRS & DC Plan Valuations*

10: 55 – 11:05 **B. Acceptance of Experience Study for July 1, 2017 to June 30, 2021**

Action: *Adoption of New Assumptions*
(Effective beginning with 6/30/2022 Valuations)

11:05 – 11:15 **C. Acceptance of Actuarial Audit**

Action: *Acceptance of Actuarial Audit*

X. 11:15 AM Presentations

11:15 – 12:15 **A. Performance Measurement – 1st Quarter**
Paul Erlendson, Senior Vice President, Callan
Steve Center, Senior Vice President, Callan

LUNCH @ 12:15 pm (75 MINUTES)

1:30 – 2:15 **B. ARMB Domestic and International Equity**
Mark Moon, State Investment Officer
Michelle Prebula, State Investment Officer

Action: *Global Ex-US Manager Search*

2:15 – 2:50 **C. Opportunistic/Multi-Asset**
Shane Carson, State Investment Officer

2:50 – 3:25 **D. McKinley Healthcare Transformation**
Robert A. Gillam, CEO/CIO

BREAK @ 3:25 pm (15 MINUTES)

3:40 – 4:25 **E. Executive Session**

Friday, June 17, 2022

Call In (Audio Only): 1-907-202-7104	**Code:** 885 265 704#

9:00 – 9:50 **F. Private Credit Education and Implementation** *[EDUCATION SESSION]*
Pete Keliuotis, Executive Vice President, Callan
Catherine Beard, Senior Vice President, Callan

9:50 – 10:35 **G. Crestline**
Doug Bratton, Founding Partner, CEO and Co-CIO
Keith Williams, Managing Partner and Co-CIO

10:35 – 10:45 **H. Opportunistic/Multi-Asset Action Wrap-up and Action**
Shane Carson, State Investment Officer

Action: *Private Debt Manager Hire*

BREAK @ 10:45 am (15 MINUTES)

11:00 – 11:40 **I. ARMB 2022 Asset Allocation Strategy – Callan LLC**
Jay Kloepfer, Executive Vice President and Director, Capital Market Research

11:40 – 12:15 **J. Asset Allocation Discussion and Action**
Zachary Hanna, Chief Investment Officer

Action: *Resolution 2022-02 Asset Allocation for Public Employees' Retirement System (PERS) Defined Benefit and Defined Contribution Plans, Teacher's Retirement System (TRS) Defined Benefit and Defined Contribution Plans, and Judicial Retirement System (JRS) Defined Benefit Plan*

Action: *Resolution 2022-03 Asset Allocation for the Alaska National Guard and Naval Militia Retirement System (NGNMRS)*

XI.	**12:30 PM**	**Unfinished Business**
XII.		**New Business**
XIII.		**Other Matters to Properly Come Before the Board**
XIV.		**Public/Member Comments**
XV.		**Investment Advisory Council Comments**
XVI.		**Trustee Comments**
XVII.		**Future Agenda Items**
XIII.	**12:50 PM**	**Adjournment**

NOTE: Times are approximate, every attempt will be made to stay on schedule; however, adjustments may be made. All education sessions are shown in blue boxes.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
MEETING

Videoconference

MINUTES OF
March 17-18, 2022

Thursday, March 17, 2022

CALL TO ORDER

CHAIR BOB WILLIAMS called the videoconference of the Alaska Retirement Management Board (ARMB) to order at 9:00 a.m.

ROLL CALL

Nine ARMB trustees were present at roll call to form a quorum.

Board Members Present
Bob Williams, *Chair*
Lorne Bretz
Allen Hippler
Donald Krohn
Commissioner Lucinda Mahoney
Dennis Moen
Sandra Ryan
Michael Williams
Commissioner Paula Vrana

Board Members Absent
None

Investment Advisory Council Members Present
Dr. William Jennings
Dr. Jerrold Mitchell
Ruth Ryerson

Department of Revenue Staff Present
Zachary Hanna, Chief Investment Officer
Pamela Leary, Director, Treasury Division
Shane Carson, State Investment Officer

Victor Djajalie, State Investment Officer
Emily Howard, State Investment Officer
Joe Carrillo, Accountant IV
Casey Colton, State Investment Officer
Cyla Garcia, Accountant III
Benjamin Garrett, State Investment Officer
Scott Jones, Head of Investment Operations, Performance & Analytics
Ryan Kauzlarich, Accountant V
Alysia Jones, Board Liaison
Grant Ficek, Business Analyst
Sam Hobbs, Accountant V
Sean Howard, State Investment Officer
Tina Martin, Accountant IV
Mark Moon, State Investment Officer
Courtney Oliva, Accountant IV
Nick Orr, State Investment Officer
Stephanie Pham, State Investment Officer
Michelle Prebula, State Investment Officer
Hunter Romberg, Investment Data Analyst
Rose Sanchez, Compliance Officer

Department of Administration Staff Present
Ajay Desai, Director, Division of Retirement & Benefits
Kevin Worley, Chief Financial Officer, Division of Retirement & Benefits
Roberto Aceveda, Benefits and Counseling Manager
Emily Ricci, Health Care Policy Administrator, Division of Retirement & Benefits
Jim Puckett, Chief Pension Officer

ARMB Legal Counsel Present
Benjamin Hofmeister, Assistant Attorney General, Department of Law

Consultants, Invited Participants
Steve Center, Callan
Paul Erlendson, Callan
David Kershner, Buck
Scott Young, Buck
Paul Wood, Gabriel Roeder Smith
Bill Detweiler, Gabriel Roeder Smith
General David Petraeus, Chairman KKR Global Institute
Vance Serchuk, Executive Director KKR Global Institute
John Emerson, Vice-Chair, Capital Group International
Kelly McKale, Client Relationship Manager, Senior Vice-President, Capital Group
Michael Kelly, Managing Director, Head of Multi-Asset, PineBridge
Joy Booker, PineBridge
Jeffrey Moore, CFA, Fixed Income Portfolio Manager, Fidelity

Jordan Alexiev, Fidelity
Melissa Moesman, Fidelity

Others Present
Tabitha Neimann, Public
Ian Malowitz, Public
Mario Cacae, Public
Tony Laing (Recording), Public
Bob Schroeder, Public
Elaine Schroeder, Public
Jim Simard, Public
Tom Brice, Public

CHAIR WILLIMAS noted that two new board members were present, MS. SANDI RYAN and MR. MIKE WILLIAMS and asked them to introduce themselves. MS. RYAN explained that she was a 28-year educator in Fairbanks and MR. WILLIAMS said that he had worked for the Department of Revenue for 24 years.

PUBLIC MEETING NOTICE
Board Liaison ALYSIA JONES confirmed that public meeting notice requirements had been met.

APPROVAL OF AGENDA
MS. RYAN moved to approve the agenda. MR. KROHN seconded the motion.

With no objections, the agenda was approved.

PUBLIC/MEMBER PARTICIPATION, COMMUNICATIONS AND APPEARANCES
CHAIR WILLIAMS stated he had a list of seven people who had requested to testify. He then recognized MS. NEIMANN.

MS. NEIMANN introduced herself stating that she was with the United Food and Commercial Workers International Union. She informed the Board of the escalating labor dispute with Bob's Discount Furniture that is majority owned by Bain Capital Fund X which the Board invested $1.3 million, and the dispute could prove a risk to the investment. She noted that instead of working to a resolution regarding pending issues, Bob's had encouraged workers to decertify the union and had refused to settle contracts at two new unionized stores. She asked the trustees to determine if Bain was acting in their best interest and to urge Bain to resolve its labor issues, abandon its aggressive anti-union program and to work at solving delivery problems for its customers.

CHAIR WILLIAMS thanked MS. NEIMANN, and recognized MR. MALOWITZ.

MR. MALOWTIZ introduced himself stating that he worked for Bob's Discount Furniture in Poughkeepsie New York and was on the negotiation for USCW Local 888 and noted that he and his co-workers had voted to join the UFCW Local 888 and had been negotiating their first contract for almost six months. He explained how Bob's had been slowing the process and negotiating separate

contracts for the stores which costs money. He then explained their payroll structure and how their pay is dependent upon the furniture being delivered which had been taking three to four months and if a customer cancels, it affected their pay. He thanked the Board for their time and asked them to urge Bain to resolve the labor issue and abandon its anti-union campaign.

CHAIR WILLIAMS thanked MR. MALOWITZ and recognized MR. CACAE.

MR. CACAE introduced himself stating that he was a sales associate at Bob's Discount Furniture in Yonkers, New York and was represented by the USCW Local 888. He discussed the commission rate for sales and how the rate had not increased but had been lowered to five percent in the outlet stores and took the commission away entirely from the web orders. He explained how the sales were getting canceled due to lack of merchandise and delays on the delivery dates. He noted how they are pressured to push consumer credit cards and reprimanded in front of the customers for not pushing the store card. He said the morale in the stores is low due to the discipline issues and the payroll issues. He thanked the Board for their time.

CHAIR WILLIAMS thanked MR. CACAE and recognized the recorded testimony of MR. LANG.

MR. LANG appeared via a recorded audio. He introduced himself stating he was a sales associate at Bob's Discount Furniture in Glendale New York and shop steward for USCW Local 888. He explained the negotiating tactics of Bob's as aggressive with the goal of decertifying the union. He explained that for two years stores in Poughkeepsie and Paramus had voted to join the local but Bob's management along with the anti-union lawyers hired by the corporation had been dragging their feet and insisting on separate contracts for the stores. He noted that the cost of health coverage had increased 43 percent after a store had a certification election, in prior years, Bob's had covered insurance in full. He further explained the companies' various tactics to lure members away from the union. He then thanked the Board for their time.

CHAIR WILLIAMS thanked MR. LANG and recognized MR. SCHROEDER.

MR. SCHROEDER introduced himself stating that he was a member of 350 Juneau and explained the groups affiliation with other watchdog groups. He explained why fossil fuel investments were bad bets in a world that must transition to a carbon-free economy. He noted the effects of greenhouse gas emissions on the ecology and urged the ARMB to consider divesting from Fossil Fuel holdings and other investments that propped up the declining fossil fuel extractive industry. He thanked the Board for their time.

CHAIR WILLIAMS thanked MR. SCHROEDER and recognized MS. SCHROEDER.

MS. SCHROEDER explained that she would be reading a statement from Mr. Doug Woodby who was unable to attend. She said that MSCI and Russell FTSE indexes used by the ARMB were delisting Russian companies. She said the Board should examine the ethical and moral reasons to divest from fossil fuel companies. She noted his concern about the investments in coal at $400 million at the end of the last fiscal year and that the pension fund included 20 coal producers, such as China Shenhua Energy, China Coal Energy, and others. She asked the Board to take climate risk seriously and

decarbonize the investments to protect fossil fuels.

CHAIR WILLIAMS thanked MS. SCHROEDER and recognized MR. SIMARD.

MR. SIMARD introduced himself stating that he was a retired librarian and a board member of 350 Juneau. He reminded the Board of his previous testimony regarding ongoing court cases where U.S. cities were suing fossil fuel companies for damages caused by climate disruption. He explained the latest developments for Boulder County Colorado suing Sun Corp, Energy and ExxonMobil over flood and erosion damage from 2017 and the rejection of the Tenth U.S. Circuit Court of Appeals of the oil firms' attempt to move the case from state to federal court. He then noted a ruling for a case in Hawaii as the first climate disinformation case to move to the legal discovery phase where the companies would be forced to disclose internal company documents and correspondence. He encouraged the Board to assess the investment risks and to consider the impending legal actions against oil and gas companies.

CHAIR WILLIAMS thanked MR. SIMARD for his time.

APPROVAL OF MINUTES – December 2 – 3, 2021
MR. HIPPLER moved to approve the minutes of the December 2-3, 2021, meeting of the ARM Board. MR. KROHN seconded the motion.

With no objection, the motion was approved.

ELECTION OF SECRETARY
CHAIR WILLIAMS requested a motion for nomination of a new secretary. MR. HIPPLER nominated MR. WILLIAMS. MR. KROHN seconded the motion.

A roll call vote was taken, and the result was unanimous in favor of MR. WILLIAMS as the new secretary.

STAFF REPORTS

A. Retirement & Benefits Division Report
CHAIR WILLIMAS invited MR. WORLEY to speak.

MR. WORLEY noted the report, which was the summary of monthly billing for Buck, started on page 54 of the packet. He explained the quarterly reporting. He said the second report started on page 57 of the packet and was member statistics for the quarters ending September 30 and December 31, 2021, and said the specific data was shown on page 59. MR. WORLEY then invited MS. HUMBERT to speak.

MS. HUMBERT introduced herself and noted that several modules of the IT modernization project had been completed. She said they were currently working on the processing module and said the project was on time and on budget, and anticipated implementation in early December 2023.

MR. WORLY invited MR. DESAI to speak about the legislative update.

MR. DESAI directed their attention to page 64 of the packet which displayed the legislative update reports. He explained there were several bills they were watching on the pension side and a few on the health side, but the key bills they were watching closely was HB 51 and HB 220.

B. Treasury Division Report

CHAIR WILLIAMS invited MS. LEARY to present the Treasury Division Report.

MS. LEARY said that in the interest of time she would yield her time to staff reports.

C. Liaison Report

CHAIR WILLIMAS invited MS. JONES to present the Liaison Report.

MS. JONES noted the report began on page 67 of the packet. She said the report included the fourth quarter financial disclosure memorandum and noted no disclosure transactions required additional review or discussion.

MS. JONES explained the communications memorandum included communications directed to the board since the December meeting and public record requests received from November 16, 2020, through February 28, 2022.

MS. JONES noted the remaining 2022 meeting calendar was included in the packet along with a draft of the 2023 calendar. She said they were proposing moving out the late April meeting dates to early May and would follow up offline.

MS. JONES said the last item was the timeline for contract and review deadlines for FY22 through FY27. She noted that they were working with DRB to add the recordkeeper and auditor and welcomed feedback from the Board.

D. CIO Report

MR. HANNA stated that his report was going to be longer than usual due to the ARM Board's exposure to Russian investments as well as what was going on in the world markets.

MR. HANNA explained that prior to the invasion the markets were grappling with inflation and the immediate impact on energy and the commodity crises. He noted the CPI was the highest in 40 years ending 7.9 percent in February. He said the interest rates started to increase with a 25-basis point move and six more rate increases were expected this year.

MR. HANNA commented on the agenda, noting Callan's presentation on performance in the economy, commenting that the fourth quarter would probably be the last time where there would be a strong positive performance and noted Q1 had been a difficult quarter for global markets, both on bonds and stocks. He noted MR. SIKES would be moderating a discussion on the Russian/Ukrainian crisis with General David Petraeus and Vance Serchuk from KKR to discuss history and the military implications of the invasion. Then Fidelity will discuss the impact on bond and equity investments.

MR. HANNA noted three new additions they were recommending to the watch list. The first was Fidelity Signals due to turnover and the second was BlackRock Real Estate, also due to turnover. He explained that, due to poor performance, Brandes International Equity, both in the DB and DC portfolios, was also being recommended to the watch list. He then recommended a single motion to place the three entities on the watch list.

MR. WILLIAMS moved to adopt MR. HANNA'S recommendations to place Fidelity Signals, BlackRock Real Estate, and the Brandes International Equity Mandate on the ARMB watch list. MR. MOEN seconded the motion.

A roll call vote was taken, and the motion passed unanimously.
MR. HANNA noted that item 3 on his report were areas where he exercised CIO delegation for contracting. He explained item A was un update to the T. Rowe stable value contract provided by Mass Mutual and that item B was a 25-million-dollar private equity commitment to Battery Ventures XIV, explaining that they were a venture capital group specializing in technology investments across the globe.

MR. HANNA said item 4 was a summary of the portfolio rebalancing that took place between September and October. He said that during a rebalance, they buy things that have performed less well and sell things that performed well. He said in Q4, they sold 671 million in domestic equities and bought 412 million in fixed income, 218 million in international equity.

MR. HANNA then updated the board on Russian investments explaining that there were close to 1300 sanctions that were likely to have an impact on the Russian government and economy. He presented several slides and noted that Russian equities had decreased in value by 53 percent in February due to the crisis. He noted that the invasion began on February 24th and trading halted on the Moscow exchange a day later and as a result, there was no way to either sell or buy Russian equities on an exchange.

MR. HANNA explained that most major stock indices such as MSCI had already removed Russian securities from their holdings and as a result passive index funds were now holding Russian securities at a very low value. He said across the 43 billion in ARM Board assets as of January 31st, there was a low level of Russian exposure - .25 percent or $107 million. He said that with the 34-billion-dollar client benefit systems, they have Russian exposure of .28 percent, or 93.5 million. He noted that all of the ARM Board's international managers, except for Baillie Gifford had Russian equities. He said they were monitoring the situation closely and had been in close contact with their investment managers and have halted any new purchases of Russian securities.

MR. HANNA said with respect to the existing holdings, unless directed otherwise by the legislature or by the ARM Board, they planned to work with the investment managers to evaluate the valuations, risks, and other market conditions that prevail at the time that markets open before considering additional action.

MR. HIPPLER noted that it appeared the exposure was mostly through large international funds, then

asked if there was any exposure through private equity investments; MR. HANNA said there was no exposure.

CHAIR WILLIAMS noted that on January 31st investments were under 107 million and then asked if it was accurate that now it was not worth anywhere near 50 million; MR. HANNA said that was accurate.

MR. HANNA explained that they had directed Custodian Bank to mark the separate account holdings at zero. He noted that there were other managers who were using their independent pricing services to strike a value of the equities, but that it was all over the map and highly speculative.

MR. BRETZ asked if it was possible that it could repeat itself in any other conflict; MR. HANNA said that there had been discussions in the press about potential conflict with China; MR. BRETZ asked if they should take preventative action; MR. HANNA said that would be a good discussion to have.

E. Legal Report

MR. HOFMEISTER reported that House Bill 396 was currently in from of the House State Affairs committee and explained it was "An Act restricting certain investments of state funds in certain Russian entities and providing for an effective date".

MR. HOFMEISTER referred to Subsection H, which defined what Russian entities are. He also explained the Office of Foreign Assets Control (OFAC) list, which listed the different types of entities and individuals who the United States government does not transact with and recommends no transactions with other private entities.

MR. HOFMEISTER commented that the commingled fund investment part found in Subsection B of HB 396, was important. He explained that the subsection says that the fiduciary will submit letters to the managers of commingled investments requesting the managers to consider removing a Russian entity from any investment. He noted that there was also protection for the fiduciaries.

MR. HOFMEISTER announced that he had just received notice that the Governor introduced a bill (HB 401) and there was a corollary bill (SB 235). He said one of the key differences to HB 396 was that the governor's bill would not apply to ARMB or APFC.

MR. HIPPLER asked if any of the bills MR. HOFMEISTER referenced have a sunset clause or otherwise expire in the event of peace.

MS. LEARY responded, confirming HB 401 was out and the section expires on July 1, 2023. MR. HOFMEISTER said HB 396 expires January 1, 2024.

MR. HOFMEISTER then provided an update on the Metcalfe case. He said there was a four-month window to provide notice to former members that would be impacted by the Metcalfe decision and commented that MR. PUCKETT had been working with his office on the notification. He also mentioned that his office had been consulting with their tax counsel, Ice Miller, because returning

people from the DCR plan to the DB plan is going to be complicated.

MR. HOFMEISTER moved on to the Hughes case, which is a U.S. Supreme Court case dealing with self-directed brokerage accounts that came out in January 2022. He said the fiduciary duty described in the decision was important for this Board to keep in mind and that if, going forward, there were options that the ARMB was going to provide to its members, they needed to be conscious of the fact that there needs to be a certain level of vetting the options.
MR. HOFMEISTER then discussed two RPEA cases related to the diminishment clause. He said the parties ended up putting both cases into a mediation. He commented that the mediation and settlement was in large part due to Emily Ricci and her team. He also stated that the formation of the Retirement Health Advisory Board had come a long way in terms of reaching out to retirees and explaining how these changes affect them.

F. Fund Financial Presentation

MR. KAUZLARICH noted that on page 75 of the packet was the financials as of January 31st. He explained that the total plan assets for PERS was 24.8 billion, TRS was 11.6 billion, JRS was 292.6 million, MRS was 49.2 million SBS was 5 billion, deferred comp was 1.2 billion, total non-participant-directed plans were 9 billion and total assets were 42.9 billion. He said as of January 31st year-to-date income was 1.2 billion, the plans had experienced a net withdrawal of 587.9 million and internally managed assets were 17.1 billion. He also shared the figures as of March 15th explaining that they were a decrease. He said PERS assets were 23.9 billion, TRS assets were 11.1 billion, JRS assets were 281.3 million, NGNMRS assets were 47.1 million. He said the total assets were 41.4 billion and fiscal year-to-date investment income was negative 133.4 million, year-to-date withdrawals were 696.9 million and invested assets under internal management were 16.7 billion.

MR. WORLEY said the Division of Retirement and Benefits' report was on page 104 and it showed the seven months ending January 31.

TRUSTEE REPORTS

A. Chair Report

CHAIR WILLIAMS said that he had multiple meetings with MR. HANNA and individuals from Treasury and Administration discussing their agendas and lining up for the ARM Board meeting. He said he had met with Empower and discussed matters in front of the DC Committee meeting. He shared his appreciation for the two departing trustees, Mr. Rob Johnson and Ms. Gayle Harbo and noted a letter of appreciation that was being mailed out and then he read the letters into the record.

To Trustee Rob Johnson:

> *Dear Rob, thank you so much for your longstanding dedication and service to the Alaska Retirement Management Board as a trustee since 2016, and as counsel from 2005 through 2014. Your service includes counsel to our predecessor boards, the Alaska State Pension Investment Board from 1992 to 2005, and the Teacher Retirement System and Public Employee Retirement System Boards from 1982 to 2005.*

Your fellow trustees now and over the years have truly appreciated your devoted service, including years as Chair of the board and Chair of the Operations Committee. Your experience and institutional knowledge span 40 years of service. I hope you realize how you have been a great benefit to the beneficiaries of Alaska's public pension systems and the state and local governments bearing the obligations of the systems. The importance of your work simply cannot be overstated.

The trustees on the ARM Board, as well as the staff and affiliates of the board, wish you all the very best. You've been a wonderful colleague, mentor, guide, and friend. Thank you. Sincerely, Bob Williams Chair.

To Trustee Gayle Harbo:

Dear Gayle, thank you very much for your service as a trustee and as the Secretary for the Alaska Retirement Management Board since its inception in October 2005, and your service on the previous Alaska Teacher Retirement System Board since 1999.

In 1989, you were celebrated and recognized as the Alaska Teacher of the Year. Thank you for bringing the same skill and commitment to your board service. Your service has been critical to the board and the beneficiaries of the Alaska public pension systems.

Your fellow trustees have truly appreciated your dedicated service and rigorous professionalism. Each trustee you have served with has come away better educated and better informed from your thoughtful and insightful questions and comments at our board meetings. You've been a model trustee in terms of preparation, commitment, and thoughtfulness.

The trustees on the ARM Board as well as the staff and affiliates of the board wish you all the very best. You've been a wonderful colleague and friend. Thank you. Sincerely, Bob Williams, Chair.

B. Committee Reports

1. Audit Committee

CHAIR WILLIAMS explained that Trustee MIKE WILLIAMS had been appointed as Chair of the Audit Committee but was unable to attend and he had chaired the meeting on his behalf. He said the Audit Committee heard reports on employer audits from MR. WORLEY and MS. HELMICK and heard a report on delinquent and late-filing employers. He said two of them, including school districts were filing their reports on time for TRS but not for PERS for some of the delinquent accounts. He said MR. WORLEY reported on the material weakness on forward-looking actuarial assumptions and explained that there needed to be a review of assumptions to see if they applied to NGNMRS. He said MS. SANCHEZ presented the compliance report and noted one of the items was being in compliance with not having investments in Iran. He said MS. LEARY and MR. WORLEY gave a report on cost allocations.

2. DC Plan Committee

CHAIR WILLIAMS said they had a presentation by T. Rowe Price about the implementation of improvements to the target date funds. He thanked MR. HANNA and MS. PREBULA for the negotiations to make significant improvements to the target date funds. He said MR. WORLEY gave an update on member services and fees and there was also an update from Empower regarding the concerns about transparency of fees on the website when making adjustments to the options. He said MS. DAUBENSPECK also presented a demonstration of their website. He noted quality assurance issues had come up that revealed a glitch in the system and that it had been fixed. He said MR. HANNA and MS. PREBULA then gave an update of the self-directed brokerage accounts and a motion was passed stating the Committee recommends Alaska Retirement Management Board direct staff not to move forward with implementing a brokerage platform for members of the Alaska Supplemental Annuity Plan, the Defined Contribution Retirement Plans, and the Deferred Compensation Plan.

CHAIR WILLIAMS moved the motion on behalf of the DC Plan Committee.

MR. HIPPLER said that he thought the issue needed continued investigation and asked if the motion would prevent the item from coming up at a future Defined Contribution Committee meeting; CHAIR WILLIAMS said it could be discussed.

MR. BRETZ asked if there was a plan to inform the members of the result of the action; CHAIR WILLIAMS said there was a plan that it would be put on the website explaining that it would not be happening.
A roll call vote was taken, and the motion passed unanimously.

3. Actuarial Committee

MR. HIPPLER said they had reviewed the 2021 valuation results highlighting both assets and liability gains realized by the plans. He said they then discussed prescription-incurred claims and a spike of claims that occurred in March 2020 and again in March 2021 and how that might impact the plans going forward. He said they discussed valuation projections and sensitivity analysis with respect to healthcare plans. He said they also had an educational session on the 25-year-layered unfunded liability amortization methodology and how the plans, in order to mitigate the up-and-down nature and volatility of the funds, had a 25-year layering option so the funding would be more predictable to the State of Alaska and other payors into the system. He said they also discussed the hypothetical feature of approaching overfunding on the PERS system and the impact of layering at a future point. He said they heard a presentation from GRS who reviewed the actuarial findings and noted that Buck concurred with the findings and plans to conduct more research related to one of the findings. They also reviewed the assumptions for the experience study, including updated economic assumptions, inflation assumption and a real return assumption put together by Buck..

CHAIR WILLIAMS then announced that he appointed Trustee Bretz, Trustee Ryan and himself to the Proposal Evaluation Committee to review proposals received in response to RFP # 2022-0400-0015 ARMB Actuarial Review Services.

4. Operations Committee

MR. MOEN said there was an update on recruitment for the comptroller and that the deputy comptroller had been doing great. He said recruitment was still underway for two other vacancies. He said staff would be gathering quotes for transcribing and minutes preparation, with the intent to provide a summarized version as they have the full transcripts and board packet to refer back to. He said MR. JONES reported that they had successfully tested backup files and server restoration.

5. Alaska Retiree Health Plan Advisory Board

MR. BRETZ said that they spent most of the meeting going over past experience of the plan versus current experience, utilization and that a lot of time things were pretty consistent. He went on to say that things were changing as far as numbers they were utilizing but it was something that was monitored. He said they want to make sure that the prescribed drugs were being used to make the members healthy which means some pre-authorization would need to occur. He noted improvements to the website to make it more intuitive for the members to find what they were looking for.

MR. BRETZ noted that the Aetna network had grown by 444 providers which puts them up over 4,000 network providers in Alaska. He said the GCIT network benefits covers gene-based cellular and innovative therapies, but the therapies were so new that Aetna and most network providers had not established an agreed-upon price for the services. He said Alaska Care Plan currently had an individual lifetime maximum benefit of $2 million and prescription drugs do not apply to the lifetime maximum, but GCIT services would move the retiree plan members closer to exhausting their lifetime maximum.

MR. BRETZ said the Division would draft an administrative regulation to formalize the process to review proposed changes to the retiree health plans and the public would have at least 60 days to comment on any resulting proposed regulations.

CHAIR WILLIAMS recessed the meeting from 11:01 a.m. until 11:08 a.m.

PRESENTATIONS

A. Draft June 30, 2021, Actuarial Reports

CHAIR WILLIAMS invited MR. KERSHNER and MR. SCOTT from Buck to present.

MR. KERSHNER explained that they had two presentations, the first being the draft June 30, 2021 valuation reports. He reminded the Board that the valuation was a snapshot measurement of the assets and liabilities as of June 30, 2021. He briefly reviewed the table on page 2 of the summary pointing out the increase in the pension funded ratio based on valuation assets up to 68 percent from 64 percent due to the approximate 30 percent market return the funds experienced in FY 21. He said the fair value of assets jumped from 62 percent to over 77 percent. He noted that the healthcare trusts were overfunded due to the market return as well as liability gains. He then moved on to the next page to show the funded ratio history saying that they were more than 80 percent funded for the PERS which meant they were making the right progress based on the funding policy that the ARM Board had adopted.

MR. KERSHNER then presented the comparative summary of contribution rates, reminding the

Board the contribution rates would be adopted in September and would reflect the two-year period where they project results for contribution rates. Once they know what the FY 22 asset returns are, they would prepare the FY 24 contribution rates for the ARM Board to adopt in September. He said the preliminary results were shown on the chart, the pension contribution rate had decreased from 18.4 percent gain to 16 and a half percent and healthcare was down slightly, which was a minimal cost as healthcare plans were overfunded. He said the bottom line was that it was a favorable year on both the assets and the liability side which was why there was an increase in the funded ratios and decreased contribution rates.

MR. KERSHNER noted that at the bottom of the chart on the next page were the liability gains and losses. He said each time they collect new data, they compare what they expected the liabilities to be based on last year's valuation and then compare that to the new measurement based on the new data and any differences between those are the gains and losses.

MR. YOUNG explained that the largest component of the healthcare gain was the per capita claims cost, which had been the biggest piece of gain/loss for the last couple of years and would be the biggest for futures as well.

MR. YOUNG said the big factor that caused gains during the last two years was the implementation of EGWP and the new prescription drug contract with Optum which was smoothed in over time and was the main driver of the gains during the two previous valuations. He noted that medical costs, which are separate from the prescription, were within one percent of what was expected.

MR. YOUNG said that even a one percent change was a big dollar amount because the per capita cost effects every person for every year in the future. He noted that once the Optum change was fully phased in for the two prior years, the prescription drug average cost was within one percent.

MR. KERSHNER noted that the total pension gain of 161 million was approximately one percent of the PERS pension liability and most of that gain was due to the PRPA increases. He also noted that the story was similar for TRS as the assets were invested in similar allocations.

B. Experience Study

MR. KERSHNER explained that the experience study was required by statute at least every four years and it was intended to analyze the experience of the that last few years and compare it with the assumptions for those four years. He said that they also look at expectations for the next 20, 30 years and adjust the assumptions to best match what they expect the experience to be.

MR. KERSHNER said the study involved demographic assumptions which deal with behavior of the participants in regard to retirement, termination, as well as lifespan. The economic assumptions deal with expectations of what happens to the money and invested assets, participants' salary increases, etc. He said they take the participants pay they currently earn and project them to when they were expected to retire.

MR. KERSHNER said PERS was on slide 60 and item 4 was the funded ratio, the comparison of the

actuarial value of assets to the liabilities for 2020. He said the funded ratio for PERS was 79.3 percent and if the ARM Board adopts all proposed assumptions, the fund ratio would be projected to decrease to 78 percent.

MR. KERSHNER said for demographics, the most significant assumption was updating the mortality assumption which they were proposing to update to the recently published public sector-based mortality tables which have separate tables based on classification of employees. He noted TRS had the same information except that last year the funded ratio was 86.6 percent and had decreased to 84.3 percent.

C. Actuarial Review of June 30, 2021, Valuations

MR. WOOD explained that they validate Buck's results, review the assumptions and methods, review the development of per capita claims cost, review the report content to ensure proper disclosures are in the report, and then they also review the test life audit, to determine whether assumptions are being applied correctly and benefits are being valued properly.

MR. WOOD said Buck provided a PowerPoint presentation that showed the development of the per capita claims costs. He said based on the data in the presentation, there was favorable claims experience and the PCCC was found to be reasonable. He said they expected to see an increase in prescription drug at around five to seven percent, but there was a bit of a decrease resulting in an increase of 3.7 percent.

MR. WOOD said slide 5 showed five years of gains mostly due to the positive experience for medical claims. He noted that Buck included a four percent expense load in per capita claims cost to account for some COVID experience and they felt it was an appropriate load.

MR. WOOD said with three years of experience under the most recently adopted assumptions they could start to monitor any developing trends such as the new Medicare Part B assumption causing consistent gains and investment return expectations continuing a downward trend around the country.

MR. WOOD said for the test live review, they take a small sample of test lives that are valued as part of the valuation mode and look for data inputs, benefit amounts, and liability calculations. He said the sample lives tells them if the assumptions were correctly employed and if the plan provisions were valued correctly. He said that actuaries look to the Actuarial Standards of Practice noting that an item or a combination of related items would be material if its omission or misstatement could influence a decision of an intended user. He said if they found something in the valuation that would change the decision that the Board was making, then that would lead to being material.

MR. DETWEILER said they had five findings based on the test life reviews they had completed and walked through each of the findings. He noted that Buck agreed with four of the findings and updates would be made to the valuations. He said the fifth finding was still under review, but that none of them would impact the contribution rates that the Board would be adopting.

MR. WOOD discussed the summary of recommendations noting one that they wanted to point out – the new entrant, rehire assumption for the DCR plan. He said it had been incorporated on the DB

side but was not implemented with the DCR plan. He said they felt comfortable with Buck's conclusion that they were not going to include it because it would increase the normal cost for the DCR plans which were already well funded and would divert more money to these plan that did not need it.

D. Audit of State's Actuary

MR. WOOD reminded the Board that they had presented their initial findings at the December 2021 meeting. He said their opinion was that Buck valuation conclusions accurately portrayed the actual real state of the systems and reflected the required contribution rates. He commented that since then they had dug a little deeper and identified additional test lives to check for issues that could be incorporated into future valuations. They found six issues and provided the findings to Buck. He said that both Buck and GRS agreed the findings were immaterial and recommended they be included in the next valuation.

MR. HIPPLER asked if GRS had other clients who are considering their inflation assumptions at this time and what they are seeing. MR. WOOD said in the last four years a lot of their inflation assumptions had come down significantly and that every one of their clients is either at or below the two-and-a-half percent.

MR. HIPPLER then asked MR. WOOD what real rate of return they were seeing in the large plans. MR. WOOD indicated that most were in the neighborhood of 4.5, 4.75, which was in line with where they were at.

CHAIR WILLIAMS recessed the meeting from 12:00 p.m. until 1:30 p.m.

C. Performance Measurement – 4th Quarter

CHAIR WILLIAMS invited MR. ERLENDSON and MR. CENTER to present.

MR. ERLENDSON welcomed the new members and explained what Callan does and touched on the concerns of raising inflation and interest rates. He then presented slide 2, which showed the V-shaped recovery in equity up 119 percent from market bottom. He moved to slide 3 which showed stock market returns since 1801 and briefly discussed some of the influences. He then moved to slide 9 which showed contributors to recent inflation and monthly changes. He also explained that they were seeing changes in affiliations and trade patterns as a result from strategic partnerships with Iran and Venezuela. He said some of the trade alliances and the impact on global trade patterns would continue to be a challenge for managers and economies into the future.

MR. ERLENDSON moved to slide 14 which had the Callan periodic table of investment returns from June of 2012 to June of 2021. He then showed slide 26 which showed a graph of historical public fund asset allocation and rolling 10-year returns. He said the average 10-year return pre-March 2009 was +10.8 percent and post-March 2009 it had dropped to +6.4 percent with an average 10-year return of +9.3 percent.

MR. ERLENDSON said going forward there were several challenges - rising interest rates, which they think long-term would be healthy for the economy, rising inflation which they think would be

mitigated in the foreseeable future, greater uncertainty due to geopolitical challenges, and a greater focus on getting the strategic allocation and looking at in in terms of liquidity, risk mitigation and cost.

DR. MITCHELL asked if the volatilities of the different asset classes had changed much since 1985 to present; MR. ERLENDSON said they come and go. He noted that MR. CENTER's presentation had the total fund volatility numbers in the dashboard and said that he would forewarn MR. KLOEPFER of the question and to address it during his presentation.

MR. CENTER presented the PERS, TRS and JRS Performance Dashboard, the Health Care Plans Performance Dashboard, and the Military Dashboard. He reminded the Board that the dashboards were a one-stop shop for high-level information about the total plan performance. He noted that each one of the dashboards showed strong performance with returns above the benchmark and above the median over all time periods. He said that page 31 was a snapshot of the asset allocation of the calendar year end for PERS and said the other plans exhibit similar modest and understandable variations from strategic target allocations.

MR. CENTER moved to page 32 which showed asset class allocations were in line with targets after the asset allocation update and associated rebalancing and noted that weighting to real assets and alternatives were relatively high in comparison to other public funds.

MR. ERLENDSON explained the real assets column as a defensive play against inflation by having more allocated to real assets than the typical public pension fund.

MR. CENTER then presented page 33 which showed the performance was above the public funds' medians for the one-, three-, five-, and ten-year periods and despite the recent change to the asset allocation, longer-term performance reflected the Board's prior orientation toward capital growth as opposed to income generation. He then noted that page 34 showed the Sharpe Ratio Rankings and said the Board's risk-adjusted return was above the Public Funds median for the one-, three-, five-, and ten-year periods as well. He then moved to page 35 showing the maximum drawdown rankings. He said the drawdown experienced in the first quarter of 2020 was the largest of the last 10 years and the amount that was lost by the PERS plan was less than other peers during the same time period. He said the standard deviation rankings were on page 36 and showed the Board's portfolio diversification had resulted in volatility that was lower than median compared to peers and said it was primarily due to the higher allocation to the private plans.

MR. CENTER moved on to page 37 which showed the relative attribution effects for quarter ending December 31, 2021. He said the table helps explain what drove the performance for this time period. He explained that the columns labeled "Manager Effect" and "Asset Allocation" showed the measures of the key drivers of the performance for the plan. He said that over the last year the key driver of performance was the overall manager performance relative to their benchmarks.

MR. CENTER explained page 38 saying that each fund had two targets, the asset allocation policy return, and the actuarial return. He said the total fund returns continued to closely track the strategic allocation target.

MR. ERLENDSON commented that they had not only exceeded the actuarial rate but were also ahead of the passive benchmark.

MR. CENTER skipped ahead to page 42 to total domestic equity. He said it was ahead of its benchmark by about 70 basis points for the last 12 months and had outperformed its benchmark by about 1.6 percent. He said one of the key drivers for the factor-based strategies was value versus growth within the equity market.

MR. ERLENDSON said that through the previous evening, value in both margin small cap was 11 percentage points ahead of the growth equivalent which were all negative.

MR. CENTER explained that when the market goes down the value stocks tend to go down by less which could be a good sign for performance in the first quarter of 2022.

MR. CENTER then move up to page 44 noting that the overall domestic equity portfolio's market capitalization was smaller than 44 percent of public funds. He said the large cap portfolio was on page 45 and it was made up of a passive investment in S&P 900 index fund – 70 percent passive and 30 percent factor-based. He said the longer-term performance drag was on page 46. He said the large cap domestic equity returns outperformed the Russell 1000 index by 63bps in the fourth quarter of 2021.

MR. CENTER said pages 47 and 48 showed the small cap portfolio explaining that it was passively invested in the S&P 600 strategy which has shown a return premium over the Russell 2000 benchmark.

MR. CENTER explained page 49 as non-U.S. equity which included developing markets and emerging markets and said it lagged slightly last quarter by about 40 basis points but over all other time periods was ahead of its benchmark. He said the developed market on page 50 was ahead of the benchmark over all time periods, so a very strong performance, slightly below the median over the las ten years.

MR. CENTER jumped to page 50 to discuss emerging markets. He said that portfolio was invested in passively and emerging market strategies that were more factor-based, and those markets had done very well. He said the fixed income portfolio on page 54 had done very well and that it was focused more on Bloomberg Aggregate Index which made up 70 percent of the portfolio. He said some of the building blocks were listed on page 55 and noted that the internal aggregate portfolio had lagged the aggregate over the last year but was right in line with the benchmark. He commented that both the opportunistic fixed income and alternative fixed income were very additive over the last year.

MR. CENTER said the opportunistic income class on page 56, made up of alternative equity, tactical asset allocation strategies, and alternative beta investments was up 12.4 percent over last year. MR. CENTER then touched on the participant directed plans from total asset allocation and size standpoints.

MR. CENTER explained the color coding on what he referred to as their "stop light" pages. He said when an option or its index ranks above median, the cell is coded green. Yellow means it is falling in the third quartile relative to the peer group, and red means it is falling in the bottom quartile versus the peer group. He commented that all the funds were structured very well – they are low cost and overall, the target date funds have done extremely well for the participant-directed plans.

CHAIR WILLIAMS asked if a footnote might be warranted when looking at the target date funds to note when they are looking at five-year returns, seven-year returns, etc. MR. CENTER commented that T. Rowe Price was not alone in altering glide paths or adding new options and that their peers were doing similar things. He added that it was a good fit for what they had profiled they wanted to achieve.
DR. MITCHELL asked about the slight value tile for U.S. equities and whether that applies to international and emerging as well. MR. CENTER stated that the non-U.S. equity portfolio has a slight value tilt now because of how the emerging market equities is being implemented. MR. HANNA added that they have scientific beta in that portfolio, which does have kind of a value factor orientation. He said historically, large institutional portfolios like theirs would be better characterized as more value oriented. He said that now they were heavily overweight in traditional growth sector and commented that it was a big explanatory factor in terms of performance.

CHAIR WILLIAMS suggested rotating the order of materials so that participant directed plans would occasionally be discussed first. MR. CENTER and MR. ERLENDSON expressed their appreciation for the direction and indicated they could do that going forward.

D. Risk Management

CHAIR WILLIAMS then invited MR. CARSON to present.

MR. CARSON introduced himself to the new Trustees. He then moved to page 2 and explained key board decisions included determining investment objectives, asset allocation, implementation oversight and monitoring results. He said that his presentation focused on the fourth objective of monitoring results. MR. CARSON said the pension systems face a lot of layers of risk and noted that this presentation focused on investment risk. He explained that they use TruView, a portfolio and risk analytics platform that generates risk reporting stress tests and clarified that TruView does not look at actual experience, but rather a snapshot of the portfolio on December 30th and June 30th and infer risk metrics, benefit analytics for that snapshot.

MR. CARSON said that risk metrics were within expectations, that public equity allocation was the largest driver of the portfolio volatility, but that volatility remained below the expected 13.9 percent of the target allocation for the fiscal year. He said the overall portfolio volatility increased from the June report and was approaching Callan's long-term risk expectations. He said TruView modeled several historical and predictive scenarios and that the ARM Board's portfolio sensitivity to the stress tests had been changed over time indicating there were no sudden or unexpected exposures to assets that were sensitive to the scenarios provided.

CHAIR WILLIAMS recessed the meeting from 3:04 p.m. until 3:19 p.m.

G. Fixed Income and Cash Management

MR. HANNA introduced MR. DJAJALIE and MS. HOWARD.

MR. DJAJALIE provided an overview of the fixed income team and each team member's position within the team. He then moved to page 5 which showed a pie chart of the ARMB target asset allocation for FY 2022. He said they $5.5 billion of the ARMB's $7.5 billion fixed income assets were managed internally. He said they also manage the portfolio to the Bloomberg aggregate index.

MR. DJAJALIE said the 10-year US Treasury rates remained low by historical standard despite recent selloffs spurred by the Fed tapering announcement and the expectation of Fed hikes. He said the rates had been volatile and were influenced by pandemic headlines, concern over Russian invasion of Ukraine, and inflation. He said the Feds had raised rates by 25 basis points and also increased their rate of tapering. He said the median rate hike was seven times this year and had six more left to go.

MR. DJAJALIE said page 9 showed the profitability and leverage, that company fundamentals remained robust, supported by strong profit margin and healthy balance sheets. He said defaults inched higher in the most recent quarter but remained at a seven year low with a total of four defaults in Q4. He said the default rate was expected to rise as strong growth and earnings normalized. He said the downgrade to upgrade ratio was low and had been for five consecutive quarters.

MR. DJAJALIE said that Corporate Bond Net Issuance on page 11 showed a busy year as companies tried to bolster their balance sheet by taking preemptive action to strengthen the balance sheet and issue a lot of debt in order to have cash reserve. He said Investment Grade Corporate Spreads was now at about 40 basis wider than the chart showed, as it was prepared prior to the Russian invasion of Ukraine.

MR. DJAJALIE moved to page 15 and explained that they had three primary objectives for investment, they are to generate excess return relative to the index over time, provide liquidity as required, and serve as a diversifier to reduce risk as part of asset allocation.

MR. DJAJALIE said page 16 explained the investment approach which is reviewed on a daily basis and periodically they optimize it before they cross multiple rate scenarios to identify a broad rate of potential movement in curve from one month to three months and then they position the portfolio across the curve in such a way as to outperform across those scenarios. He said there are risks that they have to deal with as shown on page 17.

MS. RYERSON asked if there was a team process when deciding to get rid of investments; MR. DJAJALIE said they do have a team discussion but ultimately, he makes the decision.

CHAIR WILLIAMS asked how such a small team would manage so many different things and the risk and all the decisions; MR. DJAJALIE said they had the benefit of working together for so long, that they have put in a lot of effort to create a lot of back up. He said they all know the analytics and how to trade and to make sure a trade settles.

MR. DJAJALIE moved to slide 18 which discussed the dependence on technology and

generalizations. He said managing a fixed income portfolio was a complex task because the index is comprised of over 12,000 securities. He said they own over 850 securities and over 200 corporate bond issuers, for treasury agency, mortgages, CMBS, Asset Bank and many more. He said they use analytic tools such as Bloomberg and YieldBook to map general characteristics of the index portfolio. He said that page 21 showed the result of the investments.

MS. HOWARD said that she had prepared a presentation discussing the investment strategy and the profile of AY70. She said AY70 was a metaphor for the short-term investment pool. She said it invests funds for both State of Alaska and the ARM Board accounts and its current assets under management was 4 billion and the ARM Board assets represented about nine percent of AY70's stocks. She said the objectives were to earn the highest possible return while meeting significant liquidity requirements and taking low principal risks. She presented page 3 which contained a pie chart showing the sector exposures.

MS. HOWARD said the asset -backed securities shown on page 4 were a specific pool of collateral, such as auto loans, auto leases, and credit card receipts. She said ABS represented the lion's share of their spread product exposure. She noted that the ABS they own was very short with a weighted average life less than half of a year and that most ABS have an amortizing structure. She said they typically purchase and hold the ABS securities to maturity. She noted that even though ABS securities are not as liquid as T-bills, the cycle of pay-down and reinvestment contributes to the overall liquidity profile for AY70.

MS. HOWARD moved to page 6 to show the ABS structure and how the principal payments flow from the top down while the losses flow from the bottom up.

MS. HOWARD said the corporate exposure was smaller in size than ABS but was still significant as displayed in the chart on page 8.

CHAIR WILLIAMS asked if the allocation had been fairly consistent over time and if there were any concerns in the level of concentration in auto buying loans with respect to having a diversified portfolio. MS. HOWARD responded that within ABS tranches or deals, they are spread out across the country and that the exposure was not so much the auto industry, but rather the American consumer and that is one of the most diversified exposures one can have. She noted that the make-up of the fund had changed a little bit over time and that it was dependent on the size of the short-term investment. She added that AY70 had stayed relatively stable over the past 3 to 4 years and that it was representative of where they the liquidity requirements would be.

MS. HOWARD moved to page 9, Supra-sovereigns which are bonds backed by one or more sovereign nations. She explained that these can earn a small spread to treasuries but generally very little versus the spread available in other sectors.

MS. HOWARD said page 10 discussed the developments of note LIBOR transition and said that and that there was a shift away from LIBOR into a replacement rate. She said SOFR was the heir apparent to LIBOR. She said the majority of AY70's corporate holding was in floating rate notes and those maturing after June 2023 were all benchmarked to SOFR.

CHAIR WILLIAMS requested that Agenda Item XI Investment Actions, from Friday's agenda be brought forward at this time, ask asked MR. CENTER and MR. ERLENDSON to leave the meeting.

INVESTMENT ACTIONS

A. General Consultant Contract

MR. HANNA said the two actions in the board packet were both regarding contracts with Callan - one for the general consultant contract and the other for the real assets contract. He said both were structured as five-year total term agreements, with an initial three-year term, and then two optional one-year extensions.

MR. HANNA said that the staff holds Callan in high regard and believed that they had provided the ARM Board with good service and recommended that the ARM Board direct staff to exercise the first of these one-year contract extensions, extending Callan's general consulting contract until June 30, 2023

MR. JENNINGS said that he supported continuing with Callan and that if there was any dissatisfaction, he would advise that it is almost always better to find a different set of employees of the consultant than fully moving the consultant.

MS. RYERSON said she too would support it. She said they had always been responsive to the ARM Board's needs.

DR. MITCHELL said he too supported extending the contract. He said the firm had been very steady over the years in its response to the requests of the ARM Board.

CHAIR WILLIAMS said that he always thinks of capabilities, commitment, and chemistry and that he saw high marks in all three of those and the responsiveness of different requests and comments was duly noted.

MR. BRETZ motioned to extend Callan's general consulting contract until June 20th, 2023. MS. RYAN seconded the motion.

CHAIR WILLIAMS stated that the motion language should be recorded as follows, the Alaska Retirement Management Board directs staff to exercise the first of two one-year contract extensions to extend Callan's general consulting contract until June 30th of 2023.

A roll call vote was taken, and the motion passed unanimously.

B. Real Assets Consultant Contract

MR. HANNA said the same five-year contract term, which included an initial three-year term and two optional one-year extension, applied to the Real Assets contract with Callan, with the initial period expiring June of this year.

MR. HANNA noted that this was the first time they had used a Callan as a real assets consultant and that staff have been pleasantly surprised. He added that there was a lot of cost savings in making this

transition and that Callan had been very responsive.

CHAIR WILLLIAMS said that they had discussed the combination of the two contracts which had totaled $700,000; MR. HANNA said it was very close to $700,000.

MR. M. WILLIAMS motioned that the Alaska Retirement Management Board direct staff to exercise the first of two one-year contract extensions to extend Callan's real assets consultation contract until June 30th, 2023. MR. BRETZ seconded the motion.

A roll call vote was taken, and the motion passed unanimously.

CHAIR WILLIAMS recessed the meeting at 4:15 p.m.

Friday, March 18, 2022

CALL BACK TO ORDER

CHAIR WILLIAMS reconvened the meeting at 9:00 a.m.

H. Current Geopolitical and the ARMB Portfolio

CHAIR WILLIAMS invited MR. SIKES to present.

MR. SIKES explained that he would be moderating a series of discussions focused on the implications of the war in the Ukraine. He said that there were there were four presenters to help think about the developments and the potential short- and long-term implications on the business of managing a large public pension plan. He said they would start with geopolitics and hear from members of the KKR Global Institute.

MR. SIKES welcomed GENERAL PETRAEUS and MR. SERCHUK and asked if they could give their current assessment of the war and their expectations going forward.

GENERAL PETRAEUS said their earlier estimates had been validated and that it may prove worse than Afghanistan for Russia. He said he did not see an orderly way out and that it appeared they were at a stalemate. He then described where the various forces of the Russian army were located in the Ukraine and what their losses had been thus far. He described the tack that the Ukrainians had been utilizing and the outcome. He then explained that Mariupol had been encircled and the Russians were achieving their goal of that city. He said the city had no power or water and the Russians were going to starve them out and if Mariupol were to surrender that would free up Russian forces that could be used elsewhere.

GENERAL PETRAEUS explained another major offensive in Mykolaiv which is on a river up from the Black Sea, he said the Russians need the two bridges in Mykolaiv to get across. He said the bridges were rigged with explosives and would be demolished, if necessary, but said the mayor and his military counterparts had been doing an admirable job holding off the Russians.

GENERAL PETRAEUS said that Odessa was another major port for Ukraine, he described it as the lifeblood directly on the Black Sea. He said it had been on the receiving end of sea-launched cruise missiles and other naval bombardment but had not been that engaged in the fighting. He noted that the Ukraine was receiving enormous quantities of additional weapons systems, ammunition, small arms, vehicles and would get air defense systems that can extend higher than a Stinger - about 10,000-foot altitude. He said they were getting a Switchblade drone, which was basically a kamikaze drone that was very deadly and effective. He said NATO had pledged an S-300 Russian air defense system.

GENERAL PETRAEUS said his expectations for the short-term was a continued stalemate and the potential fall of Mariupol.

MR. SIKES asked MR. SERCHUK if he would shed some light on the history of the war and Russia's thinking and objectives and what that says about the potential trajectory and scope of the Ukraine situation.

MR. SERCHUK said that Ukraine means frontier or border and when Russia would talk about the Ukraine, they would reference it more like one would a field, as if it was a place, rather than a country. He said Ukraine has been a sort of border between the European great powers in the area. He spoke of the history of Kyiv Rus and how Ukraine was described as the border between the Kyiv Rus and Poland. He said Ukraine had been traded among different empires, the Pols, Swedes, and the Slavs. He said within the aftermath of World War I, the Russian empire collapsed, there were several attempts to establish a Ukrainian state on the territory that is now Ukraine. He said the Soviet Union emerges in Russia with the Bolsheviks and conquer the territory that is now Ukraine. The Bolsheviks organized a new power along national lines, the Russian National Republic, the Ukrainian National Republic, and the Belarusian National Republic and that became the Soviet Union. He said the real power was concentrated in the party in Moscow. He said in the late 1980's with the decline of the Soviet Union and then in 1991 with the collapse of the Soviet Union, the party imploded, and the national republics became independent states.

MR. SERCHUK explained that Putin argues that the borders were arbitrarily drawn by the Soviets as part of their experiment and there was no reality behind them. He said Ukraine had noticed that the countries around them were on a very different course with their competitive elections, higher standards of life and this had caused a great deal of discontent and unrest with the political elite in Ukraine and that manifested into uprisings in 2004, 2005 and 2014. The Ukrainians wanted it to be more like the West with a better quality of like. He said Putin saw it differently, he saw it as a foreign plot cooked up by the CIA in order to grab Ukraine. He saw the uprisings as a cause for aggression against Ukraine. In 2014 after the overthrow of President Viktor Yanukovych, Putin moved to seize Crimea and the Donbas and Eastern Ukraine. He said Putin still thinks that Ukraine is not a country, and the resistance is not coming from Ukraine, since they do not exist, but from foreign interference. He said the most interesting factor was the strength of Ukrainian nationalism which was not particularly strong until Putin helped conjure it into existence.

MR. SIKES asked what they saw as a way to give Putin a way out.

GENERAL PETRAEUS said they did not want Putin backed into a corner with nothing left to lose.

He said Putin has nuclear weapons he could use, and possibly chemical and biological weapons as well. He said he thought there were two ways out, one would be through a negotiated settlement. The other option would be if Putin was replaced. He said there could also be a Ukrainian victory but most likely there was the potential for a negotiated settlement.

MR. SIKES asked what the long-term ramifications of the Ukraine war is in terms of world order and structure.

MR. SERCHUK said that there were major events in the world that were considered turning points and that he thought there were a couple of trends worth emphasizing. He said the shift from an era of benign globalization to one of great power competition was the biggest trend. He said in the mid 1970's the global economy consisted of North America, Western Europe, and East Asia, which was not really a global economy as much as an economic bloc. He said over the years, large parts of the world integrated with it. He said the idea behind globalization was as countries plug into the system and become increasingly powerful and prosperous, they would use that power and prosperity to solve shared problems, but instead the countries started to leverage their power and prosperity to gain advantage and zero out competitors which is what Russia and China are doing. MR. SERCHUK noted that instead of globalization, the most powerful and prosperous countries were instead increasingly in adversarial blocs against each other.

MR. SERCHUK said that if there were a collapse in Russia, there would no longer be discussions about the threat of Russian strength, instead the discussion would be about managing the consequences of Russian weakness and Russian collapse which would pose a number of serious threats, including economic consequences for energy and other issues.

MR. SIKES invited questions from trustees and IAC members.

COMMISSIONER MAHONEY asked how long could Europe go with their sanctions before it debilitates their economy; GENERAL PETRAEUS said they were not imposing all the sanctions but are carving out exceptions to some of them. COMMISSIONER MAHONEY asked if he thought Alaska was at risk to the nuclear bomb threats from Russia; GENERAL PETRAEUS said he thought Alaska was safe because Russia does not need another front of war, they are not able to replace the soldiers being lost in Ukraine. MR. SERCHUK added that he expects that Russia could ratchet up the intimidation tactics against the West if the situation drags on. He said Russia's biggest loss to date was the evacuation of over 200,000 Russians who were computer scientists and academics. He described it as a huge geopolitical opportunity for the rest of the world to absorb many of Russia's best and brightest.

MR. HIPPLER asked how should Alaska phase or structure prohibitions on investments in Russia to not make things worse; GENERAL PATRAEUS said that it was a smart thing to not invest in Russia and he doubted that Russia paid attention to any additional sanctions.

CHAIR WILLIAMS asked what their thoughts were on China teaming up with Russia; GENERAL PATRAEUS said that President XI has a variety of issues he was dealing with, and he does not welcome the Russian invasion for many reasons but mostly because it could affect his election.

MR. SIKES then invited MR. MOORE from Fidelity to speak. He asked him before Ukraine, where were the fixed income markets headed and how did Ukraine impact that?

MR. MOORE noted that there was a year of too much fiscal spending and deficit spending and way too much monetary stimulus and with the Russian invasion of Ukraine there was so much fog for investors, it became difficult for asset prices.

MR. SIKES asked how to evaluate U.S. and global recessionists given CPI levels of 7.9 percent, the far-reaching impact of high energy prices, and the general commodities spike the Ukraine conflict had caused?

MR. MOORE said that it was going to be difficult to tighten up the economy fast enough without causing a recession.

MR. SIKES asked how they see a correlation between stocks and bonds evolving?

MR. MOORE said one thing they were watching was the MOVE index, seeing how much gets embedded. They were trying to see who the buyers were and what was the tail of the auctions.

MR. SIKES asked how did they see the European economy being impacted by Ukraine and how did they expect the fixed income markets to respond?

MR. MOORE said that they thought Europe would be more directly hit than the U.S., that they will slow and keep being slow so any rate rises that happen in ECB would be considerably less that the U.S. Federal Reserve.

CHAIR WILLIAMS commented on interest rates in the 70's being close to 20 percent that had been at zero now for long time and was slowly inching up. He asked if things were getting back to normal or were there going to be a lot of consequences?

MR. MOORE said he thought the goal was to get back to normal, that Chair Powell had said that he was going to take the six or seven rate hikes for the year because the market had already given it to him.

MR. SIKES then invited MR. EMERSON from Capital Group and asked him in terms of economic impact and growth implications, how were they thinking about the potential impact in global growth particularly on Europe and the Ukraine?

MR. EMERSON noted that refugee flows would have a significant challenging economic impact on Europe. He said with regard to energy, the EU said that within a month or two they would be completely independent of Russian coal and would have reduced their dependency on Russian oil and gas by two-thirds by the end of the year. He said there would be an economic hit in the short to medium term, but they were rethinking things such as nuclear, the power line situation, and investing in renewables.

MR. SIKES asked about the potential impact on the U.S. elections.

MR. EMERSON said that the Democrats had a very steep hill to climb and noted that with the low approval rates of Biden and the challenges in the polls that all did not bode well for the Democrats to keep the House. He said that the Senate would be a flip of the coin as to who would be in control. He said Biden was getting bipartisan support for what he's been doing as far as his foreign policy. But he did not think the Ukrainian conflict would impact the voters as much as the economic issues.

CHAIR WILLIAMS recessed the meeting from 10:37 a.m. until 10:50 a.m.

I. Fidelity Signals

MR. HANNA invited MR. ALEXIEV and MS. MOESMAN from Fidelity to present.

MS. MOESMAN introduced herself and explained she was the day-to-day contact for the staff for various strategies managed on behalf of the ARM Board. She explained that Ms. Cathy Pena, a previous presenter to the board had been promoted as Chief Investment Officer with Strategic Advisers with Fidelity and was no longer a member of the GIS Portfolio Management Team, however MR. ALECIEV would be the future face of the team and that there would be no change in the terms of the team approach, structure, or process. She said they also had plans to add an additional portfolio manager to the GIS team. She then turned the presentation over to MR. ALEXIEV.

MR. ALEXIEV introduced himself explaining that he was from Bulgaria and that he was part of the portfolio management team. He then turned to the slide presentation and briefly touched on the members of the team.

MR. ALEXIEV moved to page 6 that showed the portfolio performance as of December 31, 2021, commenting that the past two years had been robust on the asset allocation side and security selection side.

CHAIR WILLIAMS asked when they could expect the portfolio to outperform the benchmark and what situations he thought they should expect it to underperform the benchmark: MR. ALEXIEV said that he had been working the past few months with Shane Carson to provide more information about the level of correlation of the outcomes to the benchmark and what they discovered was the outcomes were uncorrelated. He said the goal was to provide uncorrelated source of return. He said the table at the bottom of page 8 showed the correlation of their signals with each other over time.

MR. ALEXIEV then explained the Business Cycle - how the asset prices were influenced by the constant flow from economic expansion to contraction and back. He said assets tend to revert over time toward their Fair Value Levels. He said that assets that are outperforming tend to continue to outperform.

MR. ALEXIEV then moved to page 9 explaining that business cycle transitioned from early to mid-cycle in the beginning of 2021, while both early and mid-cycle promote an overweight to equities and an underweight to Core Bonds, they tend to hold more High Yield bonds earlier in the cycle and

transition to international equities as the cycle progresses. He said the reduction in emerging market equities overweight throughout 2021 was due to momentum and discretion of GIS PM team regarding concerns about Chinese slowdown. He explained that inflation protections increased during 2021 due to momentum and discretion that the market was underestimating the longevity of higher inflation and a rising late cycle signal contributed to increased inflation protection in October 2021.

MR. HIPPLER noted that he thought the purpose of the beta of the portfolio was to provide a reduction in overall risk and volatility in beta, but the graph on page 10 showed that it was increasing beta of the overall portfolio.

MR. ALEXIEV explained that the beta would change over time, that they had been risk-on adding beta over one in an environment where equities had gone up 30 percent. He said they can recognize when it is a good time to take risk, get compensated and as the risk/reward ratio shifts, they try to position the portfolio more defensively.

MR. HIPPLER asked if the mandate was supposed to reduce or increase the beta of the overall portfolio; MR. ALEXIEV said that it was not supposed to act for their beta. He said that over time, when they have looked at the correlation of the returns with the portfolio, they have been uncorrelated, so the beta should not go up. He noted that they were trying to deliver alpha on top of the 70/30 benchmark in a controlled way.

MR. HANNA explained that these multi-asset portfolios had elements of tactical asset allocation and what was shown in the graphs was expected. He said they expect the manager to modestly tilt the portfolios over time towards risk-seeking assets in environments where they expect those assets to be rewarded. He said they were adding and subtracting risk in opportune times in the market cycle.

MR. ALEXIEV moved to pages 16 and 17 which explained the current landscape of risks and opportunities. He said the opportunities shown on the left side of page 16 were what was seen in the market, the right side showed the risks needed to balance the portfolio and explained each one. He then referred to page 17 which showed past peak growth within different economies. He said the global economy likely passed its peak rate of growth, but a sustained expansion appeared to be likely. He said that despite signs of late-cycle pressures in the labor markets, they expected the U.S. mid-cycle backdrop to prevail in 2022.

CHAIR WILLIAMS asked if the different regions on different phases of the business cycle travel through the business cycle in a similar manner and was placement based on certain rules or was it the discretion of the team; MR. ALEXIEV said the regions move at their own speed, oftentimes they get clustered together. He said they had a lot of qualitative models that calculate the probability of the cycles, and they perform the calculations across all countries.

J. PineBridge

MR. HANNA invited MR. KELLY and MS. BOOKER to present.

MS. BOOKER introduced herself by stating that she headed up client relations for the retirement business and covered the Alaska account. She then presented pages 4 and 5 which included a brief

overview of PineBridge Investments and the employees. She noted that in 2021, they named a corporate social responsibility officer who works with clients to make sure their goals and objectives are met.

MR. KELLY moved to page 8 which discussed multi-asset teams. He noted that they utilize the investment teams that reside in 15 different countries managing across almost all the asset classes and they see themselves as generalists in the multi-asset team.

MR. KELLY them moved to page 9 and commented on the global equity performance. He said the CPI plus five had been an equity-like return over a long period of time and that the GDAA had also performed an equity-like return for vertical. He then noted the graph on the left showing a 70/30 risk budget. He then moved to page 10 that showed the performance returns as of December 31, 2021.

MR. KELLY moved to page 12 which discussed their investment philosophy as an active, fundamentally driven manager, selecting asset classes using judgment as opposed to quantitative analytics.

CHAIR WILLIAMS asked with the rise of inflation if he thought the CPI plus 5 would still accomplish the objective going forward; MR. KELLY said he believed they could stay ahead of the inflation with the higher risk budget of 70/30, using a rolling five-year period. He then explained that they move into asset classes that they think will be favored of the kind of environment that is present. He noted that certain asset classes perform better under higher inflationary environments. He then moved to page 13 that showed the investment process they use. He said they start with a five-year valuation tool called the Capital Market Line that looks at the next five years and how the backdrop will influence cash flows away from long-term averages and how the pricing of those asset prices will be pushed away from long-term averages.

MR. KELLY then moved to page 15 that showed a snapshot of the types of classic environments. Page 16 showed the consumer disposable income and excess household savings and said it showed the consumer is in great shape and that the economy from the consumer side, can grow faster than what they were used to seeing.

MR. KELLY said that page 17, Global Growth, showed the business investment, which was another key driver, and that the US was seeing the second fastest assent in coming out of a recession. He then moved to page 18 which showed the overall GDP growth trend. He noted that it was a period with somewhat faster growth, which was a good thing but if it happened to quickly, it would be inflationary.

MR. KELLY then moved to page 22 which displayed global savings glut and QE (quantitative easing) have flowed into fixed income and private equity noting that the global savings rate had been edging up for a long time, that capital has been piling up faster than the economy has been growing - a key reason why valuations have become more and more lenient. He said the GDP has been going up and it should be flat. He explained that when its flat, central banks are neither adding to nor reducing liquidity. He noted that when the global savings rate and central bank liquidity growth comes up at the same time, get as much global stocks and bonds in the portfolio as you can afford, because it is

the tide coming in. He said for the next five to possible twenty years the tide would be going out, and to keep up with CPI plus five, they have to get into the asset classes that will perform best in that type of environment.

MR. KELLY shared page 29 saying that China was in a policy-driven slowdown last year. He said they were changing all the rules regarding market power, data privacy and private education. He said their Vice-Premier, Leo Hua, said they had gone too far, and China was now reversing a lot of their policies and putting in stimulus. He said one of the things their policy hurt the most was property developers. He noted that the bonds were generally high-yielding bonds, but they had gone into a tailspin and now was a good time to be buying the higher quality China property bonds which were delivering double-digit returns.

MR. KELLY then moved to page 30 and noted that Latin America local currency bonds were very attractive now. He said in 2021, emerging markets faced an early spike in inflation and central banks responded swiftly as was the case in Latin American, which was more vulnerable to food and energy prices. He said they see good prospects for inflation to peak and decline as rapidly as supply issues fade and substantial rate hikes take effect. He noted that Latin America was another example of opportunistic diversification that teams nicely with the board's strategic allocation into big core asset classes.

MR. KELLY said due to the wage price spiral in the United States, another wave of COVID in China and Europe, they have been taking a more conservative approach to the amount of risk they take.

MR. KELLY noted that another allocation they moved into was TIPS, inflation-protected securities and did well on the low-risk allocation.

CHAIR WILLIAMS asked if he would discuss page 24 and the capital market line and local currency views and also asked if they test the forecasts for accuracy and if so, how often; MR. KELLY said that over time they have had 80 basis points. He said they had done at least one-an-a-half percent from the asset allocation judgments and the other half of the alpha comes from the buy and hold of more attractive asset classes above the line.

CHAIR WILLIAMS then asked if emerging markets were worth investing, from either a diversification or a return perspective; MR. KELLY said it depended where they wanted to go – that they were not great fans of China, they love the China property bonds but not the China stock market. He said it depended on how targeted they could be in accessing an emerging market equity, fixed income, or private type of capability.

MR. HIPPLER asked if they select managers on the basis of their race and sex, or on the basis of their competence; MR. KELLY said they were an extraordinarily diverse organization, they have 55 percent in Asia, they are in the Americas, in Europe and in Latin America. He said with the different perspectives, different political systems, and business systems, it gives them an edge to understanding cultures, political systems, and economics, which is a great investment edge. He noted that in Asia, there are more female portfolio managers than male, especially in China.

MS. BOOKER said that in their industry, the war for talent is on and the pool for candidates is very tight. She said that PineBridge has doubled down on widening the pipeline. She said they have partnered with community groups including the Opportunity Network, Futures and Options, GAIN (Girls Are INvestors) and other programs which are designed to make sure that the talent pool becomes larger.

CHAIR WILLIAMS asked if they had a succession plan and if so, could they summarize it; MR. KELLY said that in the investment team they have a very long-tenured team, including in the multi-asset team. He said his goal was to train CIOs because he needs CIO-quality people to interact with the sophisticated clients. He said he reviews with the CEO and the board candidates once a year for succession planning.

CHAIR WILLIAMS recessed the meeting from 12:22 p.m. until 1:30 p.m.

K. Peer Assumptions, Risk, and Time Horizon

CHAIR WILLIAMS invited MR. HANNA to speak.

MR. HANNA explained that the intent of his presentation was to bridge the gap between the economic assumptions that the board was looking to set for the actuarial experience study and the board's annual asset allocation process.

MR. HANNA moved to page 4 of the presentation, ARMB Actuarial Assumption History, which he described as a review of where the board had been from actuarial assumption perceptive. He noted that the current nominal return assumption was 7.3 percent but had been above 8 percent for most of the 40-year period the graph covered. He said that inflation was currently at two-and-a-half percent which leaves them with a real return assumption of 4.88 percent. He said the real returns, assumptions for the ARM Board were relatively steady due to the level of risk increasing over time.

MR. HANNA moved to page 5 to look at nominal returns and the comparisons with NASRA data which went through 2020 as 2021 data was not available. He said per NASRA's website, the median was currently below 7 percent. He commented that the gray area on the chart, which represented the 7 to 7.5 nominal return group, of which the ARMB was in, was growing in size. The chart on the right showed a histogram of where other plans were in 2020, noting that the actual range was between 4.24 and 7.75 percent.

MR. HANNA then move to page 6 which showed inflation using the same style of graphs that showed a broad range between 2 percent and 3.75 for the cohort group. He noted that they perform an experience study every four years. He said inflation had been coming down for a long time and that Buck had alluded to that and that it would probably continue to come down.

CHAIR WILLIAMS asked MR. HANNA how many plans were in the data set; MR. HANNA said it was 203 for the nominal return assumptions and 188 for the real return assumptions. He said that since the inflation expectation was at median and the nominal return expectation was above, the real return expectation was also above by the same amount, 4.88 was the assumption versus 4.5 for other plans in 2020

MR. HANNA moved to page 13 which summarized the past four or five slides. He explained that the solid lines were their assumptions over time and the dotted lines were NASRA assumptions over time. He noted several rational reasons why plans may have different assumptions, including differences in the time horizon, capital market assumptions, as well as differences in benefits and contributions that affect the risk tolerance..

MR. HANNA explained that staff used the risk and return data from 51 plans with greater than one billion in assets to provide a detailed comparison of the ARM Board's risk profile compared to peers. He said that there were five to seven dominant investment consultants, each with their own set of capital market assumptions which always differ but were within reasonable range. He said they normalized that by using Callan-only assumptions and a Callan-specific ten-year time horizon. He then moved to page 8 explaining that the median was the triangle and their FY20 asset allocation was the diamond, which showed they did have a higher than median risk appetite and a higher than median expected return that comes from the bond. MR. HANNA reiterated that time horizon was a big differentiator among plans and that it mattered greatly with respect to the ability to tolerate risk.

MR. HANNA said the goal for the defined benefit system was to pay all the benefits when due and the actuaries had done a great job providing forward estimates of the timing and magnitude of the payments. He said the top chart on page 10 depicted those payments with the 2.25 percent inflation adjusted in real time. He said he used Callan's current market assumption to discount the nominal benefits over time. He said the chart showed payments extending to the future by 96 years and appear to peak in 10 to 20 years and start to diminish rapidly at that point. He said the plans were closed and were expected to pay out 71 billion in the future and current forward contributions were expected to cover $8 billion of it. He said they had $33 billion in assets which left $30 billion payments that were needed to be covered.

MR. HANNA moved to page 11 that shows how important the time horizon was in respect to both return and inflation expectations. He said the return expectations were increasing with the time horizon, the longer the appropriate time horizon, the more that would be expected to earn over time. He said that inflation expectations were trending downward over time due to higher expected shorter-term inflation.

MR. HANNA moved to page 12 that discussed benefit payments over time. He said the full expected time horizon of the retirement system was 96 years, with payments decreasing to low levels long before that point. He said the percentage of total benefit payments remaining decrease to 50 percent in 20 years, to 25 percent in 30 years and 10 percent in 40 years.

MR. HANNA moved to page 15 showing the economic assumptions and asset allocations. He said the bottom chart showed the ARM Board's specific version of the graphs at the top of the page. He said the red line showed the standard deviation over time and the numbers were the actual capital market assumptions that were adopted at various points in time. He said in 2019 they moved to a 20-year time horizon for asset allocation, noting that it had been prompted more from an investment perspective than the results of the experience study. He said they tried to think about the right risk posture for the portfolio.

MR. HANNA said he thought the board had an opportunity to come full circle and consider aligning the economic assumptions with the capital market assumptions, since they share the same time horizon.

MS. RYAN asked MR. HANNA to go back to page 10 and said that there were two bills in the legislature and asked what his thoughts were if they did return or have the option to return to a defined benefit; MR. HANNA said that he did not think that it would impact the current situation because they were focused on the current set of assets and liabilities. He said if people had an option to convert, assets would need to go into the system at an amount equivalent to the benefit that would be expected over time. He said it would change the slope of it because there would be new entrants back into the system; MS. RYAN then asked if there was any information that would help them in making that decision; MR. HANNA said that he did not have an answer for that but would give it some thought.

CHAIR WILLIAMS asked MR. HANNA if he was envisioning much difference between the 2021 and the 2020 displayed on page 6; MR. HANNA said he thought it would continue to grow, but that the median may not change. He said that the 2.25 had become more popular and thought it may exceed the 2.50 number.

CHAIR WILLIAMS commented on inflation, its tie to benefits and potential impact. MR. HANNA responded, saying that Buck had done a good job exposing the board to how the inflation assumption impacts the work they do. He said that whatever number the board ultimately arrives at, is the base on which the actuary builds all of their other adders to the inflation. He noted that wages and healthcare were front and center in his mind and that they have very significant adders to that base level of inflation on the front end of the work they do. He explained those adders reach a terminal value with a fixed amount added to that.

L. Capital Market Assumptions

MR. KLOEPFER explained that he would start his presentation by discussing inflation, the Fed's response, the activities in the Ukraine, and what impacts it has. He noted that they did not have Ukraine built into their ten-year projections and explained that they use a firm called IHS Markit, which is part of the S&P, for an unbiased view of world events. He said the consensus in the asset management world was that the U.S. economy was strong, inflation was a problem, the labor market still had some kinks to work out and the supply chain would get a bit worse due to the geopolitical landscape. He said that he felt that in a ten-year time frame, they were not sure that it was going to materially change things unless NATO gets drawn in. He said the Fed had raised the rates and were watching inflation and that they were concerned but did not think the framework was wrong.

MR. KLOEPFER moved on to page 4 to discuss capital markets projections. He said the projections for the next 10-years were the key elements to set reasonable return and risk expectation for the time horizon, keeping in mind that this was the midpoint of a range that can be wide for some of the asset classes. He said that it was important to use common sense and recent market developments, so the tail doesn't wag the dog.

MR. KLOEPFER then moved to page 5 and said their beliefs were that the long-term equilibrium

relationship between the capital markets and lasting trends in global economic growth were key drivers to setting capital market expectations, that long-term compensated risk premiums represent beta exposure to each broad market with limited dependence on successful realization of alpha.

MR. KLOEPFER said that page 6 represented the projections. He said that inflation was at two-and-a-quarter, cash at 1.2 and core fixed income at 1.75, which represented a negative return relative to inflation. He explained that the changes made from last year were very modest. They changed some components within fixed income, primarily high yield, and TIPS, and lowered their expectation for private credit in line with their thoughts on high yield. He noted that they did not change core fixed income or the equity expectations. He noted that there was a summary of the current market on page 8.

MR. KLOEPFER then moved to page 10 which displayed the returns for the S&P 500 by calendar year, noting that it had been a phenomenal ten-year run. He said year-to-date was challenging with a tough start to the year; but S&P was up 16-and-a-half percent, just behind the index for Cambridge Private Equity.

MR. KLOEPFER than move to page 12, a chart they created showing the beginning of the pandemic and how unique the past two years had been with the GDP recovering after the biggest drop in 75 years. He then moved to page 13 to discuss the role of economic variables. He said GDP forecasts provide a rough estimate of future earnings growth while inflation forecasts provide an approximate path for short-term yields. He said they were expecting up to two-and-a-half for the U.S over the next ten years, weaker for the developed markets but stronger for the emerging markets and all below their long-term averages.

MR. KLOEPFER moved to page 15 regarding the Fed's inflation framework. He said the Fed's announced a couple of years ago that they were going to let inflation run hot so they could average 2 percent, but they never really got to 2 and were now saying they were going to let it run a little hotter. He said the chart on page 16 was outdated but that he wanted to show the CPI and PPI through 4th quarter of 2021. He noted that they had been an interesting cycle that's been followed through several components of CPI. He then went on to discuss shut down of production across the globe during the pandemic and said that he thought there was going to be elevated inflation into next year due to the troubles in the supply chain and labor market.

MR. KLOEPFER moved to page 19 which discussed when inflation becomes a problem. He noted that different percentiles of income have been hit hard by the pandemic, but total personal income did not go down during the 2020 recession because of all the support provided. He said the savings rate went up due to people not having a place to spend their money during the pandemic. He said looking at the Fed's balance sheet, there was not much long-term debt. He then moved to page 22 that showed the federal fund's effective rate, and the consumer price index back to the 1960s. He noted that there was a decent connection between the two historically, and then directed the Board's attention to 2010 to present. He said short term rates were held down by policy in response to the GFC and then the pandemic, and that in these more recent years there was clearly a disconnect.

MR. HIPPLER asked why emerging markets underperformed or why would they perform much

more competitively relative to U.S. equities in the future; MR. KLOEPFER said they give it a premium because they think it's cheap relative to the U.S. and developed markets overseas. He said it had always been cheaper when looking at price to earnings because it is a bit riskier.

MR. LOZINSKI added that over the long run, they anchor the earnings growth expectation to GDP and still expect GDP growth to be stronger in emerging markets than developed ones. He noted that another potential reason for the underperformance might be related to currency.

DR. MITCHELL asked if they raised military spending worldwide, continued to try to raise consumer spending by free money, and continue sanctions and tariffs was that higher inflation; MR. KLOEPFER said he agreed and thought the Fed was committed to removing accommodation, that they may get nervous if the geopolitical situation continued to worsen or if there is NATO involvement. He said he thought they did need to raise the rates and the phraseology in the Feds was they need to get to neutral as quickly as practicable, but they could lose their nerve if the conflict spills out and gets worse.

MR. LOZINSKI said that he had averaged inflation going back to June of 2021 and figured out that if the average of 6.3 from June to February was maintained for an extended period through the end of 2023, the ten-year average inflation would be 2.8. He said if prices start to normalize, the two-and-a-quarter over a long-time horizon was reasonable.

MR. HIPPLER asked MR. LOZINSKI what would have to happen for him to think that inflation would not be 2.25 going forward for ten years; MR. LOZINSKI said that the Fed was committed to not letting inflation get to where it was in the 70s. He said that what would change his mind would be loss of confidence in the Fed's willingness to raise rates to tamp down inflation.

CHAIR WILLIAMS asked if they would consider it irrational if they held firm at two-an-a-half percent; MR. KLOEPFER said no he did not think it was irrational.

MR. LOZINSKI moved to page 24 to discuss fixed income.. He said they use the building blocks approach which included income or yield from holding bonds, capital gains/losses. He then touched briefly on the 10-year projections. He said there was not a lot of change, especially for the investment grade asset classes.

MR. LOZINSKI then discussed the yield curve which he described as the most critical component of a bond model or bond assumption. He said they looked at the long-term relationship between inflation and cash and then assumed that cash gets to that long-term premium inflation over a 30-year horizon. He said they also assumed treasuries would reach a long-term premium over cash over a 30-year horizon.

MR. LOZINSKI said the chart on page 26 displayed the rate movement of last year, noting that it did not rise as much as they thought. He said the chart showed that for high yield, spreads tightened so much that the overall yield on the benchmark declined over that time period. He said the slide on page 27 showed the return components that they have for the core fixed income assumption.

CHAIR WILLIAMS asked if there was any expectation that capital appreciation would show a positive at some point: MR. LOZINSKI said not in their forecast because they assume a smooth path from where rates started to the long-term equilibrium, that they would probably rise and then fall a bit and then they might rise again. So, in practice there may be some capital appreciation.

MR. LOZINSKI then moved to page 28 showing key assumption changes related to high yield for 2022. He said last year spreads were above median and this year the spreads were in the bottom decile. He said if spreads rise back to long-term medians in addition to rising risk-free rates, it will create a stronger headwind to performance.

MR. LOZINSKI moved to page 29 which showed high yield starting yield vs. forward 10-year return, noting that there had only been a few periods where the subsequent 10-year return beat the starting yield.

MR. LOZINSKI showed page 30 noting that since inflation assumption was flat, that implied their raising yield forecast. He said they moved to from nominal duration to using real duration which gave TIPS a bigger capital loss hit as rates rise.

MR. LOZINSKI moved to page 32, U.S. Equity Assumptions and said that COVID-19 had caused a decline in yields around the world and had still not reached their pre-pandemic levels but were moving back up towards the long-term average.

MR. LOZINSKI said slide 34 showed the current earnings growth projections as of December 2021 and that they were likely to outpace return of 29 percent. He said because of the strong earnings growth, there was a huge run at the stock market from 2020 through 2021 and that the graph on page 36 showed it best.

MR. LOZINSKI said page 37 showed the mid and small cap relative valuations relative to large cap, which supported their continued expectation that there will be higher returns from small and mid-cap than from the large going forward which is the building blocks approach they take. He said page 38 was mostly a logic check they use to check the numbers they've come up with from the building blocks approach.

MR. LOZINSKI said that page 39 was the non-U. S. developed markets which tend to generate returns slightly differently than the U. S. He said they have lower earnings growth reflected at times in the lower multiples that investors were willing to pay, but higher dividend yields. Page 40 contained the same type of data, but for the emerging markets with a lot more dispersion. He said in general you get more earnings growth in emerging markets than in developed non-U.S. markets, but that you also get higher dividend yields in the emerging markets than you do in the U.S.

MR. WILLIAMS asked if the dividend yields in emerging markets factor in the currency adjustments or the difference between U.S. dollars and local currency; MR. LOZINSKI responded affirmatively, saying they were based on the U.S. dollar for indexes.

MR. LOZINSKI said page 41 was a summary of all the building blocks that he had gone through. He

said they had dividend yields, buyback, and inflation, and because the returns were in nominal terms, earnings growth and in the case of large cap U.S. evaluation adjustment. He said they lowered the dividend yield in all the cases because of companies protecting capital and where prices are. He said they had also increased the inflation expectation to offset each other.

MR. LOZINSKI said for alternatives, they didn't change anything for public equities or private equities in terms of returns. He also said that their core fixed income and real estate assumptions didn't change either, but they did bump hedge funds because those building blocks included cash and their cash assumption rose; they bumped it up ten basis points.

MR. LOZINSKI noted that the biggest changes was to private credit on page 47. He said it represented middle market direct lending and briefly discussed each chart and how trends played into their lower expectation for this year.

MR. KLOEPFER moved to page 49, which showed a summary of Callan's long-term capital market assumptions (2022 – 2031). He said the biggest changes were cash up 20 basis points, inflation was bumped up from 2.00 to 2.25 percent and no change in return or risk assumptions for public equity, core fixed income, or short duration. He then moved to page 52 that showed a graphic depiction of risk and return for each asset classes over time.

MR. KLOEPFER moved to page 53 which contained a historical comparison of actual returns versus projections from 1989 to 2012. He said for the most part they were within one standard deviation range and somewhat below S&P 500. He said page 54 showed the return projections for major asset classes for 1989 - 2022, then jumped to page 56 showing expected returns over the past 30 years.

MR. KLOEPFER moved to page 58 to show the targets within the ARMB system. He said they had modeled the portfolio with some customization in regard to the ARMB cored fixed income expectations and the components of real assets listed with their weights. He said the overall capital market expectations did not change much during the past 10 years. He said the correlation assumptions on page 59 only had a modest adjustment.

MR. KLOEPFER turned to page 60, stating that as the time horizon grew beyond 10 years, the capital market expectations increasingly incorporate equilibrium returns. He said they were focusing on a goal of 4.88 real return, which was the nominal return assumption minus the actuaries' inflation assumption shown on page 62. He said page 63 showed the twenty-year mark with the return expectation for compound 6.88 as opposed to six-and-a-quarter. He said page 64 showed the comparison between last year's projection and the current year, noting that the nominal compound return was similar due to higher inflation expectation and the real return was a bit lower. He said the goal was 4.88 and with the assumptions and the portfolio in 20 years it would be 4.63, within 25 basis points.

MR. HANNA asked if the Board adopted a 2.5 percent inflation expectation, was there an expectation to further compress real return, or would it pass through to the nominal return; MR. KLOEPFER said he would pass it through on an assumption basis over the next couple of years; MR. HANNA asked him if he made his decision to compress the real return effectively when he increased inflation the

last year; MR. KLOEPFER said yes; MR. HANNA asked him if he was inclined to move inflation to two-and-a-half and not further compress the real return: MR. KLOEPFER said yes.

MR. HIPPLER asked what he would recommend as an alternative to hedge against volatility; MR. KLOEPFER said they believed in the roles of fixed income but agree that the returns do not look very attractive. He added that fixed income provides protection as shown by the events of the past three weeks.

MR. HIPPLER then asked MS. RYERSON, who used to run a pension, what she would have done in a situation where there was 25 percent of the portfolio getting a negative real return to reduce risk; MS. RYERSON said she would have done just as the consultants recommend, even though it seems to be counterintuitive.

COMMISSIONER MAHONEY asked if when rolling the forecasts out to other retirement plans, were they having discussions about changing asset allocations; MR. KLOEPFER said that as an advisor, his goal was to beat inflation, he needed more of the higher returning asset classes, so it tilts toward equity as a solution.

UNFINISHED BUSINESS - None.

NEW BUSINESS – None

OTHER MATTERS TO PROPERLY COME BEFORE THE BOARD - None.

PUBLIC/MEMBER COMMENTS
MS. JONES said that she had emailed written comments to the board prior to the afternoon session. She said there was one from Happy Allen on investment governance concerns relating to a company held within private equity funds as well as written versions of the testimony provided yesterday from members of the United Food and Commercial Workers International Union.

INVESTMENT ADVISORY COUNCIL COMMENTS
MS. RYERSON commented on page 655 of the Board packet and noted that every board would love to be in the top quartile on a regular basis, that to be above median for all those time periods was amazing. She also commented on the well-balanced asset allocation and noted that the fixed income team had summarized it by saying "we're not trying to hit the ball out of the park, we're trying to hit that benchmark on a very consistent basis".

DR. JENNINGS said that he found the geopolitical assessment informative, that the geopolitical divestment in emerging market conversations they've had recently encouraged thinking about simpler and less global portfolios. He said he found the PineBridge presentation useful, mind expanding and thought provoking – that the manager's comment regarding Chinese property bonds was a little eye-opening and highlights the idea of diversification. He encouraged them to embrace discomfort and to balance it with good fiduciary prudence.

DR. MITCHELL said he agreed with the comments about the excellence of the fund's performance

for the long time periods. He said he also liked the presentation on the fixed income and cash management as it showed a very conservative approach. He likened it to insurance and said it was the anchor of the portfolio and advised keeping a responsible allocation in fixed income. He also commented on inflation, private equity returns, and regulatory environment, and commented that the returns in the past may not be an indication of returns in the near future.

TRUSTEE COMMENTS
MS. RYAN commented that the staff had lined out an incredible lineup of speakers.

CHAIR WILLIAMS once again welcomed new board members, MR. M. WILLIAMS, and MS. RYAN, and thanked the staff for everything that was put together.

FUTURE AGENDA ITEMS - None.

ADJOURNMENT

There being no objection and no further business to come before the board, the meeting was adjourned at 4:07 p.m. on March 18, 2022, on a motion made by MS. RYAN and seconded by MR. HIPPLER.

Chair of the Board of Trustees
Alaska Retirement Management Board

ATTEST:

_____

Corporate Secretary

Note: An outside contractor recorded the meeting and prepared the summary minutes. For in-depth discussion and more presentation details, please refer to the recording of the meeting and presentation materials on file at the ARMB office.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
BOARD OF TRUSTEES MEETING

Videoconference

MINUTES OF
May 4, 2022

Wednesday May 4, 2022

ATTENDANCE

Committee Present:
Bob Williams, *Chair*
Lorne Bretz
Allen Hippler
Donald Krohn
Commissioner Lucinda Mahoney
Sandra Ryan
Michael Williams

Committee Absent:
Dennis Moen
Commissioner Paula Vrana

IAC Members Present:
Dr. William Jennings
Dr. Jerrold Mitchell
Ruth Ryerson

Department of Revenue Staff Present:
Zachary Hanna, Chief Investment Officer
Pamela Leary, Director, Treasury Division
Ryan Kauzlarich, Assistant Comptroller
Michelle Prebula, State Investment Officer
Alysia Jones, Board Liaison
Grant Ficek, Business Analyst
Leighan Gonzales, Executive Secretary

Department of Administration Staff Present:
Dave Donley, Deputy Commissioner, Department of Administration

Amanda Pillifant, Executive Secretary, Department of Administration
Ajay Desai, Director, Division of Retirement and Benefits
Kevin Worley, Chief Financial Officer, Division of Retirement and Benefits
Jim Puckett, Deputy Director, Division of Retirement and Benefits

ARMB Legal Counsel Present:
Benjamin Hofmeister, AAG, Department of Law

Others Present:
Steve Center, Callan
Paul Erlendson, Callan
Jay Kloepfer, Callan
David Kershner, Buck
Scott Young, Buck
Paul Wood, GRS
Bill Detweiler, GRS

I. CALL TO ORDER

CHAIR BOB WILLIAMS called the meeting of the Alaska Retirement Management Board meeting to order at 9:30 a.m.

II. ROLL CALL

MR. BRETZ, MR. HIPPLER, MR. KROHN, COMMISSIONER MAHONEY, MS. RYAN, CHAIR WILLIAMS and MR. WILLIAMS were present.

III. PUBLIC MEETING NOTICE

ALYSIA JONES confirmed that public meeting notice requirements had been met.

IV. A. APPROVAL OF AGENDA

MR. WILLIAMS moved to approve the agenda. MS. RYAN seconded the motion. The agenda was approved without objection.

V. PUBLIC/MEMBER PARTICIPATION, COMMUNICATIONS & APPEARANCES – None.

VI. EXECUTIVE SESSION

CHAIR WILLIAMS explained that they had recently received proposals in response to RFP Number 2022-400-0015, ARM Board actuarial review services. He stated that under AS 36.30.230, proposals "are open for public inspection after the notice of intent to award a contract is issued under AS 36.30.365". Because proposals are confidential by law, he asked for a motion to go into executive session per AS 44.62.310(C) (3) to consider the Proposal Evaluation Committee's recommendations. He invited MR. HANNA, MS. LEARY, MR. HOFMEISTER, MS. JONES, MR. DESAI, MR. PUCKETT, and IAC members to join.

MS. RYAN moved to for executive session. MR. HIPPLER seconded the motion. The motion was approved without objection.

The board went off the record at 9:35 a.m. and was back on the record at 10:47 a.m.

VII. REVIEW ACTUARY RFP RECOMMENDATION

MS. RYAN stated that on behalf of the Proposal Evaluation Committee, she recommended the continuation of the proposal for GRS. She explained Alaska Statute 37.10.220(A)(9) provides that all actuarial assumptions prepared shall be reviewed and certificated by a second member of the American Academy of Actuaries. She then explained the process involved in RFP 2022-0400-0015 and noted that four proposals were received, evaluated, and scored by the PEC members, and explained the evaluation criteria the proposals were scored on. She then recommended that the Alaska Retirement Management Board direct the staff to issue a notice of intent to award the contract following the expiration of the ten days' protest period when a contract would be entered into with GRS.

With no discussion, roll call vote was taken, and the motion passed unanimously.

VIII. EXPERIENCE ANALYSIS RECAP

MR. WORLEY invited MR. KERSHNER to present.

MR. KERSHNER stated that they would present a follow-up to the projected healthcare funded ratios, give an update on the experience study, and present the alternative assumption scenario.

MR. KERSHNER presented slide 4 that represented three scenarios with six years of returns. He then explained each scenario and noted that other than the asset returns, all valuation and projection assumptions were the same as those shown in the draft June 30, 2021, actuarial valuation reports.

MR. KERSHNER then moved to slide 6 which illustrated how the inflation rate directly affected various assumptions and liabilities. He noted that slide 7 illustrated various expert opinions and forecasts of inflation rates over the next 10, 20 and 30 years.

COMMISSIONER MAHONEY asked, jumping ahead to slide 8, if everyone was embracing the Fed's assumption, that inflation was transitory; MR. KERSHNER noted that when they look at actuarial assumptions, they ignore the short-term fluctuations and use the long-term outlook, because of the framing of the retirement systems.

CHAIR WILLIAMS asked if their two choices were to hold at 2.5 or reduce to 2.25 inflation rate; MR. WILLIAMS said if they were saying that inflation was transitory for one or two years, he could accept the fact that inflation might be high but would normalize within a couple of years.

MR. HIPPLER said that he did not think they should reduce their projected inflation.

DR. JENNINGS said he thought there will be transitory inflation for the next 10 or 20 years. He said the shorter-term numbers may be bigger but might also be helpful in framing the 2.5 number.

MR. KERSHNER moved to slide 10 which showed the current and proposed assumptions. He said the current assumptions were based on the last experience study with the four years ending in 2017 and the assumptions the Board adopted had been used since the 2018 valuations. He noted the proposed assumptions that the Board adopts in June will be used beginning with the 2022 valuations.

MR. KERSHNER said the next few slides through slide 14 showed two sets of proposed assumptions; he said proposal 1 was from the March meeting and proposal 2 was what they were asked to present. He then went through each slide which showed the current and proposed assumptions and gave a brief explanation. He explained that they had used the Getzen model that the state has used for the last years and had changed the inflation assumption from either two-and-a-half or two-and-three-quarter and let the model project out the various rates.

MR. KERSHNER said that slides 15 through 34 were the proposed demographic assumptions that were discussed at the March meeting and noted there was a general agreement with those proposed assumptions.

MR. KERSHNER said slide 36 showed the various cost effects of the assumptions by plan and various proposed assumptions.

CHAIR WILLIAMS noted that increase in return or keeping the return at the same had more of an impact that the inflation change. MR. KERSHNER said that was correct.

COMMISSIONER MAHONEY asked what the average rate of return had been; MR. WORLEY said that it was 8.33 for pers, and 8.37 for TRS for a 30-year average rate of return.

MR. HANNA said that it was the nominal return over 30 years for PERS and TRS.

MR. KERSHNER said slide 37 showed the various cost effects of the assumptions for TRS. He noted that the next two slides were the same story for the other plans.

CHAIR WILLIAMS recessed the meeting from 10:28 a.m. until 10:39 a.m.

IX. STAFF UPDATES

A. CIO Report

MR. HANNA gave a brief report noting that equities were down close to 14 percent through the end of April, that bonds were down on rising interest rates and the Fed had announced that they were increasing rates by 50 basis points and that the Bloomberg aggregate bond index was down 9.5 percent in April. He said that stocks and bonds were down fairly steeply through April so the DB portfolio through April was down 7.2 percent. He said for the fiscal year the plan was down 0.8 percent. He said the plans sizable allocation to real assets continue to perform very well which provided downside protection to the plans.

MR. HANNA said that as to the ARM Board's Russian investments, the Moscow Exchange did reopen at the end of March to local investors but remained closed to foreign investors so there was no

way to buy or sell Russian equities. He said all major stock indices had completed their process of dropping Russian securities. He said that staff directed a halt on the purchase of Russian securities and also instructed the custodian bank to hold Russian securities at a zero value until there is more reliable pricing information.
CHAIR WILLIAMS asked if fixed income would heal itself or if something fundamentally changed that might be a different landscape going forward. MR. HANNA said they would have to wait and see how it played out, adding that the general expectation was that those rates would probably continue to normalize. He added in regard to the equity market, the ARM Board's bond holdings were relatively low compared to peers and that they would likely have less impact than those with higher bond holdings.

B. Legal Report - None

C. Retirement & Benefits Division Report

MR. DESAI noted that the new DRB website had gone live as of May 3rd. He said it took them longer due to the amount of documentation in the database and how to populate it in the appropriate location.

MR. DESAI said they received Commissioner Vrana's approval for a one-year extension on the recordkeeper contract and that they would continue the RFP process next year. He said Empower was willing to reduce their rate if their contract would be extended further and that was still under consideration..

MR. DESAI presented the legislative report starting on page 49 of the pdf.

MR. DESAI said that they are working on providing notice regarding the Metcalfe case by May 31st. He said they were going to provide notice on the public websites, and local newspapers to meet the court's requirements and would continue to work to find a way to mail out notices during the paper shortage due to a paper mill closure.

CHAIR WILLIAMS commented that he had met with MR. PUCKETT and Empower regarding transparency of fee information on the website and having additional clarity on what options cost money. He said he looked forward to an update at the June meeting.

CHAIR WILLIAMS also asked about the possibility of adjustments to the rate of deferred compensation and fees. MR. DESAI reported that they had prepared a memo to the Commissioner and were hopeful that it would be approved, and they would provide an update in June.

X. UNFINISHED BUSINESS - None

XI. NEW BUSINESS - None

XII. OTHER MATTERS TO PROPERLY COME BEFORE THE BOARD - None

XIII. PUBLIC/MEMBERS COMMENTS –None

XIV. INVESTMENT ADVISORY COUNCIL COMMENTS

MR. RYERSON commented that she was fairly conservative and preferred to keep the actuarial rates at 2.5 percent but if she had to choose between the total rate of 7 or 7-and-a-quarter, she would go with 7.

DR. MITHCELL said that he wrestles with how to incorporate short-term information with long-term forecasts and that he did not know if the Feds had the answer. He said that he would go along with the actuary's suggestions and Callan's long-term estimates.

CHAIR WILLIAMS noted that DR. JENNINGS had no further comments.

XV. TRUSTEE COMMENTS

MS. RYAN thanked the RPF proposal evaluation committee and team for their hard work.

CHAIR WILLIAMS also thanked the proposal evaluation committee and everyone for taking their tine to go through the packet and discuss the issues.

XVI. FUTURE AGENDA ITEMS - None.

IVII. ADJOURNMENT

MS. RYAN moved to adjourn the meeting. MR. KROHN seconded the motion. The motion passed without objection.

The meeting was adjourned at 11:09 a.m.

ATTEST:

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Corporate Secretary

Note: An outside contractor recorded the meeting and prepared the summary minutes. For in-depth discussion and more presentation details, please refer to the recording of the meeting and presentation materials on file at the ARMB office.

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Disclosure – Communications – Calendar Update
June 16, 2022

The 1st Quarter Disclosure Memorandum is included in the packet; no disclosure transactions require additional review or discussion.

The Communications Memorandum lists communications directed to the Board since the March 17-18, 2022 Board of Trustees meeting, as well as a summary of public records requests received between March 1 and May 31, 2022.

The remaining 2022 meeting calendar is attached, along with the proposed 2023 meeting calendar.

POTENTIAL ACTION: The Board may decide to adopt the 2023 ARMB Meeting Calendar.

The ARMB website will be updated to reflect the most current calendars.

A copy of the timeline showing contract and review deadlines for FY2022 through FY2027 is included for reference.

ALASKA RETIREMENT MANAGEMENT BOARD
M E M O R A N D U M

To: ARMB Trustees
From: Alysia Jones
Date: 5/31/2022
Subject: Financial Disclosures

As required by AS 37.10.230 and Alaska Retirement Management Board policy relating to investment conduct and reporting, trustees and staff must disclose certain financial interests. We are hereby submitting to you a list of disclosures for individual transactions made by trustees and staff.

1st Quarter January 1, 2022 – March 31, 2022

Name	Position Title	Disclosure Type	Disclosure Date
Hunter Romberg	Investment Data Analyst	Equities	4/01/2022
Donald Krohn	ARMB Trustee	Equities/ Options	4/05/2022
Jerrold Mitchell	Investment Advisory Council Member	Equities	4/08/2022
Allen Hippler	ARMB Trustee	Equities	4/15/2022

ALASKA RETIREMENT MANAGEMENT BOARD
M E M O R A N D U M

To: ARMB Trustees
From: Alysia Jones
Date: May 31, 2022
Subject: Communications & Information Requests

Communications to Trustees
The following is a list of communications directed to the Board, that were received since the March 17-18, 2022 Board of Trustees meeting.

Name	Type	Date	Topic
Katie Campbell	Email	3/28/2022	Inflation Protected Investment Options
Linda Green (on behalf of Dr. Michael Wasserman)	Email	5/18/2022	Investment governance relating to a company held in the S&P 600 index

Communications Sent on behalf of the Board
There are no communications to report.

Public Records Requests
From March 1, 2022 to May 31, 2022

Topics	# of Requests	Description
Investment Portfolio	9	Portfolio performance data, Investment pools, hedge funds/absolute return, real estate, and private debt
Legal information	1	Depositions from *Alaska Retirement Management Board v. Mercer, Inc.*
Meeting Materials	1	Summary of Board Actions
Procurement / Contracts	3	Investment manager contract information, RFP Proposals and scoring information

ALASKA RETIREMENT MANAGEMENT BOARD
Remaining 2022 Meeting Calendar

DATE	LOCATION	DESCRIPTION
June 15 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
June 16-17 Thursday - Friday	**Anchorage, AK**	**Board of Trustees Meeting:** *Final Actuary Reports/Adopt Valuation* *Adopt Asset Allocation* *Performance Measurement - 1st Quarter* *Manager Review (FY22 Questionnaire)* *Manager Presentations*
September 14 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
September 15-16 Thursday - Friday	**Anchorage, AK**	**Board of Trustees Meeting:** *Set Contribution Rates* *Audit Results/Assets – Auditor* *Approve Budget* *Performance Measurement – 2nd Quarter* *Real Estate Annual Plan* *Real Assets Evaluation – Callan LLC* *Manager Presentations*
October 11 Tuesday *(placeholder)*	Videoconference	Audit Committee
November 30 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
December 1-2 Thursday-Friday	**Anchorage, AK**	**Board of Trustees Meeting:** *Audit Report - DRB Auditor* *Performance Measurement – 3rd Quarter* *Manager Review (FY23 Questionnaire)* *Private Equity Evaluation - Callan LLC* *Review Private Equity Annual Plan* *Cybersecurity* *Manager Presentations*

NOTE: Meeting locations and topics are subject to change.

Updated: 5/31/2022

ALASKA RETIREMENT MANAGEMENT BOARD
2023 DRAFT Meeting Calendar

DATE	LOCATION	DESCRIPTION
March 15 Wednesday	Juneau, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
March 16-17 Thursday-Friday	**Juneau, AK**	**Board of Trustees Meeting:** *Performance Measurement – 4th Quarter* *Buck Draft Actuarial Report/GRS Draft Actuary Certification* *Capital Markets – Asset Allocation* *Manager Presentations*
April 27* Thursday	Videoconference	Actuarial Committee *Follow-up/additional discussion/questions on valuations*
April 28* Friday	**Videoconference**	**Board of Trustees Meeting**
June 14 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
June 15-16 Thursday - Friday	**Anchorage, AK**	**Board of Trustees Meeting:** *Final Actuary Reports/Adopt Valuation* *Adopt Asset Allocation* *Performance Measurement - 1st Quarter* *Manager Presentations*
September 13 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
September 14-15 Thursday - Friday	**Anchorage, AK**	**Board of Trustees Meeting:** *Set Contribution Rates* *Audit Results/Assets – Auditor* *Approve Budget* *Performance Measurement – 2nd Quarter* *Real Estate Annual Plan* *Real Assets Evaluation – Callan LLC* *Manager Presentations*
October 10 Tuesday *(placeholder)*	Videoconference	Audit Committee
December 6 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
December 7-8 Thursday-Friday	**Anchorage, AK**	**Board of Trustees Meeting:** *Audit Report - DRB Auditor* *Performance Measurement – 3rd Quarter* *Manager Review (Questionnaire)* *Private Equity Evaluation - Callan LLC* *Review Private Equity Annual Plan* *Cybersecurity* *Manager Presentations*

NOTE: Meeting locations and topics are subject to change.

**Meetings to be held as necessary*

ARMB Timeline of Contract and Review Deadlines FY2022 - FY2027

FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Trustee Appointments/ Nominations for Terms Ending 3/01/2022 *PERS - R. Johnson* *TRS - G. Harbo*	**Trustee Appointments/ Nominations for Terms Ending 3/01/2023** *Finance Officer - L. Bretz* *Public - A. Hippler*	**Trustee Appointments/ Nominations for Terms Ending 3/01/2024** *Public - D. Krohn* *PERS - D. Moen* *TRS - B. Williams*		**Trustee Appointments/ Nominations for Terms Ending 3/01/2026** *PERS - TBD* *TRS - TBD*	**Trustee Appointments/ Nominations for Terms Ending 3/01/2027** *Finance Officer - TBD* *Public - TBD*
	IAC Appointments *Seat 1 - R. Ryerson* Sept 2022 agenda Effective Date: 1/1/2023 *Seat 3 - W. Jennings* Mar 2023 agenda Effective Date: 7/01/2023 (FY24)	**IAC Appointments** *Seat 2 - J. Mitchell* March 2024 agenda Effective Date: 7/01/2024 (FY25)		**IAC Appointments** *Seat 1 - TBD* Sept 2025 agenda Effective Date: 1/01/2026 *Seat 2 - TBD* March 2025 agenda Effective Date: 7/01/2026 (FY27)	**IAC Appointments** *Seat 3 - TBD* March 2027 agenda Effective Date: 7/01/207 (FY28)
Performance Measurement - General Consultant Contract (TRSY) *1st Renewal Option -Callan LLC* Approved - March 17, 2022 Effective Date: 7/1/2022 (FY23)	**Performance Measurement (General) Consultant Contract (TRSY)** *2nd Renewal Option - Callan LLC* March 2023 agenda Effective Date: 7/01/2023 (FY24)	**Performance Measurement (General) Consultant Contract (TRSY)** *RFP - March 2024* Effective Date: 7/01/2024 (FY25)			**Performance Measurement - General Consultant Contract (TRSY)** *1st Renewal Option or RFP -* TBD March 2027 agenda Effective Date: 7/1/2027 (FY28)
		Performance Consultant Review (TRSY) AS 37.10.220(a)(11) *RFP - March 2024* Presentation Sept 2024 (FY25)			
Real Assets Consultant Contract (TRSY) *1st Renewal Option -Callan LLC* Approved - March 17, 2022 Effective Date: 7/1/2022 (FY23)	**Real Assets Consultant Contract (TRSY)** *2nd Renewal Option -Callan LLC* March 2023 agenda Effective Date: 7/01/2023 (FY24)	**Real Assets Consultant Contract (TRSY)** *RFP - March 2024* Effective Date: 7/01/2024 (FY25)			**Real Assets Consultant Contract** *1st Renewal Option or RFP* - TBD March 2027 agenda Effective Date: 7/1/2027 (FY28)
		Asset Liability Study (TRSY) *Recommendation: Every 5 years*			
	Actuary Contract (DRB) AS 37.10.220(a)(8 & 9) *3yr Renewal Option - Buck* March 2023 agenda Effective Date: 7/01/2023 (FY24)			**Actuary Contract (DRB)** AS 37.10.220(a)(8 & 9) *2yr Renewal Option - Buck* March 2026 agenda Effective Date: 7/01/2026 (FY27)	
Review Actuary Contract (TRSY) AS 37.10.220(a)(9) Approved (GRS) - May 4, 2022 Effective Date: 7/01/2022 (FY23)			**Review Actuary Contract (TRSY)** AS 37.10.220(a)(9) *2yr Renewal Option* March 2025 agenda Effective Date: 7/01/2025 (FY26)		**Review Actuary Contract (TRSY)** AS 37.10.220(a)(9) *2 yr Renewal Option* March 2027 *agenda* Effective Date: 7/01/2027 (FY28)
			Actuarial Audit RFP (TRSY) AS 37.10.220(a)(10) RFP March 2025 Effective Date: 7/01/2025 (FY26)		
Actuarial Valuations AS 37.10.220(a)(8)	**Actuarial Valuations** AS 37.10.220(a)(8)	**Actuarial Valuations** AS 37.10.220(a)(8)	**Actuarial Valuations** AS 37.10.220(a)(8)	**Actuarial Valuations** AS 37.10.220(a)(8)	**Actuarial Valuations** AS 37.10.220(a)(8)
Actuarial Experience Analysis AS 37.10.220(a)(9)			**Actuarial Experience Analysis** AS 37.10.220(a)(9)		
	Recordkeeper RFP (DRB) 1 yr Extension Approved/ RFP TBD Effective Date: TBD				
		Auditor (DRB) *2nd Renewal Option - KPMG* Effective Date: 7/01/2024 (FY25)			

Updated: 5/31/2022

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Fund Financials – Cash Flow Report
June 16, 2022

Ryan Kauzlarich, Assistant State Comptroller, Department of Revenue

As of April 2022 month-end, total plan assets were as follows: PERS - $23.5 billion, TRS - $10.9 billion, JRS - $277.9 million, NGNMRS - $46.1 million, SBS - $4.6 billion, DCP - $1.1 billion. Total non-participant directed plans totaled $32.1 billion, and participant-directed plans totaled $8.4 billion. Total assets were $40.5 billion.

Year-to-date income was $(814.5) million, and the plans experienced a net withdrawal of $918.4 million. Total assets were down 4.10% year-to-date.

Internally managed assets totaled $15.9 billion.

As of month-end, all plans were within their asset allocations bands.

Kevin Worley, Chief Financial Officer, Division of Retirement and Benefits

Presented is the Division of Retirement and Benefits (DRB) Supplement to the Treasury Division's Financial Report as of April 30, 2022.

DRB's supplement report expands on the ARMB Financial Report column "Net Contributions (Withdrawals)" located on pages 1 and 2. DRB reports the summary totals of actual employee and employer, State of Alaska, and other revenue items, as well as benefit payments, refunds & disbursements, and combined administrative & investment expenditures. DRB's supplement report presents cash inflows and outflows for the 10-months ended April 30, 2022 (page 1) and for the month of April 2022 (page 2).

Also presented are participant-directed distributions by plan and by type for the year-to-date period on page 3. This page includes Tier information on the defined benefit refunds, and vested percentage on defined contribution distributions.

"Notes for the DRB Supplement to the Treasury Report" includes information for the pension and healthcare plans. Additional information regarding other income is also presented on pages 4 and 5.

ALASKA RETIREMENT MANAGEMENT BOARD
FINANCIAL REPORT

As of April 30, 2022

ALASKA RETIREMENT MANAGEMENT BOARD
Schedule of Investment Income and Changes in Invested Assets by Fund
Fiscal Year-to-Date through April 30, 2022

	Beginning Invested Assets	Investment Income [1]	Net Contributions (Withdrawals)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income [2]
Public Employees' Retirement System (PERS)						
Defined Benefit Plans:						
Retirement Trust	$ 11,697,812,951	$ (72,356,682)	$ (321,546,432)	$ 11,303,909,837	-3.37%	-0.63%
Retirement Health Care Trust	9,655,275,640	(64,657,958)	(287,364,126)	9,303,253,556	-3.65%	-0.68%
Total Defined Benefit Plans	21,353,088,591	(137,014,640)	(608,910,558)	20,607,163,393	-3.49%	-0.65%
Defined Contribution Plans:						
Participant Directed Retirement	1,964,383,666	(156,136,631)	82,547,802	1,890,794,837	-3.75%	-7.78%
Health Reimbursement Arrangement	670,208,687	(6,602,716)	40,994,846	704,600,817	5.13%	-0.96%
Retiree Medical Plan	200,227,739	(2,006,805)	13,463,242	211,684,176	5.72%	-0.97%
Defined Benefit Occupational Death and Disability:						
Public Employees	41,171,441	(431,157)	3,247,462	43,987,746	6.84%	-1.01%
Police and Firefighters	17,708,969	(172,249)	1,030,199	18,566,919	4.84%	-0.95%
Total Defined Contribution Plans	2,893,700,502	(165,349,558)	141,283,551	2,869,634,495	-0.83%	-5.58%
Total PERS	**24,246,789,093**	**(302,364,198)**	**(467,627,007)**	**23,476,797,888**	-3.18%	-1.26%
Teachers' Retirement System (TRS)						
Defined Benefit Plans:						
Retirement Trust	6,614,621,768	(36,673,178)	(245,258,046)	6,332,690,544	-4.26%	-0.56%
Retirement Health Care Trust	3,671,369,667	(25,120,571)	(95,083,413)	3,551,165,683	-3.27%	-0.69%
Total Defined Benefit Plans	10,285,991,435	(61,793,749)	(340,341,459)	9,883,856,227	-3.91%	-0.61%
Defined Contribution Plans:						
Participant Directed Retirement	812,550,138	(65,144,774)	26,900,718	774,306,082	-4.71%	-7.89%
Health Reimbursement Arrangement	196,700,402	(1,874,973)	9,849,287	204,674,716	4.05%	-0.93%
Retiree Medical Plan	65,764,221	(609,859)	2,879,096	68,033,458	3.45%	-0.91%
Defined Benefit Occupational Death and Disability	6,479,434	(59,273)	253,971	6,674,132	3.00%	-0.90%
Total Defined Contribution Plans	1,081,494,195	(67,688,879)	39,883,072	1,053,688,388	-2.57%	-6.15%
Total TRS	**11,367,485,630**	**(129,482,628)**	**(300,458,387)**	**10,937,544,615**	-3.78%	-1.15%
Judicial Retirement System (JRS)						
Defined Benefit Plan Retirement Trust	238,747,285	(1,572,430)	(1,250,883)	235,923,972	-1.18%	-0.66%
Defined Benefit Retirement Health Care Trust	42,511,516	(313,760)	(238,932)	41,958,824	-1.30%	-0.74%
Total JRS	**281,258,801**	**(1,886,190)**	**(1,489,815)**	**277,882,796**	-1.20%	-0.67%
National Guard/Naval Militia Retirement System (MRS)						
Defined Benefit Plan Retirement Trust	49,296,334	(1,587,665)	(1,646,736)	46,061,933	-6.56%	-3.28%
Other Participant Directed Plans						
Supplemental Annuity Plan	5,064,367,505	(306,654,870)	(114,626,169)	4,643,086,466	-8.32%	-6.12%
Deferred Compensation Plan	1,217,085,734	(72,498,345)	(32,573,003)	1,112,014,386	-8.63%	-6.04%
Total All Funds	**42,226,283,097**	**(814,473,896)**	**(918,421,117)**	**40,493,388,084**		
Total Non-Participant Directed	33,167,896,054	(214,039,276)	(880,670,465)	32,073,186,313	-3.30%	-0.65%
Total Participant Directed	9,058,387,043	(600,434,620)	(37,750,652)	8,420,201,771	-7.05%	-6.64%
Total All Funds	**$ 42,226,283,097**	**$ (814,473,896)**	**$ (918,421,117)**	**$ 40,493,388,084**	**-4.10%**	**-1.95%**

Notes:

(1) Includes interest, dividends, securities lending, expenses, realized and unrealized gains/losses

(2) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates and can be found at: http://treasury.dor.alaska.gov/armb/Reports-and-Policies/Investment-Performance.aspx

ALASKA RETIREMENT MANAGEMENT BOARD
Schedule of Investment Income and Changes in Invested Assets by Fund
For the Month Ended April 30, 2022

	Beginning Invested Assets	Investment Income (1)	Net Contributions (Withdrawals)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (2)
Public Employees' Retirement System (PERS)						
Defined Benefit Plans:						
Retirement Trust	$ 11,789,237,391	$ (444,124,792)	$ (41,202,762)	$ 11,303,909,837	-4.12%	-3.77%
Retirement Health Care Trust	9,694,758,496	(366,885,058)	(24,619,882)	9,303,253,556	-4.04%	-3.79%
Total Defined Benefit Plans	21,483,995,887	(811,009,850)	(65,822,644)	20,607,163,393	-4.08%	-3.78%
Defined Contribution Plans:						
Participant Directed Retirement	2,011,244,638	(131,962,277)	11,512,476	1,890,794,837	-5.99%	-6.54%
Health Reimbursement Arrangement	727,920,398	(27,663,027)	4,343,446	704,600,817	-3.20%	-3.79%
Retiree Medical Plan	218,545,771	(8,306,906)	1,445,311	211,684,176	-3.14%	-3.79%
Defined Benefit Occupational Death and Disability:						
Public Employees	45,379,733	(1,725,670)	333,683	43,987,746	-3.07%	-3.79%
Police and Firefighters	19,175,593	(728,765)	120,091	18,566,919	-3.17%	-3.79%
Total Defined Contribution Plans	3,022,266,133	(170,386,645)	17,755,007	2,869,634,495	-5.05%	-5.62%
Total PERS	**24,506,262,020**	**(981,396,495)**	**(48,067,637)**	**23,476,797,888**	-4.20%	-4.01%
Teachers' Retirement System (TRS)						
Defined Benefit Plans:						
Retirement Trust	6,618,804,656	(249,098,578)	(37,015,534)	6,332,690,544	-4.32%	-3.77%
Retirement Health Care Trust	3,698,109,709	(139,993,813)	(6,950,213)	3,551,165,683	-3.97%	-3.79%
Total Defined Benefit Plans	10,316,914,365	(389,092,391)	(43,965,747)	9,883,856,227	-4.20%	-3.78%
Defined Contribution Plans:						
Participant Directed Retirement	825,389,441	(54,594,006)	3,510,647	774,306,082	-6.19%	-6.60%
Health Reimbursement Arrangement	211,491,573	(8,036,731)	1,219,874	204,674,716	-3.22%	-3.79%
Retiree Medical Plan	70,329,035	(2,671,834)	376,257	68,033,458	-3.26%	-3.79%
Defined Benefit Occupational Death and Disability	6,904,571	(262,248)	31,809	6,674,132	-3.34%	-3.79%
Total Defined Contribution Plans	1,114,114,620	(65,564,819)	5,138,587	1,053,688,388	-5.42%	-5.87%
Total TRS	**11,431,028,985**	**(454,657,210)**	**(38,827,160)**	**10,937,544,615**	-4.32%	-3.98%
Judicial Retirement System (JRS)						
Defined Benefit Plan Retirement Trust	245,730,746	(9,256,077)	(550,697)	235,923,972	-3.99%	-3.77%
Defined Benefit Retirement Health Care Trust	43,403,906	(1,648,172)	203,090	41,958,824	-3.33%	-3.79%
Total JRS	**289,134,652**	**(10,904,249)**	**(347,607)**	**277,882,796**	-3.89%	-3.77%
National Guard/Naval Militia Retirement System (MRS)						
Defined Benefit Plan Retirement Trust	48,004,385	(1,775,596)	(166,856)	46,061,933	-4.05%	-3.71%
Other Participant Directed Plans						
Supplemental Annuity Plan	4,912,877,506	(265,208,822)	(4,582,218)	4,643,086,466	-5.49%	-5.40%
Deferred Compensation Plan	1,183,923,375	(68,581,296)	(3,327,693)	1,112,014,386	-6.07%	-5.80%
Total All Funds	**42,371,230,923**	**(1,782,523,668)**	**(95,319,171)**	**40,493,388,084**		
Total Non-Participant Directed	33,437,795,963	(1,262,177,267)	(102,432,383)	32,073,186,313	-4.08%	-3.78%
Total Participant Directed	8,933,434,960	(520,346,401)	7,113,212	8,420,201,771	-5.75%	-5.82%
Total All Funds	**$ 42,371,230,923**	**$ (1,782,523,668)**	**$ (95,319,171)**	**$ 40,493,388,084**	**-4.43%**	**-4.21%**

Notes:

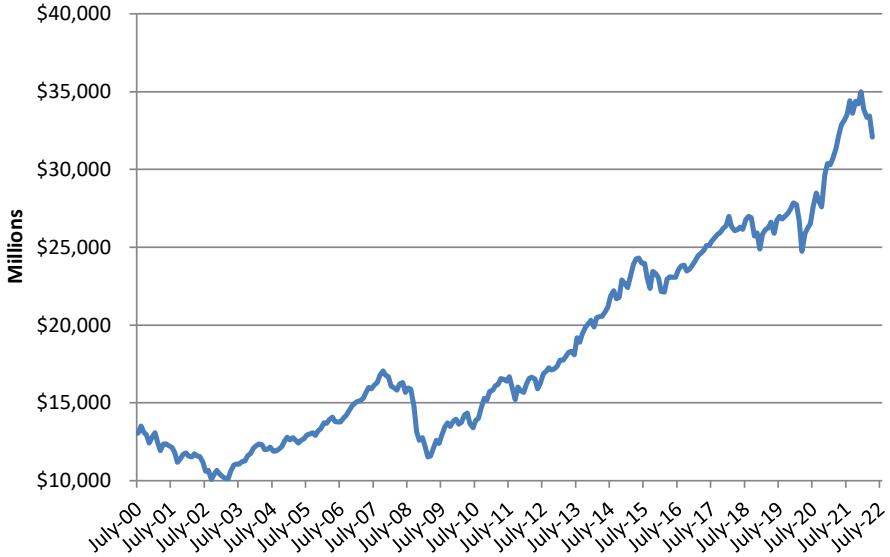
(1) Includes interest, dividends, securities lending, expenses, realized and unrealized gains/losses

(2) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates and can be found at: http://treasury.dor.alaska.gov/armb/Reports-and-Policies/Investment-Performance.aspx

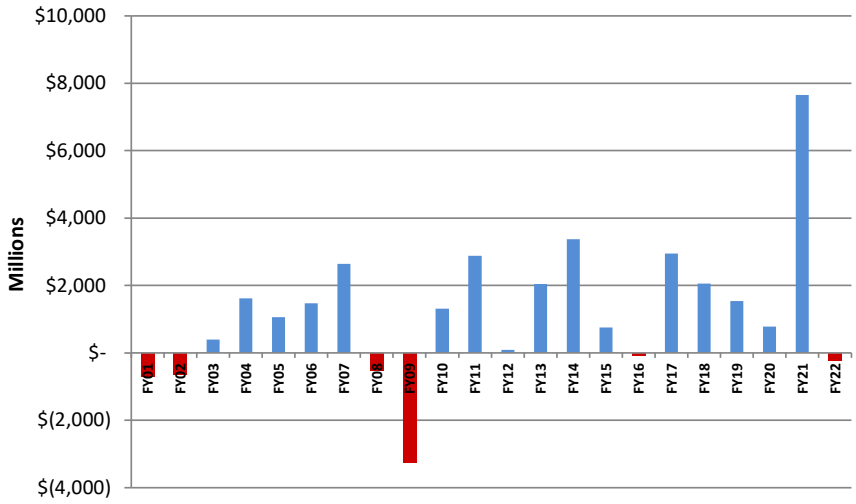
Total Non Participant Directed Assets

As of April 30, 2022

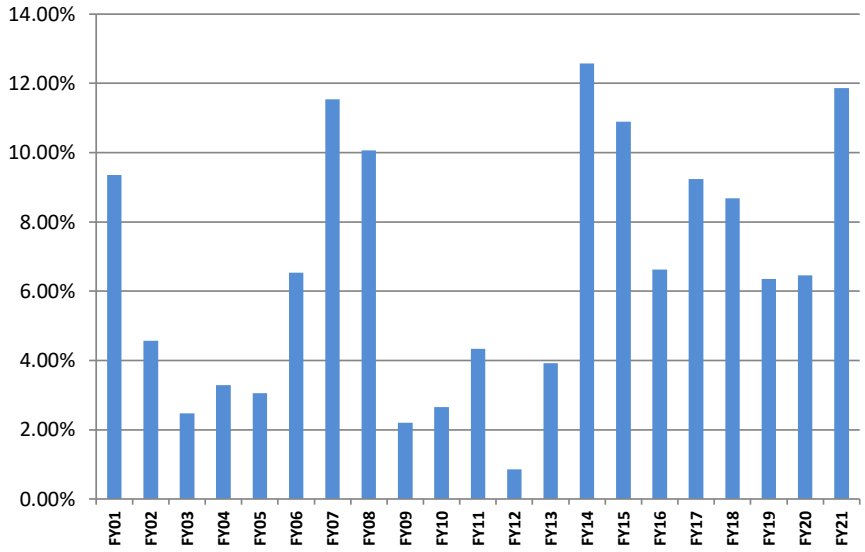
Total Assets History



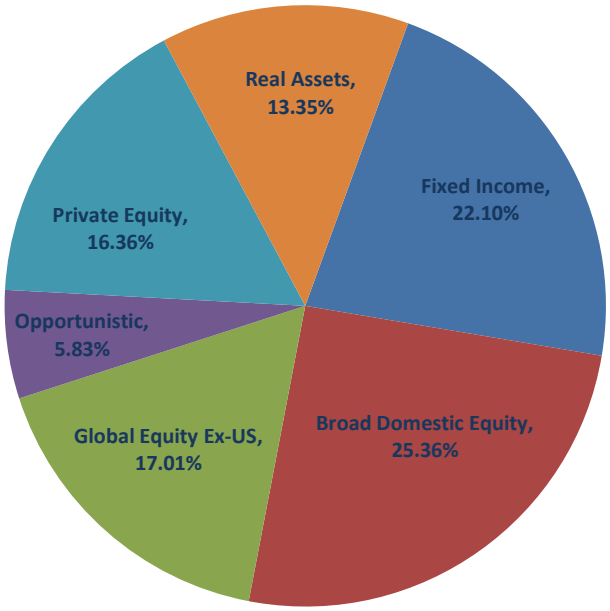
Income by Fiscal Year



5-year Annualized Returns as of Fiscal Year End

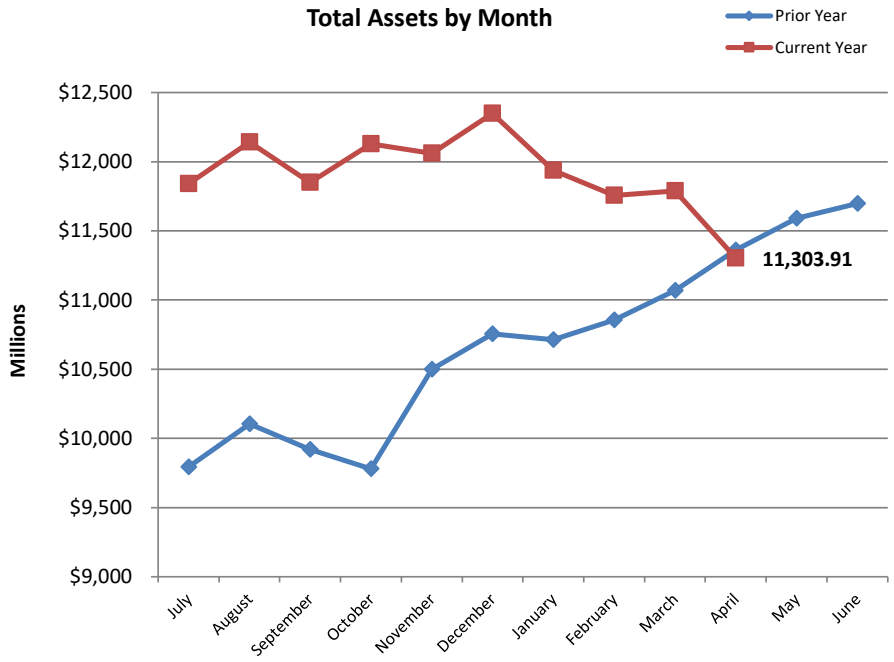


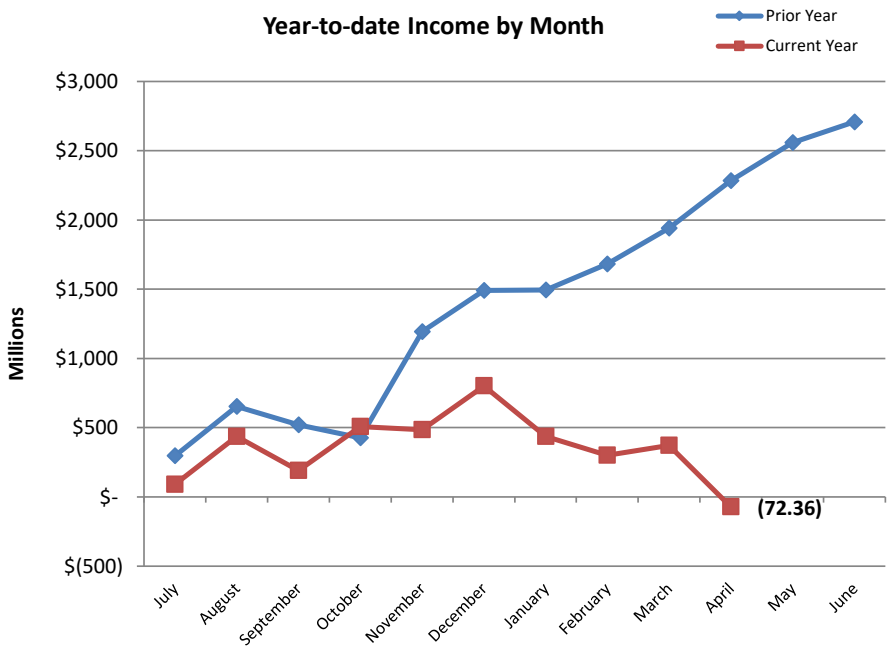
Actual Asset Allocation

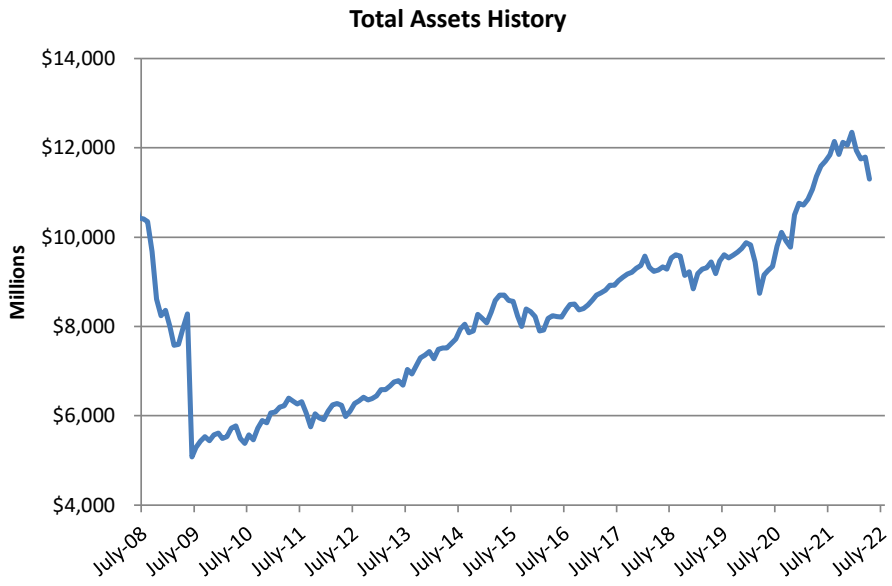


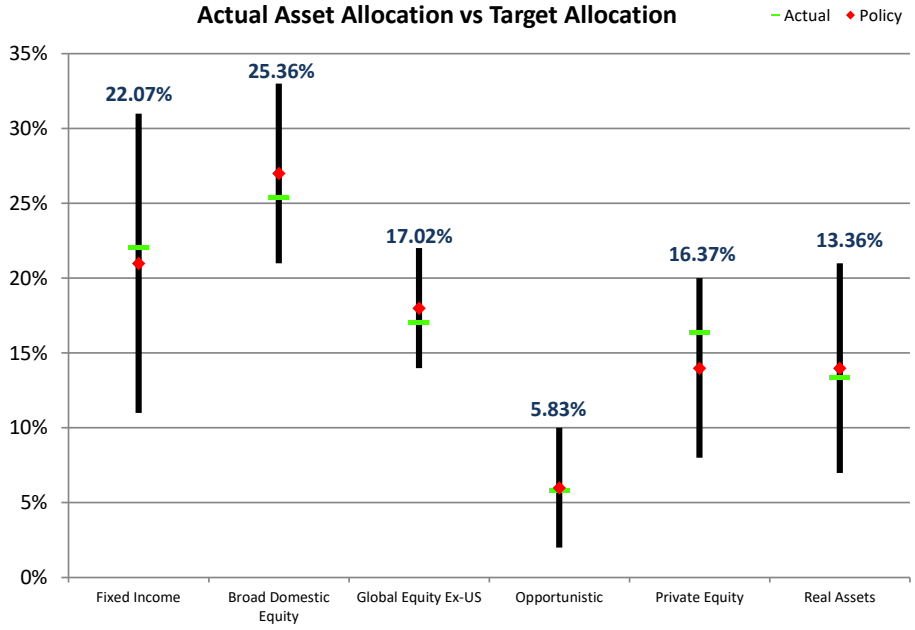
Public Employees' Retirement Pension Trust Fund

Fiscal Year-to-Date through April 30, 2022



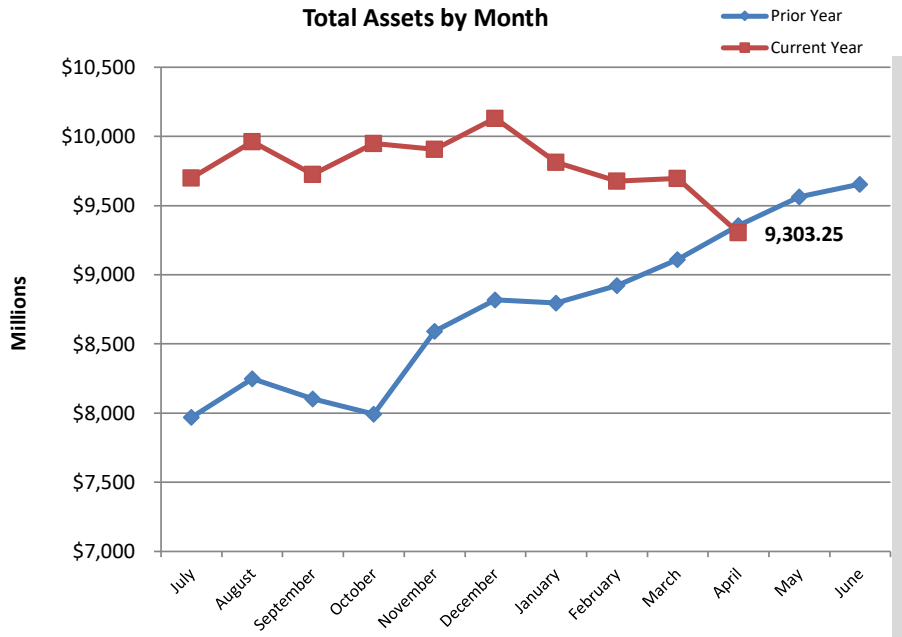


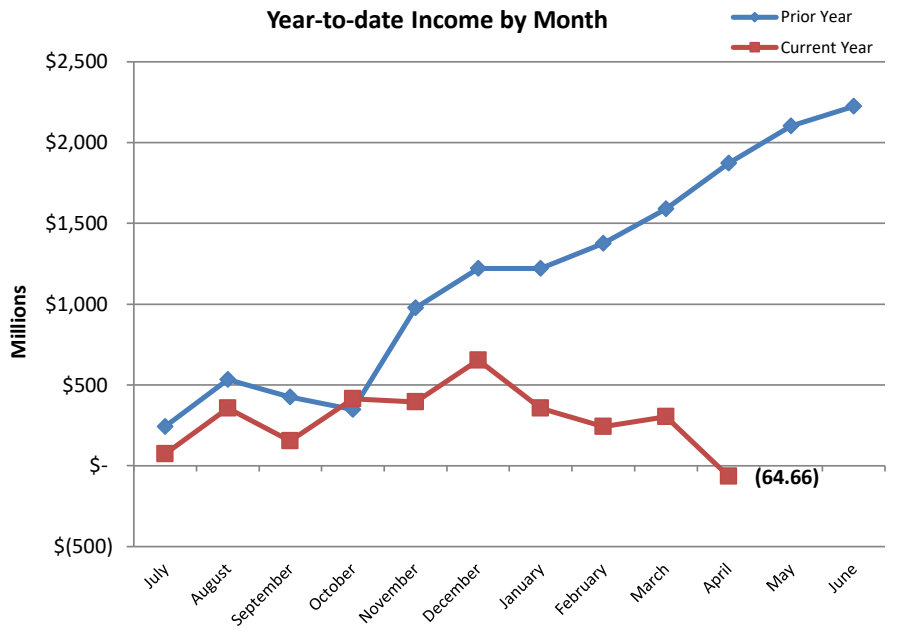


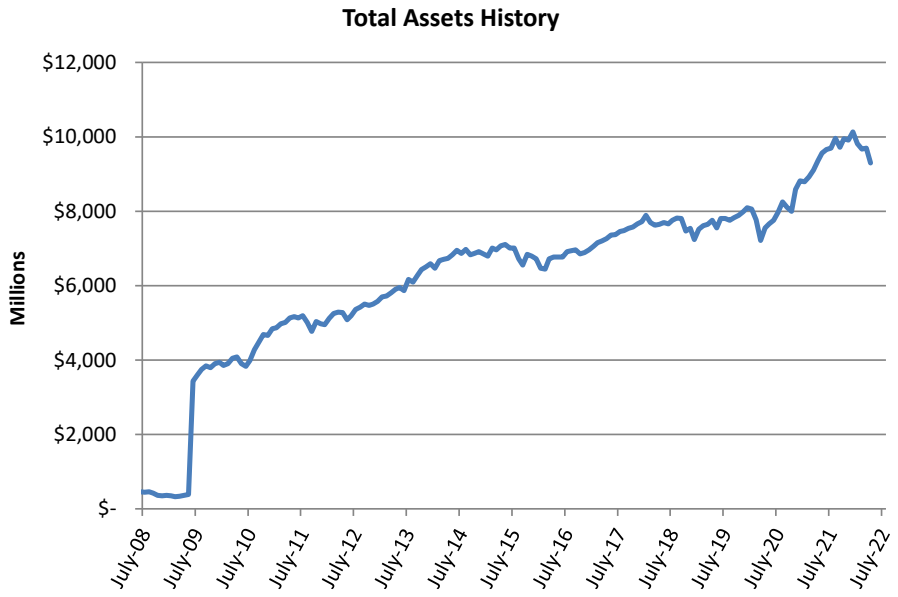


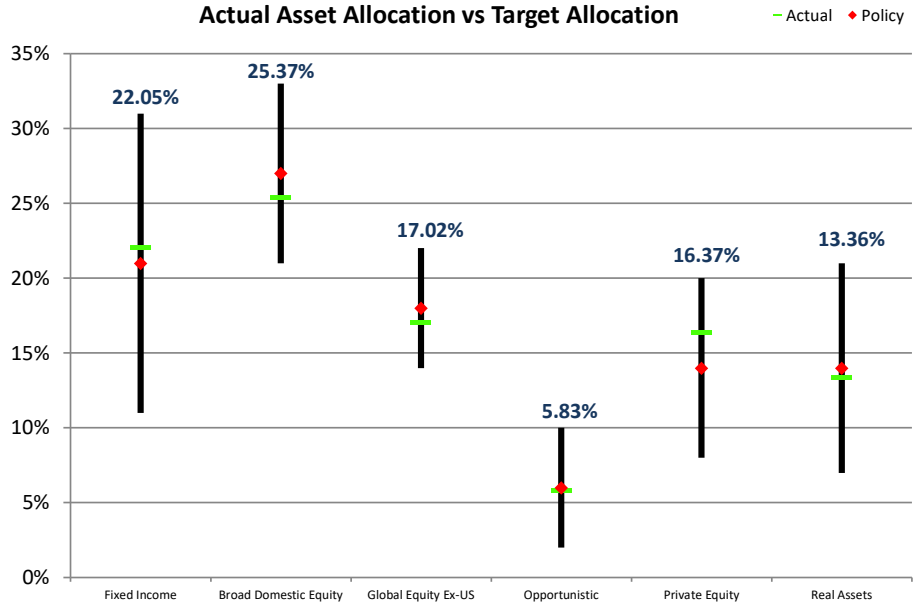
Public Employees' Retirement Health Care Trust Fund

Fiscal Year-to-Date through April 30, 2022



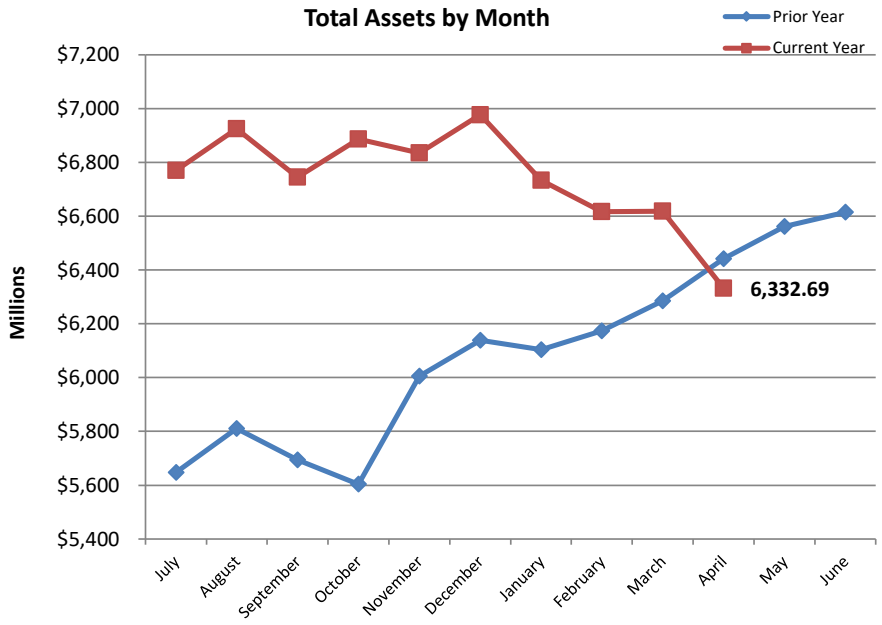


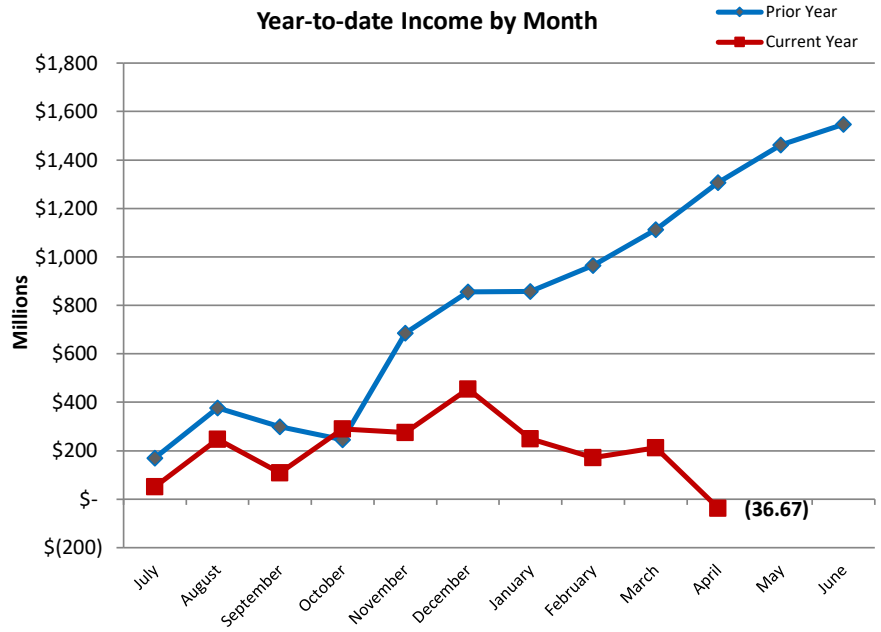


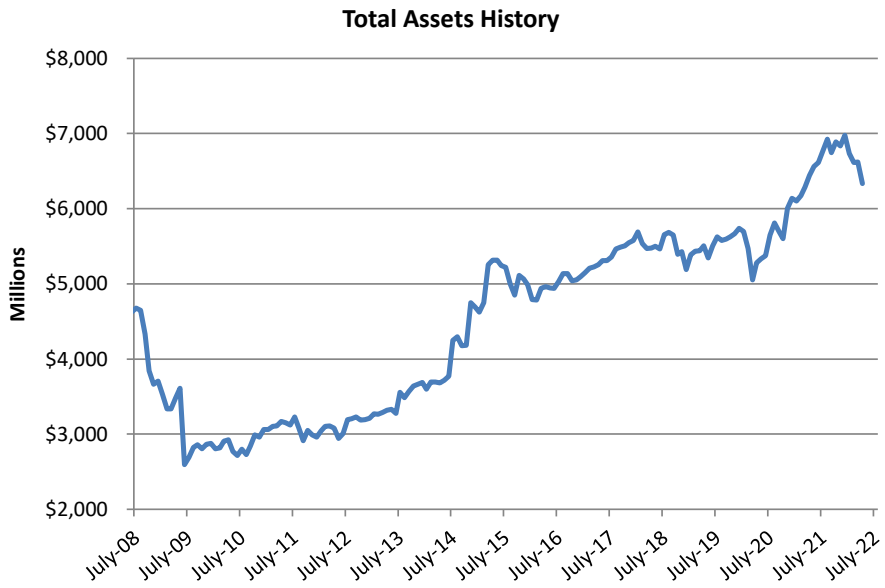


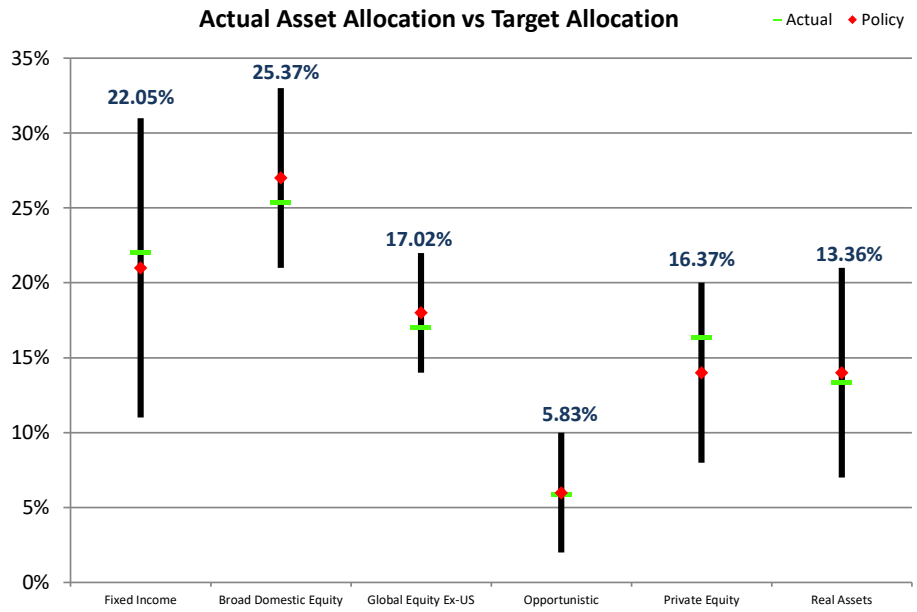
Teachers' Retirement Pension Trust Fund

Fiscal Year-to-Date through April 30, 2022



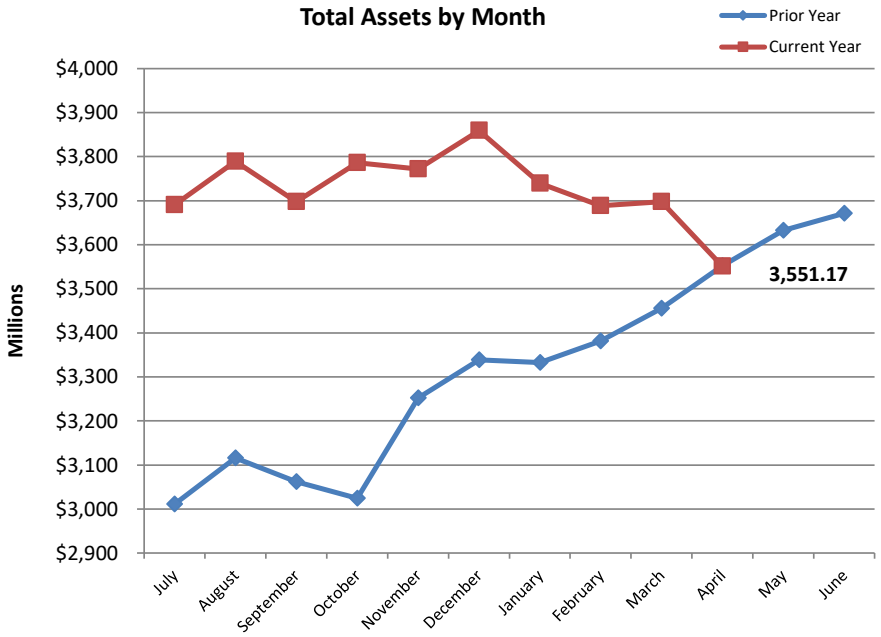


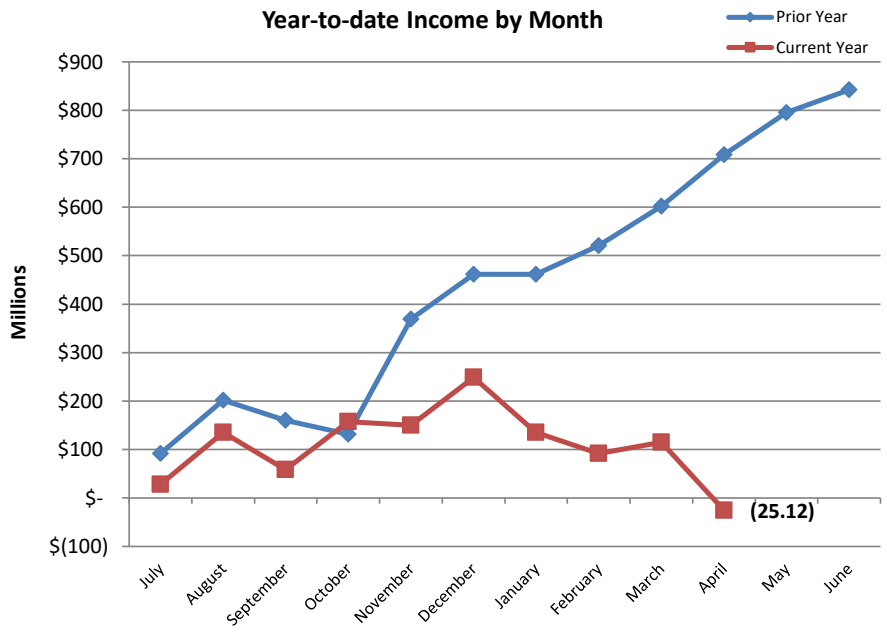


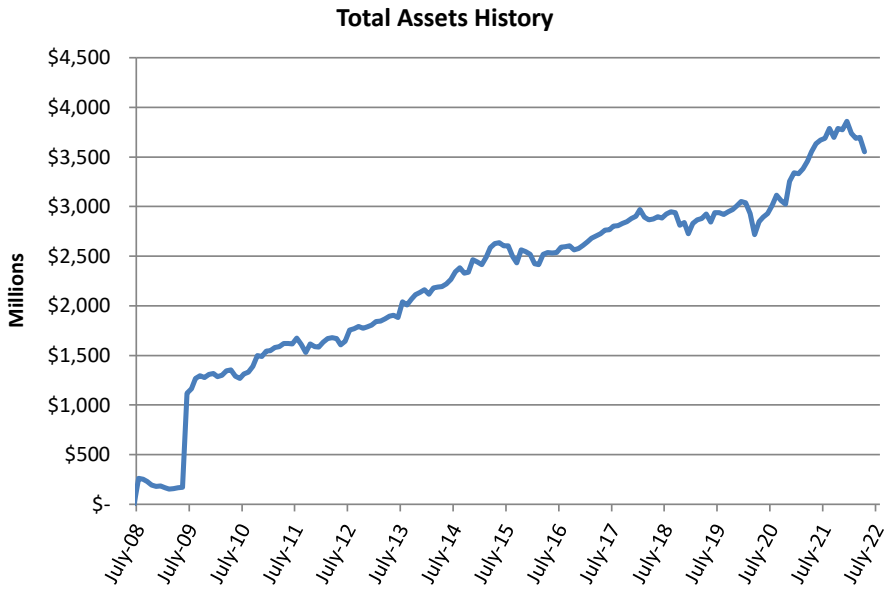


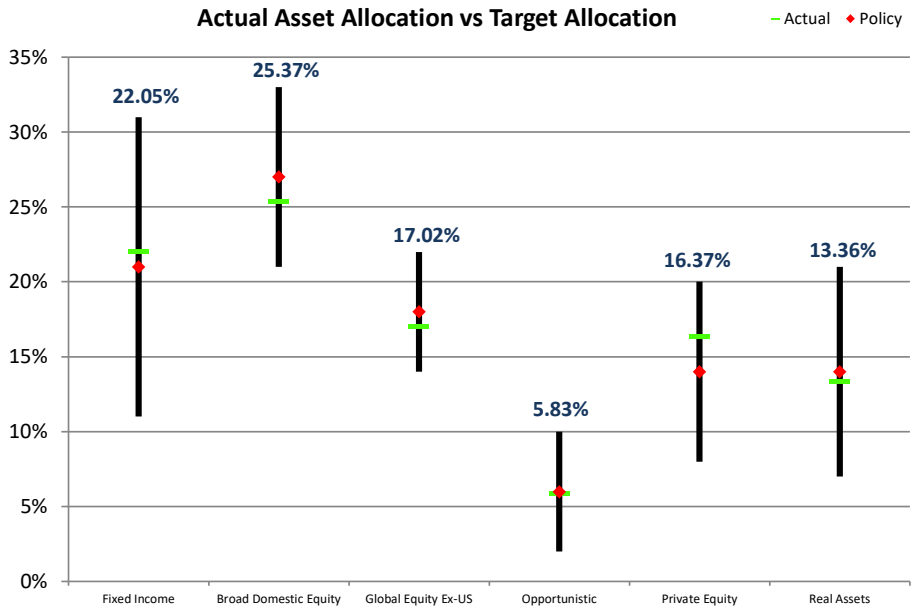
Teachers' Retirement Health Care Trust Fund

Fiscal Year-to-Date through April 30, 2022



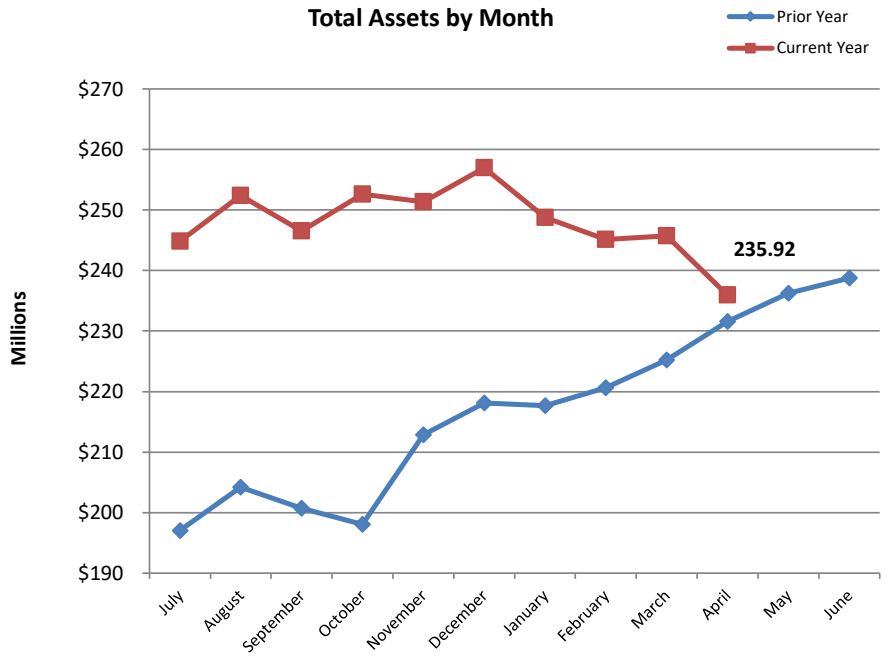


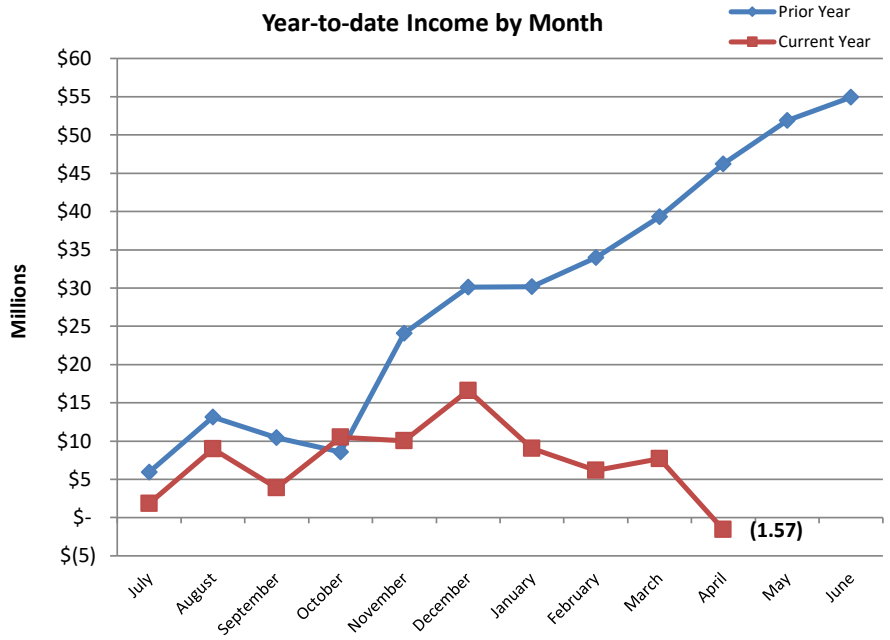


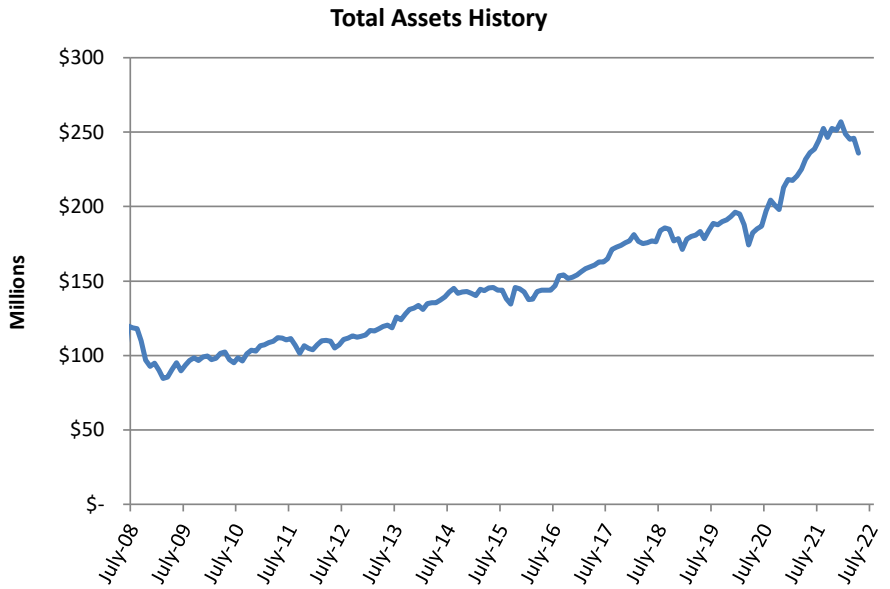


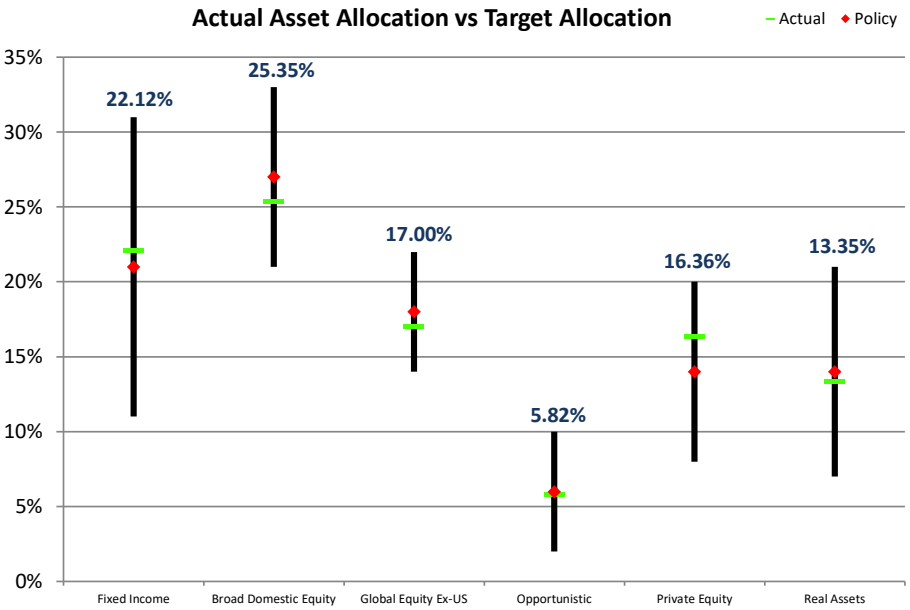
Judicial Retirement Pension Trust Fund

Fiscal Year-to-Date through April 30, 2022



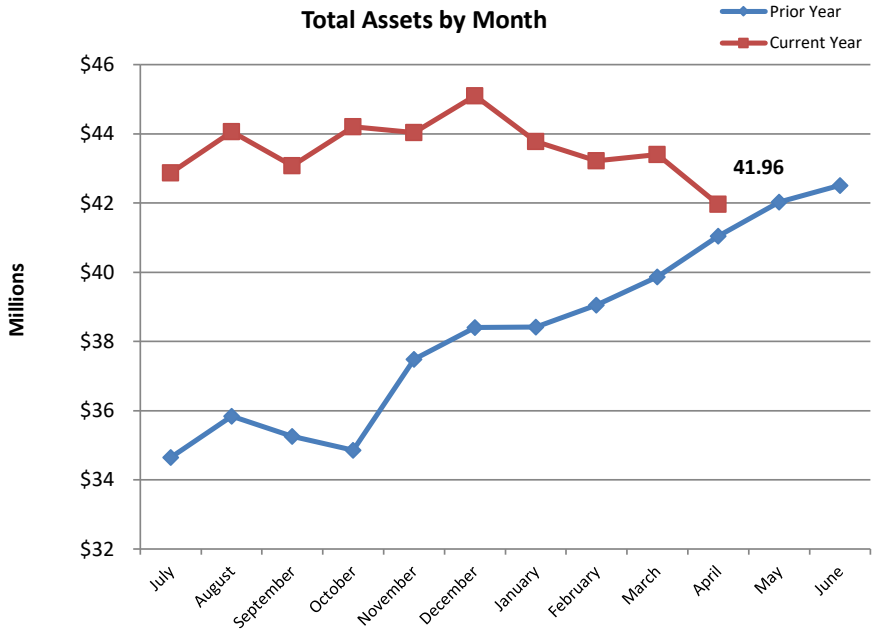


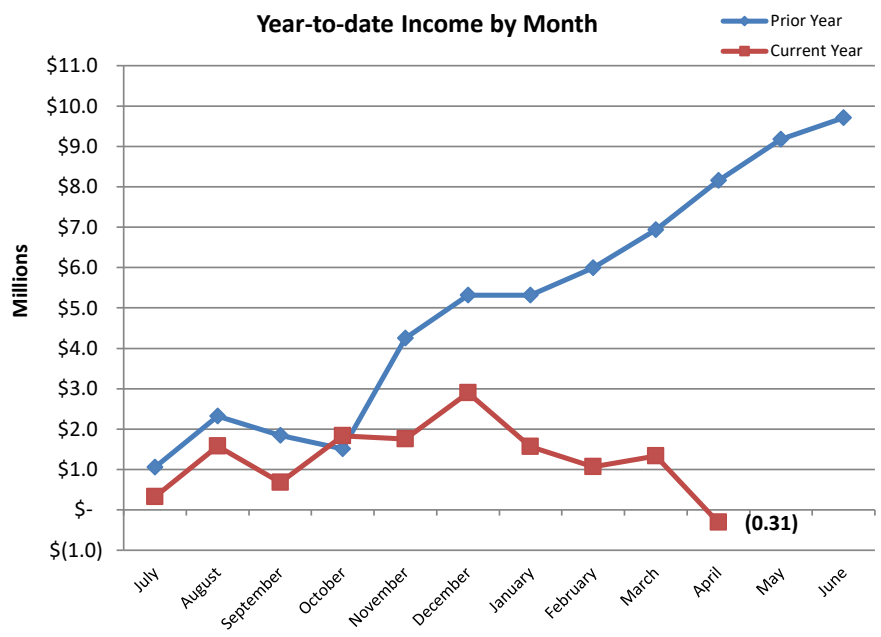


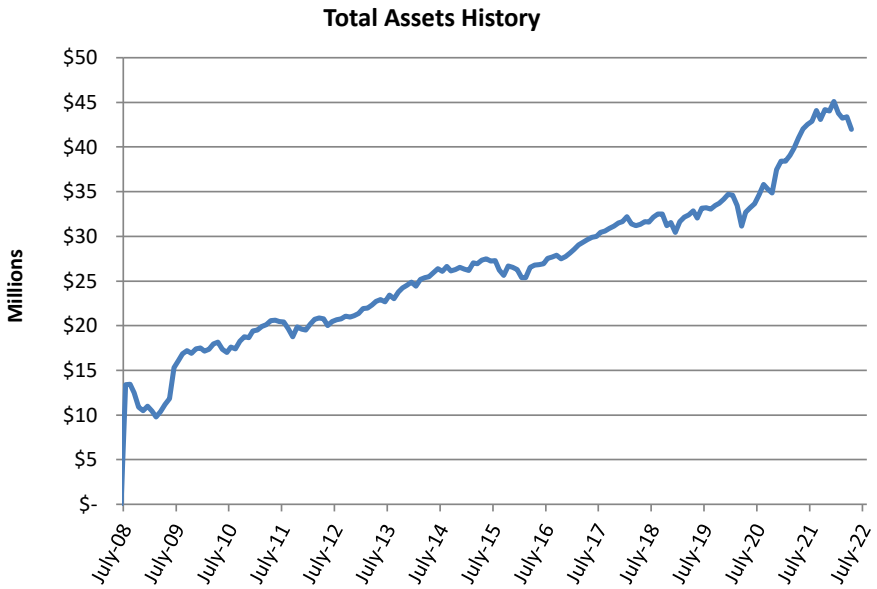


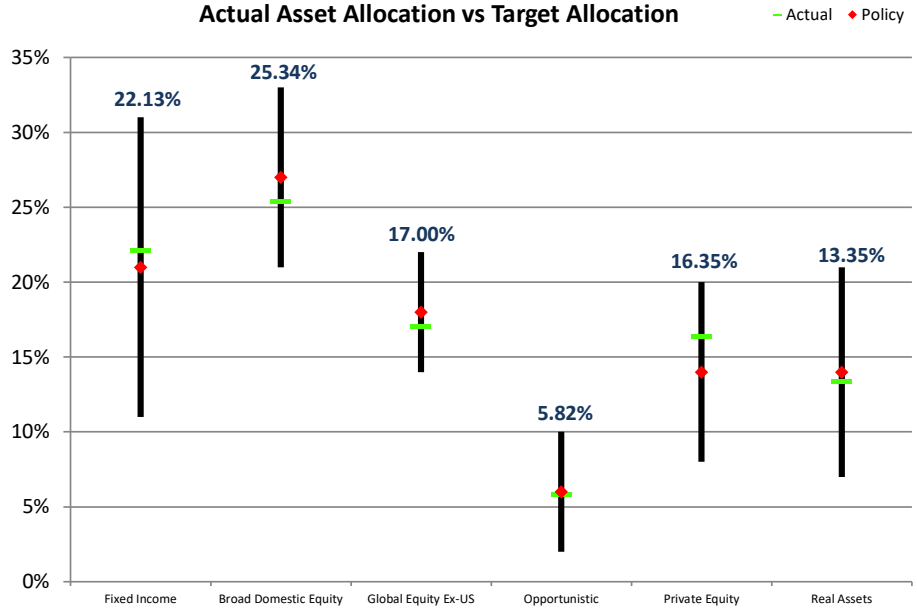
Judicial Retirement Health Care Trust Fund

Fiscal Year-to-Date through April 30, 2022



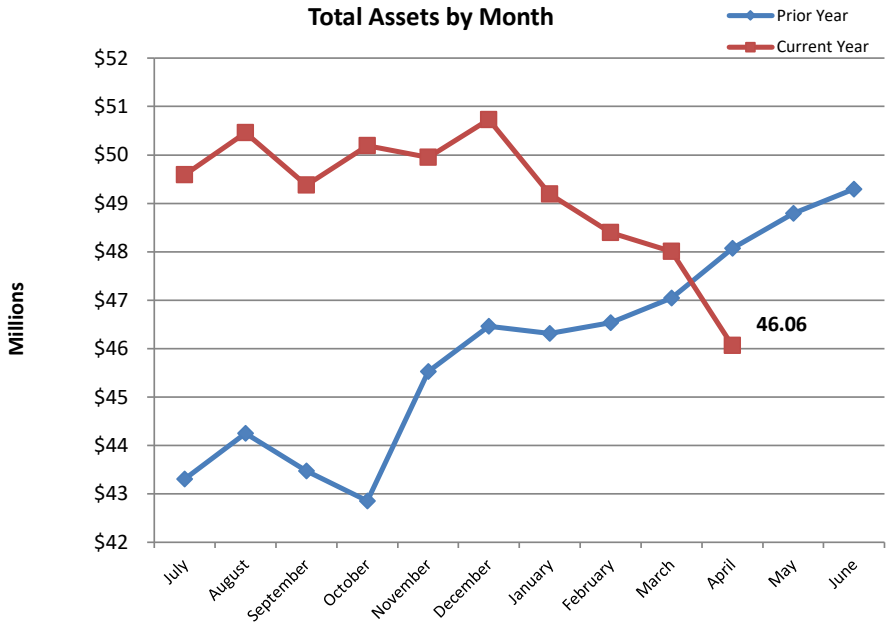


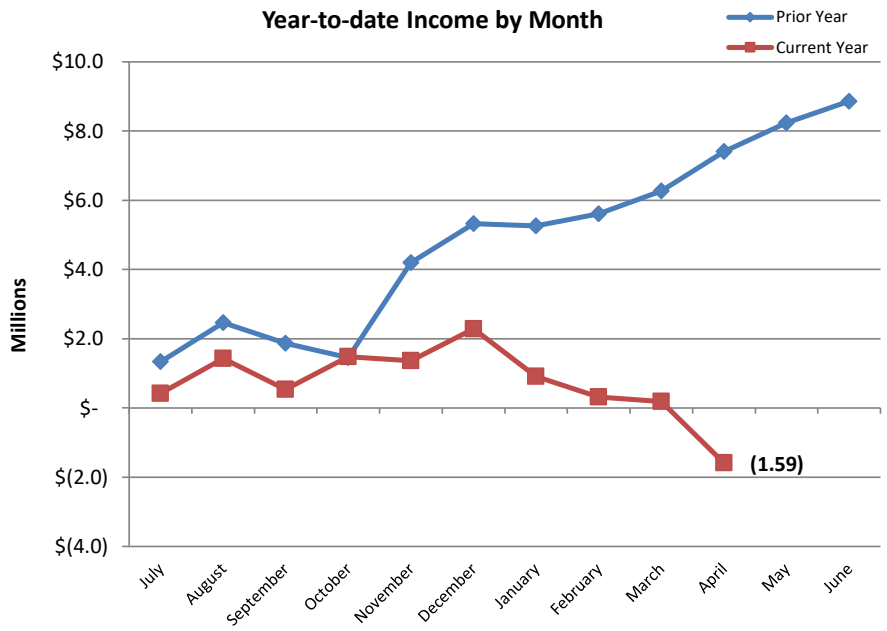


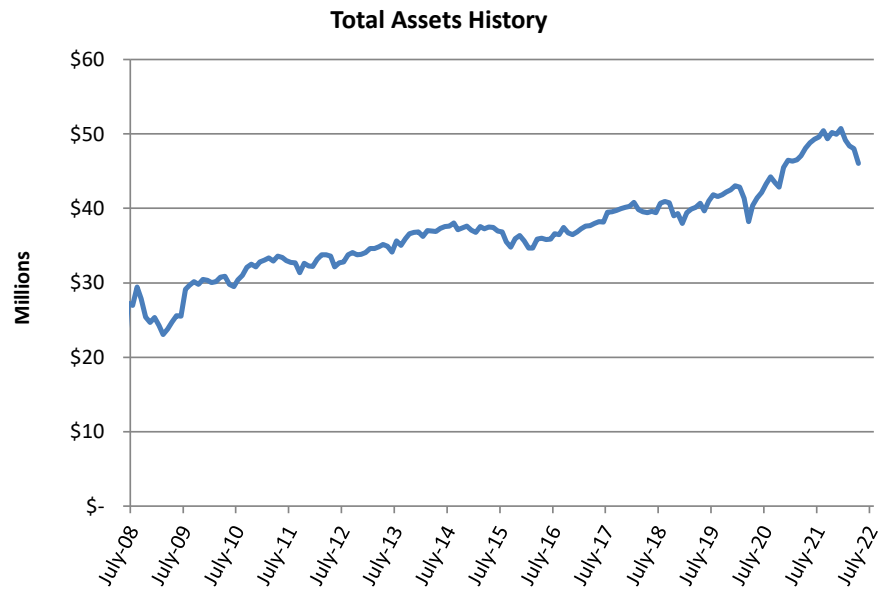


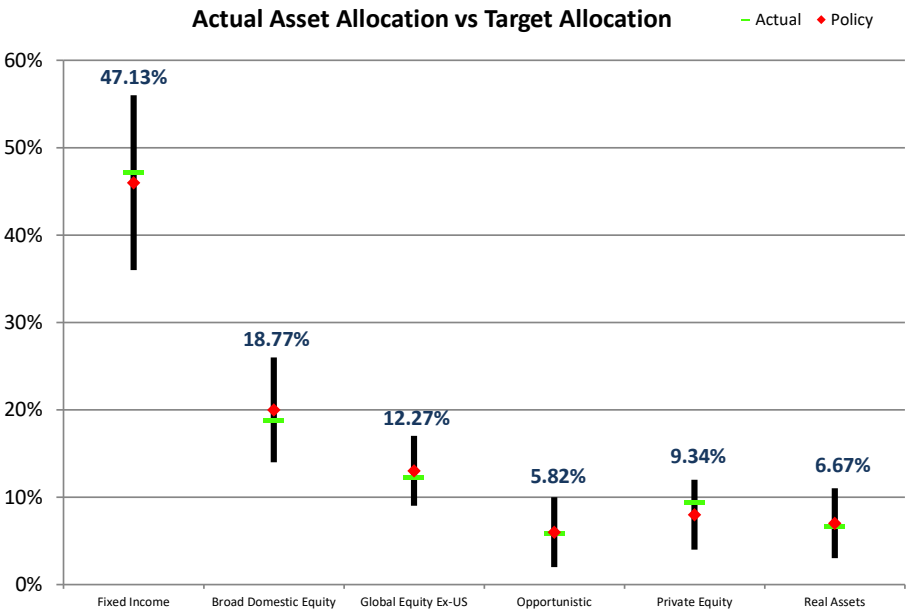
Military Retirement Trust Fund

Fiscal Year-to-Date through April 30, 2022









ALASKA RETIREMENT MANAGEMENT BOARD

Reporting of Funds by Manager

All Non-Participant Directed Plans

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended April 30, 2022

	Beginning Invested Assets	Investment Income	Net Contributions and (Withdrawals)	Ending Invested Assets	% increase (decrease)	% Change due to Investment Income
Cash						
Short-Term Fixed Income Pool	$ 247,905,831	$ 141,229	$ 71,410,627	$ 319,457,687	28.86%	0.05%
Securities Lending Income Pool	48,599	74,059	(48,774)	73,884	52.03%	305.88%
Total Cash	247,954,430	215,288	71,361,853	319,531,571	28.87%	0.08%
Fixed Income						
Alternative Fixed Income						
Crestline Investors, Inc.	632,276,317	24,111,287	9,543,523	665,931,127	5.32%	3.78%
Prisma Capital Partners	71,087,214	(1,376,316)	-	69,710,898	-1.94%	-1.94%
Crestline Specialty Fund	7,676,860	1	(61,979)	7,614,882	-0.81%	0.00%
Crestline Specialty Lending Fund II	47,513,069	1,860,695	-	49,373,764	3.92%	3.92%
Crestline Specialty Lending Fund III	26,966,769	392,338	-	27,359,107	1.45%	1.45%
Total Alternative Fixed Income	785,520,229	24,988,005	9,481,544	819,989,778	4.39%	3.16%
Opportunistic Fixed Income						
Fidelity Inst. Asset Mgmt. High Yield CMBS	214,364,812	(2,519,749)	-	211,845,063	-1.18%	-1.18%
Fidelity Institutional Asset Management	959,654,579	(29,014,572)	554,781	931,194,788	-2.97%	-3.02%
MacKay Shields, LLC	2,016,185	110	-	2,016,295	0.01%	0.01%
Total Opportunistic Fixed Income	1,176,035,576	(31,534,211)	554,781	1,145,056,146	-2.63%	-2.68%
ARMB Barclays Agg Bond Fund	4,965,034,604	(179,931,872)	17,000,000	4,802,102,732	-3.28%	-3.62%
Total Fixed Income	6,926,590,409	(186,478,078)	27,036,325	6,767,148,656	-2.30%	-2.69%
Domestic Equities						
Small Cap						
Passively Managed						
ARMB S&P 600	701,335,244	(54,766,719)	-	646,568,525	-7.81%	-7.81%
Total Passive	701,335,244	(54,766,719)	-	646,568,525	-7.81%	-7.81%
Actively Managed						
Transition Account	-	-	-	-	-	-
Total Active	-	-	-	-	-	-
Total Small Cap	701,335,244	(54,766,719)	-	646,568,525	-7.81%	-7.81%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended April 30, 2022

Large Cap						
Passively Managed						
ARMB S&P 900	5,897,648,432	(497,732,136)	(106,400,000)	5,293,516,296	-10.24%	-8.52%
Total Passive	5,897,648,432	(497,732,136)	(106,400,000)	5,293,516,296	-10.24%	-8.52%
Actively Managed						
ARMB Domestic Residual Assets	101,743	1,680	-	103,423	1.65%	1.65%
ARMB Large Cap Multi-Factor	805,347,976	(64,130,004)	-	741,217,972	-7.96%	-7.96%
ARMB Scientific Beta	1,622,041,547	(110,214,119)	(60,300,000)	1,451,527,428	-10.51%	-6.92%
Transition Account	-	34	-	34	-	-
Total Active	2,427,491,266	(174,342,409)	(60,300,000)	2,192,848,857	-9.67%	-7.27%
Total Large Cap	8,325,139,698	(672,074,545)	(166,700,000)	7,486,365,153	-10.08%	-8.15%
Total Domestic Equity	9,026,474,942	(726,841,264)	(166,700,000)	8,132,933,678	-9.90%	-8.13%
Global Equities						
Large Cap						
Arrow Street Capital	574,815,050	(33,728,054)	-	541,086,996	-5.87%	-5.87%
Baillie Gifford Overseas Limited	507,042,104	(54,479,756)	499,101	453,061,449	-10.65%	-10.74%
Brandes Investment Partners	601,333,813	(27,206,970)	-	574,126,843	-4.52%	-4.52%
Cap Guardian Trust Co	531,025,739	(43,609,488)	-	487,416,251	-8.21%	-8.21%
Legal & General	901,041,004	(50,193,818)	-	850,847,186	-5.57%	-5.57%
ARMB Int'l Residual Assets	2,808,673	(140,691)	-	2,667,982	-5.01%	-5.01%
SSgA MSCI World Ex-US IMI Index Fund	1,665,172,055	(112,414,225)	27,000,000	1,579,757,830	-5.13%	-6.70%
State Street Global Advisors	201,659	(3)	-	201,656	0.00%	0.00%
Total Large Cap	4,783,440,097	(321,773,005)	27,499,101	4,489,166,193	-6.15%	-6.71%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended April 30, 2022

Emerging Markets Equity						
MSCI Emerging Markets Index Fund	723,375,956	(40,153,870)	-	683,222,086	-5.55%	-5.55%
Legal & General Sci-Beta Emerging Markets	296,122,895	(12,704,726)	-	283,418,169	-4.29%	-4.29%
Total Emerging Markets	1,019,498,851	(52,858,596)	-	966,640,255	-5.18%	-5.18%
Total Global Equities	5,802,938,948	(374,631,601)	27,499,101	5,455,806,448	-5.98%	-6.44%
Opportunistic						
Alternative Equity Strategy						
Alternative Equity Strategies Transition Account	-	-	-	-	-	-
McKinley Global Health Care	364,422,905	(31,847,694)	426,214	333,001,425	-8.62%	-8.73%
Total Alternative Equity Strategy	364,422,905	(31,847,694)	426,214	333,001,425	-8.62%	-8.73%
Alternative Beta						
Man Group Alternative Risk Premia	332,495,226	10,437,202	-	342,932,428	3.14%	3.14%
Total Alternative Beta	332,495,226	10,437,202	-	342,932,428	3.14%	3.14%
Other Opportunities						
Project Pearl	8,299,224	(35,647)	-	8,263,577	-0.43%	-0.43%
Schroders Insurance Linked Securities	5,903,502	(1,451)	(1,600,000)	4,302,051	-27.13%	-0.03%
Total Other Opportunities	14,202,726	(37,098)	(1,600,000)	12,565,628	-11.53%	-0.28%
Tactical Allocation Strategies						
Fidelity Signals	635,666,365	(43,283,116)	487,457	592,870,706	-6.73%	-6.81%
PineBridge	610,702,727	(22,492,451)	-	588,210,276	-3.68%	-3.68%
Total Tactical Allocation Strategies	1,246,369,092	(65,775,567)	487,457	1,181,080,982	-5.24%	-5.28%
Total Opportunistic	1,957,489,949	(87,223,157)	(686,329)	1,869,580,463	-4.49%	-4.46%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended April 30, 2022

Private Equity						
Abbott Capital	2,040,766,699	46,790,685	(1,312,759)	2,086,244,625	2.23%	2.29%
Advent International GPE Fund VIII-B	36,459,117	(1,788,592)	-	34,670,525	-4.91%	-4.91%
Advent International GPE Fund IX	48,087,168	2,305,150	-	50,392,318	4.79%	4.79%
Clearlake Capital Partners VI	32,873,248	5,998,527	-	38,871,775	18.25%	18.25%
Clearlake Capital Partners VII	-	(594,372)	6,439,852	5,845,480	100.00%	-18.46%
Dyal Capital Partners III	37,247,680	-	-	37,247,680	-	-
Dyal Capital Partners IV	30,047,281	-	-	30,047,281	-	-
Genstar X	3,075,724	184,057	-	3,259,781	5.98%	5.98%
Glendon Opportunities	13,304,382	525,100	(990,291)	12,839,191	-3.50%	4.10%
Glendon Opportunities II	74,511,380	3,009,045	-	77,520,425	4.04%	4.04%
Insight XII	18,012,043	-	-	18,012,043	-	-
KKR Lending Partners II	10,327,920	-	-	10,327,920	-	-
Lexington Capital Partners VIII	34,481,264	-	(542,763)	33,938,501	-1.57%	-
Lexington Partners VII	12,578,339	-	(344,087)	12,234,252	-2.74%	-
Merit Capital Partners	10,777,341	562,367	-	11,339,708	5.22%	5.22%
NB SOF III	14,640,291	-	-	14,640,291	-	-
NB SOF IV	36,226,959	-	-	36,226,959	-	-
Neuberger Berman Secondary Opportunities Fund V	4,542,881	-	-	4,542,881	-	-
New Mountain Partners IV	10,525,318	758,563	-	11,283,881	7.21%	7.21%
New Mountain Partners V	69,071,202	4,046,373	-	73,117,575	5.86%	5.86%
New Mountain Partners VI	17,039,648	451,633	-	17,491,281	2.65%	2.65%
NGP XI	36,908,696	-	(605,625)	36,303,071	-1.64%	-
NGP XII	27,626,456	-	180,666	27,807,122	0.65%	-
Onex Partnership III	4,046,837	163,611	-	4,210,448	4.04%	4.04%
Pathway Capital Management LLC	2,182,111,365	31,837,940	(17,247,781)	2,196,701,524	0.67%	1.46%
Resolute Fund III	7,267,891	868,651	-	8,136,542	11.95%	11.95%
Resolute Fund IV	60,282,089	6,696,550	-	66,978,639	11.11%	11.11%
Resolute Fund V	31,596,947	396,800	5,361,964	37,355,711	18.23%	1.16%
Summit Partners GE IX	63,163,557	3,862,727	-	67,026,284	6.12%	6.12%
Summit Partners GE X	29,669,251	570,171	1,403,500	31,642,922	6.65%	1.88%
Warburg Pincus Global Growth Fund	44,551,769	-	1,100,000	45,651,769	2.47%	-
Warburg Pincus X	622,929	-	-	622,929	-	-
Warburg Pincus XI	14,421,940	130,427	(426,000)	14,126,367	-2.05%	0.92%
Warburg Pincus XII	90,617,099	-	(425,750)	90,191,349	-0.47%	-
Total Private Equity	5,147,482,711	106,775,413	(7,409,074)	5,246,849,050	1.93%	2.08%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended April 30, 2022

Real Assets						
Farmland						
UBS Farmland Investors LLC	891,007,772	-	-	891,007,772	-	-
Total Farmland	891,007,772	-	-	891,007,772	-	-
Timber						
Timberland Invt Resource LLC	362,918,668	-	(7,400,000)	355,518,668	-2.04%	-
Total Timber	362,918,668	-	(7,400,000)	355,518,668	-2.04%	-
Energy						
EIG Energy Fund XIV-A	3,871,042	(19,986)	-	3,851,056	-0.52%	-0.52%
EIG Energy Fund XV	6,759,313	1,358,636	-	8,117,949	20.10%	20.10%
EIG Energy Fund XVI	52,498,825	1,111,535	-	53,610,360	2.12%	2.12%
Total Energy	63,129,180	2,450,185	-	65,579,365	3.88%	3.88%
REIT						
REIT Transition Account	-	-	-	-	-	-
ARMB REIT	652,930,228	(23,749,883)	18,550	629,198,895	-3.63%	-3.64%
Total REIT	652,930,228	(23,749,883)	18,550	629,198,895	-3.63%	-3.64%
Infrastructure Private						
IFM Global Infrastructure Fund-Private	618,287,170	18,456,294	(1,460,037)	635,283,427	2.75%	2.99%
JP Morgan Infrastructure Fund-Private	143,342,671	-	-	143,342,671	-	-
Total Infrastructure Private	761,629,841	18,456,294	(1,460,037)	778,626,098	2.23%	2.43%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended April 30, 2022

Real Estate						
Core Commingled Accounts						
BlackRock US Core Property Fund	391,627,765	-	-	391,627,765	-	-
JP Morgan	186,500,127	4,480,180	(1,101,798)	189,878,509	1.81%	2.41%
UBS Trumbull Property Fund	40,600,139	2,913,899	(3,281,244)	40,232,794	-0.90%	7.48%
Total Core Commingled	618,728,031	7,394,079	(4,383,042)	621,739,068	0.49%	1.20%
Core Separate Accounts						
Sentinel Separate Account	255,280,805	-	(44,557,256)	210,723,549	-17.45%	-
UBS Realty	610,555,049	-	(790,395)	609,764,654	-0.13%	-
Total Core Separate	865,835,854	-	(45,347,651)	820,488,203	-5.24%	-
Non-Core Commingled Accounts						
Almanac Realty Securities V	51,911	(569)	-	51,342	-1.10%	-1.10%
Almanac Realty Securities VII	30,225,499	-	-	30,225,499	-	-
Almanac Realty Securities VIII	19,454,969	1,843,627	1,237,717	22,536,313	15.84%	9.18%
Clarion Ventures 4	23,217,217	-	-	23,217,217	-	-
Colony Investors VIII, L.P.	85,460	(611)	-	84,849	-0.71%	-0.71%
ING Clarion Development Ventures III	1,301,639	-	-	1,301,639	-	-
KKR Real Estate Partners Americas L.P.	4,120,418	-	-	4,120,418	-	-
KKR Real Estate Partners Americas II	11,190,142	-	-	11,190,142	-	-
KKR Real Estate Partners Americas III	17,348,202	-	5,813,901	23,162,103	33.51%	-
Silverpeak Legacy Pension Partners II, L.P.	976,466	(48,842)	-	927,624	-5.00%	-5.00%
Silverpeak Legacy Pension Partners III, L.P.	2,541,214	(338,148)	-	2,203,066	-13.31%	-13.31%
Tishman Speyer Real Estate Venture VI	2,028,012	-	(2,013,697)	14,315	-99.29%	-
Tishman Speyer Real Estate Venture VII	143,851	-	-	143,851	-	-
Total Non-Core Commingled	112,685,000	1,455,457	5,037,921	119,178,378	5.76%	1.26%
Total Real Estate	1,597,248,885	8,849,536	(44,692,772)	1,561,405,649	-2.24%	0.56%
Total Real Assets	4,328,864,574	6,006,132	(53,534,259)	4,281,336,447	-1.10%	0.14%
Total Assets	$ 33,437,795,963	$ (1,262,177,267)	$ (102,432,383)	$ 32,073,186,313	-4.08%	-3.78%

ALASKA RETIREMENT MANAGEMENT BOARD

Reporting of Funds by Manager

Participant Directed Plans

Supplemental Annuity Plan
Schedule of Investment Income and Changes in Invested Assets
for the Month Ended
April 30, 2022

	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
Participant Options							
T. Rowe Price							
Stable Value Fund	$ 505,469,798	$ 774,736	$ (3,422,854)	$ 1,826,974	$ 504,648,654	-0.16%	0.15%
Small Cap Stock Fund	228,735,232	(19,864,398)	(203,783)	1,001,866	209,668,917	-8.34%	-8.67%
Alaska Balanced Trust	1,146,467,680	(46,602,188)	(3,194,275)	(2,456,232)	1,094,214,985	-4.56%	-4.07%
Long Term Balanced Fund	756,412,836	(42,057,760)	57,342	(1,507,270)	712,905,148	-5.75%	-5.57%
AK Target Date 2010 Trust	10,082,484	(431,809)	(70,656)	988,973	10,568,992	4.83%	-4.10%
AK Target Date 2015 Trust	73,593,883	(3,145,726)	(185,555)	(539,753)	69,722,849	-5.26%	-4.30%
AK Target Date 2020 Trust	85,878,417	(4,180,279)	(354,098)	486,013	81,830,053	-4.71%	-4.86%
AK Target Date 2025 Trust	117,252,791	(6,434,860)	(183,435)	(1,728,485)	108,906,011	-7.12%	-5.53%
AK Target Date 2030 Trust	100,025,901	(6,137,914)	555,141	585,253	95,028,381	-5.00%	-6.10%
AK Target Date 2035 Trust	100,675,548	(6,659,548)	621,607	110,088	94,747,695	-5.89%	-6.59%
AK Target Date 2040 Trust	95,170,077	(6,652,861)	667,546	(215,622)	88,969,140	-6.52%	-6.97%
AK Target Date 2045 Trust	116,021,494	(8,437,496)	946,384	(659,437)	107,870,945	-7.03%	-7.26%
AK Target Date 2050 Trust	127,886,894	(9,426,566)	898,283	(454,945)	118,903,666	-7.02%	-7.36%
AK Target Date 2055 Trust	133,629,372	(9,872,145)	1,665,926	(413,202)	125,009,951	-6.45%	-7.35%
AK Target Date 2060 Trust	9,810,526	(727,473)	514,881	(253,901)	9,344,033	-4.76%	-7.32%
AK Target Date 2065 Trust	4,196,423	(328,498)	244,272	141,638	4,253,835	1.37%	-7.48%
Total Investments with T. Rowe Price	3,611,309,356	(170,184,785)	(1,443,274)	(3,088,042)	3,436,593,255		
JP Morgan							
JPMorgan SmartRetirement Blend 2015 R6	955,154	(46,285)	1,901	14,684	925,454	-3.11%	-4.80%
JPMorgan SmartSpending 2020 R6	-	-	-	-	-	0.00%	0.00%
JPMorgan SmartRetirement Blend 2020 R6	150,639	(7,357)	1,649	(1)	144,930	-3.79%	-4.86%
Total Investments with JP Morgan	1,105,793	(53,642)	3,550	14,683	1,070,384		
State Street Global Advisors							
Money Market	68,408,811	15,937	(99,532)	1,222,841	69,548,057	1.67%	0.02%
S&P 500 Stock Index	524,536,057	(45,663,118)	(2,761,862)	(256,259)	475,854,818	-9.28%	-8.73%
Russell 3000 Index	161,730,236	(14,475,992)	410,820	(1,145,707)	146,519,357	-9.41%	-8.97%
World Equity Ex-US Index	75,123,238	(4,899,228)	(2,819)	1,396,352	71,617,543	-4.67%	-6.46%
Total Investments with SSgA	829,798,342	(65,022,401)	(2,453,393)	1,217,227	763,539,775		
BlackRock							
Passive U.S. Bond Index Fund	152,655,661	(5,775,394)	(529,812)	(140,660)	146,209,795	-4.22%	-3.79%
Strategic Completion Fund	41,367,219	(923,026)	(154,960)	621,590	40,910,823	-1.10%	-2.22%
Total Investments with BlackRock	194,022,880	(6,698,420)	(684,772)	480,930	187,120,618		
Brandes and Baillie Gifford							
AK International Equity Fund	115,995,551	(9,317,205)	113,626	(117,511)	106,674,461	-8.04%	-8.03%
Northern Trust							
Environmental, Social, and Governance Fund	160,645,584	(13,932,369)	(117,955)	1,492,713	148,087,973	-7.82%	-8.64%
Total All Funds	$ 4,912,877,506	$ (265,208,822)	$ (4,582,218)	$ -	$ 4,643,086,466	-5.49%	-5.40%

Notes: Source data provided by the record keeper, Empower Retirement.

(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.

Supplemental Annuity Plan
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
April 30, 2022
$ (Thousands)

Invested Assets (at fair value)	**July**	**August**	**September**	**October**	**November**	**December**	**January**	**February**	**March**	**April**
Investments with T. Rowe Price										
Stable Value Fund	$ 488,478	$ 491,047	$ 496,851	$ 496,422	$ 493,197	$ 496,578	$ 500,435	$ 508,709	$ 505,470	$ 504,649
Small Cap Stock Fund	277,757	277,500	267,769	276,182	263,304	263,397	231,062	230,246	228,735	209,669
Alaska Balanced Trust	1,223,740	1,228,707	1,200,662	1,218,503	1,205,383	1,211,955	1,177,198	1,158,956	1,146,468	1,094,215
Long Term Balanced Fund	774,789	783,806	763,138	788,770	777,998	798,632	772,039	757,112	756,413	712,905
AK Target Date 2010 Trust	10,085	10,174	10,009	10,317	10,219	10,598	10,149	10,113	10,082	10,569
AK Target Date 2015 Trust	83,324	83,550	80,248	81,032	79,381	79,705	76,326	74,792	73,594	69,723
AK Target Date 2020 Trust	92,999	93,604	91,518	94,397	91,264	92,513	89,183	86,544	85,878	81,830
AK Target Date 2025 Trust	116,770	119,535	116,297	122,038	121,258	124,436	118,205	116,462	117,253	108,906
AK Target Date 2030 Trust	97,336	98,709	96,270	101,931	101,714	103,675	101,050	99,172	100,026	95,028
AK Target Date 2035 Trust	99,225	101,763	98,230	102,219	101,264	105,583	101,017	99,161	100,676	94,748
AK Target Date 2040 Trust	94,988	96,923	93,922	98,068	96,915	99,813	95,313	93,330	95,170	88,969
AK Target Date 2045 Trust	113,224	116,158	111,828	117,863	115,792	121,264	115,914	113,246	116,021	107,871
AK Target Date 2050 Trust	126,689	129,643	124,797	132,034	128,963	132,376	127,078	125,319	127,887	118,904
AK Target Date 2055 Trust	128,109	131,897	127,877	135,479	133,321	138,862	133,160	130,575	133,629	125,010
AK Target Date 2060 Trust	7,336	7,669	7,712	8,548	8,687	9,338	9,222	9,306	9,811	9,344
AK Target Date 2065 Trust	3,129	3,452	3,007	3,210	3,532	3,958	4,016	4,010	4,196	4,254
Investments with JP Morgan										
JPMorgan SmartRetirement Blend 2015 R6	14	0	0	44	3	9	1,260	940	955	925
JPMorgan SmartSpending 2020 R6	9	317	3	50	344	38	42	52	0	0
JPMorgan SmartRetirement Blend 2020 R6	9	317	3	50	344	38	42	52	151	145
Investments with State Street Global Advisors										
Money Market	66,716	67,010	67,679	68,691	67,742	67,655	68,490	68,008	68,409	69,548
S&P 500 Stock Index	534,147	547,482	516,062	547,889	542,403	561,532	532,812	512,152	524,536	475,855
Russell 3000 Index	139,778	145,498	142,405	155,260	157,498	168,466	162,694	158,435	161,730	146,519
World Equity Ex-US Index	53,790	54,806	55,740	60,526	61,635	69,502	72,415	72,862	75,123	71,618
Investments with BlackRock										
Passive U.S. Bond Index Fund	189,913	188,612	185,482	183,405	181,925	174,799	165,760	159,024	152,656	146,210
Strategic Completion Fund	37,611	37,762	37,018	38,044	37,285	39,259	38,557	39,219	41,367	40,911
Investments with Brandes and Baillie Gifford										
AK International Equity Fund	150,369	154,751	147,219	149,304	139,854	140,468	128,871	120,292	115,996	106,674
Investments with Northern Trust										
Environmental, Social, and Governance Fund	175,596	179,135	166,807	178,900	170,883	172,024	157,127	151,212	160,646	148,088
Total Invested Assets	**$ 5,085,920**	**$ 5,149,507**	**$ 5,008,551**	**$ 5,169,125**	**$ 5,091,762**	**$ 5,186,437**	**$ 4,989,392**	**$ 4,899,246**	**$ 4,912,878**	**$ 4,643,086**
Change in Invested Assets										
Beginning Assets	$ 5,064,368	$ 5,085,920	$ 5,149,507	$ 5,008,551	$ 5,169,125	$ 5,091,762	$ 5,186,437	$ 4,989,392	$ 4,899,246	$ 4,912,878
Investment Earnings	40,530	73,949	(130,128)	164,003	(65,272)	111,985	(183,632)	(80,873)	27,993	(265,209)
Net Contributions (Withdrawals)	(18,978)	(10,361)	(10,828)	(3,428)	(12,092)	(17,310)	(13,412)	(9,273)	(14,361)	(4,582)
Ending Invested Assets	**$ 5,085,920**	**$ 5,149,507**	**$ 5,008,551**	**$ 5,169,125**	**$ 5,091,762**	**$ 5,186,437**	**$ 4,989,392**	**$ 4,899,246**	**$ 4,912,878**	**$ 4,643,086**

Note: Source data provided by the record keeper, Empower Retirement.

Deferred Compensation Plan
Schedule of Invested Assets and Changes in Invested Assets
for the Month Ended
April 30, 2022

	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
Participant Options							
T. Rowe Price							
Stable Value Fund	$ 205,901,918	$ 316,933	$ (620,333)	$ 456,872	$ 206,055,390	0.07%	0.15%
Small Cap Stock Fund	129,623,147	(11,221,395)	(609,572)	369,682	118,161,862	-8.84%	-8.66%
Alaska Balanced Trust	46,871,794	(1,911,407)	(84,892)	177,519	45,053,014	-3.88%	-4.07%
Long Term Balanced Fund	92,754,455	(5,114,807)	(1,137,228)	178,559	86,680,979	-6.55%	-5.54%
AK Target Date 2010 Trust	3,141,387	(128,243)	3,758	224,493	3,241,395	3.18%	-3.94%
AK Target Date 2015 Trust	9,491,096	(406,925)	(18,128)	(1,617)	9,064,426	-4.50%	-4.29%
AK Target Date 2020 Trust	24,181,278	(1,169,999)	(85,065)	(14,801)	22,911,413	-5.25%	-4.85%
AK Target Date 2025 Trust	30,230,596	(1,650,697)	(36,142)	(692,467)	27,851,290	-7.87%	-5.53%
AK Target Date 2030 Trust	19,352,794	(1,183,899)	129,247	127,837	18,425,979	-4.79%	-6.08%
AK Target Date 2035 Trust	15,113,338	(998,918)	47,291	(20,295)	14,141,416	-6.43%	-6.60%
AK Target Date 2040 Trust	13,459,896	(941,411)	112,203	(22,622)	12,608,066	-6.33%	-6.97%
AK Target Date 2045 Trust	10,960,275	(785,366)	121,736	(318,249)	9,978,396	-8.96%	-7.23%
AK Target Date 2050 Trust	8,615,771	(631,631)	77,450	(54,671)	8,006,919	-7.07%	-7.32%
AK Target Date 2055 Trust	6,887,240	(508,960)	98,124	(15,154)	6,461,250	-6.19%	-7.35%
AK Target Date 2060 Trust	1,518,001	(114,881)	57,428	2,052	1,462,600	-3.65%	-7.42%
AK Target Date 2065 Trust	701,869	(61,309)	15,658	152,335	808,553	15.20%	-7.80%
Total Investments with T. Rowe Price	618,804,855	(26,512,915)	(1,928,465)	549,473	590,912,948		
JP Morgan							
JPMorgan SmartRetirement Blend 2015 R6	6,514	(307)	222	(387)	6,042	-7.25%	-4.77%
JPMorgan SmartSpending 2020 R6	-	-	-	-	-	0.00%	0.00%
JPMorgan SmartRetirement Blend 2020 R6	69,313	(3,777)	17,130	-	82,666	19.26%	-4.85%
Total Investments with JP Morgan	75,827	(4,084)	17,352	(387)	88,708		
State Street Global Advisors							
Money Market	20,166,540	4,676	(7,549)	26,141	20,189,808	0.12%	0.02%
S&P 500 Stock Index	274,753,090	(23,904,523)	(704,936)	(416,501)	249,727,130	-9.11%	-8.72%
Russell 3000 Index	58,876,637	(5,262,924)	(141,303)	(179,384)	53,293,026	-9.48%	-8.96%
World Equity Ex-US Index	23,951,875	(1,553,560)	68,216	228,500	22,695,031	-5.25%	-6.45%
Total Investments with SSgA	377,748,142	(30,716,331)	(785,572)	(341,244)	345,904,995		
BlackRock							
Passive U.S. Bond Index Fund	69,396,003	(2,622,939)	(352,743)	(101,726)	66,318,595	-4.43%	-3.79%
Strategic Completion Fund	17,525,319	(394,542)	8,699	392,874	17,532,350	0.04%	-2.23%
Total Investments with BlackRock	86,921,322	(3,017,481)	(344,044)	291,148	83,850,945		
Brandes and Baillie Gifford							
AK International Equity Fund	45,091,150	(3,613,104)	(105,394)	(209,041)	41,163,611	-8.71%	-8.04%
Northern Trust							
Environmental, Social, and Governance Fund	55,282,079	(4,717,381)	(181,570)	(289,949)	50,093,179	-9.39%	-8.57%
Total All Funds	$ 1,183,923,375	$ (68,581,296)	$ (3,327,693)	$ -	$ 1,112,014,386	-6.07%	-5.80%

Notes: Source data provided by the record keeper, Empower Retirement.

(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.

Deferred Compensation Plan
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
April 30, 2022
$ (Thousands)

Invested Assets (at fair value)	**July**	**August**	**September**	**October**	**November**	**December**	**January**	**February**	**March**	**April**
Investments with T. Rowe Price										
Stable Value Fund	$ 204,937	$ 205,613	$ 206,301	$ 206,279	$ 204,471	$ 203,250	$ 204,924	$ 206,636	$ 205,902	$ 206,055
Small Cap Stock Fund	152,997	154,380	149,317	154,660	148,136	149,446	130,722	130,627	129,623	118,162
Alaska Balanced Trust	45,949	46,782	45,773	47,238	46,750	47,616	46,475	46,235	46,872	45,053
Long Term Balanced Fund	91,855	93,589	91,457	94,749	93,930	96,726	94,850	92,969	92,754	86,681
AK Target Date 2010 Trust	3,367	3,400	3,404	3,198	3,166	3,238	3,133	3,098	3,141	3,241
AK Target Date 2015 Trust	10,022	10,104	9,823	10,059	9,891	9,600	9,334	9,486	9,491	9,064
AK Target Date 2020 Trust	26,231	26,498	25,784	27,250	26,083	26,717	25,347	24,623	24,181	22,911
AK Target Date 2025 Trust	32,470	33,030	31,684	32,461	33,063	32,921	31,427	30,467	30,231	27,851
AK Target Date 2030 Trust	18,706	19,160	18,134	19,481	19,258	20,466	19,413	19,105	19,353	18,426
AK Target Date 2035 Trust	14,380	14,428	13,883	14,369	14,544	15,194	14,768	14,641	15,113	14,141
AK Target Date 2040 Trust	13,562	13,793	13,199	13,741	13,740	14,192	13,622	13,312	13,460	12,608
AK Target Date 2045 Trust	10,409	10,783	10,399	10,921	10,779	11,583	10,550	10,528	10,960	9,978
AK Target Date 2050 Trust	8,111	8,359	8,079	8,803	8,600	8,744	8,584	8,491	8,616	8,007
AK Target Date 2055 Trust	6,422	6,636	6,473	6,795	6,737	7,085	6,811	6,685	6,887	6,461
AK Target Date 2060 Trust	1,450	1,485	1,445	1,465	1,452	1,530	1,488	1,477	1,518	1,463
AK Target Date 2065 Trust	629	599	589	681	684	677	661	714	702	809
Investments with JP Morgan										
JPMorgan SmartRetirement Blend 2015 R6	3	3	0	0	0	0	6	6	7	6
JPMorgan SmartSpending 2020 R6	3	3	0	0	0	0	6	6	0	0
JPMorgan SmartRetirement Blend 2020 R6	3	3	12	13	5	5	6	7	69	83
Investments with State Street Global Advisors										
Money Market	21,081	21,454	22,467	21,968	21,875	20,468	20,380	20,387	20,167	20,190
S&P 500 Stock Index	275,631	281,834	266,972	284,001	280,831	293,278	277,118	266,920	274,753	249,727
Russell 3000 Index	52,658	54,024	52,307	57,037	57,587	61,840	59,345	58,060	58,877	53,293
World Equity Ex-US Index	19,029	19,419	19,567	20,855	20,734	23,081	23,460	23,466	23,952	22,695
Investments with BlackRock										
Passive U.S. Bond Index Fund	80,804	80,060	78,818	78,015	77,793	76,367	73,512	71,302	69,396	66,319
Strategic Completion Fund	16,889	16,832	16,196	16,435	16,027	16,844	16,630	16,787	17,525	17,532
Investments with Brandes and Baillie Gifford										
AK International Equity Fund	58,826	59,613	56,665	57,370	53,990	53,536	49,486	46,468	45,091	41,164
Investments with Northern Trust										
Environmental, Social, and Governance Fund	57,412	58,923	55,352	59,420	57,261	57,960	53,722	51,379	55,282	50,093
Total Invested Assets	**$ 1,223,830**	**$ 1,240,801**	**$ 1,204,100**	**$ 1,247,263**	**$ 1,227,383**	**$ 1,252,364**	**$ 1,195,774**	**$ 1,173,877**	**$ 1,183,923**	**$ 1,112,014**
Change in Invested Assets										
Beginning Assets	$ 1,217,086	$ 1,223,830	$ 1,240,801	$ 1,204,100	$ 1,247,263	$ 1,227,383	$ 1,252,364	$ 1,195,774	$ 1,173,877	$ 1,183,923
Investment Earnings	10,325	20,564	(33,515)	45,849	(16,735)	30,535	(52,696)	(19,359)	11,114	(68,581)
Net Contributions (Withdrawals)	(3,581)	(3,594)	(3,186)	(2,687)	(3,144)	(5,555)	(3,894)	(2,538)	(1,068)	(3,328)
Ending Invested Assets	**$ 1,223,830**	**$ 1,240,801**	**$ 1,204,100**	**$ 1,247,263**	**$ 1,227,383**	**$ 1,252,364**	**$ 1,195,774**	**$ 1,173,877**	**$ 1,183,923**	**$ 1,112,014**

Note: Source data provided by the record keeper, Empower Retirement.

Defined Contribution Retirement - Participant Directed PERS
Schedule of Investment Income and Changes in Invested Assets
for the Month Ended
April 30, 2022

Participant Options	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
T. Rowe Price							
Stable Value Fund	$ 123,705,092	$ 188,699	$ (288,485)	$ (1,055,274)	$ 122,550,032	-0.93%	0.15%
Small Cap Stock Fund	103,908,836	(9,047,415)	145,977	145,604	95,153,002	-8.43%	-8.69%
Alaska Balanced Trust	55,346,393	(2,281,054)	(95,697)	1,052,312	54,021,954	-2.39%	-4.09%
Long Term Balanced Fund	33,854,269	(1,878,676)	(53,485)	(131,699)	31,790,409	-6.10%	-5.56%
AK Target Date 2010 Trust	3,025,135	(119,060)	24,067	1	2,930,143	-3.14%	-3.92%
AK Target Date 2015 Trust	12,575,464	(533,206)	(199,242)	(317,075)	11,525,941	-8.35%	-4.33%
AK Target Date 2020 Trust	44,413,490	(2,142,259)	(363,590)	(22,553)	41,885,088	-5.69%	-4.84%
AK Target Date 2025 Trust	85,621,862	(4,756,284)	528,793	(237,668)	81,156,703	-5.21%	-5.55%
AK Target Date 2030 Trust	98,592,123	(6,045,133)	935,396	(287,292)	93,195,094	-5.47%	-6.11%
AK Target Date 2035 Trust	125,218,220	(8,272,890)	977,986	(324,033)	117,599,283	-6.08%	-6.59%
AK Target Date 2040 Trust	149,172,573	(10,440,375)	1,108,650	(153,452)	139,687,396	-6.36%	-6.98%
AK Target Date 2045 Trust	194,857,603	(14,219,246)	1,617,986	(272,165)	181,984,178	-6.61%	-7.27%
AK Target Date 2050 Trust	231,862,470	(17,116,655)	2,049,041	(565,254)	216,229,602	-6.74%	-7.36%
AK Target Date 2055 Trust	250,451,500	(18,523,081)	2,888,437	(607,955)	234,208,901	-6.49%	-7.36%
AK Target Date 2060 Trust	11,936,230	(919,782)	860,000	33,991	11,910,439	-0.22%	-7.43%
AK Target Date 2065 Trust	6,014,588	(481,991)	458,254	317,134	6,307,985	4.88%	-7.53%
Total Investments with T. Rowe Price	1,530,555,848	(96,588,408)	10,594,088	(2,425,378)	1,442,136,150		
JP Morgan							
JPMorgan SmartRetirement Blend 2015 R6	2,683	(205)	640	(134)	2,984	11.22%	-6.98%
JPMorgan SmartSpending 2020 R6	-	-	-	-	-	0.00%	0.00%
JPMorgan SmartRetirement Blend 2020 R6	54,913	(2,682)	1,430	(3,340)	50,321	-8.36%	-4.97%
Total Investments with JP Morgan	57,596	(2,887)	2,070	(3,474)	53,305		
State Street Global Advisors							
Money Market	16,337,892	3,789	19,243	92,508	16,453,432	0.71%	0.02%
S&P 500 Stock Index	84,839,012	(7,466,354)	193,420	771,545	78,337,623	-7.66%	-8.75%
Russell 3000 Index	92,296,321	(8,259,848)	340,305	(759,836)	83,616,942	-9.40%	-8.97%
World Equity Ex-US Index	54,790,658	(3,601,235)	155,183	1,571,201	52,915,807	-3.42%	-6.47%
Total Investments with SSgA	248,263,883	(19,323,648)	708,151	1,675,418	231,323,804		
BlackRock							
Passive U.S. Bond Index Fund	65,321,599	(2,463,665)	11,821	(639,652)	62,230,103	-4.73%	-3.79%
Strategic Completion Fund	5,889,947	(129,193)	(4,209)	(18,720)	5,737,825	-2.58%	-2.20%
Total Investments with BlackRock	71,211,546	(2,592,858)	7,612	(658,372)	67,967,928		
Brandes and Baillie Gifford							
AK International Equity Fund	87,915,711	(7,091,286)	160,233	568,327	81,552,985	-7.24%	-8.03%
Northern Trust							
Environmental, Social, and Governance Fund	73,240,054	(6,363,190)	40,322	843,479	67,760,665	-7.48%	-8.64%
Total All Funds	$ 2,011,244,638	$ (131,962,277)	$ 11,512,476	$ -	$ 1,890,794,837	-5.99%	-6.54%

Notes: Source data provided by the record keeper, Empower Retirement.
(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.

Defined Contribution Retirement - Participant Directed PERS
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
April 30, 2022
$ (Thousands)

Invested Assets (at fair value)	**July**	**August**	**September**	**October**	**November**	**December**	**January**	**February**	**March**	**April**
Investments with T. Rowe Price										
Stable Value Fund	$ 118,076	$ 119,540	$ 120,658	$ 120,594	$ 122,847	$ 124,020	$ 124,849	$ 124,368	$ 123,705	$ 122,550
Small Cap Stock Fund	124,848	125,147	119,941	122,899	114,946	116,083	103,248	104,812	103,909	95,153
Alaska Balanced Trust	47,383	49,356	49,779	52,528	53,836	54,961	54,299	54,323	55,346	54,022
Long Term Balanced Fund	13,857	15,467	17,912	21,908	25,200	30,035	33,070	34,107	33,854	31,790
AK Target Date 2010 Trust	3,467	3,515	3,416	3,357	3,359	3,425	3,202	3,161	3,025	2,930
AK Target Date 2015 Trust	13,574	13,592	13,269	13,587	13,249	13,294	12,783	12,572	12,575	11,526
AK Target Date 2020 Trust	46,846	47,035	45,731	46,976	46,510	47,421	45,730	44,789	44,413	41,885
AK Target Date 2025 Trust	86,710	88,196	85,890	88,831	87,797	89,764	86,517	85,020	85,622	81,157
AK Target Date 2030 Trust	97,134	98,887	96,310	100,381	99,510	102,587	98,793	97,267	98,592	93,195
AK Target Date 2035 Trust	123,227	125,787	121,833	127,547	126,108	130,543	125,704	123,177	125,218	117,599
AK Target Date 2040 Trust	145,065	148,749	144,451	151,539	149,129	154,559	149,076	146,327	149,173	139,687
AK Target Date 2045 Trust	189,980	194,566	187,799	197,310	194,365	202,266	193,954	190,081	194,858	181,984
AK Target Date 2050 Trust	226,477	231,766	224,317	236,286	232,602	240,590	230,863	226,652	231,862	216,230
AK Target Date 2055 Trust	239,429	246,604	239,298	252,737	249,379	260,177	249,924	245,034	250,452	234,209
AK Target Date 2060 Trust	7,460	7,796	8,023	9,033	9,534	10,534	10,611	10,990	11,936	11,910
AK Target Date 2065 Trust	3,250	3,699	3,785	4,254	4,510	5,159	5,259	5,457	6,015	6,308
Investments with JP Morgan										
JPMorgan SmartRetirement Blend 2015 R6	5	0	0	0	1	1	2	2	3	3
JPMorgan SmartSpending 2020 R6	5	0	0	0	1	1	2	2	0	0
JPMorgan SmartRetirement Blend 2020 R6	5	0	1	3	36	45	59	58	55	50
State Street Global Advisors										
Money Market	14,810	15,438	15,656	15,571	15,561	15,136	16,582	16,619	16,338	16,453
S&P 500 Stock Index	78,578	80,615	76,541	82,360	82,633	87,270	82,876	81,001	84,839	78,338
Russell 3000 Index	72,802	76,379	74,804	82,172	83,918	92,467	91,100	90,593	92,296	83,617
World Equity Ex-US Index	42,667	42,874	42,316	44,580	44,077	50,203	51,959	52,922	54,791	52,916
Investments with BlackRock										
Passive U.S. Bond Index Fund	83,219	82,134	79,693	77,762	77,259	74,574	71,024	68,371	65,322	62,230
Strategic Completion Fund	5,956	5,781	5,689	5,853	5,609	5,810	5,688	5,953	5,890	5,738
Investments with Brandes and Baillie Gifford										
AK International Equity Fund	108,915	112,201	107,694	110,745	104,918	105,914	96,810	90,622	87,916	81,553
Investments with Northern Trust										
Environmental, Social, and Governance Fund	89,553	91,018	84,086	89,412	84,162	82,012	72,028	68,558	73,240	67,761
Total Invested Assets	**$ 1,983,291**	**$ 2,026,142**	**$ 1,968,893**	**$ 2,058,225**	**$ 2,031,055**	**$ 2,098,847**	**$ 2,016,009**	**$ 1,982,836**	**$ 2,011,245**	**$ 1,890,795**
Change in Invested Assets										
Beginning Assets	$ 1,964,384	$ 1,983,291	$ 2,026,142	$ 1,968,893	$ 2,058,225	$ 2,031,055	$ 2,098,847	$ 2,016,009	$ 1,982,836	$ 2,011,245
Investment Earnings	12,809	37,132	(64,693)	81,461	(39,028)	58,320	(89,237)	(40,841)	19,903	(131,962)
Net Contributions (Withdrawals)	6,098	5,720	7,443	7,872	11,858	9,472	6,399	7,669	8,505	11,512
Ending Invested Assets	**$ 1,983,291**	**$ 2,026,142**	**$ 1,968,893**	**$ 2,058,225**	**$ 2,031,055**	**$ 2,098,847**	**$ 2,016,009**	**$ 1,982,836**	**$ 2,011,245**	**$ 1,890,795**

Note: Source data provided by the record keeper, Empower Retirement.

Defined Contribution Retirement - Participant Directed TRS
Schedule of Investment Income and Changes in Invested Assets
for the Month Ended
April 30, 2022

Participant Options	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
T. Rowe Price							
Stable Value Fund	$ 48,507,873	$ 74,724	$ 38,993	$ 234,815	$ 48,856,405	0.72%	0.15%
Small Cap Stock Fund	42,324,760	(3,681,747)	33,111	22,912	38,699,036	-8.57%	-8.69%
Alaska Balanced Trust	23,097,411	(951,653)	40,340	390,842	22,576,940	-2.25%	-4.08%
Long Term Balanced Fund	14,841,285	(825,739)	(48,922)	(32,487)	13,934,137	-6.11%	-5.58%
AK Target Date 2010 Trust	1,252,975	(49,345)	10,012	-	1,213,642	-3.14%	-3.92%
AK Target Date 2015 Trust	3,904,837	(168,608)	32,580	-	3,768,809	-3.48%	-4.30%
AK Target Date 2020 Trust	12,975,635	(630,057)	35,631	(67,362)	12,313,847	-5.10%	-4.86%
AK Target Date 2025 Trust	26,796,772	(1,493,231)	159,720	(2)	25,463,259	-4.98%	-5.56%
AK Target Date 2030 Trust	37,579,920	(2,300,118)	275,199	(68,060)	35,486,941	-5.57%	-6.10%
AK Target Date 2035 Trust	53,300,158	(3,521,737)	417,658	(159,754)	50,036,325	-6.12%	-6.59%
AK Target Date 2040 Trust	64,607,155	(4,520,900)	383,895	135,148	60,605,298	-6.19%	-6.97%
AK Target Date 2045 Trust	92,685,519	(6,738,479)	214,955	(14,073)	86,147,922	-7.05%	-7.26%
AK Target Date 2050 Trust	128,356,620	(9,454,834)	643,963	(244,001)	119,301,748	-7.05%	-7.35%
AK Target Date 2055 Trust	85,278,673	(6,298,858)	656,491	(66,388)	79,569,918	-6.69%	-7.36%
AK Target Date 2060 Trust	3,957,503	(303,565)	244,778	1	3,898,717	-1.49%	-7.44%
AK Target Date 2065 Trust	923,149	(71,316)	56,777	(1)	908,609	-1.58%	-7.49%
Total Investments with T. Rowe Price	640,390,245	(40,935,463)	3,195,181	131,590	602,781,553		
JP Morgan							
JPMorgan SmartRetirement Blend 2015 R6	-	-	-	-	-	0.00%	0.00%
JPMorgan SmartSpending 2020 R6	-	-	-	-	-	0.00%	0.00%
Total Investments with JP Morgan	-	-	-	-	-		
State Street Global Advisors							
Money Market	5,121,063	1,193	13,070	(25,005)	5,110,321	-0.21%	0.02%
S&P 500 Stock Index	23,446,931	(2,046,847)	97,863	(141,833)	21,356,114	-8.92%	-8.74%
Russell 3000 Index	38,089,329	(3,405,394)	6,061	(311,726)	34,378,270	-9.74%	-8.98%
World Equity Ex-US Index	23,714,981	(1,548,917)	57,495	408,285	22,631,844	-4.57%	-6.47%
Total Investments with SSgA	90,372,304	(6,999,965)	174,489	(70,279)	83,476,549		
BlackRock							
Passive U.S. Bond Index Fund	24,400,499	(921,806)	13,364	(188,155)	23,303,902	-4.49%	-3.79%
Strategic Completion Fund	1,805,690	(39,100)	11,737	(61,119)	1,717,208	-4.90%	-2.20%
Total Investments with BlackRock	26,206,189	(960,906)	25,101	(249,274)	25,021,110		
Brandes and Baillie Gifford							
AK International Equity Fund	38,308,548	(3,085,746)	71,877.00	(32,637)	35,262,042	-7.95%	-8.05%
Northern Trust							
Environmental, Social, and Governance Fund	30,112,155	(2,611,926)	43,999.00	220,600	27,764,828	-7.80%	-8.64%
Total All Funds	$ 825,389,441	$ (54,594,006)	$ 3,510,647	$ -	$ 774,306,082	-6.19%	-6.60%

Notes: Source data provided by the record keeper, Empower Retirement.
(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.

Defined Contribution Retirement - Participant Directed TRS
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
April 30, 2022
$ (Thousands)

Invested Assets (at fair value)	**July**	**August**	**September**	**October**	**November**	**December**	**January**	**February**	**March**	**April**
Investments with T. Rowe Price										
Stable Value Fund	$ 46,955	$ 47,342	$ 47,754	$ 47,461	$ 48,163	$ 48,995	$ 49,285	$ 48,866	$ 48,508	$ 48,856
Small Cap Stock Fund	50,379	50,599	48,156	49,222	46,068	46,556	41,849	42,542	42,325	38,699
Alaska Balanced Trust	20,063	20,970	20,990	21,734	22,292	22,871	22,576	22,501	23,097	22,577
Long Term Balanced Fund	5,573	6,530	7,354	8,928	10,530	12,777	14,269	14,814	14,841	13,934
AK Target Date 2010 Trust	1,196	1,256	1,239	1,275	1,266	1,085	1,271	1,264	1,253	1,214
AK Target Date 2015 Trust	4,024	4,173	4,113	4,239	4,223	4,319	4,254	3,985	3,905	3,769
AK Target Date 2020 Trust	14,018	13,876	13,534	13,891	13,694	13,732	13,491	13,155	12,976	12,314
AK Target Date 2025 Trust	27,427	27,347	26,508	27,495	27,317	28,226	26,904	26,513	26,797	25,463
AK Target Date 2030 Trust	37,836	38,163	36,847	38,675	38,380	39,320	37,827	37,036	37,580	35,487
AK Target Date 2035 Trust	52,959	53,903	51,606	54,161	53,408	55,467	53,324	52,662	53,300	50,036
AK Target Date 2040 Trust	62,818	64,059	62,219	65,476	64,379	66,519	63,857	63,042	64,607	60,605
AK Target Date 2045 Trust	90,922	92,299	88,891	93,559	92,280	96,200	92,227	90,711	92,686	86,148
AK Target Date 2050 Trust	126,623	129,199	124,467	131,132	128,736	133,879	128,422	126,167	128,357	119,302
AK Target Date 2055 Trust	82,393	84,076	81,075	85,230	84,190	87,713	84,168	83,061	85,279	79,570
AK Target Date 2060 Trust	2,521	2,634	2,609	2,932	3,079	3,447	3,496	3,652	3,958	3,899
AK Target Date 2065 Trust	365	388	395	473	516	590	614	843	923	909
Investments with JP Morgan										
JPMorgan SmartRetirement Blend 2015 R6	0	0	0	0	0	0	0	0	0	0
JPMorgan SmartSpending 2020 R6	0	0	0	0	0	0	0	0	0	0
Investments with State Street Global Advisors										
Money Market	4,501	4,754	4,583	4,627	4,549	4,610	4,795	4,887	5,121	5,110
S&P 500 Stock Index	22,155	22,404	21,052	22,759	22,808	24,091	22,978	22,382	23,447	21,356
Russell 3000 Index	29,502	30,900	30,379	33,635	34,438	37,705	37,527	37,523	38,089	34,378
World Equity Ex-US Index	18,199	18,208	17,995	18,873	18,865	21,698	22,578	22,911	23,715	22,632
Investments with BlackRock										
Passive U.S. Bond Index Fund	32,563	32,163	31,093	30,233	29,624	28,234	26,713	25,457	24,400	23,304
Strategic Completion Fund	1,591	1,549	1,521	1,571	1,551	1,574	1,584	1,743	1,806	1,717
Investments with Brandes and Baillie Gifford										
AK International Equity Fund	46,757	47,935	45,605	46,672	44,516	45,514	42,133	39,481	38,309	35,262
Investments with Northern Trust										
Environmental, Social, and Governance Fund	38,315	38,547	35,289	37,402	34,900	33,523	29,370	28,127	30,112	27,765
Total Invested Assets	**$ 819,656**	**$ 833,273**	**$ 805,272**	**$ 841,655**	**$ 829,772**	**$ 858,644**	**$ 825,512**	**$ 813,326**	**$ 825,389**	**$ 774,306**
Change in Invested Assets										
Beginning Assets	$ 812,550	$ 819,656	$ 833,273	$ 805,272	$ 841,655	$ 829,772	$ 858,644	$ 825,512	$ 813,326	$ 825,389
Investment Earnings	5,164	15,463	(26,802)	33,555	(16,485)	24,147	(36,835)	(16,964)	8,207	(54,594)
Net Contributions (Withdrawals)	1,942	(1,845)	(1,199)	2,827	4,602	4,725	3,704	4,778	3,856	3,511
Ending Invested Assets	**$ 819,656**	**$ 833,273**	**$ 805,272**	**$ 841,655**	**$ 829,772**	**$ 858,644**	**$ 825,512**	**$ 813,326**	**$ 825,389**	**$ 774,306**

Note: Source data provided by the record keeper, Empower Retirement.

ALASKA RETIREMENT MANAGEMENT BOARD

FINANCIAL REPORT
(Supplement to the Treasury Division Report)

As of April 30, 2022

Prepared by the Division of Retirement & Benefits

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Ten Months Ending April 30, 2022

	Contributions				Expenditures				Net
	Contributions EE and/or ER	State of Alaska	Other	Total Contributions	Benefits	Refunds & Disbursements	Administrative & Investment	Total Expenditures	Contributions/ (Withdrawals)
Public Employees' Retirement System (PERS)									
Defined Benefit Plans:									
Retirement Pension Trust	$ 391,677,881	$ 97,699,500	$ 153,592	$ 489,530,973	$ (796,302,940)	$ (7,147,507)	$ (7,626,958)	$ (811,077,405)	$ (321,546,432)
Retirement Health Care Trust	55,011,542	-	75,408,230	130,419,772	(404,603,979)	-	(13,179,919)	(417,783,898)	(287,364,126)
Total Defined Benefit Plans	446,689,423	97,699,500	75,561,822	619,950,745	(1,200,906,919)	(7,147,507)	(20,806,877)	(1,228,861,303)	(608,910,558)
Defined Contribution Plans:									
Participant Directed Retirement	171,906,472	-	-	171,906,472	-	(83,853,166)	(5,505,504)	(89,358,670)	82,547,802
Health Reimbursement Arrangement [(a)]	41,547,824	-	16,395	41,564,219	(397,115)	-	(172,258)	(569,373)	40,994,846
Retiree Medical Plan [(a)]	14,462,026	-	150,620	14,612,646	(1,027,742)	-	(121,662)	(1,149,404)	13,463,242
Occupational Death and Disability: [(a)]									
All Others	3,387,754	-	-	3,387,754	(112,599)	-	(27,693)	(140,292)	3,247,462
Peace Officers and Firefighters	1,326,902	-	-	1,326,902	(278,713)	-	(17,990)	(296,703)	1,030,199
Total Defined Contribution Plans	232,630,978	-	167,015	232,797,993	(1,816,169)	(83,853,166)	(5,845,107)	(91,514,442)	141,283,551
Total PERS	**679,320,401**	**97,699,500**	**75,728,837**	**852,748,738**	**(1,202,723,088)**	**(91,000,673)**	**(26,651,984)**	**(1,320,375,745)**	**(467,627,007)**
Teachers' Retirement System (TRS)									
Defined Benefit Plans:									
Retirement Pension Trust	44,325,701	142,665,000	29,952	187,020,653	(427,510,141)	(1,090,669)	(3,677,889)	(432,278,699)	(245,258,046)
Retirement Health Care Trust	16,946,284	-	25,147,242	42,093,526	(130,308,423)	-	(6,868,516)	(137,176,939)	(95,083,413)
Total Defined Benefit Plans	61,271,985	142,665,000	25,177,194	229,114,179	(557,818,564)	(1,090,669)	(10,546,405)	(569,455,638)	(340,341,459)
Defined Contribution Plans:									
Participant Directed Retirement	54,218,695	-	-	54,218,695	-	(25,256,705)	(2,061,272)	(27,317,977)	26,900,718
Health Reimbursement Arrangement [(a)]	10,049,721	-	(15,316)	10,034,405	(134,203)	-	(50,915)	(185,118)	9,849,287
Retiree Medical Plan [(a)]	3,154,444	-	15,140	3,169,584	(229,252)	-	(61,236)	(290,488)	2,879,096
Occupational Death and Disability [(a)]	287,714	-	-	287,714	(22,549)	-	(11,194)	(33,743)	253,971
Total Defined Contribution Plans	67,710,574	-	(176)	67,710,398	(386,004)	(25,256,705)	(2,184,617)	(27,827,326)	39,883,072
Total TRS	**128,982,559**	**142,665,000**	**25,177,018**	**296,824,577**	**(558,204,568)**	**(26,347,374)**	**(12,731,022)**	**(597,282,964)**	**(300,458,387)**
Judicial Retirement System (JRS)									
Defined Benefit Plan Retirement Pension Trust	7,026,221	4,185,000	4	11,211,225	(12,312,958)	-	(149,150)	(12,462,108)	(1,250,883)
Defined Benefit Plan Retirement Health Care Trust	573,977	-	381,570	955,547	(1,118,266)	-	(76,213)	(1,194,479)	(238,932)
Total JRS	**7,600,198**	**4,185,000**	**381,574**	**12,166,772**	**(13,431,224)**	**-**	**(225,363)**	**(13,656,587)**	**(1,489,815)**
National Guard/Naval Militia Retirement System (NGNMRS)									
Defined Benefit Plan Retirement Pension Trust [(a)]	-	-	-	-	(1,356,213)	-	(290,523)	(1,646,736)	(1,646,736)
Other Participant Directed Plans									
Supplemental Annuity Plan (SBS)	148,554,581	-	-	148,554,581	-	(255,033,049)	(8,147,701)	(263,180,750)	(114,626,169)
Deferred Compensation Plan [(b)] (DCP)	42,351,691	-	-	42,351,691	-	(72,721,207)	(2,203,487)	(74,924,694)	(32,573,003)
Total All Funds	**1,006,809,430**	**244,549,500**	**101,287,429**	**1,352,646,359**	**(1,775,715,093)**	**(445,102,303)**	**(50,250,080)**	**(2,271,067,476)**	**(918,421,117)**
Total Non-Participant Directed	589,777,991	244,549,500	101,287,429	935,614,920	(1,775,715,093)	(8,238,176)	(32,332,116)	(1,816,285,385)	(880,670,465)
Total Participant Directed	417,031,439	-	-	417,031,439	-	(436,864,127)	(17,917,964)	(454,782,091)	(37,750,652)
Total All Funds	**$ 1,006,809,430**	**$ 244,549,500**	**$ 101,287,429**	**$ 1,352,646,359**	**$ (1,775,715,093)**	**$ (445,102,303)**	**$ (50,250,080)**	**$ (2,271,067,476)**	**$ (918,421,117)**

(a) Employer only contributions.
(b) Employee only contributions.

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Month Ended April 30, 2022

	Contributions				Expenditures				Net
	Contributions EE and/or ER	State of Alaska	Other	Total Contributions	Benefits	Refunds & Disbursements	Administrative & Investment	Total Expenditures	Contributions/ (Withdrawals)
Public Employees' Retirement System (PERS)									
Defined Benefit Plans:									
Retirement Pension Trust	$ 39,895,410	$ -	$ 11,718	$ 39,907,128	$ (80,248,431)	$ (435,096)	$ (426,363)	$ (81,109,890)	$ (41,202,762)
Retirement Health Care Trust	5,330,260	-	11,060,246	16,390,506	(39,330,313)	-	(1,680,075)	(41,010,388)	(24,619,882)
Total Defined Benefit Plans	45,225,670	-	11,071,964	56,297,634	(119,578,744)	(435,096)	(2,106,438)	(122,120,278)	(65,822,644)
Defined Contribution Plans:									
Participant Directed Retirement	20,308,679	-	-	20,308,679	-	(8,056,294)	(739,909)	(8,796,203)	11,512,476
Health Reimbursement Arrangement [(a)]	4,405,744	-	-	4,405,744	(38,221)	-	(24,077)	(62,298)	4,343,446
Retiree Medical Plan [(a)]	1,500,371	-	27,598	1,527,969	(69,570)	-	(13,088)	(82,658)	1,445,311
Occupational Death and Disability: [(a)]									
All Others	348,989	-	-	348,989	(13,448)	-	(1,858)	(15,306)	333,683
Peace Officers and Firefighters	146,875	-	-	146,875	(25,989)	-	(795)	(26,784)	120,091
Total Defined Contribution Plans	26,710,658	-	27,598	26,738,256	(147,228)	(8,056,294)	(779,727)	(8,983,249)	17,755,007
Total PERS	**71,936,328**	**-**	**11,099,562**	**83,035,890**	**(119,725,972)**	**(8,491,390)**	**(2,886,165)**	**(131,103,527)**	**(48,067,637)**
Teachers' Retirement System (TRS)									
Defined Benefit Plans:									
Retirement Pension Trust	5,978,426	-	8,756	5,987,182	(42,741,792)	(14,106)	(246,818)	(43,002,716)	(37,015,534)
Retirement Health Care Trust	2,144,346	-	4,029,388	6,173,734	(12,512,524)	-	(611,423)	(13,123,947)	(6,950,213)
Total Defined Benefit Plans	8,122,772	-	4,038,144	12,160,916	(55,254,316)	(14,106)	(858,241)	(56,126,663)	(43,965,747)
Defined Contribution Plans:									
Participant Directed Retirement	6,183,649	-	-	6,183,649	-	(2,356,350)	(316,652)	(2,673,002)	3,510,647
Health Reimbursement Arrangement [(a)]	1,234,200	-	-	1,234,200	(7,345)	-	(6,981)	(14,326)	1,219,874
Retiree Medical Plan [(a)]	391,020	-	5,350	396,370	(14,618)	-	(5,495)	(20,113)	376,257
Occupational Death and Disability [(a)]	36,596	-	-	36,596	(4,328)	-	(459)	(4,787)	31,809
Total Defined Contribution Plans	7,845,465	-	5,350	7,850,815	(26,291)	(2,356,350)	(329,587)	(2,712,228)	5,138,587
Total TRS	**15,968,237**	**-**	**4,043,494**	**20,011,731**	**(55,280,607)**	**(2,370,456)**	**(1,187,828)**	**(58,838,891)**	**(38,827,160)**
Judicial Retirement System (JRS)									
Defined Benefit Plan Retirement Pension Trust	699,213	-	-	699,213	(1,241,237)	-	(8,673)	(1,249,910)	(550,697)
Defined Benefit Plan Retirement Health Care Trust	72,721	-	213,692	286,413	(78,037)	-	(5,286)	(83,323)	203,090
Total JRS	**771,934**	**-**	**213,692**	**985,626**	**(1,319,274)**	**-**	**(13,959)**	**(1,333,233)**	**(347,607)**
National Guard/Naval Militia Retirement System (NGNMRS)									
Defined Benefit Plan Retirement Pension Trust [(a)]	-	-	-	-	(164,494)	-	(2,362)	(166,856)	(166,856)
Other Participant Directed Plans									
Supplemental Annuity Plan (SBS)	19,591,112	-	-	19,591,112	-	(23,206,917)	(966,413)	(24,173,330)	(4,582,218)
Deferred Compensation Plan [(b)] (DCP)	4,670,603	-	-	4,670,603	-	(7,707,178)	(291,118)	(7,998,296)	(3,327,693)
Total All Funds	**112,938,214**	**-**	**15,356,748**	**128,294,962**	**(176,490,347)**	**(41,775,941)**	**-**	**(223,614,133)**	**(95,319,171)**
Total Non-Participant Directed	62,184,171	-	15,356,748	77,540,919	(176,490,347)	(449,202)	(3,033,753)	(179,973,302)	(102,432,383)
Total Participant Directed	50,754,043	-	-	50,754,043	-	(41,326,739)	(2,314,092)	(43,640,831)	7,113,212
Total All Funds	**$ 112,938,214**	**$ -**	**$ 15,356,748**	**$ 128,294,962**	**$ (176,490,347)**	**$ (41,775,941)**	**$ (5,347,845)**	**$ (223,614,133)**	**$ (95,319,171)**

(a) Employer only contributions.
(b) Employee only contributions.

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Ten Months Ending April 30, 2022

PARTICIPANT DIRECTED DISBURSEMENTS BY PLAN AND TYPE

Type	PERS DCR Plan	TRS DCR Plan	Supplemental Annuity Plan	Deferred Compensation	TOTAL	% of Total
Payment to Beneficiary	$ 60,423	$ -	$ 796,644	$ 252,108	$ 1,109,175	0.3%
Death Benefit	1,985,485	972,253	13,277,247	4,870,746	21,105,731	4.8%
Disability / Hardship	37,519	-	55,989	53,479	146,987	0.0%
Minimum Required Distribution	197,367	46,603	12,183,794	4,684,695	17,112,459	3.9%
Deminimus Acct Balance Distribution	-	-	-	3,372	3,372	0.0%
Qualified Domestic Relations Order	923,478	155,858	5,637,194	458,336	7,174,866	1.6%
Separation from Service / Retirement	80,648,894	24,072,980	222,227,069	59,155,447	386,104,390	88.5%
Purchase of Service Credit	-	9,011	855,112	160,671	1,024,794	0.2%
Transfer to a Qualifying Plan	-	-	-	-	-	0.0%
59-½ In-service Distribution	-	-	-	3,042,965	3,042,965	0.7%
Qualified Birth / Adoption Expense	-	-	-	39,388	39,388	0.0%
CARES Act Distributions	-	-	-	-	-	0.0%
TOTAL	$ 83,853,166	$ 25,256,705	$ 255,033,049	$ 72,721,207	$ 436,864,127	100.0%

PERS & TRS PARTICIPANT DIRECTED DISBURSEMENTS BY PLAN AND VESTED PERCENTAGE

Vesting	PERS DCR Plan	TRS DCR Plan	TOTAL	% of Total
100% Vested	$ 75,461,285	$ 22,520,802	$ 97,982,087	89.8%
75% Vested	1,938,631	701,049	2,639,680	2.4%
50% Vested	1,624,029	624,367	2,248,396	2.1%
25% Vested	2,091,381	580,400	2,671,781	2.4%
0% Vested	2,737,840	830,087	3,567,927	3.3%
TOTAL	$ 83,853,166	$ 25,256,705	$ 109,109,871	100.0%

DEFINED BENEFIT REFUNDS BY PLAN, TIER, CONTRIBUTION TYPE AND VESTED STATUS

	PERS DB Pension Plan				TRS DB Pension Plan			JRS	TOTAL
Contribution Type	Tier 1	Tier 2	Tier 3	Total	Tier 1	Tier 2	Total	DB Pension Plan	DB Pension Plan
Mandatory Vested	$ 238,792	$ 1,002,114	$ 1,932,517	$ 3,173,423	$ -	$ 196,538	$ 196,538	$ -	$ 3,369,961.00
Mandatory Non-Vested	144,094	275,007	583,245	1,002,346	141,933	727,521	869,454	-	1,871,800
Geographic Differential	-	223,728	187,458	411,186	-	-	-	-	411,186
Voluntary Full	348,061	717,934	1,141,238	2,207,233	-	-	-	-	2,207,233
Indebtedness, Lagging & Partial	8,303	80,518	264,498	353,319	176	24,501	24,677	-	377,996
TOTAL	$ 739,250	$ 2,299,301	$ 4,108,956	$ 7,147,507	$ 142,109	$ 948,560	$ 1,090,669	$ -	$ 8,238,176

Notes for the DRB Supplement to the Treasury Report

April 2022

This report is the DRB supplement to the Treasury Division's Financial Report. It expands the "Net Contributions/(Withdrawals)" column into contributions and expenditures. It shows contributions received from both employees and employers, contributions from the State of Alaska, and other non-investment income. This report also expands expenditures into benefits, refunds & disbursements, and administrative & investment expenditures.

The net amount of total contributions and total expenditures, presented as "Net Contributions/(Withdrawals)", agrees with the same column in the Treasury Division's Report. Page one shows the year-to-date totals for the first ten months of Fiscal Year 2022, while page two shows only the month of April 2022.

Highlights – On page one, for the ten months ending April 30, 2022:

- PERS DB Pension – Average employer and employee contributions of $39.2 million per month; benefit payments of approximately $79.6 million per month; refunds average $715 thousand; and administrative and investment expenditures of $763 thousand per month (DOR and DRB).
- PERS DB Healthcare – Average employer contributions of $5.5 million per month; benefit payments of approximately $40.5 million per month; other income of $20.7 million from OptumRx EGWP subsidies (most recently received in April for April 2022); $23.8 million from OptumRx pharmacy rebates (most recently received in February for 4th Qtr 2021); $822 thousand from Aetna pharmacy rebates (most recently received in March for 3rd Qtr 2021); $29.3 million from EGWP coverage gap discount program (CGDP) (most recently received in April for 4th Qtr 2021); $594 thousand from CMS retiree drug subsidies (RDS); and average administrative and investment expenditures of $1.3 million per month (DOR and DRB).
- PERS DC Pension – Average employer and employee contributions of $17.2 million per month; participant disbursements average $8.4 million per month; and average administrative and investment expenditures of $551 thousand per month (DOR and DRB).
- PERS DCR Health – For HRA, RMP, and OD&D, only employer contributions average $6.1 million per month on behalf of participating employees; benefit payments of approximately $182 thousand per month. Currently, 15 benefits are being paid from the Occupational Death & Disability plans, 110 retirees are participating in RMP, and 160 retirees are participating in HRA. Other income of $52 thousand from OptumRx EGWP subsidies (most recently received in April for April 2022), $43 thousand from OptumRx pharmacy rebates (most recently received in February for 4th Qtr 2021), $54 thousand from EGWP coverage gap discount program (CGDP) (most recently received in April for 4th Qtr 2021); and administrative and investment expenditures were approximately $34 thousand per month (DOR and DRB).
- TRS DB Pension – Average employer and employee contributions of $4.4 million per month; benefit payments of approximately $42.8 million per month; refunds average $109 thousand; and average administrative and investment expenditures of $368 thousand per month (DOR and DRB).
- TRS DB Healthcare – Average employer contributions of $1.7 million per month; benefit payments of approximately $13 million per month; other income of $7.3 million from OptumRx EGWP subsidies (most recently received in April for April 2022), $7.3 million from OptumRx pharmacy rebates (most recently received in February for 4th Qtr 2021), $284 thousand from Aetna pharmacy rebates (most recently received in March for 3rd Qtr 2021), $9.9 million from EGWP coverage gap discount program (CGDP) (most recently received in April for 4th Qtr 2021), $312 thousand from CMS retiree drug subsidies (RDS); and average administrative and investment expenditures of $687 thousand per month (DOR and DRB).

- TRS DC Pension – Average employer and employee contributions of $5.4 million per month; participant disbursements average $2.5 million per month; and average administrative and investment expenditures of $206 thousand per month (DOR and DRB).
- TRS DCR Health – For HRA, RMP, and OD&D only, employer contributions average $1.3 million per month on behalf of participating employees; benefit payments of approximately $39 thousand per month. Currently, 1 benefit is being paid from the Occupational Death & Disability plan, 22 retirees are participating in RMP, and 38 retirees are participating in HRA. Other income of $6 thousand was received from monthly OptumRx EGWP subsidies (most recently received in April for April 2022), $4 thousand from OptumRx pharmacy rebates (most recently received in February for 4th Qtr 2021); and administrative and investment expenditures were approximately $12 thousand per month (DOR and DRB).
- JRS Pension – Average employer and employee contributions of $703 thousand per month; benefit payments of approximately $1.2 million per month; and average administrative and investment expenditures of $15 thousand per month (DOR and DRB).
- JRS Healthcare – Average employer contributions of $57 thousand per month; benefit payments of approximately $112 thousand per month. Other income of $61 thousand from OptumRx EGWP subsidies (most recently received in April for April 2022), $48 thousand from OptumRx pharmacy rebates (most recently received in February for 4th Qtr 2021); $90 thousand from EGWP coverage gap discount program (CGDP) (most recently received in April for 4th Qtr 2021), $179 thousand from CMS retiree drug subsidies (RDS); and average administrative and investment expenditures of $8 thousand per month (DOR and DRB).
- NGNMRS – A combination of lump-sum and monthly benefit payments of $136 thousand per month; and average administrative and investment expenditures of $29 thousand per month (DOR and DRB).
- SBS – Average employer and employee contributions and transfers in of $14.9 million per month. Participant disbursements average of $25.5 million per month; and average administrative and investment expenditures of $815 thousand per month (DOR and DRB).
- Deferred Compensation – Average employer and employee contributions and transfers in of $4.2 million per month; participant disbursements average of $7.3 million per month; and average administrative and investment expenditures of $220 thousand per month (DOR and DRB).

Highlights – On page two, activity for the one month of April 2022 only:

- PERS DB Healthcare – Other income of $11.0 million from OptumRx EGWP subsidies, EGWP coverage gap discount program and CMS retiree drug subsidies.
- PERS DC Healthcare – Other income of $27 thousand from OptumRx EGWP subsidies, EGWP coverage gap discount program and CMS retiree drug subsidies.
- TRS DB Healthcare – Other income of $4.0 million from OptumRx EGWP subsidies, EGWP coverage gap discount program and CMS retiree drug subsidies.
- TRS DC Healthcare – Other income of $5 thousand from OptumRx EGWP subsidies, EGWP coverage gap discount program and CMS retiree drug subsidies.
- JRS DB Healthcare – Other income of $213 thousand from OptumRx EGWP subsidies, EGWP coverage gap discount program and CMS retiree drug subsidies.
- Deferred Compensation – April was the first month that an employer provided matching contributions in DCP.
- All other funds – Nothing significant to report.

If you have any questions or comments, please let me know.

ALASKA RETIREMENT MANAGEMENT BOARD
STAFF REPORT
Division of Retirement & Benefits Report
June 16, 2022

Summary of Monthly Billings – Buck Global LLC

Attached is the requested summary schedule of invoices by quarter related to actuarial services provided by the Division's consulting actuary, Buck Global LLC.

Included on this schedule is the quarters ended September 30, 2021, December 31, 2021, and March 31, 2022.

Items listed on the left side of the schedule represent regular and non-regular services provided under our current contract.

The associated costs of each service are charged to the System or Plan noted on the column headings.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Summary of Monthly Billings - Buck Global LLC

DATE: June 16, 2022

ACTION: _____

INFORMATION: X

BACKGROUND:

AS 37.10.220(a)(8) prescribes that the Alaska Retirement Management Board (Board) "coordinate with the retirement system administrator to have an annual actuarial valuation of each retirement system prepared to determine system assets, accrued liabilities, and funding ratios…."

As part of the oversight process, the Board has requested that the Division of Retirement and Benefits provide quarterly summary updates to review services provided and costs incurred for actuarial valuations and other systems' requests.

STATUS:

Attached are the summary totals for the nine months ended March 31, 2022 with comparative totals from the prior fiscal year.

Buck
Billing Summary
For the Three Months Ended September 30, 2021

	PERS	TRS	JRS	NGNMRS	EPORS	TOTAL
Actuarial valuations	$ 53,466	42,561	5,457	5,457	2,184	$ 109,125
KPMG audit information request	3,142	1,278	23	90	-	4,533
ARMB presentations and meeting attendance	3,411	3,414	-	-	-	6,825
FY20 final PERS/TRS contribution rates	3,411	3,414	-	-	-	6,825
GASB 67/74	7,572	6,060	759	759	-	15,150
GASB 68/75	22,722	18,180	2,274	2,274	-	45,450
Projections	6,750	6,750	-	-	-	13,500
Estimated funded status of DB plan at 6/30/21	7,139	2,898	-	-	-	10,037
2020 valuation projections - no FY23 ASC and 3-year asset smoothing	25,235	9,816	26	-	-	35,077
AlaskaCare retiree plan cost study	6,185	2,296	22	-	-	8,503
Reset actuarial value of assets to market value of assets	11,445	4,646	-	-	-	16,091
TOTAL	$ 150,478	101,313	8,561	8,580	2,184	$ 271,116
For the Three Months Ended September 30, 2020	$ 101,046	81,969	8,500	8,523	-	$ 200,038

For the Three Months Ended December 31, 2021

	PERS	TRS	JRS	NGNMRS	EPORS	TOTAL
Actuarial valuations	$ 53,466	42,561	5,457	5,457	2,184	$ 109,125
KPMG audit information request	6,332	2,574	46	181	-	9,133
ARMB presentations and meeting attendance	39,467	18,075	266	1,030	-	58,838
FY20 final PERS/TRS contribution rates	3,411	3,414	-	-	-	6,825
GASB 67/74	7,572	6,060	759	759	-	15,150
GASB 68/75	22,722	18,180	2,274	2,274	-	45,450
Projections	6,750	6,750	-	-	-	13,500
Meeting materials	3,285	1,335	23	94	-	4,737
TOTAL	$ 143,005	98,949	8,825	9,795	2,184	$ 262,758
For the Three Months Ended December 31, 2020	$ 101,334	82,634	8,512	8,570	-	$ 201,050

For the Three Months Ended March 31, 2022

	PERS	TRS	JRS	NGNMRS	EPORS	TOTAL
Actuarial valuations	$ 17,823	14,190	1,818	1,818	726	$ 36,375
ARMB presentations and meeting attendance	1,125	1,125	-	-	-	2,250
FY20 final PERS/TRS contribution rates	1,125	1,125	-	-	-	2,250
JRS salary increase study	-	-	5,855	-	-	5,855
Projections	2,325	2,325	-	-	-	4,650
Meeting materials	5,140	2,089	36	147	-	7,412
Senate Finance Committee preparation	8,179	3,319	-	-	-	11,498
TOTAL	$ 35,717	24,173	7,709	1,965	726	$ 70,290
For the Three Months Ended March 31, 2021	$ 45,797	28,340	4,669	1,818	-	$ 80,624

Summary through the Nine Months Ended March 31, 2022

	PERS	TRS	JRS	NGNMRS	EPORS	TOTAL
Actuarial valuations	$ 124,755	99,312	12,732	12,732	5,094	$ 254,625
KPMG audit information request	9,474	3,852	69	271	-	13,666
ARMB presentations and meeting attendance	44,003	22,614	266	1,030	-	67,913
FY20 final PERS/TRS contribution rates	7,947	7,953	-	-	-	15,900
GASB 67/74	15,144	12,120	1,518	1,518	-	30,300
GASB 68/75	45,444	36,360	4,548	4,548	-	90,900
JRS salary increase study	-	-	5,855	-	-	5,855
Projections	15,825	15,825	-	-	-	31,650
Meeting materials	8,425	3,424	59	241	-	12,149
Estimated funded status of DB plan at 6/30/21	7,139	2,898	-	-	-	10,037
2020 valuation projections - no FY23 ASC and 3-year asset smoothing	25,235	9,816	26	-	-	35,077
AlaskaCare retiree plan cost study	6,185	2,296	22	-	-	8,503
Reset actuarial value of assets to market value of assets	11,445	4,646	-	-	-	16,091
Senate Finance Committee preparation	8,179	3,319	-	-	-	11,498
TOTAL	$ 329,200	224,435	25,095	20,340	5,094	$ 604,164
Summary through the Nine Months Ended March 31, 2022	$ 248,177	192,943	21,681	18,911	-	$ 481,712

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Division of Retirement & Benefits Report
June 16, 2022

Retirement System Membership Activity as of March 31, 2022

Attached are the membership statistics for the quarter ending

- March 31, 2022

There is a net increase in active members from last quarter, all in DCR members:

- PERS Tier 1-3 active members decreased from 9,586 to 9,454, or a decrease of 132.
- PERS DCR active members increased from 25,388 to 25,609, or an increase of 221.
- PERS active members had a net increase of 89.

- TRS Tier 1-2 active members decreased from 3,449 to 3,415, or a decrease of 34.
- TRS DCR active members increased from 6,622 to 6,649, or an increase of 27.
- TRS active members had a net decrease of 7.

Retiree counts have changed in the following manner:

- PERS retirees increased from 37,123 to 37,194, or an increase of 71 (all tiers).
- TRS retirees decreased from 13,511 to 13,491, or a decrease of 20 (all tiers).

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Retirement System Membership Activity as of March 31, 2022

ACTION: _____

DATE: June 16, 2022

INFORMATION: **X**

BACKGROUND:

Information related to PERS, TRS, JRS, NGNMRS, SBS, and DCP membership activity as requested by the Board.

STATUS:

Membership information as of March 31, 2022.

MEMBERSHIP STATISTICS AS OF SEPTEMBER 30, 2021

	PERS						TRS					JRS	NGNMRS	SBS	DCP
	DB				DCR	SYSTEM	DB			DCR	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	613	2,163	7,022	9,798	24,686	34,484	143	3,292	3,435	6,194	9,629	73	n/a	20,655	6,659
Terminated Members															
Entitled to Future Benefits	243	1,632	3,209	5,084	2,185	7,269	17	613	630	858	1,488	2	n/a	29,150	5,817
Other Terminated Members	985	1,995	7,330	10,310	16,706	27,016	220	1,437	1,657	2,880	4,537	1	n/a	n/a	n/a
Total Terminated Members	1,228	3,627	10,539	15,394	18,891	34,285	237	2,050	2,287	3,738	6,025	3	n/a	29,150	5,817
Retirees & Beneficiaries	22,236	9,297	5,350	36,883	145	37,028	9,966	3,543	13,509	42	13,551	144	692	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,973	5,973	n/a	n/a	n/a	1,496	1,496	n/a	n/a	3,354	3,171
Retirements - 1st QTR FY22	51	134	150	335	18	353	43	218	261	12	273	1	3	n/a	n/a
Full Disbursements - 1st QTR FY22	16	45	72	133	463	596	3	10	13	114	127	-	n/a	580	195
Partial Disbursements - 1st QTR FY22	n/a	n/a	n/a	n/a	151	151	n/a	n/a	n/a	42	42	n/a	n/a	1,378	608

MEMBERSHIP STATISTICS AS OF DECEMBER 31, 2021

	PERS						TRS					JRS	NGNMRS	SBS	DCP
	DB				DCR	SYSTEM	DB			DCR	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	586	2,100	6,900	9,586	25,388	34,974	155	3,294	3,449	6,622	10,071	73	n/a	19,882	6,645
Terminated Members															
Entitled to Future Benefits	239	1,568	3,166	4,973	2,215	7,188	16	600	616	829	1,445	1	n/a	30,450	5,942
Other Terminated Members	976	1,972	7,283	10,231	17,106	27,337	217	1,423	1,640	2,832	4,472	1	n/a	n/a	n/a
Total Terminated Members	1,215	3,540	10,449	15,204	19,321	34,525	233	2,023	2,256	3,661	5,917	2	n/a	30,450	5,942
Retirees & Beneficiaries	22,104	9,382	5,485	36,971	152	37,123	9,916	3,555	13,471	40	13,511	145	685	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,980	5,980	n/a	n/a	n/a	1,501	1,501	n/a	n/a	3,410	3,257
Retirements - 2nd QTR FY22	37	136	149	322	7	329	5	21	26	-	26	1	19	n/a	n/a
													11		
Full Disbursements - 2nd QTR FY22	11	43	91	145	483	628	2	9	11	80	91	-	n/a	547	167
Partial Disbursements - 2nd QTR FY22	n/a	n/a	n/a	n/a	166	166	n/a	n/a	n/a	48	48	n/a	n/a	1,697	757

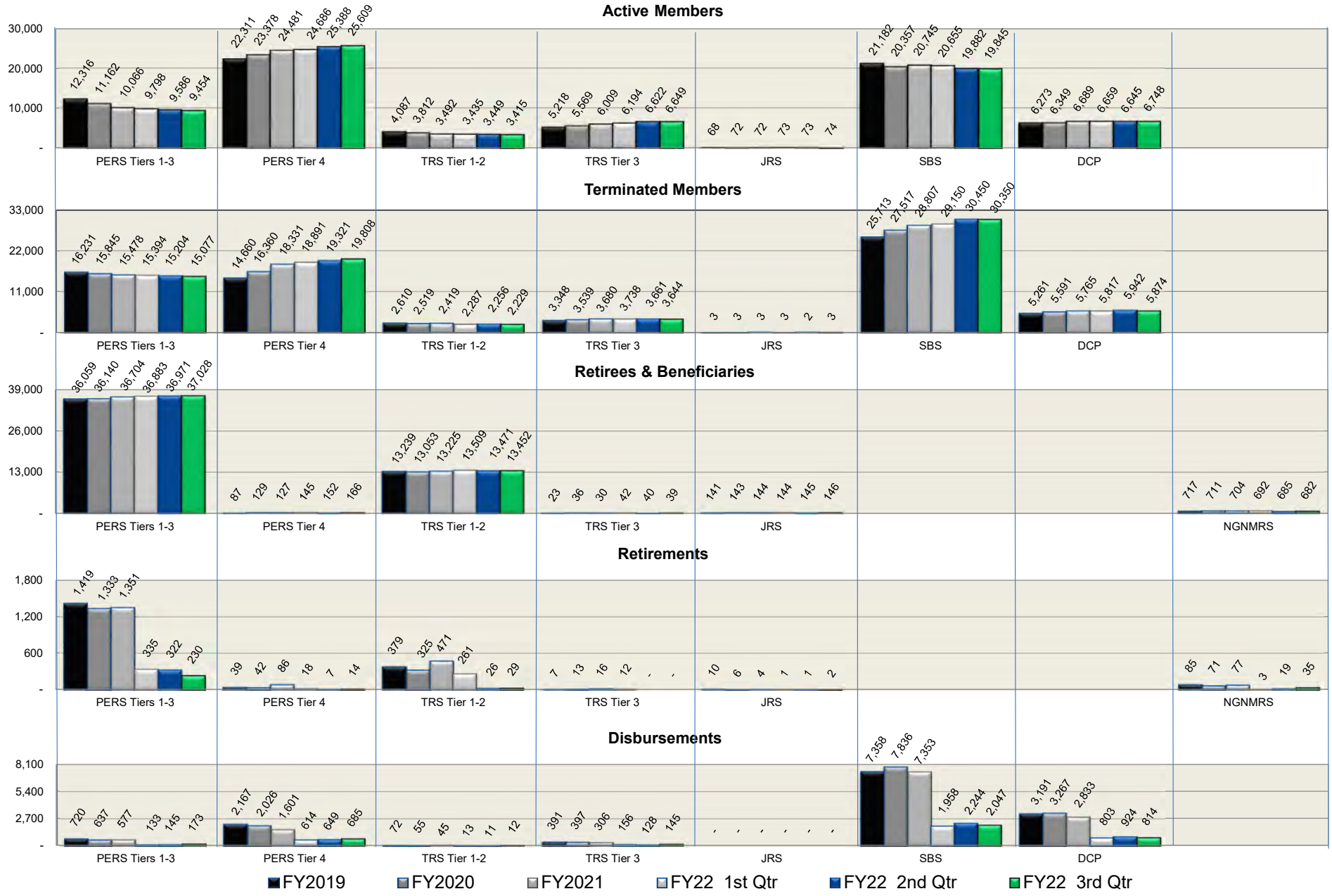
MEMBERSHIP STATISTICS AS OF MARCH 31, 2022

	PERS						TRS					JRS	NGNMRS	SBS	DCP
	DB				DCR	SYSTEM	DB			DCR	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	563	2,069	6,822	9,454	25,609	35,063	143	3,272	3,415	6,649	10,064	74	n/a	19,845	6,748
Terminated Members															
Entitled to Future Benefits	236	1,533	3,132	4,901	2,260	7,161	16	587	603	817	1,420	1	n/a	30,350	5,874
Other Terminated Members	968	1,953	7,255	10,176	17,548	27,724	215	1,411	1,626	2,827	4,453	2	n/a	n/a	n/a
Total Terminated Members	1,204	3,486	10,387	15,077	19,808	34,885	231	1,998	2,229	3,644	5,873	3	n/a	30,350	5,874
Retirees & Beneficiaries	22,008	9,441	5,579	37,028	166	37,194	9,870	3,582	13,452	39	13,491	146	682	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	6,016	6,016	n/a	n/a	n/a	1,514	1,514	n/a	n/a	3,472	3,320
Retirements - 3rd QTR FY22	35	83	112	230	14	244	-	29	29	-	29	2	35	n/a	n/a
Full Disbursements - 3rd QTR FY22	15	50	108	173	512	685	1	11	12	87	99	-	n/a	555	182
Partial Disbursements - 3rd QTR FY22	n/a	n/a	n/a	n/a	173	173	n/a	n/a	n/a	58	58	n/a	n/a	1,492	632

Alaska Division of Retirement and Benefits

FY 2022 QUARTERLY REPORT OF MEMBERSHIP STATISTICS

Annual & Quarterly Trends as of March 31, 2022



LEGEND

Active Members - All active members at the time of the data pull,
except SBS & DCP, which are counts of contributors during the final quarter of each period.

Terminated Members - All members who have terminated without refunding their account,
except SBS & DCP, which are counts of members with balances at the end of the period less active members.

Retirees & Beneficiaries - All members who have retired from the plans, including beneficiaries eligible for benefits.

Managed Accounts - Individuals who have elected to participate in the managed accounts option with Empower.

Retirements - The number of retirement applications processed.

Full Disbursements - All types of disbursements that leave the member balance at zero.

Partial Disbursements - All types of disbursements that leave the member balance above zero. If more than one
partial disbursement is completed during the quarter for a member, they are counted only once for statistical purposes.

THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Revenue

ALASKA RETIREMENT MANAGEMENT BOARD

PO Box 110405
Juneau, Alaska 99811-0405
Main: 907.465.3749
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Chief Investment Officer Report

June 2022

1. CIO Update

2. Watch List:
   a. Existing – Man Group, personnel turnover, 3/21
   b. Existing – Fidelity Real Estate High Income, performance, 12/21
   c. Existing – Fidelity Signals, personnel turnover, 3/22
   d. Existing – Blackrock Real Estate, personnel turnover, 3/22
   e. Existing – Brandes International, performance, 3/22
   f. Recommended Removal – Man Group

3. Material contract and investment actions:
   a. 02/22/22 Battery Ventures XIV $25 million private equity commitment
   b. 03/24/22 SSGA DC contract
   c. 04/08/22 Advent GPE X $50 million private equity commitment

4. Portfolio Transaction Update from February 2022 through April 2022

Individual Manager Transactions

February 2022 - April 2022

Asset Class	Total
Fixed Income	156,996,505
Broad Domestic Equity	(224,745,953)
Global Equity Ex-US	68,999,448
Real Assets	-
Opportunistic	(1,250,000)
Private Equity	-
Net Buys	225,995,953
Net Sells	(225,995,953)

Manager	Total	Fund	Asset Class	Description
Short Term Fixed Income Pool	146,996,505	AY70	Fixed Income	Rebalancing
ARMB Multi-factor	100,000,000	AYK4	Dom. Equity	Rebalancing
SSGA World ex-US IMI	69,000,000	AYL7	Intl. Equity	Rebalancing
ARMB Aggregate Bond Fund	10,000,000	AY77	Fixed Income	Rebalancing
International Equity Residual Asset	(552)	AY69	Intl. Equity	Closed Account Cleanup
Small Cap Transition Account	(7,546)	AY43	Dom. Equity	Closed Account Cleanup
ARMB Domestic Residual Assets	(38,407)	AY5E	Dom. Equity	Closed Account Cleanup
Schroders Advanced ILS Fund	(1,250,000)	AY1H	Opportunistic	Closed Account Cleanup
ARMB S&P 600	(20,000,000)	AYGA	Dom. Equity	Rebalancing
ARMB S&P 900	(128,400,000)	AY4L	Dom. Equity	Rebalancing
ARMB Scientific Beta	(176,300,000)	AYLM	Dom. Equity	Rebalancing

REPORT ON ALASKA RETIREE HEALTH PLAN ADVISORY BOARD MEETING

MARCH 25, AND MAY 05, 2022

The advisory board facilitates engagement and coordination between the State's retirement systems' members, the ARMB, and the Commissioner regarding the administration of the retiree health plan.

At the March 25 RHAB meeting, the board reviewed the details of the medication settlement agreement. Since 2016, the State of Alaska has been engaged in litigation with the Retired Public Employees of Alaska, Inc. (RPEA) regarding changes made in 2014 to the AlaskaCare Defined Benefit Retiree Health Plan (Medical Plan) and to the AlaskaCare Retiree Dental, Vision, and Audio Plan (DVA Plan). The parties mediated the outstanding issues related to the litigation on February 11, 2022, and a final settlement agreement was signed on February 28, 2022.

In accordance with the settlement agreement, the Division of Retirement and Benefits (Division) made the following recommendations that were adopted by the Board:

1. The establishment of a Regulations Subcommittee, with a position on this Subcommittee for a RPEA member. Wendy Woolf was appointed to this new position. The purpose of the committee is to review and discuss current and future regulations pertaining to the AlaskaCare Retiree Health Plans. This subcommittee will be the venue to review and develop advisory recommendations to be considered by the full Board regarding regulations describing the process for making changes to the Medical Plan and to the DVA Plan.

The RHPAB Regulations Subcommittee reviewed the current process and commented on it at their April 25 meeting. The Process Regulation Development Draft is currently being worked on as a coordinated effort between the DRB and Law. There will be a 60-day public comment period this summer over the draft language before the final version is completed and adopted this fall.

2. The Board created a position on the Modernization Subcommittee to be filled by a member of RPEA. Mauri Long was appointed to this position.

3. Amend Bylaws - The Board amended the RHPAB Bylaws at the meeting May 5, 2022 to memorialize the changes in items 1 and 2 above.

The settlement for the DVA plan provides for members to retain access to both the Standard and Legacy dental plans. However, the plans must be viable or be subject to termination. The Standard plan will become the default plan for new retiree members. The process for setting premiums will be done transparently, and plan changes will follow the same process as the medical plan's change process.

The settlement terms for the medical plan include a plan amendment clarifying portions of the medical plan; issue a benefit clarification about maintenance care visits for musculoskeletal disorders; recommend adding an additional seat designating an RPEA member on the Retiree Health Plan Advisory Board; creating two standing subcommittees, and including an RPEA member on each.

Adding GCIT Network Benefits

Under the proposed program, the Plan would only provide medical plan coverage for GCIT services received from a GCIT-designated provider or facility. Covered services would also include travel and lodging expenses (lodging: $50 per night per person) up to $10,000 per course of treatment for the member and a companion if the care must be administered away from the patient's home.

This proposal would amend the plan to clarify that these products are covered under the medical plan, rather than the pharmacy plan. This would align with the current plan language, emerging industry standards, and ensure members are accessing these benefits through a coordinated approach.

Use of the GCIT- network is expected to save the plan an average of 17% below the listed Average Wholesale Price for applicable drugs and may include drug rebates in eligible circumstances.

Website

The Division has launched their new website. It is more intuitive and user friendly with no hidden or buried pages. This redesigned website is intended to make information more readily available and easier to find.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Certification of Actuarial Review ACTION: X

DATE: June 16-17, 2022 INFORMATION: _____

BACKGROUND:

AS 39.10.220 (a) (9) prescribes certain duties and reports that the Alaska Retirement Management Board is responsible for securing from a member of the American Academy of Actuaries. Additionally, it contains a requirement that "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."

AS 37.10.220(a)(9) provides that "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 Global, LLC (Buck), the board's primary actuary, has completed valuation reports of the following two (2) defined benefit plans as of June 30, 2021:

- Public Employees' Retirement System (PERS)
- Teachers' Retirement System (TRS)

The following two (2) defined contribution plans as of June 30, 2021:

- PERS Tier IV for Occupational Death & Disability and Retiree Medical Benefits
- TRS Tier III for Occupational Death & Disability and Retiree Medical Benefits

And a roll-forward actuarial valuation (letter dated January 6, 2022) of the Judicial Retirement System (JRS) and National Guard and Naval Militia Retirement System (NGNMRS), as of June 30, 2021.

Gabriel Roeder Smith & Company (GRS), the board's review actuary, has reviewed the valuation reports prepared by Buck and provided a letter and report describing a review of the above listed valuation reports.

GRS compiled and reviewed an audit findings list (incorporated in the report referenced above) setting out recommendations and suggestions from the GRS review reports for further discussion or action.

RECOMMENDATION:

That the Alaska Retirement Management Board accept the review and certification of the FY 2021 actuarial reports by Gabriel Roeder Smith & Company.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Acceptance of Actuarial Valuation Reports PERS / TRS DB & DCR, JRS, NGNMRS	ACTION:	X
DATE:	June 16, 2022	INFORMATION:	

BACKGROUND:

AS 37.10.220(a)(8) prescribes that the Alaska Retirement Management Board (Board) "coordinate with the retirement system administrator to have an annual actuarial valuation of each retirement system prepared to determine system assets, accrued liabilities, and funding ratios and to certify to the appropriate budgetary authority of each employer in the system."

AS 37.10.220(a)(9) provides that "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 Global, LLC (Buck), the Department of Administration's and Plans' actuary, has completed and reviewed the following reports with the Board's Actuarial Committee on December 1, 2021, March 16, 2022, and June 15, 2022:

1) an actuarial valuation of the Public Employees' Retirement System as of June 30, 2021
2) an actuarial valuation of the Teachers' Retirement System as of June 30, 2021
3) an actuarial valuation of the Public Employees' Retirement System – Defined Contribution Retirement Plan (for Occupational Death and Disability and Retiree Medical Benefits) as of June 30, 2021
4) an actuarial valuation of the Teachers' Retirement System – Defined Contribution Retirement Plan (for Occupational Death and Disability and Retiree Medical Benefits) as of June 30, 2021
5) a roll-forward actuarial valuation (letter dated January 6, 2022) of the Judicial Retirement System (JRS) and National Guard and Naval Militia Retirement System (NGNMRS) as of June 30, 2021

There are two assumption changes recommended and presented in the final reports:

1) Healthcare claim costs are updated annually and described in Section 5.2 for the PERS and TRS DB and Section 4.2 for the PERS DCR and TRS DCR actuarial valuation reports; and
2) The Normal Cost load for administrative expenses was updated based on the most recent two years of actual amounts paid from plan asset.

Gabriel Roeder Smith & Company (GRS), the Board's actuary, has reviewed the listed actuarial valuations and provided their reports and audit findings to the Actuarial Committee and the Board.

RECOMMENDATION:

That the Alaska Retirement Management Board accept the actuarial valuation reports prepared by Buck for the Public Employees', Teachers', Public Employees' Defined Contribution (for Occupational Death and Disability and Retiree Medical Benefits), Teachers' Defined Contribution (for Occupational Death and Disability and Retiree Medical Benefits), and the roll-forward actuarial valuation report for the Judicial and National Guard and Naval Militia retirement systems as of June 30, 2021.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Acceptance of Experience Analysis

ACTION: **X**

DATE: June 16, 2022

INFORMATION: _____

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 Global, LLC (Buck), the Department of Administration's and Plans' actuary, has completed the following experience analysis and the results have been presented to the Board and the Actuarial Committee on December 1, 2021, March 16, 2022, May 4, 2022, and June 15, 2022:

(1) an experience analysis of the Public Employees' Retirement System and Teachers' Retirement System Defined Benefit Retirement Plans for the period July 1, 2017 to June 30, 2021;
(2) an experience analysis of the Public Employees' Retirement System and Teachers' Retirement System Defined Contribution Retirement Plans for the period July 1, 2017 to June 30, 2021;
(3) an experience analysis of the Judicial Retirement System for the period July 1, 2017 to June 30, 2021; and
(4) an experience analysis of the National Guard and Naval Militia Retirement System for the period July 1, 2017 to June 30, 2021.

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

RECOMMENDATION:

The Alaska Retirement Management Board approve Resolution 2022-01, accepting the experience analysis prepared by Buck, as well as the assumption and methods changes recommended therein as [_____].

NOTE: The final experience study report for the period July 1, 2017 to June 30, 2021 will be issued by Buck once the assumptions have been adopted by the Board.

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 2022-01

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 analysis 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, 2021, as well as the assumption and method changes recommended therein, and attached as [_____], prepared by Buck be approved.

DATED at Anchorage, Alaska this 16th day of June, 2022.

_____
Chair

ATTEST:

_____
Secretary

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Acceptance of Actuarial Audit ACTION: X

DATE: June 16-17, 2022 INFORMATION: _____

BACKGROUND:

AS 39.10.220 (a) (10) provides that the Alaska Retirement Management Board (the Board) shall contract for an independent audit of the state's actuary not less than once every four years. Upon research and discussion with former legal counsel, it was determined that the statute did not preclude the review actuary, currently Gabriel Roeder Smith & Company (GRS) from performing the independent audit of the state's actuary.

In accordance with 15 AAC 112.160, the Board directed staff to pursue a sole source procurement contract with GRS and concurrently manage an expression of interest process for an independent audit of the state's actuary, focused solely on recent valuation reports.

RFI 04-001-21 was issued February 12, 2021 and closed March 1, 2021. Staff reviewed both RFI submissions received and determined that a sole source procurement contract with GRS was in the best interest of the beneficiaries of the pension and benefits funds due to their longstanding experience with the plans and low-cost proposal.

STATUS:

GRS conducted an actuarial audit of the June 30, 2020 actuarial valuations of the State of Alaska retirement systems, which includes:

- Public Employees' Retirement System (PERS) Defined Benefit (DB) Pension and Medical
- Teachers' Retirement System (TRS) DB Pension and Medical
- PERS Defined Contribution Retirement (DCR) - Occupational Death & Disability (OD&D) and Medical
- TRS DCR - OD&D and Medical
- Judicial Retirement System DB Pension and Medical
- National Guard & Naval Militia DB Pension

GRS presented updates on the actuarial audit and findings at the December 2021 and March 2022 Board of Trustee meetings.

RECOMMENDATION:

That the Alaska Retirement Management Board accept the *Actuarial Audit of Pension and Postemployment Healthcare Plans*, dated May 20, 2022 by Gabriel Roeder Smith & Company.

Callan

June 16, 2022

ARMB Board Meeting

Preliminary Investment Performance
Periods Ended March 31, 2022

Steve Center, CFA
Senior Vice President

Paul Erlendson
Senior Vice President

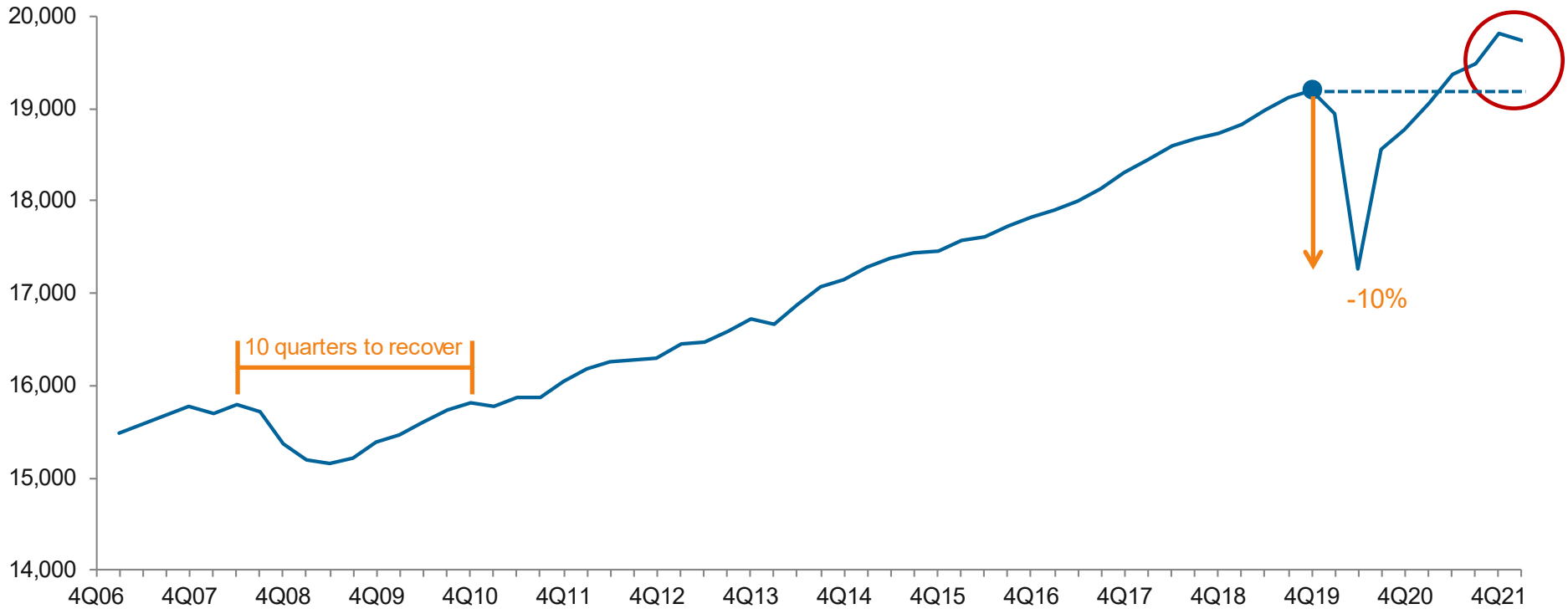
Agenda

- Market and Economic Environment
- Total Fund Performance
  - Defined Benefit Plans' Major Asset Classes
  - Participant-Directed Plans

GDP Dipped in 1Q22 After Rocketing Out of the Pandemic Bottom

Recovered pre-pandemic level in 2Q21 after deepest drop in 75 years

Seasonally Adjusted Real GDP in Billions of Dollars



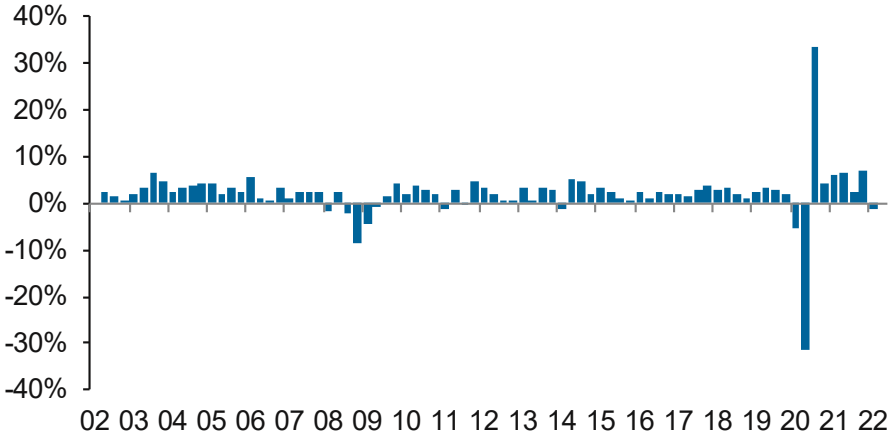
- Consensus estimates for GDP growth in 2022 have been scaled back, from north of 4% at the start of the year to 3% or lower
  - 1Q22 GDP fell 1.4% in U.S.
  - Loss of business and consumer confidence following the start of the conflict in Ukraine

Source: Federal Reserve Bank of St. Louis

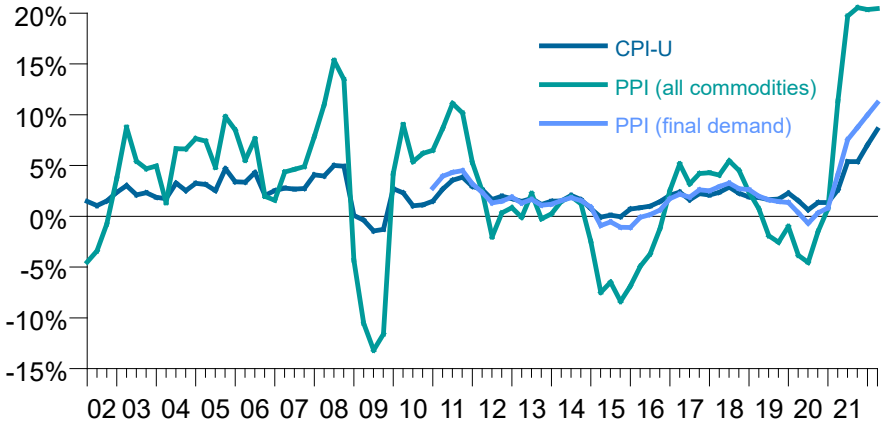
U.S. Economy—Summary

For periods ended 3/31/22

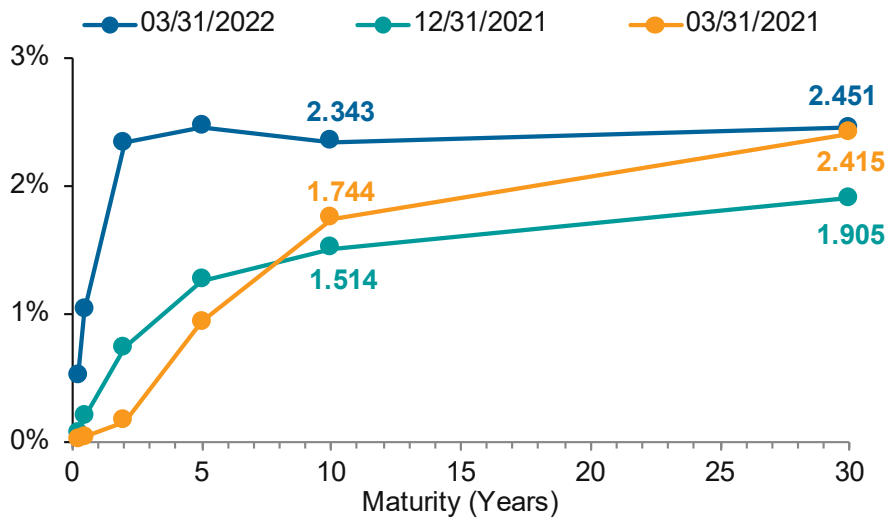
Quarterly Real GDP Growth



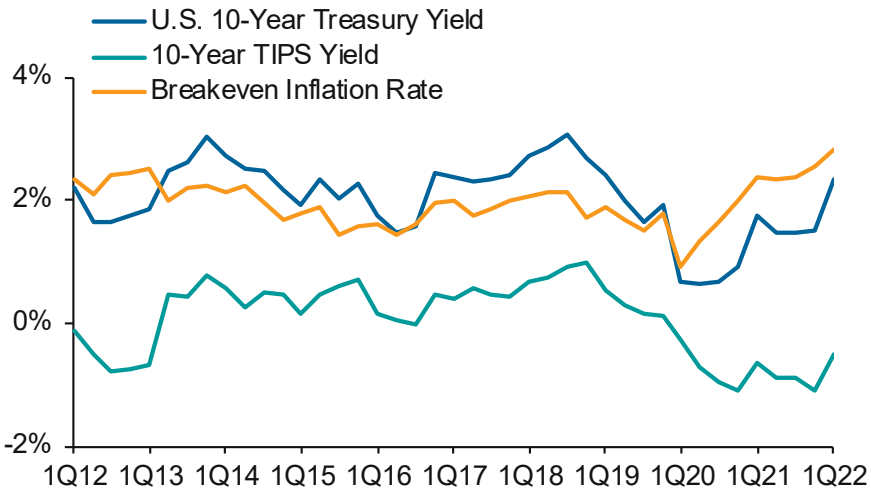
Inflation Year-Over-Year



U.S. Treasury Yield Curves



Historical 10-Year Yields

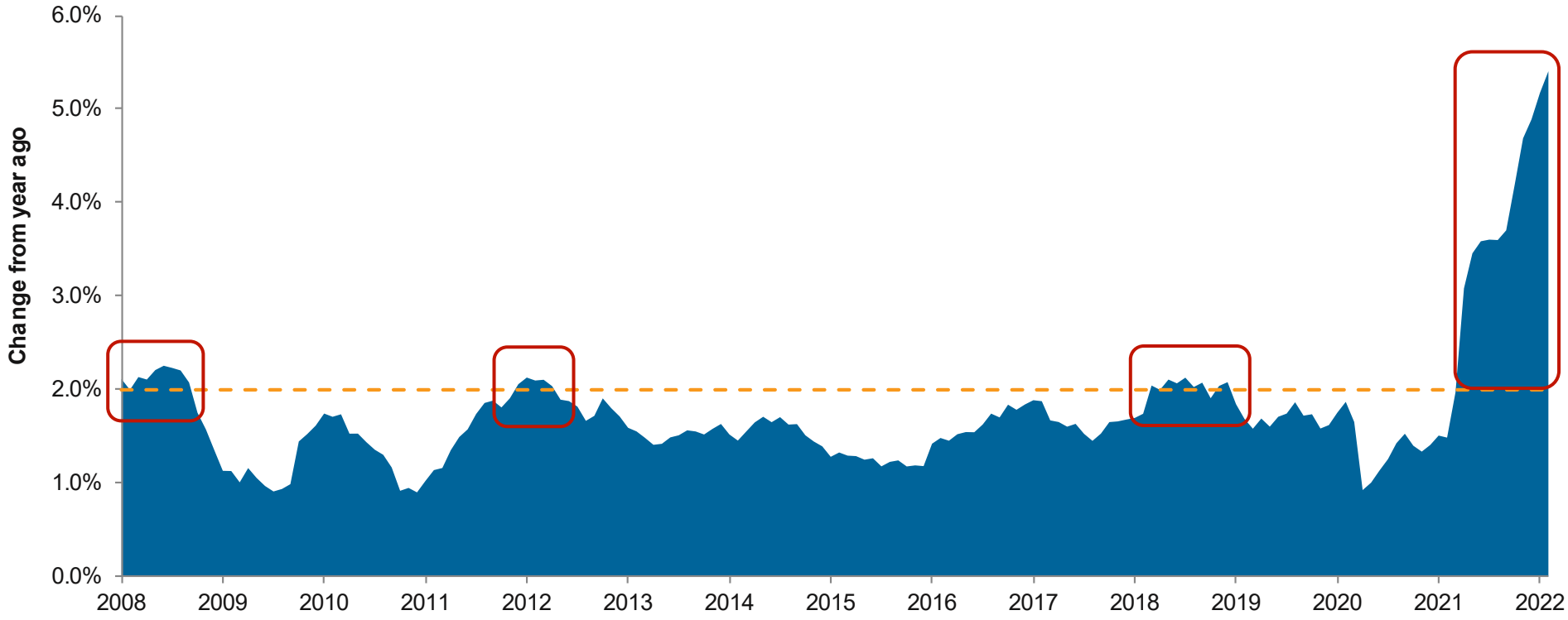


Sources: Bloomberg, Bureau of Labor Statistics, Callan

The Fed's New Inflation Framework

Targeting core Personal Consumption Expenditures Index

PCE Excluding Food and Energy (Chain-Type Price Index)

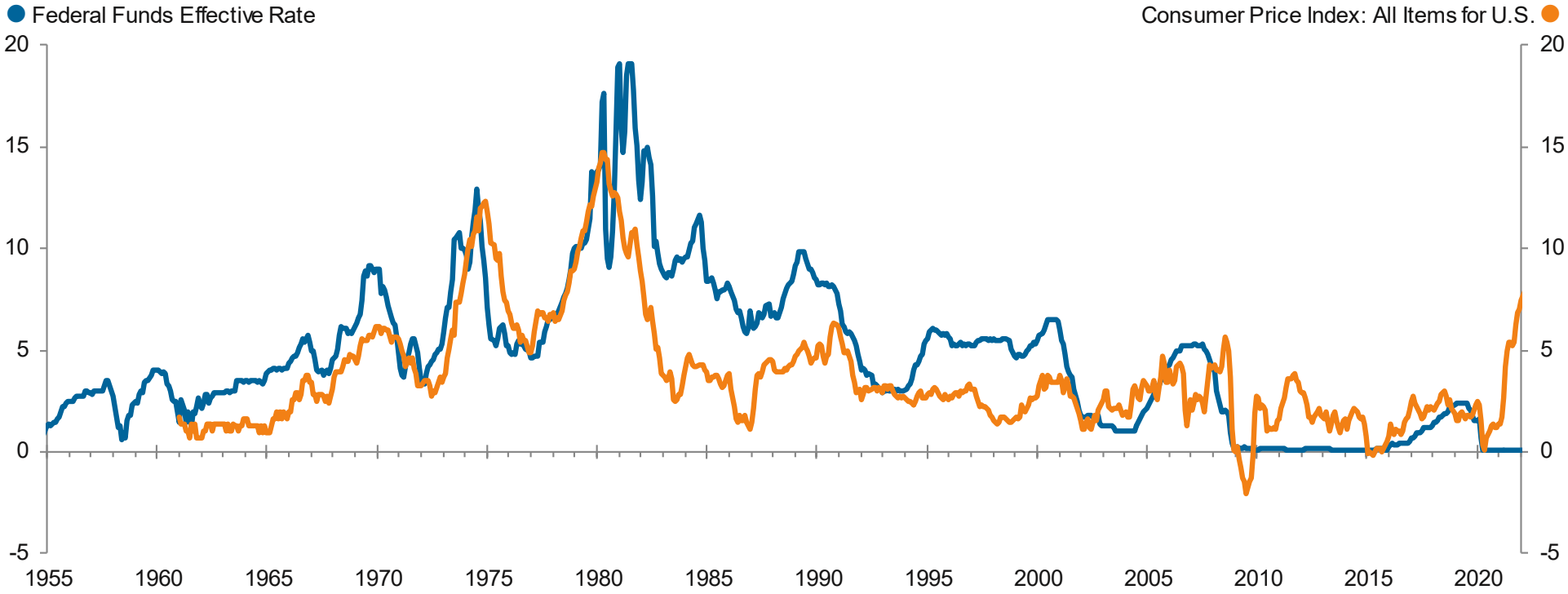


- Inflation worries are in the headlines, and the data are challenging the Fed's dual mandate to manage inflation and unemployment.
- Inflation had consistently undershot the Fed's 2% target, prompting the Fed to change its inflation framework.
- Fed's aim is to achieve an average of 2% inflation over the medium term, which is not specifically defined.
- Personal Consumption Expenditures (PCE) Index is the Fed's target, different from and typically lower than CPI-U, which had a year-over-year gain of 8.5% in March 2022.

Sources: Federal Reserve Bank of St. Louis, U.S. Bureau of Economic Analysis

Inflation vs. Interest Rates Over the Long Term

Federal Funds vs. Consumer Price Index



- We are now looking at an inflation spike that is above the last rise in inflation from 2005–2008.
- The gap between inflation and the Fed Funds rate is larger than that seen just before the GFC.
  - History suggests that the Fed Funds rate is typically above inflation, not below it
- This gap of 8.5% CPI vs. 25 bps Fed Funds rate is unprecedented in the history of the CPI, going back to 1961
  - Resolution to the historic relationship requires the Fed Funds rate to rise and inflation to fall.
- The market expects that inflation for the years 2027 through 2031 will be less than 2.5%

Source: Federal Reserve Bank of St. Louis

Contributors to Recent Inflation: Primary and Sub-Categories

Primary Category	Primary Category Weight	Subcategory	Sub-Category Weight	Year-over-Year Change											
				Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Food & Bev	14.3%	Food at home	8.2%	1.2%	0.7%	0.9%	2.6%	3.0%	4.5%	5.4%	6.4%	6.5%	7.4%	8.6%	10.0%
		Food away from home	5.2%	3.8%	4.0%	4.2%	4.6%	4.7%	4.7%	5.3%	5.8%	6.0%	6.4%	6.8%	6.9%
		Alcoholic beverages	0.9%	1.9%	1.6%	1.9%	2.4%	2.6%	2.8%	2.2%	1.9%	2.3%	2.7%	3.5%	3.7%
Housing	42.4%	Shelter	32.9%	2.1%	2.2%	2.6%	2.8%	2.8%	3.2%	3.5%	3.8%	4.1%	4.4%	4.7%	5.0%
		Fuels and utilities	4.6%	5.7%	6.4%	6.4%	7.0%	7.9%	8.2%	10.4%	10.0%	9.5%	12.0%	11.0%	12.5%
		Household furnishings & ops	4.8%	3.5%	4.6%	4.1%	3.8%	4.0%	5.1%	6.2%	6.5%	7.4%	9.0%	9.7%	10.1%
Apparel	2.5%	Men's and boys' apparel	0.6%	2.1%	4.2%	2.3%	3.0%	3.9%	4.4%	6.3%	7.8%	7.8%	6.6%	8.6%	7.8%
		Women's and girls' apparel	1.0%	-0.3%	4.8%	5.3%	4.6%	3.6%	0.6%	2.1%	3.4%	4.4%	3.6%	4.9%	6.3%
		Footwear	0.6%	3.9%	7.1%	6.5%	4.6%	5.1%	6.5%	5.2%	4.7%	6.0%	6.1%	7.0%	6.6%
		Infants' and toddlers' apparel	0.1%	1.7%	3.1%	-0.5%	-1.2%	-1.4%	3.0%	7.6%	4.5%	4.6%	8.8%	12.4%	13.0%
		Jewelry and watches	0.2%	9.5%	12.4%	11.2%	9.5%	10.7%	6.8%	6.1%	5.2%	7.2%	6.2%	4.2%	2.7%
Transportation	18.2%	Private transportation	17.4%	15.5%	20.3%	21.9%	19.8%	18.5%	17.8%	20.3%	22.8%	22.6%	22.1%	22.1%	23.2%
		Public transportation	0.8%	7.0%	15.9%	17.3%	14.0%	8.4%	1.6%	-1.1%	-0.6%	2.4%	4.0%	8.3%	14.9%
Medical Care	8.5%	Medical care commodities	1.5%	-1.7%	-1.9%	-2.2%	-2.1%	-2.5%	-1.6%	-0.4%	0.2%	0.4%	1.4%	2.5%	2.7%
		Medical care services	7.0%	2.2%	1.5%	1.0%	0.8%	1.0%	0.9%	1.7%	2.1%	2.5%	2.7%	2.4%	2.9%
Recreation	5.1%	Video and audio	1.5%	2.9%	3.0%	4.0%	3.7%	3.6%	3.5%	3.3%	3.2%	2.1%	3.2%	3.0%	2.6%
		Pets, pet products and services	1.1%	2.4%	2.5%	2.9%	3.2%	2.4%	3.3%	3.8%	3.5%	4.1%	4.4%	5.5%	7.5%
		Sporting goods	0.6%	7.0%	9.0%	7.5%	5.7%	7.6%	7.5%	8.7%	8.4%	6.3%	8.2%	7.1%	7.9%
		Photography	0.1%	1.5%	3.1%	1.5%	2.2%	2.6%	2.3%	2.0%	3.2%	3.6%	3.4%	2.0%	3.2%
		Other recreational goods	0.4%	1.8%	2.1%	1.5%	1.3%	1.1%	-0.6%	-0.3%	1.1%	2.5%	2.9%	3.5%	2.7%
		Other recreation services	1.5%	-0.2%	-2.4%	-0.5%	3.5%	3.2%	3.1%	3.9%	1.9%	3.0%	5.7%	5.8%	4.3%
		Recreational reading materials	0.1%	5.5%	3.8%	0.7%	1.5%	1.3%	2.8%	1.7%	2.2%	0.3%	0.0%	4.1%	1.6%
Education & Communication	6.4%	Education	2.7%	0.8%	1.0%	1.2%	1.2%	1.4%	2.0%	2.0%	2.1%	2.0%	2.1%	2.1%	2.5%
		Communication	3.7%	2.4%	2.6%	2.8%	1.1%	1.0%	1.5%	1.5%	1.3%	1.3%	1.2%	1.1%	0.8%
Other Goods & Svcs	2.7%	Tobacco and smoking products	0.5%	6.8%	7.3%	7.0%	6.4%	6.3%	6.7%	8.5%	8.9%	9.0%	7.0%	7.0%	6.9%
		Personal care	2.2%	1.7%	1.6%	1.5%	2.1%	2.8%	2.6%	3.2%	3.3%	3.4%	4.3%	5.2%	5.1%

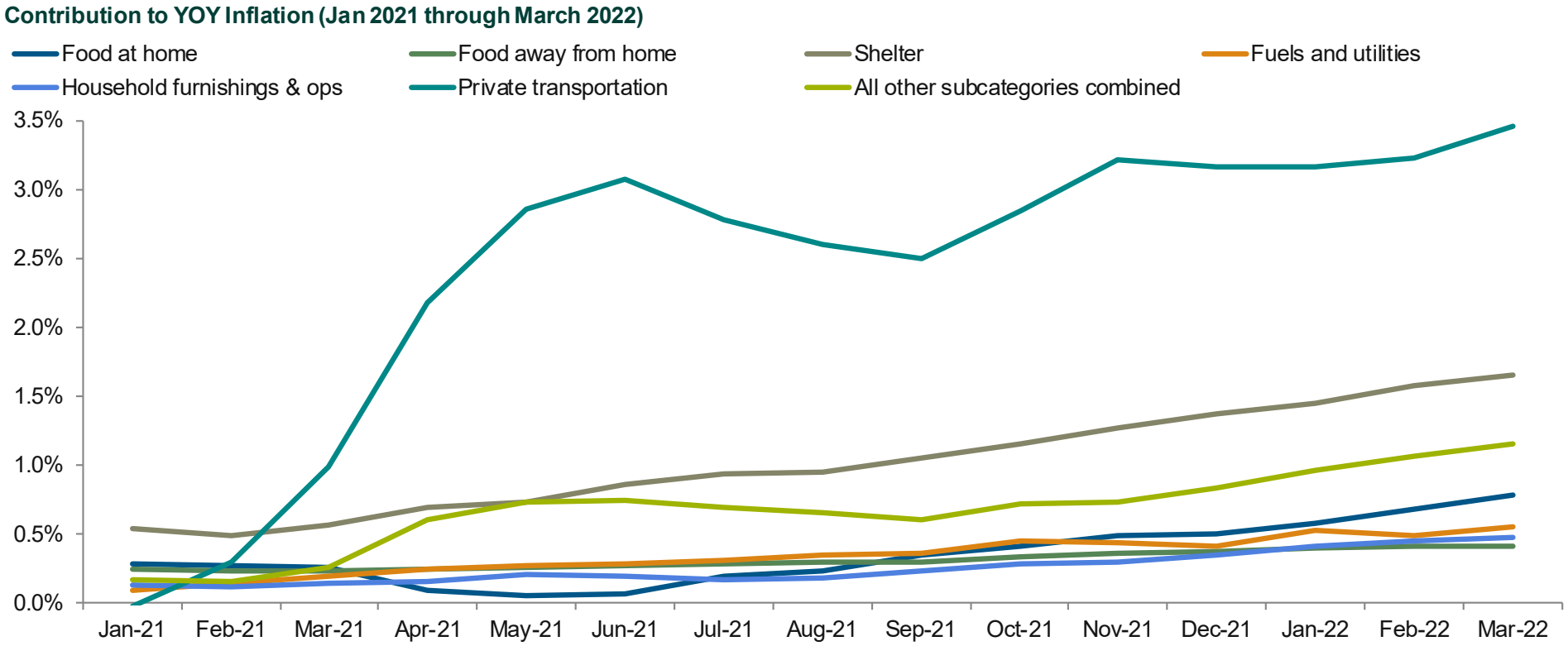
Subcategories highlighted in **blue** were the biggest contributors to March YOY headline CPI due to a combination of high index weights and high inflation within the subcategory.

- These components combined make up over 70% of the index weight.

Other subcategories such as public transportation, infants' and toddlers' apparel, and sporting goods have also seen high inflation but do not contribute as much to headline inflation due to lower index weights.

Source: U.S. Bureau of Labor Statistics

Contributors to Recent Inflation: Weighted Contribution Over Time



Looking at the six subcategories highlighted before, and combining the remaining 20, shows how impactful those few areas have been in driving inflation.

- Combining those 20 subcategories would only make them the third-largest contributor to inflation over the last 1¼ years even if they were a single category.

Private transportation stands out because the category has not seen inflation readings this high since 1980.

- If private transportation were at its long-term average of 2.5%, March headline inflation would have dropped from 8.5% to 5.4%.

Source: U.S. Bureau of Labor Statistics

Callan Periodic Table of Investment Returns – Trailing Year

Monthly Returns												Trailing Year
Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2022	Feb 2022	Mar 2022	Last 12 Mos.
Real Estate 6.42%	Dev ex-U.S. Equity 3.48%	Large Cap Equity 2.33%	Real Estate 3.83%	Large Cap Equity 3.04%	High Yield -0.01%	Large Cap Equity 7.01%	U.S. Fixed Income 0.30%	Real Estate 6.33%	Emerging Market Equity -1.89%	Small Cap Equity 1.07%	Real Estate 4.47%	Real Estate 1.66%
Large Cap Equity 5.34%	Emerging Market Equity 2.32%	Small Cap Equity 1.94%	Large Cap Equity 2.38%	Emerging Market Equity 2.62%	U.S. Fixed Income -0.87%	Real Estate 5.98%	Large Cap Equity -0.69%	Dev ex-U.S. Equity 5.08%	Global ex-U.S. Fixed Income -1.96%	High Yield -1.03%	Large Cap Equity 3.71%	Large Cap Equity 0.21%
Dev ex-U.S. Equity 3.15%	Real Estate 1.79%	High Yield 1.34%	Global ex-U.S. Fixed Income 1.51%	Small Cap Equity 2.24%	Global ex-U.S. Fixed Income -2.45%	Small Cap Equity 4.25%	Global ex-U.S. Fixed Income -0.72%	Large Cap Equity 4.48%	U.S. Fixed Income -2.15%	Global ex-U.S. Fixed Income -1.11%	Small Cap Equity 1.24%	High Yield -5.22%
Emerging Market Equity 2.49%	Global ex-U.S. Fixed Income 1.36%	Real Estate 0.78%	U.S. Fixed Income 1.12%	Dev ex-U.S. Equity 1.60%	Dev ex-U.S. Equity -2.87%	Dev ex-U.S. Equity 2.98%	High Yield -0.97%	Small Cap Equity 2.23%	High Yield -2.73%	U.S. Fixed Income -1.12%	Dev ex-U.S. Equity 1.16%	Dev ex-U.S. Equity -6.66%
Small Cap Equity 2.10%	Large Cap Equity 0.70%	U.S. Fixed Income 0.70%	Dev ex-U.S. Equity 0.66%	Real Estate 1.31%	Small Cap Equity -2.95%	Emerging Market Equity 0.99%	Real Estate -2.24%	Emerging Market Equity 1.88%	Dev ex-U.S. Equity -4.41%	Dev ex-U.S. Equity -1.56%	High Yield -1.15%	U.S. Fixed Income -8.51%
Global ex-U.S. Fixed Income 1.62%	U.S. Fixed Income 0.33%	Emerging Market Equity 0.17%	High Yield 0.38%	High Yield 0.51%	Emerging Market Equity -3.97%	U.S. Fixed Income -0.03%	Emerging Market Equity -4.08%	High Yield 1.87%	Large Cap Equity -5.17%	Real Estate -2.47%	Emerging Market Equity -2.26%	Global ex-U.S. Fixed Income -15.55%
High Yield 1.09%	High Yield 0.30%	Dev ex-U.S. Equity -1.02%	Small Cap Equity -3.61%	U.S. Fixed Income -0.19%	Large Cap Equity -4.65%	High Yield -0.17%	Small Cap Equity -4.17%	Global ex-U.S. Fixed Income -0.07%	Real Estate -5.75%	Emerging Market Equity -2.99%	U.S. Fixed Income -2.78%	Small Cap Equity -16.87%
U.S. Fixed Income 0.79%	Small Cap Equity 0.21%	Global ex-U.S. Fixed Income -2.02%	Emerging Market Equity -6.73%	Global ex-U.S. Fixed Income -0.61%	Real Estate -5.80%	Global ex-U.S. Fixed Income -0.39%	Dev ex-U.S. Equity -4.68%	U.S. Fixed Income -0.26%	Small Cap Equity -9.63%	Large Cap Equity -2.99%	Global ex-U.S. Fixed Income -3.20%	Emerging Market Equity -18.33%

Sources: ● Bloomberg Aggregate ● Bloomberg Corp High Yield ● Bloomberg Global Aggregate ex US ● FTSE EPRA Nareit Developed ● MSCI World ex USA ● MSCI Emerging Markets ● Russell 2000 ● S&P 500

Callan Periodic Table of Investment Returns – Trailing Fiscal Years

Fiscal Year Returns – Ending June 30									
06/2012	06/2013	06/2014	06/2015	06/2016	06/2017	06/2018	06/2019	06/2020	06/2021
U.S. Fixed Income 7.47%	Small Cap Equity 24.21%	Large Cap Equity 24.61%	Large Cap Equity 7.42%	Real Estate 11.58%	Small Cap Equity 24.60%	Small Cap Equity 17.57%	Large Cap Equity 10.42%	U.S. Fixed Income 8.74%	Small Cap Equity 62.03%
High Yield 7.27%	Large Cap Equity 20.60%	Dev ex-U.S. Equity 23.83%	Small Cap Equity 6.49%	Global ex-U.S. Fixed Income 11.24%	Emerging Market Equity 23.75%	Large Cap Equity 14.37%	U.S. Fixed Income 7.87%	Large Cap Equity 7.51%	Emerging Market Equity 40.90%
Large Cap Equity 5.45%	Dev ex-U.S. Equity 17.07%	Small Cap Equity 23.64%	U.S. Fixed Income 1.86%	U.S. Fixed Income 6.00%	Dev ex-U.S. Equity 19.49%	Emerging Market Equity 8.20%	Real Estate 7.68%	Global ex-U.S. Fixed Income 0.71%	Large Cap Equity 40.79%
Real Estate 1.62%	Real Estate 13.50%	Emerging Market Equity 14.31%	Real Estate -0.36%	Large Cap Equity 3.99%	Large Cap Equity 17.90%	Dev ex-U.S. Equity 7.04%	High Yield 7.48%	High Yield 0.03%	Dev ex-U.S. Equity 33.60%
Global ex-U.S. Fixed Income -0.33%	High Yield 9.49%	Real Estate 13.55%	High Yield -0.40%	High Yield 1.62%	High Yield 12.70%	Real Estate 5.64%	Global ex-U.S. Fixed Income 4.10%	Emerging Market Equity -3.39%	Real Estate 33.55%
Small Cap Equity -2.08%	Emerging Market Equity 2.87%	High Yield 11.73%	Emerging Market Equity -5.12%	Small Cap Equity -6.73%	Real Estate 0.21%	Global ex-U.S. Fixed Income 2.78%	Dev ex-U.S. Equity 1.29%	Dev ex-U.S. Equity -5.42%	High Yield 15.37%
Dev ex-U.S. Equity -14.13%	U.S. Fixed Income -0.69%	Global ex-U.S. Fixed Income 9.42%	Dev ex-U.S. Equity -5.28%	Dev ex-U.S. Equity -9.84%	U.S. Fixed Income -0.31%	High Yield 2.62%	Emerging Market Equity 1.22%	Small Cap Equity -6.63%	Global ex-U.S. Fixed Income 4.60%
Emerging Market Equity -15.94%	Global ex-U.S. Fixed Income -3.40%	U.S. Fixed Income 4.37%	Global ex-U.S. Fixed Income -13.19%	Emerging Market Equity -12.05%	Global ex-U.S. Fixed Income -3.80%	U.S. Fixed Income -0.40%	Small Cap Equity -3.31%	Real Estate -16.25%	U.S. Fixed Income -0.33%

Sources: ● Bloomberg Aggregate ● Bloomberg Corp High Yield ● Bloomberg Global Aggregate ex US ● FTSE EPRA Nareit Developed ● MSCI World ex USA ● MSCI Emerging Markets ● Russell 2000 ● S&P 500

Down Equity and Fixed Income Markets in 1Q22

Negative returns for stocks and bonds at the same time are unusual

Global equity markets are down sharply following the invasion of Ukraine:

- Similar impact across developed markets
- Greater impact on small cap and emerging markets

Fixed income down with sharply higher inflation and interest rates:

- Blmbg Aggregate: -5.9% (and much worse since, -9.5% through April)
- CPI-U: +8.5% for the year ended 1Q22

Number of times stocks and bonds have been down together:

- 37 quarters in almost 100 years, about 10% of the quarters
- But just twice on annual basis

Inflation spiked to the highest rate reported in decades.

Economic data show growth hit "pause" in the U.S.:

- GDP fell 1.4% in 1Q22, down from almost 7% GDP growth in 4Q21
- Forecasters are revising growth estimates for 2022 down to 3% or lower.

Returns for Periods ended 3/31/22

	1 Quarter	1 Year	5 Years	10 Years	25 Years
U.S. Equity					
Russell 3000	-5.28	11.92	15.40	14.28	9.53
S&P 500	-4.60	15.65	15.99	14.64	9.44
Russell 2000	-7.53	-5.79	9.74	11.04	8.88
Global ex-U.S. Equity					
MSCI World ex USA	-4.81	3.04	7.14	6.25	5.25
MSCI Emerging Markets	-6.97	-11.37	5.98	3.36	--
MSCI ACWI ex USA Small Cap	-6.52	0.03	7.89	7.28	6.70
Fixed Income					
Bloomberg Aggregate	-5.93	-4.15	2.14	2.24	4.71
90-day T-Bill	0.04	0.06	1.13	0.63	2.01
Bloomberg Long Gov/Credit	-10.95	-3.11	4.60	4.72	6.93
Bloomberg High Yield Corporate	-4.84	-0.66	4.69	5.75	6.62
Bloomberg Global Agg ex-US	-6.15	-7.89	1.27	0.06	3.40
Real Estate					
NCREIF Property	5.33	21.87	8.54	9.61	9.50
FTSE Nareit Equity	-3.86	26.49	9.63	9.81	9.69
Alternatives					
CS Hedge Fund	2.13	7.47	5.48	4.71	6.61
Cambridge Private Equity*	--	--	--	--	--
Bloomberg Commodity	25.55	49.25	9.00	-0.70	1.90
Gold Spot Price	6.86	13.90	9.33	1.57	7.07
Inflation - CPI-U	3.12	8.54	3.35	2.28	2.37

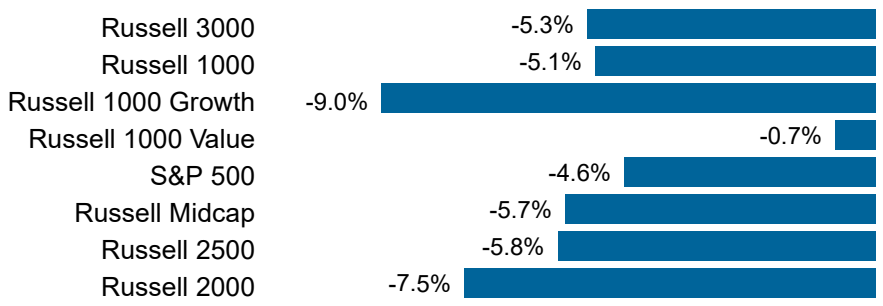
*Cambridge PE data through 09/30/21.
Sources: Bloomberg, Callan, Cambridge, Credit Suisse, FTSE Russell, MSCI, NCREIF, S&P Dow Jones Indices

U.S. Equity Performance: 1Q22

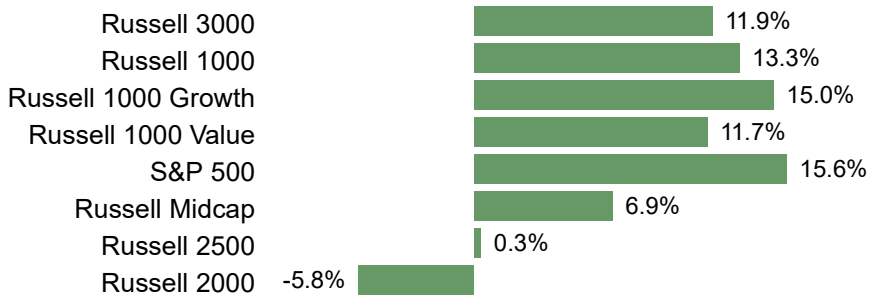
Returns take a step back given increased macro uncertainty

- The S&P 500 Index fell 4.6% in 1Q, but was down more than 12% early in March before staging a rally into quarter-end.
- Value stocks sharply outpaced growth across capitalizations, with the spread exceeding 10% in both mid and small caps and just over 8% in large caps.
- Energy (+39%) was the best-performing sector given a 33% spike in WTI crude oil prices. Commodity-linked Basic Materials and Utilities sectors also performed well on a relative basis.
- Communication Services (-12%), Consumer Discretionary (-9%), and Information Technology (-8%) were the worst-performing sectors.
- Uncertainty over rates, inflation, and geopolitical tensions all contributed to a volatile and risk averse environment.
- Interestingly, the Russell Dynamic Index (-4.3%) outperformed the Russell Defensive Index (-5.9%) during the 1Q downturn. Quality did not hold up as well as expected in some sectors.

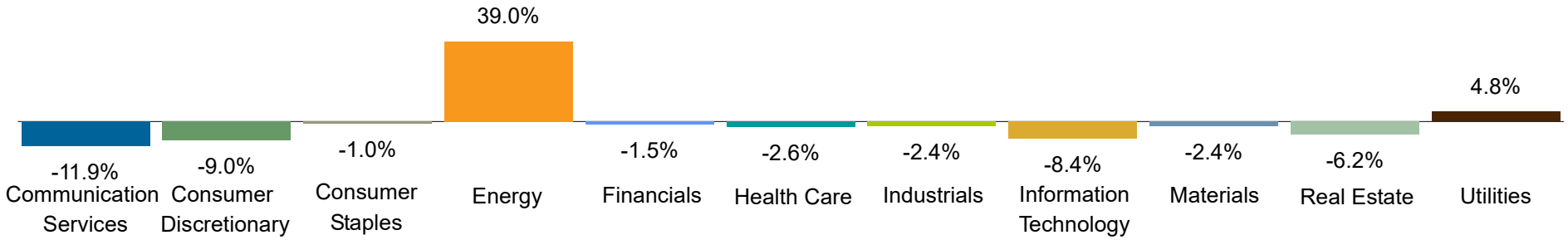
U.S. Equity: Quarterly Returns



U.S. Equity: One-Year Returns



Industry Sector Quarterly Performance (S&P 500)

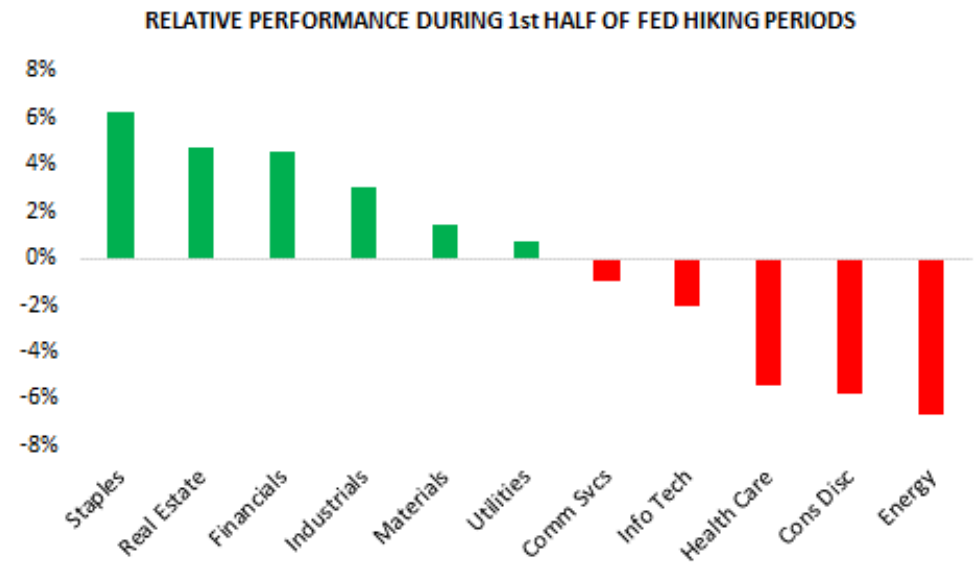


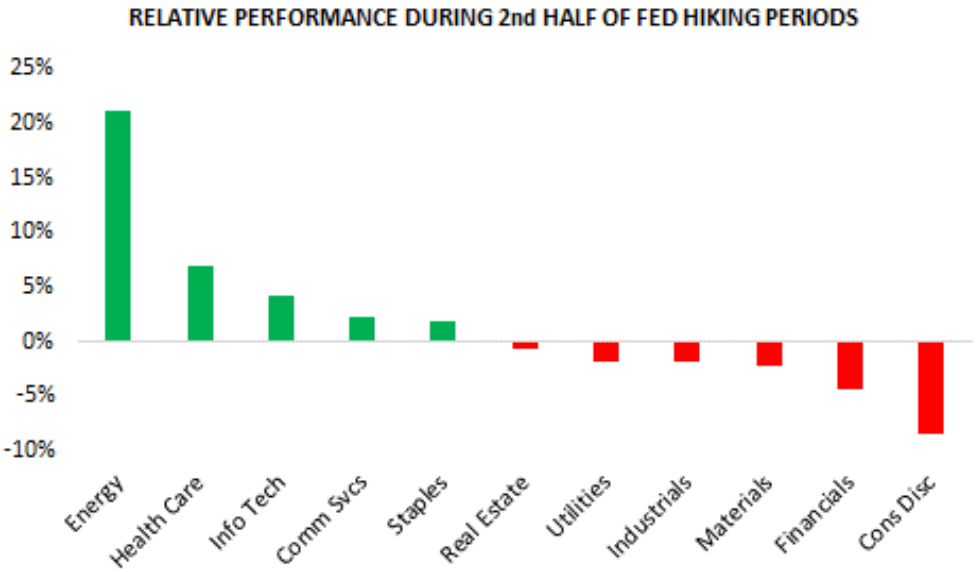
Sources: FTSE Russell, S&P Dow Jones Indices

U.S. Equity Market Overview

Sector performance in a rising rate environment

- Most research mentions value outperformance during a rising rate environment. Historically, while some value sectors including Financials and Industrials have outperformed in periods leading up to the first Fed hike and the first half of rates rising, more traditional growth sectors like Technology, Communication Services, and areas of Health Care performed better in the second half of rate hikes.
- The Energy sector reversed its historical results in the early stages of rate hikes and produced very strong recent sector returns.





Source: Furey Research. *Based upon median market cap weighted returns for the '88/'89, '94/'95, '99/'00, '04/'06 and '15/'18 Fed hiking periods.*

Global ex-U.S. Equity Performance: 1Q22

War in Ukraine stoked market volatility

- In the aftermath of invading Ukraine, Russia faced condemnation and sanctions that crippled its stocks, bonds, and currency and shocked the global markets.
- The fog of war exacerbated inflationary concerns and led energy prices to surge as Russia is the second-largest natural gas provider and the third-largest oil producer in the world.
- Energy exporters notably outperformed importers.

Fears of COVID-19

- A resurgence of COVID-19 cases in Europe and Asia, specifically in China, weighed on global recovery.
- China's zero-COVID policy has injected doubt into the 2022 GDP growth projection of 5.5%, already its lowest annual target in more than 25 years.

Growth vs. value

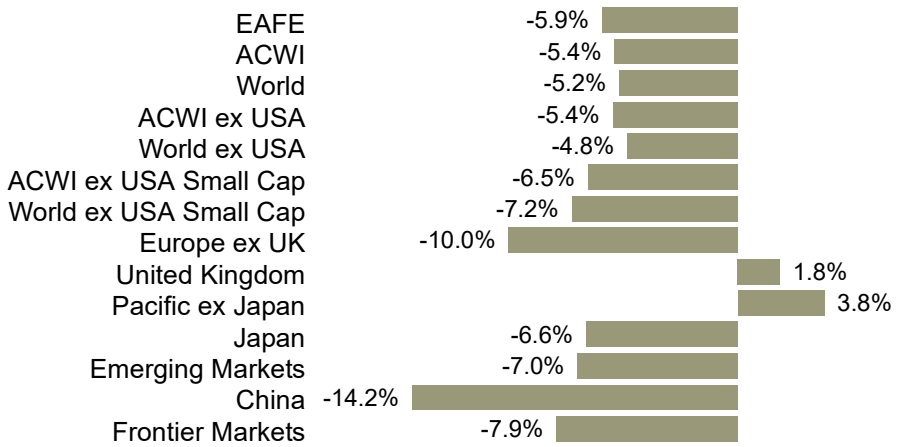
- Value sectors such as Energy, Materials, and Financials were in favor relative to growth sectors like Consumer Discretionary and Information Technology due to a combination of recession fears and tightening monetary cycle.
  - However, Energy was the worst performer within Emerging Markets due to the removal of Russia from indices with effectively zero value.

U.S. dollar vs. other currencies

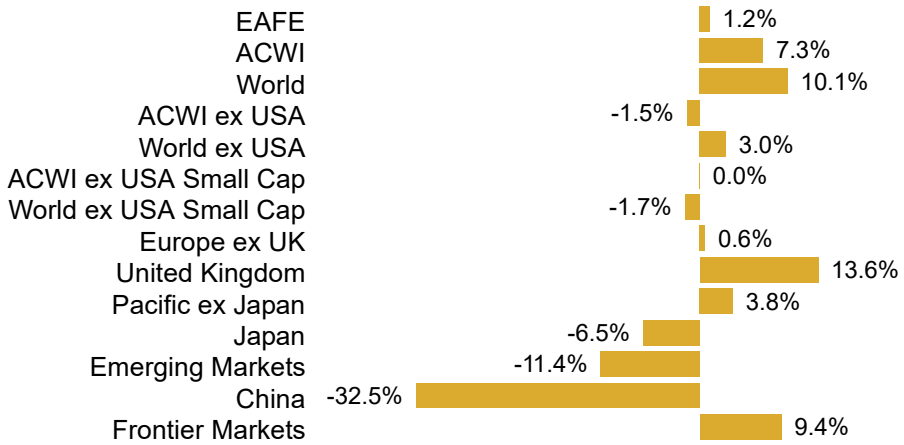
- With the uncertainty of war, the U.S. dollar strengthened against other major currencies.

Source: MSCI

Global Equity: Quarterly Returns



Global Equity: One-Year Returns



U.S. Fixed Income Performance: 1Q22

Bonds hit hard as rates rose sharply

- Bloomberg Aggregate worst quarterly return since 1980
- Curve flattened; as of 3/31 5-year UST yield 10 bps higher than 10-year UST yield (2.42% vs 2.32%)
- TIPS outperformed nominal Treasuries and 10-year breakeven spreads widened to 2.84% from 2.56% as of year-end.
- Fed raised rates by 25 bps with many more hikes expected this year.

Credit sectors underperformed

- Investment grade corporates underperformed duration-matched U.S. Treasuries by 145 bps; RMBS by 71 bps.
- High yield "benefited" from less interest rate sensitivity and relatively higher exposure to the energy sector; excess return vs. U.S. Treasuries was 92 bps.
- Defaults remain low (less than 1%) and yield breeched 6%.

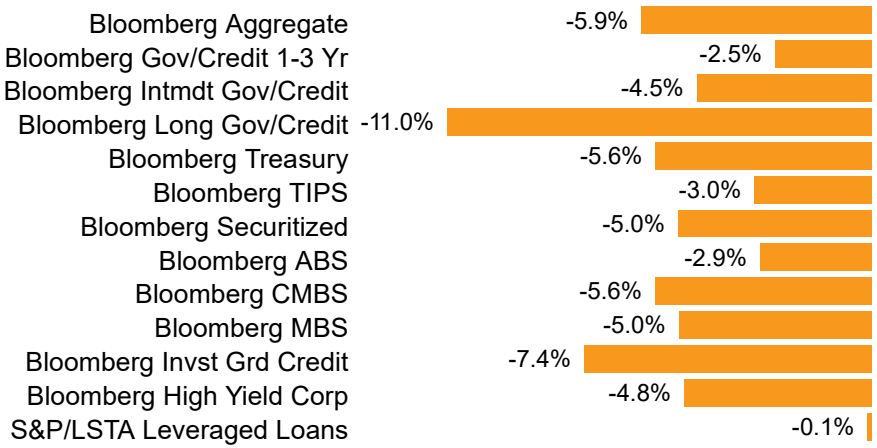
Leveraged loans performed relatively well

- Helped by floating rate coupons / low duration

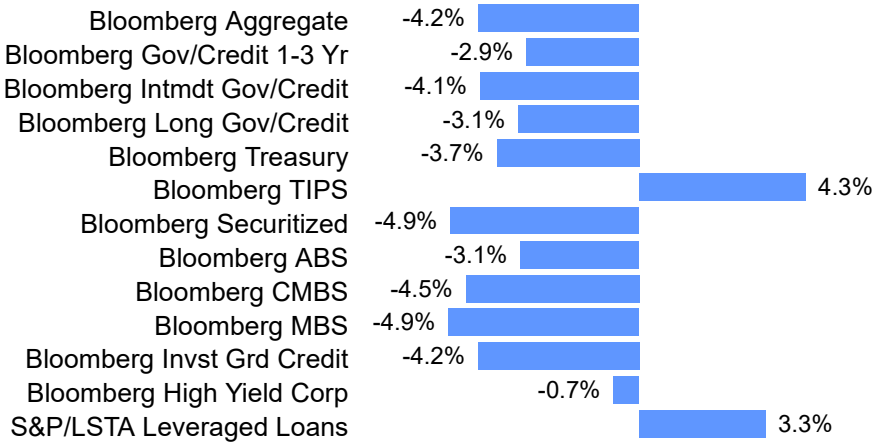
Securitized sectors performed relatively well

- Consumer ABS held up the best within the sector due to its shorter duration profile and solid consumer spending.
- Conduit CMBS traded in line as economy re-opens.
- Agency MBS saw duration extend by 0.4 yr due to higher rates (deters refinancing and slows payments to monthly mins).

U.S. Fixed Income: Quarterly Returns



U.S. Fixed Income: One-Year Returns

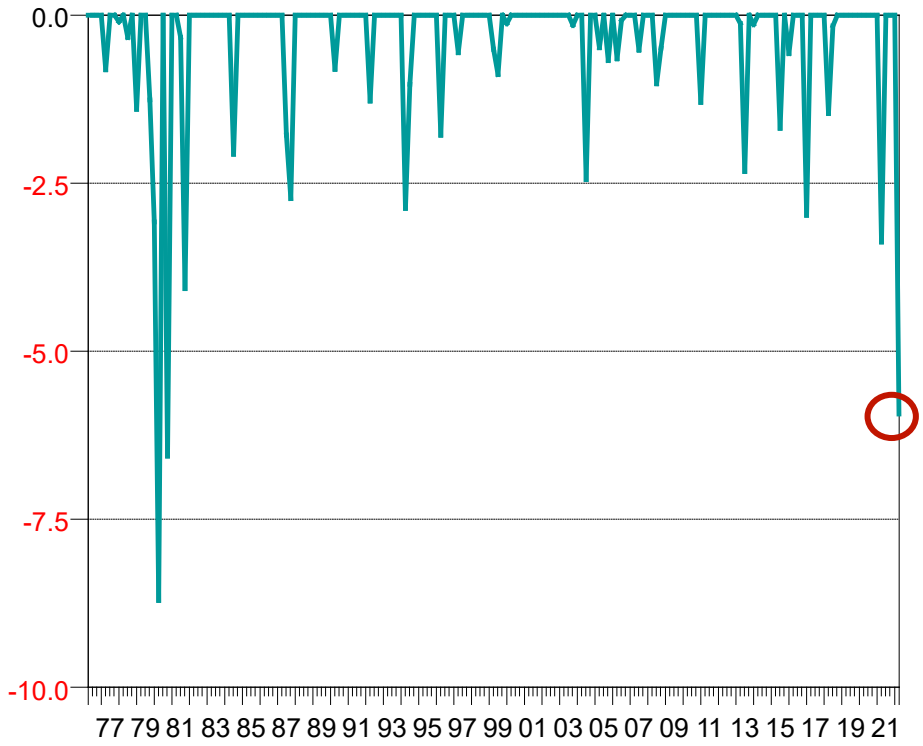


Sources: Bloomberg, S&P Dow Jones Indices

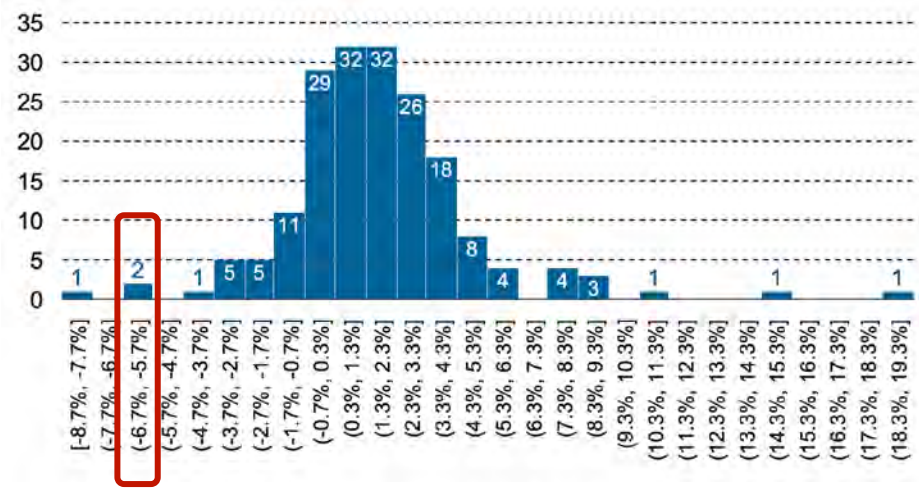
A Brutal Bond Market from a Historical Perspective

1Q22 was the third-worst quarterly loss since the inception of the Bloomberg Aggregate Index

Maximum Drawdown (Quarterly) – Bloomberg Aggregate Index



Histogram of Quarterly Returns for the Bloomberg Aggregate Index Since Inception (n=184)



Source: Bloomberg, Aggregate Index inception date: 1/1/1976

U.S. Private Real Estate Market Trends

Continued strong performance across the asset class

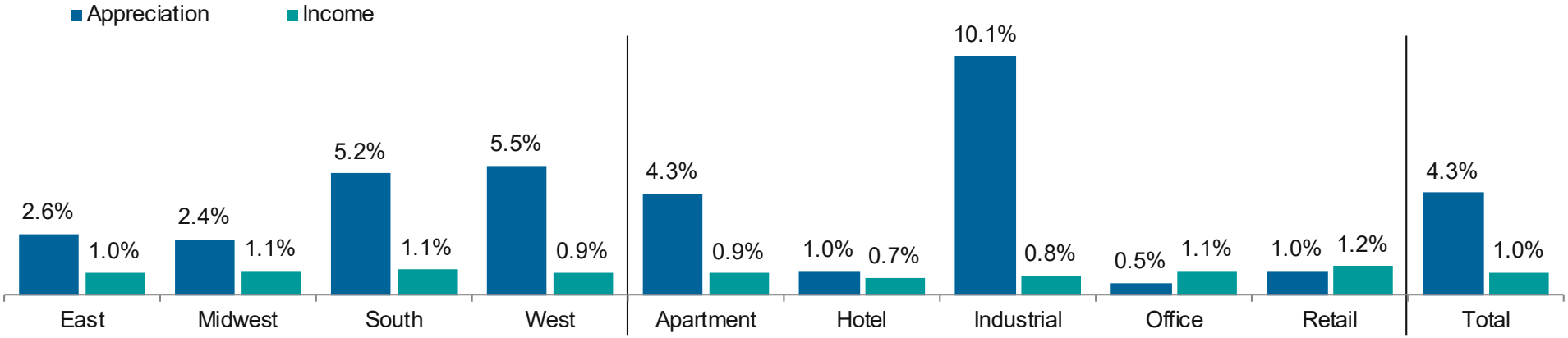
Another strong quarter for real estate

- Income returns were positive across sectors.
- Valuations are reflective of strong fundamentals in Industrial and Apartment and continued uncertainty despite a modest recovery in Office and Retail.
- Return dispersion by manager within the ODCE Index was due to the composition of underlying portfolios.
- Niche sectors such as self-storage and life sciences continued to be accretive.

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
NCREIF ODCE	7.4%	28.5%	11.3%	9.9%	10.9%
Income	0.9%	4.0%	4.0%	4.1%	4.5%
Appreciation	6.4%	23.8%	7.1%	5.6%	6.2%
NCREIF Property Index	5.3%	21.9%	9.6%	8.5%	9.6%
Income	1.0%	4.2%	4.3%	4.4%	4.6%
Appreciation	4.3%	17.2%	5.2%	4.0%	4.8%

Returns are geometrically linked

NCREIF Property Index Quarterly Returns by Region and Property Type

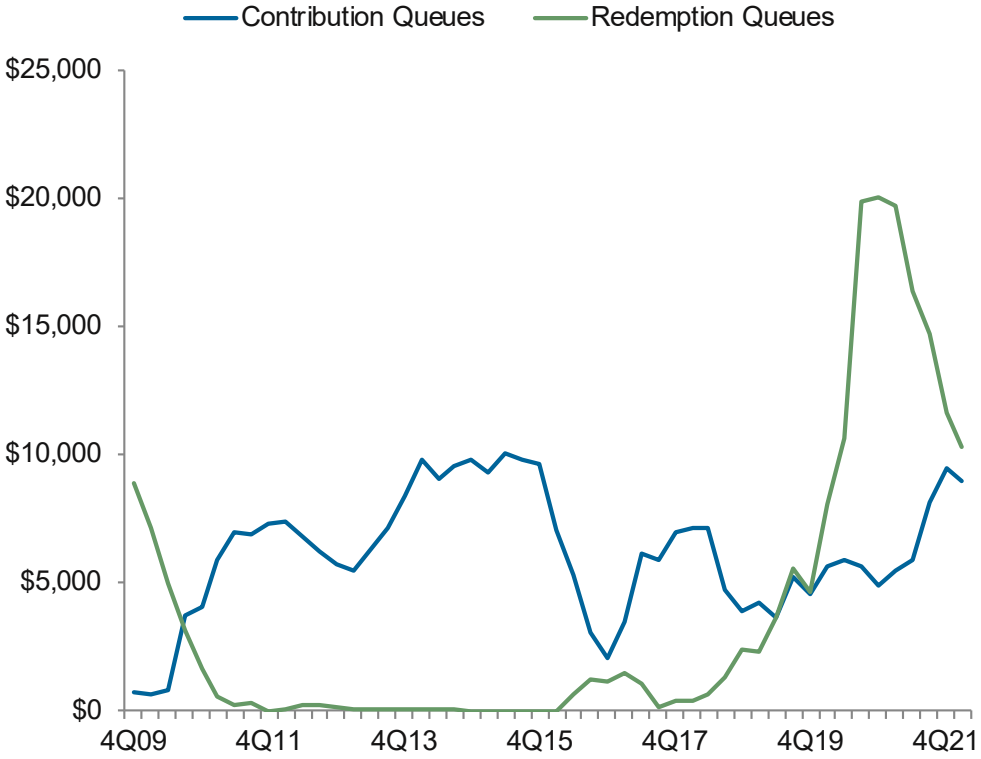


Source: NCREIF, ODCE return is net

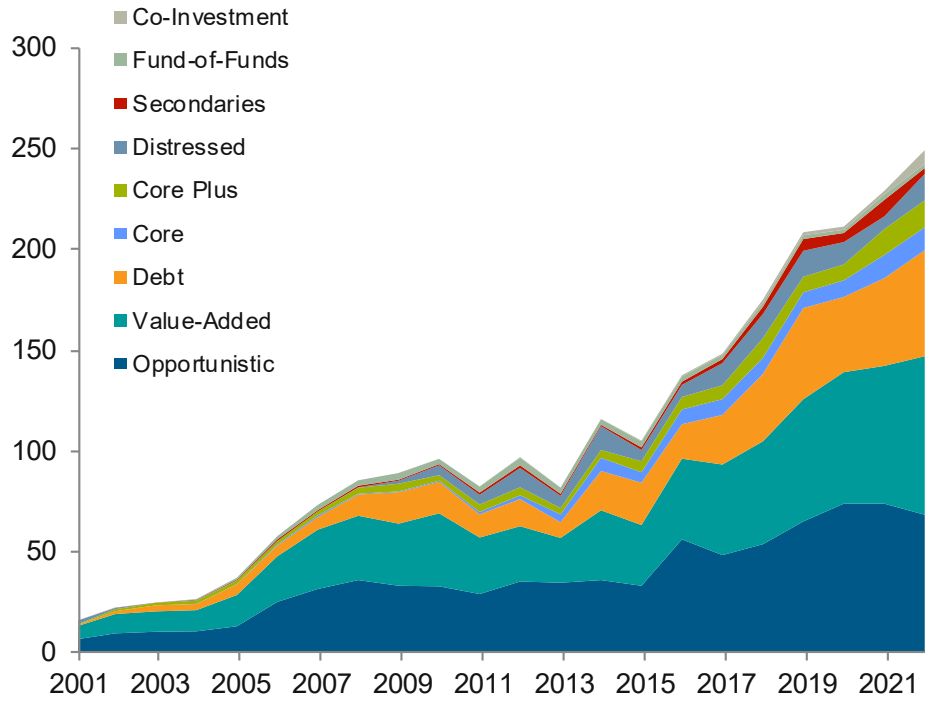
U.S. Private Real Estate Market Trends

Dry powder increasing and exceeds $200 billion

Core Fund Contribution/Redemption Queues ($mm)*



Dry Powder for CRE Investment in North America ($bn)



- Net core activity has rebounded considerably during the last three quarters of 2021.
- >$200 billion of capital waiting to be deployed in North America
- Majority of dry powder capital in opportunistic, value-add, and debt funds

Sources: AEW, NCREIF, Preqin
*Queue data as of 4Q21

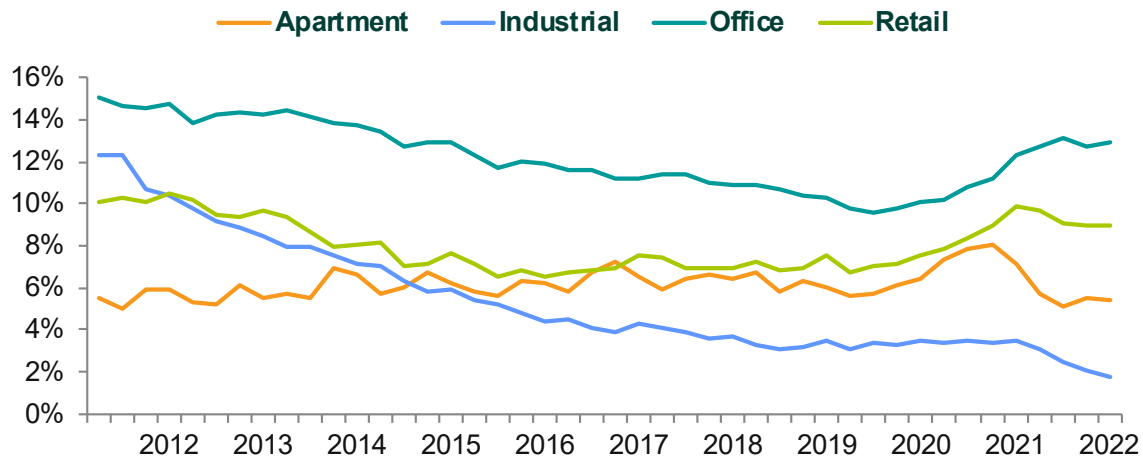
U.S. Private Real Estate Market Trends

Vacancy rates mixed and NOI growth turns negative for Office

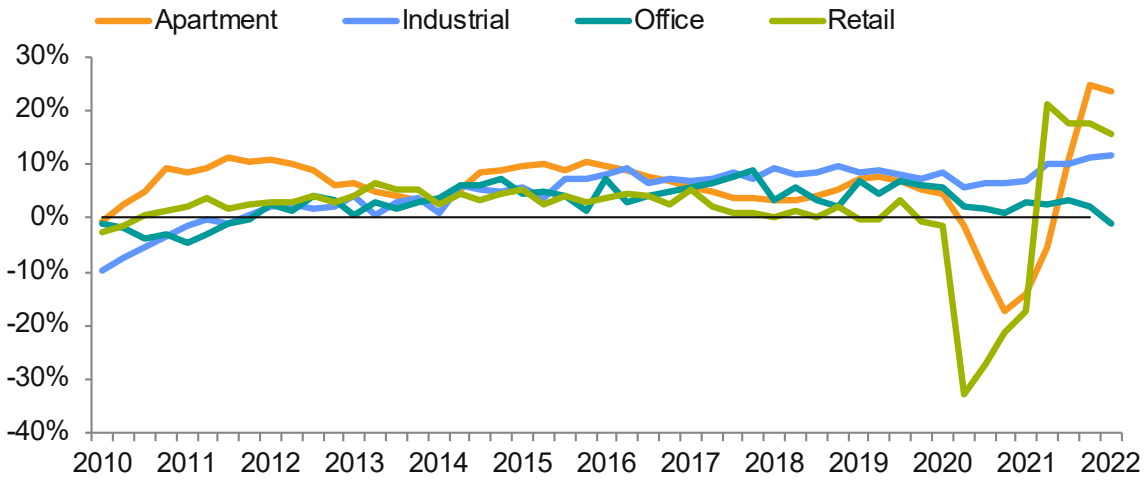
Mixed vacancy and NOI growth results

- Vacancy rates continued to compress in Industrial and Apartment.
- Office and Retail vacancy rates increased slightly during the quarter.
- Net operating income growth turned negative for Office as the Omicron variant delayed many return-to-office plans.
- Net operating income growth continued its gradual increase in Industrial while decreasing slightly in Apartment and Retail.

Vacancy by Property Type



Rolling 4-Quarter NOI Growth by Property Type



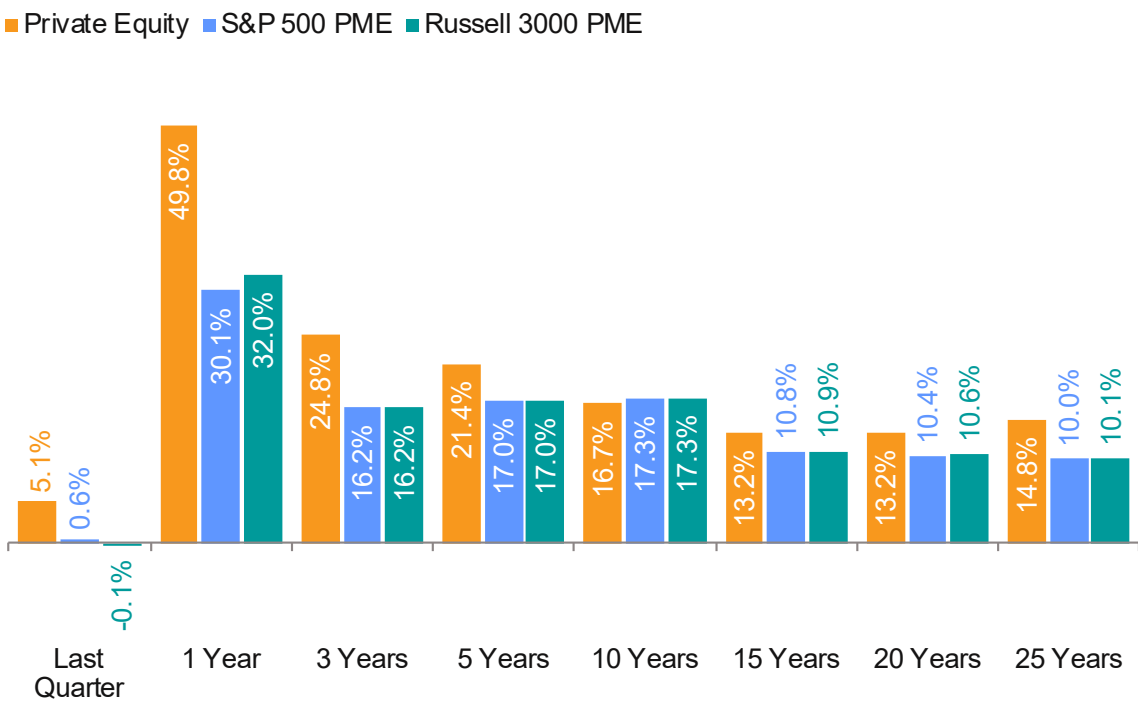
Source: NCREIF

Private Equity Performance

Huge gains over the last year, outpacing public equity

- Significant outperformance over one-year period with private equity exceeding the public markets by 18 to 20 percentage points
- Private equity 3Q21 gains ahead of those of public equity by 5 percentage points
- Private equity consistently ahead of public equity by ~2 to 4 percentage points across all longer-term time horizons, except over the last 10 years
- Volatility in recent public markets performance yet to translate to private markets performance

Net IRRs as of 09/30/21



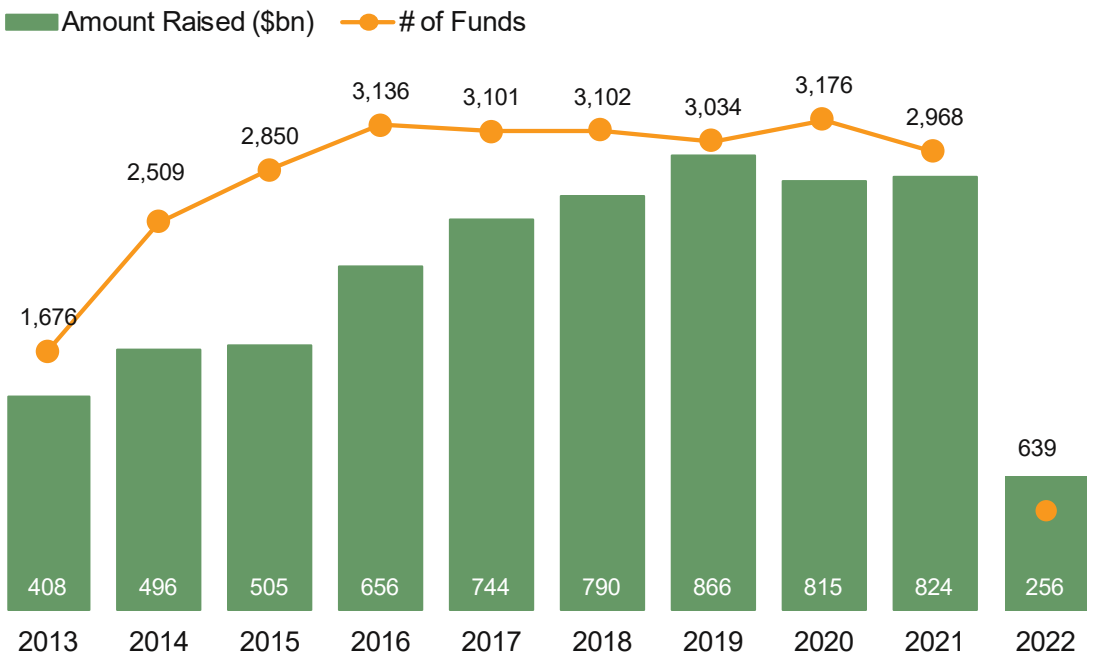
Source: Refinitiv/Cambridge

Private Equity Global Fundraising

2021 fundraising holds steady

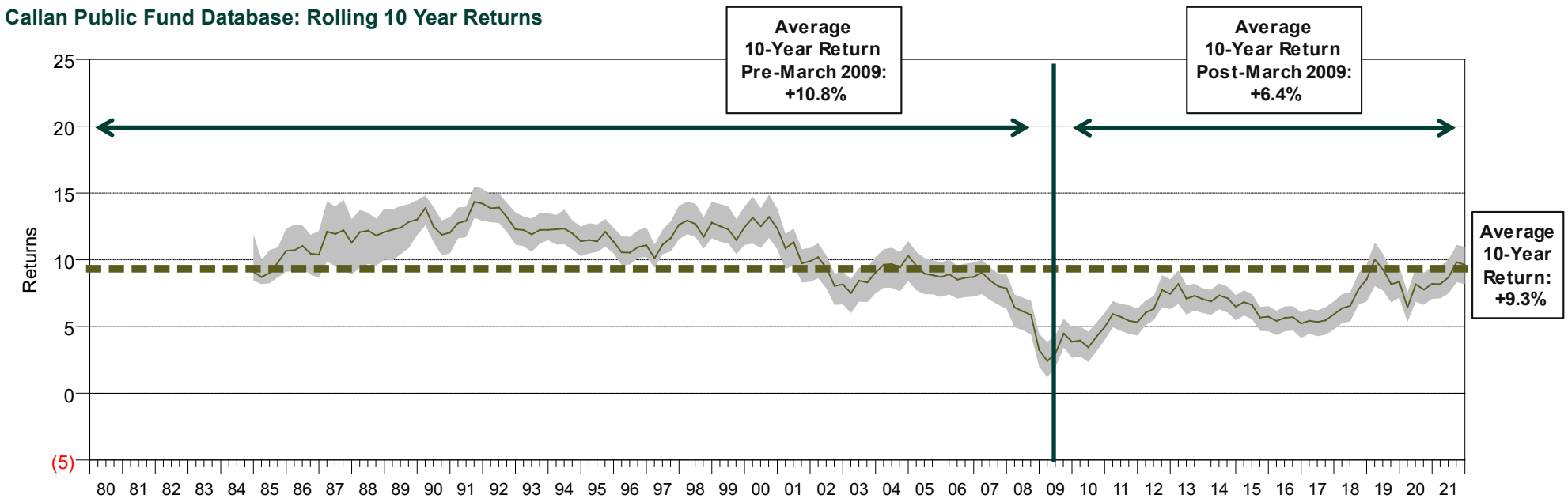
- 2021 fundraising lagging 2019's peak by 5%, but remains consistent with 2020 fundraising
- While a large number of funds were raising in 2021, many did not hold final closes until 2022 due to LP capital budgeting constraints. Fundraising timelines have consequently become extended.
- As a result, a surge in fundraising stats is expected in 2022.

Annual Fundraising

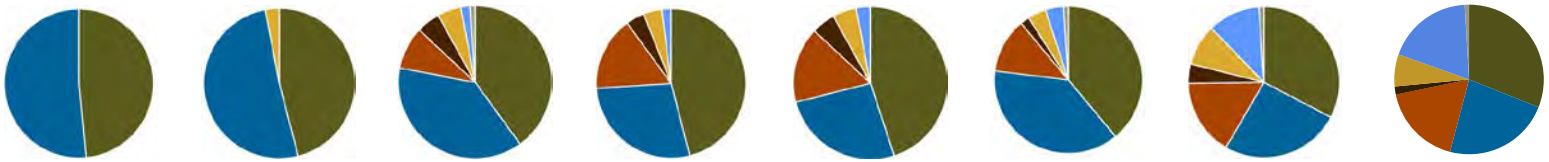


Source: PitchBook, data through April 2022

Historical Public Fund Asset Allocation and Returns



10 Year Return	10.7%	12.0%	11.4%	12.4%	8.7%	5.0%	5.7%	9.7%



Asset Class	1985	1990	1995	2000	2005	2010	2015	2021
Domestic Equity	49%	46%	40%	46%	45%	39%	33%	31%
Domestic Fixed Income	52%	51%	38%	28%	26%	30%	26%	23%
Non-U.S. Equity			9%	16%	16%	15%	16%	18%
Non-U.S. Fixed Income			5%	4%	5%	4%	4%	2%
Real Estate		3%	5%	4%	5%	4%	9%	7%
Other Alternatives			2%	2%	3%	7%	11%	19%
Cash Equivalents			1%			1%	1%	1%

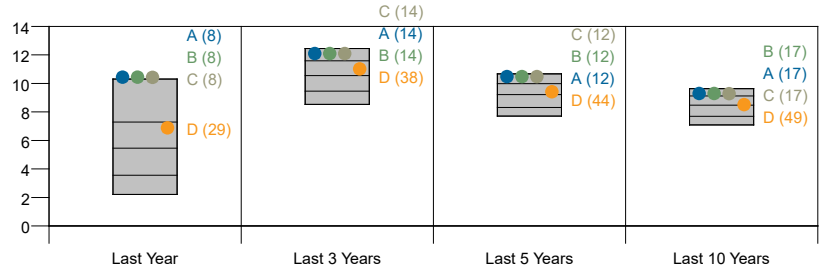
Allocations are as of December 31 of the applicable year except the current year which is September 30.

Callan

Pension Plan

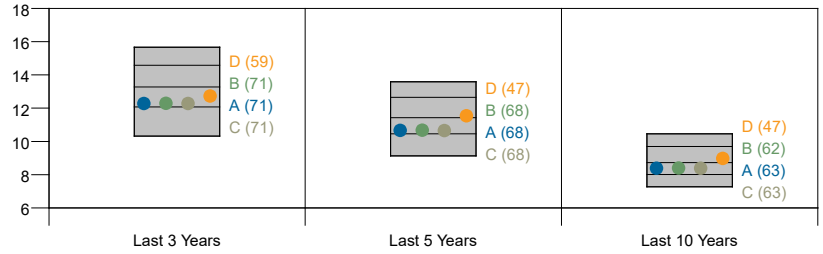
PERS, TRS, and JRS Performance Dashboard – March 31, 2022

Returns vs Callan Public Fund Sponsor Database



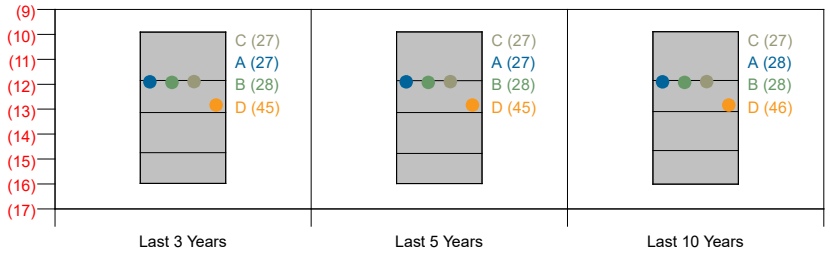
		Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		10.31	12.46	10.68	9.64
25th Percentile		7.29	11.59	9.99	9.13
Median		5.46	10.55	9.22	8.48
75th Percentile		3.56	9.47	8.32	7.70
90th Percentile		2.22	8.54	7.71	7.10
Member Count		241	241	239	227
Employees' Total Plan	A	10.45	12.10	10.49	9.30
Teachers' Total Plan	B	10.45	12.10	10.49	9.31
Judicial Total Plan	C	10.44	12.11	10.49	9.29
Policy Target	D	6.89	11.04	9.42	8.52

Standard Deviation vs Callan Public Fund Sponsor Database



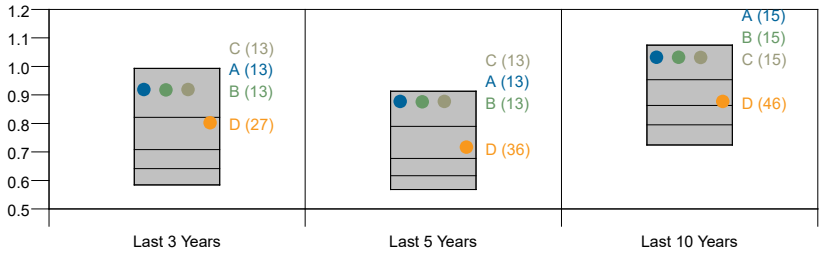
		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		15.67	13.59	10.46
25th Percentile		14.59	12.66	9.70
Median		13.28	11.44	8.73
75th Percentile		12.08	10.46	8.01
90th Percentile		10.32	9.13	7.28
Member Count		241	239	227
Employees' Total Plan	A	12.29	10.67	8.39
Teachers' Total Plan	B	12.30	10.68	8.41
Judicial Total Plan	C	12.29	10.67	8.39
Policy Target	D	12.74	11.55	8.99

Maximum Drawdown vs Callan Public Fund Sponsor Database



		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		(9.90)	(9.89)	(9.89)
25th Percentile		(11.85)	(11.85)	(11.84)
Median		(13.13)	(13.13)	(13.09)
75th Percentile		(14.74)	(14.77)	(14.66)
90th Percentile		(15.98)	(15.98)	(16.00)
Member Count		241	239	227
Employees' Total Plan	A	(11.90)	(11.90)	(11.90)
Teachers' Total Plan	B	(11.92)	(11.92)	(11.92)
Judicial Total Plan	C	(11.89)	(11.89)	(11.89)
Policy Target	D	(12.83)	(12.83)	(12.83)

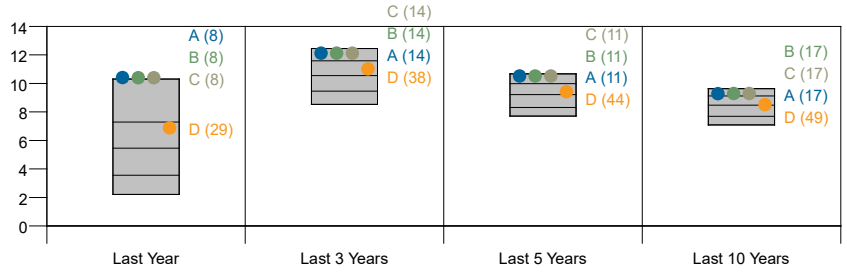
Sharpe Ratio vs Callan Public Fund Sponsor Database



		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		0.99	0.91	1.08
25th Percentile		0.82	0.79	0.95
Median		0.71	0.68	0.86
75th Percentile		0.64	0.62	0.80
90th Percentile		0.58	0.57	0.72
Member Count		241	239	227
Employees' Total Plan	A	0.92	0.88	1.03
Teachers' Total Plan	B	0.92	0.88	1.03
Judicial Total Plan	C	0.92	0.88	1.03
Policy Target	D	0.80	0.72	0.88

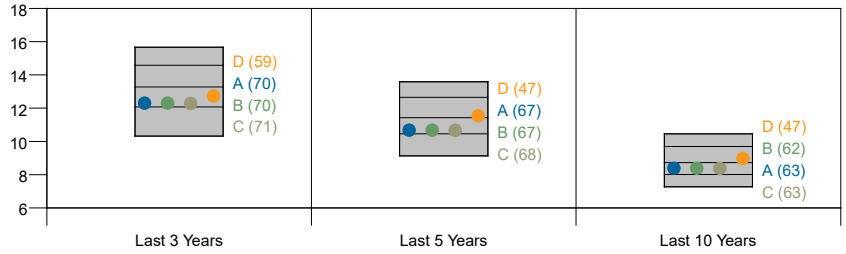
Health Care Plans Performance Dashboard – March 31, 2022

Returns vs Callan Public Fund Sponsor Database



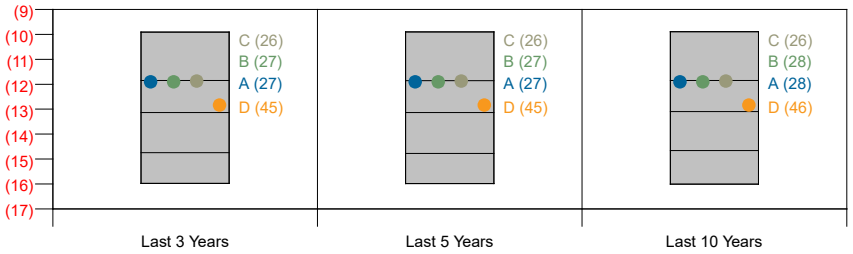
		Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		10.31	12.46	10.68	9.64
25th Percentile		7.29	11.59	9.99	9.13
Median		5.46	10.55	9.22	8.48
75th Percentile		3.56	9.47	8.32	7.70
90th Percentile		2.22	8.54	7.71	7.10
Member Count		241	241	239	227
PERS Health Plan	A	10.42	12.13	10.53	9.30
TRS Health Plan	B	10.41	12.13	10.53	9.30
JRS Health Plan	C	10.41	12.14	10.54	9.30
Policy Target	D	6.89	11.04	9.42	8.52

Standard Deviation vs Callan Public Fund Sponsor Database



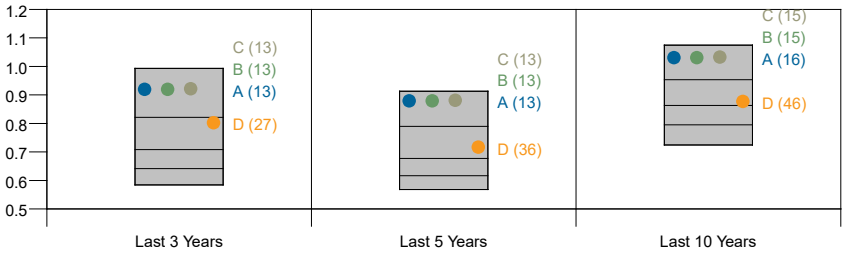
		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		15.67	13.59	10.46
25th Percentile		14.59	12.66	9.70
Median		13.28	11.44	8.73
75th Percentile		12.08	10.46	8.01
90th Percentile		10.32	9.13	7.28
Member Count		241	239	227
PERS Health Plan	A	12.31	10.69	8.40
TRS Health Plan	B	12.31	10.69	8.40
JRS Health Plan	C	12.29	10.67	8.39
Policy Target	D	12.74	11.55	8.99

Maximum Drawdown vs Callan Public Fund Sponsor Database



		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		(9.90)	(9.89)	(9.89)
25th Percentile		(11.85)	(11.85)	(11.84)
Median		(13.13)	(13.13)	(13.09)
75th Percentile		(14.74)	(14.77)	(14.66)
90th Percentile		(15.98)	(15.98)	(16.00)
Member Count		241	239	227
PERS Health Plan	A	(11.90)	(11.90)	(11.90)
TRS Health Plan	B	(11.90)	(11.90)	(11.90)
JRS Health Plan	C	(11.87)	(11.87)	(11.87)
Policy Target	D	(12.83)	(12.83)	(12.83)

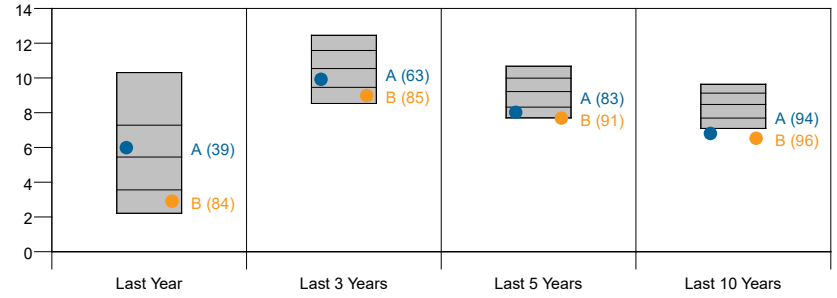
Sharpe Ratio vs Callan Public Fund Sponsor Database



		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		0.99	0.91	1.08
25th Percentile		0.82	0.79	0.95
Median		0.71	0.68	0.86
75th Percentile		0.64	0.62	0.80
90th Percentile		0.58	0.57	0.72
Member Count		241	239	227
PERS Health Plan	A	0.92	0.88	1.03
TRS Health Plan	B	0.92	0.88	1.03
JRS Health Plan	C	0.92	0.88	1.03
Policy Target	D	0.80	0.72	0.88

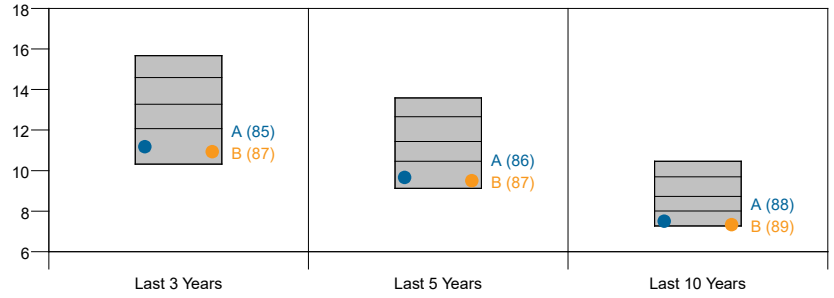
Military Plan Performance Dashboard – March 31, 2022

Returns vs Callan Public Fund Sponsor Database



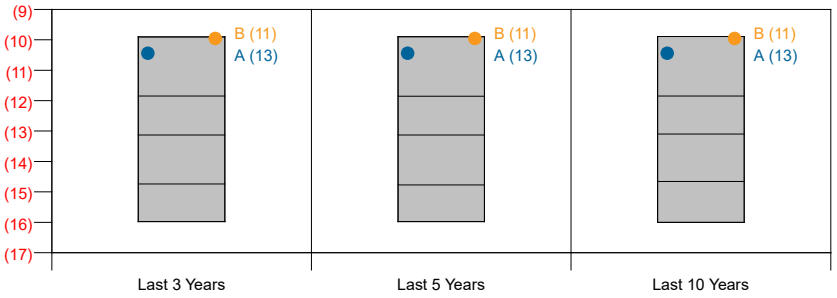
		Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		10.31	12.46	10.68	9.64
25th Percentile		7.29	11.59	9.99	9.13
Median		5.46	10.55	9.22	8.48
75th Percentile		3.56	9.47	8.32	7.70
90th Percentile		2.22	8.54	7.71	7.10
Member Count		241	241	239	227
Military Total Plan	A	5.99	9.92	8.03	6.82
Military Policy Target	B	2.91	8.99	7.70	6.53

Standard Deviation vs Callan Public Fund Sponsor Database



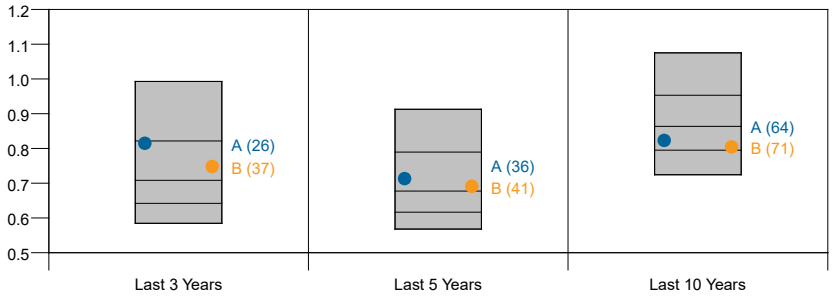
		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		15.67	13.59	10.46
25th Percentile		14.59	12.66	9.70
Median		13.28	11.44	8.73
75th Percentile		12.08	10.46	8.01
90th Percentile		10.32	9.13	7.28
Member Count		241	239	227
Military Total Plan	A	11.19	9.67	7.51
Military Policy Target	B	10.94	9.50	7.34

Maximum Drawdown vs Callan Public Fund Sponsor Database



		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		(9.90)	(9.89)	(9.89)
25th Percentile		(11.85)	(11.85)	(11.84)
Median		(13.13)	(13.13)	(13.09)
75th Percentile		(14.74)	(14.77)	(14.66)
90th Percentile		(15.98)	(15.98)	(16.00)
Member Count		241	239	227
Military Total Plan	A	(10.44)	(10.44)	(10.44)
Military Policy Target	B	(9.95)	(9.95)	(9.95)

Sharpe Ratio vs Callan Public Fund Sponsor Database

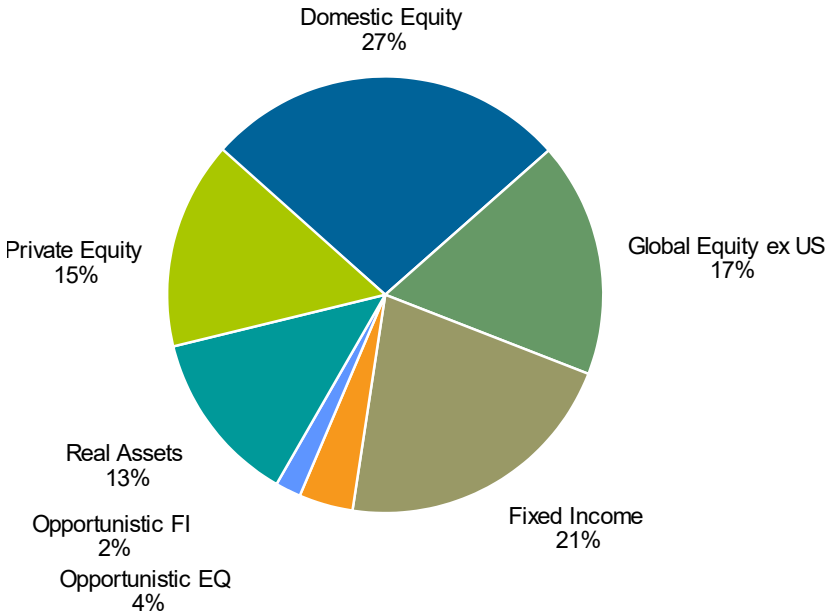


		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		0.99	0.91	1.08
25th Percentile		0.82	0.79	0.95
Median		0.71	0.68	0.86
75th Percentile		0.64	0.62	0.80
90th Percentile		0.58	0.57	0.72
Member Count		241	239	227
Military Total Plan	A	0.81	0.71	0.82
Military Policy Target	B	0.75	0.69	0.80

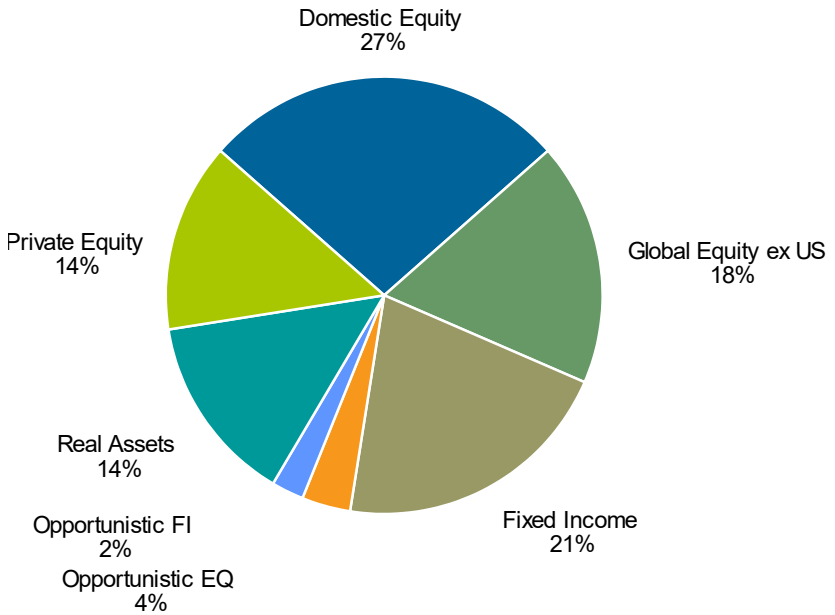
Asset Allocation – Public Employees' Retirement System

Quarter Ending March 31, 2022

Actual Asset Allocation



Target Asset Allocation



Asset Class	$000s Actual	Weight Actual	Target	Percent Difference	$000s Difference
Domestic Equity	3,182,151	27.0%	27.0%	(0.0%)	(938)
Global Equity ex US	2,045,758	17.4%	18.0%	(0.6%)	(76,302)
Fixed Income	2,529,771	21.5%	21.0%	0.5%	54,034
Opportunistic EQ	467,260	4.0%	3.6%	0.4%	42,848
Opportunistic FI	222,555	1.9%	2.4%	(0.5%)	(60,386)
Real Assets	1,526,648	12.9%	14.0%	(1.1%)	(123,843)
Private Equity	1,815,078	15.4%	14.0%	1.4%	164,587
Total	11,789,220	100.0%	100.0%		

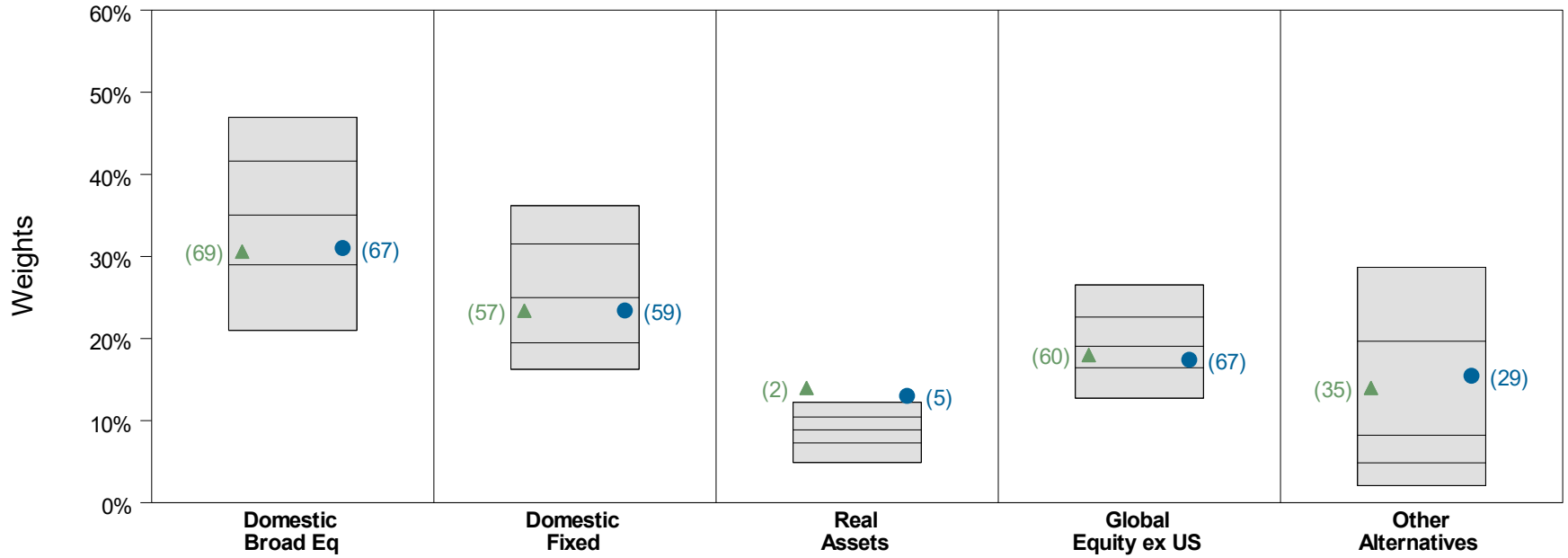
PERS is used as illustrative throughout the presentation.

The other plans exhibit modest variations from strategic target allocations.

Asset Allocation vs. Public Funds (PERS)

Callan Public Fund Database

Asset Class Weights vs Callan Public Fund Sponsor Database



	Domestic Broad Eq	Domestic Fixed	Real Assets	Global Equity ex US	Other Alternatives
10th Percentile	46.95	36.19	12.24	26.53	28.67
25th Percentile	41.62	31.53	10.44	22.61	19.67
Median	35.05	24.98	8.87	19.07	8.22
75th Percentile	28.99	19.49	7.29	16.45	4.86
90th Percentile	21.00	16.26	4.90	12.75	2.10
Fund ●	30.96	23.35	12.95	17.35	15.40
Target ▲	30.60	23.40	14.00	18.00	14.00

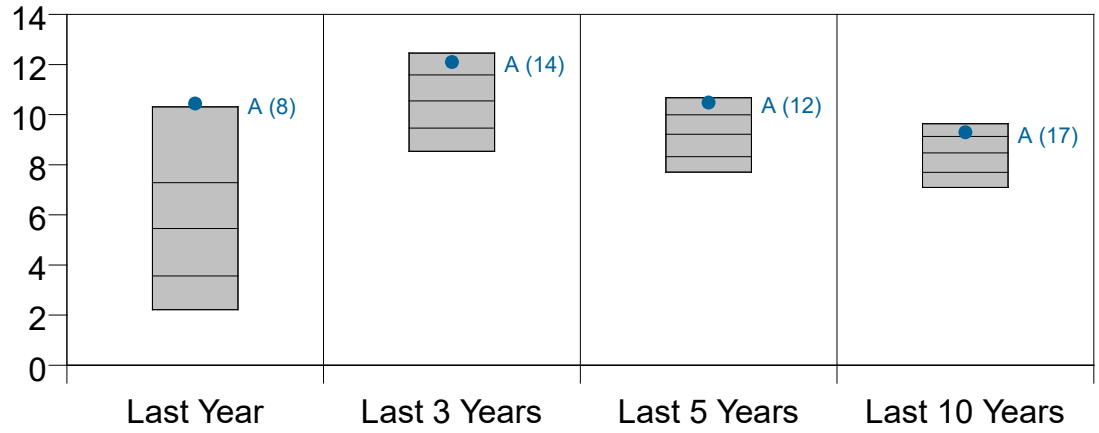
- Asset class allocations are in line with targets after the asset allocation update and associated rebalancing.
- Weightings to real assets and alternatives are relatively high in comparison to other public funds.

Notes: Real Assets includes Private Real Estate, REITs, Farmland, Timber, Energy, and Infrastructure. Other Alternatives represents private equity.

Total Fund Return vs Public Funds (PERS)

Callan Public Fund Database

Gross of Fee Returns
for Periods Ended March 31, 2022
Group: Callan Public Fund Sponsor Database



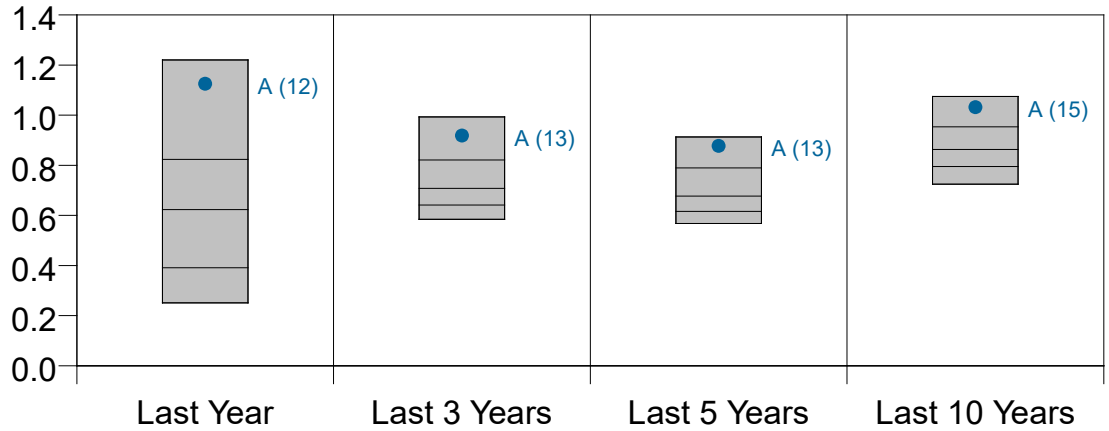
	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	10.31	12.46	10.68	9.64
25th Percentile	7.29	11.59	9.99	9.13
Median	5.46	10.55	9.22	8.48
75th Percentile	3.56	9.47	8.32	7.70
90th Percentile	2.22	8.54	7.71	7.10
Member Count	241	241	239	227
PERS - Total Fund ● A	10.45	12.10	10.49	9.30

- Despite the recent change to the asset allocation, longer-term performance reflects ARMB's prior orientation toward capital growth as opposed to income generation.
- Performance was above the Public Funds median for the one-, three-, five-, and ten-year periods.

Total Fund Sharpe Ratio Rankings vs Public Funds (PERS)

Callan Public Fund Database

Gross of Fee Sharpe Ratio
for Periods Ended March 31, 2022
Group: Callan Public Fund Sponsor Database



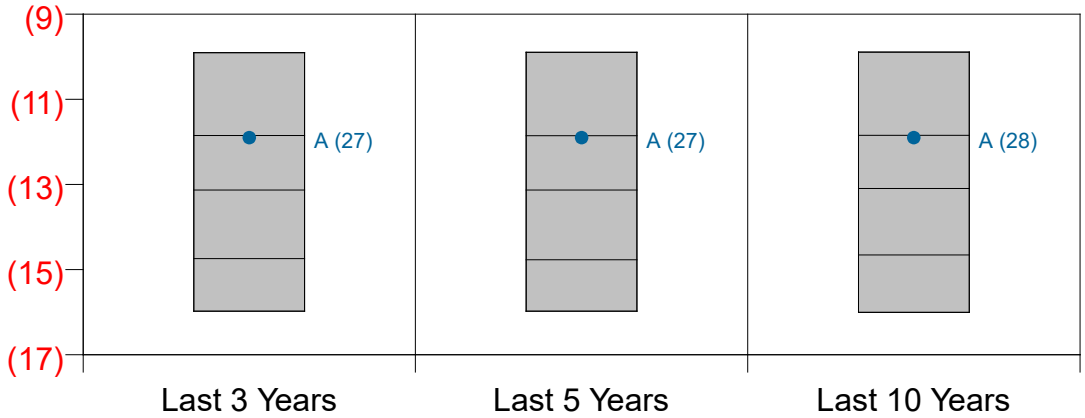
	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	1.22	0.99	0.91	1.08
25th Percentile	0.82	0.82	0.79	0.95
Median	0.62	0.71	0.68	0.86
75th Percentile	0.39	0.64	0.62	0.80
90th Percentile	0.25	0.58	0.57	0.72
Member Count	241	241	239	227
PERS - Total Fund ● A	1.13	0.92	0.88	1.03

- "Sharpe ratio" is a risk-adjusted measure of excess return above the risk-free rate.
- ARMB's risk-adjusted return (Sharpe ratio) was above the Public Funds median for the one-, three-, five-, and ten-year periods.

Total Maximum Drawdown Rankings vs Public Funds (PERS)

Callan Public Fund Database

Gross of Fee Maximum Drawdown
for Periods Ended March 31, 2022
Group: Callan Public Fund Sponsor Database



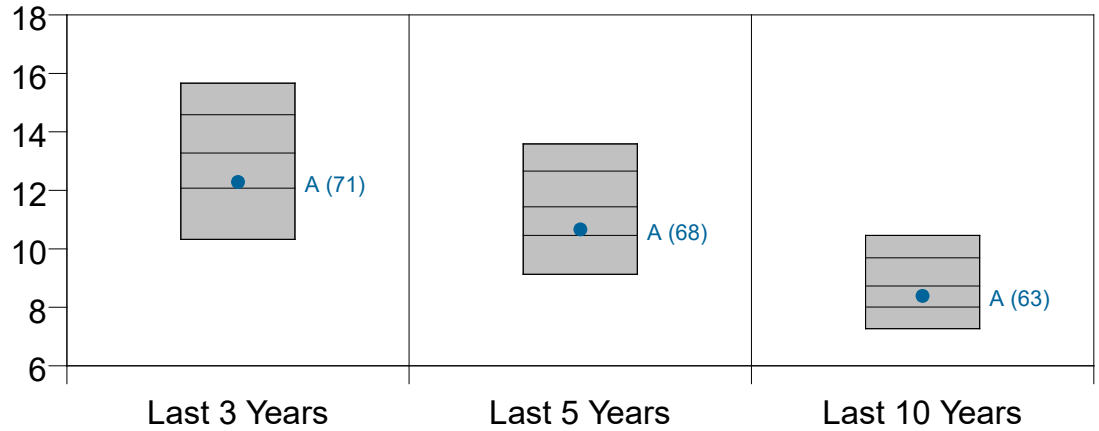
	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	(9.90)	(9.89)	(9.89)
25th Percentile	(11.85)	(11.85)	(11.84)
Median	(13.13)	(13.13)	(13.09)
75th Percentile	(14.74)	(14.77)	(14.66)
90th Percentile	(15.98)	(15.98)	(16.00)
Member Count	241	239	227
PERS - Total Fund ● A	(11.90)	(11.90)	(11.90)

- "Maximum drawdown" is a measure of the largest loss from peak to trough in a given period.
- Lower rankings reflect larger drawdowns (i.e. bigger losses). ARMB's drawdown rankings for all periods have reflected better than average drawdowns (i.e. lower losses) and have improved over time.
- The drawdown experienced in the first quarter of 2020 is the largest of the last 10 years.

Standard Deviation Ranking vs Public Funds (PERS)

Callan Public Fund Database

Gross of Fee Standard Deviation
for Periods Ended March 31, 2022
Group: Callan Public Fund Sponsor Database



	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	15.67	13.59	10.46
25th Percentile	14.59	12.66	9.70
Median	13.28	11.44	8.73
75th Percentile	12.08	10.46	8.01
90th Percentile	10.32	9.13	7.28
Member Count	241	239	227
PERS - Total Fund ● A	12.29	10.67	8.39

- "Standard deviation" measures variability of returns. It is one measurement of investment risk.
- Less standard deviation results in lower rankings. A lower ranking of standard deviation suggests lower variability.
- ARMB's portfolio diversification has resulted in volatility that is lower than median compared to peers.

PERS Performance Attribution – 1st Quarter 2022 & Trailing Year

Relative Attribution Effects for Quarter ended March 31, 2022

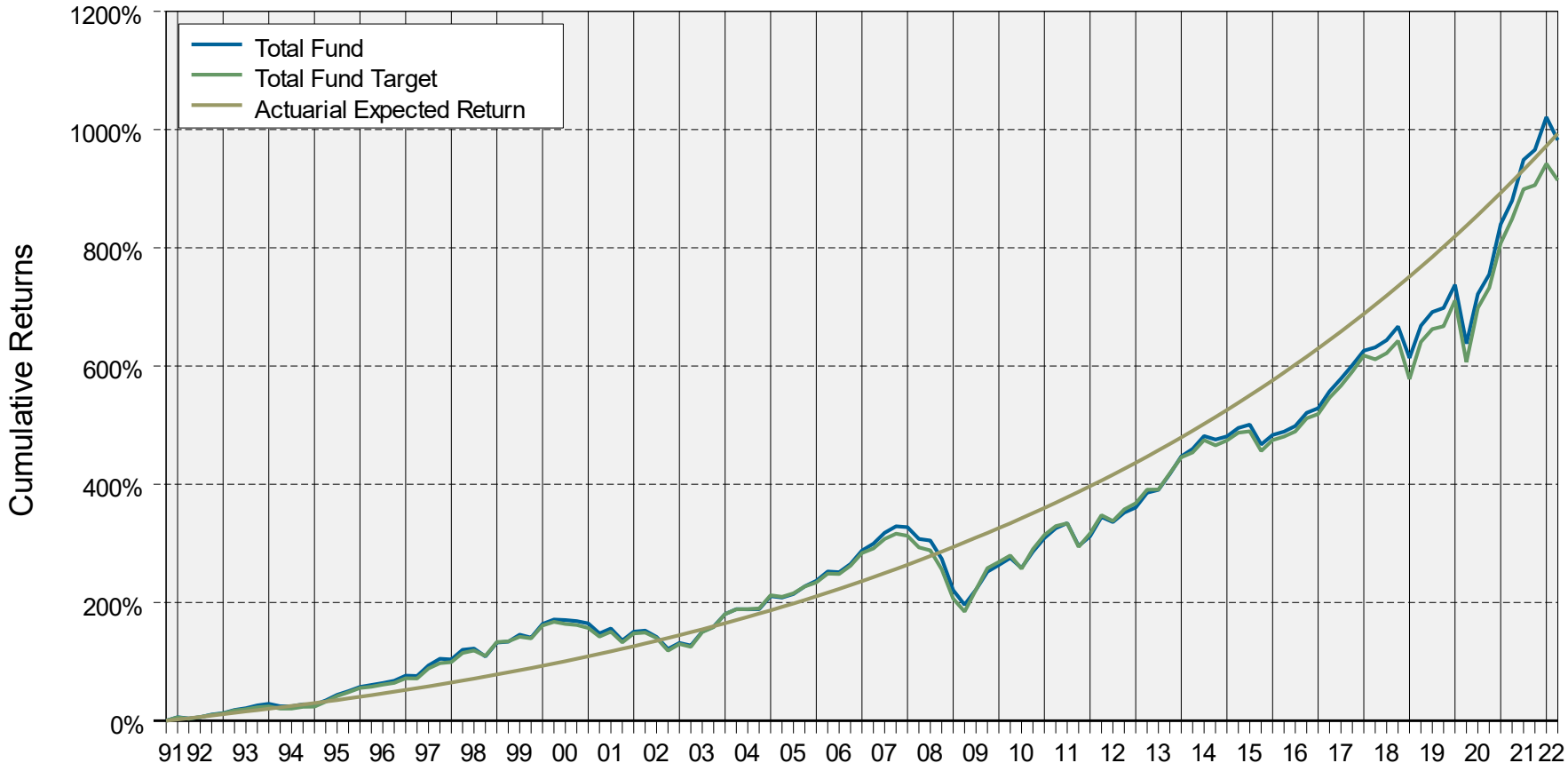
Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	28%	27%	(4.87%)	(5.28%)	0.11%	(0.03%)	0.09%
Fixed-Income	21%	21%	(4.38%)	(5.64%)	0.27%	(0.01%)	0.26%
Opportunistic	6%	6%	(6.27%)	(5.65%)	(0.04%)	0.00%	(0.03%)
Real Assets	12%	14%	2.17%	3.71%	(0.19%)	(0.10%)	(0.29%)
Global Equity ex US	18%	18%	(7.31%)	(5.60%)	(0.30%)	0.01%	(0.30%)
Private Equity	15%	14%	1.60%	5.29%	(0.54%)	0.06%	(0.48%)
Total			**(3.45%) =**	**(2.69%) +**	**(0.69%) +**	**(0.07%)**	**(0.76%)**

One Year Relative Attribution Effects

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	28%	27%	12.58%	11.92%	0.18%	(0.01%)	0.17%
Fixed-Income	22%	21%	(1.19%)	(3.94%)	0.64%	(0.06%)	0.58%
Opportunistic	6%	6%	4.15%	2.06%	0.13%	0.00%	0.13%
Real Assets	12%	14%	14.91%	15.36%	(0.06%)	(0.18%)	(0.25%)
Global Equity ex US	18%	18%	(2.85%)	(1.27%)	(0.29%)	0.01%	(0.28%)
Private Equity	14%	13%	46.41%	18.24%	3.19%	0.01%	3.20%
Total			**10.45% =**	**6.89% +**	**3.79% +**	**(0.23%)**	**3.56%**

PERS Long-Term Total Fund Performance as of 03/31/2022

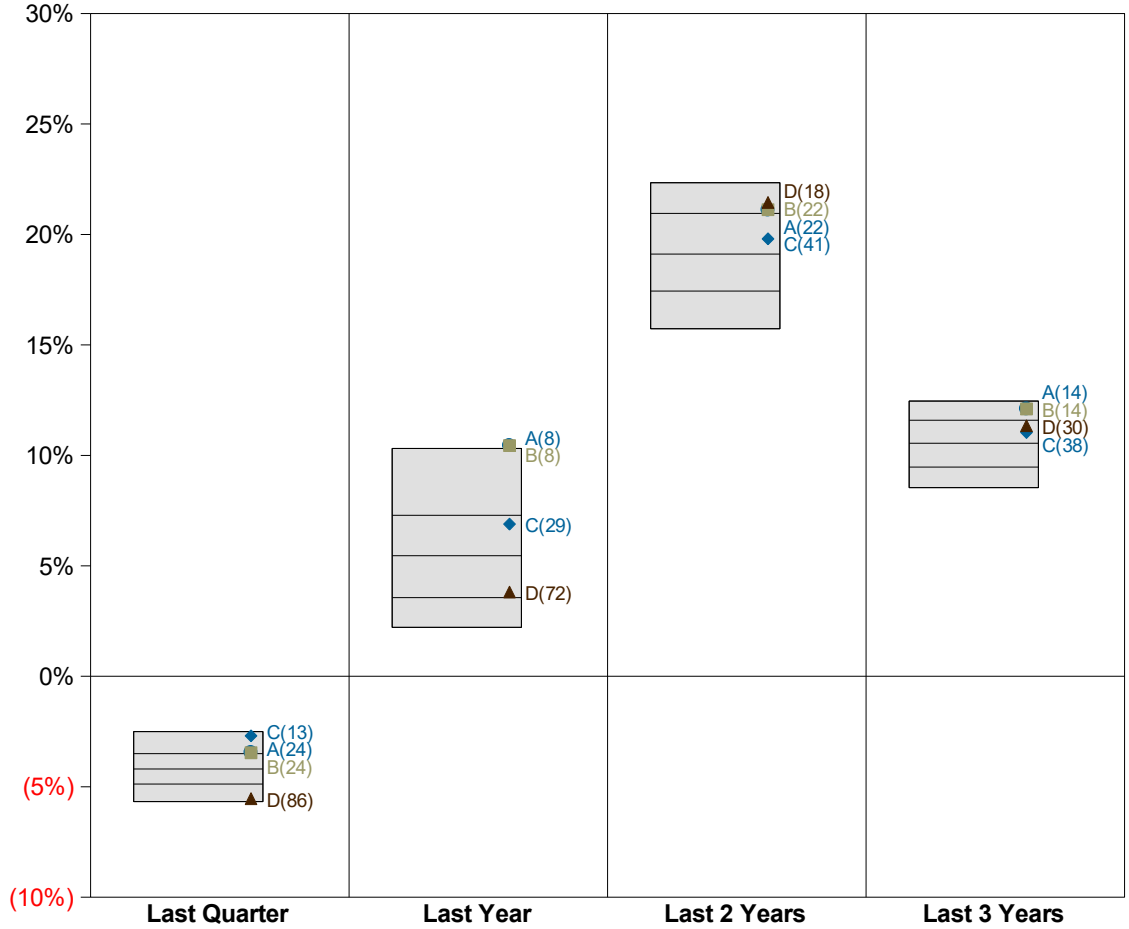
Cumulative Returns Actual vs Target



- Each Fund has two targets: the asset allocation policy return and the actuarial return.
- Total Fund returns continue to closely track the strategic allocation target.
- Market correction setbacks in 3Q15, 4Q18, 1Q20, and 1Q22 have hindered the Total Fund's progress toward closing the gap versus the actuarial return following the Global Financial Crisis of 2008/2009.

Annualized Total Fund Returns as of 03/31/22

Callan Public Fund Database



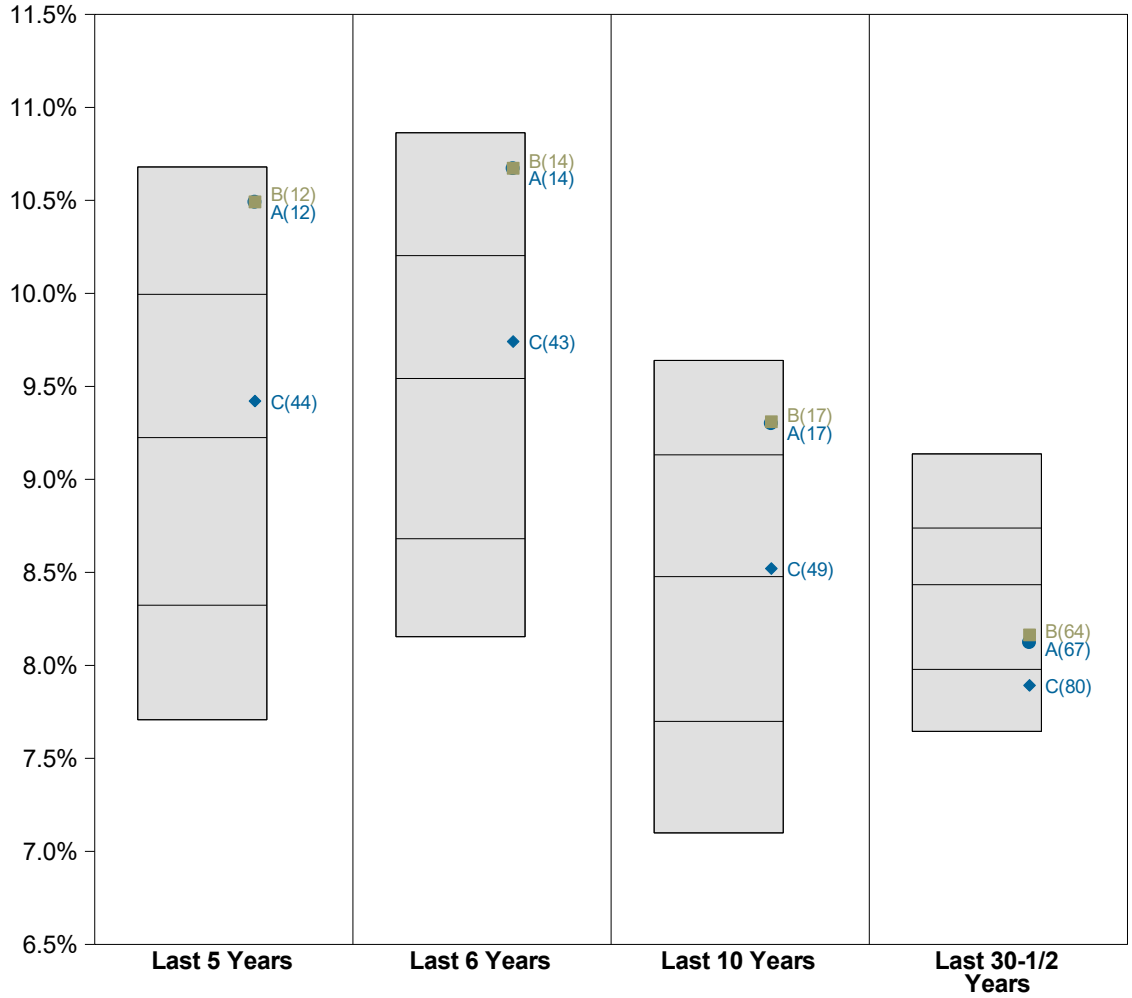
	Last Quarter	Last Year	Last 2 Years	Last 3 Years
10th Percentile	(2.50)	10.31	22.34	12.46
25th Percentile	(3.50)	7.29	20.95	11.59
Median	(4.20)	5.46	19.11	10.55
75th Percentile	(4.87)	3.56	17.44	9.47
90th Percentile	(5.67)	2.22	15.73	8.54
PERS Total Plan ● A	(3.45)	10.45	21.11	12.10
TRS Total Plan ■ B	(3.46)	10.45	21.12	12.10
Target Index ◆ C	(2.69)	6.89	19.80	11.04
Public Market Proxy ▲ D	(5.54)	3.81	21.45	11.34

- PERS and TRS have outperformed their target for the last year, two-year and three-year periods.

The Public Market Proxy consists of 45% Russell 3000 Index, 30% MSCI ACWI ex US IMI (Net), and 25% Bloomberg Aggregate Index.

Longer-Term Total Fund Returns as of 03/31/22

Callan Public Fund Database

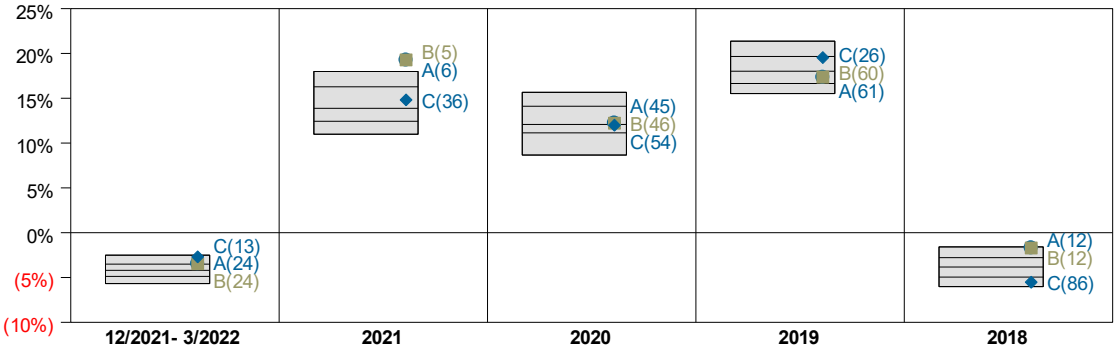


	Last 5 Years	Last 6 Years	Last 10 Years	Last 30-1/2 Years
10th Percentile	10.68	10.86	9.64	9.14
25th Percentile	9.99	10.20	9.13	8.74
Median	9.22	9.54	8.48	8.43
75th Percentile	8.32	8.68	7.70	7.98
90th Percentile	7.71	8.15	7.10	7.64
PERS Total Plan ● A	10.49	10.67	9.30	8.12
TRS Total Plan ■ B	10.49	10.67	9.31	8.16
Target Index ◆ C	9.42	9.74	8.52	7.89

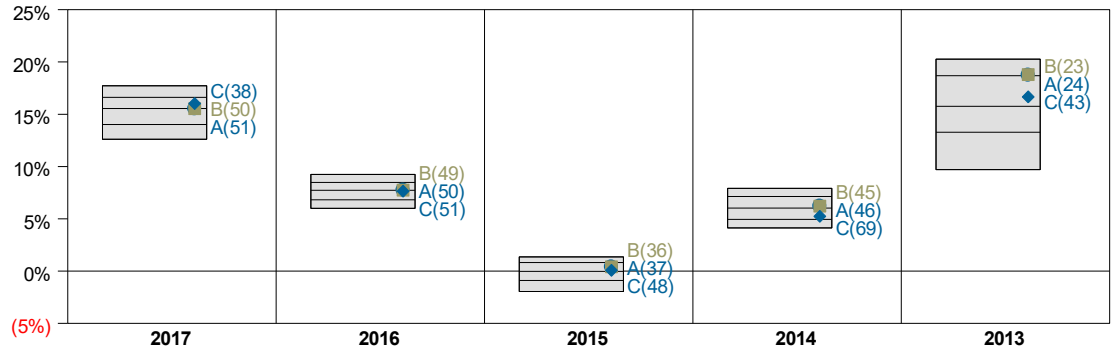
- Five-, six-, and ten-year performance is above target and median.
- 30 year and two quarter return for PERS beat the target by 23 basis points.

Calendar Period Total Fund Performance

Callan Public Fund Database



	12/2021- 3/2022	2021	2020	2019	2018
10th Percentile	(2.50)	17.99	15.66	21.36	(1.58)
25th Percentile	(3.50)	16.28	14.11	19.66	(2.78)
Median	(4.20)	13.88	12.08	18.01	(3.83)
75th Percentile	(4.87)	12.43	11.14	16.65	(4.96)
90th Percentile	(5.67)	10.99	8.66	15.52	(6.02)
'ERS Total Plan ● A	(3.45)	19.27	12.23	17.34	(1.70)
TRS Total Plan ■ B	(3.46)	19.28	12.21	17.36	(1.70)
Target Index ◆ C	(2.69)	14.81	11.99	19.54	(5.53)

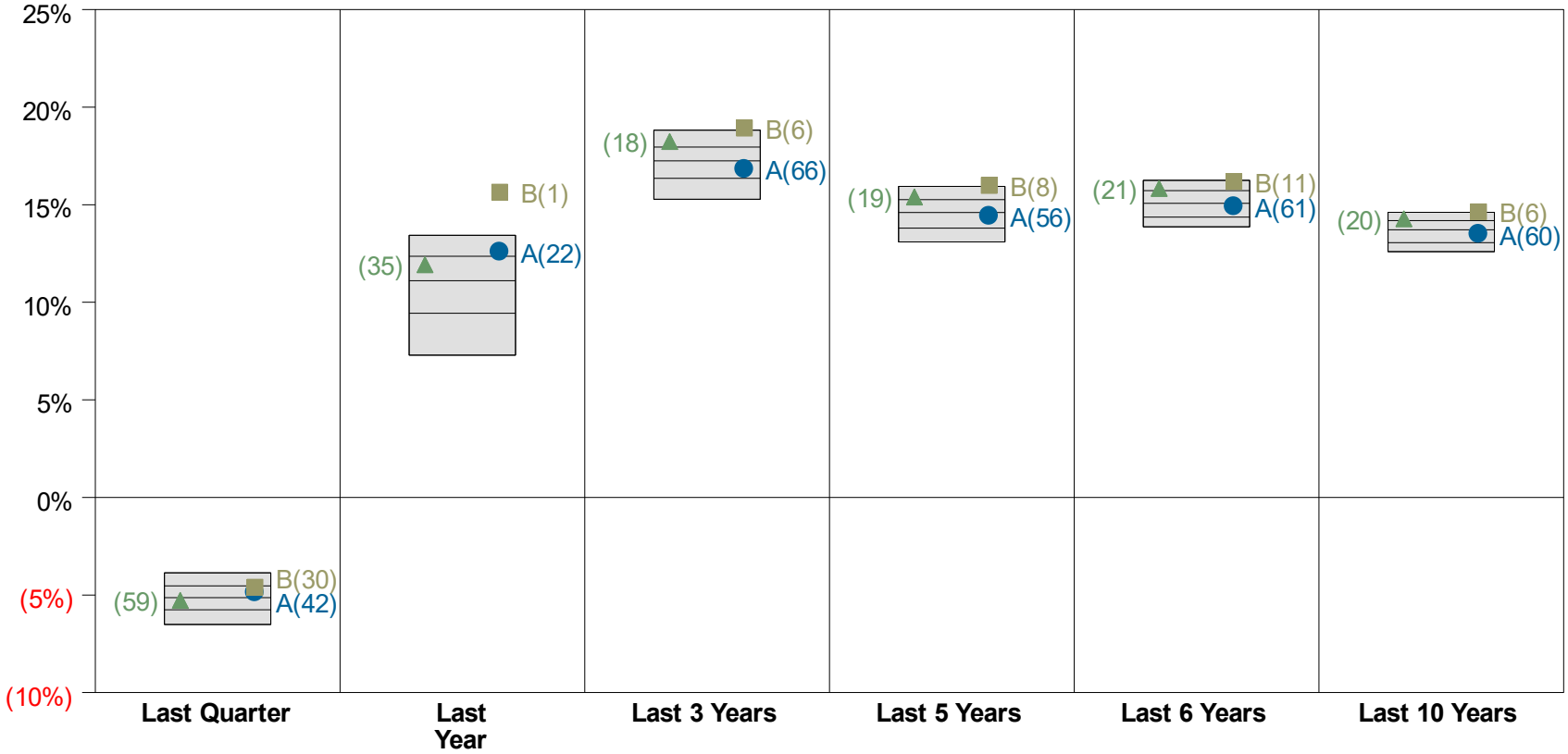


	2017	2016	2015	2014	2013
10th Percentile	17.73	9.24	1.36	7.91	20.27
25th Percentile	16.61	8.48	0.82	7.14	18.69
Median	15.55	7.73	(0.02)	6.03	15.76
75th Percentile	14.02	6.81	(0.89)	4.95	13.28
90th Percentile	12.61	6.00	(1.95)	4.13	9.71
'ERS Total Plan ● A	15.52	7.74	0.40	6.22	18.74
TRS Total Plan ■ B	15.54	7.74	0.41	6.22	18.79
Target Index ◆ C	16.03	7.64	0.08	5.24	16.66

- PERS and TRS rank at or above median in nine of the ten periods shown.
- Peer group range of returns during 2016, 2015, and 2014 were very tight.
- Wide range of peer group returns during calendar 2013 due to varying fixed-income allocations within the Public Fund universe.
- In the three periods with negative Public Fund returns (first calendar quarter 2022; calendar years 2018 and 2015), ARMB's results ranked well above median in the Public Fund universe.

Total Domestic Equity through 03/31/22

Performance vs Public Fund - Domestic Equity (Gross)



		Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile		(3.86)	13.43	18.82	15.94	16.25	14.61
25th Percentile		(4.53)	12.36	17.96	15.26	15.73	14.18
Median		(5.14)	11.11	17.25	14.60	15.07	13.71
75th Percentile		(5.76)	9.44	16.35	13.80	14.37	13.06
90th Percentile		(6.51)	7.29	15.28	13.10	13.87	12.60
Domestic Equity Pool	● A	(4.87)	12.58	16.82	14.43	14.91	13.50
Standard & Poor's 500	■ B	(4.60)	15.65	18.92	15.99	16.19	14.64
Russell 3000 Index	▲	(5.28)	11.92	18.24	15.40	15.84	14.28

Domestic Equity Component Returns

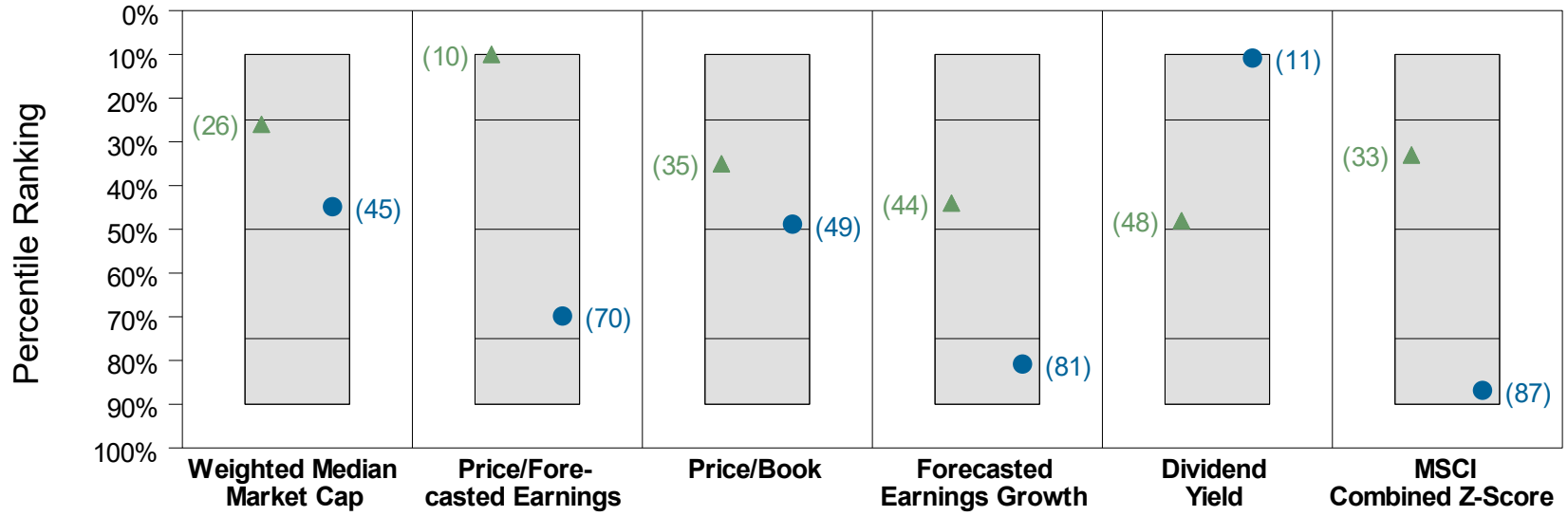
Returns for Periods Ended March 31, 2022

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Total Dom Equity Pool	(4.87%)	12.58%	16.82%	14.43%	13.50%
Russell 3000 Index	(5.28%)	11.92%	18.24%	15.40%	14.28%
Large Cap Managers	(4.82%)	13.58%	17.03%	14.75%	13.89%
Russell 1000 Index	(5.13%)	13.27%	18.71%	15.82%	14.53%
Small Cap Managers	(5.67%)	0.88%	13.80%	11.73%	12.01%
Russell 2000 Index	(7.53%)	(5.79%)	11.74%	9.74%	11.04%

- The large cap composite trailed its benchmark (the Russell 1000 Index) for the trailing 3-, 5-, and 10-year periods and outperformed over the last quarter and year.
- The small cap composite has outperformed its benchmark (the Russell 2000 Index) over all periods shown in the table.

Domestic Equity Portfolio Characteristics

Portfolio Characteristics Percentile Rankings
Rankings Against Public Fund - Domestic Equity
as of March 31, 2022

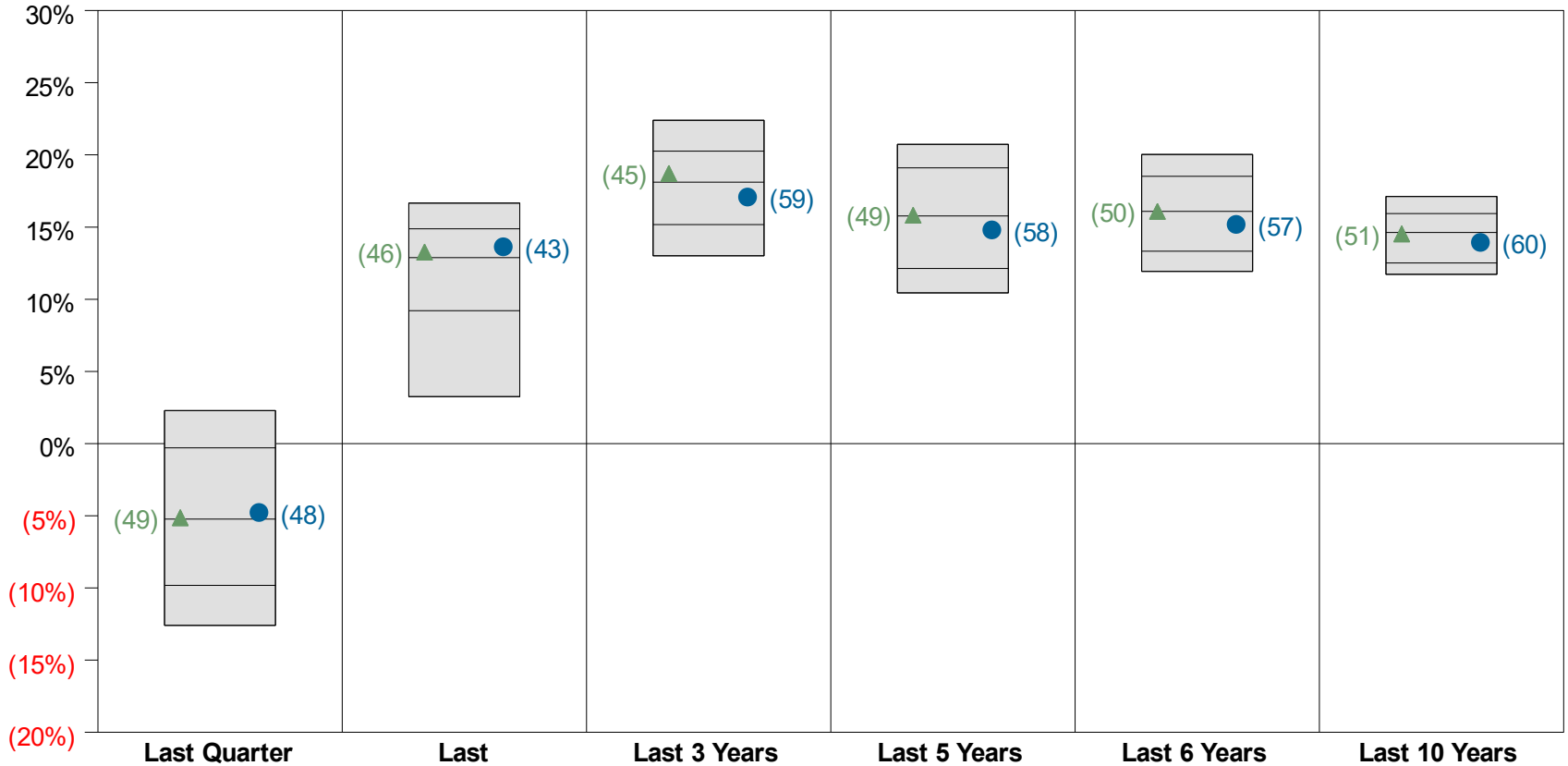


	Weighted Median Market Cap	Price/Forecasted Earnings	Price/Book	Forecasted Earnings Growth	Dividend Yield	MSCI Combined Z-Score
10th Percentile	203.31	19.90	4.24	18.81	1.41	0.11
25th Percentile	141.97	19.60	4.15	17.74	1.39	0.02
Median	85.78	18.84	3.53	17.32	1.33	(0.02)
75th Percentile	58.40	17.52	3.25	17.08	1.22	(0.05)
90th Percentile	44.64	16.19	2.83	15.98	1.15	(0.20)
Domestic Equity Pool ●	98.58	18.06	3.54	16.69	1.41	(0.10)
Russell 3000 Index ▲	134.73	19.90	3.89	17.56	1.35	0.00

- ARMB's overall domestic equity portfolio's market capitalization is smaller than 45% of public funds (first column).
- Overall, ARMB's domestic equity portfolio tilts decidedly "value" versus peers (last column on right).
  - "MSCI Combined Z-Score" measures Growth and Value characteristics of individual stocks within managers' portfolios.
  - A low Z-Score rank (i.e.– the dot appears towards the top of the floating bar) indicates a Growth bias.
  - A high Z-Score rank (i.e. – the dot appears towards the bottom of the floating bar) indicates a Value bias.

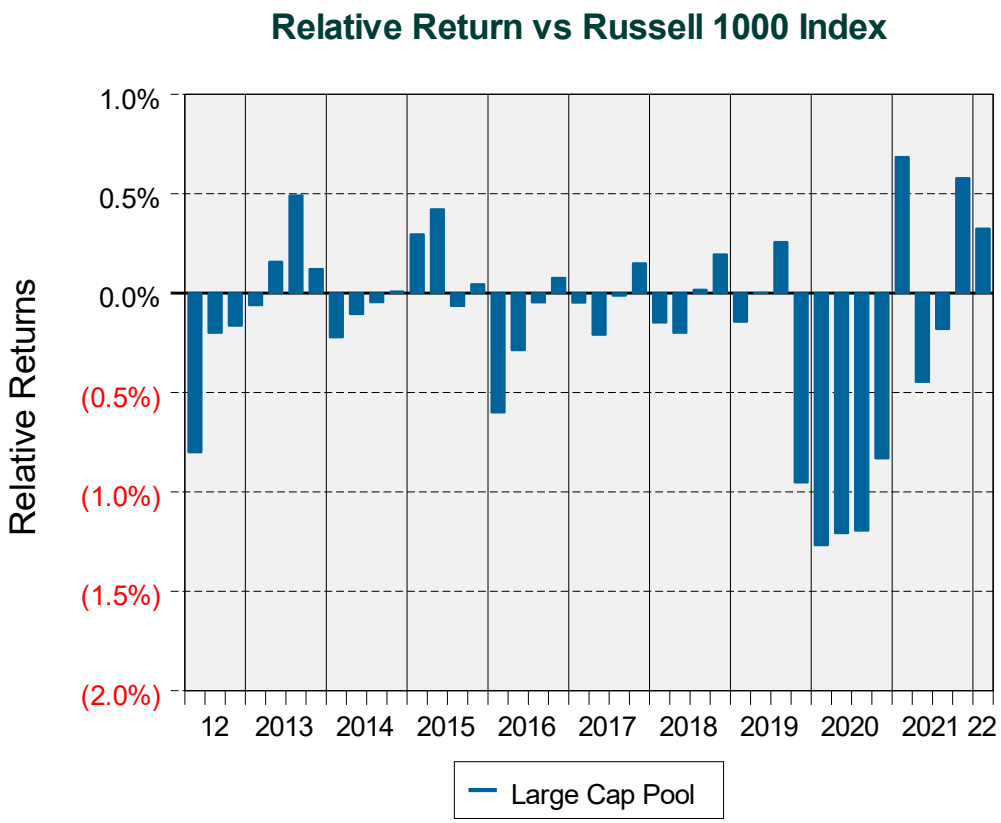
Large Cap Domestic Equity through 03/31/22

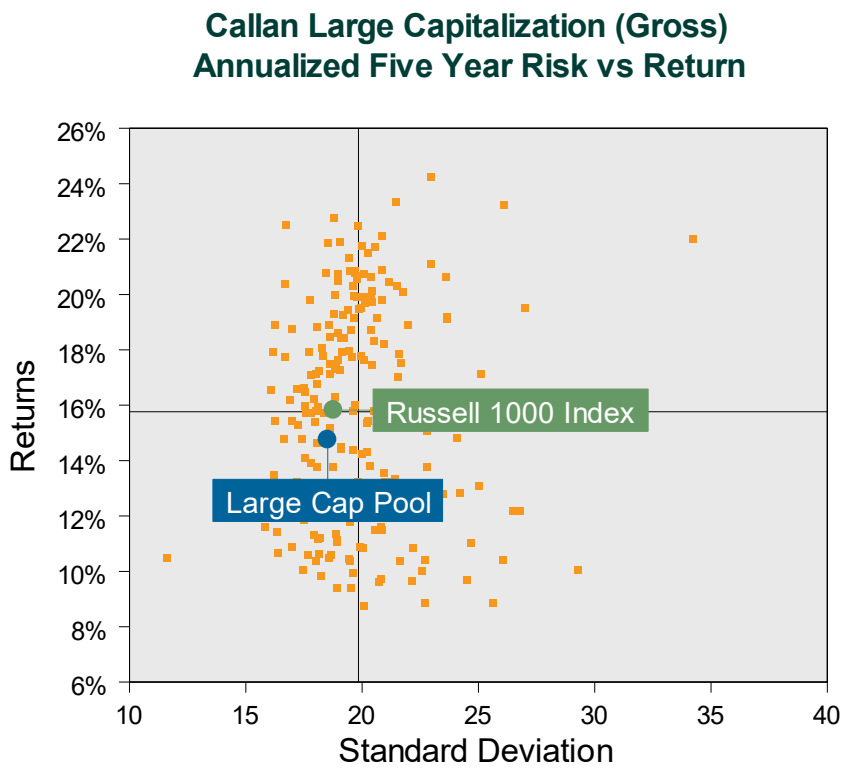
Performance vs Callan Large Capitalization (Gross)



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	2.28	16.66	22.40	20.73	20.03	17.12
25th Percentile	(0.29)	14.88	20.26	19.10	18.52	15.93
Median	(5.23)	12.89	18.12	15.77	16.08	14.62
75th Percentile	(9.82)	9.21	15.17	12.14	13.33	12.51
90th Percentile	(12.60)	3.25	13.01	10.43	11.92	11.72
Large Cap Pool ●	(4.82)	13.58	17.03	14.75	15.14	13.89
Russell 1000 Index ▲	(5.13)	13.27	18.71	15.82	16.09	14.53

Large Cap Domestic Equity as of 03/31/22





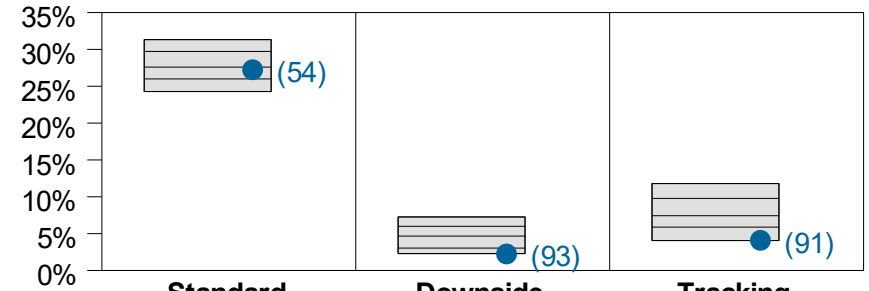
- Large Cap Domestic Equity returns outperformed the Russell 1000 index by 31bps in the first quarter of 2022.
- Long-term performance exhibits market-like returns with similar risk.
- Underperformance vs. the Russell 1000 Index in 4Q19 through 4Q20 was driven by Scientific Beta, which trailed the broad benchmark by between 2% and 4% in each of those quarters.
- Passive implementation also detracted as the S&P 900 Index trailed the Russell 1000 Index by 1.1% in 2Q20, 0.8% in 3Q20, and 0.9% in 4Q20.

Small Cap Domestic Equity through 03/31/22

Performance vs Callan Small Capitalization (Gross)

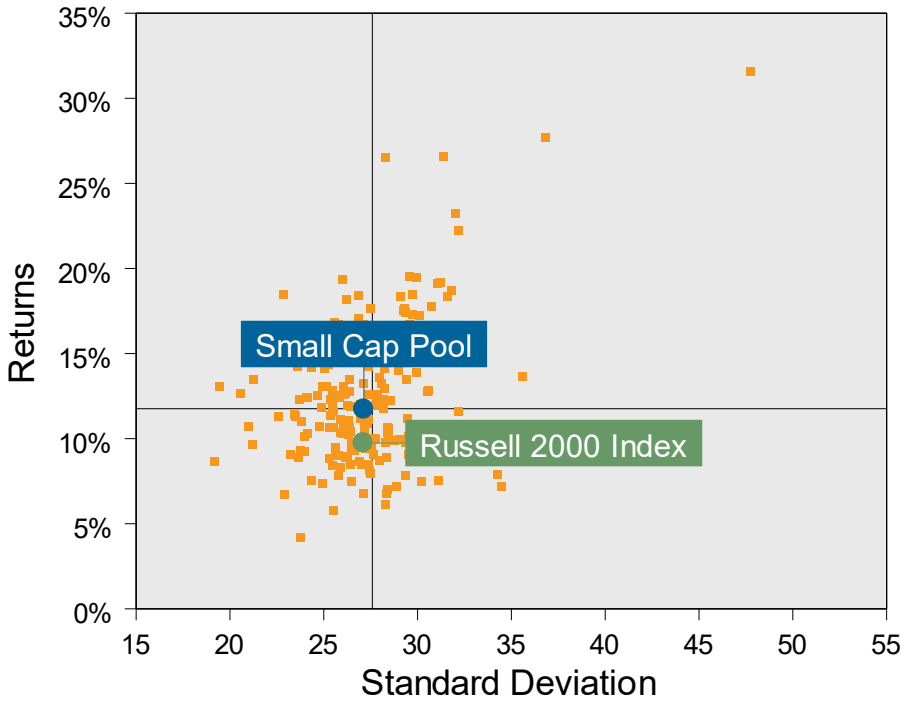
	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	(1.01)	10.09	52.15	19.07	17.68	19.04	14.95
25th Percentile	(3.30)	5.98	45.74	16.50	14.62	15.92	14.06
Median	(7.04)	0.93	39.64	14.23	11.77	13.67	12.80
75th Percentile	(11.34)	(4.51)	34.89	12.39	9.48	12.12	11.65
90th Percentile	(13.96)	(11.68)	29.73	10.87	8.12	10.76	10.57
Small Cap Pool ●	(5.67)	0.88	40.20	13.80	11.73	13.77	12.01
Russell 2000 Index ▲	(7.53)	(5.79)	35.49	11.74	9.74	12.33	11.04

Small Cap Domestic Equity through 03/31/22



	Standard Deviation	Downside Risk	Tracking Error
10th Percentile	31.34	7.27	11.80
25th Percentile	29.73	5.99	9.80
Median	27.59	4.68	7.43
75th Percentile	26.01	3.05	5.90
90th Percentile	24.29	2.31	4.06
Small Cap Equity Pool ●	27.15	2.15	4.00

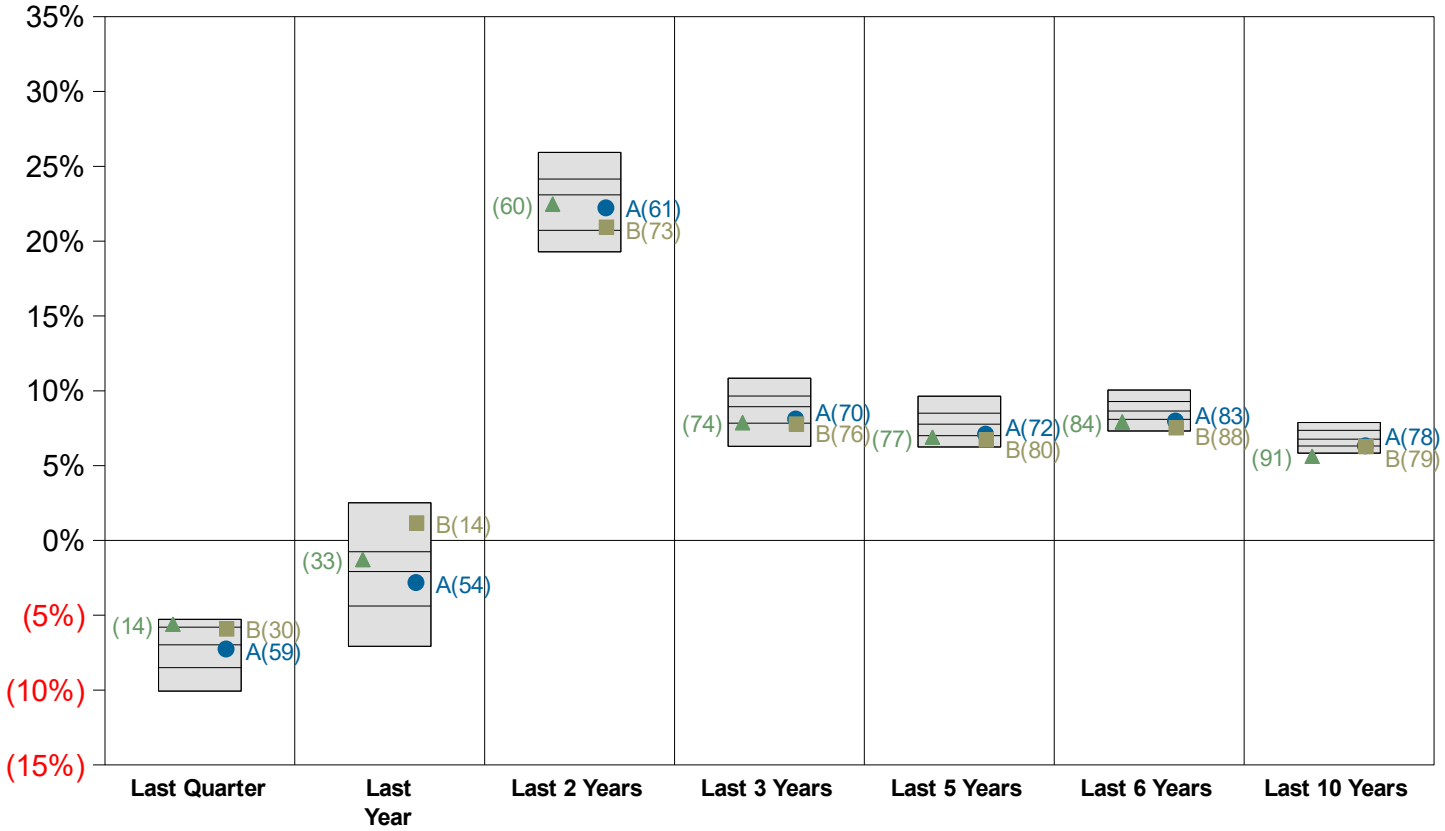
Callan Small Capitalization (Gross)
Annualized Five Year Risk vs Return



- The five-year risk statistics of standard deviation, downside risk, and tracking error compare favorably versus the peer group of small cap managers.

Global Equity ex-US through 03/31/22

Performance vs Public Fund - International Equity (Gross)

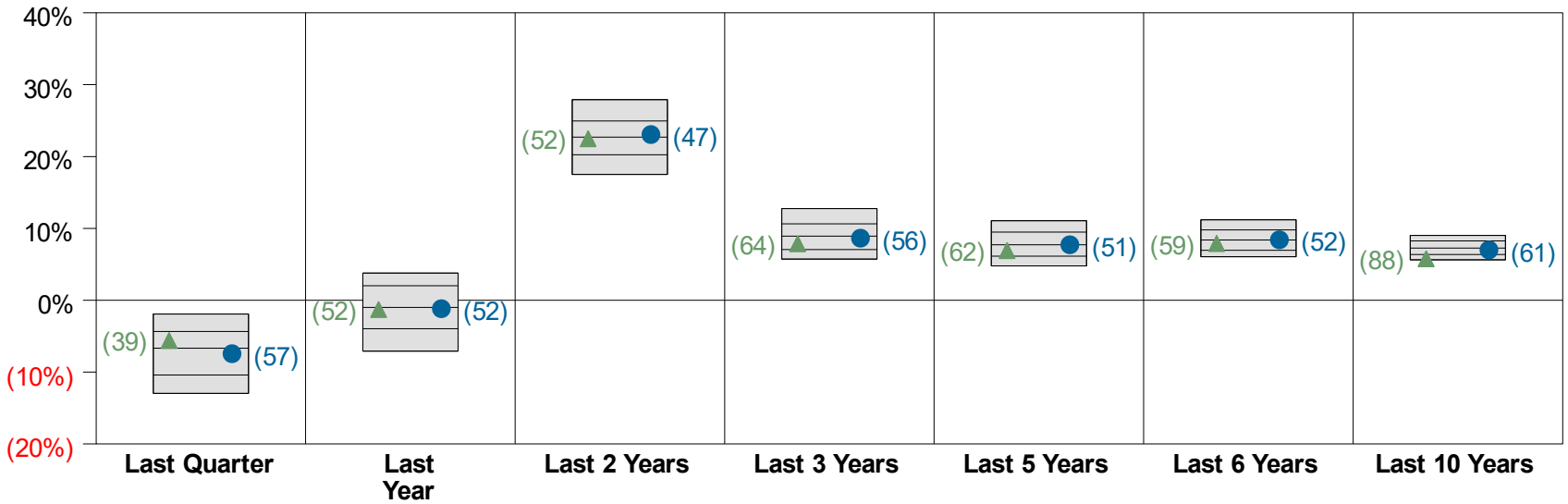


		Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile		(5.28)	2.51	25.93	10.84	9.64	10.05	7.89
25th Percentile		(5.79)	(0.76)	24.15	9.65	8.50	9.28	7.36
Median		(6.98)	(2.08)	23.09	8.94	7.77	8.64	6.77
75th Percentile		(8.50)	(4.38)	20.72	7.83	7.00	8.09	6.31
90th Percentile		(10.07)	(7.08)	19.29	6.29	6.25	7.31	5.83
Global Equity ex-US	● A	(7.30)	(2.86)	22.18	8.07	7.06	7.94	6.27
MSCI EAFE Index	■ B	(5.91)	1.16	20.93	7.78	6.72	7.53	6.27
Int'l Equity Target	▲	(5.60)	(1.27)	22.48	7.87	6.90	7.92	5.62

The Int'l Equity Target currently consists of MSCI ACWI ex U.S. IMI.

International Equity ex Emerging Markets through 03/31/22

Performance vs Callan Non-US Equity (Gross)



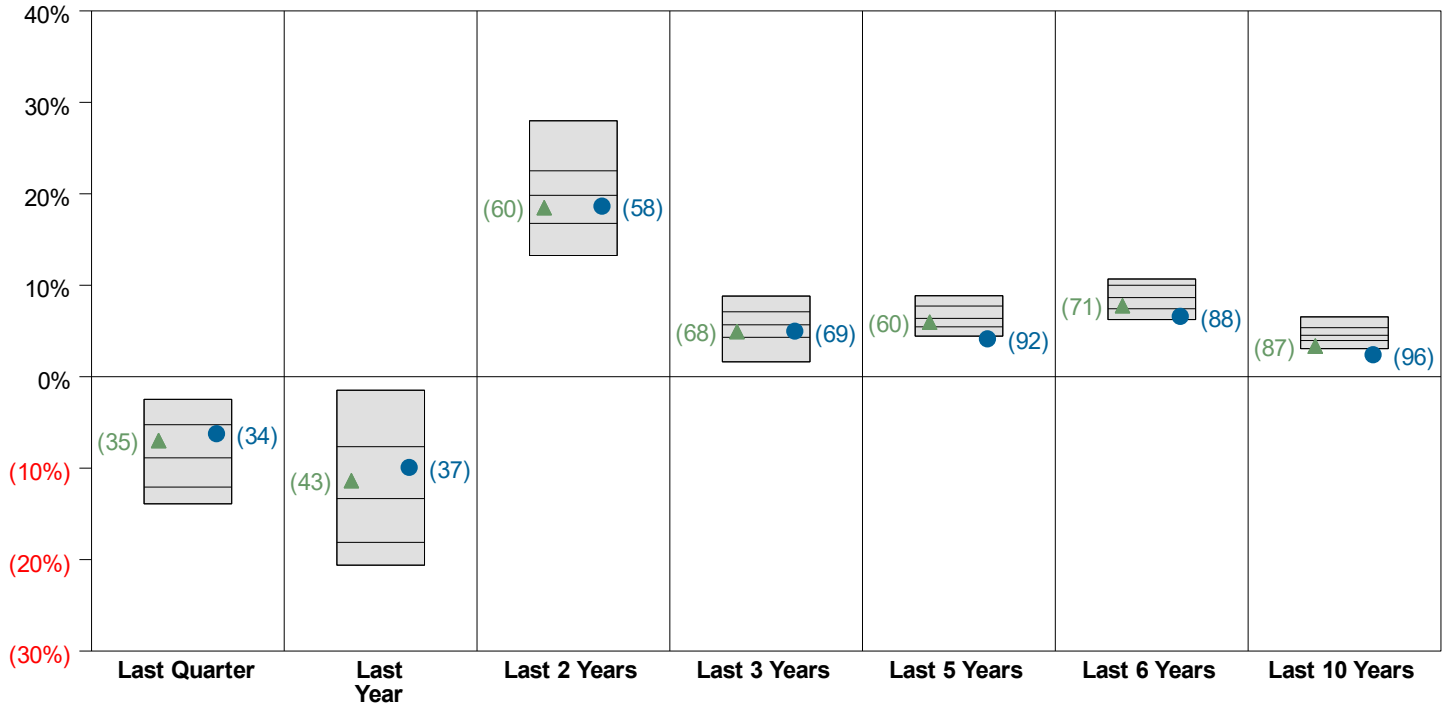
	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	(1.92)	3.78	27.91	12.76	11.06	11.20	9.01
25th Percentile	(4.36)	2.03	24.95	10.63	9.49	9.79	8.25
Median	(6.66)	(1.00)	22.69	8.93	7.72	8.38	7.25
75th Percentile	(10.40)	(3.95)	20.26	7.04	6.13	6.96	6.38
90th Percentile	(12.95)	(7.07)	17.51	5.72	4.77	6.07	5.62
Int'l Equity Pool (ex Emerging. Mkt) ●	(7.53)	(1.27)	22.96	8.54	7.62	8.31	6.89
MSCI ACWI ex US IMI ▲	(5.60)	(1.27)	22.48	7.87	6.92	7.91	5.78

International Equity ex Emerging Markets through 03/31/22

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Int'l Equity Pool (ex Emerging Market)	**(7.53%)**	**(1.27%)**	**8.54%**	**7.62%**	**6.89%**
Arrowstreet ACWI ex -US	(6.66%)	0.61%	14.11%	11.26%	-
Baillie Gifford ACWI ex US	(18.51%)	(15.56%)	10.32%	8.91%	-
Brandes Investment	(2.98%)	1.32%	6.14%	5.13%	6.17%
Capital Guardian	(14.53%)	(10.96%)	8.61%	9.57%	8.15%
L&G Sci Beta Dev ex US	(3.50%)	4.35%	-	-	-
SSgA World ex US IMI	(5.14%)	2.35%	8.74%	-	-
MSCI EAFE Index	(5.91%)	1.16%	7.78%	6.72%	6.27%
MSCI ACWI ex-US IMI Index	(5.60%)	(1.27%)	7.87%	6.92%	5.78%

Emerging Markets through 03/31/22

Performance vs Callan Emerging Broad (Gross)



	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	(2.47)	(1.47)	27.99	8.82	8.86	10.69	6.55
25th Percentile	(5.25)	(7.65)	22.52	7.11	7.73	10.01	5.36
Median	(8.86)	(13.32)	19.83	5.68	6.38	8.66	4.53
75th Percentile	(12.05)	(18.11)	16.76	4.32	5.45	7.44	3.96
90th Percentile	(13.89)	(20.60)	13.26	1.63	4.45	6.25	3.07
Emerging Markets Pool ●	(6.29)	(10.00)	18.59	4.91	4.08	6.54	2.34
MSCI EM ▲	(6.97)	(11.37)	18.48	4.94	5.98	7.77	3.36

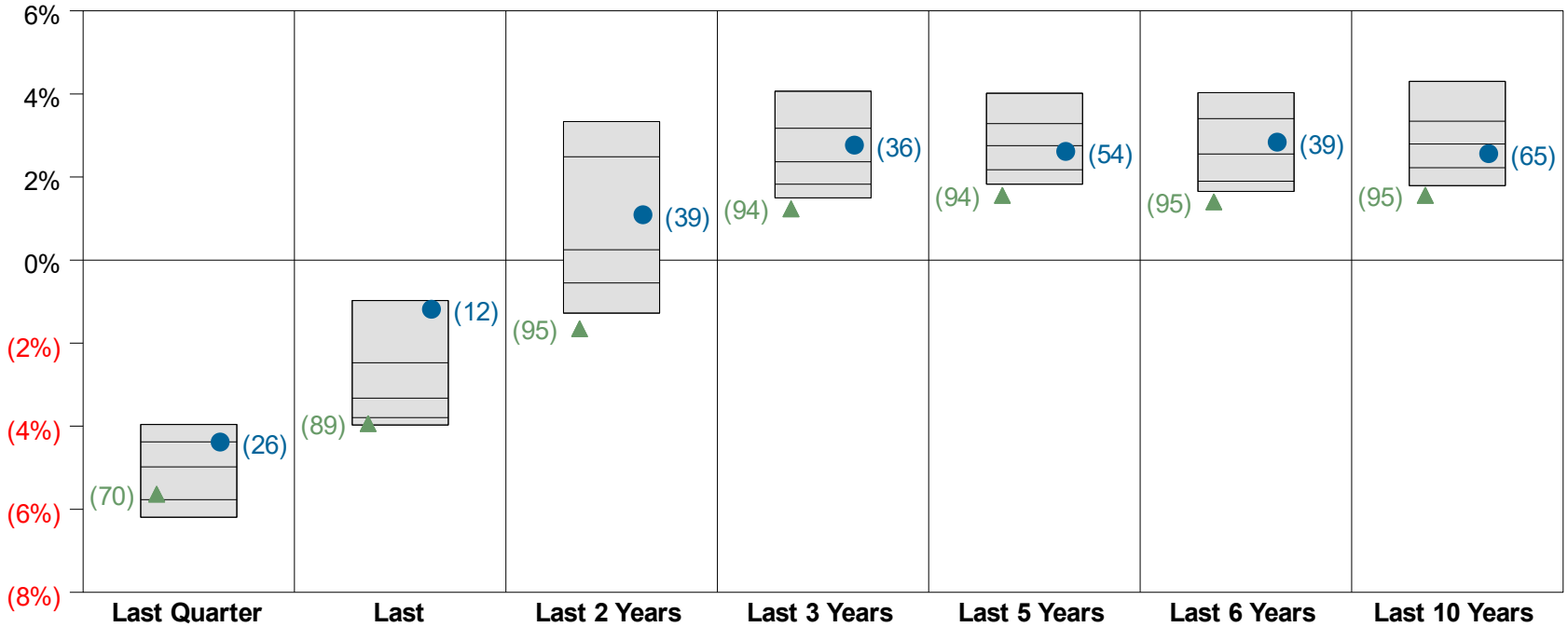
- After underperforming by 3.76% in 2Q17, 1.38% in 3Q17, 1.68% in 4Q17, 4.03% in 2Q18, 1.87% in 1Q19, 1.41% in 4Q19, 0.94% in 1Q21, 0.47% in 2Q21, the Emerging Markets Pool outperformed the benchmark by 1.37% over the last year, 0.68% in 1Q22 and ranks above median over the last quarter.
- DRZ and Lazard were liquidated and L&G Scientific Beta was funded in 4Q19, leaving only passive and smart beta approaches within the emerging markets equity space.

Emerging Markets Pool through 03/31/22

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Emerging Markets Pool	**(6.29%)**	**(10.00%)**	**4.91%**	**4.08%**	**2.34%**
SSgA Emerging Markets	(7.00%)	(11.37%)	4.82%	-	-
L&G SciBeta EM	(4.52%)	(6.50%)	-	-	-
MSCI EM	(6.97%)	(11.37%)	4.94%	5.98%	3.36%

Total Fixed Income as of 03/31/22

Performance vs Public Fund - Domestic Fixed (Gross)



	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	(3.96)	(0.98)	3.33	4.07	4.02	4.03	4.30
25th Percentile	(4.38)	(2.47)	2.49	3.17	3.29	3.41	3.34
Median	(4.98)	(3.33)	0.25	2.36	2.76	2.55	2.80
75th Percentile	(5.77)	(3.79)	(0.55)	1.83	2.17	1.90	2.22
90th Percentile	(6.19)	(3.97)	(1.28)	1.50	1.82	1.65	1.79
Total Fixed Income Pool ●	(4.40)	(1.20)	1.07	2.75	2.60	2.82	2.55
Fixed Income Target ▲	(5.64)	(3.94)	(1.65)	1.23	1.56	1.40	1.56

- The Total Fixed Income Pool portfolio outperformed the Fixed Income Target in all time periods shown.
- The transition from intermediate Treasury to Aggregate mandates was completed during the fourth quarter of 2019.

Total Fixed Income through 03/31/22

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Fixed Income	**(4.40%)**	**(1.20%)**	**2.75%**	**2.60%**	**2.55%**
Fixed Income Target	(5.64%)	(3.94%)	1.23%	1.56%	1.56%
Blmbg Treasury Intmdt	(4.21%)	(4.17%)	1.04%	1.34%	1.29%
ARMB US Aggregate	(5.70%)	(4.00%)	-	-	-
Opportunistic Fixed Income	**(3.68%)**	**0.50%**	**3.06%**	**4.10%**	**5.29%**
FIAM Tactical Bond	(3.91%)	(0.20%)	4.64%	4.56%	-
Blmbg Aggregate	(5.93%)	(4.15%)	1.69%	2.14%	2.24%
FIAM REHI	(2.67%)	2.76%	2.45%	3.80%	-
Blmbg:Universal CMBS xAaa	(5.78%)	(3.42%)	2.20%	3.42%	3.82%
Alternative Fixed Income	**0.85%**	**14.35%**	**-**	**-**	**-**
Crestline (Blue Glacier)	0.25%	13.51%	6.91%	6.55%	7.38%
Prisma Capital (Polar Bear)	5.87%	27.91%	11.45%	7.60%	5.70%
Crestline Specialty Lending Fund	17.80%	30.12%	23.59%	18.83%	-
Crestline Specialty Lndg Fd II	0.00%	10.77%	12.69%	-	-
HFRI Fund of Funds Index	(2.73%)	1.23%	5.87%	4.63%	3.92%
T-Bills + 5%	1.26%	5.06%	5.81%	6.13%	5.63%

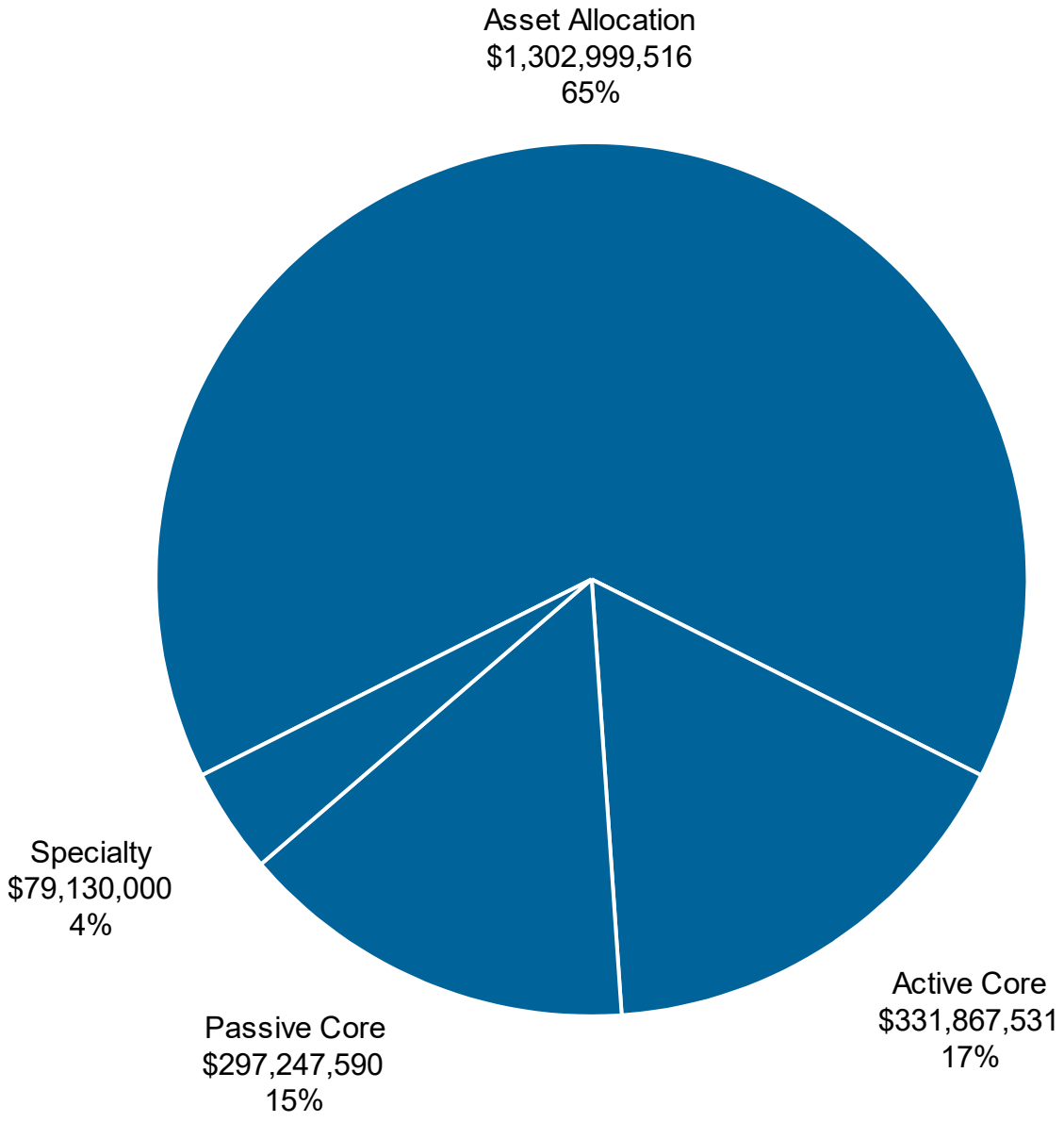
Opportunistic through 03/31/22

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Opportunistic (T)	**(6.21%)**	**4.30%**	**7.92%**	**-**	**-**
Alternative Equity Strategies	**(12.03%)**	**3.93%**	**14.04%**	**11.35%**	**9.81%**
McKinley Healthcare Transformation	(12.03%)	3.93%	13.44%	-	-
MSCI ACWI	(5.36%)	7.28%	13.75%	11.64%	10.00%
Other Opportunities	**0.02%**	**(1.89%)**	**(1.41%)**	**(0.34%)**	**-**
Project Pearl	0.00%	(13.26%)	-	-	-
T-Bills + 6%	1.50%	6.06%	6.81%	7.13%	6.63%
Tactical Allocation Strategies	**(7.00%)**	**1.86%**	**8.82%**	**-**	**-**
PineBridge	(8.89%)	(1.58%)	6.95%	-	-
Pine Bridge Benchmark	(5.57%)	3.17%	9.02%	8.02%	6.45%
Fidelity Signals	(5.11%)	5.36%	10.69%	-	-
Fidelity Signals Benchmark	(5.57%)	3.17%	9.40%	8.12%	7.15%
Alternative Beta	**4.38%**	**15.44%**	**(2.01%)**	**(1.90%)**	**-**
Man Group Alternative Risk Premia	4.38%	15.44%	1.03%	-	-
T-Bills + 5%	1.26%	5.06%	5.81%	6.13%	5.63%

Participant-Directed Plans

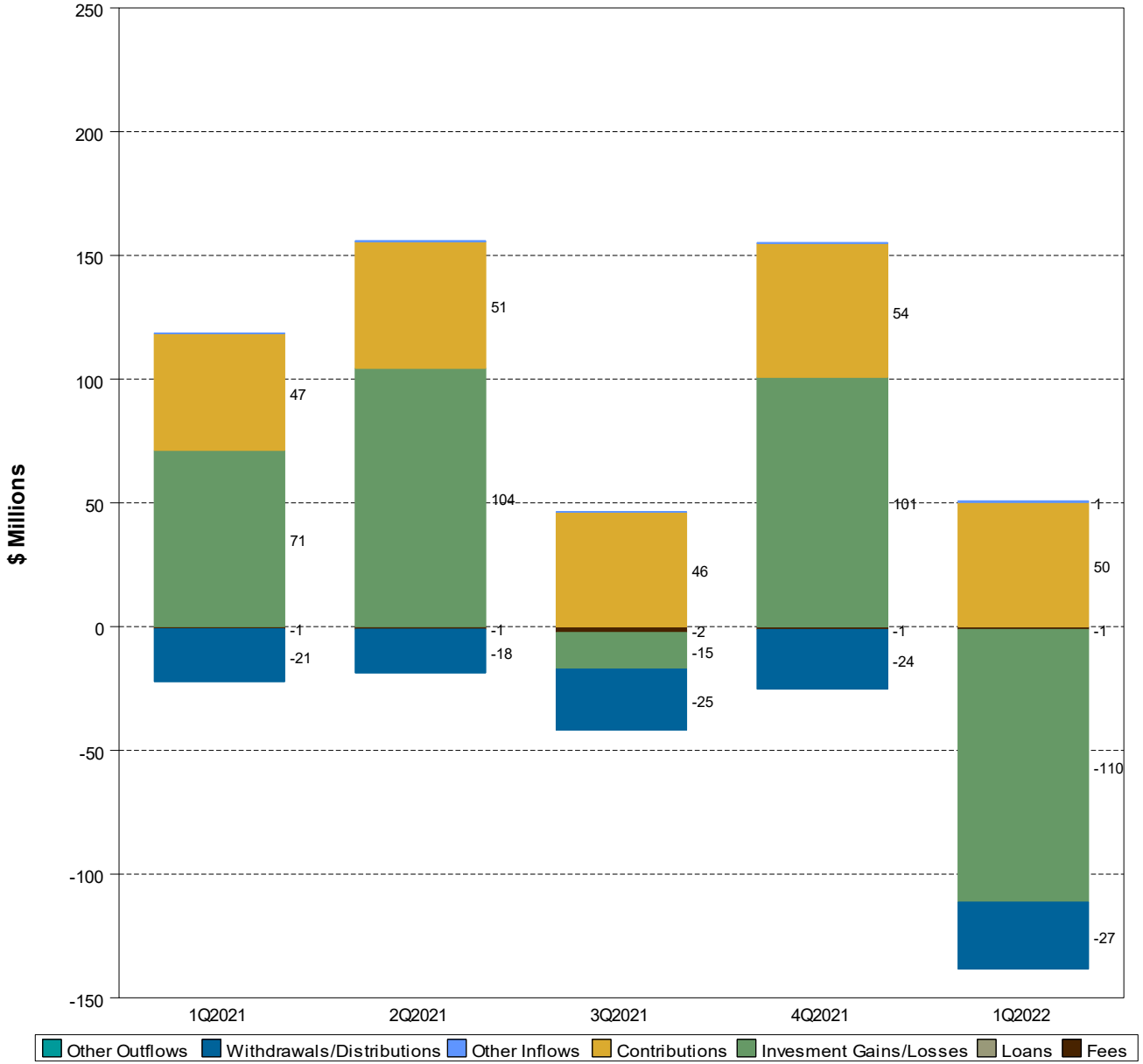
PERS DC Plan

March 31, 2022



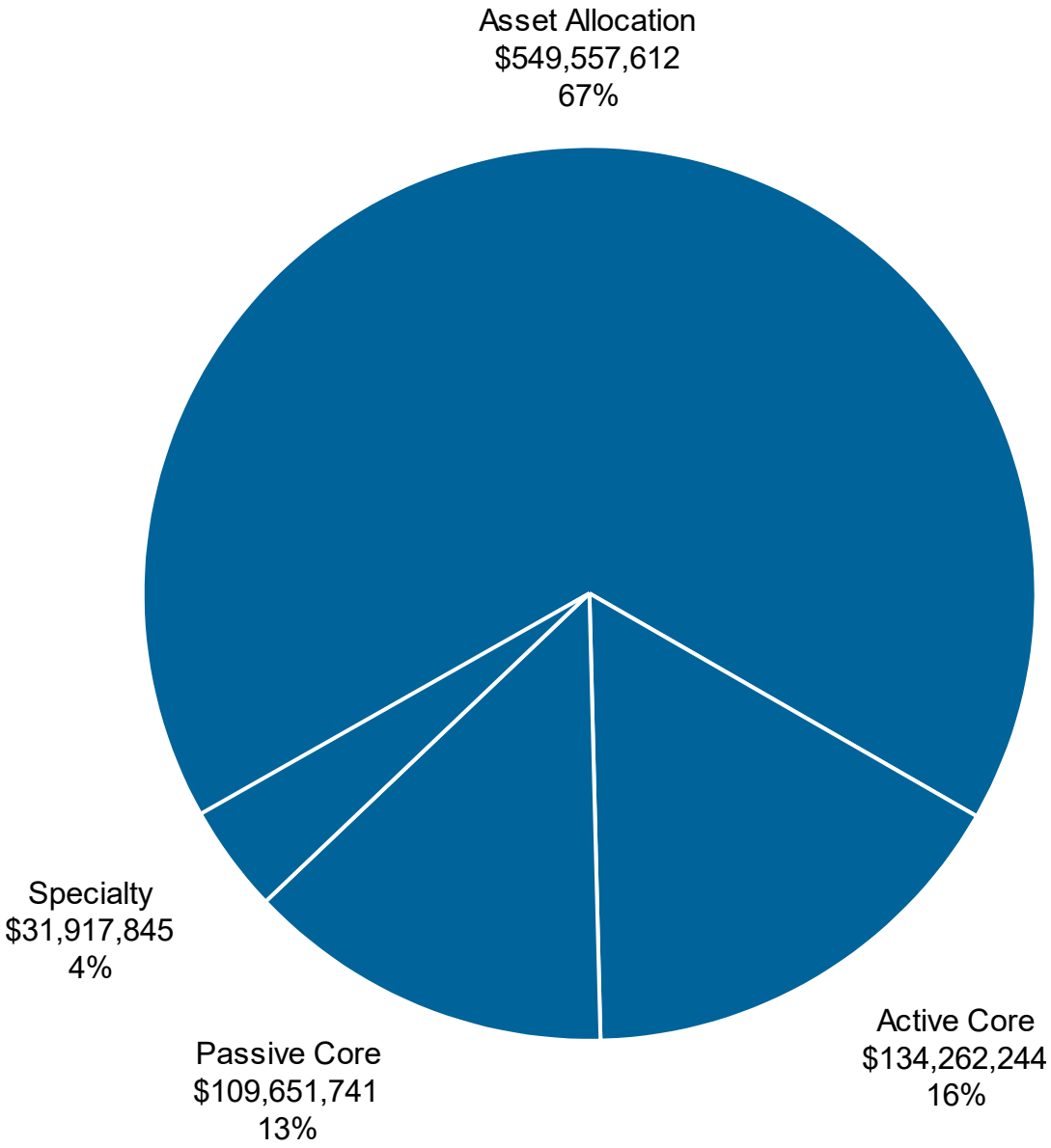
PERS DC Plan: Asset Changes

March 31, 2022



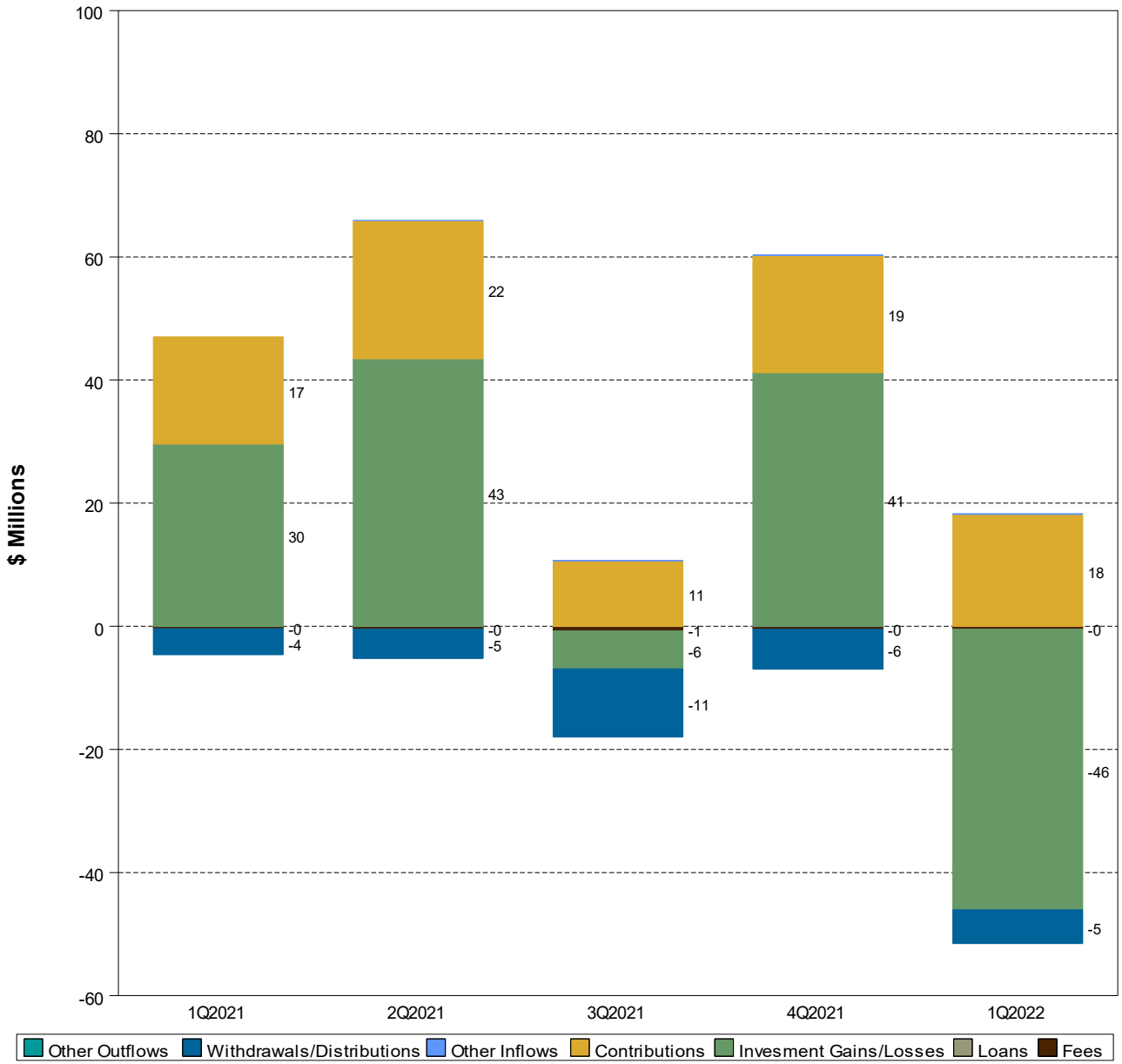
TRS DC Plan

March 31, 2022



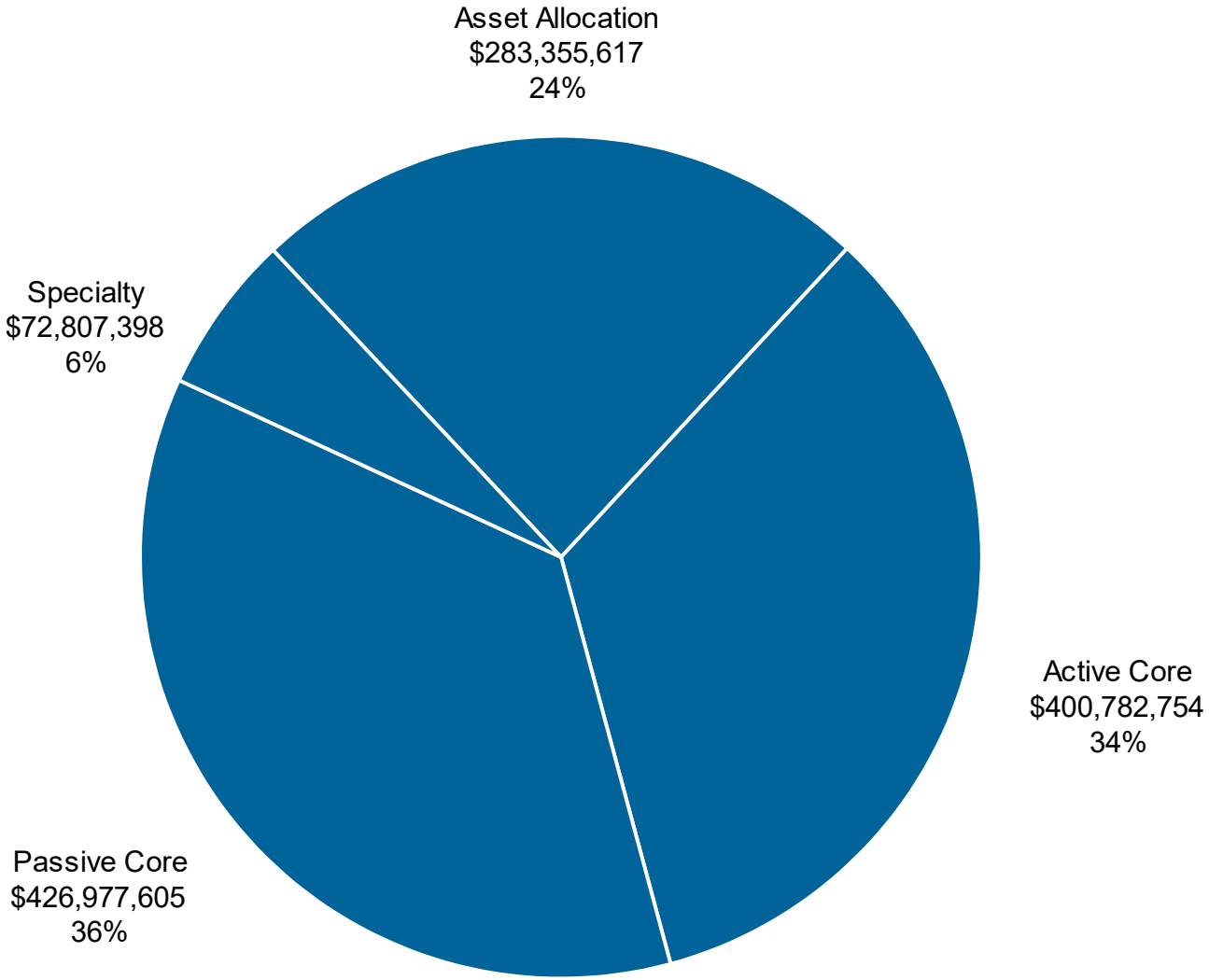
TRS DC Plan: Asset Changes

March 31, 2022



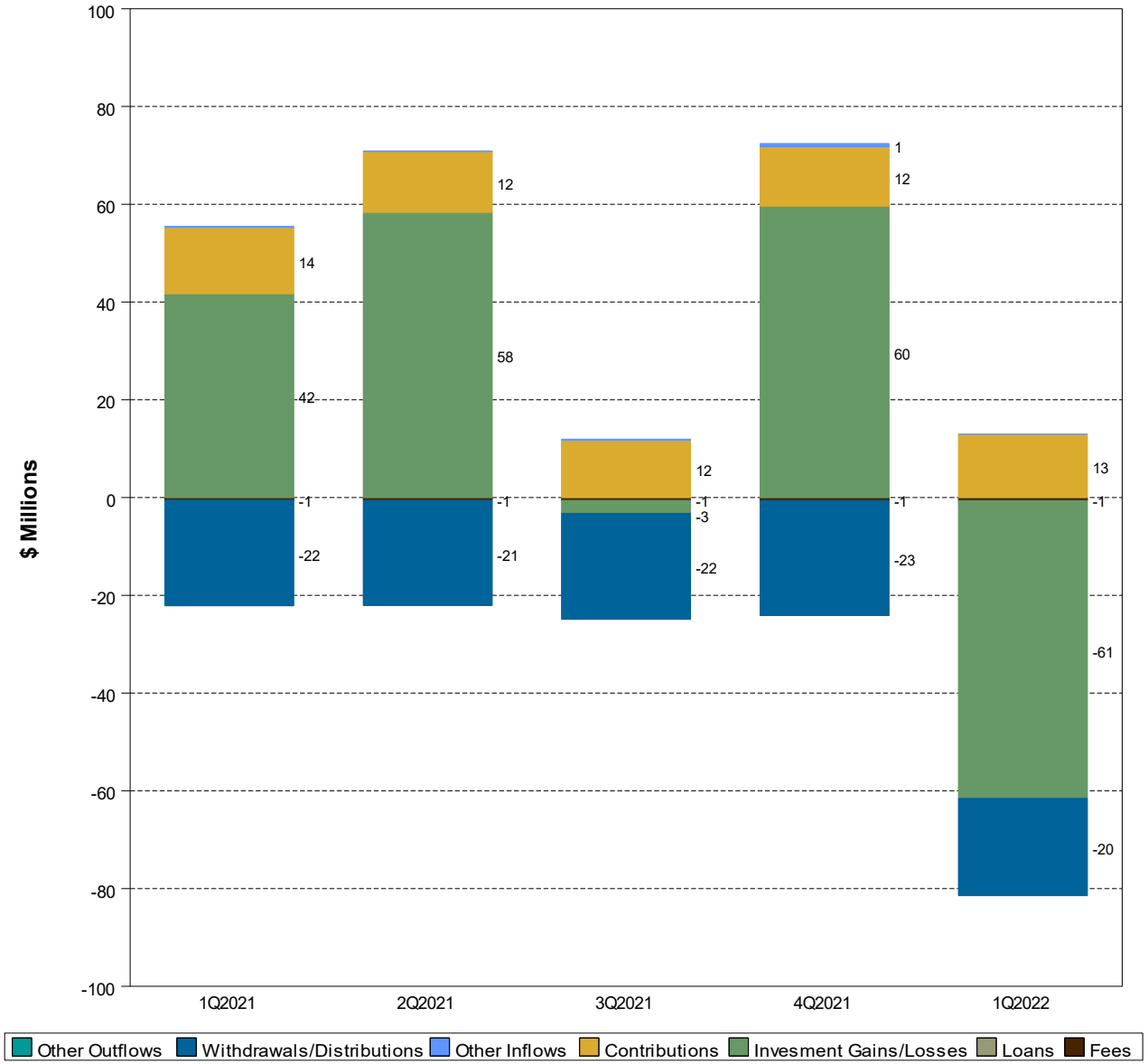
Deferred Comp Plan

March 31, 2022



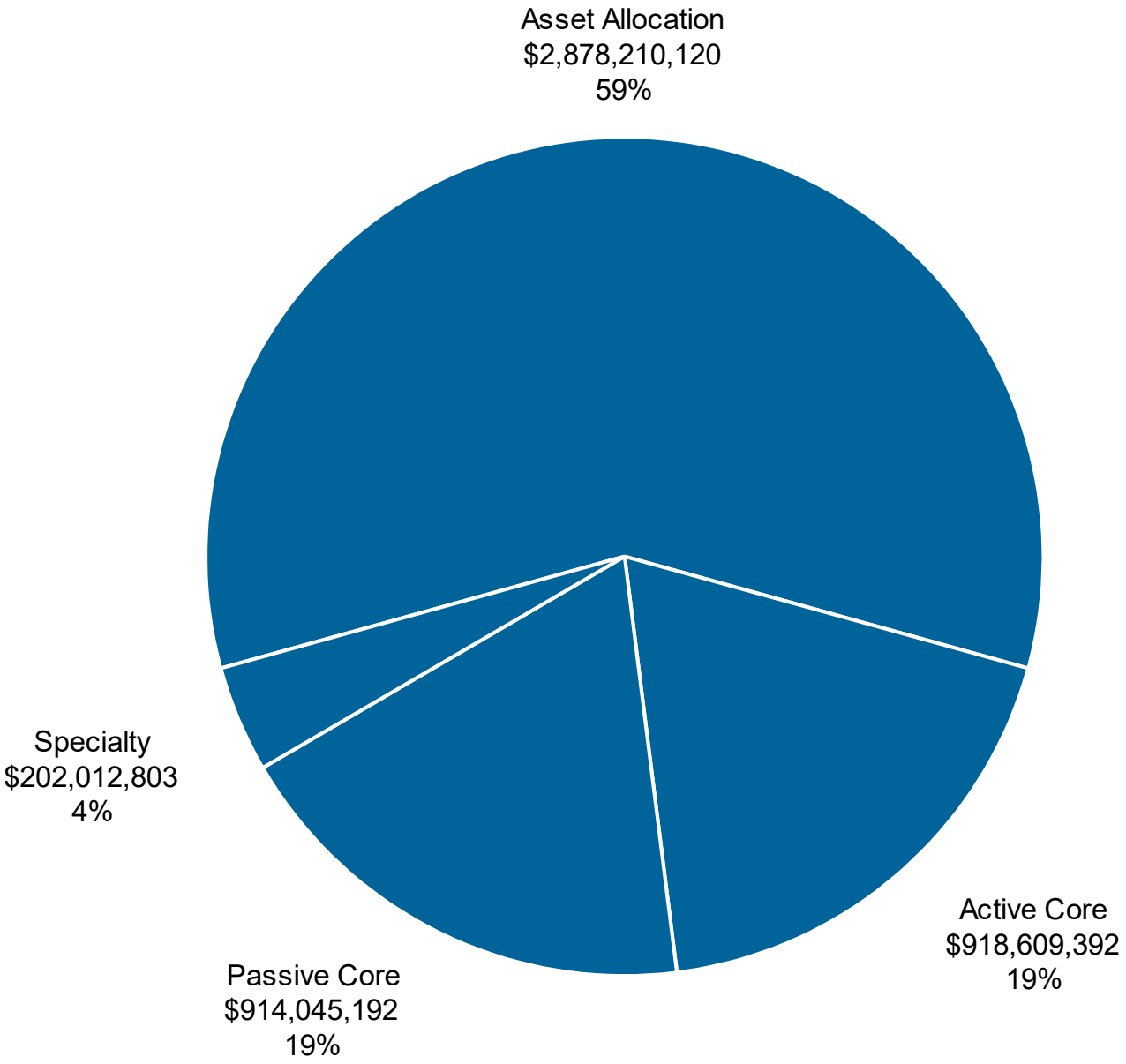
Deferred Comp Plan: Asset Changes

March 31, 2022



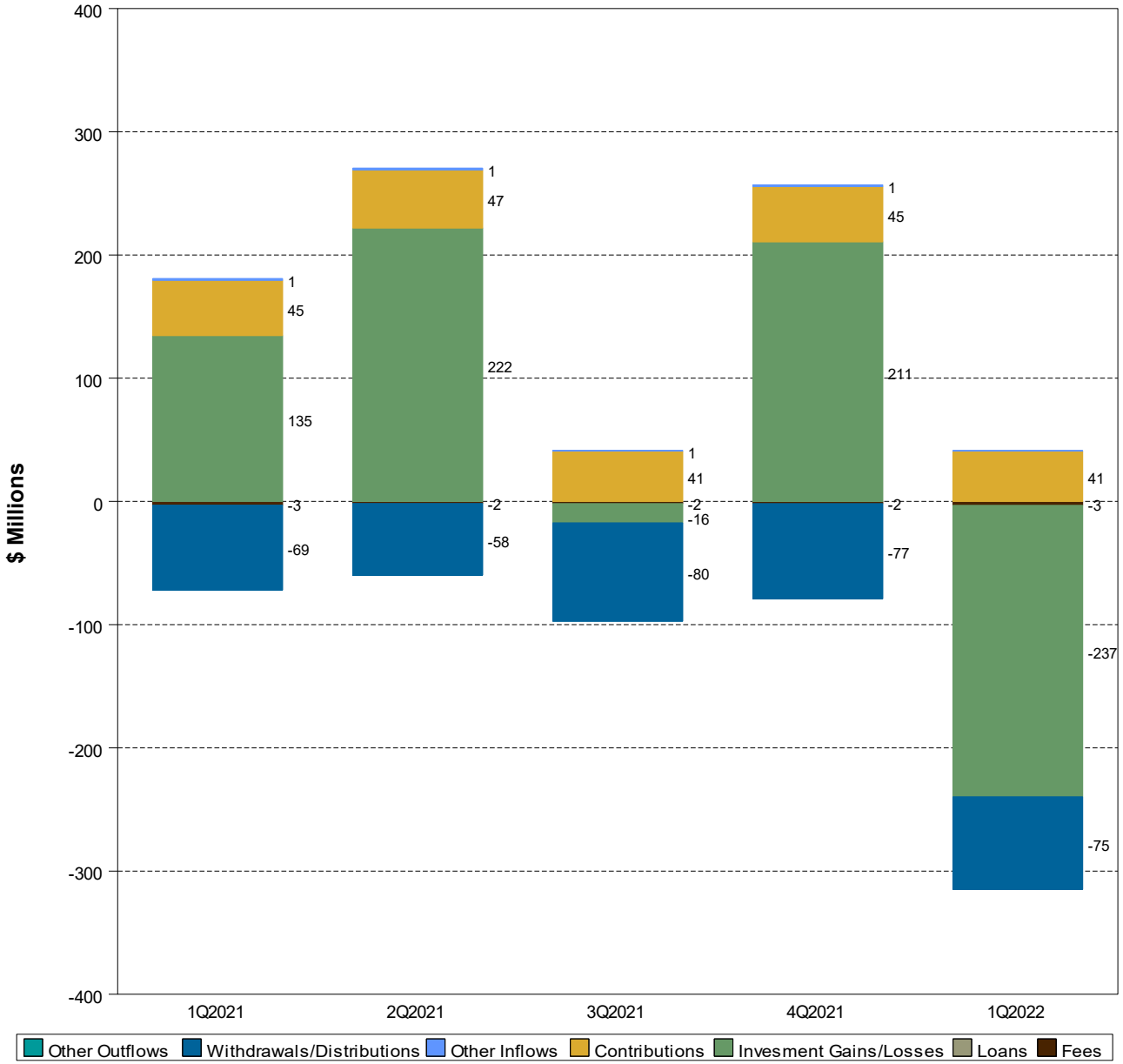
SBS Fund

March 31, 2022



SBS Fund: Asset Changes

March 31, 2022



Individual Account Option Performance: 03/31/22

Balanced & Target Date Funds

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Asset Allocation										
Alaska Balanced Trust	**-4.2** 30	**0.7** 37	**6.5** 24	**5.9** 20	**5.1** 22	**6.9** 72		**-0.3** 34	**0.3** 100	**0.7** 6
CAI MA Tgt Alloc Cons MFs										
Passive Target	-4.3 31	1.0 35	6.6 22	6.0 20	5.2 21	7.0 69				0.7 6
Alaska Long-Term Balanced	**-4.5** 38	**3.4** 46	**9.8** 36	**8.5** 33	**7.4** 33	**11.2** 61		**-0.6** 61	**0.3** 100	**0.7** 25
CAI MA Tgt Alloc Mod MFs										
Passive Target	-4.7 40	3.6 42	9.9 33	8.7 31	7.5 31	11.4 58				0.7 22
Target 2010 Trust	**-3.6** 16	**1.6** 31	**6.9** 35	**6.3** 35	**5.5** 38	**7.7** 57		**-0.6** 77	**0.3** 99	**0.7** 24
CAI Tgt Date 2010										
Custom Index	-3.7 17	2.0 25	7.0 34	6.5 23	5.6 30	7.9 52				0.7 20
Target 2015 Trust	**-3.8** 18	**2.2** 31	**7.9** 27	**7.2** 17	**6.3** 18	**8.9** 54		**-0.2** 27	**0.4** 100	**0.7** 18
CAI Tgt Date 2015										
Custom Index	-3.9 19	2.5 27	7.9 26	7.2 16	6.3 17	9.1 45				0.7 20
Target 2020 Trust	**-4.0** 14	**3.0** 23	**9.1** 12	**8.2** 13	**7.2** 12	**10.6** 29		**-0.3** 17	**0.4** 100	**0.7** 17
CAI Tgt Date 2020										
Custom Index	-4.2 15	3.3 20	9.2 12	8.3 12	7.2 12	10.8 26				0.7 18
Target 2025 Trust	**-4.4** 9	**3.9** 11	**10.3** 8	**9.1** 7	**8.0** 6	**12.2** 22		**-0.4** 17	**0.4** 100	**0.7** 10
CAI Tgt Date 2025										
Custom Index	-4.5 9	4.1 10	10.4 6	9.3 4	8.0 6	12.4 18				0.7 10
Target 2030 Trust	**-4.6** 8	**4.6** 11	**11.4** 6	**10.0** 5	**8.7** 6	**13.6** 26		**-0.5** 23	**0.3** 100	**0.6** 8
CAI Tgt Date 2030										
Custom Index	-4.7 9	5.0 10	11.5 5	10.1 3	8.8 4	13.9 25				0.7 7
Target 2035 Trust	**-4.8** 7	**5.3** 13	**12.3** 6	**10.7** 8	**9.3** 8	**14.9** 43		**-0.5** 27	**0.3** 100	**0.6** 5
CAI Tgt Date 2035										
Custom Index	-4.9 7	5.7 10	12.4 5	10.9 5	9.4 6	15.1 41				0.6 5
Target 2040 Trust	**-5.0** 10	**5.9** 11	**13.1** 10	**11.3** 11	**9.8** 7	**15.9** 54		**-0.5** 29	**0.3** 100	**0.6** 3
CAI Tgt Date 2040										
Custom Index	-5.0 12	6.3 9	13.2 9	11.5 6	9.9 5	16.1 52				0.6 3
Target 2045 Trust	**-5.1** 10	**6.5** 12	**13.7** 8	**11.7** 8	**10.1** 4	**16.7** 63		**-0.6** 29	**0.3** 100	**0.6** 3
CAI Tgt Date 2045										
Custom Index	-5.1 11	6.8 8	13.8 5	11.9 3	10.2 3	16.9 59				0.6 3

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:

Excess Return Ratio:
- above median
- third quartile
- fourth quartile

Tracking Error:
- below median
- second quartile
- first quartile

Sharpe Ratio:
- above median
- third quartile
- fourth quartile

Individual Account Option Performance: 03/31/22

Balanced & Target Date Funds

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Target 2050 Trust	**-5.1** 11	**6.5** 14	**13.7** 5	**11.7** 7	**10.1** 6	**16.7** 75		**-0.6** 30	**0.3** 100	**0.6** 3
CAI Tgt Date 2050 Custom Index	-5.2 12	6.8 10	13.8 5	11.9 4	10.2 5	16.9 69				0.6 3
Target 2055 Trust	**-5.1** 9	**6.5** 20	**13.7** 7	**11.7** 8	**10.1** 6	**16.7** 80		**-0.6** 40	**0.3** 100	**0.6** 3
CAI Tgt Date 2055 Custom Index	-5.2 9	6.8 11	13.8 6	11.9 3	10.2 5	16.9 75				0.6 3
Target 2060 Trust	**-5.1** 12	**6.4** 17	**13.6** 10	**11.6** 16		**16.7** 81		**-0.9** 74	**0.3** 100	**0.6** 4
CAI Tgt Date 2060 Custom Index	-5.2 13	6.8 12	13.8 7	11.9 5		16.9 74				0.6 3
Target 2065 Trust	**-5.2** 12	**6.4** 10								
CAI Tgt Date 2065 Custom Index	-5.2 12	6.8 7								
JPMorgan SmartRetirementBlend 2015 R6	**-5.4** 91									
Callan Target Date 2015 JPMorgan:SR Income MF Idx	-5.0 61	0.8 72	6.0 92	5.6 92	5.0 92	8.0 75				0.6 83
JPMorgan SmartRetirementBlend 2020 R6	**-5.3** 66									
Callan Target Date 2020 JPMorgan:SR 2020 MF Index	-5.0 52	0.8 82	6.3 83	6.1 80	5.5 71	8.7 79				0.6 68

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:

Excess Return Ratio:
- above median
- third quartile
- fourth quartile

Tracking Error:
- below median
- second quartile
- first quartile

Sharpe Ratio:
- above median
- third quartile
- fourth quartile

Other Options: 03/31/22

Passive Strategies

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Index Funds										
SSgA S&P 500 Index Fund (i)	**-4.6** 9	**15.6** 21	**18.9** 14	**16.0** 11	**14.0** 10	**18.1** 46		**-1.0** 15	**0.0** 78	**0.8** 13
Callan S&P 500 Index MFs										
S&P 500 Index	-4.6 6	15.6 1	18.9 6	16.0 6	14.0 6	18.1 33				0.8 6
SSgA Russell 3000 Index Fund (i)	**-5.2** 45	**12.1** 47	**18.3** 42	**15.4** 49	**13.4** 45	**19.2** 57		**0.1** 47	**0.1** 100	**0.7** 49
CAI Mut Fd: Large Cap Broad Style (Net)										
Russell 3000 Index	-5.3 46	11.9 50	18.2 42	15.4 49	13.4 45	19.2 57				0.7 49
SSgA World Equity ex-US Index Fund (i)	**-6.0** 28	**-1.9** 45	**7.5** 47	**6.8** 45	**5.3** 43	**18.6** 74		**0.1** 42	**1.0** 99	**0.3** 42
CAI MF: Non-U.S. Equity Style										
MSCI ACWI x U.S. Index (Net)	-5.4 27	-1.5 41	7.5 47	6.8 47	5.2 43	18.2 80				0.3 41
BlackRock Passive US Bd Index Fund (i)	**-5.8** 52	**-4.1** 57	**1.7** 89						**0.1** 100	
Callan Core Bond MFs										
Blmbg Aggregate	-5.9 56	-4.2 62	1.7 88	2.1 94	1.9 88	4.4 77				0.2 89

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:

Excess Return Ratio:
- above median
- third quartile
- fourth quartile

Tracking Error:
- below median
- second quartile
- first quartile

Sharpe Ratio:
- above median
- third quartile
- fourth quartile

(i) – Indexed scoring method used. Green: manager & index ranking differ by less than +/- 10 percentiles; Yellow: manager and index ranking differ by +/- 20 percentiles; Red: manager & index ranking differ by more than 20 percentiles.

Other Options: 03/31/22

Active Equity, Stable Value, and Money Market

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Active and Other Funds										
BlackRrock Strategic Completion Fd	**2.4** 75	**17.8** 51								
Callan Real Assets MFs										
Strategic Completion Custom Index	2.5 74	18.1 50								
Northern Trust ESG Fund	**-5.9** 51	**15.8** 13	**19.3** 30						**0.1** 100	
Callan Lg Cap Broad MF										
MSCI USA ESG	-5.9 51	15.9 13	19.5 29	16.6 42	13.9 40	17.5 89				0.9 24
International Equity Fund	**-11.2** 73	**-8.4** 87	**8.1** 40	**5.8** 59	**3.3** 84	**20.4** 33		**-0.2** 61	**4.7** 69	**0.2** 64
CAI Mut Fd: Non-U.S. Equity Style										
MSCI ACWI ex US Index	-5.4 27	-1.5 41	7.5 47	6.8 47	5.2 43	18.2 80				0.3 41
T. Rowe Price Small Cap	**-11.3** 62	**-4.5** 59	**14.0** 41	**13.5** 33	**11.7** 27	**24.0** 89		**0.6** 10	**7.0** 88	**0.5** 27
CAI Mut Fd: Sm Cap Broad Style										
Russell 2000 Index	-7.5 45	-5.8 63	11.7 72	9.7 69	8.9 66	27.1 52				0.3 66
T. Rowe Price Stable Value	**0.5** 3	**1.9** 4	**2.3** 2	**2.3** 1	**2.3** 1	**0.1** 65		**3.4** 5	**0.4** 26	**8.5** 5
Callan Stable Value CT										
FTSE 3 Mo T-Bill	0.0 99	0.1 99	0.8 99	1.1 97	0.8 99	0.5 1				-0.1 97
SSgA Inst Treasury Money Market	**0.0** 16	**0.0** 71	**0.6** 15	**1.0** 10	**0.7** 11	**0.4** 10		**-3.2** 56	**0.0** 95	**-0.3** 10
Callan Money Market Funds										
FTSE 3 Mo T-Bill	0.0 2	0.1 7	0.8 2	1.1 3	0.8 2	0.5 4				-0.1 3

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:

Excess Return Ratio:
- above median
- third quartile
- fourth quartile

Tracking Error:
- below median
- second quartile
- first quartile

Sharpe Ratio:
- above median
- third quartile
- fourth quartile

Callan

Callan Update

Published Research Highlights from 1Q22

Alternatives Focus, a new quarterly publication

Callan 2022-2031 Capital Markets Assumptions

2022 Defined Contribution Trends Survey

Periodic Table Collection: Year-End 2021

2017	2018	2019	2020	2021
Emerging Markets 37.28%	Real Estate Funds 7.36%	Large Cap 31.49%	Small Cap 19.96%	Large Cap 28.71%
Dev ex-U.S. Equity 24.21%	Cash Equivalent 1.87%	Small Cap 25.52%	Large Cap 18.40%	Real Estate Funds 21.02%
Large Cap 21.83%	U.S. Fixed 0.01%	Dev ex-U.S. Equity 22.49%	Emerging Markets 18.31%	Small Cap 14.82%
Small Cap 14.65%	High Yield -2.08%	Emerging Markets 18.44%	Global ex-U.S. Fixed 10.11%	Dev ex-U.S. Equity 12.62%

Recent Blog Posts

Hedge Funds and Ukraine: A Guide for Institutional Investors

Joe McGuane

Why It Was a Tough 4Q21 for Large Cap Growth Managers

David Wang

DOL Shifts Tone on Private Equity in DC Plans

Patrick Wisdom

Additional Reading

Private Equity Trends quarterly newsletter
Active vs. Passive quarterly charts
Capital Markets Review quarterly newsletter
Monthly Updates to the Periodic Table
Market Pulse Flipbook quarterly markets update
Real Estate Indicators market outlook

Callan Institute Events

Upcoming conferences, workshops, and webinars

Callan College

Intro to Investments – Learn the Fundamentals

This course is for institutional investors, including trustees and staff members of public plans, corporate plans, and nonprofits. This session familiarizes trustees and staff with basic investment theory, terminology, and practices.

Join our next LIVE session in San Francisco (1½-day session):
July 26–27, 2022

Join our next VIRTUAL session via Zoom (3 sessions, 2–3 hours each):
September 20–22, 2022

Mark Your Calendar

2022 June Regional Workshops

June 7, 2022 – Atlanta
June 9, 2022 – Portland

2022 October Regional Workshops

October 18, 2022 – Denver
October 20, 2022 – San Francisco

Watch your email for further details and an invitation.

Webinars & Research Café Sessions

Research Café: Private Equity Fee Study

May 11, 2022 – 9:30am (PT)

Webinar: Pension Risk Transfer

May 18, 2022 – 9:30am (PT)

Market Intelligence

July 15, 2022 – 9:30am (PT)

Content Calendar – Callan Institute

4Q22 Webinar Topics:

- Market Intelligence
- Regional Workshop Recap
- ESG Survey
- Research Café (TBD)

1Q22 Webinar Topics:

- Capital Markets Assumptions
- Market Intelligence
- DC Trends Survey
- Research Café (TBD)

2Q22 Webinar Topics:

- Market Intelligence
- Regional Workshop Recap
- Research Café: ESG Interview Series
- Pension Risk Transfer

3Q22 Webinar Topics:

- Market Intelligence
- Research Café (TBD)

Callan College | Conference /Workshop | Publication | Webinar | Research Café

Callan Updates

Firm updates by the numbers, as of March 31, 2022

Total Associates: ~200

Ownership

- 100% employees
- All shareholders own less than 10% of the firm
- 67% of employees are equity owners
- 55% of shareholders identify as women or minority

Total General and Investment Consultants: more than 55

Total Specialty and Research Consultants: more than 60

Total CFA/CAIA/FRMs: ~55

Total Institutional Investor Clients: more than 400

AUA: more than $3 trillion

Leadership Changes

- Greg Allen, CEO & Chief Research Officer, is now also Callan's Diversity, Equity & Belonging Executive Sponsor
- Lauren Mathias, SVP, non-U.S. equities consultant and head of the Callan Connects program, is now also Callan's DEB Champion

"Our focus is to build on all of the diversity work we've done over the years to bring change to our firm and our industry. Like many firms, we know we have a ways to go, and we're confident that the strategy we've developed will help us make meaningful, lasting change now and in the future."

— Lauren Mathias, senior vice president and DEB Champion, on Callan's new Diversity, Equity & Belonging program

Disclaimers

This report is for informational purposes only and should not be construed as legal or tax advice on any matter. Any decision you make on the basis of this content is your sole responsibility. You should consult with legal and tax advisers before applying any of this information to your particular situation.

This report may consist of statements of opinion, which are made as of the date they are expressed and are not statements of fact.

Reference to or inclusion in this report of any product, service or entity should not be construed as a recommendation, approval, affiliation or endorsement of such product, service or entity by Callan.

Past performance is no guarantee of future results.

The statements made herein may include forward-looking statements regarding future results. The forward-looking statements herein: (i) are best estimations consistent with the information available as of the date hereof and (ii) involve known and unknown risks and uncertainties such that actual results may differ materially from these statements. There is no obligation to update or alter any forward-looking statement, whether as a result of new information, future events or otherwise. Undue reliance should not be placed on forward-looking statements.

ALASKA RETIREMENT MANAGEMENT BOARD

Public Equity

Mark Moon, Manager Internal Public Equities & Research
Michelle Prebula, CPA, CTP, Manager External Public Equity & DC Investments

Key Board Decisions

Determine Investment Objective

- Fund's Purpose
- Governance – who makes which decisions?

Determine Asset Allocation

- Strategic
- Tactical

Oversee Implementation

- Manager Structure – number and types of manager allocations.
- Manager Selection

Monitor Results

- Are the fund, asset classes and mandates performing as expected?
- Are they achieving objectives?

Background

The Great Reset of 2019 - In response to low alpha after fees from active managers and duplicative positions across accounts, major changes were made including:

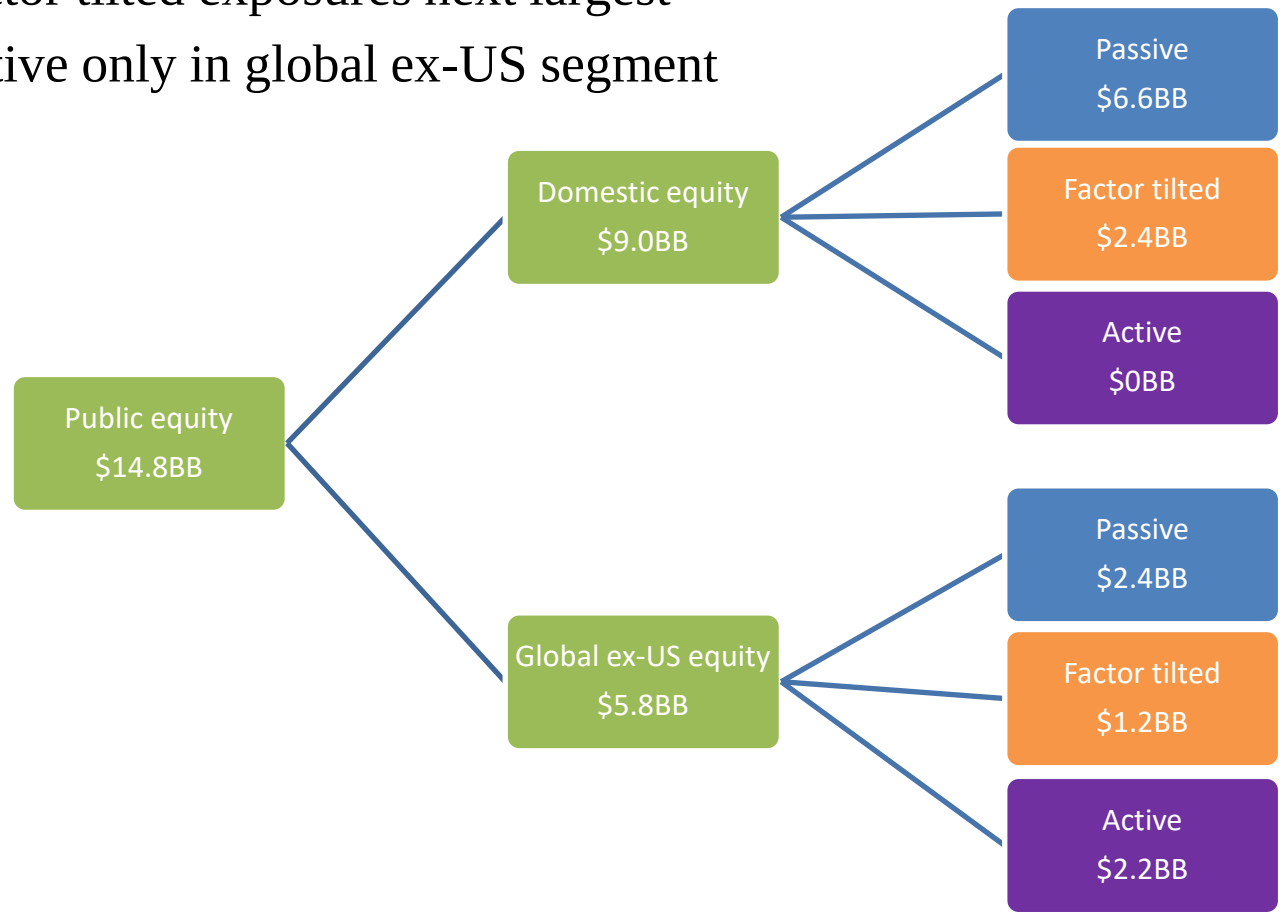
- Consolidation of various domestic large cap strategies/portfolios
- Termination of all active domestic managers
- Termination of all but 4 active international managers
- Re-orientation of overall exposures to be broadly:
  - Passive
  - Factor tilted
  - Active

Framing Equity Exposures

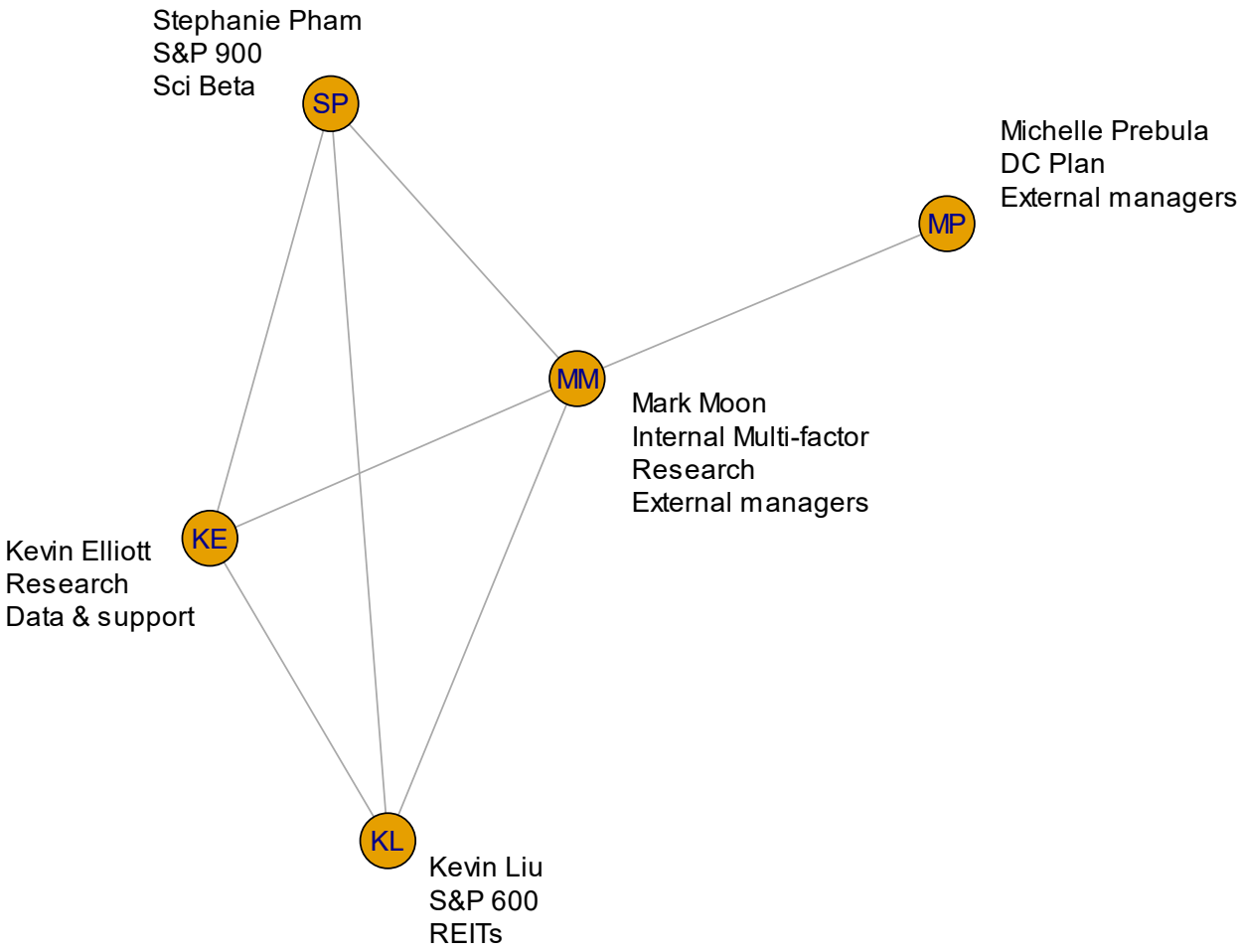
- Passive
  - Replicating well known market cap weighted indexes (MSCI ACWI; Russell; S&P)
  - Highest capacity
  - Lowest fees
  - Largest segment of ARMB equity exposure
- Factor tilted
  - Tilting portfolios toward desired and away from undesired systematic exposures/attributes/characteristics
  - Common desired exposures include smaller size, higher value, lower volatility, higher momentum, etc.
  - Lower capacity than passive
  - Higher return expectations than passive
  - Fees higher than passive but lower than active
  - Smaller segment of ARMB exposure than passive
- Active
  - Strategies generally benchmarked to passive cap weighted indexes but can deviate substantially
  - Highest expected performance over benchmark along with highest expected tracking error
  - Highest fees
  - Capacity depends on specific strategy and liquidity of assets comprising it
  - Smallest segment of ARMB equity exposure

Current Structure as of March 31, 2022

- Passive exposures largest
- Factor tilted exposures next largest
- Active only in global ex-US segment

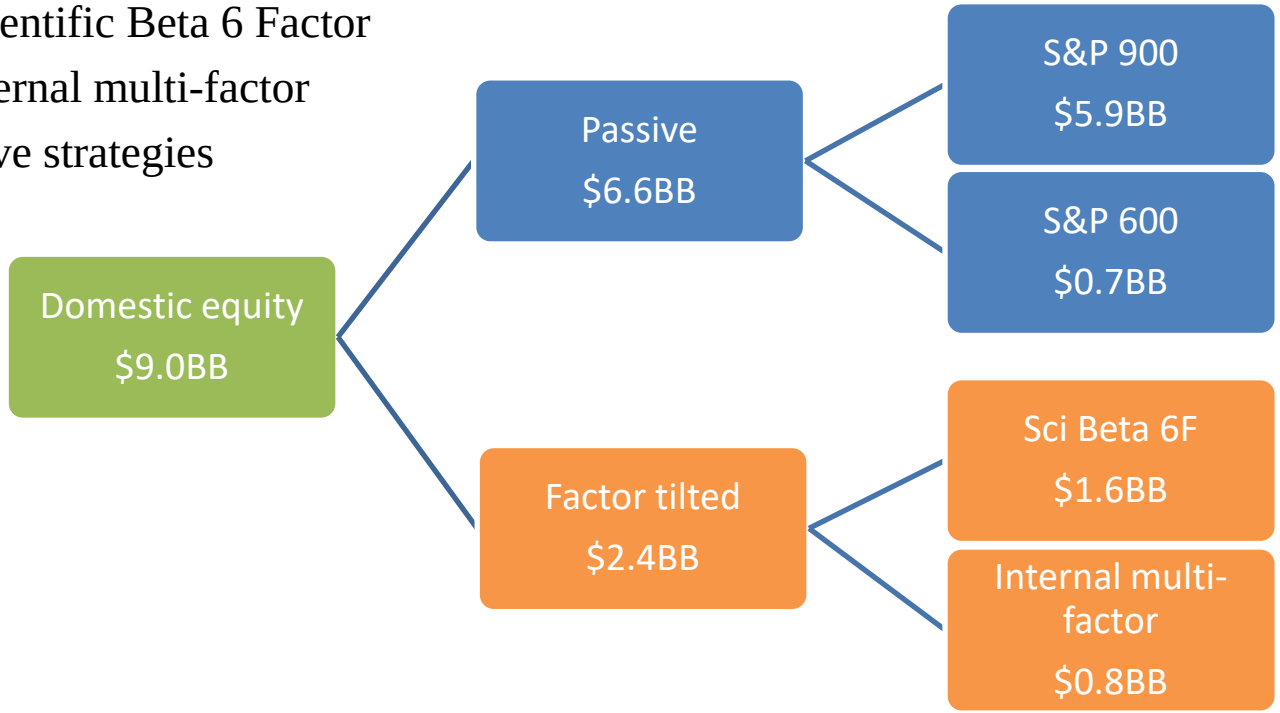


Public equity team



Domestic Equity

- All strategies run by internal equity team
- Benchmark: Russell 3000 Index
- Passive exposure composed of S&P 900 and 600 Indexes
- Factor tilted exposure from
  - Scientific Beta 6 Factor
  - Internal multi-factor
- No active strategies



Why deviate from benchmark?

- Overall purpose of equity portfolio is to generate equity returns consisting of risk-free rate + equity risk premium
- How to do this?
  - Hold broadly diversified equity portfolio
  - Don't pay high fees or high transactions costs
- Russell 3000 Index benchmark is example of broadly diversified, market cap weighted equity portfolio which should generate return of risk-free rate + equity risk premium
- But, can we do better?
  - Replicating S&P Indexes: broadly diversified equity portfolio but higher quality tilt than Russell 3000 Index which we see as desirable
  - Factor tilted strategies are also broadly diversified but tilt toward higher expected return "factors" than Russell 3000 Index
- Because of current structure, domestic equity portfolio has tracking error relative to the Russell 3000 Index benchmark, but, current portfolio still should generate broadly representative equity returns and, hopefully, higher returns than the benchmark over time

Performance

- 2020 difficult period for factor tilted strategies
- Subsequently stronger factor tilted performance
- S&P 900 and 600 performance adding value
- Internal multi-factor overall has outperformed Scientific Beta

Returns for Periods Ended March 31, 2022

	Last Quarter	Fiscal YTD	Last Year	Last 3 Years	Last 5 Years
Broad Domestic Equity	**(4.87%)**	**4.45%**	**12.58%**	**16.82%**	**14.43%**
Large Cap Pool	**(4.82%)**	**5.12%**	**13.58%**	**17.03%**	**14.75%**
ARMB Large Cap Multi Factor	(4.13%)	**4.80%**	**12.84%**	**16.83%**	-
ARMB S&P 900	(4.59%)	**6.23%**	**14.93%**	-	-
ARMB Scientific Beta	(5.90%)	**1.67%**	**9.56%**	**13.00%**	**11.71%**
Russell 1000 Index	-5.13%	**4.36%**	**13.27%**	**18.71%**	**15.82%**
Small Cap Pool	**(5.67%)**	**(3.24%)**	**0.88%**	**13.80%**	**11.73%**
ARMB S&P 600	(5.67%)	(3.24%)	**0.88%**	**13.29%**	**10.79%**
Russell 2000 Index	(7.53%)	(9.66%)	(5.79%)	**11.74%**	**9.74%**

Source: Callan ARMB Board Report Quarterly Review and Callan PEP

ARMB Factor Strategy Evolution

- Began 2017 with Scientific Beta 4 Factor (portfolio weights licensed from Scientific Beta and implemented internally)
- In 2018 internal equity team created internally sourced multi-factor model utilizing daily stock level data, seeded with $100MM 1Q2019
- Size of Scientific Beta portfolio increased with 2019 changes to equity structure
- Specific Scientific Beta model used moved from 4 factor to 6 factor in 2020
- Assets reallocated quarterly from Scientific Beta strategy to internal multi-factor strategy since end of 2020
- Factor strategies performed poorly in 2020 during pandemic (value and size tilts generated underperformance relative to cap weighted indexes)
- Subsequent performance has improved and most recently value tilts paying off

Internal Multi-factor Strategy

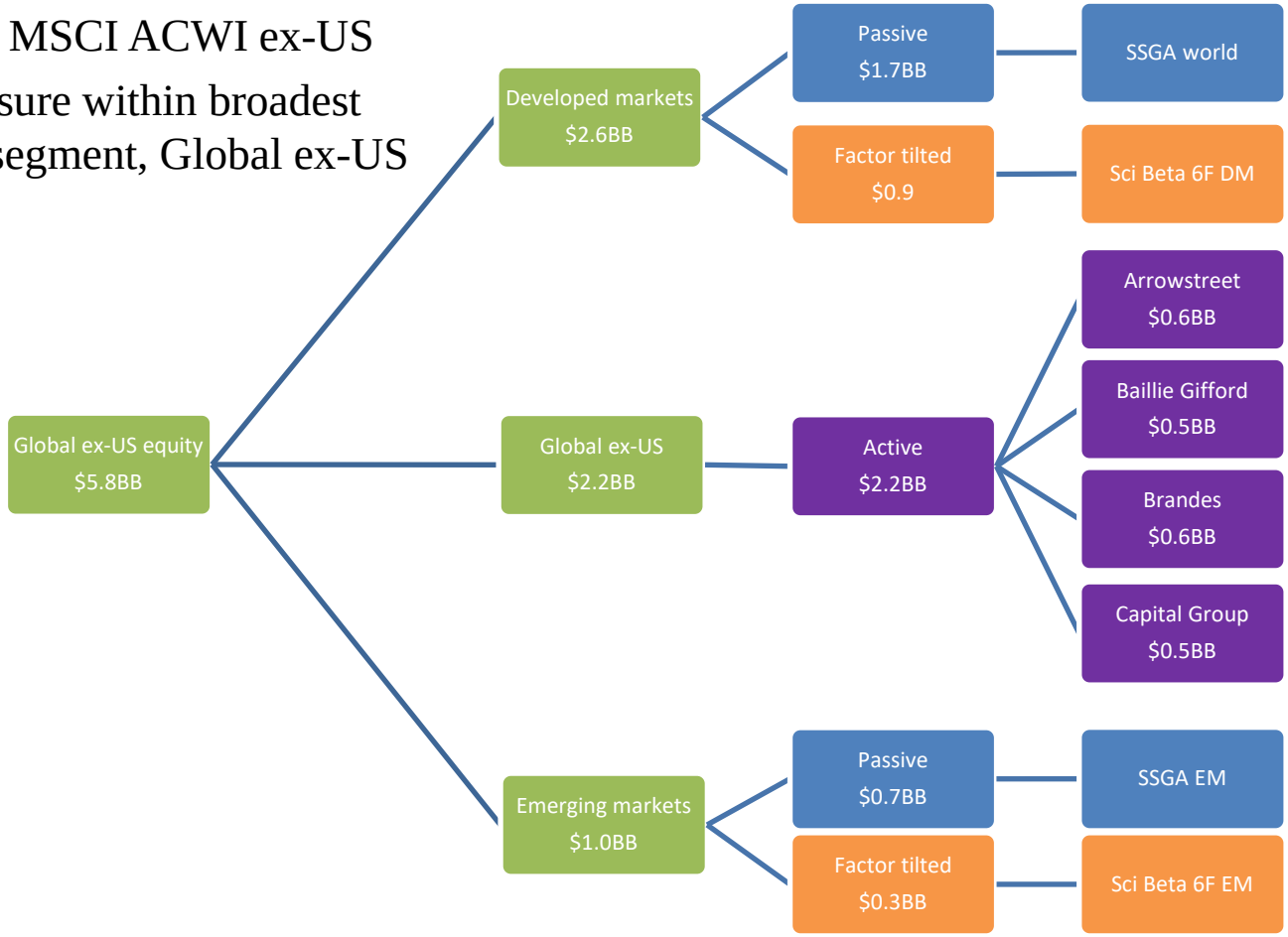
- Designed to tilt toward small size, high value, low volatility, high momentum and low reversal
- Simple mapping of each stock's exposure to above attributes into expected alpha
- Portfolio optimized against Russell 1000 benchmark, with various constraints and penalties (sector exposure, active weights, turnover, tracking error, liquidity)
- Strategy serves as a reasonable example of systematic equity strategies that can be created and managed efficiently by staff

Domestic Equity - Current Research Efforts

- Exploring internally generated market cap weighted strategies
- Examining optimized index portfolios vs. current direct replication
- Improving internal multi-factor strategy (time-varying risk model; non-linear mapping of attributes into expected alpha)
- Considering internally sourced developed markets factor tilted strategy

Global ex-US Equity

- All strategies run externally
- Benchmark: MSCI ACWI ex-US
- Active exposure within broadest market cap segment, Global ex-US

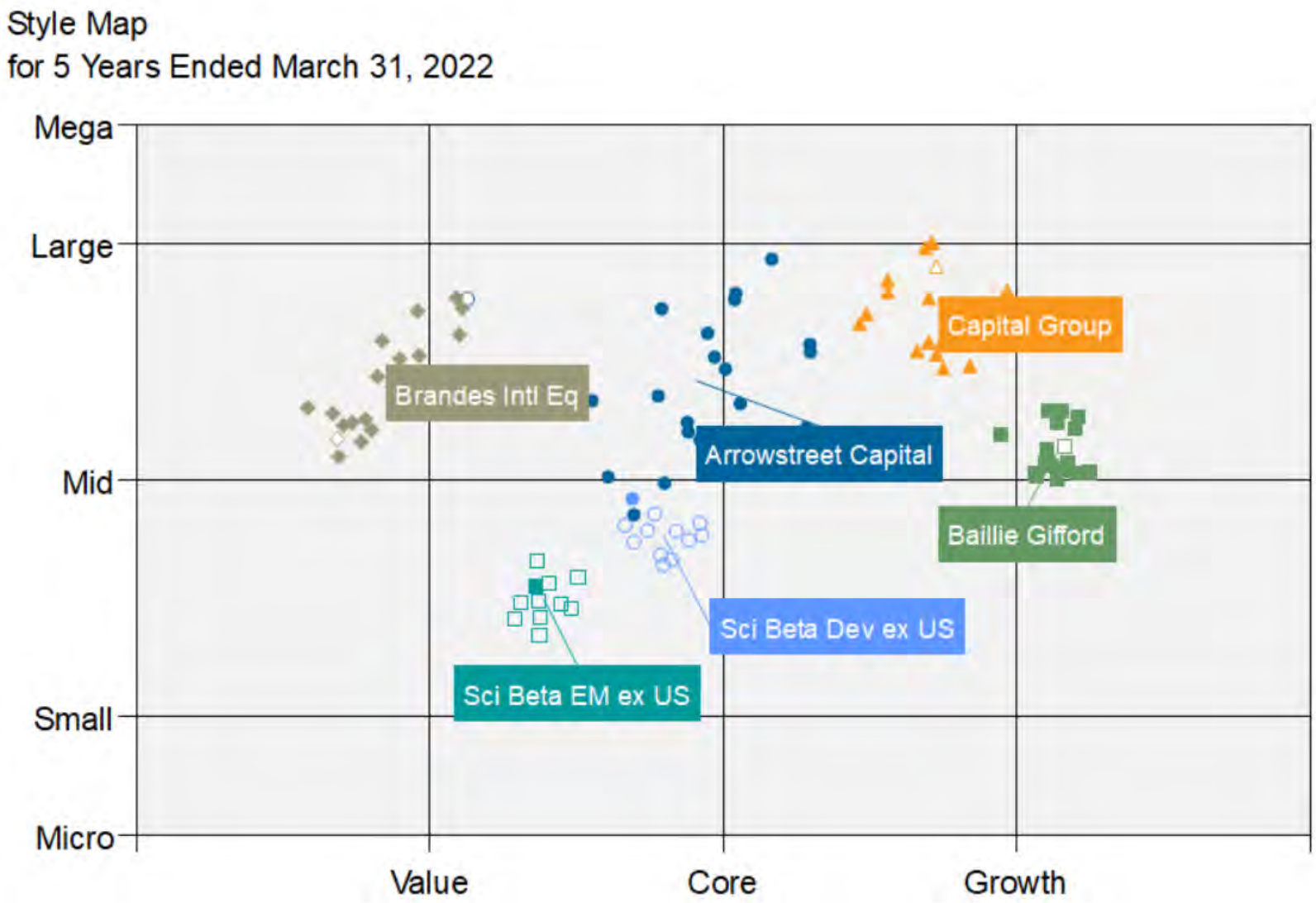


Performance

	Returns for Periods Ended March 31, 2022				
	Last Year	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
International Equity Pool	**(1.27%)**	**8.54%**	**7.62%**	**8.31%**	**6.89%**
Arrowstreet ACWI ex -US(net)	0.17%	13.61%	10.79%	11.38%	-
Baillie Gifford ACWI ex US(net)	(15.92%	9.84%	8.44%	8.72%	-
Brandes Investment(net)	1.00%	5.74%	4.75%	5.68%	5.78%
Capital Guardian(net)	(11.34%	8.16%	9.13%	9.90%	7.73%
L&G Sci Beta Dev ex US(net)	4.32%	-	-	-	-
SSgA World ex US IMI(net)	2.34%	8.72%	-	-	-
MSCI EAFE Index	1.16%	7.78%	6.72%	7.53%	6.27%
MSCI ACWI ex-US Index	(1.48%)	7.51%	6.76%	7.80%	5.55%
Emerging Markets Pool	**(10.00%**	**4.91%**	**4.08%**	**6.54%**	**2.34%**
SSgA Emerging Markets(net)	(11.39%	4.80%	-	-	-
L&G SciBeta EM(net)	(6.56%)	-	-	-	-
MSCI EM (net)	(11.37%	4.94%	5.98%	7.77%	3.36%

Source: Callan ARMB Investment Measurement Service Quarterly Review

Active and Factor Managers



Source: Callan PEP

Summary

- Outperformance in 2021
- Outperformance in 2021 and Q1 2022 by factors
- Underperformance in Q1 2022 by active managers
- Fewer active managers has been easier to manage with fewer resources
- Currently have a good mix of value growth and core
- Adding at least two more international managers to the mix would increase ARMB's flexibility in terms of asset allocation
- Recommendation

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Global Ex-US Manager Search	ACTION:	X
DATE:	June 16-17, 2022	INFORMATION:	

BACKGROUND:

In September 2019, ARMB terminated seven Global Ex-US Equity managers, reducing the number of active managers in the Global Ex-US equity portfolio to four. While staff continues to favor a smaller number of active managers than in years past, the addition of one to three managers at this time will allow staff additional flexibility in making allocation decisions among managers without overdiversifying the portfolio of managers.

RECOMMENDATION:

The Alaska Retirement Management Board directs staff to engage Callan Associates to conduct a search for one or more Global Ex-US investment manager(s).

ALASKA RETIREMENT MANAGEMENT BOARD

Opportunistic and Alternative Fixed Income

June 2022

Shane Carson, CAIA, CFA
State Investment Officer

Key Board Decisions

Determine Investment Objective

- Fund's Purpose
- Governance – who makes which decisions?

Determine Asset Allocation

- Strategic
- Tactical

Oversee Implementation

- Manager Structure – number and types of manager allocations.
- Manager Selection

Monitor Results

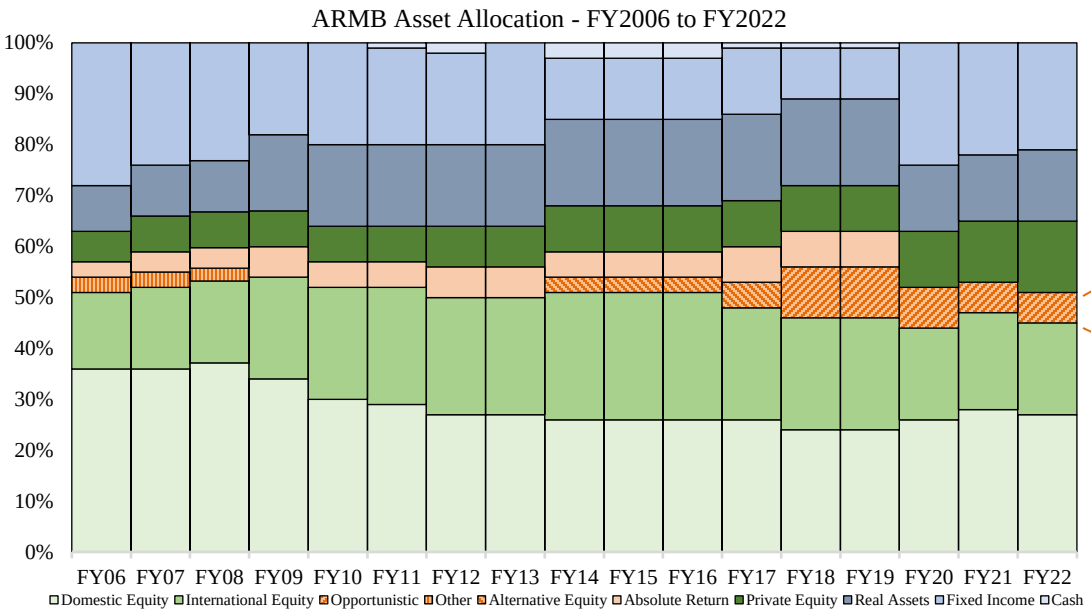
- Are the fund, asset classes and mandates performing as expected?
- Are they achieving objectives?

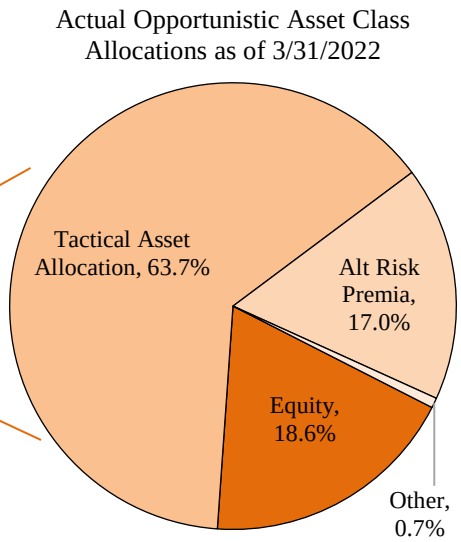
Agenda

- Opportunistic asset class
  - Brief history
  - Current structure
  - Performance
- Alternative Fixed Income pool
  - Current structure
- Proposed changes
- McKinley Capital Management, LLC – Healthcare Equity
- Callan Presentation – Private Debt
- Crestline Investors, Inc. Presentation – SLF and BGF

Opportunistic Asset Class

- Asset class has had a dynamic history with multiple names and underlying strategies
- Fiscal year 2022 target allocation is 6% of total ARMB portfolio
  - Three main strategic themes
  - Six underlying strategies
- Benchmark is 60% MSCI ACWI IMI and 40% Bloomberg US Aggregate Bond Index

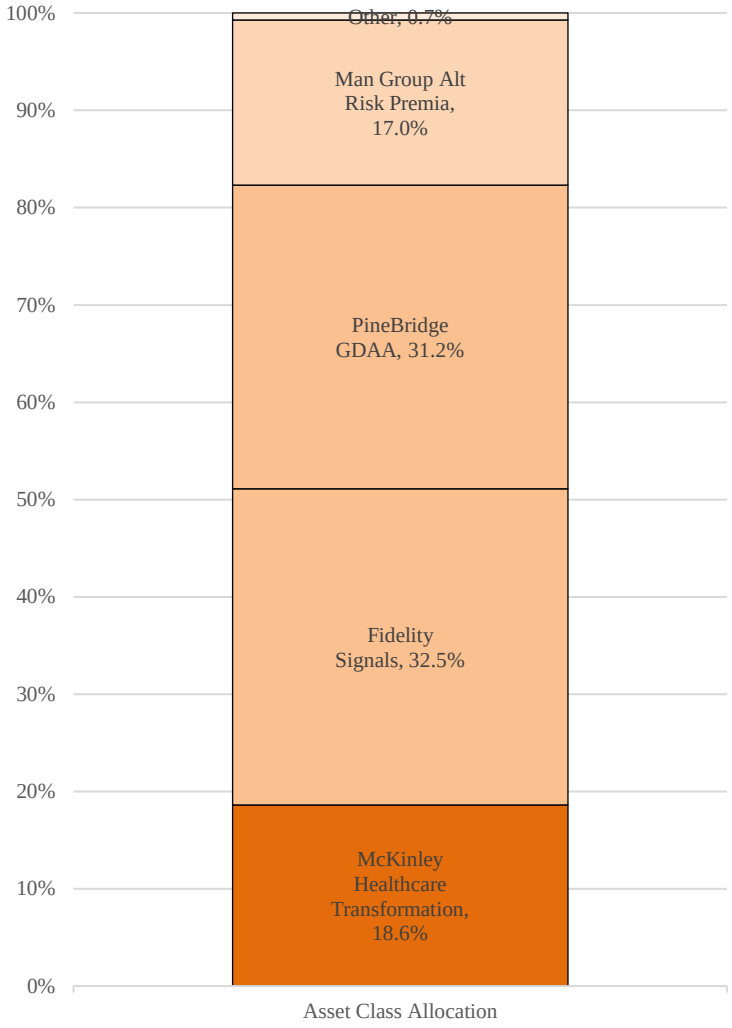




Values as of 3/31/2022
Allocations may not sum to 100% due to rounding
Certain asset classes in historical chart were aggregated to simplify charting

Structure

- Alternative Risk Premia
  - Man Group Alternative Risk Premia (ARP)
    - Funded: 2017
    - Watch Listed in March 2021 for personnel departure
- Tactical Asset Allocation
  - Fidelity Signaling Portfolio
    - Funded: 2018
    - Watch Listed in March 2022 for personnel departure
  - PineBridge Global Dynamic Asset Allocation
    - Funded: 2018
- Equity
  - McKinley Healthcare Equity
    - Funded: 2019

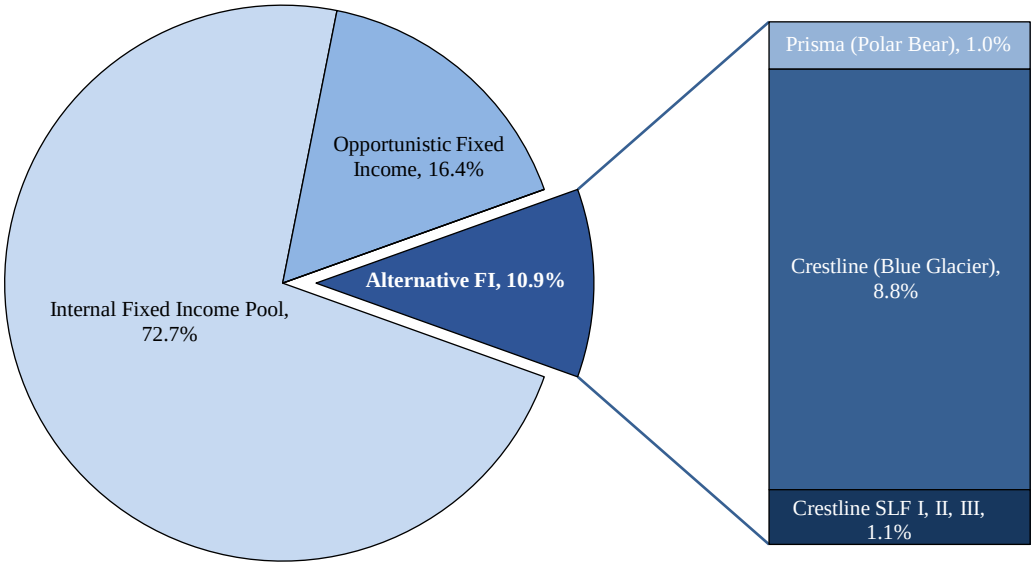


Other consists of two strategies each sized less than $10 million.

Alternative Fixed Income

- Alternative Fixed Income is a pool of strategies that currently resides in the Fixed Income Asset class.
- As of 3/31/2022, total allocation was 2.4% of ARMB portfolio.
- Three main Private Debt strategic themes
  - Five underlying strategies
- Internal benchmark is Three-month T-bill + 5%

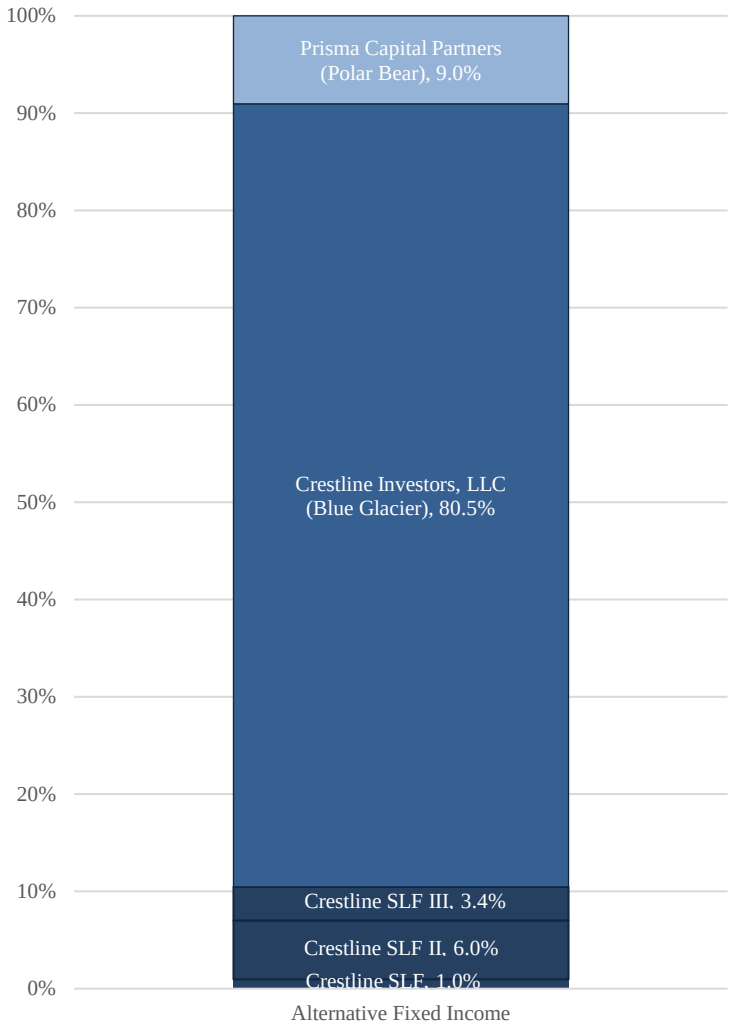
Fixed Income Asset Class Allocation



Values as of 3/31/2022
Allocations may not sum to 100% due to rounding

Structure

- PAAMCO Prisma Polar Bear Fund
  - Funded: 2010
  - Fund is in wind down
- Opportunistic Private Debt
  - Crestline Blue Glacier Fund
    - Multiple classes of strategies
    - Class B funding in 2013
- Direct Lending Private Debt
  - Crestline Specialty Lending Fund
    - $50m commitment in 2015
  - Crestline Specialty Lending Fund II
    - $60m commitment in 2017
  - Crestline Specialty Lending Fund III
    - $100m commitment in 2021



Proposed Changes

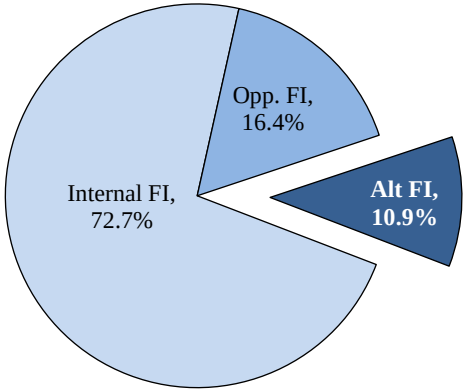
- Name asset class Multi-Asset and refine the purpose statement
- Transition Alternative Fixed Income mandates into Multi-Asset.
- Engage Callan to conduct a search for Private Debt managers focusing on:
  - Lower end of risk
  - Evergreen/open-end fund structure
- Work with Crestline to explore modifying the BGF contract eliminating the need for rolling into new classes

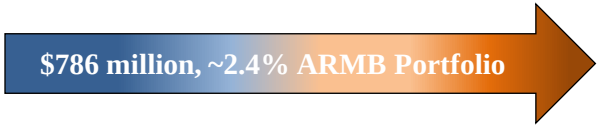
Asset Class Purpose Statement

Provide accretive returns to the overall portfolio through differentiated investments:

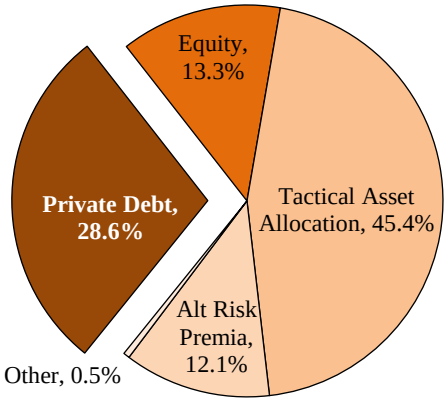
- *Specialized and/or diversifying sources of return*
- *Single and multi-asset investments*
- *Public and private investments*

Fixed Income Allocation





Multi-Asset Allocation



Values as of 3/31/2022
Allocations may not sum to 100% due to rounding

Summary

- Historically, ARMB has employed an asset class to house investments that do not fit into existing or traditional asset classes
- Performance of the Opportunistic Asset Class has been mixed
- Move Alternative Fixed Income from the Fixed Income Asset Class and into Opportunistic
- Change the name of Opportunistic to Multi-Asset
- Action Memo directing staff to engage Callan to conduct a search for up to two private debt managers

Performance

	Last Quarter	Last Year	Last 3 Years
Opportunistic (T)	**(6.21%)**	**4.30%**	**7.92%**
Alternative Equity Strategies	**(12.03%)**	**3.93%**	**14.04%**
McKinley Healthcare Transformation	(12.03%)	3.93%	13.44%
MSCI ACWI	(5.36%)	7.28%	13.75%
Other Opportunities	**0.02%**	**(1.89%)**	**(1.41%)**
Project Pearl	0.00%	(13.26%)	-
T-Bills + 6%	1.50%	6.06%	6.81%
Tactical Allocation Strategies	**(7.00%)**	**1.86%**	**8.82%**
PineBridge	(8.89%)	(1.58%)	6.95%
Pine Bridge Benchmark	(5.57%)	3.17%	9.02%
Fidelity Signals	(5.11%)	5.36%	10.69%
Fidelity Signals Benchmark	(5.57%)	3.17%	9.40%
Alternative Beta	**4.38%**	**15.44%**	**(2.01%)**
Man Group Alternative Risk Premia	4.38%	15.44%	1.03%
T-Bills + 5%	1.26%	5.06%	5.81%
Alternative Fixed Income	**0.85%**	**14.35%**	**-**
Crestline (Blue Glacier)	0.25%	13.51%	6.91%
Prisma Capital (Polar Bear)	5.87%	27.91%	11.45%
Crestline Specialty Lending Fund	17.80%	30.12%	23.59%
Crestline Specialty Lndg Fd II	0.00%	10.77%	12.69%
HFRI Fund of Funds Index	(2.73%)	1.23%	5.87%
T-Bills + 5%	1.26%	5.06%	5.81%

McKinley Capital Management, LLC

Relevant Mandates: **Healthcare Equity** **Hired:** **2019**

Firm Information	Investment Approach	Total ARMB Mandate
McKinley Capital Management, LLC, ("McKinley Capital") is a privately-owned systematic global growth asset manager. The firm was founded in 1990 and is headquartered in Anchorage, Alaska, with a Chicago, Illinois office. As of 3/31/2022, the firm's total assets under management (including assets under advisement) are $3.1 billion. **Key Executives:** **Robert A. Gillam**, **CFA**, *CEO, CIO* **John Guerard, Jr., Ph.D.**, *Director of Quantitative Research* **Forrest Badgley, CFA,** *Director of Public Investments/Senior Portfolio Manager* **Renne Marsjanik**, *Director of Client Solutions*	McKinley Capital uses a disciplined investment methodology to identify fast growing opportunities in global equities. The unique approach is data-driven (using their proprietary global alpha-factor MQ) followed by a qualitative review overlay. This specialized approach has little overlap with other managers. The McKinley investment team is advised by a 10-person Scientific Advisory Board including Nobel Laureate and Modern Portfolio Theory author Harry Markowitz, Ph.D., CFA. McKinley Capital's Global Healthcare Transformation (GHT) strategy is designed to capture the opportunity rising from the profound transformation of the global healthcare industry driven by rapid advances in technology. Companies at the forefront of this transformation should benefit from organic growth prospects in large, growing domestic and international markets, and provide investors with the potential for greater returns versus traditional healthcare benchmarks. **Benchmark:** MSCI All Country World Index (ACWI)	3/31/2022 $364,849,120

Concerns: None

3/31/2022 Performance

	Last Quarter	1-Year	3-Years Annualized
McKinley HC	-12.03	3.93	13.44
McKinley HC (net)	-12.14	3.44	12.87
MSCI ACWI	-5.36	7.28	13.75

McKINLEY CAPITAL
MANAGEMENT, LLC

JUNE 2022

ACCOUNT REVIEW

Global Healthcare Transformation Strategy

PREPARED FOR:

ALASKA RETIREMENT MANAGEMENT BOARD

Board of Trustees Meeting

Thank you ARMB

- Longtime McKinley client since 1997 (25 years)
- Lead investor in McKinley's Global Healthcare Transformation strategy
- Custom, thematic strategy developed with ARMB staff
- Addresses growing cost of healthcare and longevity risk of ARMB membership
- Offsets risk associated with aging membership population and skyrocketing healthcare costs
- AMRB finalist for 2021 World Pension Plan Innovation Award from *Pensions and Investments*® magazine
- Thank you for your partnership and your business!

McKINLEY CAPITAL MANAGEMENT, LLC

McKinley Update

- Firm Update
- Team Update
  - Welcome industry-veteran Renne Marsjanik, McKinley's Director of Client Solutions
  - Scientific Advisory Board meeting
- Product Update
  - Diversified Income
  - Minimum Volatility

McKINLEY CAPITAL
MANAGEMENT, LLC

ARMB Mandate

Liquid Diversified Health Care will have a primary emphasis on diversification to minimize risk by investing in permissible domestic and international equities as permitted by the ARMB's Investment Guidelines, Appendix E of the Investment Management Agreement. The investment objective is to have returns, net of fees, over time in excess of the MSCI ACW Net - Div Index.

Photo courtesy of McKinley Management's
Hiring Our Heroes intern, Captain Stephan Caskey.

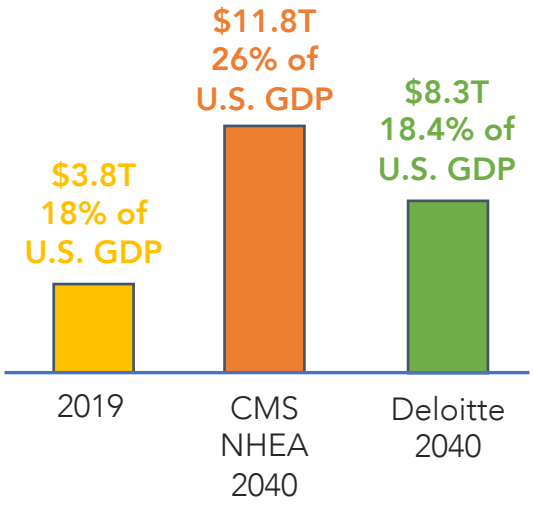
McKINLEY CAPITAL
MANAGEMENT, LLC

“

McKinley believes the market is at the cusp of a long innovative and value creation cycle, pointed at the healthcare space globally, as several mega-trends in technology (AI, data, bandwidth, cloud, wireless, etc.) meet urgent requirements from governments and corporations around the world for faster, cheaper, better healthcare outcomes for their constituents.

The Case For Healthcare Transformation

- U.S. healthcare spending as % of GDP has increased every year for 60 years – from 5% in 1960 to 18% in 2019*
- If trend continues, health spending would reach $11.8T in 2040, 26% of GDP*
- Deloitte suggests traditional healthcare spending will make up only 18.4% of U.S. GDP in 2040 driven by a **significant decrease** in spending devoted to treatment and much higher spending on activities and enterprises that sustain well-being.
- Deloitte predicts emerging technologies, an ability to cure and prevent disease, and highly engaged consumers will lead to a **deceleration of traditional healthcare spending** between now and 2040.



- * CMS NHEA data reported by Deloitte Insights, Breaking the Cost Curve
- Source: Deloitte Insights, Breaking the cost curve, www2.deloitte.com

McKINLEY CAPITAL MANAGEMENT, LLC

The Case For Healthcare Transformation

Deloitte predicts three realities will take place by 2040:

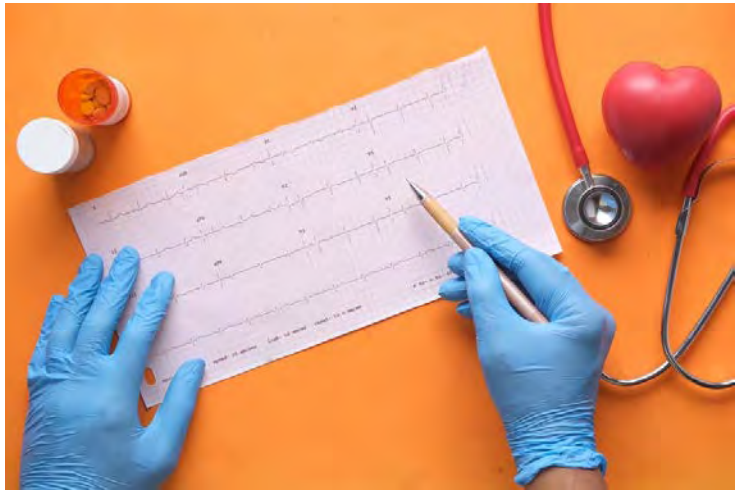
- **Future Reality #1:**
  A U.S. $3.5T well-being dividend —the return on investment for tools, systems, or protocols that help consumers to take an active role in their health and well-being
- **Future Reality #2:**
  A shift from 80% care and treatment to 60% activities related to health and well-being
- **Future Reality #3:**
  A new health economy will drive 85% of revenue. This includes an end of the general hospital as we know it, a slowdown of mass-produced biopharma, and a seismic shift in the way health care is financed

Source: Deloitte Insights, Breaking the cost curve, www2.deloitte.com

McKINLEY CAPITAL
MANAGEMENT, LLC

Investment Thesis

- McKinley's Global Healthcare Transformation strategy was developed to capture the opportunity rising from the transformation of the global healthcare industry which represents 20% of global GDP and growing
- We believe companies at the forefront of this transformation will benefit from organic growth prospects in large, growing domestic and international market
- We think this provides investors with the potential for greater returns versus traditional benchmarks
- This likelihood increases in a low return world (which Callan reports we may experience in the coming decade)

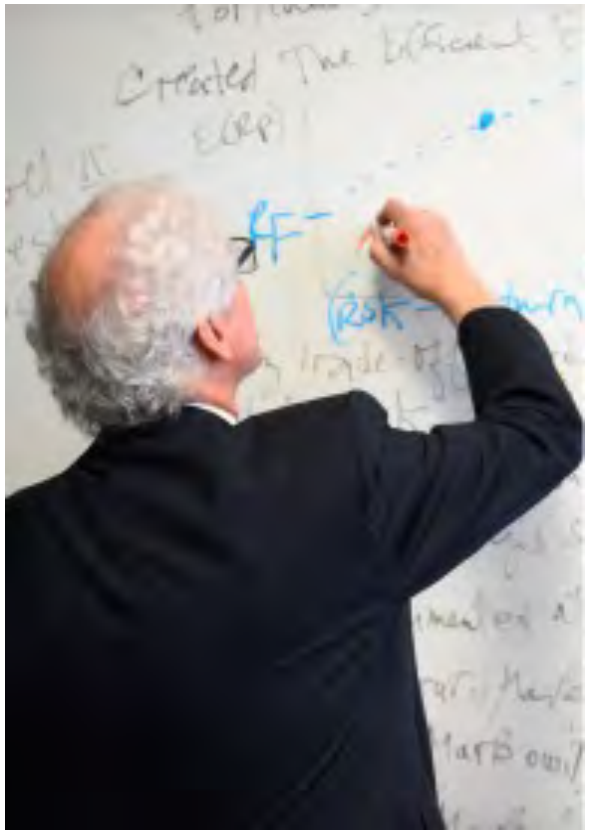


Past performance is not indicative of future returns. Performance is not guaranteed. See full disclosure at end of presentation.

McKINLEY CAPITAL MANAGEMENT, LLC

Portfolio Construction

- Custom thematic strategy developed with ARMB, account launched March 12, 2019
- Few, if any, similar products in the industry
- Seeks to identify and target critical innovation healthcare themes
- We believe have the greatest potential to propel transformation and impact the industry
- Portfolio provides a uniquely designed, differentiated, high-capacity public equity portfolio
- Tailored to investors' appetite for risk, volatility and return
- Benchmarks against MSCI ACW Net-Div and MSCI ACW Healthcare indexes



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McKINLEY CAPITAL MANAGEMENT, LLC

Health Drivers and Catalysts

PAYMENT REFORM

Shifting payment and incentive models – "fee-for-service" to "pay-for-performance" driving a need to reorient care management models.

DIGITAL HEALTH

Proliferation of wireless and mobile technology to improve accessibility, delivery, and early identification, monitoring and management of various disease conditions.

PERSONALIZED MEDICINE

Increasing consumer engagement in delivery and coverage, with a focus towards patient satisfaction / experience and provider and insurer quality / transparency.

HEALTHCARE DELIVERY REDESIGN

Transition from higher intensity / higher cost to lower intensity / lower cost, often in a more desired setting.

PATIENT CENTERED CARE

Harnessing the power of digital data and analytics to develop new capabilities in "connected" care, population health and clinical decision support.

WIRELESS & MOBILE HEALTH

Development of disruptive new medical technologies (e.g. genomics, PCR diagnostics, bioinformatics) that enable personalized medicine and serve unmet / poorly met medical needs.

McKINLEY CAPITAL MANAGEMENT, LLC

GLOBAL HEALTHCARE TRANSFORMATION

Inception	April 1, 2019
Benchmark	MSCI ACW Healthcare - Net Div
Product AUM/AUA*	$ 365M
Holding Count	60

INVESTMENT OBJECTIVE

Seeks to identify and target critical innovation healthcare themes we believe have the greatest potential to propel transformation and impact the industry. The portfolio provides a uniquely designed, differentiated, high-capacity public equity portfolio tailored to investors' appetite for risk, volatility and return.

TOP HOLDINGS, % WT	Strategy	Active
UnitedHealth Group Inc	8.04	1.92
Danaher Corporation	4.25	1.85
Thermo Fisher Scientific	2.92	-0.04
Stryker Corporation	2.77	1.61
Anthem, Inc.	2.54	1.02
STERIS Plc (Ireland)	2.48	2.17
Perficient, Inc.	2.27	2.27
West Pharmaceutical Serv	2.25	1.86
IQVIA Holdings, Inc.	2.16	1.60
R1 RCM, Inc.	2.15	2.15

CHARACTERISTICS	Strategy	Bench
Wtd Avg Market Cap ($M)	127,768	173,953
FY0 to FY1 EPS Growth %	10.00	10.84
FY1 P/E	27.59	22.77
Dividend Yield %	0.18	0.49
Price to Book	5.56	4.47
ROIC %	7.84	11.51

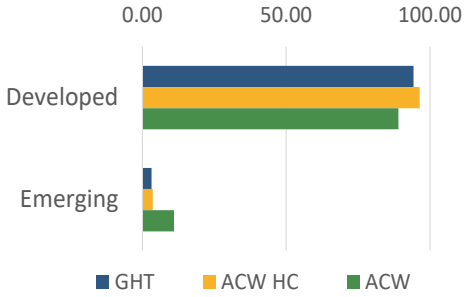
PERFORMANCE

$US	MTD	QTD	YTD	1Y	3Y	ITD
Global Healthcare Transformation (Gross)	2.74	-12.04	-12.04	3.93	13.62	13.6
Global Healthcare Transformation (Net)	2.74	-12.04	-12.14	3.56	13.08	13.1
MSCI ACW HC - Net Div	4.59	-3.79	-3.79	12.55	13.83	13.8
Difference (Gross)	-1.85	-8.25	-8.25	-8.62	-0.21	-0.21
MSCI ACW - Net Div	2.17	-5.36	-5.36	7.28	13.75	13.7
Difference (Gross)	0.57	-6.68	-6.68	-3.35	-0.14	-0.14

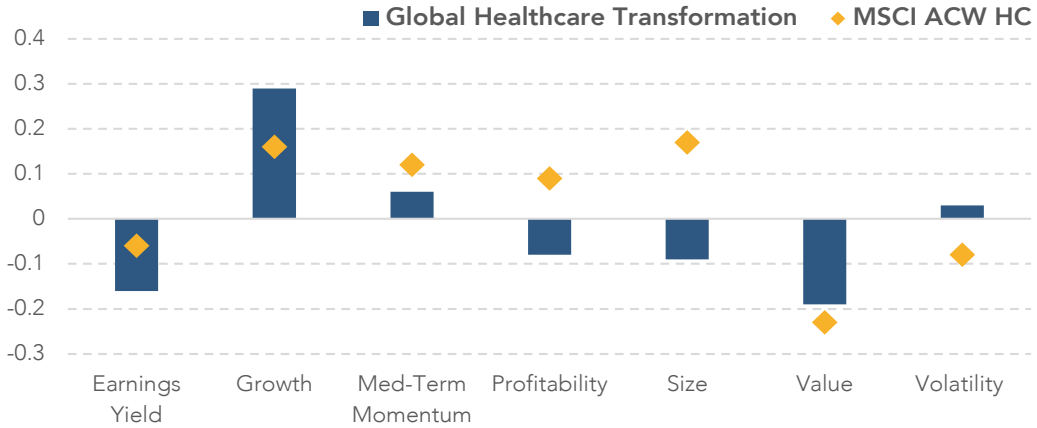
ITD = Inception To Date; MTD return is preliminary; Periods > 1 year are annualized.

$US	2021	2020	2019
Global Healthcare Transformation (Gross)	16.4	34.4	6.54
Global Healthcare Transformation (Net)	15.9	33.8	6.16
MSCI ACW HC-Net Div	17.5	14.9	13.6
Difference (Gross)	-1.07	19.5	-7.03
MSCI ACW - Net Div	18.5	16.3	12.9
Difference (Gross)	-2.10	18.2	-6.31

DEVELOPED & EMERGING MARKETS



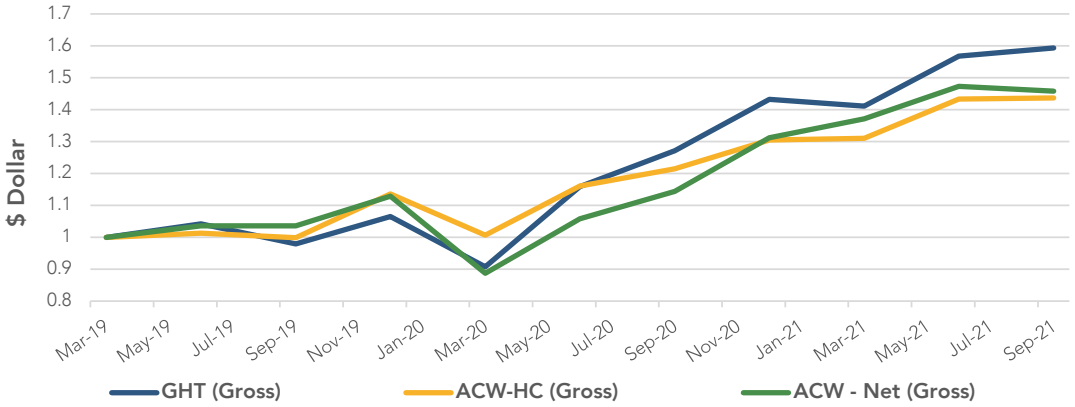
STYLE FACTOR EXPOSURES



Source: McKinley Capital Management, LLC and FactSet. Market Capitalization is weighted average; all other figures are median. Sector and country weights vs. MSCI All Country World Healthcare Net Index. Past performance is not indicative of future returns. *AUA reflects model portfolio assets.

SUB-INDUSTRY WEIGHTS %	Strategy	Bench	Active
Life Sciences Tools & Services	22.37	11.30	11.07
Health Care Equipment	21.69	16.64	5.04
Managed Health Care	13.10	9.36	3.74
Health Care Services	10.10	3.90	6.20
Health Care Technology	8.70	1.07	7.63
Health Care Supplies	3.45	2.29	1.16
Health Care Distributors	3.24	1.51	1.74
Pharmaceuticals	3.22	39.23	-36.01
Health Care Facilities	2.34	1.50	0.84

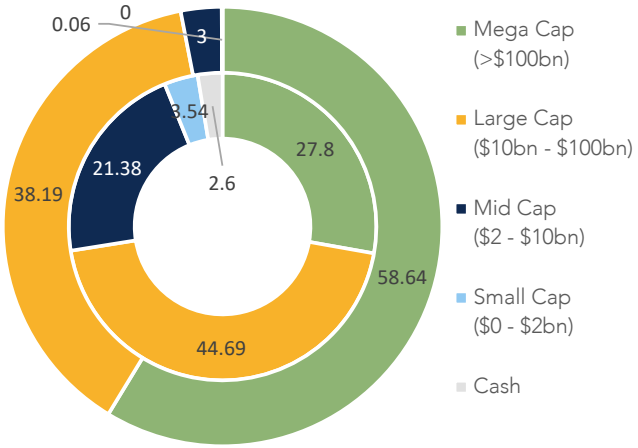
SINCE INCEPTION GROWTH OF A DOLLAR



TOP 10 COUNTRY WEIGHTS %			
United States	80.22	69.35	10.87
Switzerland	4.99	8.07	-3.07
Netherlands	2.45	0.54	1.91
Germany	2.16	2.19	-0.03
Australia	1.40	1.64	-0.24
Canada	1.32	0.11	1.21
India	1.27	0.58	0.69
Thailand	1.07	0.13	0.94
Sweden	1.07	0.12	0.95
China	0.85	1.64	-0.79

MARKET CAP WEIGHTS %

Inner: Strategy, Outer: Benchmark



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Any such offering can be made only at the time a qualified offeree receives a Confidential Private Placement Memorandum and other offering documents which contain significant details with respect to risks and should be carefully considered before investing. Returns are based on fully discretionary accounts and do not take individual investor tax categories into consideration. Future investments may be made under different economic conditions, in different securities and using different investment strategies. The **MSCI ACWI Health Care Index** includes large and mid cap securities across 24 developed markets and 26 emerging markets countries*. All securities in the index are classified in the Health Care as per the Global Industry Classification Standard (GICS®). The **MSCI ACWI Index** is a free float-adjusted market capitalization-weighted index that is designed to measure the equity market performance of developed and emerging markets. The MSCI ACWI Index consists of 49 country indices comprising 23 developed markets. Data may have originated from various sources including, but not limited to, FactSet, Bloomberg, TQA, ITG™, APT, Zephyr and/or other similar systems and programs. "FTSE®", "Russell®", "MTS®", "FTSE TMX®" and "FTSE Russell" and other service marks and trademarks related to the FTSE or Russell indexes are trademarks of the London Stock Exchange Group companies. All rights in the FTSE Russell® Indices vest in FTSE Russell® and/or its licensors. Neither FTSE Russell® nor its licensors accept any liability for any errors or omissions in the Indices or underlying data. No further distribution or dissemination of the FTSE Russell® data is permitted without express written consent. 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Deviations may include, but are not limited to, factors such as the purchase of higher risk securities, over/under weighting specific sectors and countries, limitations in market capitalization, company revenue sources, McKinley Capital's investment process and/or client restrictions. Global market investing, (including developed, emerging and frontier markets), also carries additional risks and/or costs including but not limited to: political, economic, financial market, currency exchange, liquidity, accounting, and trading capability risks. Derivatives trading and short selling may materially increase investment risk and potential returns. These risks may include, but are not limited to, margin/mark-to-market cash calls, currency exchange, liquidity, unlimited asset exposure, and counter-party risk. Foreign accounting principles may also differ from standard U.S. GAAP standards. Portfolio performance is shown gross and/or net of investment advisory fees. Net returns are calculated after such fees have been charged and will be lower. Fees are billed monthly or quarterly, which produces a compounding effect on the rate management fees are deducted. For example, a 0.5% annual fee deducted quarterly (0.125%) from an account with a ten-year annualized growth rate of 5.0% will produce a net result of 4.4%. Actual performance results will vary from this example. All information is believed to be correct, but accuracy cannot be guaranteed.

ARMB Account Performance Overview As of 3/31/22

Portfolio	Month To Date	Quarter To Date	Year To Date	Latest 1 Year	Annualized Latest 3 Years	Annualized Since Inception 3/12/2019
Account (Gross of Fees)	2.74	-12.04	-12.04	3.94	13.62	13.44
Account (Net of Fees)	2.70	-12.14	-12.14	3.45	13.08	12.90
Index						
ACW - Net Div	2.17	-5.36	-5.36	7.28	13.75	13.97
Excess Return (Gross of Fees)	0.57	(6.68)	(6.68)	(3.34)	(0.13)	(0.54)
ACW Health Care - Net Div	4.59	-3.79	-3.79	12.55	13.83	13.96
Excess Return (Gross of Fees)	(1.85)	(8.25)	(8.25)	(8.61)	(0.21)	(0.52)

ARMB Global Healthcare Transformation account as of 03/31/22. All figures in US Dollars. Past performance is not indicative of future results. Performance for most recent month has been finalized.

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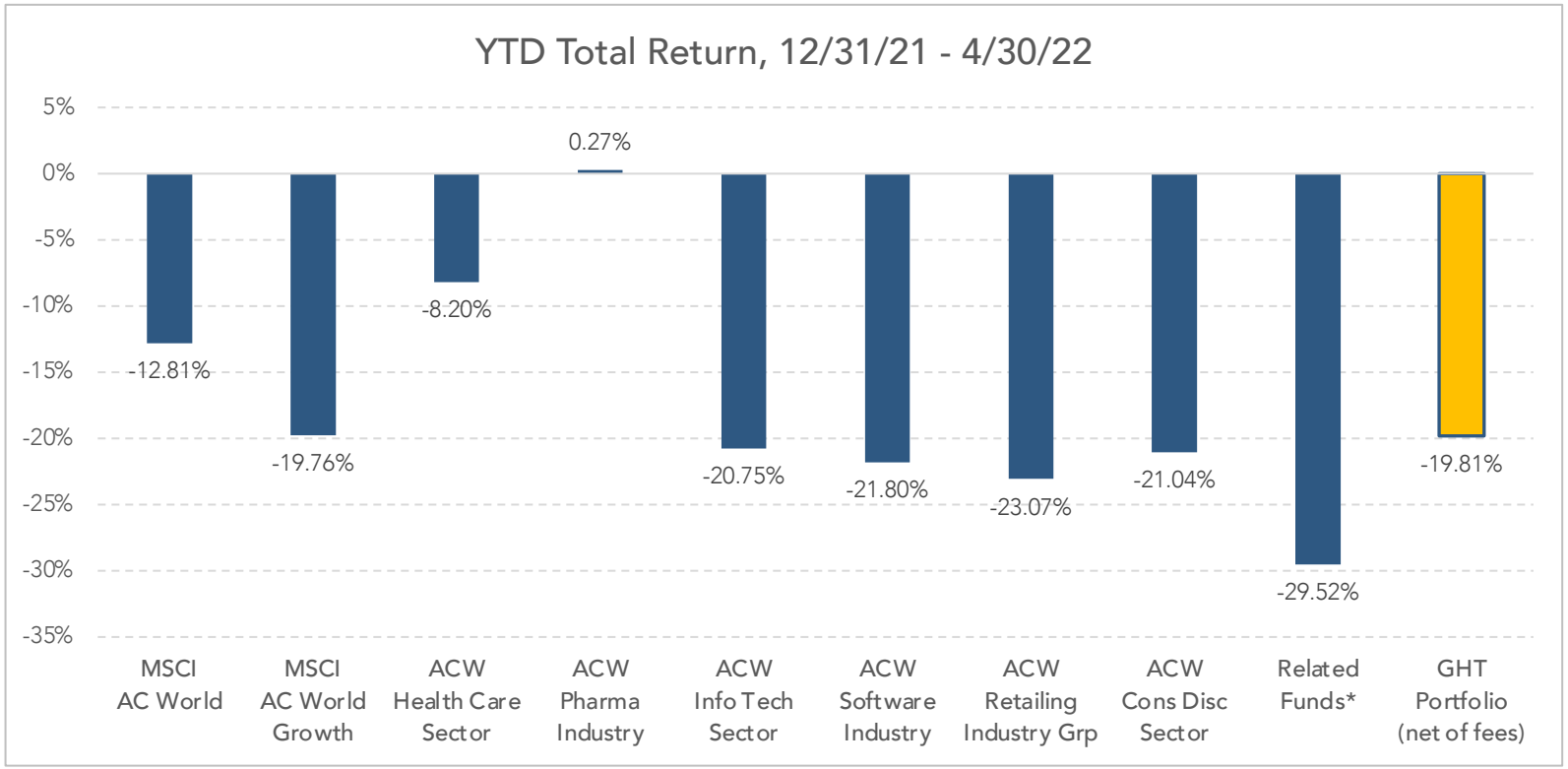
Peer Group Comparison



Source: MSCI, FactSet, 5/23/22.
ACW Sector and Industry Group returns are from MSCI Indices, while Industry returns are from MSCI AC World Brinson attribution in FactSet.
*Average total return of Fidelity Disruptive Medicine (-24.40%), Ballie Gifford Health Innovation Equities Fund (-35.07%) and Robo Global Healthcare Technology Innovation ETF (-29.09%)

Fidelity Disruptive Medicine Fund: Normally investing at least 80% of assets in securities of disruptive medicine companies. Companies within the disruptive medicine theme include but are not limited to those companies that, in the Adviser's opinion, are engaged in robotic surgery, gene therapy, genomics, rare diseases, medical devices and equipment, immunotherapy, technology-based health care platforms, and consumer wellness. Fidelity's disruptive strategies seek to identify innovative developments that could signal new directions for delivering products and services to customers. Generally, these companies have or are developing new or unconventional ways of doing business that could disrupt and displace incumbents over time. This may include creating, providing, or contributing to new or expanded business models, value networks, pricing, and delivery of products and services. In pursuing this investment theme, the fund may invest in companies in any economic sector. Although the fund may invest across economic sectors, the fund concentrates its investments in the health care industries. Normally investing primarily in equity securities. Using fundamental analysis of factors such as each issuer's financial condition and industry position, as well as market and economic conditions, to select investments with quantitative portfolio construction. Investing in either "growth" stocks or "value" stocks or both. Investing in securities of domestic and foreign issuers.

Baillie Gifford Health Innovation Equities Fund: We aim to invest in companies that have the potential to bring substantial improvements to human health and healthcare systems. We believe such companies are best positioned to deliver attractive investment returns over the long term. We also recognize that the most creative companies often lie at the intersection of different disciplines, driven by the convergence of technologies. Therefore, it is critical that we do not limit our scope to the traditional definition of the healthcare sector.

Robo Global Healthcare Technology & Innovation ETF: Provides unique, global exposure to best-in-class companies leading the healthcare technology revolution, across diagnostics, robotics, genomics, precision and regenerative medicine, lab automation, instruments, data analytics, and telehealth. To date, we have identified 9 subsectors in the universe of healthcare technology that carry high growth and earnings potential. The ROBO Global Healthcare Technology & Innovation Index includes more than 80 stocks across 9 subsectors in 15 countries. The Index is built to minimize risk by limiting reliance on the largest-cap players, and to capture the growth of rapidly developing healthcare technology companies around the globe.

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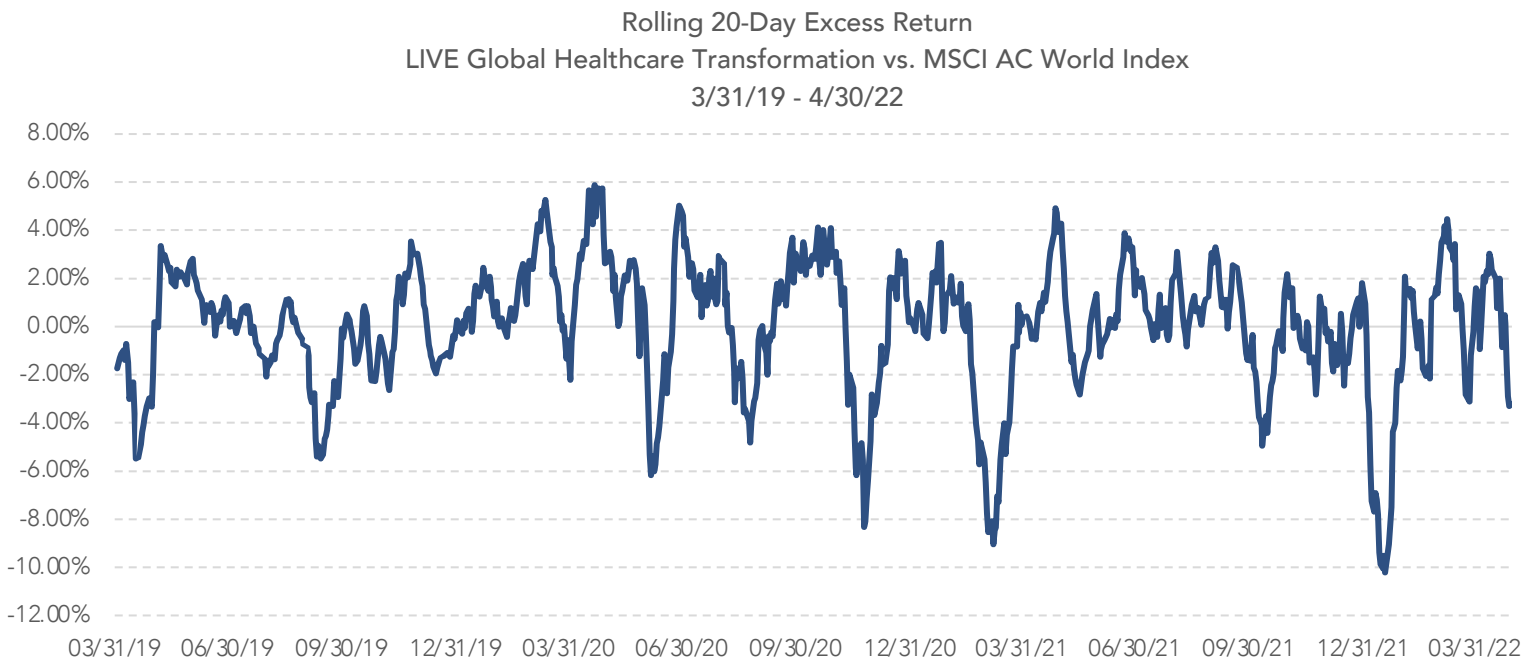
Drawdown Analysis

- The recent drawdown is within the bounds of both live performance (3-year trailing) and pre-launch simulation data*
- Periods of drawdown are to be expected in a portfolio with a tracking error of 11% vs. the MSCI ACW index
- These will occur both on the up and down sides of return



Source: Bloomberg, 5/23/22. Performance calculated using Bloomberg end-of-day holdings data and is not official composite.
* See following page for simulations disclosure.

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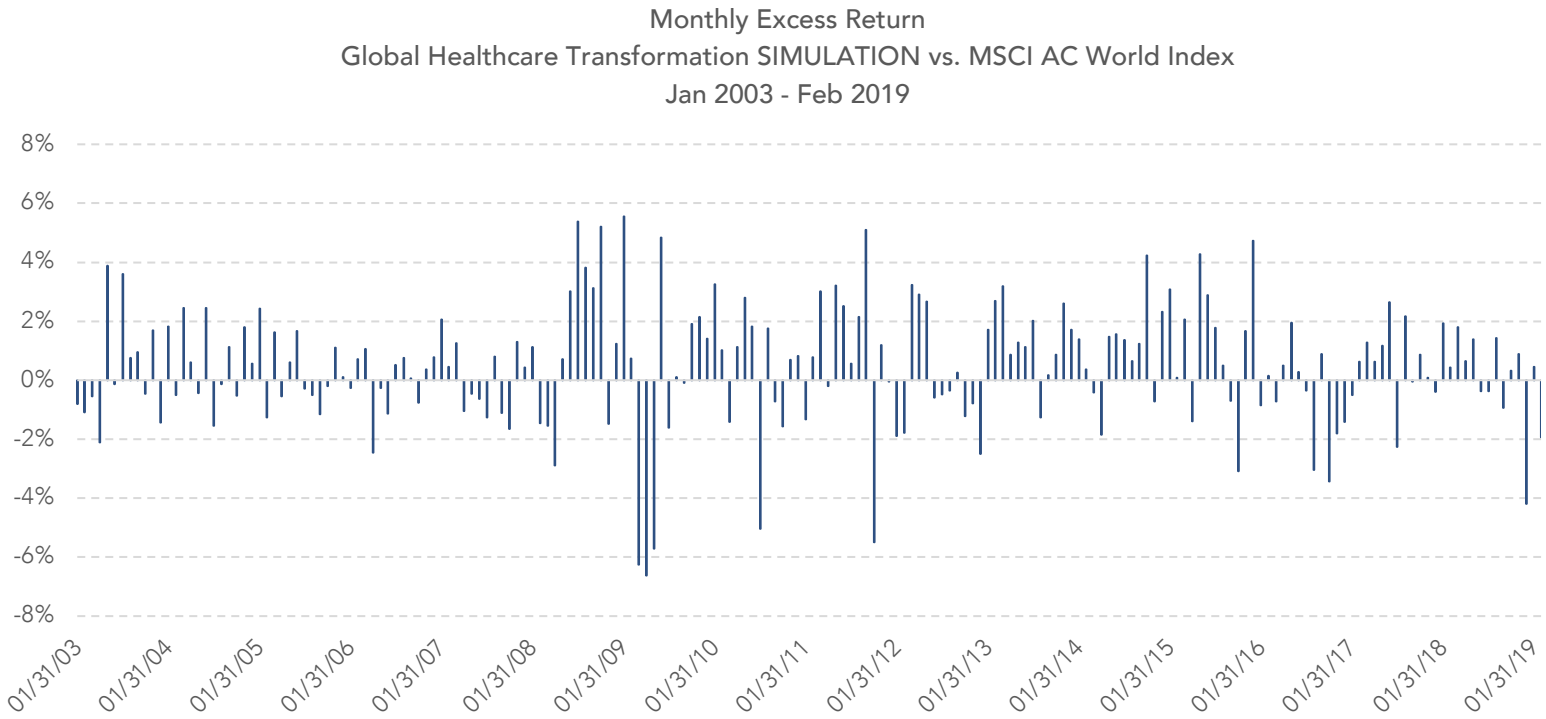
Drawdown Analysis



Simulated performance is NOT an indicator of future actual results. The results reflect the performance of a strategy not historically offered to investors and do NOT represent returns that any investor actually attained. Simulated results are calculated by the retroactive application of a model constructed on the basis of historical data and based on assumptions integral to the model which may or may not be testable and are subject to losses. General assumptions include: McKinley Capital would have been able to purchase the securities recommended by the model and the markets were sufficiently liquid to permit all trading. Changes in these assumptions may have a material impact on the simulated returns presented. Certain assumptions have been made for modeling purposes and are unlikely to be realized. No representations and warranties are made as to the reasonableness of the assumptions. This information is provided for illustrative purposes only. Simulated performance is developed with the benefit of hindsight and has inherent limitations. Specifically, simulated results do not reflect actual trading or the effect of material economic and market factors on the decision-making process. Since trades have not actually been executed, results may have under- or over-compensated for the impact, if any, of certain market factors, such as lack of liquidity, and may not reflect the impact that certain economic or market factors may have had on the decision-making process. Further, simulation allows the security selection methodology to be adjusted until past returns are maximized. Actual performance may differ significantly from simulated performance. Simulated results are adjusted to reflect the reinvestment of dividends and other income and, except where otherwise indicated, are presented gross-of fees and do not include the effect of simulated transaction costs, management fees, performance fees or expenses, if applicable. Please note all regulatory considerations regarding the presentation of fees must be taken into account. No cash balance or cash flow is included in the calculation.

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Looking Ahead

- We believe healthcare transformation will see significant flow of investment dollars and drive the return of those companies
- We expect to see outsized moves in our portfolio holdings as a result of their lower market cap and liquidity vs. other more traditional healthcare names
- We believe that markets are distracted by the noise of war and challenges related to interest rates and inflation
- As this noise subsides, we believe revenue/earnings growth of healthcare transformation subset is likely to reassert leadership in the market

Past performance is not indicative of future returns.
See full disclosure at end of presentation.

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“

McKinley believes in the long-term attractiveness of Global Healthcare Transformation as a standalone equity investment, especially given its low correlation to other categories of stocks. We have found that clients are generally interested in placing this thematic strategy within equity, special opportunities and/or liability offset portions of their asset allocation.

Questions?

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Callan

June 2022

Alaska Retirement Management Board

Private Credit Education and Implementation

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Catherine Beard, CFA
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- Private Credit Program Design
- Private Credit Manager Selection and Due Diligence
- Private Credit Portfolio Implementation

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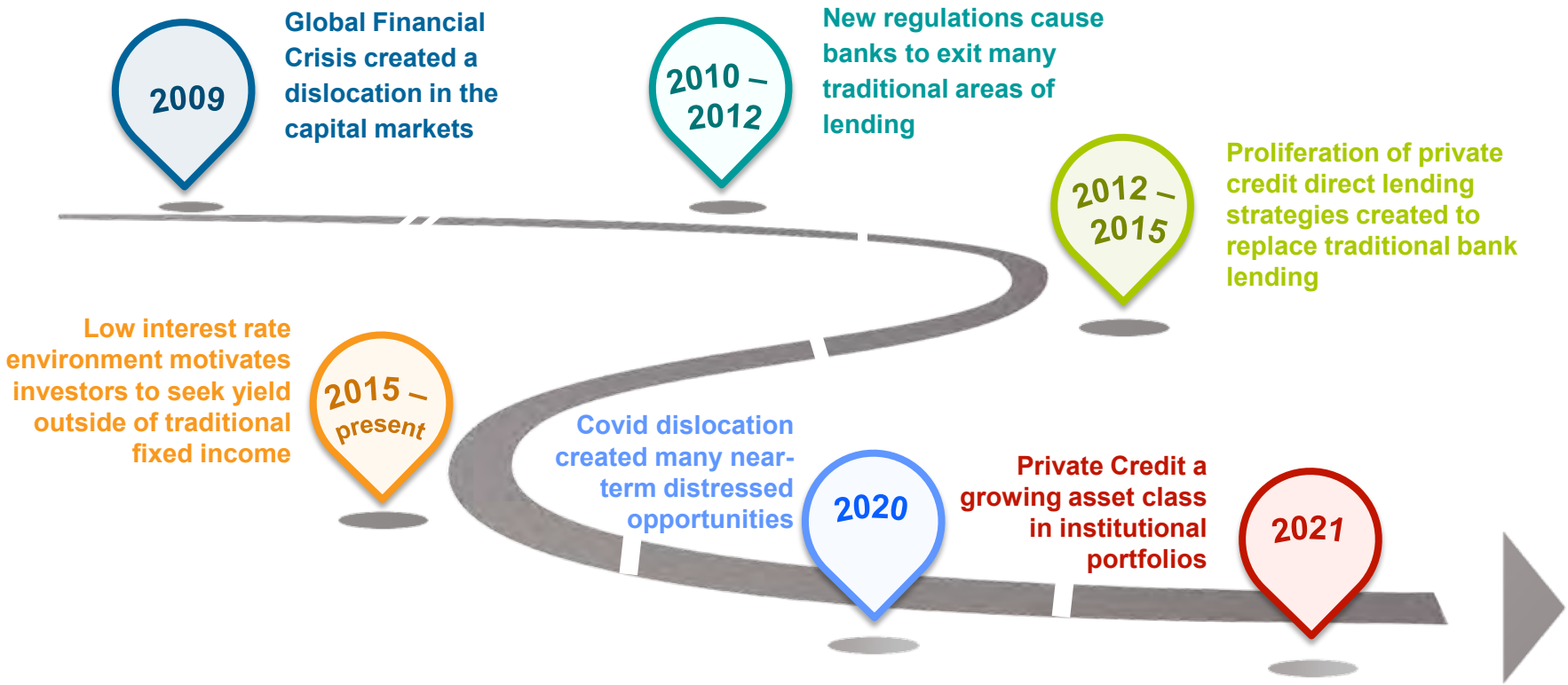
- Standard 2022-2031 Capital Market Expectations

Callan

Private Credit Review

What is Private Credit?

A growing and diverse asset class which largely invests in private loans that are not publicly traded. These assets are typically rated below investment grade or not rated and are generally invested in through closed-end fund vehicles.



A Comparison of High Yield Bonds and Private Loans

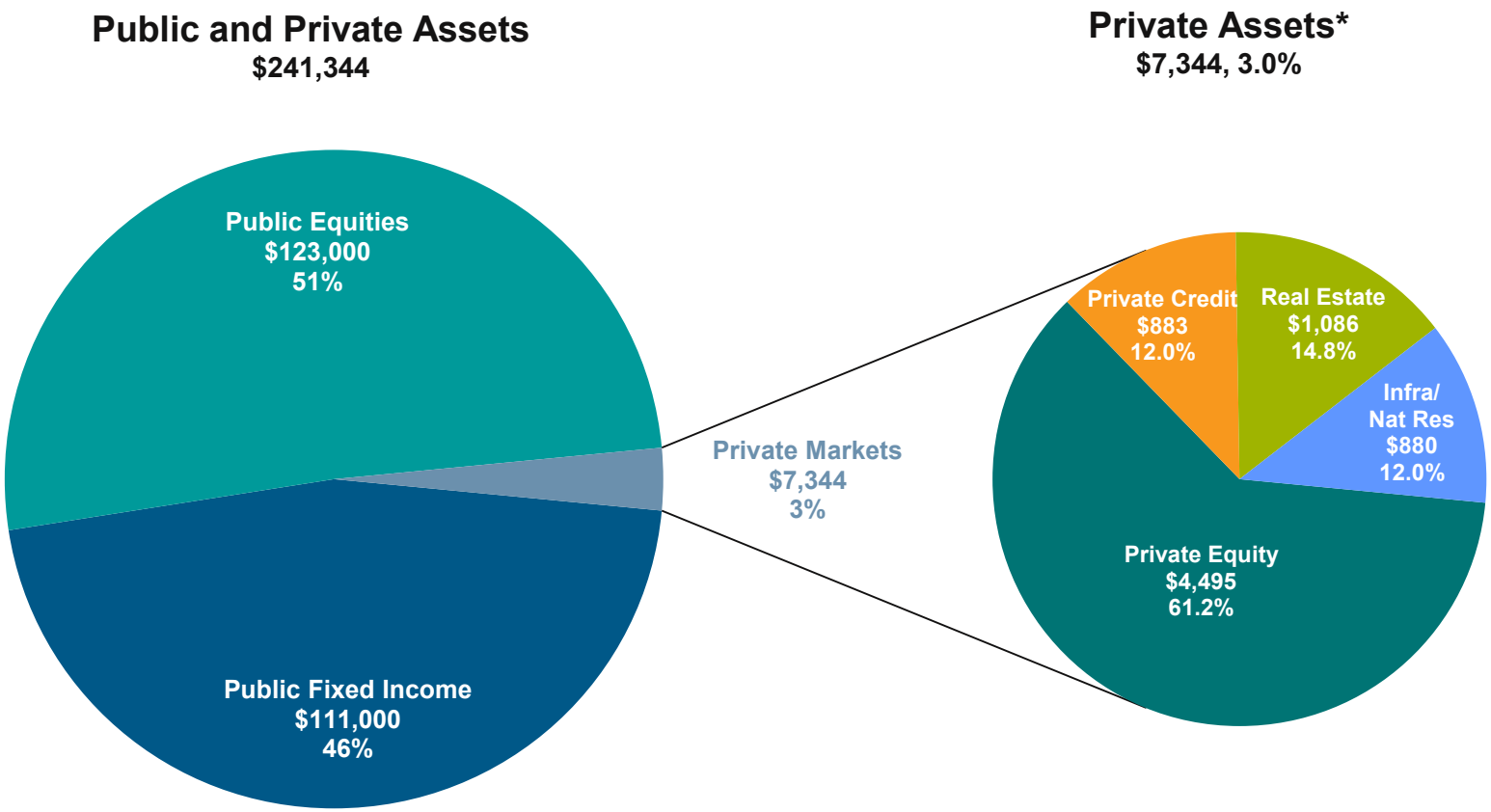
	High Yield Bonds	Private Loans
Liquidity	Liquid	Illiquid
Maturity	7 – 10 yr	3 – 5 yr
Interest rate	Fixed	Floating
Number of lenders	Multiple (syndicated)	One or small club (2 – 4)
Originators	Large banks	Private credit managers
Cash distributions	Quarterly	Quarterly
Covenant protection	Little to none	Moderate
Underlying collateral	Corporate	Corporate or other
Return drivers	Coupon and capital appreciation	Coupon, illiquidity premium up-front fees, capital appreciation

- Private loans are typically floating rate, providing a cushion against the impact of rising interest rates
- Since private loans are directly negotiated and often have less competition, creditor protections are typically stronger, with more debt covenants
- Primary risks of private loans include illiquidity and higher credit risk, as borrowers are typically smaller and less established companies

Size of the Private Credit Market

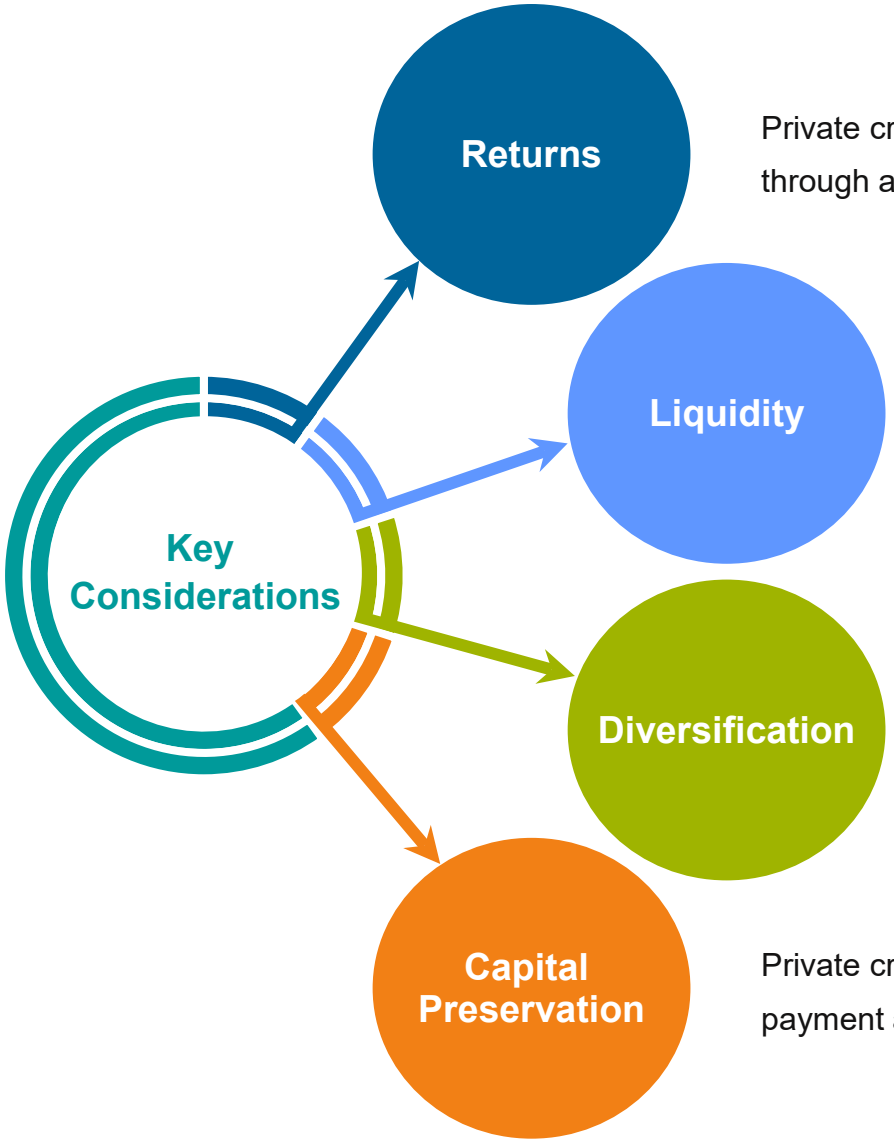
Private credit estimated ~$900 billion*, or 12% of the $7.3 trillion in private market assets

Public and Private Market Assets Under Management as of June 30, 2021 ($billion)



Percentages shown as a % of private assets
Source: McKinsey analysis, Preqin, SIFMA
* More recent figures estimate Private Credit market at **$1.0 - $1.2 Trillion** (Source: Bloomberg)

Callan's Framework for Private Credit Investing



Private credit strategies generate returns in excess of traditional fixed income through additional compensation for illiquidity and complexity.

Private credit is less liquid than traditional fixed income. Cash coupon distributions from some strategies help mitigate this illiquidity.

Private credit strategies are diversified by sub-strategy, industry, geography, and underlying collateral.

Private credit assets are structured to limit capital loss through priority of payment and other legal protections compared to equity holders.

Private Credit Strategies

Core

Direct Lending

Senior secured commercial loans used to finance general business operations, specific projects, or growth opportunities. Includes sponsor and non-sponsor related lending

Mezzanine/Junior Capital

Commercial direct loans below first lien; often includes a portion of preferred and common equity

Structured Credit

Pools of corporate and other asset backed loans including corporate, consumer and residential-related structures

Opportunistic

Distressed/Special Situations

Investments across the capital structure in stressed or distressed companies, often with the intention of creating value through active restructuring. Includes special situations such as legal or market driven events

Multi-Strategy

All inclusive strategy investing in multiple subcategories. Allocations to sub-sectors may change opportunistically over time

Niche

Specialty Finance

Origination or purchase of loans backed by more esoteric forms of collateral, usually requiring specialized expertise

Other Niche

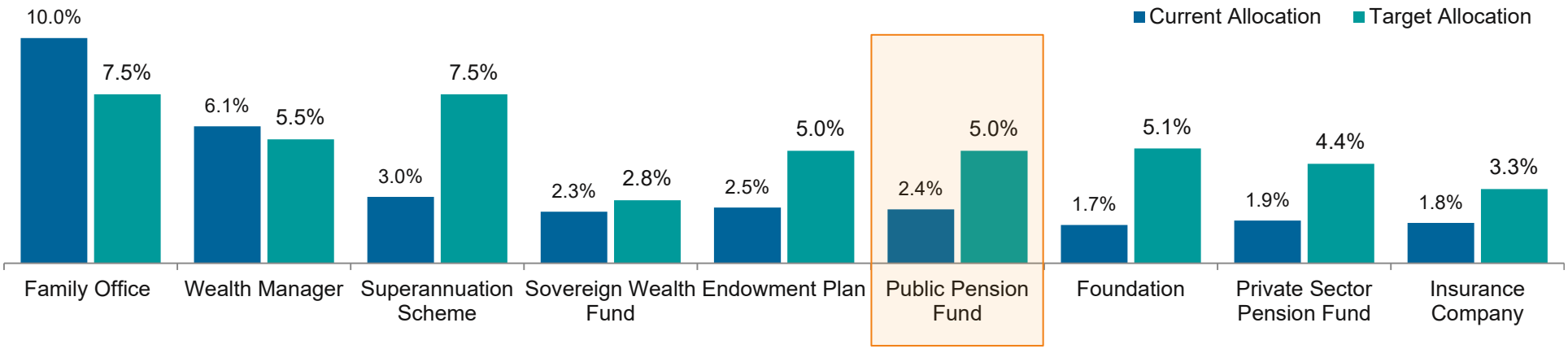
Debt related investing in niche sectors such as insurance and health care royalties

- Diverse asset class that provides investors exposure to credit investments in closed-end or evergreen funds
- Rapid growth since the GFC, filling a vacuum created when traditional banks exited a number of lending areas

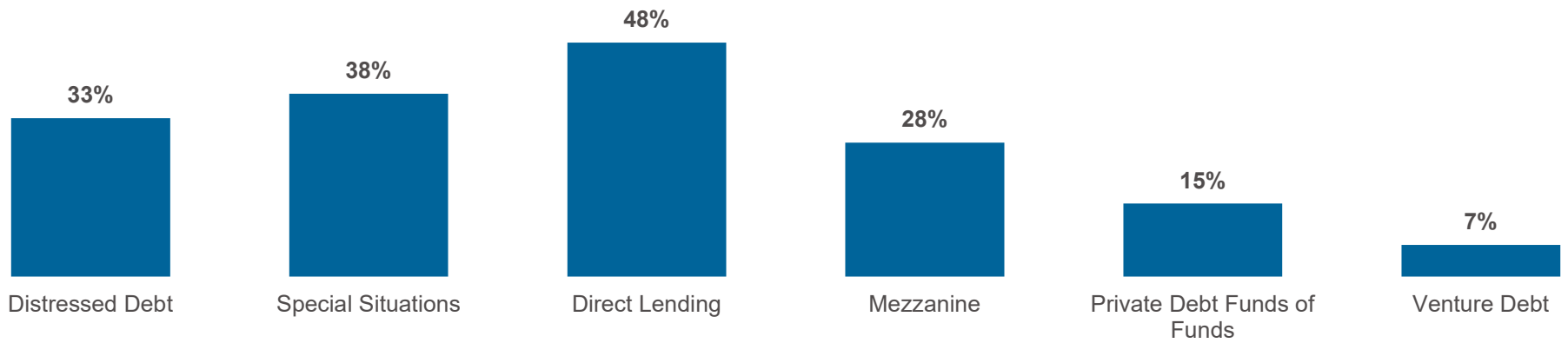
Private Demand by Asset Class

A Preqin study from late 2021 showed target Private Credit allocations between 3 and 10%, with most interest in direct lending, special situations, and distressed debt strategies.

Investor Median Current and Target Allocations by Type



Fund Types Viewed as Best Opportunities Over Next 12 Months*



Source: Preqin 2021 Annual Private Credit Study

Private Credit Landscape

Overview

Attractive relative value drives demand

- As credit spreads have compressed, investors have pushed into private credit (PC) in search of yield
- PC vintages 2008-18 generated 8.3% median net IRR with a standard deviation of only 6.1%
- Preqin survey shows investors find direct lending, mezzanine, and special situations as among best PC opportunities
- Distressed debt opportunities were active during the brief Covid dislocation but aggressive government stimulus led to a quick recovery in credit markets

Themes

Investor appetite

- Investor demand remains strong; 35% of investors polled by Preqin say they are allocating to PC
- Average investor target allocation to PC is 6.2%
- Majority of investors polled say PC returns have met expectations
- About 40% of investors polled intend to commit more capital to PC over next 12 months

Investor expectations

- Private credit is seen as fairly valued
- Rising rate environment should be supportive for PC due to floating rate structures
- According to recent Preqin poll, investors see competition for lending opportunities, regulation, and geopolitical backdrop as potential headwinds for strong PC returns

Observations

- We see continued strong PC demand in a low-yield but rising rate environment for core fixed income
- As manager and strategy dispersion are high, careful manager selection is paramount
- Direct and opportunistic lending strategies positioning for a potential recession in 12-24 months
- Multi-strategy funds provide an attractive all-weather investment solution and may be better positioned to pursue tactical distressed opportunities should they arise
- Growing interest in niche, diversifying strategies to complement a core direct lending or mezzanine portfolio and drive higher yields and total returns

Private Credit Fundraising Landscape

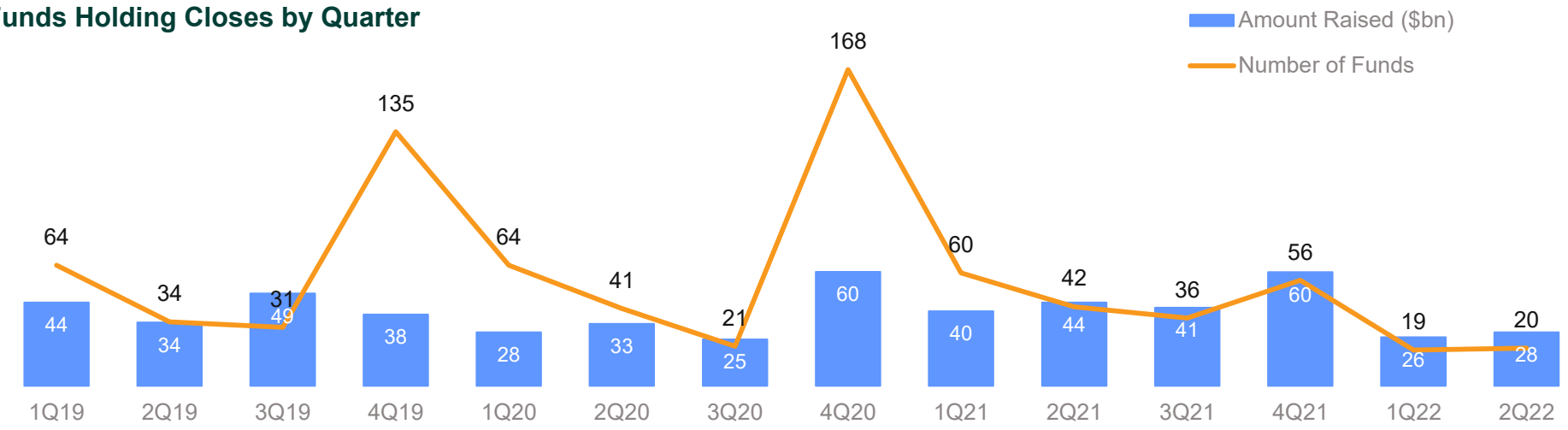
Fundraising activity remains strong through 1Q22

- As interest rates declined after the GFC private credit has attracted increased interest from institutional investors.
- Private credit fundraising was robust leading into the Covid dislocation with a particular focus on direct lending and distressed strategies.
- For mature private credit programs demand is increasing for diversifying strategies to capture opportunities outside of traditional sponsor-backed direct lending.

Largest Funds Holding Closes in 1Q22

Name	Amount ($millions)	Strategy
Blackstone Capital Opportunities Fund IV	$8,750	Credit Special Situations
Crescent Direct Lending Fund III	$6,000	Direct Lending
Crestline Opportunity Fund IV	$2,500	Credit Special Situations
Varde Fund XIV	$2,000	Distressed Debt

Funds Holding Closes by Quarter



Source: Pitchbook

Callan

Private Credit Program Design

Alternative Investment Consulting Philosophy

Combine a long-term perspective with proven investments

We help clients…

Achieve success

by integrating unique and compelling opportunities with a customized plan

Improve returns

by selectively targeting high-quality investments, negotiating fees, and avoiding fads

Control risk

through rigorous due diligence, prudent diversification and comprehensive monitoring

Through an implementation approach focusing on…

Program Design

Design bespoke program based on each client's unique attributes and risk/return objectives

Investment Planning

Budget capital consistently and build a diversified portfolio; avoid chasing a target

Monitoring & Reporting

Closely monitor managers post-closing and report progress towards program goals

Manager Selection

Select resilient and differentiated managers to successfully implement the investment plan

Private Credit Program Design

Road map for designing bespoke private credit portfolios that meet the client's investment objectives

Key Objectives

- Establish clear investment and operational goals and objectives
- Assess current program structure relative to objectives
- Design a strategic roadmap to achieve investment and operational goals

Client Objectives

- Target allocation to private credit
- Target return, yield, and liquidity
- Strategy diversification

Processes

- Document collection and review
- Stakeholder discussions
- Draft investment and operational strategic plan
- Review and adopt strategic plan
- Implement strategic plan

Client Deliverables

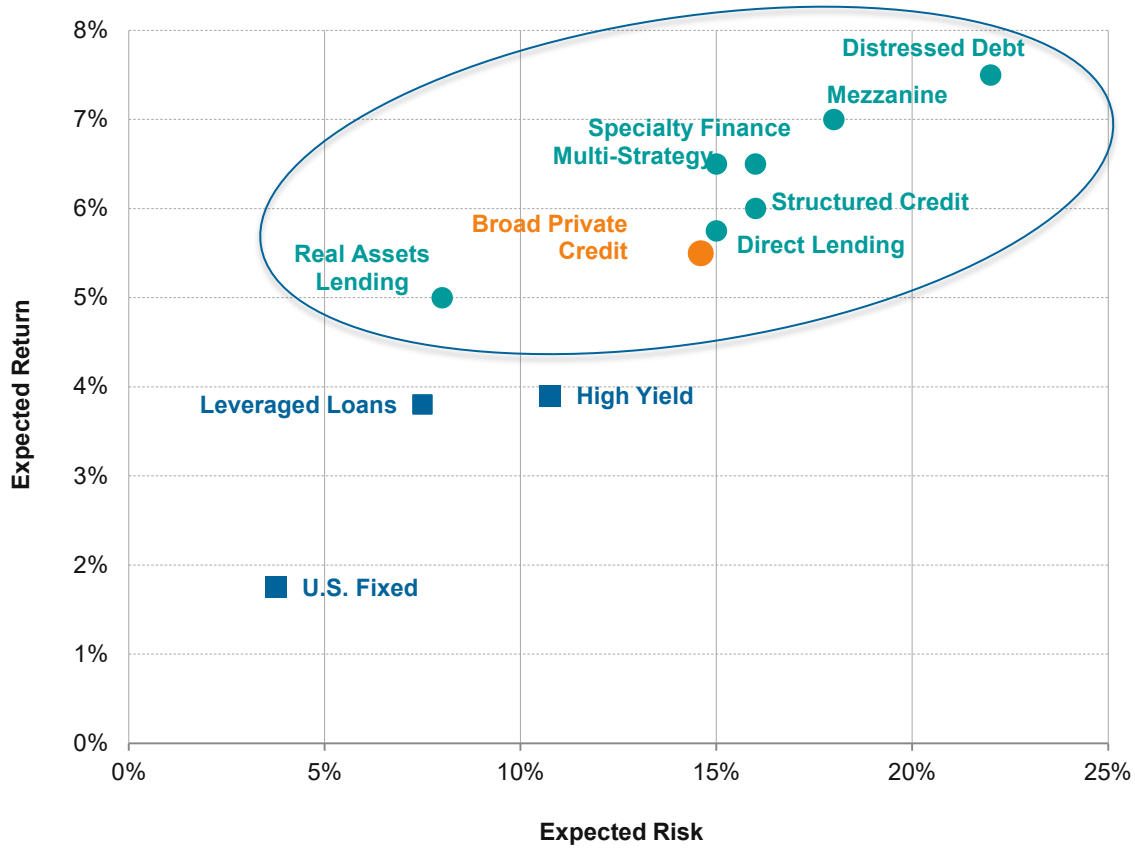
- Strategic goals and objectives
- Program assessment and gap analysis
- Investment and operational strategic plan
- Investment policy statement
- Budget/spend, ESG/DEI, and other goals assessment

Private Credit Strategies

2022–2031 Capital Market Assumptions

- Continued strong private credit demand in low-yield and rising rate environment
- Resilience in direct lending portfolios with strong portfolio performance, robust pipelines, and contracting economics
- Distressed cycle muted post-dislocation but new opportunities starting to emerge
- Multi-strategy funds: an all-weather investment solution with optionality to pursue distressed
- Continued evolution of pockets of opportunity, particularly in niche, diversifying areas

Expected Risk/Return Profile by Private Credit Asset Strategies



Source: Callan 2022-2031 Capital Market Assumptions

Callan Capital Markets Assumptions 2022–2031

Under Callan's capital markets assumptions, private credit's projected return is **5.50%**, 160 bps above liquid high yield bonds and 250 bps below private equity.

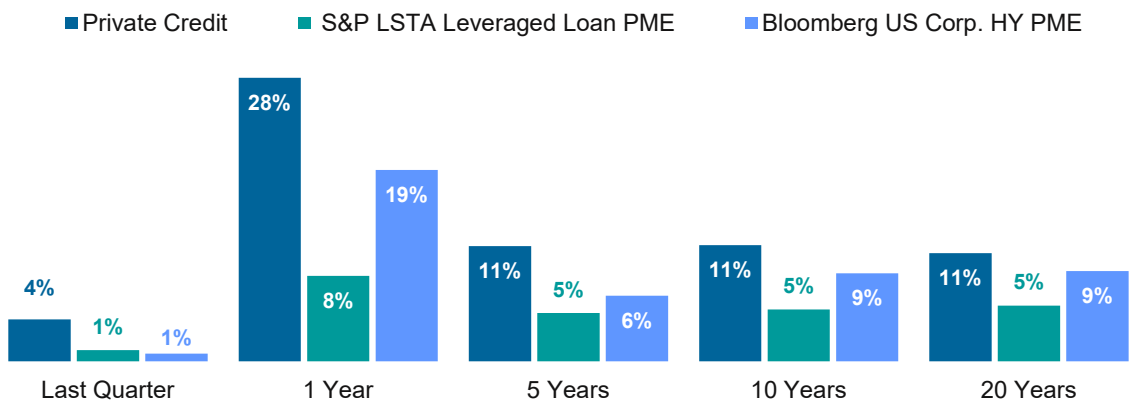
		Projected Return			Projected Risk
Asset Class	**Index**	**1-Year Arithmetic**	**10-Year Geometric***	**Real**	**Standard Deviation**
High Yield	Bloomberg High Yield	4.40%	3.90%	1.65%	10.75%
Private Credit	50% High Yield / 50% S&P LSTA**	6.40%	5.50%	3.25%	14.60%
Private Equity	Cambridge Private Equity	11.45%	8.00%	5.75%	27.60%

* Geometric returns are derived from arithmetic returns and the associated risk (standard deviation).
** No widely used private markets benchmark available for Private Credit overall

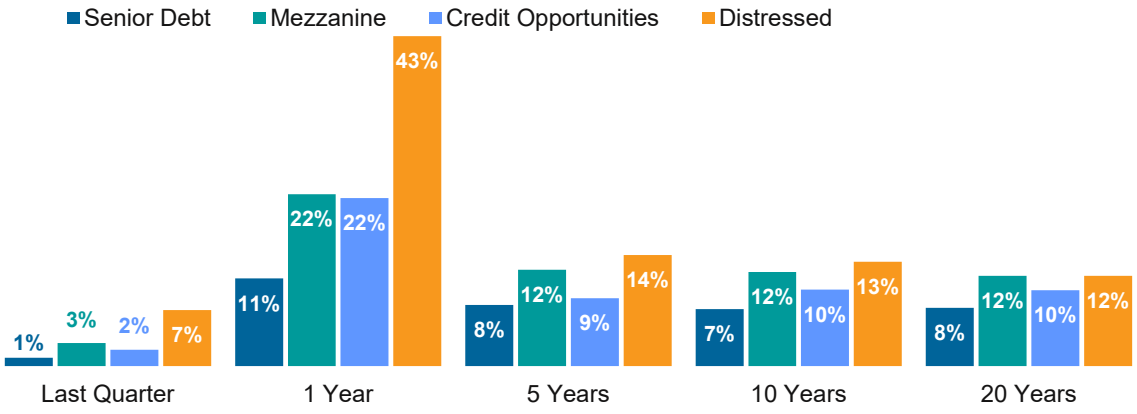
Historical Private Credit Performance

- On average, Private Credit has historically generated net IRRs of 8% to 10%.
- Private credit performance varies across sub-asset class and underlying return drivers.
- Higher-risk strategies such as Mezzanine and Distressed have had higher returns than lower-risk strategies such as Senior Debt.
- Senior Debt strategy returns are driven primarily by coupon income with less equity upside than higher-risk strategies.

Pooled Horizon Net IRRs as of September 30, 2021



Pooled Horizon Net IRRs by Strategy as of September 30, 2021



* PME: Public Market Equivalent, a benchmark that applies the cash flows of the private credit funds to a public market index and then calculates an IRR.
Source: Refinitiv/Cambridge

Private Credit Benchmarking Best Practices

Three primary benchmark methodologies

Absolute Return

- Investor chooses a minimum absolute return hurdle (e.g., 8%) for a fund or program to be deemed successful
- Should be measured over the full life of the fund
- May vary by strategy type (direct lending vs. distressed)

Peer Group Comparison

- Few are broadly accepted
- Partnerships classified by vintage year and strategy
- Seeks to allow “apples-to-apples” comparison, yet significant flaws and biases still exist
- With a few exceptions (direct lending, mezzanine), most strategies are relatively new and/or heterogeneous, making benchmarking difficult

Public Markets Index + Premium

- Typically a below-investment grade fixed income benchmark (Bloomberg High Yield or S&P LSTA)
- Most investors apply a spread (typically 100-200 bps) to reflect the expected illiquidity and complexity return premium
- Index can be used to create a PME (public market equivalent) benchmark to reflect opportunity cost vs. public markets

Benchmark comparisons should be made on a “net-net” basis (net of all fees, expenses, and carried interest)

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Private Credit Due Diligence and Manager Selection Process

Considering Private Credit Risks

Careful manager selection helps to mitigate these risks

Underperformance Risk	Determine whether a manager has the resources, staffing, expertise to generate targeted returns in a particular strategy
Risk of Capital Loss	Look for proven ability of manager to minimize downside risk and preserve capital, through disciplined credit underwriting, ongoing monitoring and risk management, and structuring loans with appropriate covenant protections designed to trigger in times of borrower stress
Business Risk	Assess the stability of the underlying business of the manager, looking at leadership, governance, incentive alignment, asset valuation, compliance, and other internal controls
Strategy Risk	Consider the investment strategy relative to the market opportunity and determine whether the demand for capital in the strategy equals or is greater than the underlying supply

Investment Due Diligence Process

Callan follows a consistent and thorough due diligence process

Screening

Maximize investable universe

- Develop global fund universe
- Formulate key screening criteria
- Proactive manager outreach & meetings

Global Forward Calendar

Initial Analysis

Develop investment thesis for targeted strategy

- Collect & review of offering materials
- Meet senior investment team
- Peer group benchmarking

Fund Offering Factsheet

Quantitative Analysis

Quantitative validation of investment thesis

- Performance attribution and PME analysis
- Historical fund sensitivity analysis
- Prior fund operating metrics review

Historical Performance Attribution Analysis

Advanced Review

Qualitative validation of investment thesis

- Onsite meeting(s) with senior team
- Assess firm, team, process and terms; business management and operations
- Legal, regulatory & compliance review

Draft Diligence Report

Final Due Diligence

Present formal recommendation

- Alternatives Review Committee
- Reference checks
- Legal & closing support

Final Diligence Report/ Recommendation

- All recommendations are reviewed by Callan's Alternatives Review Committee
- Callan is open to considering client-sourced opportunities and would utilize the same due diligence process
- The due diligence process will be modified as needed to conform with Client's procurement procedures

Operational Due Diligence

Assessment of operational risks seek to reduce risk and mitigate losses from operations

Firm Structure, Governance and Alignment

- Organizational Structure
- Decision-Making Process
- Ownership Structure
- Role of LPAC
- Reputational Risk
- Distribution of Economics
- Professional Turnover
- Co-Investments

Compliance and Legal Assessment

- Compliance Team Structure
- Regulatory Oversight and Review
- Document Review – Compliance Manual, Code of Ethics, etc.
- Conflicts of Interest
- Historical and Active Litigation
- LPA and Side Letter Compliance
- Legal Venue

Internal and Financial Controls

- Operations Team Structure
- Review of Outsourced Functions
- Valuation Policy and Procedures
- Accounting Standards
- Cash Controls/ Expense Allocation
- Valuation Policy and Procedures
- Review Auditor and Audit Opinions
- Reporting Transparency

Other Areas of Assessment

- ESG and DEI
- Fund Terms and Conditions
- Disaster Recovery Procedures
- IT Infrastructure
- Allocation Policy
- Insurance Coverage
- Third-Party Providers
- Background checks*

* Background checks by request of client. Expenses may be allocated to clients for background checks.

Legal Due Diligence

Focus on business terms and conditions relative to market standards

Fund Structure

- Investment Period
- Fund Term
- Extensions
- Capital Reinvestment

Governance

- Legal Venue
- Fiduciary Duty
- Role of LPAC
- Amendments

Management

- Fund Guarantees
- Key Person Provision
- Investment Guidelines
- Credit Facility

Alignment of Interest

- GP Commitment (amount and funding)
- Fee Structure
- Conflicts of Interest
- Carried Interest Allocation

LP Rights

- Removal of GP
- Fund Dissolution
- Investment Period Suspension
- Co-Investment Allocation

Fees and Expenses

- Offsets and Exclusions
- Management Fee & Carried Interest
- Fee Allocation
- Partnership Expenses

Waterfall

- Type (European vs. American)
- Calculation
- GP/LP Catch-Up
- Clawback

Reporting

- Transparency
- Timeliness
- Audit Process
- Valuation Process

- Review legal documentation for deviations from ILPA principles and general market terms
- Callan private equity fees and terms study utilized to understand market conditions and trends across key private equity terms.

Private Credit Manager Selection

Callan prefers strategies that emphasize differentiated sourcing, capital preservation, and avoidance of realized credit losses, without relying on excessive leverage to drive returns.

Style Preferences

Seniority

Primary exposure to well-collateralized first lien, senior secured loans; managers that move down in capital structure should have structural protections to avoid losses

Modest Leverage

Portfolio level leverage between 0.5x and 1.5x; leverage should not be primary driver of returns

Yield Enhancement

Significant yield premium from complexity and illiquidity

Full Cycle Strategies

Experience avoiding credit losses during downturns; can restructure companies if necessary

Style Avoidance

Market Structure

New entrants, lack of experience working through credit downturns

Sourcing

Inferior deal origination capabilities

Differentiation

Undifferentiated, non-core strategy for sponsor

Capital Supply

Areas where there is an oversupply of capital

Private Credit Manager Selection

Key elements of manager selection criteria by strategy

Direct Lending/ Mezzanine

- Broad loan origination capabilities (sponsored or non-sponsored)
- Credit underwriting discipline
- Avoidance of realized credit losses through structural protections

Structured Credit

- Low loan principal loss rates
- Clean collateral packages
- Strong asset management capabilities aimed at maximizing cash flows, self-amortizing assets

Distressed Debt/ Special Situations

- Strong investment and legal infrastructure for controlling, managing reorganization process
- Experience in driving value through a restructuring

Niche/Specialty Finance

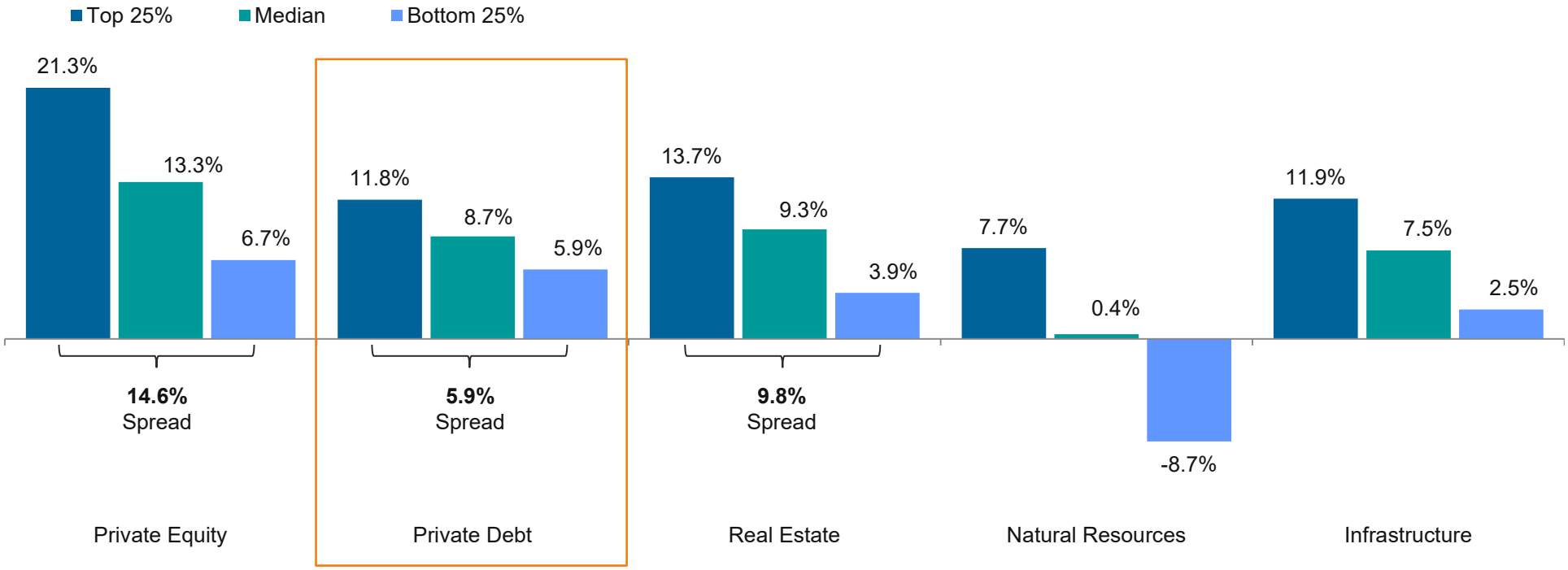
- Deep domain knowledge
- Competitive advantage in sourcing model
- Risk-adjusted yield advantage, including complexity premium, relative to core private credit

Multi-Strategy

- Demonstrated ability to add value through exposure to various underlying strategies
- Global reach and ability to be flexible with capital allocation
- Deep, experienced teams within each primary sector

Importance of Private Credit Manager Selection

Global fund median IRR and percentile spreads by asset type, net IRR to date through 9/30/2020, for vintage 2007-17 funds



Methodology: Internal rate of return (IRR) spreads calculated for funds within vintage years separately and then averaged out. Median IRR was calculated by taking the average of the median IRR for funds within each vintage year.

- While historical return dispersion of Private Credit managers is tighter than for other private asset classes, manager selection is still important to making a successful Private Credit allocation.

Source: Burgiss

Callan Alternative Investments Team

Private equity, private energy, private credit, and marketable alternatives

14	Dedicated team members	**$29bn**	Capital commitments underwritten (2018–2021)
17	Average years of experience	**>500**	Manager research meetings per year

Private Credit

Private Equity and Energy

Marketable Alternatives

Pete Keliuotis, CFA	David Smith, CFA, CTP	Chrissy Mehnert	Catherine Beard, CFA
Ashley DeLuce, CAIA	Aidan Davison	Roxy Quinn	Sean Lee, CFA
Gary Robertson	Jonathan Farr, CFA	Kristin Bradbury, CFA	Joe McGuane, CFA
		Jared Ungar*	David Welsch, CFA

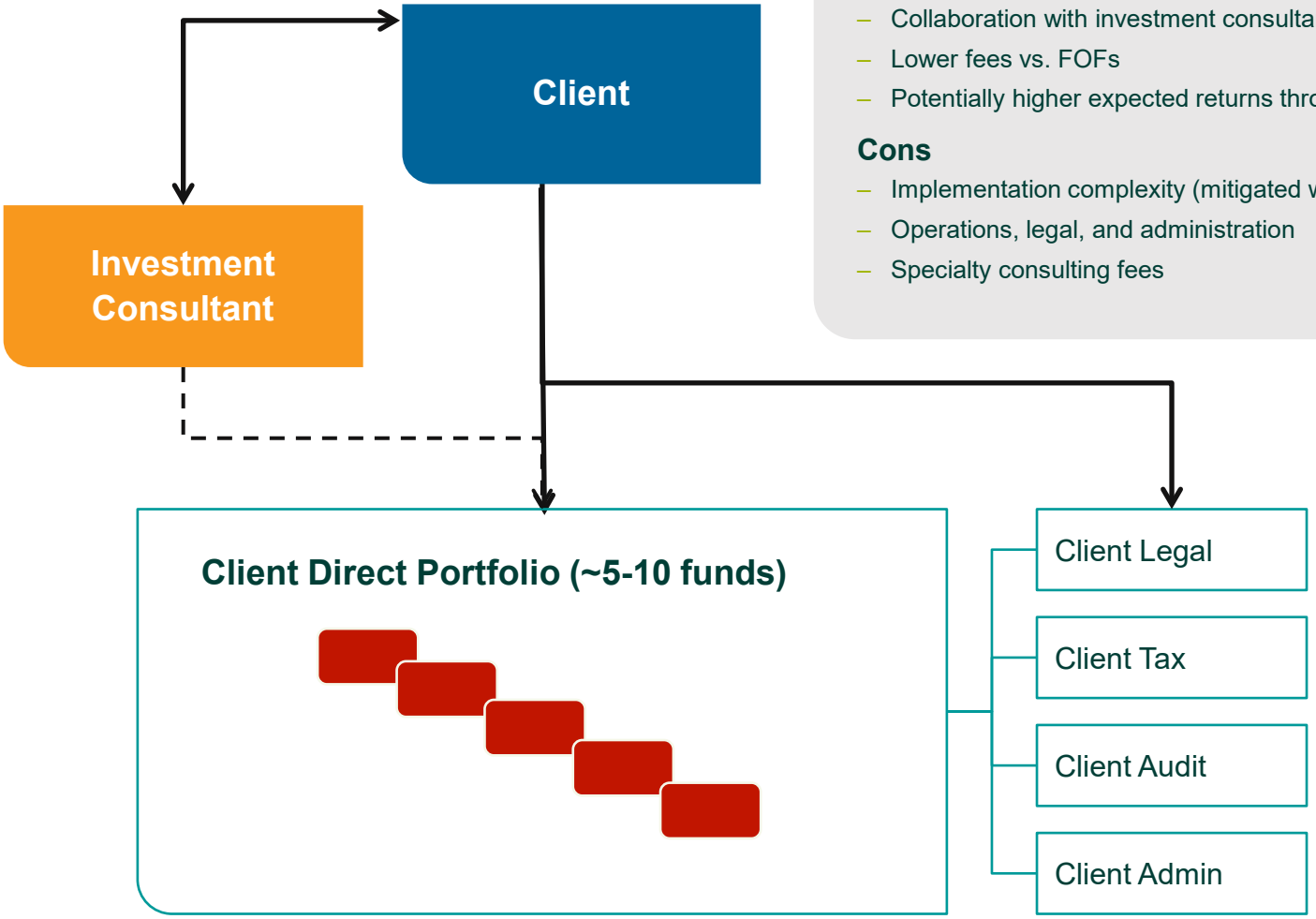
*Not pictured. **Member of Callan's IAG team
Does not include 3 MAC specialists in Callan Capital Market Research group

Callan

Private Credit Portfolio Implementation

Preferred Option: Direct Program

Collaboration on portfolio construction & manager selection



Client responsible for legal & admin at portfolio level, not fund level

Pros

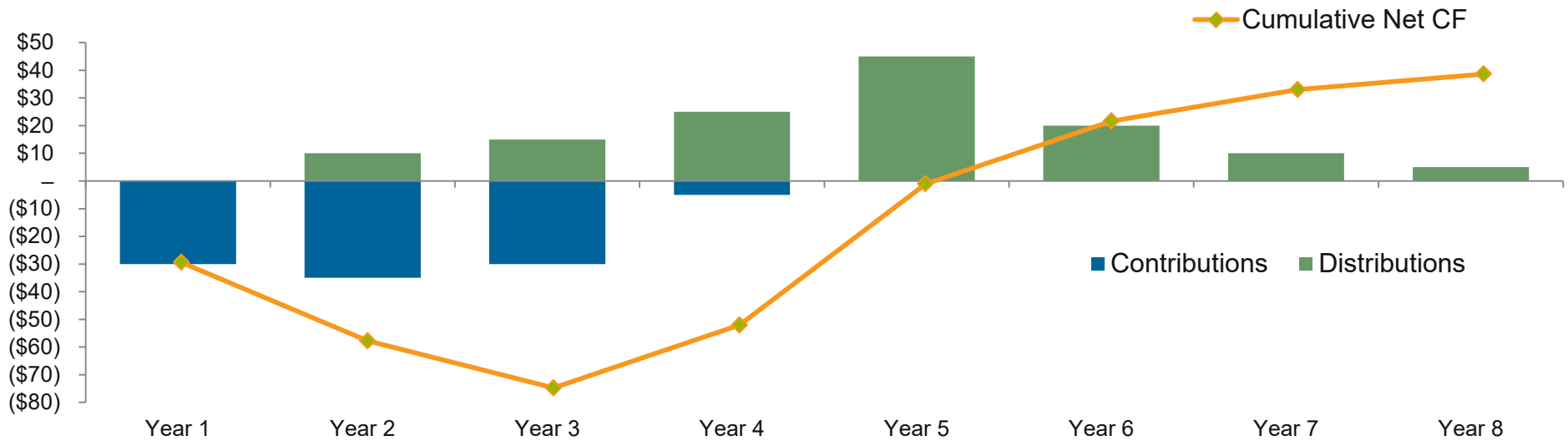
- Client retains authority over manager selection and portfolio construction
- Broader opportunity set of strategies
- Collaboration with investment consultant to help source and monitor fund ideas
- Lower fees vs. FOFs
- Potentially higher expected returns through more concentrated portfolio

Cons

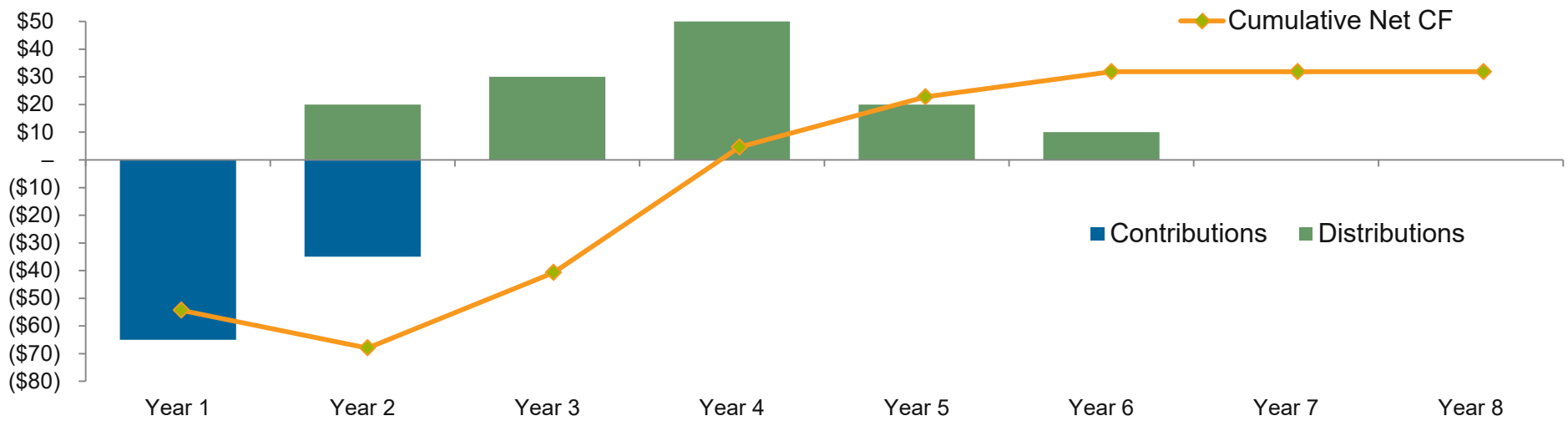
- Implementation complexity (mitigated with evergreen fund structures)
- Operations, legal, and administration
- Specialty consulting fees

Comparative Timelines of Direct Program: Closed-End vs. Evergreen

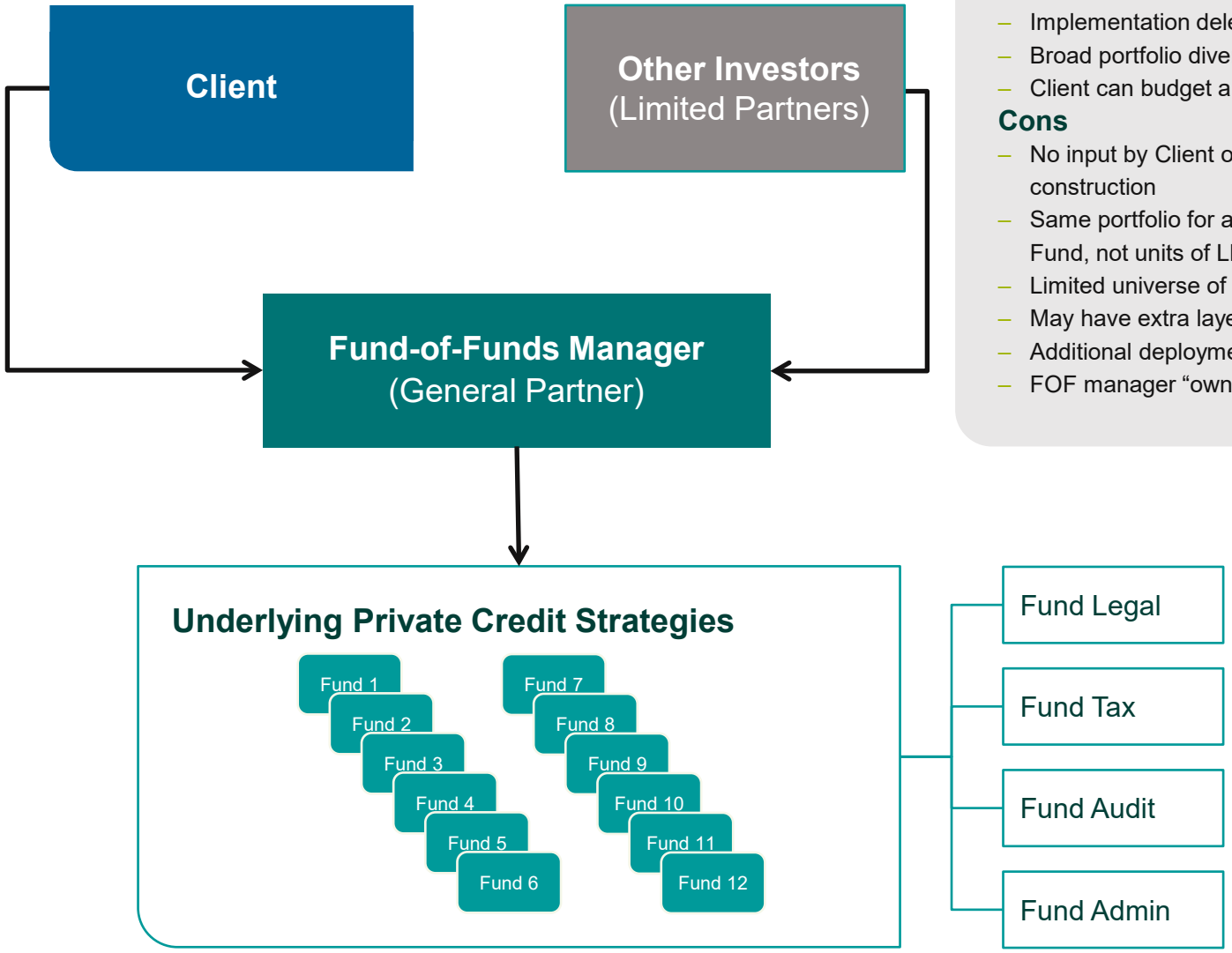
Annual cash flows for a CLOSED END fund commitment (illustrative)



Annual cash flows for an EVERGREEN/SMA fund commitment (illustrative)



Alternative Option #1: Fund-of-Funds (commingled)



Pros

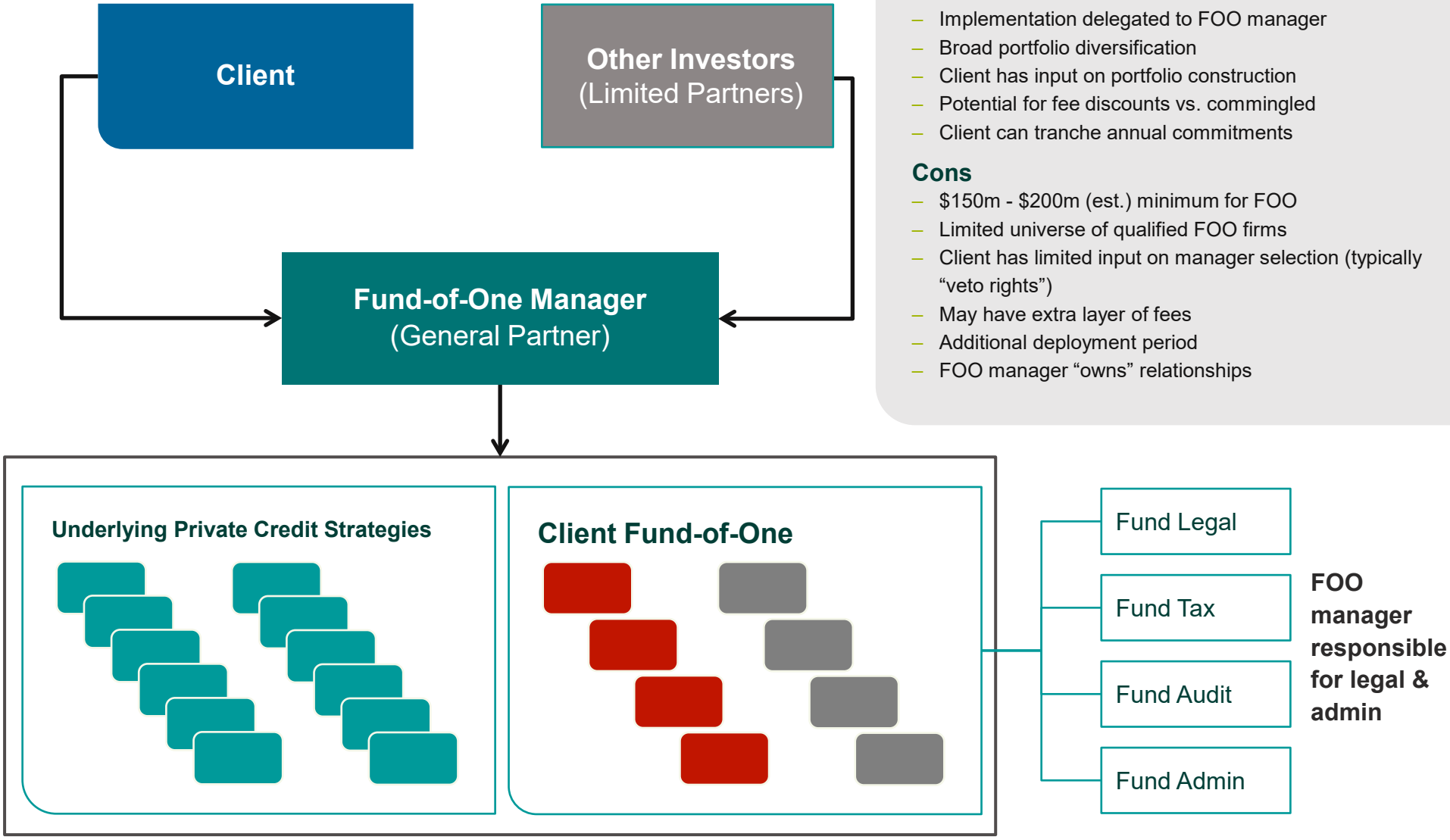
- Implementation delegated to FOF manager
- Broad portfolio diversification
- Client can budget annual commitments

Cons

- No input by Client on manager selection and portfolio construction
- Same portfolio for all investors (investors own "units" of Fund, not units of LPs)
- Limited universe of qualified FOF firms
- May have extra layer of fees
- Additional deployment period
- FOF manager "owns" relationships

FOF manager responsible for legal & admin

Alternative Option #2: Fund-of-Funds (fund-of-one, or "FOO")



Pros

- Implementation delegated to FOO manager
- Broad portfolio diversification
- Client has input on portfolio construction
- Potential for fee discounts vs. commingled
- Client can tranche annual commitments

Cons

- $150m - $200m (est.) minimum for FOO
- Limited universe of qualified FOO firms
- Client has limited input on manager selection (typically "veto rights")
- May have extra layer of fees
- Additional deployment period
- FOO manager "owns" relationships

Alternative Option #3: Hybrid Fund-of-Funds/Direct Program

Implementation Process

Conduct search for one diversified Fund-of-Funds (FOF) or Fund-of-One (FOO), combined with direct manager searches

Pros

- Can be “best of both worlds” – fund-of-funds provides broad, diversified core private credit exposure complemented by a smaller direct portfolio
- Single FOF/FOO streamlines implementation and administration vs. fully direct program
- FOF exposure may be partially customizable if in a Fund-of-One structure (Alternative Option #2)

Cons

- Limited universe of private credit focused Funds-of-Funds
- May be overly diversified compared with Direct program
- May have extra layer of fees for FOF/FOO plus specialty consulting fees on Direct program

Private Credit Implementation Options

	Direct (Primary Fund) Program	Fund of Funds (commingled)	Fund of Funds (fund-of-one)
Summary	Tailored portfolio of private credit funds with consultant assistance	Commingled fund-of-funds with a broad mandate	Customized portfolio of private credit funds
Implementation Risk	Higher	Lower	Moderate
Program Complexity	Higher	Lower	Moderate
Diversification	Custom	Higher	Higher
Portfolio Fee Structure (Mgmt. Fee and Carried Interest Est. Fee Range)*	Advisory fee + Underlying Fund Level Mgmt. Fee & Carried Interest*	FOF fees: Mgmt. Fee (0-50 bps) + Carried Interest (0%-10%) + Underlying Fund Level Mgmt. Fee & Carried Interest*	FOO fees Mgmt. Fees (0-30 bps) + Carried Interest (0% - 5%) + Underlying Fund Level Mgmt. Fee & Carried Interest*
Net Returns	Potentially Higher	Moderate	Moderate
Return Dispersion	Higher (more concentrated)	Lower	Higher
Degree of Client Collaboration	Higher	Lower	Moderate
Key Benefits	– Customized portfolio construction and risk profile – Opportunity to collaborate with Client – Lower cost vs. commingled FOFs – Stronger governance rights; Client owns relationships – Flexible degrees of delegation	– Lower complexity (“turnkey”) vs Direct – Broad PC exposure – Will accept smaller AUM assignment – No Client admin or operations – Delegated investment authority	– Customized portfolio construction and risk profile – Broad PC exposure – Opportunity to collaborate with FOO Manager – Lower cost vs. commingled FOFs – Stronger governance rights vs. commingled FOF
Key Considerations	– Implementation complexity – Client maintains legal review, operations, administration – More time and resource intensive for Staff and Board	– No Client input – Additional fee layer – Potential over-diversification – Additional deployment period	– Limited Client input – Additional fee layer – Higher cost than direct program, lower than commingled – Additional deployment period

** Underlying Fund Level Management Fee = typically 1.0% to 1.5%; Underlying Fund Carried Interest = typically 10% - 15%*

Callan

Appendix

2022–2031 Capital Market Expectations

2022 Risk and Returns

Summary of Callan's Long-Term Capital Market Assumptions (2022 – 2031)

		Projected Return			Projected Risk
Asset Class	**Index**	**1-Year Arithmetic**	**10-Year Geometric***	**Real**	**Standard Deviation**
Equities					
Broad U.S. Equity	Russell 3000	8.00%	6.60%	4.35%	17.95%
Large Cap U.S. Equity	S&P 500	7.85%	6.50%	4.25%	17.70%
Smid Cap U.S. Equity	Russell 2500	8.75%	6.70%	4.45%	21.30%
Global ex-U.S. Equity	MSCI ACWI ex USA	8.70%	6.80%	4.55%	20.70%
Developed ex-U.S. Equity	MSCI World ex USA	8.25%	6.50%	4.25%	19.90%
Emerging Market Equity	MSCI Emerging Markets	9.80%	6.90%	4.65%	25.15%
Fixed Income					
Short Duration Gov/Credit	Bloomberg 1-3 Yr G/C	1.50%	1.50%	-0.75%	2.00%
Core U.S. Fixed	Bloomberg Aggregate	1.80%	1.75%	-0.50%	3.75%
Long Government	Bloomberg Long Gov	1.85%	1.10%	-1.15%	12.50%
Long Credit	Bloomberg Long Cred	2.60%	2.10%	-0.15%	10.50%
Long Government/Credit	Bloomberg Long G/C	2.30%	1.80%	-0.45%	10.40%
TIPS	Bloomberg TIPS	1.35%	1.25%	-1.00%	5.05%
High Yield	Bloomberg High Yield	4.40%	3.90%	1.65%	10.75%
Global ex-U.S. Fixed	Bloomberg Gl Agg xUSD	1.20%	0.80%	-1.45%	9.20%
Emerging Market Sovereign Debt	EMBI Global Diversified	4.00%	3.60%	1.35%	9.50%
Alternatives					
Core Real Estate	NCREIF ODCE	6.60%	5.75%	3.50%	14.20%
Private Infrastructure	MSCI Glb Infra/FTSE Dev Core 50/50	7.10%	6.10%	3.85%	15.45%
Private Equity	Cambridge Private Equity	11.45%	8.00%	5.75%	27.60%
Private Credit	N/A	6.40%	5.50%	3.25%	14.60%
Hedge Funds	Callan Hedge FOF Database	4.35%	4.10%	1.85%	8.20%
Commodities	Bloomberg Commodity	4.05%	2.50%	0.25%	18.00%
Cash Equivalents	90-Day T-Bill	1.20%	1.20%	-1.05%	0.90%
Inflation	CPI-U		2.25%		1.60%

* Geometric returns are derived from arithmetic returns and the associated risk (standard deviation).

Note: Private Credit return assumption based on senior middle market direct lending with modest portfolio leverage (0.5-1.0x)
Source: Callan

2022 Correlations

- Callan's Private Credit correlations are highest relative to equities, reflecting the large contribution to returns of riskier credits with equity participation.
- Negative correlation of Private Credit relative to Core Fixed and Government bonds due to mix of credit exposure and floating rate structures typical of Private Credit

	Large Cap	Smid Cap	Dev ex-U.S. Equity	Em Markets	Short Duration	Core Fixed	Long Gov	Long Credit	TIPS	High Yield	GI ex-U.S. Fixed	EM	Core Real Estate	Private Infra	Private Equity	**Private Credit**	Hedge Funds	Comm	Cash Equiv	Inflation
U.S. Large Cap	1.00																			
U.S. Smid Cap	0.90	1.00																		
Dev ex-U.S. Equity	0.77	0.77	1.00																	
Em Market Equity	0.79	0.76	0.84	1.00																
Short Dur Gov/Credit	-0.06	-0.08	-0.06	-0.10	1.00															
Core U.S. Fixed	-0.10	-0.12	-0.11	-0.14	0.78	1.00														
Long Government	-0.15	-0.16	-0.13	-0.16	0.67	0.84	1.00													
Long Credit	0.28	0.25	0.26	0.24	0.64	0.80	0.69	1.00												
TIPS	-0.08	-0.08	-0.09	-0.10	0.56	0.70	0.53	0.52	1.00											
High Yield	0.71	0.68	0.69	0.69	-0.01	0.00	-0.08	0.40	0.06	1.00										
Global ex-U.S. Fixed	0.01	0.00	0.05	0.08	0.48	0.50	0.42	0.49	0.45	0.12	1.00									
EM Sovereign Debt	0.56	0.54	0.55	0.61	0.08	0.14	0.05	0.35	0.18	0.60	0.15	1.00								
Core Real Estate	0.64	0.60	0.60	0.56	-0.01	-0.04	-0.09	0.24	-0.02	0.53	-0.02	0.33	1.00							
Private Infrastructure	0.65	0.60	0.61	0.58	0.00	0.01	-0.03	0.27	-0.02	0.50	0.03	0.35	0.76	1.00						
Private Equity	0.77	0.73	0.73	0.72	-0.10	-0.19	-0.21	0.15	-0.14	0.59	0.06	0.40	0.50	0.62	1.00					
Private Credit	0.68	0.65	0.65	0.64	0.00	-0.06	-0.10	0.28	-0.09	0.63	0.06	0.48	0.47	0.52	0.65	1.00				
Hedge Funds	0.79	0.74	0.75	0.74	0.10	0.13	0.07	0.39	0.09	0.64	0.05	0.53	0.45	0.47	0.57	0.61	1.00			
Commodities	0.28	0.27	0.27	0.27	-0.10	-0.10	-0.10	0.01	0.10	0.15	0.15	0.19	0.21	0.18	0.23	0.17	0.23	1.00		
Cash Equivalents	-0.06	-0.08	-0.10	-0.10	0.30	0.15	0.08	-0.05	0.12	-0.11	0.00	-0.07	0.00	-0.07	0.00	-0.06	-0.04	-0.02	1.00	
Inflation	-0.02	0.02	0.00	0.03	-0.21	-0.25	-0.23	-0.25	0.08	0.05	-0.10	0.00	0.10	0.06	0.06	0.06	0.15	0.29	0.05	1.00

Source: Callan 2022-2031 Capital Market Assumptions

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Crestline Investors, Inc.

Relevant Mandate: **Private Debt and Opportunistic** **Hired:** **2004**

Firm Information

Founded in 1997 and based in Fort Worth, Texas, Crestline is an institutional alternative investment management firm with approximately $15.0 billion* of assets under management. Crestline specializes in credit and opportunistic investments, including financing and restructuring solutions for mature private equity funds. In addition, the firm manages a multi-PM equity market-neutral hedge fund and provides beta and hedging solutions for institutional clients. The company maintains affiliate offices in New York City, London, Toronto, and Tokyo.

*estimated as of 12/31/2022.

Key Executives:

Doug Bratton, Founding Partner, CEO & Co-CIO

Keith Williams, Managing Partner & Co-CIO

John Cochran, Partner & COO

Investment Approach

Crestline believes that protecting capital will always be critical to the objective of achieving alpha relative to peers. Furthermore, investing in areas where less capital is deployed will continue to provide the best opportunity to generate better returns with less overall risk.

Opportunistic Strategy (BGF):

The Opportunistic strategy is designed to 1) provide flexible capital solutions to mid-market and lower mid-market companies in the form of debt and/or structured equity, normally in sizes ranging from $20 million to $100 million, on a bilateral basis, 2) purchase high quality assets in inefficient or dislocated sectors or forced/motivated seller situations at a discount to intrinsic value, 3) lend to or create asset platforms on a bilateral basis to aggregate cash flow streams backed by assets, and 4) protect capital by consistently maintaining a controlling position and structuring investments with a combination of asset-backing, recourse to visible and predictable recurring cash flows, first ranking seniority within capital structures, and thoroughly structured well-covenanted transactions with multiple practical routes to realization.

Portfolio Financing Strategy (BGF):

The Portfolio Financing strategy aims to achieve attractive risk adjusted returns by providing low-LTV bespoke financing solutions to mature private equity funds, collateralized by portfolio NAV. These solutions meet an array of investor, manager, and portfolio company needs including, but not limited to, liquidity and growth capital.

Direct Lending Strategy (SLF):

The Direct Lending strategy is focused primarily on senior secured, first lien lending to lower-middle and middle market companies in North America with borrowing needs between $20-100 million.

Benchmark: T-Bills + 5%

Total ARMB Mandate

Assets Under Management:

3/31/2022: $714.4 million

Assets managed includes net asset values for opportunistic, portfolio financing, and direct lending mandates.

Concerns: None

3/31/2022 Performance

	1-Year	3-Year	5-Year	6-Year
BGF Net IRR	13.10%	8.23%	7.42%	8.33%
Specialty Lending I Net IRR	26.04%	12.66%	13.22%	13.26%
Specialty Lending II Net IRR	12.60%	13.79%	13.34%	
Specialty Lending III Net IRR	*			
T-Bills + 5%	1.26%	5.81%	6.13%	6.00%

Specialty Lending II: 5-Year period represents inception to date.

* Less than 1-year.

Crestline

Alaska Retirement Management Board – Crestline Overview

JUNE 2022

Crestline

Agenda

I. History, Team and Approach

II. Strategies

III. Appendix

Crestline Attendees

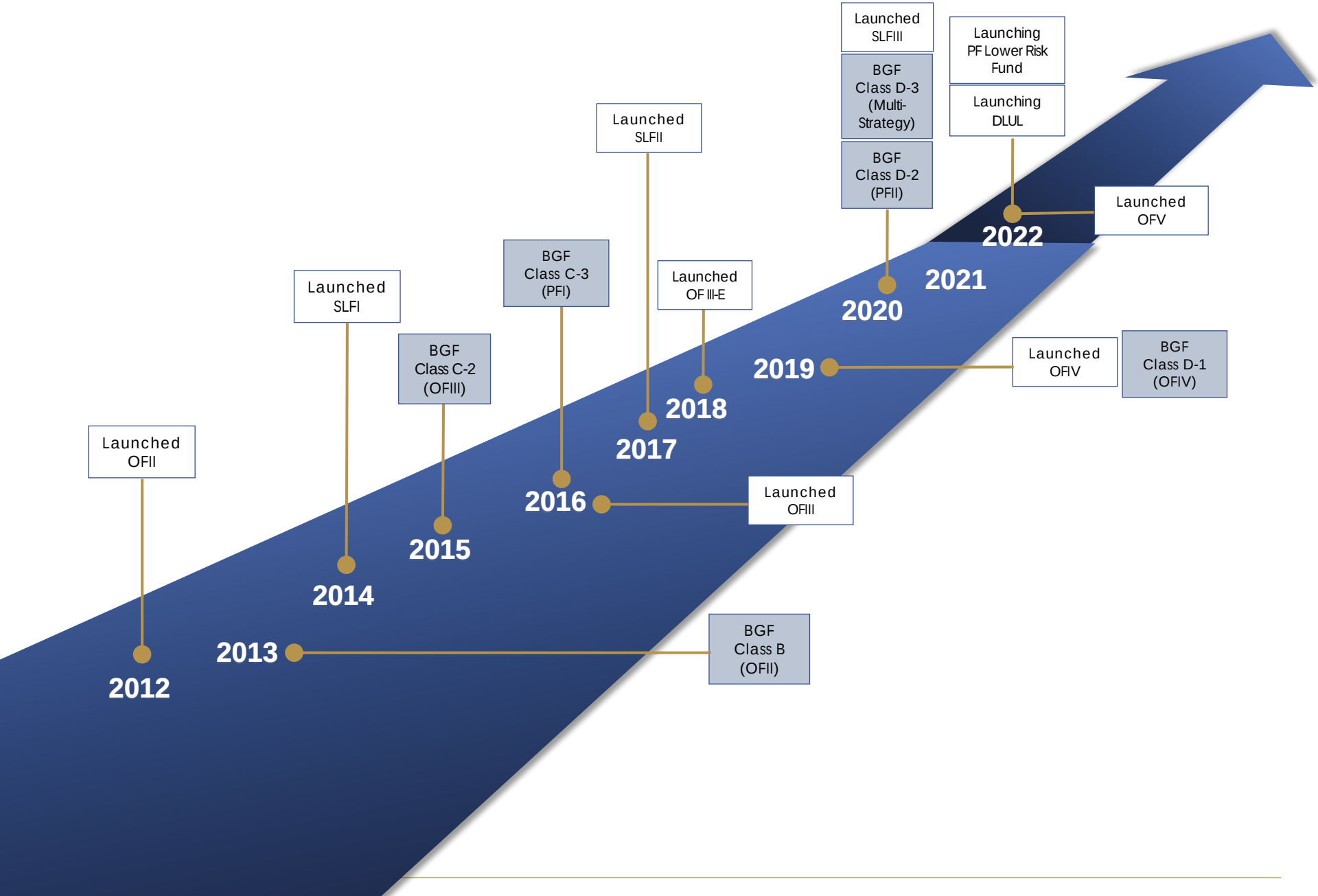
- Doug Bratton – *Founding Partner, Chief Executive Officer & Co-Chief Investment Officer*
- Keith Williams - *Managing Partner & Co-Chief Investment Officer*

Crestline

I. History, Team and Approach

Credit Strategies Timeline

Crestline



Crestline Introduction

Crestline

Doug Bratton
Founding Partner, CEO & Co-CIO

Keith Williams
Managing Partner & Co-CIO

Caroline Cooley
Managing Partner, CIO, Crestline Summit

Dave Philipp
Partner, Fund Liquidity Solutions

Chris Semple
Partner, US Credit

John Cochran
Partner & COO

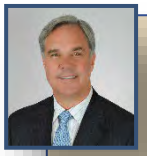
Frank Jordan
Partner, Head of Client Partnership Group

- **Seven** partners have over **220 years** of cumulative experience investing, trading, managing alternative investment strategies and in building and managing in the alternatives and asset management business
- **Keith Williams** and **Chris Semple**, former Goldman Sachs Special Situation Group ("Goldman SSG") members, were hired in 2012 to build out Crestline's private credit platform
- European Opportunistic Team of **Michael Guy**, **Sanjeev Sarkar**, and **Andrey Panna** joined Crestline in 2015 and have worked together for 18 years
- **Nine of the Senior Private Credit Members** together since 2015, **Will Palmer** and **Alfonso Ramirez** also former Goldman SSG members
- **Investment team has extensive restructuring experience** – over 25% of the team previously worked in the restructuring industry
- **Industry specialization groups** or "pods" formed to **drive sourcing** and **enhance execution**

Crestline Key Investment Officers – Opportunistic Investing

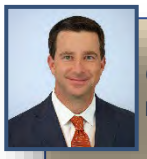
Crestline

Opportunistic Group


Doug Bratton
Founding Partner, CEO & Co-CIO

Keith Williams
Managing Partner & Co-CIO

John Cochran
Partner & COO


Chris Semple
Partner, US Credit

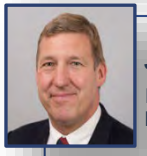
Michael Guy
CIO, Europe

Will Palmer
Managing Director

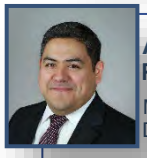
Michael Aingorn
Managing Director

James Delaune
Managing Director

Steven List
Managing Director

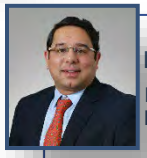

Jon Norton
Managing Director, Europe

Andrey Panna
Managing Director, Europe


Alfonso Ramirez
Managing Director

Sanjeev Sarkar
Managing Director, Europe

Marc Strauss
Managing Director

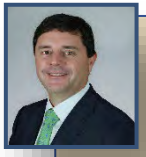

Rahul Vaid
Managing Director

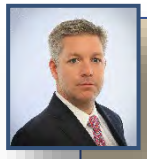
Clark Wen
Managing Director

Fund Liquidity Solutions Group

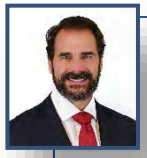
Doug Bratton
Founding Partner, CEO & Co-CIO

Keith Williams
Managing Partner & Co-CIO


John Cochran
Partner & COO

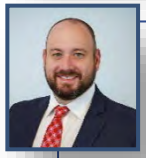

Dave Philipp
Partner, Fund Liquidity Solutions

Amit Mahajan
Managing Director & Senior Portfolio Manager


GR Christston
Managing Director

Paul Choy
Managing Director

Michael Rich
Managing Director


Bryan Fischer
Director

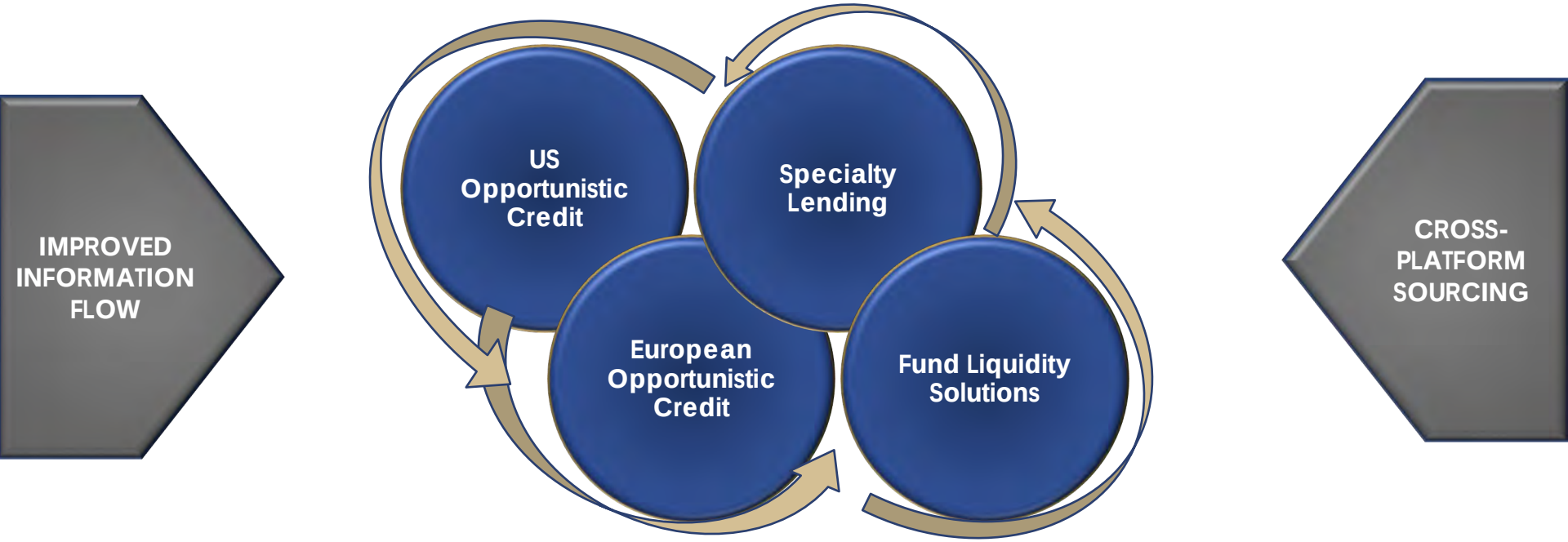
*Shaded box indicates Investment Committee Member

Crestline's Multi- Strategy Private Credit Focus

Crestline

Allows Crestline to provide a broad range of capital solutions ranging from 7% - 20%+ IRR pricing to the Middle Market

Crestline's One Firm approach creates information flow and enables cross platform sourcing and execution



Capital Preservation Approach

Crestline

We target opportunities with defensive attributes and credit oriented attachment points while applying significant structuring enhancements to control and enhance the outcome.

Three Attributes

- **Recurring Revenue**
- **Asset Backed**
- **Multiple Pools**

Attachment Points

- What are Crestline's attachment points?
- What is our security?

Capital Preservation Thesis

- What are Crestline's structural protections?
- Is there one or more paths to exit?
- How does it restructure?

Risk / Return

- Is Crestline receiving adequate return for risk?
- Is there equity upside potential?

Focus on investing in top of the capital structures to defensible companies with strong and sustainable fundamentals and the following business attributes:

- **Market leaders with high barriers to entry**
- **Defensible niche product or service**
- **Recurring revenue businesses with min. attrition**
- **Highly diverse customer bases**
- **Multiple exit or de-risking alternatives**
- **Substantial asset value or EV relative to attachment point**
- **Low technology and market risk**
- **Experienced and incentivized team**
- **Low to moderate capex requirements**

Investment strategy is based on current expectations

Crestline

II. Strategies

Crestline

Direct Lending Strategy (aka ”Specialty Lending”) Overview

Specialty Lending Fund Update

- SLF III
- SLFII
- SLF I

Executive Summary – Direct Lending

Crestline

Investment Strategy[1]

- **Senior secured direct lending with a focus on cash yield and capital preservation**
- Targets 90%+ 1st lien risk, with 95%+ cumulative 1st lien exposure since inception
- Targets less competitive landscape for opportunities between $20 – $100mm+
- Highly structured investments with maintenance covenants and conservative attachment points
- Sponsor and non-sponsor deals (75% Sponsor)
- Typically five-year loans with floating rates, quarterly cash distributions, and average principal repayment of 2-3 years
- Strategy utilizes up to 1;1 leverage

Team

- **31 direct lending investment professionals with significant credit experience, industry specializations, distressed investing acumen, and restructuring expertise (~1/3rd have extensive workout experience)**
- Core team worked together at Goldman Sachs Special Situations Group ("GS SSG") from 2004 through the global financial crisis ("GFC"), with 200+ transactions at Goldman and Crestline, respectively among private credit strategies
- Sponsor-agnostic, industry focused origination model creates differentiated direct deal sourcing network

Strategy Track Record

- **SLFI is the top performing 2014 vintage direct lending fund in North America** (per Preqin as of May 2022[2])
- 12%+ net IRR in both SLFI and SLFII[3] (as of 3/31/2022)
- Generated "Direct Alpha" outperformance of 5.49% in SLFI and 8.33% in SLFII over the benchmark index[4]
- 52 realizations to date for the strategy with a weighted average gross IRR of 13.0% as of 3/31/2022[5]
- 0.4% annualized default rate and 0.0% realized loss rate across the strategy to date

All data as of 3/31/2022 unless otherwise noted. Expected/Targeted returns are forward-looking statements that are subject to uncertainty as described further in the relevant offering memorandum and should not be regarded as a representation, warranty or prediction of any particular performance. The performance figures presented are for the entire fund and do not reflect the return for any specific investor. An individual investor's return would differ from what is presented herein based upon a variety of factors, including but not limited to, when the investor was admitted to the Fund and whether the investor is subject to certain fees and expenses.

[1]Investment strategy is based on current expectations and should not be considered definitive or a guarantee that the approaches, strategies, and investments will, in fact, possess these characteristics. [2]Per Preqin as of May-22; Resulting from the following screen in Preqin database: Private Capital Benchmarks> North American Direct Lending> 2014 Vintage. Preqin is a leading provider of data, analytics and insights to the alternative assets community. Preqin may not have exhaustive coverage or complete information of all such North American Direct Lending funds launched in 2014. [3]Net of fees as of 3/31/2022. The lowest reported investor net IRR in SLFI is 12.48% in the US Feeder. The lowest reported net IRR in SLFII is 13.34% in the US Feeder. Net IRRs do not include any closing interest earned or paid to early closers. Please see performance notes for lowest reported investor net IRR in all feeders. [4]Please see performance notes and disclosures for a summary of Direct Alpha methodology. Benchmark used for analysis is BAML US HY MASTER II TR which is unlevered. [5]Gross-of-fee IRR performance figures represent deal level performance and do not include the deduction of fund level fees and expenses and do not represent the performance of any investor. An individual investor's returns will be reduced by advisory fees and other expenses incurred in the management of its account. Past performance is not indicative of future results.

Crestline Specialty Lending Strategy – Middle and Lower-Middle Market

Crestline

Over 90% 1st Lien < 10% 2nd Lien/Minority Equity	Target Enterprise Value: $30 – $200mm+	North American Focus
Emphasis on capital preservation through first dollar of risk attachment points	Large, underserved and attractive opportunity set in the middle and lower-middle market	Established jurisdictions for creditor rights

Differentiated Sourcing Network

- Industry specializations
- Private equity sponsors
- Cross platform synergies
- Restructuring advisors
- Board seats
- Cap market/trading desks
- Illiquid and liquid debt

Structuring, Protections & Control

- Floating rates mitigate risk of rising interest rates
- 100% maintenance covenants
- 100% call protection
- Conservative LTVs
- Significant negative controls

Capital Preservation

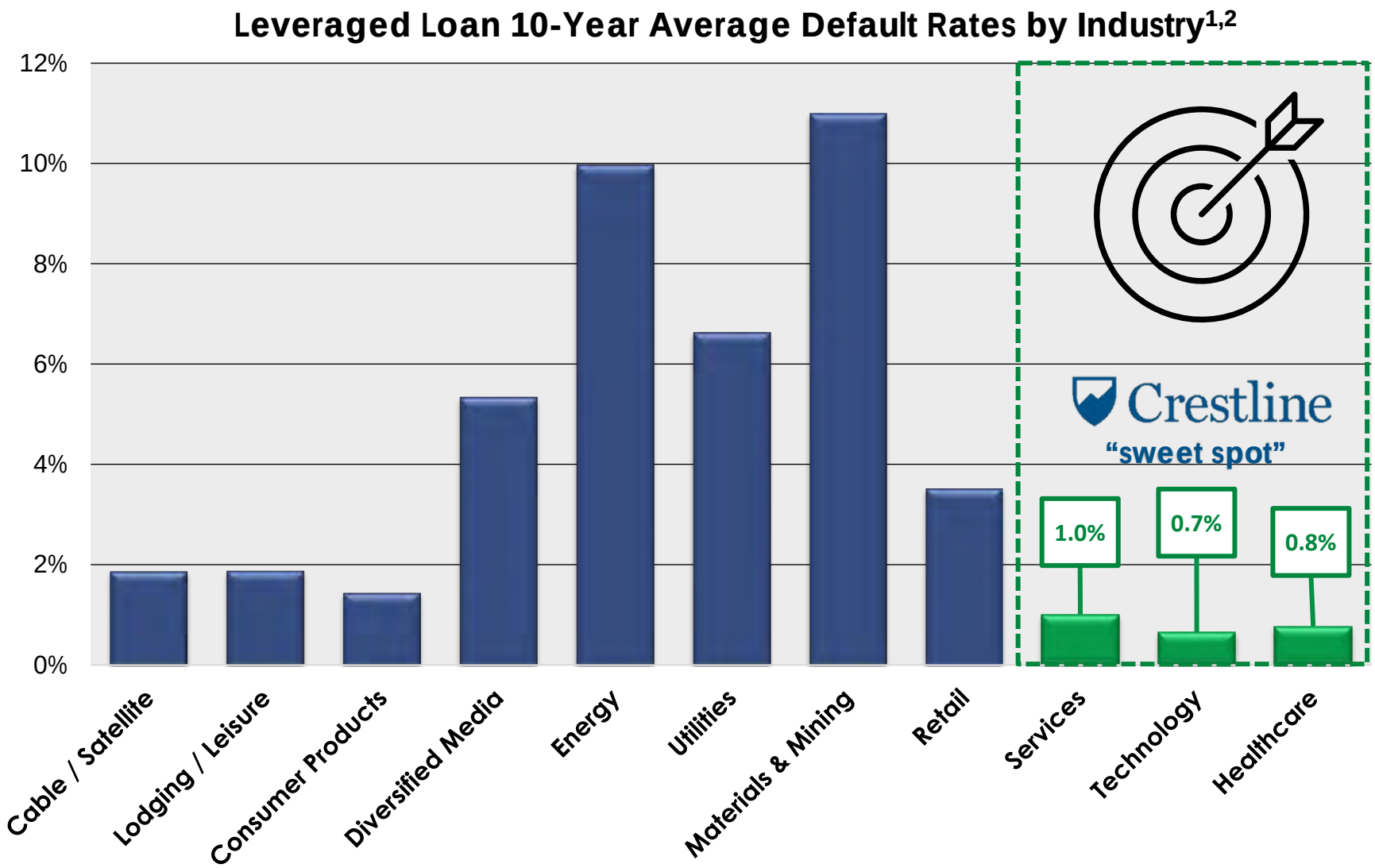
- We underwrite to a full return of principal
- We take senior most position in the capital structure
- We structure to ensure repayment of capital
- We covenant to ensure control

Investment strategy is based on current expectations

Default Resistant Industries Through Market Cycles

Crestline

By focusing on our three core attributes, we are intentionally investing in areas with a lower default rate on average



[1] Source: JPMorgan Default Monitor (March 2022). [2] The chart represents Industry-wide default rates of the sectors listed therein.

ARMB – Specialty Lending Fund III

Crestline

As of 3/31/2022 ($mm)

- **Net Capital Called of $25.8mm**
- **Remaining Uncalled Capital of $74.2mm**
- **NAV - $27.9mm**

Date Committed: June 1, 2021

Total Investor Commitments	$100.0	NAV	$27.9
Net Capital Called	$25.8	P&L	$2.1
Return of Capital (Recallable)	$0.0	Net IRR	n/m
Uncalled Capital Commitments	$74.2	Realized MOIC (incl. Recallable ROC)	0.00x
Non-Recallable Distributions	$0.0	Unrealized MOIC	1.08x
		Total MOIC	1.08x

Data shown above represents only LP's interest unless otherwise noted.
Due to rounding, numbers presented may not add up precisely to the totals.
Past performance is not indicative of future results.
n/m – not meaningful yet

Crestline Specialty Lending Fund III ("SLFIII") Summary – Q1 2022

Crestline

HIGHLIGHTS

- SLFIII Commingled has funded ~$608 million on $774 million of cumulative commitments across 32 transactions[1]
- Over 99% First Lien / Unitranche
- LTV (at U/W) of ~50%
- Average number of covenants: 2.1
- SLFIII Credit Summary
  - **0.0% Payment Defaults / 0.0% Loss Rate**
- 436bps WA spread over JPM Leveraged Loan Single B YTW (at U/W)
- Five realizations with a weighted average gross IRR of 21.0%

Fund Statistics (as of 3/31/2022)	
Current Committed	$651.6
Cumulative Committed	$774.4
Cumulative Transactions	32
Active Transactions	27
% of Transactions in Lower MM*	41.8%
% of Transactions in Middle/Upper MM*	58.2%
% Floating Rate[2*]	99.7%
% First Lien / Unitranche[6]*	99.7%
Median EBITDA (at U/W)[5*]	$28.5
Debt / EBITDA (at U/W)[3, 4*]	4.8x
LTV (at U/W)*	49.6%
Upfront Fees / OID*	1.6%
Weighted Avg. Spread*	6.9%
Weighted Avg. Floor*	1.1%
Yield to 3-Year Takeout*	8.9%
Average Number of Covenants*	2.1
% Portfolio with Covenants*	100.0%

*Cumulative since fund inception.

All figures as of 3/31/2022, unless otherwise noted.

N/M – not meaningful; Fund performance is calculated based on IRR. We believe the IRR calculation in the early stages of a fund is not meaningful because it is not reflective of the IRR that will ultimately be achieved over the life of the fund. We commence reporting IRR as the funds mature to at least 30% funded by investors (assessed after final close) or fewer than 24 months remain in the investment period from Limited Partners.

[1] $1,486mm Total Fund Commitment ($986mm of LP equity committed plus $500mm of asset-based leverage committed). [2] As a percentage of Fund Commitments.

[3] Debt / EBITDA represents the debt through the security tranche Crestline holds [4] ARR, RMR, and Asset-Backed deals are removed from the debt/EBITDA average ratios.

[5] Portfolio statistic specific to EBITDA valuation-based companies (i.e. companies valued on an ARR, BCF, NOI, RMR, or other basis are excluded from the calculation dataset). [6] Includes first lien and first lien-last out investments.

$ in mm. Expected/Target returns are forward-looking statements that are subject to uncertainties and should not be regarded as a representation, warranty, or predication of any particular performance. Gross-of-fee IRR performance figures represent deal level performance and do not include the deduction of fund level fees and expenses and do not represent the performance of any investor. An individual investor's returns will be reduced by advisory fees and other expenses incurred in the management of its account.

ARMB – Specialty Lending Fund II

Crestline

As of 3/31/2022 ($mm)

- **Net Capital Called of $56.1mm**
- **NAV - $50.3mm**
- **Realized MOIC - .40x; Unrealized .90x**
- **Net IRR 13.34%**

Date Committed: November 1, 2017

Total Investor Commitments	$60.0	NAV	$50.3
Net Capital Called	$56.1	P&L	$16.5
Return of Capital (Recallable)	$10.8	Net IRR	13.34%
Uncalled Capital Commitments	$14.7	Realized MOIC (incl. Recallable ROC)	0.40x
Non-Recallable Distributions	$11.5	Unrealized MOIC	0.90x
		Total MOIC	1.30x

Data shown above represents only LP's interest unless otherwise noted.
Due to rounding, numbers presented may not add up precisely to the totals.
Past performance is not indicative of future results.

Crestline Specialty Lending Fund II ("SLFII") Summary – Q1 2022

Crestline

HIGHLIGHTS

- SLFII Commingled has funded ~$1,670 million on $1,847 million of cumulative commitments across 62 transactions[1]
- **ARMB Net Fund IRR: 13.34% ARMB Net MOIC: 1.30x**
- Annual Yield 2021: 8.93%
- 98% First Lien / Unitranche
- LTV (at U/W) of ~49%
- Average number of covenants: 2.6
- SLFII Credit Summary
  - **0.7% Payment Defaults / 0.0% Loss Rate**
- 415bps WA spread over JPM Leveraged Loan Single B YTW (at U/W)
- 24 realizations with a weighted average gross IRR of 13.5%

Fund Statistics (as of 3/31/2022)	
Current Committed	$1,070.8
Cumulative Committed	$1,847.4
Cumulative Transactions	62
Active Transactions	38
% of Transactions in Lower MM**	52.8%
% of Transactions in Middle/Upper MM**	47.2%
% Floating Rate[2]**	95.2%
% First Lien / Unitranche[6]**	97.7%
Median EBITDA (at U/W)[5]**	$24.3
Debt / EBITDA (at U/W)[3, 4]**	4.3x
LTV (at U/W)**	49.2%
Upfront Fees / OID**	0.9%
Weighted Avg. Spread**	7.5%
Weighted Avg. Floor**	1.1%
Yield to 3-Year Takeout**	9.3%
Average Number of Covenants**	2.6
% Portfolio with Covenants**	100%

**Cumulative since fund inception.

All figures as 3/31/2022, unless otherwise noted.

Fund equity-level performance (inclusive of the effects of fund-level leverage) is calculated using the current market value estimate of each position including accreted OID/upfront frees and interest received at month end. Yields are calculated as cumulative income distributed to LPs during the observation period over the average LP equity outstanding during the same observation period. Past performance is not indicative of future results.

[1] $1,206mm Total Fund Commitment ($706mm of LP equity committed plus $500mm of asset-based leverage committed). [2] As a percentage of Fund Commitments

[3] Debt / EBITDA represents the debt through the security tranche Crestline holds [4] ARR, RMR, and Asset-Backed deals are removed from the debt/EBITDA average ratios.

[5] Portfolio statistic specific to EBITDA valuation-based companies (i.e. companies valued on an ARR, BCF, NOI, RMR, or other basis are excluded from the calculation dataset). [6] Includes first lien and first lien-last out investments.

$ in mm. Expected/Target returns are forward-looking statements that are subject to uncertainties and should not be regarded as a representation, warranty, or predication of any particular performance. Gross-of-fee IRR performance figures represent deal level performance and do not include the deduction of fund level fees and expenses and do not represent the performance of any investor. An individual investor's returns will be reduced by advisory fees and other expenses incurred in the management of its account.

ARMB – Specialty Lending Fund I

Crestline

As of 3/31/2022 ($mm)

- **Net Capital Called of $37.7mm**
- **NAV - $7.8mm**
- **Realized MOIC – 1.31x; unrealized .21x**
- **Net IRR – 12.67%**

Date Committed: April 1, 2015

Total Investor Commitments	$50.0	NAV	$7.8
Net Capital Called	$37.7	P&L	$19.5
Return of Capital (Recallable)	$0.0	Net IRR	12.67%
Uncalled Capital Commitments	$12.3	Realized MOIC (incl. Recallable ROC)	1.31x
Non-Recallable Distributions	$49.4	Unrealized MOIC	0.21x
		Total MOIC	1.52x

Data shown above represents only LP's interest unless otherwise noted.
Due to rounding, numbers presented may not add up precisely to the totals.
Past performance is not indicative of future results.

Crestline Specialty Lending Fund I ("SLFI") Summary – Q1 2022

Crestline

HIGHLIGHTS

- SLFI Commingled has funded ~$857 million on $907.5 million of cumulative commitments across 42 transactions[1]
- **ARMB Net Fund IRR: 12.67%, ARMB Net MOIC: 1.52x**
- Annual Yield 2021: 12.86%
- 98% First Lien / Unitranche
- LTV (at U/W) of ~51%
- Average number of covenants: 3.0
- SLFI Credit Summary
  - **0.0% Payment Defaults / 0.0% Loss Rate**
- Two remaining deals, Project Socrates & Skin, with spreads of 440bps and 520bps over JPM Leveraged Loan Single B YTW (at U/W)
- 40 realizations with a weighted average gross IRR of 12.5%

Fund Statistics (as of 3/31/2022)	
Current Committed	$48.6
Cumulative Committed	$907.9
Cumulative Transactions	42
Active Transactions	2
% of Transactions in Lower MM**	63.5%
% of Transactions in Middle/Upper MM**	36.5%
% Floating Rate[2**]	92.3%
% First Lien / Unitranche[6**]	98.1%
Median EBITDA (at U/W)[5**]	$14.6
Debt / EBITDA (at U/W)[3,4**]	4.2x
LTV (at U/W)**	51.1%
Upfront Fees / OID**	1.8%
Weighted Avg. Spread**	7.8%
Weighted Avg. Floor**	0.9%
Yield to 3-Year Takeout**	10.1%
Average Number of Covenants**	3.0
% Portfolio with Covenants**	100.0%

**Cumulative since fund inception.

All figures as of 3/31/2022, unless otherwise noted.

Yields are calculated as cumulative income distributed to LPs during the observation period over the average LP equity outstanding during the same observation period.

Past performance is not indicative of future results.

[1] $315mm Total Fund Commitment ($315mm of LP equity committed plus $0mm of asset-based leverage committed); [2] As a percentage of Fund Commitments; [3] Debt / EBITDA represents the debt through the security tranche Crestline holds. [4] ARR, RMR, and Asset-Backed deals are removed from the debt/EBITDA average ratios.

[5] Portfolio statistic specific to EBITDA valuation-based companies (i.e. companies valued on an ARR, BCF, NOI, RMR, or other basis are excluded from the calculation dataset). [6] Includes first lien and first lien-last out investments.

$ in mm. Expected/Target returns are forward-looking statements that are subject to uncertainties and should not be regarded as a representation, warranty, or predication of any particular performance. Gross-of-fee IRR performance figures represent deal level performance and do not include the deduction of fund level fees and expenses and do not represent the performance of any investor. An individual investor's returns will be reduced by advisory fees and other expenses incurred in the management of its account.

Crestline

Opportunistic and Fund Portfolio Finance Overview

- Blue Glacier Fund D Update
- Blue Glacier Fund C Update

Fund Strategy Overview

Crestline

- "All weather" strategy looking to take advantage of market inefficiencies and dislocations
- Designed to solve complex problems typically not met by traditional market sources
- Emphasis on capital preservation – focus on highly structured transactions with first dollar risk
- Focus on providing flexible capital solutions to underserved, complex or special situations
- Lower middle market and middle market focus provides a larger and less competitive opportunity set – focus on opportunities ranging from $20mm - $100mm

Corporate Capital Solutions

- Storied, out-of-favor, complex transactions
- Companies seeking non-control growth capital
- Flexible, yet highly structured solutions
- Typically, top of the capital structure risk
- Focused on structured returns plus equity optionality
- Industry focus provides ability to execute with certainty

Underwriting Target:
13-20%+ gross IRR

Special Situations Credit

- Dislocation driven
- Target opportunity set:
  - o Core industry focus
  - o Smaller, Underfollowed
  - o Mispriced securities
- Significant cash yield
- Mostly senior in capital structure
- Secondary market

Underwriting Target:
10-20%+ gross IRR

Asset Backed

- Loan or asset purchase
- Niche Assets:
  - o Royalties
  - o Infrastructure
  - o Logistics
- Specialty Finance
  - o Re-discount finance
  - o Leasing / factoring
- Niche Real Estate (loan or re-performing asset purchase)
- Covenants & corporate gov. rights

Underwriting Target:
10-20%+ gross IRR

Portfolio Finance

- NAV based loans and bespoke financing solutions for mature PE funds:
  - o Low LTV structures (10-30%)
  - o Short duration (2.5 years on average)
  - o Multiple assets supporting each transaction
- Tailored covenants and defined use of proceeds
- Contractual returns and make-whole provisions
- Alignment of interest across stakeholders

Underwriting Target:
10-20%+ gross IRR

Expected/Target returns are forward-looking statements that are subject to uncertainties and should not be regarded as a representation, warranty, or prediction of any particular performance.

Crestline

Blue Glacier Fund Class D

Blue Glacier Fund Class D

Crestline

As of 12/31/2021 ($mm)

- **Net Capital Called of $239.8mm**
- **Remaining Uncalled Capital of $210.2mm**
- **NAV - $289.8mm**
- **Net IRR – 19.96%**

Date Funded: August 2019

Total Investor Commitments	$450.0	NAV	$289.8
Gross Capital Called	$246.9	P&L	$50.0
Return of Capital (Recallable)	$7.1	Net IRR	19.96%
Net Capital Called	$239.8	Realized MOIC (incl. Recallable Distributions)	0.03x
Uncalled Commitments	$210.2	Unrealized MOIC	1.17x
Non-Recallable Distributions	$0.0	Total MOIC	1.20x

Crestline

Blue Glacier Fund Class D – 1 (Opportunity)

BGF Class D-1 (Opportunistic)

Crestline

Blue Glacier Class D1 (Opportunistic) offers capital solutions, ranging from $20 to $100 million, to underserved or capital constrained asset classes, including SME's, out-of-favor sectors, stressed or special situations.

- **Blue Glacier Fund Class D1 (as of May 9, 2022 unless otherwise noted)**
  - Vehicle has committed $338 million[1] and invested $263 million; 60 investments closed
  - 16 realized investments through 12/31/2021 for realized gross IRR of 53.7% and 1.26x MOIC
  - 95% 1st dollar risk assets
  - 60% Corporate / 40% Asset-Backed[1]
  - 70% North America, 23% EMEA and 7% global exposure[1]
  - Net IRR as of 12/31/2021: 20.75% (opportunistic only, does not include portfolio finance)

Security Type	Committed[1]
Senior Secured	62%
Asset-Based/Cash Flowing - Unlevered	14%
Mezzanine/Structured Equity – First Out	19%
Mezzanine/Structured Equity – Junior	3%
Common Equity	2%
Total	**100%**

95% 1st Out Assets

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[1]Based on current commitment

2022 Activity & Expectations

Crestline

Crestline expects multiple realizations in 2022 with plans on how to put the realized capital to use

Realizations

- Three realizations thus far in 2022. These three investments range in return from 19%-33% gross IRR and 1.24x – 1.43x gross MOIC
- In addition to the above three, Crestline expects another nine investments in 2022. These investments are either in a in a sale or refinancing process; potential realizations will return ~$79 of cost basis (excl. gains)
    - Expected realizations are expected to yield an average 30% gross IRR and 1.4x gross MOIC (on a deal level)

New Investments

- Six new transactions closed in 2022 (as of 5/9/2022), committing $31mm
- Three transactions closed since, committing a total of $23mm
- Currently seven primary deals in late-stage diligence
    - Commitment to ARMB SMA will vary, but total deal commitment will be ~$200mm
    - Target returns average 20% gross IRR and 1.9x gross MOIC with an average detachment point of 66%

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BGF Class D-2 (Portfolio Finance)

Crestline

- **Blue Glacier Fund Class D2 (as of May 9, 2022 unless otherwise noted)**
  - Vehicle has committed 47 million[1] and invested $40 million; 11 investments closed
  - 22% USA, 5% UK, 4% Australia, 4% Spain, 10% Other, 55% Uncommitted[1]
  - 31% Loan to Fund, 10% Pref to Fund, 4% Loan to PC w/ Guarantee, 55% Uncommitted[1]
  - LTV (at U/W) of ~15%
  - WA U/W gross all in return of 12.2%
  - WA 14 portfolio companies at U/W
  - Net IRR as of 12/31/2021: 10.87%

Use of Proceeds	Committed[1]
Growth Capital	31%
Refinance / Rescue	11%
Acq. Financing	2%
Distributions	1%
Uncommitted	55%
Total	**100%**

Past performance is not a guaranty of future results. Expected/Target returns are forward-looking statements that are subject to uncertainties and should not be regarded as a representation, warranty, or predication of any particular performance.

[1]Based on current commitment

2022 Activity & Expectations

Crestline

Realizations

- One realization thus far in 2022, generating gross return of 28.2% IRR and 1.2x MOIC

New Investments

- Four new transaction closed YTD, committing $29.8mm

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Crestline

Blue Glacier Fund Class C Total

Blue Glacier Fund Class C

Crestline

As of 12/31/2021 ($mm)

- **Net Capital Called of $390.6mm**
- **Non-Recallable Distributions of $276.7mm**
- **NAV – $264.4mm**
- **Realized MOIC - .75x; Unrealized .57x**
- **Net IRR 9.34%**

Date Committed: April 1, 2015

Total Investor Commitments	$490.0	NAV	$264.4
Gross Capital Called	$464.8	P&L	$150.5
Return of Capital (Recallable)	$74.1	Net IRR	9.34%
Net Capital Called	$390.6	Realized MOIC (incl. Recallable Distributions)	0.75x
Uncalled Commitments	$99.4	Unrealized MOIC	0.57x
Non-Recallable Distributions	$276.7	Total MOIC	1.32x

Crestline

Blue Glacier Fund Class C – 2 (Opportunistic)

BGF Class C-2 (Opportunistic)

Crestline

Blue Glacier Class C2 (Opportunistic) offers capital solutions, ranging from $20 to $100 million, to underserved or capital constrained asset classes, including SME's, out-of-favor sectors, stressed or special situations.

- **Blue Glacier Fund Class C2 (as of May 9, 2022 unless otherwise noted)**
  - Vehicle has committed $514 million[1] and invested $476 million; 49 investments closed
  - 24 realized investments through 12/31/2021 for realized gross IRR of 26.6% and 1.50x MOIC
    - Four investments realized post year-end for a cost basis of $54mm (excl. gains/losses)
    - Six investments in sale or refinancing process; potential realizations will return $53mm of cost basis (excl. gains)
  - 31% Corporate / 69% Asset Backed[1]
  - 93% North America, 7% EMEA[1]
  - Net IRR as of 12/31/2021: 9.13% (13.1% gross)
    - Inception to 2016: Corporate Investments: 23% IRR; Asset Backed (heavily weighted with under performing oil & gas investments): -3.3%
    - **2017 to Present: Corporates: 24.8% IRR; Asset Backed (applied lessons from early deals): 15.6% IRR**

Security Type	Committed[1]
Senior Secured	37%
Asset-Based/Cash Flowing - Unlevered	12%
Mezzanine/Structured Equity – First Out	31%
Asset-Based/Cash Flowing – Levered	11%
Mezzanine/Structured Equity – Junior	2%
Common Equity	7%
Total	**100%**

80% 1st Out Assets

Past performance is not a guaranty of future results. Expected/Target returns are forward-looking statements that are subject to uncertainties and should not be regarded as a representation, warranty, or predication of any particular performance. Gross-of-fee IRR performance figures represent deal level performance and do not include the deduction of fund level fees and expenses and do not represent the performance of any investor. An individual investor's returns will be reduced by advisory fees and other expenses incurred in the management of its account.

[1]Based on current commitment

BGF Class C-2 (Opportunistic) – Product Summary

Crestline

As of 12/31/2021 ($mm)

- **Net Capital Called of $308.4mm**
- **Remaining Uncalled Capital of $81.6mm**
- **NAV - $220.8mm**
- **Realized MOIC - .72x; Unrealized .62x**
- **Net IRR 9.13%**

Date Committed: April 2015

Total Investor Commitments	$390.0	NAV	$220.8
Gross Capital Called	$358.3	P&L	$121.9
Return of Capital (Recallable)	$49.9	Net IRR	9.13%
Net Capital Called	$308.4	Realized MOIC (incl. Recallable Distributions)	0.72x
Uncalled Commitments	$81.6	Unrealized MOIC	0.62x
Non-Recallable Distributions	$209.4	Total MOIC	1.34x

Data shown above represents LP interest unless otherwise noted.
Due to rounding, numbers presented may not add up precisely to the totals.
Past performance is not indicative of future results.

Crestline

Blue Glacier Fund Class C – 2 (Portfolio Finance)

BGF Class C-2 (Portfolio Finance)

Crestline

- **Blue Glacier Fund Class C-2 (as of May 9, 2022 unless otherwise noted)**
  - Vehicle has committed 151 million[1] and invested $132 million; 23 investments closed
  - 14 realized investments at a WA gross 19.4% IRR and 1.34x MOIC (as of 12/31/2021)
  - 37% USA, 4% Brazil, 3% India, 3% Other, 53% Uncommitted[1]
  - 28% Loan to Fund, 19% Loan to PC w/ Guarantee , 53% Uncommitted
  - LTV (at U/W) of ~15%
  - WA U/W gross all in return of 13.1%
  - WA 6 portfolio companies at U/W
  - Net IRR as of 12/31/2021: 10.44%

Use of Proceeds	Committed[1]
Refinance / Rescue	20%
Growth Capital	20%
Acq. Financing	7%
Uncommitted	53%
Total	**100%**

Past performance is not a guaranty of future results. Expected/Target returns are forward-looking statements that are subject to uncertainties and should not be regarded as a representation, warranty, or predication of any particular performance. Gross-of-fee IRR performance figures represent deal level performance and do not include the deduction of fund level fees and expenses and do not represent the performance of any investor. An individual investor's returns will be reduced by advisory fees and other expenses incurred in the management of its account.

[1]Based on current commitment

BGF Class C-2 (Portfolio Finance) – Product Summary

Crestline

As of 12/31/2021 ($mm)

- **Net Capital Called of $82.2mm**
- **Remaining Uncalled Capital of $17.8mm**
- **NAV - $43.6mm**

Date Committed: October 2016

Total Investor Commitments	$100.0	NAV	$43.6
Gross Capital Called	$106.5	P&L	$28.6
Return of Capital (Recallable)	$24.3	Net IRR	10.44%
Net Capital Called	$82.2	Realized MOIC (incl. Recallable Distributions)	0.86x
Uncalled Commitments	$17.8	Unrealized MOIC	0.41x
Non-Recallable Distributions	$67.3	Total MOIC	1.27x

Data shown above represents LP interest unless otherwise noted.
Due to rounding, numbers presented may not add up precisely to the totals.
Past performance is not indicative of future results.

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Blue Glacier Fund Class B – Predecessor Strategy

BGF Class B – Share Class Description

Crestline

- **Class B was a different strategy relative to current strategy, i.e. Fund of Fund investing**
  - **Investments in other private credit managers, Crestline Recovery Fund III and co-investments**
    - **2 direct lending managers; 10 opportunistic or niche managers; 2 co-investments; 2 direct deals and Crestline Recovery Fund (purchasing hedge fund secondaries)**
- LPA excerpt below
  - *"The Partnership's investment objective with respect to Class B Investments is to achieve superior capital appreciation over a finite period of time utilizing a flexible and opportunistic investment mandate. The Partnership seeks to realize its objective by investing in investments that seek to take advantage of market dislocations and inefficiencies through investments in (i) niche strategies such as asset-based royalty streams and other cash-flow strategies as well as structured finance, (ii) private credit strategies such as loans (direct origination and trading), performing and non-performing loan pools, trade claims, distressed and structured credit and (iii) liquidating or secondary assets generally purchased at a discount to net value."*

BGF Class B – Product Summary

Crestline

As of 12/31/2021 ($mm)

- **Net Capital Called of $200.9mm**
- **NAV - $115.0mm**
- **Realized MOIC - .76x; Unrealized MOIC .57x**
- **Net IRR 5.57%**

Date Committed: May 2013

Total Investor Commitments	$264.4	NAV	$115.0
Gross Capital Called	$200.9	P&L	$67.0
Return of Capital (Recallable)	$0.0	Net IRR	5.57%
Net Capital Called	$200.9	Realized MOIC (incl. Recallable Distributions)	0.76x
Uncalled Commitments	$63.5	Unrealized MOIC	0.57x
Non-Recallable Distributions	$152.9	Total MOIC	1.33x

Data shown above represents LP interest unless otherwise noted.
Due to rounding, numbers presented may not add up precisely to the totals.
Past performance is not indicative of future results.

Crestline

III. Appendix

Corporate Capital Solutions & Special Situations Investment Attributes

Crestline

Investment criteria considered for Corporate Capital Solutions and Special Situations Credit

CORE ATTRIBUTES	RECURRING REVENUE	MULTI-SITE / DISCRETE POOLS OF VALUE
DESCRIPTION	• Recurring or multi-year contractual revenue • Businesses models and services with high retention rates • Mission critical in nature	• Ideally businesses with 15+ locations, each with its own cash flow stream • Businesses with separable pools of value and diverse revenue streams • No consumer product retail
DOWNSIDE PROTECTION	• Defensible/predictable cash flow streams • Ability to underwrite attrition/retention rates creates longer term value • Mission critical attributes create high switching costs and sticky customers • Industry growth tailwinds provide exit opportunities	• Ability to restructure around profitable locations or lines of business • Optionality to shut down/sell off unprofitable locations in harvest case • Independent asset or business line sales provide risk mitigation • Multiple exit options
INDUSTRY EXAMPLES	SOFTWARE / ENABLED SERVICES DATA CENTERS ALARM MONITORING BUSINESS SERVICES PAYMENT PROCESSING INDUSTRIAL SERVICES	PORTFOLIO FINANCE HEALTHCARE SERVICES BUSINESS-TO-CONSUMER WASTE MANAGEMENT EDUCATION

Investment Types

- Growth debt or structured equity
- Refinancing, recapitalization, rescue financing
- Acquisition financing
- Secondary Purchases

Security

- First or second lien (plus warrants)
- Secured debt plus preferred equity
- Preferred equity

Structural Considerations

- Top of capital structure focus
- Covenants; Affirmative and negative controls
- Board seats
- Downside exit control

Asset Backed Investment Attributes

Crestline

Investment criteria considered for Asset Backed Transactions

CORE ATTRIBUTE	ASSET BACKED	INVESTMENT TYPES
DESCRIPTION	• Lending with a cushion or purchasing at discount to asset value • Single asset or portfolio • Niche assets	• Growth debt • Bridge financing • Refinancing, recapitalization, rescue financing • Asset Purchase
DOWNSIDE PROTECTION	• Asset coverage mitigates principal risk – liquidate in default scenario • Asset portfolios offer diversification • Ability to underwrite to notional value of underlying assets in worst-case scenario • Frequent collateral tests and tight covenants provide protections – control downside outcomes	**Security** • First Lien • Equity (unlevered or levered) **Structural Considerations** • Top of capital structure focus • Control over "asset" box • Asset value cushion • Covenants; Affirmative and negative controls
INDUSTRY EXAMPLES	LEASING FACTORING TRANSPORTATION FINANCE ROYALTY FINANCE NICHE REAL ESTATE INFRASTRUCTURE/RENEWABLES	

Portfolio Finance Investment Attributes

Crestline

Investment criteria considered for Portfolio Finance Transactions

CORE ATTRIBUTE	PORTFOLIO FINANCE	USE OF PROCEEDS
DESCRIPTION	• NAV based loans and bespoke financing solutions for mature PE funds	• Growth capital • Acquisition financing • Refinancing • Distributions to LPs
DOWNSIDE PROTECTION	▪ Low LTV structures (10-30%) ▪ Transparent and diversified collateral pools ▪ Alignment of interest across stakeholders ▪ Quarterly maintenance covenants	**Security** • First Lien • Preferred Equity **Structural Considerations** • Short duration (2.5 years on average) • Tailored covenants and defined use of proceeds • Contractual returns and make-whole provisions
INDUSTRY EXAMPLES	INDUSTRY AGNOSTIC	

Non-Traditional Channels Provides Sourcing Advantage

Crestline

Powerful Origination Platform: Direct sourcing leveraging unique access to deal flow in specific industries or themes where Crestline has proven success

Industry Focus

- Specialist approach and deep industry relationships generate higher quality deal flow and stronger execution
- Deep industry sourcing networks create first call advantage
- Industry expertise makes Crestline a valuable counterparty with the ability to influence outcomes
- Ten industry focused senior US investment professionals possess 19 years of average industry experience

Differentiated Sourcing

- Multi-credit strategy platform with proven cross origination capabilities
- Diverse multi-channel sourcing network beginning with industry relationships
- Regional sponsor, investment banking, advisor and accounting firm coverage complements industry specialists
- Organic research supported by engagement with broker/dealer desks identifies attractive secondaries
- Network of operating advisors built from prior transactions with C-level executives and industry experts

General Risks of Investing in the Crestline Funds

An investment in the Funds is speculative and involves a high degree of risk. The Funds are generally not subject to regulatory restrictions or oversight. Crestline Management, L.P., is a federally registered investment adviser and provides investment advice through various affiliates and subsidiaries. Crestline Canada, Inc. and its subsidiary Crestline Canada Sub, L.P. are investment managers doing business in Canada that provide the "beta" overlay advice to Crestline Management, L.P. and certain Canadian trusts. Crestline Europe, LLP, registered with the Financial Conduct Authority ("FCA"), serves as the European investment adviser and is helping Crestline with investment diligence and analysis for its clients on certain primarily European opportunities. The Funds may employ leverage, which among other investment techniques, can make their investment performance volatile. Opportunities for redemptions and transferability of interests in the Funds are restricted so investors may not have access to their capital if and when it is needed. There is generally no secondary market for an investor's interest in the Funds and none is expected to develop. The Funds' management fees, incentive fees/allocations, and expenses, may offset their trading profits. An investor should not invest in the Funds unless it is prepared to lose all or a substantial portion of its investment.

Principal executive officers of Crestline are also associated with Bratton Capital Management, LP ("BCM") a firm that acts as the investment adviser and general partner to single family-office-related investments. Crestline and BCM are under common control.

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Any opinions expressed herein are our current opinions only. There can be no assurance or guarantee that Crestline's investment strategy will achieve its stated goal. All information provided in this presentation is for informational purposes only. In addition, it should not be assumed that any of the securities and/or strategies discussed herein were or will prove to be profitable. Crestline accepts no liability for loss arising from the use of this material.

Within a particular strategy, Crestline may offer a domestic fund and an offshore fund ("Funds") that are managed pari passu. In such cases the Funds managed by Crestline will have investment objectives that are identical or substantially similar. It is not anticipated, however, that the Funds managed by Crestline having identical or substantially similar investment objectives will have identical or substantially similar investment portfolios. Differing investment portfolios can be expected to result from several factors, including, without limitation, the following:

- Regulatory constraints that apply to the Funds managed by Crestline;
- Investment constraints imposed by the Investment Managers of the underlying fund that the Funds may invest in;
- The availability of underlying funds for investment at certain times but not at others; and
- The amount of cash available for investment at certain time by the Funds.

As a result of factors such as these, Funds that are managed pari passu may have a different investment portfolio (and, as a result, different performance results) even though the funds may have identical or substantially similar investment objectives.

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Performance Disclosures

Per US GAAP, fair value estimates are made at a point in time, based on relevant market data as well as the best information available about the financial instrument. These estimates involve significant uncertainties and judgments and cannot be determined with precision. Because of the inherent uncertainty of valuation, this estimated value may differ from the value that would have been used had a ready market for these investments existed, and the differences could be material. Valuations reflect fair value estimates determined as of the dates indicated within this document.

Performance information is unaudited and subject to revision. Past performance as well as third party awards and ratings are not a guaranty of future results. Current and prospective investors should not assume that the future performance of any Crestline fund will equal its prior performance results or the results of any previous fund with a similar strategy, and investors risk loss of their entire investment. Each fund's performance results portrayed reflect the deduction of that fund's advisory fees, brokerage commissions and other expenses. The performance results also include the reinvestment of income and dividends, in investment vehicles where such are applicable. For each Crestline fund, an individual investor's returns will vary from the historical performance due to restrictions on participation in certain types of investments and due to the timing of subscriptions, withdrawals, and redemptions; further, the general economic conditions during extreme highs and lows may have affected the returns of the funds.

The targeted returns are forward-looking statements that are subject to uncertainties described further in the relevant offering memorandum. The targeted returns are based on research conducted by Crestline and the conclusions are Crestline's opinions based on its own independent study. The return targets are supported by various quantitative measures including1) the actual track record of the funds, 2) back-tested returns of a pro-forma portfolio using the fund's current asset allocation and 3) a forecast return calculated using a third-party risk model. For further information on targeted returns including input data and calculation methodology please contact Client Servicing. While Crestline believes that the return targets are supportable, there is no guarantee that the funds will achieve the targeted returns. The targeted rates of return included in this presentation are hypothetical returns, and are for illustrative purposes only. Accordingly, no assumptions or comparisons should be made based upon these returns. Targeted returns are subject to inherent limitations, including but not limited to the fact that the returns do not take into account the impact that market and economic risks may have on investment decision trading. In no circumstances should the targeted returns be regarded as a representation, warranty or prediction that the fund will reflect any particular performance or that it will achieve or is likely to achieve any particular result or that investors will be able to avoid losses, including total losses of their investment.

The proposed allocations and proforma illustrations are hypothetical back-tested performance and are shown for illustrative purposes only and do not represent actual performance of any client account. Crestline does not represent that the hypothetical returns would be similar to actual performance had the firm actually managed the accounts in this manner.

Hypothetical, back-tested or simulated performances have many inherent limitations only some of which are described as follows: (i) It is designed with the benefit of hindsight, based on historical data, and does not reflect the impact that certain economic and market factors might have had on the decision-making process. No hypothetical, backtested or simulated performance can completely account for the impact of financial risk in actual performance. Therefore, it will invariably show positive rates of return. (ii) It does not reflect actual client asset trading and cannot accurately account for the ability to withstand losses. (iii) The information is based, in part, on hypothetical assumptions made for modeling purposes that may not be realized in the actual management of indices or accounts. No representation or warranty is made as to the reasonableness of the assumptions made or that all assumptions used in achieving the returns have been stated or fully considered. Assumption changes may have a material impact on the model returns presented. This material is not representative of any particular client's experience. Investors should not assume that they will have an investment experience similar to the hypothetical, back-tested or simulated performance shown. There are frequently material differences between hypothetical, back-tested or simulated performance results and actual results subsequently achieved by any investment strategy.

Unlike an actual performance record based on trading actual client portfolios, hypothetical, back-tested or simulated results are achieved by means of the retroactive application of a back-tested model itself designed with the benefit of hindsight. Hypothetical, back-tested or simulated performance does not reflect the impact that material economic or market factors might have on an adviser's decision making process if the adviser were actually managing a client's portfolio. The back-testing of performance differs from actual account performance because the investment strategy may be adjusted at any time, for any reason and can continue to be changed until desired or better performance results are achieved. The back-tested performance includes hypothetical results that do not reflect the reinvestment of dividends and other earnings or the deduction of advisory fees, brokerage or other commissions, and any other expenses that a client would have paid or actually paid. No representation is made that any index or account will or is likely to achieve profits or losses similar to those shown. Alternative modeling techniques or assumptions might produce significantly different results and prove to be more appropriate. Past hypothetical, back-test or simulated results are neither indicators nor guarantees of future returns. In fact, there are frequently sharp differences between hypothetical, back-tested and simulated performance results and the actual results subsequently achieved. As a sophisticated investor, you accept and agree to use such information only for the purpose of discussing with Crestline your preliminary interest in investing in the strategy described herein.

Direct Alpha – Methodology Summary

Direct Alpha is a measure used to determine the out/underperformance of a private equity fund relative to a chosen public benchmark. While other PME benchmarking (Public Market Equivalent) methodologies exist, Direct Alpha is considered the most precise way to determine alpha (α) as defined in the traditional sense as return spread over an expected return/benchmark.

When calculating Direct Alpha, the actual contributions and distributions to/from the Fund from Limited Partners are compounded by the returns of the benchmark to a single point in time and combined with the actual quarter-end Limited Partner NAV to derive a future value net cash flow stream. The idea behind compounding the Fund's contributions and distributions to same point in time is to remove or nullify the impact of any changes in the benchmark (i.e., the returns generated) from the PE cash flows.

The resulting IRR based on those future valued net cash flows no longer contains any changes of the benchmark, but only reflects the PE performance over or below the index/benchmark. This IRR is the Direct Alpha.

Bank of America Merrill Lynch High Yield Master II Total Return Index

This data represents the ICE BofA US High Yield Index value, which tracks the performance of US dollar denominated below investment grade rated corporate debt publicly issued in the US domestic market. To qualify for inclusion in the index, securities must have a below investment grade rating (based on an average of Moody's, S&P, and Fitch) and an investment grade rated country of risk (based on an average of Moody's, S&P, and Fitch foreign currency long term sovereign debt ratings)

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Performance Disclosures

The performance figures presented are for the entire fund and do not reflect the return for any specific investor. An individual investor's return would differ from what is presented herein based upon a variety of factors, including but not limited to, when the investor was admitted to the Fund and whether the investor is subject to certain fees and expenses.

Net IRRs do not include any closing interest earned or paid to early closers.

Considering these factors, the lowest reported investor Net IRR in each LP feeder is as follows:

Specialty Lending I (SLFI) / As of 3/31//2021: US Feeder 12.48%, Canada Feeder 12.31%, Cayman Feeder 11.80%, JPN Feeder 12.28%

Specialty Lending II (SLFII) / As of 3/31/2021: US Feeder 13.34%, Canada Feeder 13.32%, Cayman Feeder 12.98%, JPN Feeder 12.88%

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Private Debt Manager Hire	ACTION:	X
DATE:	June 16-17, 2022	INFORMATION:	

BACKGROUND:

During the June 2022 Alaska Retirement Management Board (ARMB) meeting, the board heard an informational presentation from Callan LLC (Callan) about private debt investing.

Private debt describes a spectrum of investment strategies that range in risk and return prospects. Private debt has the potential for diversification and enhanced income and returns compared to public debt due to complexity and illiquidity premium. Private debt is less liquid than traditional fixed income, but cash distributions from some strategies can mitigate some of this illiquidity.

Current private market guidelines for both Real Assets and Private Equity include delegation authorizing the Chief Investment Officer to commit up to $100 million subject to an external vetting process. This delegation fits the smaller size and pacing of private market investments.

STATUS:

As of March 31, 2022, the ARMB has approximately $786 million invested in two investment managers and five private debt funds within the Alternative Fixed Income pool. One fund is in final wind down and another fund is nearly fully realized leaving three funds and one on-going manager.

Staff recommends the ARMB direct staff to engage Callan to conduct a search for private debt managers and further directs staff to contract and invest with up to two private debt managers for up to $100 million each, subject to successful due diligence and contract negotiation and report back to the ARMB.

RECOMMENDATION:

The Alaska Retirement Management Board directs staff to engage Callan to conduct a search for private debt managers and delegates authority to staff to contract and invest with up to two managers for up to $100 million each, subject to successful due diligence and contract negotiation.

Callan

ARMB 2022 Asset Allocation Strategy

June 16, 2022

Alaska Retirement Management Board

Paul Erlendson
Fund Sponsor Consulting

Jay Kloepfer
Capital Markets Research

Steven Center, CFA
Fund Sponsor Consulting

Adam Lozinski, CFA
Fund Sponsor Consulting

2022 10-Year Assumptions vs. 2021 – Standard Set

Summary of Callan's Long-Term Capital Market Assumptions (2022 - 2031)

		PROJECTED RETURN			PROJECTED RISK	2021 - 2030			vs 2021	
Asset Class	**Index**	**1-Year Arithmetic**	**10-Year Geometric***	**Real**	**Standard Deviation**	**1-Year Arithmetic**	**10-Year Geometric***	**Standard Deviation**	**Geometric* Delta**	**Std Dev Delta**
Equities										
Broad U.S. Equity	Russell 3000	8.00%	6.60%	4.35%	17.95%	8.00%	6.60%	17.95%	0.00%	0.00%
Large Cap U.S. Equity	S&P 500	7.85%	6.50%	4.25%	17.70%	7.85%	6.50%	17.70%	0.00%	0.00%
Small/Mid Cap U.S. Equity	Russell 2500	8.75%	6.70%	4.45%	21.30%	8.75%	6.70%	21.30%	0.00%	0.00%
Global ex-U.S. Equity	MSCI ACWI ex USA	8.70%	6.80%	4.55%	20.70%	8.70%	6.80%	20.70%	0.00%	0.00%
Developed ex-U.S. Equity	MSCI World ex USA	8.25%	6.50%	4.25%	19.90%	8.25%	6.50%	19.90%	0.00%	0.00%
Emerging Market Equity	MSCI Emerging Markets	9.80%	6.90%	4.65%	25.15%	9.80%	6.90%	25.15%	0.00%	0.00%
Fixed Income										
Short Duration Gov't/Credit	Bloomberg Barclays 1-3 Yr G/C	1.50%	1.50%	-0.75%	2.00%	1.50%	1.50%	2.00%	0.00%	0.00%
Core U.S. Fixed	Bloomberg Barclays Aggregate	1.80%	1.75%	-0.50%	3.75%	1.80%	1.75%	3.75%	0.00%	0.00%
Long Government	Bloomberg Barclays Long Gov	1.85%	1.10%	-1.15%	12.50%	1.35%	0.60%	12.50%	0.50%	0.00%
Long Credit	Bloomberg Barclays Long Cred	2.60%	2.10%	-0.15%	10.50%	2.95%	2.45%	10.50%	-0.35%	0.00%
Long Government/Credit	Bloomberg Barclays Long G/C	2.30%	1.80%	-0.45%	10.40%	2.30%	1.80%	10.40%	0.00%	0.00%
TIPS	Bloomberg Barclays TIPS	1.35%	1.25%	-1.00%	5.05%	1.80%	1.70%	5.05%	-0.45%	0.00%
High Yield	Bloomberg Barclays High Yield	4.40%	3.90%	1.65%	10.75%	4.85%	4.35%	10.75%	-0.45%	0.00%
Global ex-U.S. Fixed	Bloomberg Barclays Gl Agg xUSD	1.20%	0.80%	-1.45%	9.20%	1.15%	0.75%	9.20%	0.05%	0.00%
Emerging Market Sovereign Debt	EMBI Global Diversified	4.00%	3.60%	1.35%	9.50%	3.90%	3.50%	9.50%	0.10%	0.00%
Alternatives										
Core Real Estate	NCREIF ODCE	6.60%	5.75%	3.50%	14.20%	6.60%	5.75%	14.10%	0.00%	0.10%
Private Infrastructure	MSCI Glb Infra/FTSE Dev Core 50/50	7.10%	6.10%	3.85%	15.45%	7.00%	6.00%	15.45%	0.10%	0.00%
Private Equity	Cambridge Private Equity	11.45%	8.00%	5.75%	27.60%	11.50%	8.00%	27.80%	0.00%	-0.20%
Private Credit	N/A	6.40%	5.50%	3.25%	14.60%	7.15%	6.25%	14.60%	-0.75%	0.00%
Hedge Funds	Callan Hedge FoF Database	4.35%	4.10%	1.85%	8.20%	4.25%	4.00%	8.00%	0.10%	0.20%
Commodities	Bloomberg Commodity	4.05%	2.50%	0.25%	18.00%	3.80%	2.25%	18.00%	0.25%	0.00%
Cash Equivalents	90-Day T-Bill	1.20%	1.20%	-1.05%	0.90%	1.00%	1.00%	0.90%	0.20%	0.00%
Inflation	CPI-U		2.25%		1.60%		2.00%	1.50%	0.25%	0.10%

** Geometric returns are derived from arithmetic returns and the associated risk (standard deviation).*

2022 Capital Market Assumptions: Correlation Matrix – Standard Set

	Large Cap	Smid Cap	Dev ex-U.S. Equity	Em Markets	Short Duration	Core Fixed	Long Gov	Long Credit	TIPS	High Yield	GI ex-U.S. Fixed	EM	Core Real Estate	Private Infra	Private Equity	Private Credit	Hedge Funds	Comm	Cash Equiv	Inflation
U.S. Large Cap	1.00																			
U.S. Smid Cap	0.90	1.00																		
Dev ex-U.S. Equity	0.77	0.77	1.00																	
Em Market Equity	0.79	0.76	0.84	1.00																
Short Dur Gov/Credit	-0.06	-0.08	-0.06	-0.10	1.00															
Core U.S. Fixed	-0.10	-0.12	-0.11	-0.14	0.78	1.00														
Long Government	-0.15	-0.16	-0.13	-0.16	0.67	0.84	1.00													
Long Credit	0.28	0.25	0.26	0.24	0.64	0.80	0.69	1.00												
TIPS	-0.08	-0.08	-0.09	-0.10	0.56	0.70	0.53	0.52	1.00											
High Yield	0.71	0.68	0.69	0.69	-0.01	0.00	-0.08	0.40	0.06	1.00										
Global ex-U.S. Fixed	0.01	0.00	0.05	0.08	0.48	0.50	0.42	0.49	0.45	0.12	1.00									
EM Sovereign Debt	0.56	0.54	0.55	0.61	0.08	0.14	0.05	0.35	0.18	0.60	0.15	1.00								
Core Real Estate	0.64	0.60	0.60	0.56	-0.01	-0.04	-0.09	0.24	-0.02	0.53	-0.02	0.33	1.00							
Private Infrastructure	0.65	0.60	0.61	0.58	0.00	0.01	-0.03	0.27	-0.02	0.50	0.03	0.35	0.76	1.00						
Private Equity	0.77	0.73	0.73	0.72	-0.10	-0.19	-0.21	0.15	-0.14	0.59	0.06	0.40	0.50	0.62	1.00					
Private Credit	0.68	0.65	0.65	0.64	0.00	-0.06	-0.10	0.28	-0.09	0.63	0.06	0.48	0.47	0.52	0.65	1.00				
Hedge Funds	0.79	0.74	0.75	0.74	0.10	0.13	0.07	0.39	0.09	0.64	0.05	0.53	0.45	0.47	0.57	0.61	1.00			
Commodities	0.28	0.27	0.27	0.27	-0.10	-0.10	-0.10	0.01	0.10	0.15	0.15	0.19	0.21	0.18	0.23	0.17	0.23	1.00		
Cash Equivalents	-0.06	-0.08	-0.10	-0.10	0.30	0.15	0.08	-0.05	0.12	-0.11	0.00	-0.07	0.00	-0.07	0.00	-0.06	-0.04	-0.02	1.00	
Inflation	-0.02	0.02	0.00	0.03	-0.21	-0.25	-0.23	-0.25	0.08	0.05	-0.10	0.00	0.10	0.06	0.06	0.06	0.15	0.29	0.05	1.00

- Relationships between asset classes are as important as standard deviation
- To determine portfolio mixes, Callan employs mean-variance optimization
- Return, standard deviation, and correlation determine the composition of efficient asset mixes

Summary of Important Changes for 2022 Capital Markets Assumptions

- Inflation raised from 2.0 to 2.25%
- Cash return raised from 1.0% to 1.2%
- Core fixed income return held at 1.75%
- Public equity returns held steady from 2021; equity risk premium over both cash and fixed income narrowed
- High Yield returns lowered by 0.45%, from 4.35% to 3.90%
- Private Credit returns lowered by 0.75%, from 6.25% to 5.50%
- Efficient smid cap weight set to 15% of broad U.S. equity
- Efficient emerging market equity weight set to 30% of global ex-U.S. equity
- Efficient U.S. / global ex-U.S. equity split to 60/40 neutral weight (not a change, but the market has now caught up to us!)
- Private markets returns held steady, commensurate with public equity; hedge funds raised by 0.10% to reflect higher starting cash return
- Commodity returns increased from 2.25% to 2.50%
- Ever-broadening set of diversifying asset classes to consider
  - Private credit
  - Private infrastructure
  - Inflation sensitive equity – REITs, natural resources, global listed infrastructure

Customized 10-Year ARMB Capital Market Projections – PERS & TRS Target

ARMB Asset Allocation Model 2022-2031

Asset Class	Target Weight	PROJECTED RETURN 1-Year Arithmetic	PROJECTED RETURN 10-Year Geometric Return	PROJECTED RISK Annualized Standard Deviation	Projected Yield
Public Equities	**45.0%**				
Broad US Equity	27.0%	8.00%	6.60%	17.95%	1.70%
Global Ex-US Equity	18.0%	8.70%	6.80%	20.70%	2.55%
Fixed Income	**21.0%**				
ARMB Core Fixed Income	21.0%	1.75%	1.70%	3.55%	2.82%
Multi-Asset	**6.0%**				
Multi-Asset	6.0%	5.65%	5.20%	10.80%	2.40%
Private Equity	**14.0%**				
Private Equity	14.0%	11.45%	8.00%	27.60%	0.00%
Real Assets	**14.0%**	**6.90%**	**6.15%**	**13.60%**	**4.35%**
Real Estate	4.90%	6.60%	5.75%	14.20%	4.40%
Timber	1.40%	6.45%	5.40%	15.60%	3.70%
Farmland	3.50%	6.60%	5.50%	15.45%	4.25%
Private Infrastructure	2.10%	7.10%	6.10%	15.45%	4.60%
REITs	2.10%	8.15%	6.20%	20.70%	4.65%
Cash Equivalents	**0.0%**				
Cash Equivalents	0.0%	1.20%	1.20%	0.90%	1.20%
Inflation			2.25%	1.50%	
Total Fund	**100.0%**	**7.00%**	**6.24%**	**13.72%**	**2.27%**

Projection set customized to reflect specific ARMB strategies:

- Real assets, multi-asset and fixed income

Current target projected to generate a return of 6.24% compounded over 10 years, at a risk (standard deviation) of 13.72%. This return is comparable to that projected last year for the same target (6.23%).

Source: Callan LLC

Expanding the Length of the Forecast Horizon

10-Year vs. Equilibrium Capital Market Expectations

- As the time horizon grows beyond 10 years, our capital market expectations increasingly incorporate “equilibrium returns”. Equilibrium returns reference ***long-term historical mean results***, with an overlay of informed judgment. Key elements to consider:
  - Nominal returns
  - Inflation
  - Real returns
  - Risk premium – bonds over cash, stocks over bonds, long duration over short
  - Long-term underlying economic growth (real GDP)
- 10-Year expectations:
  - Large Cap Stocks: 6.5% nominal, 4.25% real, 4.75% premium over bonds
  - Bonds: 1.75% nominal, -0.50% real, 0.50 % premium over cash
  - Cash: 1.2% nominal, -1.05% real
  - Inflation: 2.25%
  - Underlying economic growth (real GDP) – 2 to 2.5% per year
- Equilibrium expectations:
  - Large Cap Stocks: 8.40% nominal, 6.15% real, 3.45% premium over bonds
  - Bonds: 5.1% nominal, 2.85% real, 2.05% premium over cash
  - Cash: 3.05% nominal, 0.80% real
  - Inflation: 2.25%
  - Underlying economic growth (real GDP) – 3% per year

As Time Horizon Increases, Expected Returns Increase

Transition from 10-Year to 20-Year Horizon – Heading Toward LT Equilibrium

AssetClass	2022-2031 10-Year Annualized Return	2022-2041 20-Year Annualized Return	2022-2051 30-Year Annualized Return	Long-Term Annualized Equilibrium Return	Projected Standard Deviation
Broad US Equity	6.60%	7.10%	7.55%	8.55%	17.97%
Large Cap US Equity	6.50%	7.00%	7.45%	8.40%	17.70%
Small/Mid Cap US Equity	6.70%	7.35%	7.95%	9.10%	21.30%
Global ex-US Equity	6.80%	7.40%	7.90%	8.90%	20.68%
Developed ex-US Equity	6.50%	7.00%	7.45%	8.35%	19.90%
Emerging Market Equity	6.90%	7.60%	8.25%	9.50%	25.15%
Core US Fixed	1.75%	2.65%	3.50%	5.10%	3.75%
ARMB Fixed Income	1.70%	2.60%	3.40%	5.00%	3.57%
Multi-Asset	5.20%	5.90%	6.50%	7.75%	10.78%
Private Credit	5.50%	6.20%	6.80%	8.15%	14.60%
Core Real Estate	5.75%	6.15%	6.55%	7.40%	14.20%
Timber	5.40%	5.85%	6.20%	7.05%	15.60%
Farmland	5.50%	5.95%	6.30%	7.10%	15.95%
Private Infrastructure	6.10%	6.55%	6.95%	7.95%	15.45%
US REITs	6.20%	6.70%	7.10%	8.05%	20.70%
Real Assets	6.15%	6.59%	6.95%	7.85%	13.62%
Hedge Funds	4.10%	4.55%	5.00%	5.85%	8.20%
Private Equity	8.00%	8.45%	8.90%	9.65%	27.60%
Cash Equivalents	1.20%	1.70%	2.15%	3.05%	0.90%

Source: Callan LLC

Focus on 20-Year Horizon – PERS ($21.5 b) & TRS ($10.3 b at 3/31/22)

Achieve Actuarial Real Return over 20-Year Horizon

ARMB adopted new target portfolio following the 2019 asset-liability study, and refined the target in the 2021 asset allocation review

- Duration, cash flows and demographic forecasts suggest the investment time horizon for PERS and TRS remains long
- Current 10-year capital market forecasts can lead investors to take on substantial risk to meet a fixed return goal
- Extending the forecast horizon enabled the plans to moderate exposure to risk assets while still meeting the return target over this longer horizon
- The target represents the risk posture of the plans and acknowledges future liquidity needs

Portfolios optimized using broad US and non-US equity, broad US fixed income, real assets and private equity

- Multi-Asset is modeled as 60/40 exposure to public market stocks and bonds
- Real assets modeled using current target weights to each component within the total real asset composite
  - *35% Real estate*
  - *10% Timber*
  - *25% Farmland*
  - *15% Private Infrastructure*
  - *15% REITs*

Fixed income modeled as 95% broad market (BB Aggregate) and 5% cash

Customized 20-Year ARMB Capital Market Projections – PERS & TRS Target

ARMB Asset Allocation Model 2022-2041

Asset Class	Target Weight	PROJECTED RETURN 1-Year Arithmetic	PROJECTED RETURN 20-Year Geometric Return	PROJECTED RISK Annualized Standard Deviation	Projected Yield
Public Equities	**45.0%**				
Broad US Equity	27.0%	8.50%	7.10%	17.95%	1.70%
Global Ex-US Equity	18.0%	9.25%	7.35%	20.70%	2.55%
Fixed Income	**21.0%**				
ARMB Core Fixed Income	21.0%	2.65%	2.60%	3.55%	2.82%
Multi-Asset	**6.0%**				
Multi-Asset	6.0%	6.35%	5.90%	10.80%	2.40%
Private Equity	**14.0%**				
Private Equity	14.0%	11.90%	8.45%	27.60%	0.00%
Real Assets	**14.0%**	**7.35%**	**6.60%**	**13.62%**	**4.35%**
Real Estate	4.90%	7.00%	6.15%	14.20%	4.40%
Timber	1.40%	6.90%	5.85%	15.60%	3.70%
Farmland	3.50%	7.05%	5.85%	15.45%	4.25%
Private Infrastructure	2.10%	7.55%	6.55%	15.45%	4.60%
REITs	2.10%	8.60%	6.70%	20.70%	4.65%
Cash Equivalents	**0.0%**				
Cash Equivalents	0.0%	1.70%	1.70%	0.90%	1.70%
Inflation			2.25%	1.50%	
Total Fund	**100.0%**	**7.59%**	**6.86%**	**13.72%**	**2.27%**

Projection set customized to reflect specific ARMB strategies:

- Real assets, multi-asset and fixed income

Current target projected to generate a return of 6.86% compounded over 10 years, at a risk (standard deviation) of 13.72%. This return is comparable to that projected last year for the same target (6.85%).

Source: Callan LLC

Focus on 20-Year Time Horizon

Compare Return and Risk for 2022 vs. 2021 Capital Market Assumptions

- Target adopted in 2021 represents a portfolio designed to meet the goal of 7.13% nominal/4.88% real return over 20 years
- Inflation assumption is 2.25%, up from 2.0% projected in 2021
  - As a result, the real return goes down for the same asset allocation and the same nominal return projection
- 2022 assumptions suggest a nominal return gap of 27 basis points versus 7.13%, with a comparable real return gap
- Actuary's effective long term real return target is 4.88%
- Target shown at right is expected to generate a long-term (20-year) return that is close to (but just below) the plan's real return target (6.86% - 2.25% = 4.61%)
- Target expected to generate a greater return for the same level of risk as a portfolio restricted to the public markets

	2022 Projection	2021 Projection
Broad US Equity	27	27
Global ex-US Equity	18	18
ARMB Fixed Income	21	21
Multi-Asset	6	6
Real Assets	14	14
Private Equity	14	14
Totals	100	100
Projected Arithmetic Return	7.00%	7.01%
10-year Compound Return	6.24%	6.23%
Projected Standard Deviation	13.72%	13.82%
Projected Arithmetic Return	7.59%	7.63%
20-year Compound Return	6.86%	6.85%
Projected Standard Deviation	13.72%	13.82%
Real Return (2.25% inflation for 2022, 2.0% for 2021)	4.61%	4.85%
Equity	63%	63%
Fixed Income	23%	23%
Alts	28%	28%

Source: Callan LLC

Focus On 20-Year Horizon – Alternative Mixes

Target 4.5% to 4.75% Real Return

			Alternative Targets			
		Target	Mix 1	Mix 2	Mix 3	Mix 4
	Broad US Equity	27	25	26	27	29
	Global ex-US Equity	18	16	17	18	19
	ARMB Fixed Income	21	23	21	19	16
	Multi-Asset	6	8	8	8	8
	Real Assets	14	14	14	14	14
	Private Equity	14	14	14	14	14
	Totals	100	100	100	100	100
10-Year Projection	Projected Arithmetic Return	7.00%	6.82%	6.95%	7.08%	7.28%
	10 Yr. Geometric Mean Return	6.24%	6.12%	6.20%	6.29%	6.42%
	Projected Standard Deviation	13.72%	13.20%	13.57%	13.93%	14.48%
20-Year Projection	Projected Arithmetic Return	7.59%	7.41%	7.54%	7.66%	7.85%
	20 Yr. Geometric Mean Return	6.86%	6.74%	6.82%	6.90%	7.02%
	Projected Standard Deviation	13.72%	13.20%	13.57%	13.93%	14.48%
	Real Return (2.25% inflation)	4.61%	4.49%	4.57%	4.65%	4.77%
	Equity (Public + Private + 60% Multi-Asset)	63%	60%	62%	64%	67%
	Fixed Income (ARMB fixed + 40% Multi-Asset)	23%	26%	24%	22%	19%
	Alts (Real + Private Equity)	28%	28%	28%	28%	28%

Alternative Targets represent potential adjustments to the current plan target to meet a range of potential real return goals from 4.5% to 4.75% over 20 years

Real returns are derived from Callan's inflation projection of 2.25%

- Mix 1 = Target 4.5% real return
- Mix 2 = Moves 2% from equity into multi-asset
- Mix 3 = Moves 2% from fixed income into multi-asset
- Mix 4 = Target 4.75% real return

Source: Callan LLC

Impact of Risk Exposure on Range of Results – 1-Year and 20-Year Horizons

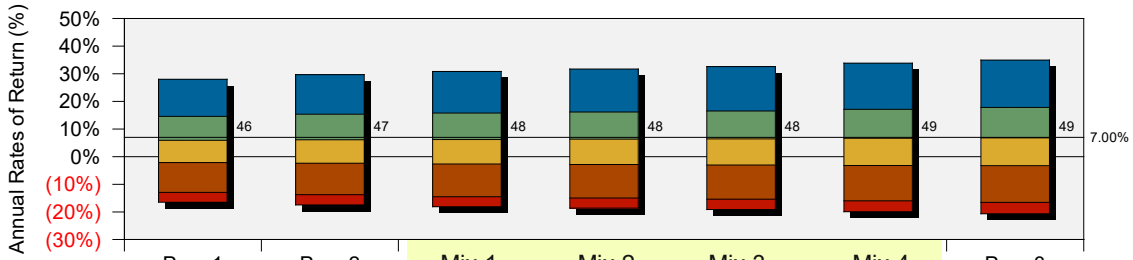
Simulated results using Callan's capital market assumptions, for any one year and for the 20-year horizon

Target return hurdle of 7.0% nominal, which implies a real return of 4.75%

Mixes 1, 2 and 3 represent optimized portfolios with risk levels representing those from a range of public fund peers

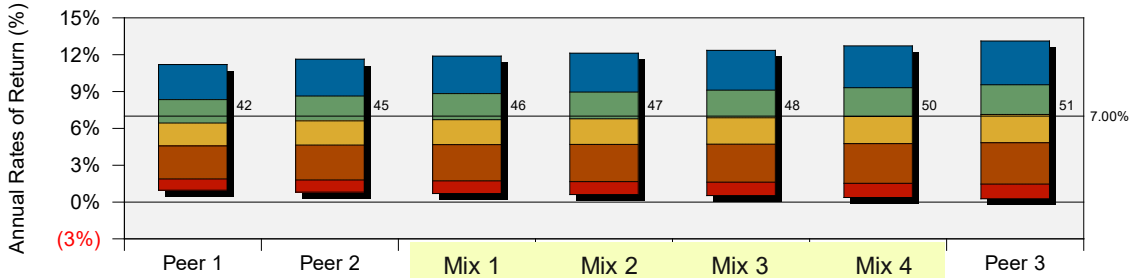
Current Target and the alternative portfolios are expected to achieve returns close to the 7% nominal return target over 20 years

1 Year



	Peer 1	Peer 2	Mix 1	Mix 2	Mix 3	Mix 4	Peer 3
5th Percentile	28.0%	29.7%	30.9%	31.7%	32.6%	33.9%	35.0%
25th Percentile	14.6%	15.4%	15.8%	16.2%	16.6%	17.1%	17.8%
Median	5.9%	6.1%	6.2%	6.3%	6.4%	6.6%	6.8%
75th Percentile	(2.1%)	(2.4%)	(2.6%)	(2.8%)	(3.0%)	(3.2%)	(3.3%)
95th Percentile	(12.9%)	(13.7%)	(14.5%)	(15.0%)	(15.4%)	(16.0%)	(16.5%)
97.5th Percentile	(16.5%)	(17.5%)	(18.1%)	(18.6%)	(19.2%)	(19.9%)	(20.7%)
Prob > 7.00%	46.4%	47.2%	47.7%	48.1%	48.4%	48.9%	49.4%
Standard Deviation	12.0%	12.70%	13.2%	13.57%	13.93%	14.48%	14.99%

20 Years



	Peer 1	Peer 2	Mix 1	Mix 2	Mix 3	Mix 4	Peer 3
5th Percentile	11.2%	11.6%	11.9%	12.1%	12.4%	12.7%	13.1%
25th Percentile	8.3%	8.6%	8.8%	9.0%	9.1%	9.3%	9.6%
Median	6.4%	6.6%	6.7%	6.8%	6.9%	7.0%	7.1%
75th Percentile	4.6%	4.6%	4.7%	4.7%	4.7%	4.8%	4.8%
95th Percentile	1.9%	1.8%	1.7%	1.7%	1.6%	1.5%	1.5%
97.5th Percentile	1.0%	0.8%	0.7%	0.6%	0.5%	0.4%	0.3%
Prob > 7.00%	42.2%	44.7%	46.1%	47.2%	48.4%	49.7%	51.3%
Standard Deviation	12.0%	12.70%	13.2%	13.57%	13.93%	14.48%	14.99%

Focus on 20-Year Horizon – Military ($48 M at 3/31/21)

Military target is more conservative (greater fixed income exposure) than PERS/TRS

Added alternative asset classes – private equity and real assets – in 2020

Plan is closed and overfunded, but has a long tail to benefit distributions, stretching out decades.

For this exercise, the portfolio is optimized using broad US and non-US equity, broad US fixed income, and will included real assets and private equity

- Multi-asset is modeled as 60/40 exposure to public market stocks and bonds
- ARMB fixed income modeled as 95% broad market (BB Aggregate) and 5% cash (same as PERS/TRS)
- Real assets modeled using current target weights adopted for PERS/TRS
  - *35% Real estate*
  - *10% Timber*
  - *25% Farmland*
  - *15% Private Infrastructure*
  - *15% REITs*

Alternative portfolio increases Multi-Asset, funded from fixed income, in pursuit of a 5.75% nominal return target over 20 years

Focus On 20-Year Horizon – Military

Compare Return and Risk for 2022 Capital Market Assumptions vs. 2021

- Current Target represents a portfolio expected to generate a nominal return of 5.67% over 20 years, or a real return of 3.42%
- 2022 assumptions suggest a nominal return comparable to that using the 2021 assumptions
- 2022 Inflation assumption is 2.25%, up from 2.0% projected in 2021; as a result the expected real return is reduced by a similar amount, down 25 basis points

	2022 Projection	2021 Projection
Broad US Equity	20	20
Global ex-US Equity	13	13
ARMB Fixed Income	46	46
Multi-Asset	6	6
Real Assets	7	7
Private Equity	8	8
Totals	100.00	100.00
Projected Arithmetic Return	5.28%	5.28%
10-year Compound Return	4.96%	4.95%
Projected Standard Deviation	9.25%	9.31%
Projected Arithmetic Return	5.96%	5.97%
20-year Compound Return	5.67%	5.67%
Projected Standard Deviation	9.25%	9.31%
Real Return (2% inflation 2021, 2.25% in 2022)	3.42%	3.67%
Equity	45%	45%
Fixed Income	48%	48%
Alts	15%	15%

Source: Callan LLC

Focus On 20-Year Horizon – Military Asset Mix Alternatives

Target 5.75% Nominal Return

		Military Target	Alternative Mix 8% Multi-Asset
	Broad US Equity	20	20
	Global ex-US Equity	13	13
	ARMB Fixed Income	46	44
	Multi-Asset	6	8
	Real Assets	7	7
	Private Equity	8	8
	Totals	100.00	100.00
10-Year Projection	Projected Arithmetic Return	5.28%	5.36%
	10-year Compound Return	4.96%	5.02%
	Projected Standard Deviation	9.25%	9.46%
20-Year Projection	Projected Arithmetic Return	5.96%	6.04%
	20-year Compound Return	5.67%	5.73%
	Projected Standard Deviation	9.25%	9.46%
	Real Return (2.25% inflation)	3.42%	3.48%
	Equity (Public + Private + 60% Multi-Asset)	45%	46%
	Fixed Income (ARMB Fixed + 40% Multi-Asset)	48%	47%
	Alts (Real + Private Equity)	15%	15%

Current target has an expected return of 5.67% over 20 years, comparable to that projected using the 2021 capital market assumptions

Alternative mix increases Multi-Asset exposure from 6% to 8%, funded from fixed income, in pursuit of a 5.75% return target over 20 years

Source: Callan LLC

Appendix

Focus On 20-Year Horizon – Alternative Mixes and Peers

Target 4.5% to 4.75% Real Return

					Alternative Targets					
		Target	Peer 1	Peer 2	Mix 1	Mix 2	Mix 3	Mix 4	Peer 3	Public Market Proxy
	Broad US Equity	27	28	30	25	26	27	29	35	45
	Global ex-US Equity	18	18	19	16	17	18	19	23	30
	ARMB Fixed Income	21	32	29	23	21	19	16	16	25
	Multi-Asset	6	0	0	8	8	8	8	0	0
	Core Real Estate	0	9	10	0	0	0	0	12	0
	Real Assets	14	0	0	14	14	14	14	0	0
	Private Equity	14	12	12	14	14	14	14	15	0
	Totals	100	100	100	100	100	100	100	100	100
10-Year Projection	Projected Arithmetic Return	7.00%	6.38%	6.64%	6.82%	6.95%	7.08%	7.28%	7.50%	6.65%
	10 Yr. Geometric Mean Return	6.24%	5.81%	6.00%	6.12%	6.20%	6.29%	6.42%	6.58%	5.89%
	Projected Standard Deviation	13.72%	12.00%	12.70%	13.20%	13.57%	13.93%	14.48%	14.99%	13.56%
	Projected Sharpe Ratio	0.42%	0.43%	0.43%	0.43%	0.42%	0.42%	0.42%	0.42%	0.40%
20-Year Projection	Projected Arithmetic Return	7.59%	7.00%	7.25%	7.41%	7.54%	7.66%	7.85%	8.06%	7.27%
	20 Yr. Geometric Mean Return	6.86%	6.46%	6.63%	6.74%	6.82%	6.90%	7.02%	7.17%	6.54%
	Projected Standard Deviation	13.72%	12.00%	12.70%	13.20%	13.57%	13.93%	14.48%	14.99%	13.56%
	Real Return (2.25% inflation)	4.61%	4.21%	4.38%	4.49%	4.57%	4.65%	4.77%	4.92%	4.29%
	Equity (Public + Private + 60% Multi-Asset)	63%	58%	62%	60%	62%	64%	67%	73%	75%
	Fixed Income (ARMB fixed + 40% Multi-Asset)	23%	32%	29%	26%	24%	22%	19%	16%	25%
	Alts (Real + Private Equity)	28%	12%	12%	28%	28%	28%	28%	15%	0%

Alternative Targets represent potential adjustments to the current plan target to meet a range of potential real return goals from 4.5% to 4.75% over 20 years

Real returns are derived from Callan's inflation projection of 2.25%

- Mix 1 = Target 4.5% real return
- Mix 2 = Moves 2% from equity into multi-asset
- Mix 3 = Moves 2% from fixed income into multi-asset
- Mix 4 = Target 4.75% real return
- Peer mixes represent portfolios with targeted risk of 12, 12.7 and 15 Standard Deviation
- Private market proxy matches the risk of Mix 2

Source: Callan LLC

2022 Correlation Assumptions for Customized ARMB Asset Class Set

Correlation Matrix	Broad US	Large	SMID	Glb ex US	Int'l	Emerge	Dom Fix	ARMB Fix	Multi-A	Priv Cred	Core RE	Timber	Farm	Priv Infra	US REITs	Real A	HF	PE	Cash	CPI
Broad US Equity	**1.000**																			
Large Cap US Equity	0.997	**1.000**																		
Small/Mid Cap US Equity	0.931	0.900	**1.000**																	
Global ex-US Equity	0.817	0.807	0.796	**1.000**																
Developed ex-US Equity	0.781	0.770	0.770	0.980	**1.000**															
Emerging Market Equity	0.796	0.790	0.760	0.931	0.840	**1.000**														
Core US Fixed	-0.104	-0.099	-0.120	-0.123	-0.106	-0.140	**1.000**													
ARMB Fixed Income	-0.105	-0.100	-0.121	-0.124	-0.107	-0.141	1.000	**1.000**												
Multi-Asset	0.957	0.951	0.904	0.929	0.904	0.877	0.022	0.021	**1.000**											
Private Credit	0.685	0.680	0.650	0.668	0.645	0.640	-0.060	-0.061	0.706	**1.000**										
Core Real Estate	0.642	0.640	0.595	0.605	0.595	0.560	-0.035	-0.035	0.656	0.470	**1.000**									
Timber	0.730	0.725	0.690	0.689	0.665	0.660	0.000	0.000	0.751	0.540	0.660	**1.000**								
Farmland	0.760	0.755	0.720	0.706	0.690	0.660	-0.020	-0.020	0.775	0.530	0.600	0.640	**1.000**							
Private Infrastructure	0.651	0.650	0.600	0.623	0.610	0.580	0.010	0.009	0.676	0.520	0.760	0.630	0.590	**1.000**						
US REITs	0.797	0.785	0.785	0.789	0.765	0.750	-0.110	-0.110	0.822	0.620	0.695	0.620	0.650	0.630	**1.000**					
Real Assets	0.832	0.827	0.788	0.792	0.773	0.743	-0.042	-0.042	0.854	0.618	0.904	0.791	0.833	0.836	0.850	**1.000**				
Hedge Funds	0.793	0.790	0.740	0.771	0.745	0.738	0.130	0.129	0.845	0.610	0.450	0.600	0.650	0.474	0.620	0.645	**1.000**			
Private Equity	0.774	0.770	0.731	0.755	0.734	0.715	-0.190	-0.190	0.782	0.650	0.500	0.620	0.610	0.620	0.750	0.708	0.568	**1.000**		
Cash Equivalents	-0.064	-0.060	-0.080	-0.104	-0.100	-0.100	0.150	0.162	-0.065	-0.060	0.000	-0.010	-0.030	-0.070	-0.050	-0.033	-0.040	0.000	**1.000**	
Inflation	-0.013	-0.020	0.020	0.011	0.000	0.030	-0.250	-0.249	-0.039	0.060	0.100	0.020	-0.020	0.055	0.120	0.070	0.150	0.060	0.050	**1.000**

Source: Callan LLC

Disclaimers

This report is for informational purposes only and should not be construed as legal or tax advice on any matter. Any decision you make on the basis of this content is your sole responsibility. You should consult with legal and tax advisers before applying any of this information to your particular situation.

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ALASKA RETIREMENT MANAGEMENT BOARD

Fiscal Year 2023

Asset Allocation Discussion

June 2022

Zachary A Hanna, CFA
Chief Investment Officer

Key Board Decisions

Determine Investment Objective

- Fund's Purpose
- Governance – who makes which decisions?

Determine Asset Allocation

- Strategic
- Tactical

Oversee Implementation

- Manager Structure – number and types of manager allocations.
- Manager Selection

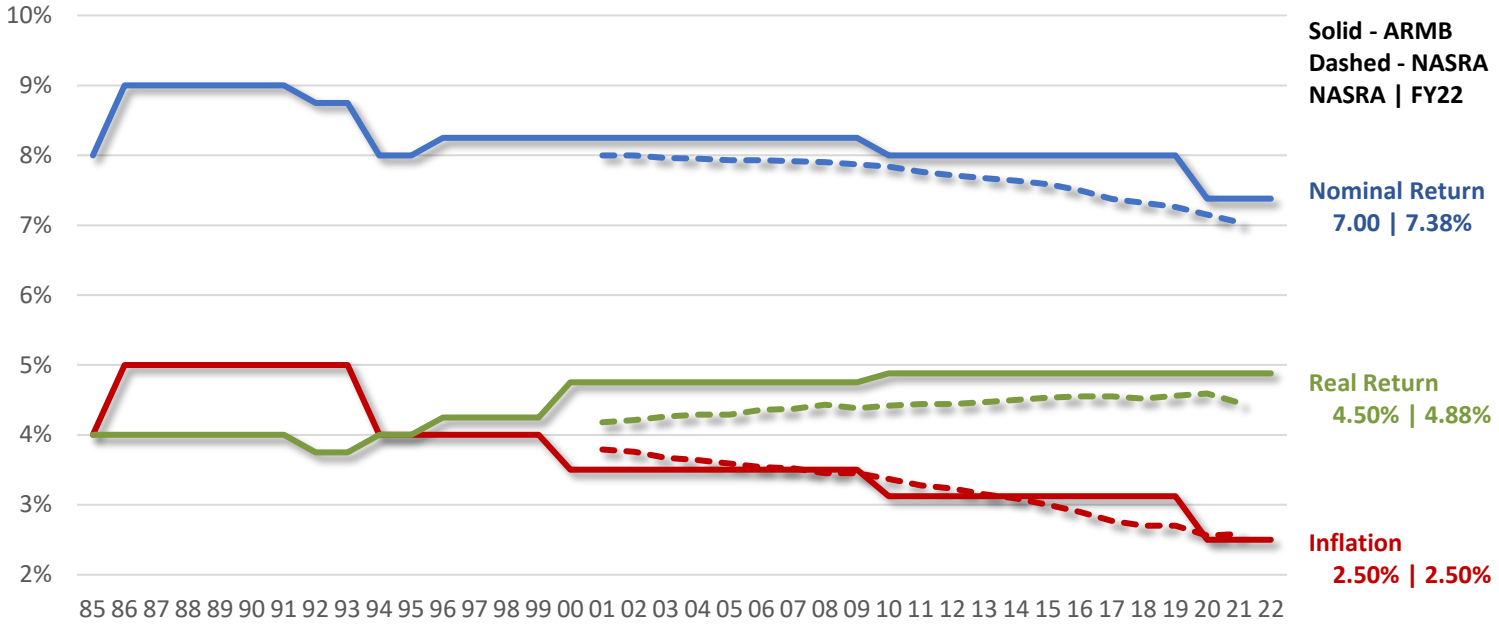
Monitor Results

- Are the fund, asset classes and mandates performing as expected?
- Are they achieving objectives?

Asset Allocation

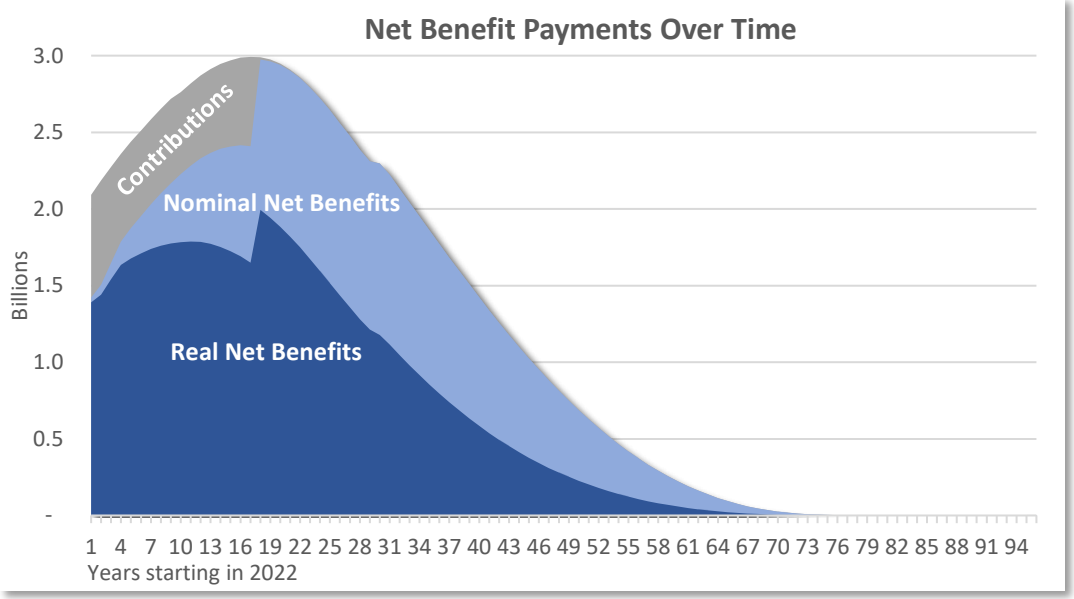
- The ARMB sets asset allocations annually.
- Asset allocation is the largest determinant of investment return and risk for the systems.
- The ARMB's process includes evaluating capital market assumptions, time horizon, liquidity needs, and peer assumptions.
- The goal is to balance investment objectives, risk tolerance, and other attributes.
- The ARMB has typically focused on adopting an asset allocation that is close to, but not necessarily the same as the actuarial real return investment objective.

ARMB Investment Objectives/Actuarial Assumptions:

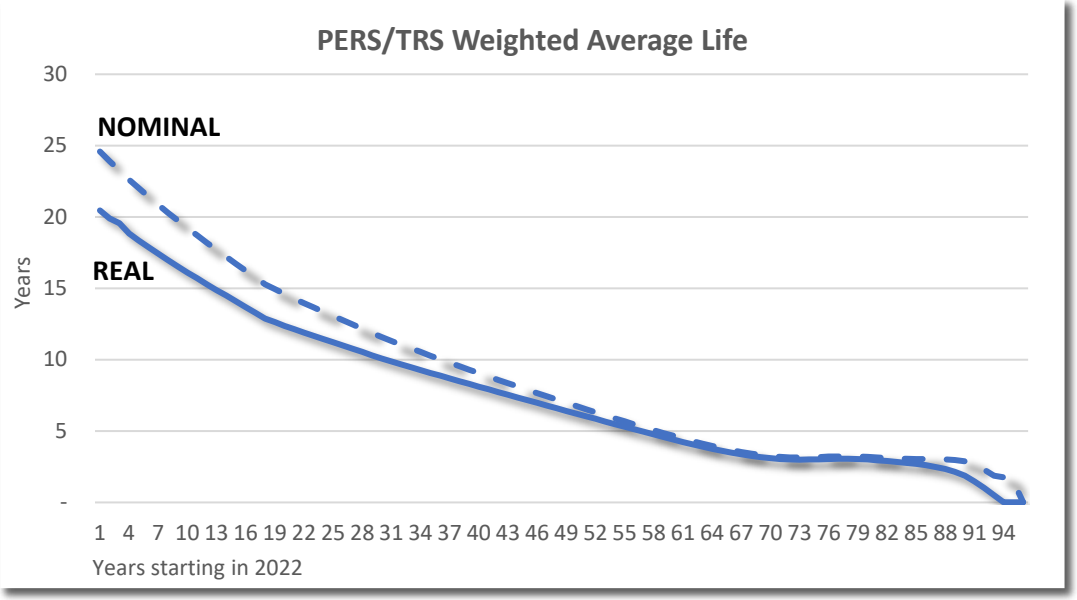


Paying Benefits When They are Due

- The PERS and TRS defined benefit systems are closed and mature but expected payments don't peak for over 10 years and extend 96 years into the future.
- The systems are heavily reliant on investment earnings to bridge the ~$30 billion gap between these payments and current assets.

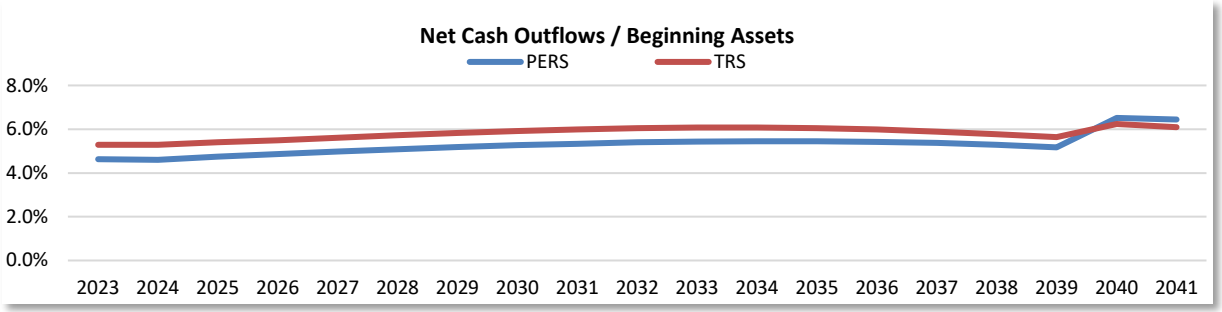


- In inflation-adjusted real terms, the weighted average life of the systems is currently 20 years.
- This is a reasonable estimate of the average investment time horizon of the funds.

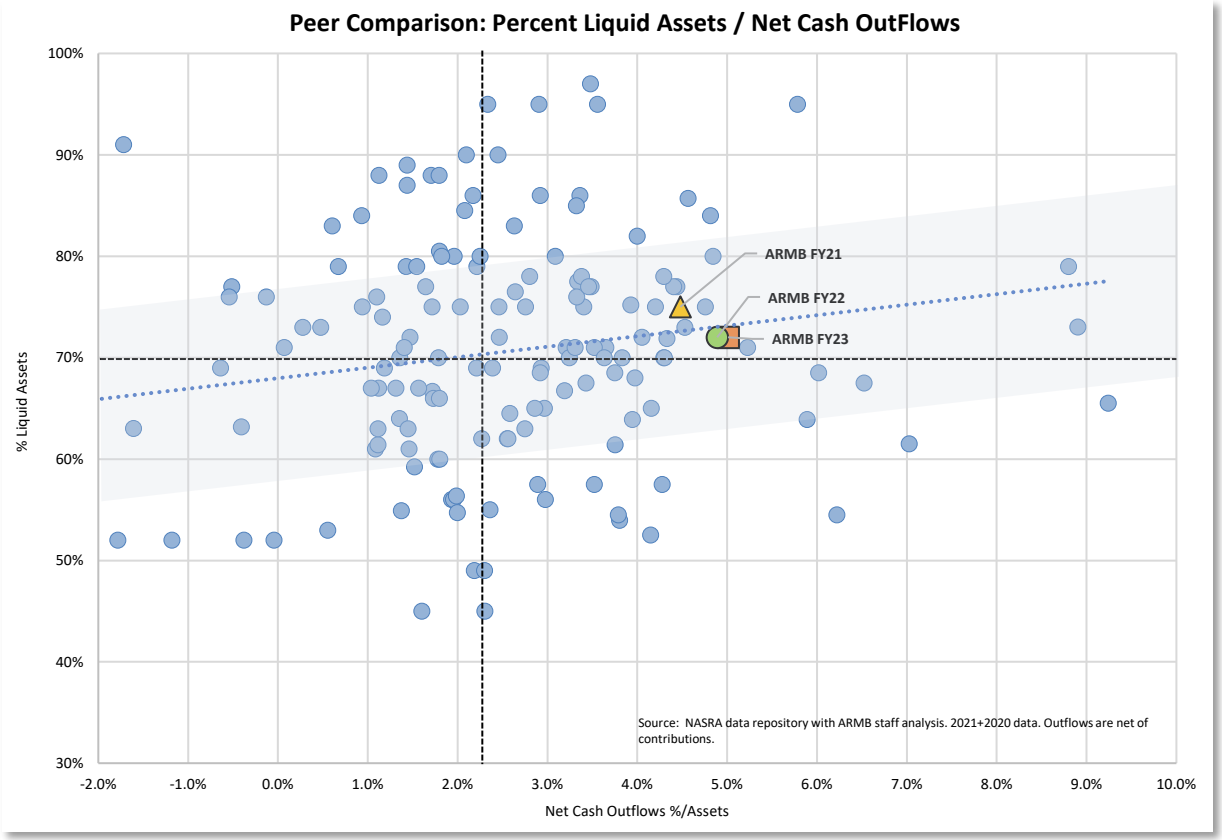


Liquidity

- PERS/TRS net cash outflows will increase over time, but the increase is expected to be relatively modest for the next 15 years.

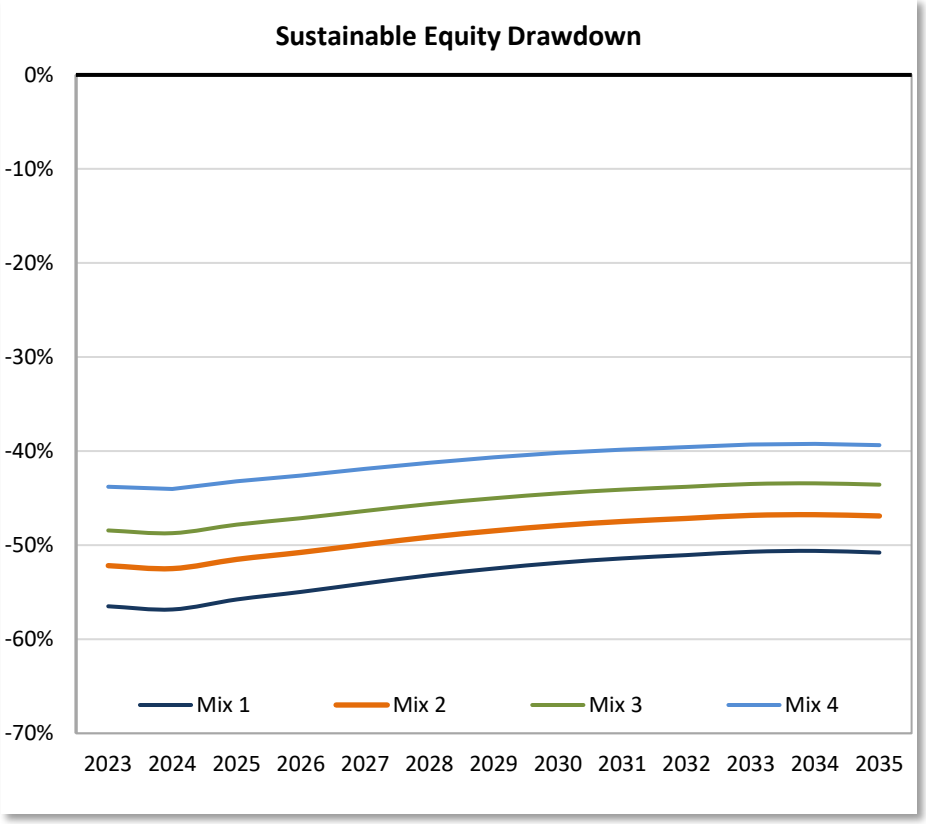


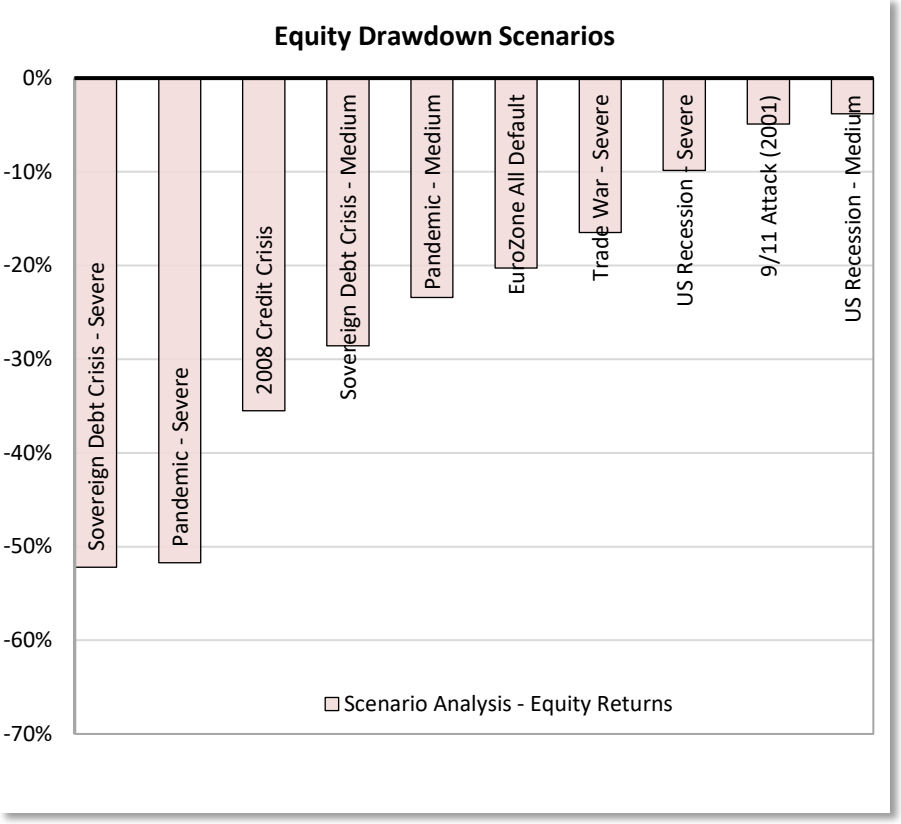
- The ARMB is closed with a shorter time horizon and higher liquidity needs than the median plan
- The current level of liquid assets should be sufficient for medium-term plan needs.
- Liquidity plays two important roles:
  - Meeting fund outflows
  - Maintaining the ARMB's risk posture through rebalancing



Liquidity, Market Stress, and Rebalancing

- The recommended asset allocation should allow the ARMB to rebalance in periods of equity market stress.

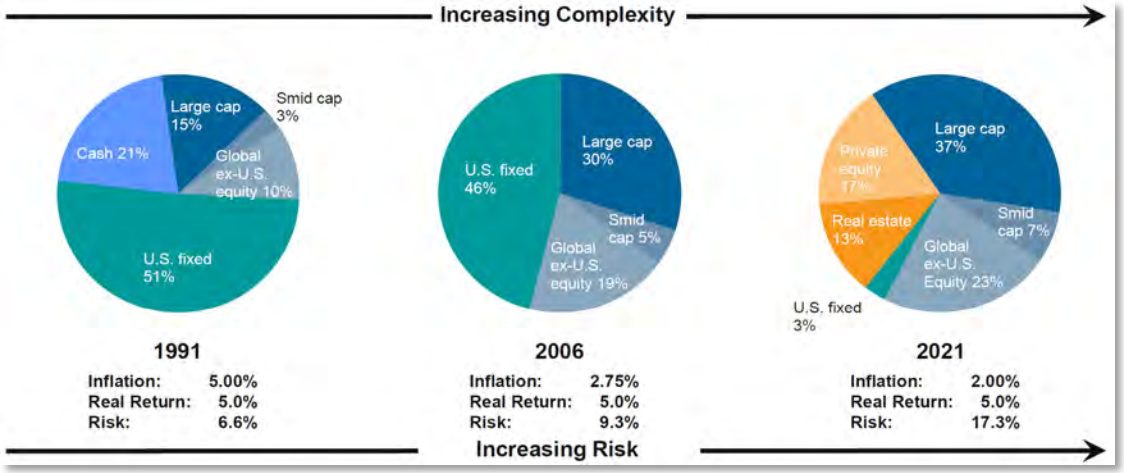




Source: Staff and truView Risk Analytics

Asset Allocation Over Time

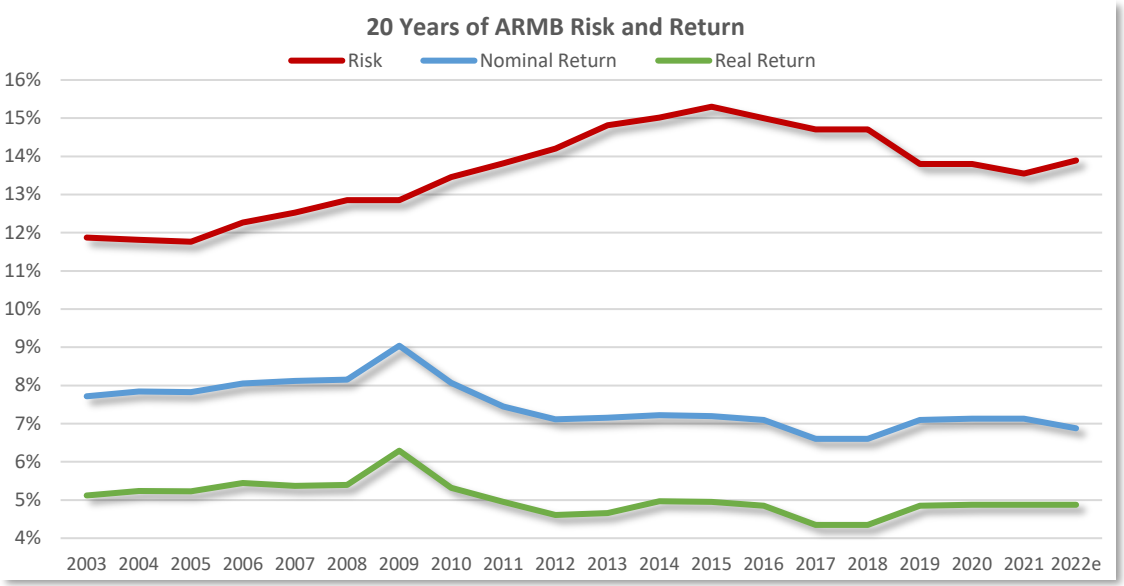
- Positioning a portfolio to achieve ~5% real return has required increasing levels of risk and complexity.



Source: Callan LLC

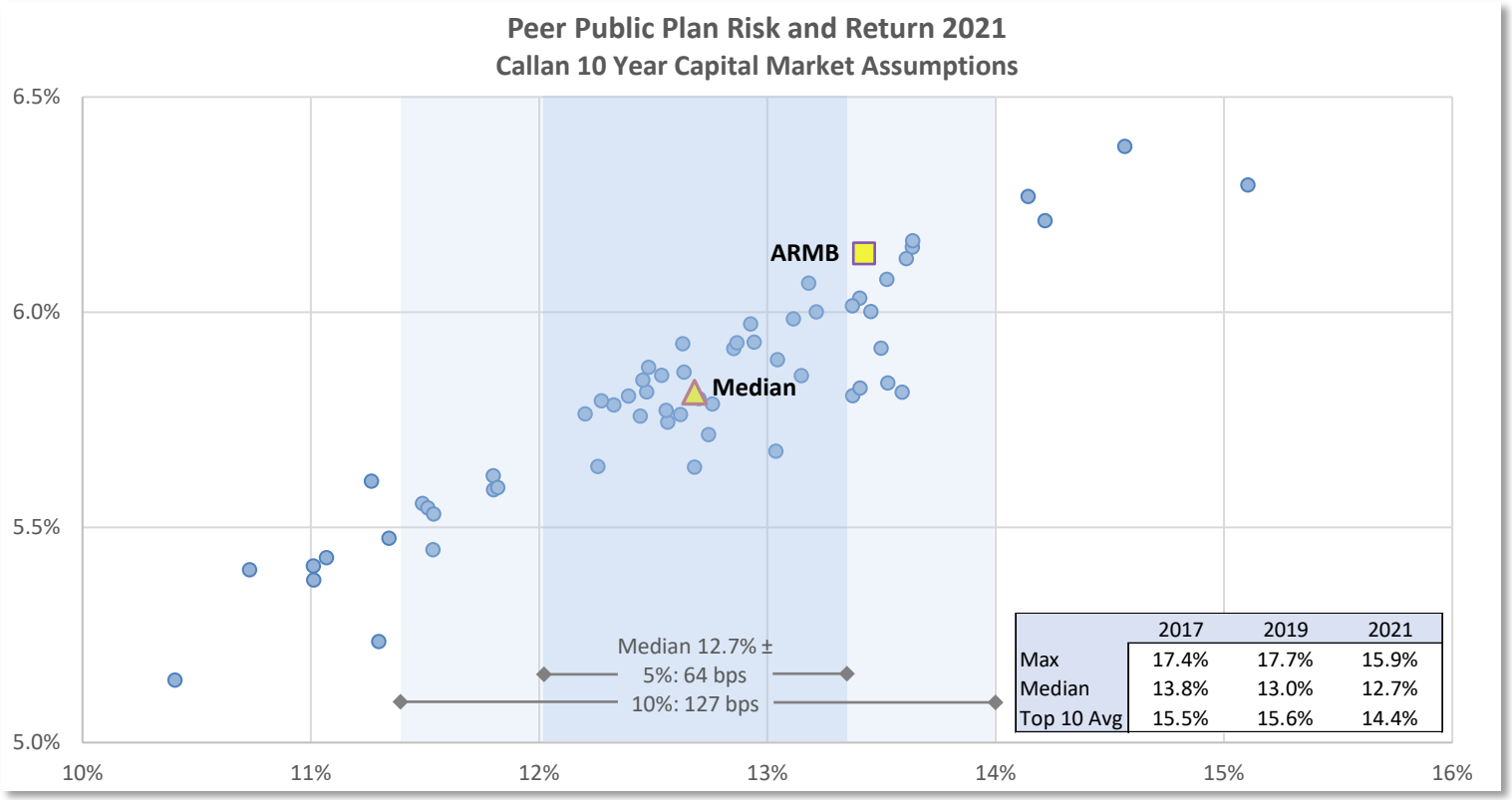
- Like most institutional investors, the ARMB's risk has generally risen over time, while real returns have remained relatively static.

- In 2019, the ARMB moved to a 20-year asset allocation time horizon to better align assets and liabilities and moderate annual asset allocation changes.



Investment Risk Posture

- Plan sponsor risk postures vary due to differing time horizons, asset/liability relationships, and other circumstances.
- The ARMB's risk posture is 6% higher than the median plan.
- The additional risk that the ARMB is taking compared to the median translates into ~25 bps of additional expected return.



	2017	2019	2021
Max	17.4%	17.7%	15.9%
Median	13.8%	13.0%	12.7%
Top 10 Avg	15.5%	15.6%	14.4%

PERS/TRS/Judicial Recommendation

- Staff is recommending the Mix 2 portfolio:
  - Callan's real return projections have decreased.
  - The ARMB has a higher level of risk than most plans and a shorter time horizon.
- The recommended portfolio is close to the actuarial target:
  - The ARMB does not target the actuarial real return every year since capital market assumptions fluctuate.
  - The ARMB can credibly expect to add excess returns.

			Alternative Targets			
		Target	Mix 1	Mix 2	Mix 3	Mix 4
	Broad US Equity	27	25	26	27	29
	Global ex-US Equity	18	16	17	18	19
	ARMB Fixed Income	21	23	21	19	16
	Multi-Asset	6	8	8	8	8
	Real Assets	14	14	14	14	14
	Private Equity	14	14	14	14	14
	Totals	100	100	100	100	100
10-Year Projection	Projected Arithmetic Return	7.00%	6.82%	6.95%	7.08%	7.28%
	10 Yr. Geometric Mean Return	6.24%	6.12%	6.20%	6.29%	6.42%
	Projected Standard Deviation	13.72%	13.20%	13.57%	13.93%	14.48%
20-Year Projection	Projected Arithmetic Return	7.59%	7.41%	7.54%	7.66%	7.85%
	20 Yr. Geometric Mean Return	6.86%	6.74%	6.82%	6.90%	7.02%
	Projected Standard Deviation	13.72%	13.20%	13.57%	13.93%	14.48%
	Real Return (2.25% inflation)	4.61%	4.49%	4.57%	4.65%	4.77%
	Equity (Public + Private + 60% Multi-Asset)	63%	60%	62%	64%	67%
	Fixed Income (ARMB fixed + 40% Multi-Asset)	23%	26%	24%	22%	19%
	Alts (Real + Private Equity)	28%	28%	28%	28%	28%

Source: Callan LLC

National Guard and Naval Recommendation

- This $48 million system has relatively fixed benefits.
- The system is overfunded but has a long time horizon for benefit payments.
- Staff is recommending a portfolio that targets the 5.75% actuarially expected return and has an 8% allocation to Multi-Asset.

		Military Target	Alternative Mix 8% Multi-Asset
	Broad US Equity	20	20
	Global ex-US Equity	13	13
	ARMB Fixed Income	46	44
	Multi-Asset	6	8
	Real Assets	7	7
	Private Equity	8	8
	Totals	100.00	100.00
10-Year Projection	Projected Arithmetic Return	5.28%	5.36%
	10-year Compound Return	4.96%	5.02%
	Projected Standard Deviation	9.25%	9.46%
20-Year Projection	Projected Arithmetic Return	5.96%	6.04%
	20-year Compound Return	5.67%	5.73%
	Projected Standard Deviation	9.25%	9.46%
	Real Return (2.25% inflation)	3.42%	3.48%
	Equity (Public + Private + 60% Multi-Asset)	45%	46%
	Fixed Income (ARMB Fixed + 40% Multi-Asset)	48%	47%
	Alts (Real + Private Equity)	15%	15%

Source: Callan LLC

Questions and Action Memos

Appendix

Callan – ARMB Mixes with Peer Proxies

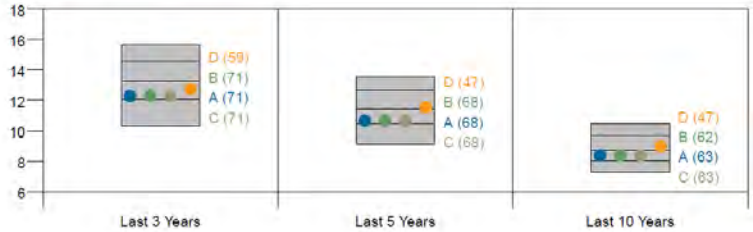
					Alternative Targets				
		Target	Peer 1	Peer 2	Mix 1	Mix 2	Mix 3	Mix 4	Peer 3	Public Market Proxy
	Broad US Equity	27	28	30	25	26	27	29	35	45
	Global ex-US Equity	18	18	19	16	17	18	19	23	30
	ARMB Fixed Income	21	32	29	23	21	19	16	16	25
	Multi-Asset	6	0	0	8	8	8	8	0	0
	Core Real Estate	0	9	10	0	0	0	0	12	0
	Real Assets	14	0	0	14	14	14	14	0	0
	Private Equity	14	12	12	14	14	14	14	15	0
	Totals	100	100	100	100	100	100	100	100	100
10-Year Projection	Projected Arithmetic Return	7.00%	6.38%	6.64%	6.82%	6.95%	7.08%	7.28%	7.50%	6.65%
	10 Yr. Geometric Mean Return	6.24%	5.81%	6.00%	6.12%	6.20%	6.29%	6.42%	6.58%	5.89%
	Projected Standard Deviation	13.72%	12.00%	12.70%	13.20%	13.57%	13.93%	14.48%	14.99%	13.56%
	Projected Sharpe Ratio	0.42%	0.43%	0.43%	0.43%	0.42%	0.42%	0.42%	0.42%	0.40%
20-Year Projection	Projected Arithmetic Return	7.59%	7.00%	7.25%	7.41%	7.54%	7.66%	7.85%	8.06%	7.27%
	20 Yr. Geometric Mean Return	6.86%	6.46%	6.63%	6.74%	6.82%	6.90%	7.02%	7.17%	6.54%
	Projected Standard Deviation	13.72%	12.00%	12.70%	13.20%	13.57%	13.93%	14.48%	14.99%	13.56%
	Real Return (2.25% inflation)	4.61%	4.21%	4.38%	4.49%	4.57%	4.65%	4.77%	4.92%	4.29%
	Equity (Public + Private + 60% Multi-Asset)	63%	58%	62%	60%	62%	64%	67%	73%	75%
	Fixed Income (ARMB fixed + 40% Multi-Asset)	23%	32%	29%	26%	24%	22%	19%	16%	25%
	Alts (Real + Private Equity)	28%	12%	12%	28%	28%	28%	28%	15%	0%

Callan Performance Dashboard – Excess Returns

Returns vs Callan Public Fund Sponsor Database

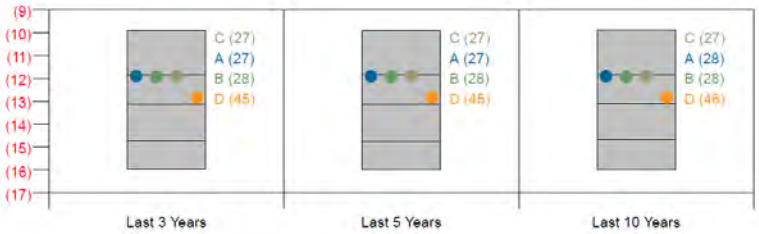
	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	10.31	12.46	10.68	9.64
25th Percentile	7.29	11.59	9.99	9.13
Median	5.46	10.55	9.22	8.48
75th Percentile	3.56	9.47	8.32	7.70
90th Percentile	2.22	8.54	7.71	7.10
Member Count	241	241	239	227
Employees' Total Plan (A)	10.45	12.10	10.49	9.30
Teachers' Total Plan (B)	10.45	12.10	10.49	9.31
Judicial Total Plan (C)	10.44	12.11	10.49	9.29
Policy Target (D)	6.89	11.04	9.42	8.52

Standard Deviation vs Callan Public Fund Sponsor Database



	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	15.67	13.59	10.46
25th Percentile	14.59	12.66	9.70
Median	13.28	11.44	8.73
75th Percentile	12.08	10.46	8.01
90th Percentile	10.32	9.13	7.28
Member Count	241	239	227
Employees' Total Plan (A)	12.29	10.67	8.39
Teachers' Total Plan (B)	12.30	10.68	8.41
Judicial Total Plan (C)	12.29	10.67	8.39
Policy Target (D)	12.74	11.55	8.99

Maximum Drawdown vs Callan Public Fund Sponsor Database



	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	(9.90)	(9.89)	(9.89)
25th Percentile	(11.85)	(11.85)	(11.84)
Median	(13.13)	(13.13)	(13.09)
75th Percentile	(14.74)	(14.77)	(14.66)
90th Percentile	(15.98)	(15.98)	(16.00)
Member Count	241	239	227
Employees' Total Plan (A)	(11.90)	(11.90)	(11.90)
Teachers' Total Plan (B)	(11.92)	(11.92)	(11.92)
Judicial Total Plan (C)	(11.89)	(11.89)	(11.89)
Policy Target (D)	(12.83)	(12.83)	(12.83)

Sharpe Ratio vs Callan Public Fund Sponsor Database

	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	0.99	0.91	1.08
25th Percentile	0.82	0.79	0.95
Median	0.71	0.68	0.86
75th Percentile	0.64	0.62	0.80
90th Percentile	0.58	0.57	0.72
Member Count	241	239	227
Employees' Total Plan (A)	0.92	0.88	1.03
Teachers' Total Plan (B)	0.92	0.88	1.03
Judicial Total Plan (C)	0.92	0.88	1.03
Policy Target (D)	0.80	0.72	0.88

Callan Simulation Results

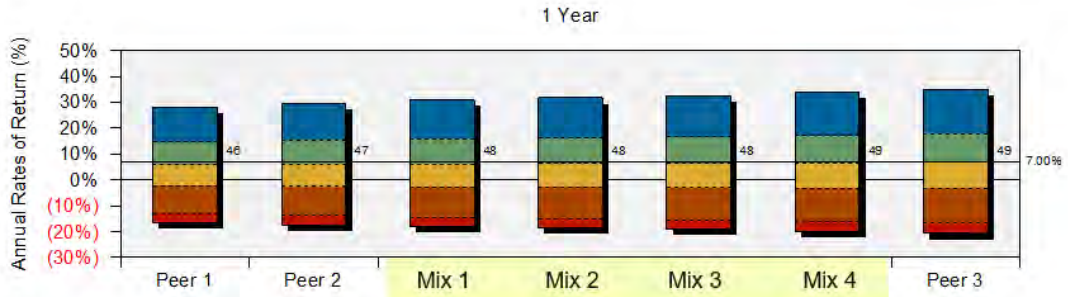
Impact of Risk Exposure on Range of Results – 1-Year and 20-Year Horizons

Simulated results using Callan's capital market assumptions, for any one year and for the 20-year horizon

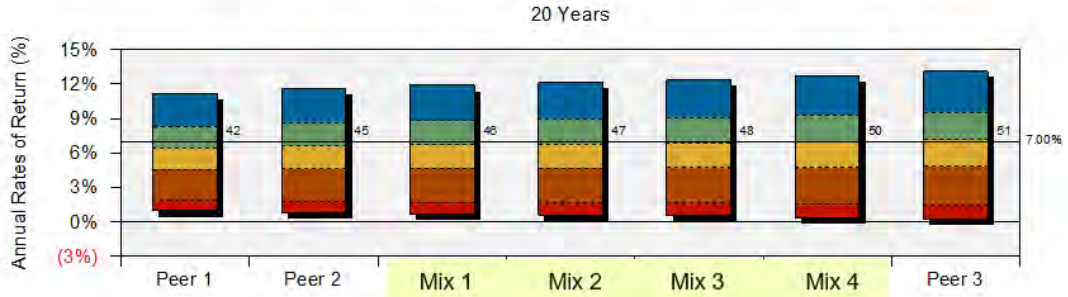
Target return hurdle of 7.0% nominal, which implies a real return of 4.75%

Mixes 1, 2 and 3 represent optimized portfolios with risk levels representing those from a range of public fund peers

Current Target and the alternative portfolios are expected to achieve returns close to the 7% nominal return target over 20 years



	Peer 1	Peer 2	Mix 1	Mix 2	Mix 3	Mix 4	Peer 3
5th Percentile	28.0%	29.7%	30.9%	31.7%	32.6%	33.9%	35.0%
25th Percentile	14.6%	15.4%	15.8%	16.2%	16.6%	17.1%	17.8%
Median	5.9%	6.1%	6.2%	6.3%	6.4%	6.6%	6.8%
75th Percentile	(2.1%)	(2.4%)	(2.6%)	(2.8%)	(3.0%)	(3.2%)	(3.3%)
95th Percentile	(12.9%)	(13.7%)	(14.5%)	(15.0%)	(15.4%)	(16.0%)	(16.5%)
97.5th Percentile	(16.5%)	(17.5%)	(18.1%)	(18.6%)	(19.2%)	(19.9%)	(20.7%)
Prob > 7.00%	46.4%	47.2%	47.7%	48.1%	48.4%	48.9%	49.4%
Standard Deviation	12.0%	12.70%	13.2%	13.57%	13.93%	14.48%	14.99%



	Peer 1	Peer 2	Mix 1	Mix 2	Mix 3	Mix 4	Peer 3
5th Percentile	11.2%	11.6%	11.9%	12.1%	12.4%	12.7%	13.1%
25th Percentile	8.3%	8.6%	8.8%	9.0%	9.1%	9.3%	9.6%
Median	6.4%	6.6%	6.7%	6.8%	6.9%	7.0%	7.1%
75th Percentile	4.6%	4.6%	4.7%	4.7%	4.7%	4.8%	4.8%
95th Percentile	1.9%	1.8%	1.7%	1.7%	1.6%	1.5%	1.5%
97.5th Percentile	1.0%	0.8%	0.7%	0.6%	0.5%	0.4%	0.3%
Prob > 7.00%	42.2%	44.7%	46.1%	47.2%	48.4%	49.7%	51.3%
Standard Deviation	12.0%	12.70%	13.2%	13.57%	13.93%	14.48%	14.99%

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Fiscal Year 2023 ARMB Asset Allocations Resolutions 2022-02 and 2022-03	ACTION:	X
DATE:	June 16-17, 2022	INFORMATION:	

BACKGROUND:

The Alaska Retirement Management Board (ARMB) sets and reviews the asset allocations on behalf of all plans over which it has fiduciary responsibility.

STATUS:

CIO Zachary Hanna, with ARMB staff and Callan LLC (Callan), reviewed Callan's capital market assumptions and asset allocation modeling work to identify potential asset allocation mixes for the ARMB to consider for the upcoming fiscal year.

Staff recommends the following strategic asset allocations after considering current asset allocations and a range of optimal portfolios produced by Callan:

Resolution 2022-02
- Public Employees' Retirement System Defined Benefit and Defined Contribution Plans
- Teachers' Retirement System Defined Benefit and Defined Contribution Plans
- Judicial Retirement System Defined Benefit Plans

Resolution 2022-03
- Alaska National Guard and Naval Militia Retirement Systems

RECOMMENDATION:

The Alaska Retirement Management Board adopt Resolutions 2022-02 and 2022-03, approving the asset allocations for fiscal year 2023.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
Relating to Asset Allocation for the Funds of the
Public Employees' Retirement System Defined Benefit and Defined Contribution Plans,
Teachers' Retirement System Defined Benefit and Defined Contribution Plans, and
Judicial Retirement System Defined Benefit Plans

Resolution 2022-02

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee of 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 policies for each of the funds entrusted to it; 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, the Board contracts with an independent consultant to provide experience and expertise in asset allocation and other investment matters to come before the Board; and

WHEREAS, the Board has reviewed the actuarial assumptions; and

WHEREAS, the Board has reviewed the asset allocation set forth in the study prepared by the external investment consulting firm of Callan Associates, Inc.; and

WHEREAS, a prudent, diversified portfolio reduces risk and volatility and considers short term and long term earnings requirements for the Funds; and

WHEREAS, the Board shall continue to review, evaluate and make appropriate adjustments to asset allocation for the retirement plans on a periodic basis;

NOW THEREFORE, BE IT RESOLVED BY THE ALASKA RETIREMENT MANAGEMENT BOARD that effective July 1, 2022, the following Policy Benchmark be established for the following funds:

(1) Public Employees' Retirement System
- Defined Benefit Plans
    - Retirement Trust
    - Retirement Health Care Trust
- Defined Contribution Plans
    - Health Reimbursement Arrangement Plan Trust Fund
    - Retiree Medical Plan
    - Defined Benefit Occupational Death and Disability
        - Public Employees All Other
        - Peace Officers and Firefighters

(2) Teachers' Retirement System
- Defined Benefit Plans
    - Retirement Trust
    - Retirement Health Care Trust
- Defined Contribution Plans
    - Health Reimbursement Arrangement Plan Trust Fund
    - Retiree Medical Plan
    - Defined Benefit Occupational Death and Disability

(3) Judicial Retirement System
- Defined Benefit Plans
    - Retirement Trust
    - Retirement Health Care Trust

PERS/TRS/Judicial

FY2023 Target Asset Allocation

Asset Class	Allocation	Range
Broad Domestic Equity	26%	± 6%
Global Equity Ex-US	17%	± 4%
Fixed Income	21%	± 10%
Multi-Asset	8%	± 4%
Real Assets	14%	± 7%
Private Equity	14%	± 7%
Total	100%	
Projected 20 Year Geometric Return	6.82%	
Projected 20 Year Real Return	4.57%	
Projected Standard Deviation	13.57%	

Policy Benchmarks

Asset Class	Benchmark
Broad Domestic Equity	Russell 3000
Global Equity Ex-US	MSCI ACWI Ex-US IMI Net
Fixed Income	95% BB US Aggregate 5% 3-Month Treasury Bill
Multi-Asset	60% MSCI ACWI IMI Net 40% BB US Aggregate
Real Assets	35% NFI-ODCE 15% FTSE-NAREIT 25% NCREIF Farmland 10% NCREIF Timberland 15% CPI+4%
Private Equity	1/3 S&P 500 1/3 Russell 2000 1/3 MSCI EAFE Net

This resolution repeals and replaces Resolution 2021-01.

DATED at Anchorage, Alaska this ____ day of June, 2022.

_____
Chair

ATTEST:

_____
Secretary

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
Relating to Asset Allocation for the Funds of the
Public Employees' Retirement System Defined Benefit and Defined Contribution Plans,
Teachers' Retirement System Defined Benefit and Defined Contribution Plans, and
Judicial Retirement System Defined Benefit Plans

Resolution ~~2021~~2022-~~01~~02

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee of 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 policies for each of the funds entrusted to it; 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, the Board contracts with an independent consultant to provide experience and expertise in asset allocation and other investment matters to come before the Board; and

WHEREAS, the Board has reviewed the actuarial assumptions; and

WHEREAS, the Board has reviewed the asset allocation set forth in the study prepared by the external investment consulting firm of Callan Associates, Inc.; and

WHEREAS, a prudent, diversified portfolio reduces risk and volatility and considers short term and long term earnings requirements for the Funds; and

WHEREAS, the Board shall continue to review, evaluate and make appropriate adjustments to asset allocation for the retirement plans on a periodic basis;

NOW THEREFORE, BE IT RESOLVED BY THE ALASKA RETIREMENT MANAGEMENT BOARD that effective July 1, ~~2021~~2022, the following Policy Benchmark be established for the following funds:

(1) Public Employees' Retirement System
- Defined Benefit Plans
  - Retirement Trust
  - Retirement Health Care Trust
- Defined Contribution Plans
  - Health Reimbursement Arrangement Plan Trust Fund
  - Retiree Medical Plan
  - Defined Benefit Occupational Death and Disability
    - Public Employees All Other
    - Peace Officers and Firefighters

(2) Teachers' Retirement System
- Defined Benefit Plans
  - Retirement Trust
  - Retirement Health Care Trust
- Defined Contribution Plans
  - Health Reimbursement Arrangement Plan Trust Fund
  - Retiree Medical Plan
  - Defined Benefit Occupational Death and Disability

(3) Judicial Retirement System
- Defined Benefit Plans
  - Retirement Trust
  - Retirement Health Care Trust

PERS/TRS/Judicial

~~FY2022~~ FY2023 Target Asset Allocation

Asset Class	Allocation	Range
Broad Domestic Equity	~~27~~26%	± 6%
Global Equity Ex-US	~~18~~17%	± 4%
Fixed Income	21%	± 10%
~~Opportunistic~~Multi-Asset	~~6~~8%	± 4%
Real Assets	14%	± 7%
Private Equity	14%	± ~~6~~7%
Total	100%	
Projected 20 Year Geometric Return	6.~~88~~82%	
Projected 20 Year Real Return	4.~~88~~57%	
Projected Standard Deviation	13.~~89~~57%	

Policy Benchmarks

Asset Class	Benchmark
Broad Domestic Equity	Russell 3000
Global Equity Ex-US	MSCI ACWI Ex-US IMI Net
Fixed Income	95% BB US Aggregate 5% 3-Month Treasury Bill
~~Opportunistic~~Multi-Asset	60% MSCI ACWI IMI Net 40% BB US Aggregate
Real Assets	35% NFI-ODCE 15% FTSE-NAREIT 25% NCREIF Farmland 10% NCREIF Timberland 15% CPI+4%
Private Equity	1/3 S&P 500 1/3 Russell 2000 1/3 MSCI EAFE Net

This resolution repeals and replaces Resolution ~~2020~~2021-~~04~~01.

DATED at Anchorage, Alaska this ____ day of June, ~~2021~~2022.

_____
Chair

ATTEST:

_____
Secretary

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
Relating to Asset Allocation
For the Alaska National Guard and Naval Militia Retirement Systems

Resolution 2022-03

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee of 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 each of the funds entrusted to it; 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, the Board contracts with an independent consultant to provide experience and expertise in asset allocation and other investment matters to come before the Board; and

WHEREAS, the Board has reviewed the actuarial assumptions for the Alaska National Guard and Naval Militia Retirement Systems; and

WHEREAS, the Board has reviewed the asset allocation set forth in the study prepared by the external investment consulting firm of Callan Associates, Inc.; and

WHEREAS, a prudent, diversified portfolio reduces risk and volatility and considers short term and long term earnings requirements for the Funds; and

WHEREAS, the Board shall continue to review, evaluate and make appropriate adjustments to asset allocation for the retirement plans on a periodic basis;

NOW THEREFORE, BE IT RESOLVED BY THE ALASKA RETIREMENT MANAGEMENT BOARD that the following asset allocation be established for the Alaska National Guard & Naval Militia Retirement System, effective July 1, 2022:

Alaska National Guard and Naval Militia Retirement Systems

FY2023 Target Asset Allocation

Asset Class	Allocation	Range
Broad Domestic Equity	20%	± 6%
Global Equity Ex-US	13%	± 4%
Fixed Income	44%	± 10%
Multi-Asset	8%	± 4%
Real Assets	7%	+ 4%
Private Equity	8%	± 4%
Total	100%	
Projected 20 Year Geometric Return	5.73%	
Projected 20 Year Real Return	3.48%	
Projected Standard Deviation	9.46%	

Policy Benchmarks

Asset Class	Benchmark
Broad Domestic Equity	Russell 3000
Global Equity Ex-US	MSCI ACWI Ex-US IMI Net
Fixed Income	95% BB US Aggregate 5% 3-Month Treasury Bill
Multi-Asset	60% MSCI ACWI IMI Net 40% BB US Aggregate
Real Assets	35% NFI-ODCE 15% FTSE-NAREIT 25% NCREIF Farmland 10% NCREIF Timberland 15% CPI+4%
Private Equity	1/3 S&P 500 1/3 Russell 2000 1/3 MSCI EAFE Net

This resolution repeals and replaces Resolution 2021-02.

DATED at Anchorage, Alaska this ____ day of June, 2022.

_____
Chair

ATTEST:

_____
Secretary

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
Relating to Asset Allocation
For the Alaska National Guard and Naval Militia Retirement Systems

Resolution ~~2021~~2022-~~02~~03

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee of 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 each of the funds entrusted to it; 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, the Board contracts with an independent consultant to provide experience and expertise in asset allocation and other investment matters to come before the Board; and

WHEREAS, the Board has reviewed the actuarial assumptions for the Alaska National Guard and Naval Militia Retirement Systems; and

WHEREAS, the Board has reviewed the asset allocation set forth in the study prepared by the external investment consulting firm of Callan Associates, Inc.; and

WHEREAS, a prudent, diversified portfolio reduces risk and volatility and considers short term and long term earnings requirements for the Funds; and

WHEREAS, the Board shall continue to review, evaluate and make appropriate adjustments to asset allocation for the retirement plans on a periodic basis;

NOW THEREFORE, BE IT RESOLVED BY THE ALASKA RETIREMENT MANAGEMENT BOARD that the following asset allocation be established for the Alaska National Guard & Naval Militia Retirement System, effective July 1, ~~2021~~2022:

Alaska National Guard and Naval Militia Retirement Systems

~~FY2022~~ FY2023 Target Asset Allocation

Asset Class	Allocation	Range
Broad Domestic Equity	20%	± 6%
Global Equity Ex-US	13%	± 4%
Fixed Income	~~46~~44%	± 10%
~~Opportunistic~~Multi-Asset	~~6~~8%	± 4%
Real Assets	7%	+ 4%
Private Equity	8%	± 4%
Total	100%	
Projected 20 Year Geometric Return	5.~~68~~73%	
Projected 20 Year Real Return	3.48%	
Projected Standard Deviation	9.~~33~~46%	

Policy Benchmarks

Asset Class	Benchmark
Broad Domestic Equity	Russell 3000
Global Equity Ex-US	MSCI ACWI Ex-US IMI Net
Fixed Income	95% BB US Aggregate 5% 3-Month Treasury Bill
~~Opportunistic~~Multi-Asset	60% MSCI ACWI IMI Net 40% BB US Aggregate
Real Assets	35% NFI-ODCE 15% FTSE-NAREIT 25% NCREIF Farmland 10% NCREIF Timberland 15% CPI+4%
Private Equity	1/3 S&P 500 1/3 Russell 2000 1/3 MSCI EAFE Net

This resolution repeals and replaces Resolution ~~2020~~2021-~~05~~02.

DATED at Anchorage, Alaska this ____ day of June, ~~2021~~2022.

_____
Chair

ATTEST:

_____
Secretary

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- FY2021 Actuarial Valuation Reports (Buck)
    - 2021 Alaska PERS DB Report
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Alaska Retirement Management Board

Actuarial Review of Pension and Postemployment Healthcare Plans for PERS and TRS

Actuarial Review of the Public employees' Tier IV and Teachers' Tier III Defined Contribution Retirement Plan - for Occupational Death and Disability and Retiree Medical Benefits

May 20, 2022

GRS

P: 720.274.7270 | www.grsconsulting.com

May 20, 2022

Mr. Zach Hanna
Chief Investment Officer
Department of Revenue, Treasury Division
Alaska Retirement Management Board
P.O. Box 110405
Juneau, AK 99811-0405

Subject: **Actuarial Review of June 30, 2021 valuations for the State of Alaska Public Employees' Retirement System Defined Benefit Retirement Plan (PERS DB) and Teachers' Retirement System Defined Benefit Retirement Plan (TRS DB)**

Actuarial Review of June 30, 2021 valuations for the State of Alaska Public Employees' Retirement System Defined Contribution Retirement Plan (PERS DCR) and Teachers' Retirement System Defined Contribution Retirement Plan (TRS DCR)

Dear Zach:

We have performed an actuarial review of the June 30, 2021 Actuarial Valuations for PERS DB, TRS DB, PERS DCR, and TRS DCR.

This report includes a review of:

- Pension Assumptions and Benefits
- Occupational Death and Disability Assumptions and Benefits
- Health Care Cost Assumptions
- Actuarial Valuation Methods and Procedures
- Contribution Rate Determination
- Actuarial Valuation Report
- Potential Areas for Future Review

A major part of the review is a thorough analysis of the test lives provided by Buck. The report includes exhibits that summarize the detailed analysis of these sample test cases, as well as a comparison of the results between Buck and GRS. We wish to thank the staff of the State of Alaska Treasury Division and Buck, without whose willing cooperation this review could not have been completed.

Sincerely,

Gabriel, Roeder, Smith & Company

Paul Wood, ASA, FCA, MAAA
Senior Consultant

Bill Detweiler, ASA, EA, FCA, MAAA
Consultant

cc: Ms. Pamela Leary
Ms. Alysia Jones

7900 East Union Avenue | Suite 650 | Denver, Colorado 80237-2746

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SECTION 1

EXECUTIVE SUMMARY

Executive Summary

Gabriel, Roeder, Smith & Co. was engaged by the Alaska Retirement Management Board (ARMB) to review the June 30, 2021 Actuarial Valuation of the State of Alaska Public Employees' Retirement System (PERS) and Teachers' Retirement System (TRS) including both the Defined Benefit Plans and the Defined Contribution Plans.

This report presents our findings in the following areas:

- General Approach
- Review of Assumptions
- Review of Actuarial Valuation Methods and Procedures (including the test lives review)
- Review of Contribution Rate Determination
- Review of Actuarial Valuation Report
- Potential Areas for Future Review
- Summary and Conclusions

In general, we found that the Buck's actuarial results and reports were reasonable and find the assumptions consistent with generally accepted actuarial practice

Monthly conference calls conducted between Buck and GRS were made this year and contributed greatly to resolving issues more quickly and thoroughly. Those issues, even if resolved, are highlighted in this report.

Key Findings From The Audit Of The June 30, 2021 Valuations

- We recommend Buck examine experience under the current assumptions in the upcoming experience study to determine if they are working as intended or need to be modified.
- We recommend Buck continues to track the medical claims experience closely, particularly any further impact from the plan changes or COVID-19 experience.
- We recommend Buck review with the Board whether to implement a new entrant/rehire assumption in the DCR plan.
- We recommend Buck continue to disclose the nature and impact of all programming changes included in the valuation.
- We recommend Buck generate a new gain/loss item that tracks the experience of the EGWP savings assumption.
- We recommend that Buck implement the changes to their valuation methods as detailed in Section 6 of this report.
- We recommend Buck make some small modifications to their valuation reports to improve communication and disclosures.

Buck's Implementation of Recommendations from Prior Review Report

As part of last year's actuarial review, we made several recommendations. These recommendations included the following:

- Changes to their valuation methods as detailed below.
    - **Timing of Alaska COLA for Disability** – The 10% Alaska COLA should be applied to all disabled members immediately, but it is not being applied until age 65 for members who have retired from disability. We recommend Buck update any calculations necessary so this COLA is applied immediately to all disabled members in both TRS and PERS.
    - **Retirement Benefit for PERS DB Peace Officer/Firefighter Occupational Disability** – When PERS Peace Officer/Firefighter members in both the DB plan and DCR plan retire from occupational disability, the benefit should be increased by the same accumulative PRPA percentage that was applied to the disability benefit. Buck is currently only applying this increase to the occupational disability benefit for Peace Officer/Firefighters in the PERS DCR plan. We recommend Buck update the occupational disability benefits in the PERS DB plan to also include this increase for Peace Officer/Firefighter members.
    - **Rate Used in Valuation Not Matching Rate Disclose in Report** – The ultimate rate of turnover for a male PERS DCR Peace Officer/Firefighter member at age 42 is shown to be 5.90% in the June 30, 2019 report, but a slightly different rate of 5.93% is being used in the calculations. We recommend not only clarifying this specific rate, but since we are unable to verify all rates with only a select number of test lives, make sure all of the decrement rates shown in the reports are consistent with those being used in the calculations.
    - **Actuarial Assumptions for TRS Early Retirement Factors** – Early retirement factors (ERFs) are based on actuarial equivalence for the TRS DB plan, but it is not clear, based on Buck's valuation report, what actuarial assumptions are being used for the ERFS. We recommend Buck clarify the actuarial assumptions being used and disclose them appropriately in the TRS DB report.
- We recommend Buck make some small modifications to their valuation reports to improve communication and make them more consistent.

We appreciate Buck considering these changes for the June 30, 2021 valuations. We confirmed most of them have been made to the valuations and have noted those that we believe still need consideration in this report.

Summary Of Test Life Review

We have included as a part of this report a detailed test life results summary.

- We matched the present value of benefits closely in total on all test lives submitted. We have included exhibits in Sections 6 and 7 of the report, which summarize the differences in calculations by decrement for the test lives analyzed. Differences between actuarial firms will always occur due to system differences and other nuances in the calculations.

- We identified the following five findings related to the valuation. While they may be viewed as immaterial, they should, at the very least, be updated in future valuations, subject to Actuarial Committee discretion.
    - Administration of Claimed Service
    - Retirement Benefit for PERS DB Peace Officer/Firefighter Occupational Disability
    - Occupational Death COLA Benefit for PERS DB Peace Officer/Firefighter
    - Service Eligibility for TRS DB
    - Occupational Disability Benefit for PERS PF DCR OD&D

SECTION 2

GENERAL APPROACH

General Approach

Gabriel, Roeder, Smith & Co. was charged with reviewing the actuarial assumptions of the pension and health care provisions of the actuarial valuations of PERS DB, TRS DB, PERS DCR, and TRS DCR.

We requested a number of items from Buck in order to perform the actuarial review and health cost assumption review:

1. In November and December of 2021, we received valuation data for pension and healthcare for both plans, we received the pension and healthcare test lives for PERS DB, TRS DB, PERS DCR and TRS DCR, and we received preliminary liabilities. In January of 2022, we received revised information for some of the plans.
2. We received draft reports in January 2022.
3. Monthly conference calls between Buck and GRS occurred, with the agenda items including timing of deliverables and the discussion of audit matters.

In performing our review, we:

4. Reviewed actuarial assumptions – We checked to see if they were consistent, comprehensive, and appeared reasonable.
5. Reviewed the actuarial valuation reports, as of June 30, 2021, for completeness and reviewed the financial determinations.
6. Reviewed, in detail, the sample members provided us – This provided us with a perspective on the actuarial process utilized by Buck with respect to the plan and allowed us to review the valuation methods and procedures.
7. Reviewed the health cost assumptions and trend.

KEY ACTUARIAL CONCEPTS

An actuarial valuation is a detailed statistical simulation of the future operation of a retirement system using the set of actuarial assumptions adopted by the Board. It is designed to simulate all of the dynamics of such a system for each current system member including:

1. Earning future service and making contributions,
2. Receiving changes in compensation,
3. Leaving the system through job change, disablement, death, or retirement, and
4. Determination of and payment of benefits from the System.

This simulated dynamic is applied to each active member of the System. It results in a set of expected future benefit payments to that member. Bringing those expected payments to present value, at the assumed rate of investment return, produces the Present Value (PV) of future Benefits for that member. In like manner, a PV of future salaries is determined.

The PV of future benefits and the PV of future salaries for the entire System are the total of these values across all members. The remainder of the actuarial valuation process depends upon these building blocks.

Once the basic results are derived, an actuarial method is applied in order to develop information on contribution levels and funding status. An actuarial method splits the PV of future benefits into two components:

1. PV of Future Normal Costs, and
2. Actuarial Accrued Liability ("AAL").

The actuarial method in use by the State of Alaska is known as the Entry Age Normal (EAN) method. Under EAN, the Normal Cost for a member is that portion of the PV of the increase in the value of that member's benefit for service during the upcoming year. The AAL is the difference between the total PVB and the PV of all future normal costs.

For TRS DB and PERS DB, the PV of future benefits applies to the following benefits:

- Retirement benefits
- Withdrawal benefits
- Disability benefits
- Death benefits
- Return of contributions
- Medical benefits
- Indebtedness (from contributions which might be redeposited)

For TRS DCR and PERS DCR plans, the actuarial present value of future benefits applies to the following benefits:

- Occupational Disability benefits
- Occupational Death benefits
- Retiree Medical benefits

The medical benefits are based on potential future health care benefits, while the others are a type of post-employment income replacement benefit, based on salary. For the medical benefits, estimates must be made of the future health care costs. This is done by determining current per capita health care claim costs by age of retiree, and projecting them into the future based on anticipated future health care inflation.

SECTION 3

REVIEW OF GAINS AND LOSSES

Review of Gains and Losses

As a part of the annual audit, we take a historical look at the gains and losses on the accrued liability. Gains and losses may measure "how closely" experience matches the actuarial assumption. Recurring gains or losses may indicate an assumption that is not meeting the actual experience for this population. In the tables below, we detail the historical gains and losses for each plan. In addition, we have shown the gain or loss as a percent of the beginning of year (BOY) accrued liability (AL).

Table 1-PERS DB Pension Gains and (Losses) by Source (000's)

Source	2021 Valuation	2020 Valuation	2019 Valuation	2018 Valuation	2017 Valuation
Retirement	$ (7,211)	$ (1,285)	$ (3,126)	$ (10,403)	$ 1,448
Termination	(7,963)	(4,857)	6,714	(5,131)	(9,254)
Mortality	12,825	(6,421)	12,459	39,631	3,856
Disability	6,650	(901)	(1,435)	(3,631)	(1,612)
Rehires	15,067	8,418	(13,297)	7,141	(6,403)
Other	3,449	5,835	(8,534)	(7,923)	25,341
Salary	(17,126)	11,228	(59,955)	97,200	121,046
COLA and PRPA	155,142	78,795	(8,371)	108,227	146,017
Total G/L	**$ 160,833**	**$ 90,812**	**$ (75,545)**	**$ 225,111**	**$ 280,439**
Total AL at BOY	**$ 15,279,525**	**$ 15,039,180**	**$ 14,606,033**	**$ 13,832,130**	**$ 13,633,033**
G/L as a % of AL	**1.05%**	**0.60%**	**-0.52%**	**1.63%**	**2.06%**

Note: 2017-2018 gains and losses are prior to the implementation of new assumptions.

The $161 million gain in the most recent valuation is predominantly made up of positive experience on the postretirement pension adjustments (PRPA). The adjustments that occurred in 2021 were less than those assumed in the actuarial valuation. This piece is based on inflation, which was low during calendar years 2019 and 2020. However, inflation significantly increased during calendar year 2021, so we are expecting large losses for this piece in the next valuation.

After a number of years with salary gains, the salary increase assumptions were lowered in the most recent experience study. There have now been three years of experience under the newly adopted assumptions and we have seen one year of gains and two years of losses. We expect this assumption to be carefully analyzed in the upcoming experience study to make sure the decreased rates in the last experience study continue to be appropriate.

The retirement category generated a loss for the fourth year in a row. There seems to be a pattern developing where more members are retiring than assumed. The retirement assumptions should be appropriately increased in the upcoming experience study to reflect this pattern.

The rehired category generated a gain. The liabilities for rehires were less than what was assumed with the normal cost rehire load. This was also an assumption that was updated in the last experience study and should be analyzed again in the upcoming experience study to make sure it was not set too high.

All of the other gains and losses will also need to be analyzed in the upcoming experience study to determine if the current assumptions are appropriate or if they need to be revised.

Table 2-PERS DB Healthcare Gains and (Losses) by Source (000's)

Source	2021 Valuation	2020 Valuation	2019 Valuation	2018 Valuation	2017 Valuation
Retirement	$ 7,125	$ 4,857	$ 1,098	$ 22,262	$ 23,360
Termination	(10,409)	(8,049)	(946)	(6,746)	(12,648)
Mortality	1,939	156	2,976	4,794	22,472
Disability	10,858	867	(981)	288	(1,155)
Rehires	14,045	15,996	10,708	5,948	1,089
Other	5,394	1,735	95,602	(19,667)	80,508
Medical Claims	272,205	278,796	642,081	412,243	830,620
Modified Part B Assumption	5,743	6,345	6,164	235,258	N/A
Dependent Coverage Election	15,017	23,400	18,580	69,614	N/A
COVID-19	-	25,856	-	-	-
Plan Changes	61,807	-	-		-
Methodology	-	-	-	-	(976,619)
Total	**$ 383,724**	**$ 349,959**	**$ 775,282**	**$ 723,994**	**$ (32,373)**
Total AL at BOY	**$ 7,036,550**	**$ 7,151,694**	**$ 7,658,104**	**$ 8,049,265**	**$ 7,736,457**
G/L as a % of AL	**5.45%**	**4.89%**	**10.12%**	**8.99%**	**-0.42%**

Note: 2017-2018 gains and losses are prior to the implementation of new assumptions.

Overall, there was a $384 million gain on the PERS DB Healthcare results. This is mostly due to positive experience on the medical claims. This is now the fifth year in a row there have been significant medical claims gains. The gains this year would have been even larger, but Buck added a 4% load to the medical claims due to account for COVID-19 experience. This will be discussed further in the next section.

This year there were also gains attributable to plan changes. These gains are primarily due to special medication prior authorization.

Based on our recommendation as part of our prior audits, Buck included separate gain loss items to detail gains and losses attributable to both the modified Part B assumption and dependent coverage elections. We are clearly seeing patterns that indicate fewer members are eligible for Part B than assumed and fewer dependents are electing coverage than assumed. Theses assumptions should be analyzed in the upcoming experience study and modified.

We are also seeing patterns develop for retirement, termination, mortality, and rehires. All of these assumptions appear to be biased and should also be revised accordingly in the upcoming experience study.

Table 3- TRS DB Pension Gains and (Losses) by Source (000's)

Source	2021 Valuation	2020 Valuation	2019 Valuation	2018 Valuation	2017 Valuation
Retirement	$ 4,502	$ 4,822	$ 4,611	$ 6,125	$ 9,201
Termination	(7,088)	(8,327)	(4,692)	(11,283)	(11,770)
Mortality	(4,778)	(11,161)	(6,628)	1,634	(282)
Disability	(103)	(337)	(1,732)	(543)	(1,010)
Rehires	3,085	(691)	2,148	3,114	5,142
Other	7,486	(3,258)	(3,295)	3,790	(10,367)
Salary	(29,192)	6,443	7,272	41,455	37,590
COLA and PRPA	81,655	43,389	(5,231)	80,819	92,877
Total	**$ 55,567**	**$ 30,880**	**$ (7,547)**	**$ 125,111**	**$ 121,381**
Total Al at BOY	**$ 7,447,036**	**$ 7,388,020**	**$ 7,276,290**	**$ 7,217,525**	**$ 7,159,788**
G/L as a % of AL	**0.75%**	**0.42%**	**-0.10%**	**1.73%**	**1.70%**

Note: 2017-2018 gains and losses are prior to the implementation of new assumptions.

TRS DB also saw an overall gain, again predominantly made up of positive experience on the PRPAs. These gains were partially offset by salary losses, as salaries increased more than expected.

There appear to be some patterns developing for all 4 decrements – retirement, termination, mortality, and disability. Again, we expect Buck to examine these more closely in the upcoming experience study and modify the assumptions appropriately.

Table 4-TRS DB Healthcare Gains and (Losses) by Source (000's)

Source	2021 Valuation	2020 Valuation	2019 Valuation	2018 Valuation	2017 Valuation
Retirement	$ (2,282)	$ 2,189	$ 3,344	$ 13,627	$ 17,174
Termination	(2,979)	(1,260)	(2,555)	(2,501)	(7,543)
Mortality	(2,440)	(2,276)	(3,198)	(812)	7,778
Disability	220	31	(19)	259	(666)
Rehires	3,476	5,506	1,710	(146)	(1,755)
Other	6,314	(4,433)	20,341	(6,683)	42,231
Medical Claims	96,861	96,760	225,987	146,354	257,626
Modified Part B Assumption	1,278	2,089	1,594	23,321	N/A
Dependent Coverage Election	9,126	7,435	15,195	18,765	N/A
COVID-19	-	17,345	-	-	-
Plan Changes	21,763	-	-	-	-
Methodology	-	-	-	-	(378,830)
Total	**$ 131,337**	**$ 123,386**	**$ 262,399**	**$ 192,184**	**$ (63,985)**
Total AL at BOY	**$ 2,489,675**	**$ 2,518,644**	**$ 2,684,150**	**$ 2,927,093**	**$ 2,747,836**
G/L as a % of AL	**5.28%**	**4.90%**	**9.78%**	**6.57%**	**-2.33%**

Note: 2017-2018 gains and losses are prior to the implementation of new assumptions.

The TRS DB healthcare plans experienced the same gains attributable to medical claims experience and COVID-19 experience. The discussion on PERS DB applies to TRS DB as well.

Table 5-PERS DCR Total Gains and (Losses) by Source (000's)

Source	2021 Valuation	2020 Valuation	2019 Valuation	2018 Valuation	2017 Valuation
Mortality	$ 2,415	$ 2,018	$ 1,197	$ 1,566	$ 883
Termination	2,579	867	1,579	3,519	1,417
Disability	3,687	2,850	1,696	1,955	2,228
New Entrants	(1,409)	(1,440)	(1,593)	(1,748)	(1,825)
Rehires	(3,115)	(3,363)	(2,671)	(2,795)	(1,393)
Other Demographic Experience	948	1,433	2,481	1,249	1,465
Salary Increases	(8)	(25)	(80)	40	131
Trend Rates/Cadillac Tax*	-	(7,485)	1,233	(1,605)	(24,441)
Plan Changes	2,029	-	-	-	-
Medical Claims Costs	7,066	7,863	15,366	759	908
Total	**$ 14,192**	**$ 2,718**	**$ 19,208**	**$ 2,940**	**$ (20,627)**
Total AL at BOY	**$ 161,335**	**$ 134,720**	**$ 126,311**	**$ 117,243**	**$ 77,052**
G/L as a % of AL	**8.80%**	**2.02%**	**15.21%**	**2.51%**	**-26.77%**

**Trend rate gain/loss applicable to 2017 & 2020 and the Cadillac tax is applicable to 2018 & 2019.*

Note: 2017-2018 gains and losses are prior to the implementation of new assumptions.

The table above shows the combined gains and losses for the PERS DCR. Similar to the DB plans, there continues to be large gains coming from the medical claims costs. There continues to be gains from mortality, termination, and disability. Buck should revised these assumptions in the upcoming experience study to slow down or eliminate these trends.

As expected, there also continues to be losses to the plan due to the new entrants and rehired members. We recommend Buck review with the Board whether to implement an assumption in the DCR plans similar to the rehire assumption in the DB plans. We recommend these losses be paid for upfront through normal cost, rather than in the future through past service cost.

Table 6-PERS DCR Healthcare Only Gains and (Losses) by Source (000's)

Source	2021 Valuation	2020 Valuation	2019 Valuation	2018 Valuation	2017 Valuation
Mortality	$ 536	$ 243	$ (387)	$ 57	$ 30
Termination	2,669	985	1,567	3,467	1,418
Disability	341	354	317	264	228
New Entrants	(1,320)	(1,301)	(1,476)	(1,587)	(1,666)
Rehires	(3,068)	(3,327)	(2,630)	(2,763)	(1,354)
Other Demographic Experience	1,196	860	2,401	1,380	1,116
Salary Increases	-	-	-	-	-
Trend Rates/Cadillac Tax*	-	(7,485)	1,233	(1,605)	(24,441)
Plan Changes	2,029	-	-	-	-
Medical Claims Costs	7,066	7,863	15,366	759	908
Total	**$ 9,449**	**$ (1,808)**	**$ 16,391**	**$ (28)**	**$ (23,761)**
Total AL at BOY	**$ 150,701**	**$ 124,946**	**$ 118,598**	**$ 109,703**	**$ 70,289**
G/L as a % of AL	**6.27%**	**-1.45%**	**13.82%**	**-0.03%**	**-33.80%**

**Trend rate gain/loss applicable to 2017 & 2020 and the Cadillac tax is applicable to 2018 & 2019.*

Note: 2017-2018 gains and losses are prior to the implementation of new assumptions.

The table above isolates the gains and losses on the PERS DCR retiree healthcare plan only. Aside from disability and mortality, these numbers are very similar to the plan in total, showing that a large portion of the gains and losses for PERS DCR come from the healthcare plan.

Table 7-TRS DCR Total Gains and (Losses) by Source (000's)

Source	2021 Valuation	2020 Valuation	2019 Valuation	2018 Valuation	2017 Valuation
Mortality	$ 67	$ 60	$ 123	$ 36	$ 41
Termination	2,354	740	1,921	865	1,433
Disability	162	178	171	99	170
New Entrants	(581)	(495)	(808)	(724)	(600)
Rehires	(2,037)	(2,313)	(874)	(2,975)	(617)
Other Demographic Experience	669	98	(31)	(49)	94
Salary Increases	-	-	1	-	-
Trend Rates/Cadillac Tax*	-	(2,153)	389	(375)	(7,948)
Plan Changes	528	-	-	-	-
Medical Claims Costs	1,883	2,162	4,135	290	303
Total	**$ 3,045**	**$ (1,723)**	**$ 5,027**	**$ (2,833)**	**$ (7,124)**
Total AL at BOY	**$ 40,857**	**$ 33,221**	**$ 32,459**	**$ 33,707**	**$ 22,007**
G/L as a % of AL	**7.45%**	**-5.19%**	**15.49%**	**-8.40%**	**-32.37%**

**Trend rate gain/loss applicable to 2017 & 2020 and the Cadillac tax is applicable to 2018 & 2019.*

Note: 2017-2018 gains and losses are prior to the implementation of new assumptions.

The table above shows the combined gains and losses for the TRS DCR. Similar to the DB plans, there are gains are coming from the medical claims cost.

As expected, there continues to be losses to the plan due to the new entrants and rehired members. We recommend Buck review with the Board whether to implement an assumption in the DCR plans similar to the rehire assumption in the DB plans. We recommend these losses be paid for upfront through normal cost, rather than in the future through past service cost.

Table 8-TRS DCR Healthcare Only Gains and (Losses) by Source

Source	2021 Valuation	2020 Valuation	2019 Valuation	2018 Valuation	2017 Valuation
Mortality	$ (39)	$ (50)	$ 15	$ (37)	$ (22)
Termination	2,361	744	1,926	871	1,435
Disability	(57)	(21)	(20)	(108)	(21)
New Entrants	(581)	(495)	(600)	(724)	(600)
Rehires	(2,038)	(2,314)	(873)	(2,974)	(617)
Other Demographic Experience	644	89	(4)	(29)	94
Salary Increases	-	-	-	-	-
Trend Rates/Cadillac Tax*	-	(2,153)	389	(375)	(7,948)
Plan Changes	528	-	-	-	-
Medical Claims Costs	1,883	2,162	4,135	290	303
Total	**$ 2,701**	**$ (2,038)**	**$ 4,968**	**$ (3,086)**	**$ (7,376)**
Total AL at BOY	**$ 40,634**	**$ 32,981**	**$ 32,429**	**$ 33,681**	**$ 21,988**
G/L as a % of AL	**6.65%**	**-6.18%**	**15.32%**	**-9.16%**	**-33.55%**

**Trend rate gain/loss applicable to 2017 & 2020 and the Cadillac tax is applicable to 2018 & 2019.*

Note: 2017-2018 gains and losses are prior to the implementation of new assumptions.

The table above isolates the gains and losses on the TRS DCR retiree healthcare plan only. These numbers are very similar to the plan in total, showing that the majority of the gains and losses for TRS DCR come from the healthcare plan.

Summary of recommendations Resulting from a Review of Gains and Losses

Based on our review above, we recommend the following be considered by Buck:

- Examine experience under the current assumptions in the upcoming experience study to determine if they are working as intended or need to be modified.
- Continue to track the medical claims experience closely, particularly any further impact from plan changes or COVID-19 experience.
- Continue to disclose the nature and impact of all programming changes included in the valuation.
- Discuss with the Board whether to include a new entrant/rehire assumption for the DCR plans.

SECTION 4

REVIEW OF ASSUMPTIONS

Review of Pension Assumptions

Buck released an experience study in 2018 and the Board approved a new assumption set to be used beginning with the actuarial valuation as of June 30, 2018. Buck is currently completing a new experience that is expected to be completed in the spring/summer of 2022. New assumptions from this experience study are expected to be adopted and used with beginning with the actuarial valuation as of June 30, 2022. GRS will issue a supplemental report that reviews this new experience study. General expectations for the new assumptions are included in this report.

Although this audit examines many assumptions and methods, not all of them are equal in terms of their ultimate impact on contribution rates. It is not the intention of this audit to imply that all proposed changes would have a similar impact on the liabilities. For example, the investment return assumption may be the greatest lever in influencing contribution rates. Thus, where options exist for spending time and resources studying assumptions, we recommend studying those with the largest impact first.

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 investment return and assumed rates of future salary increase.

Economic assumptions are normally defined by an underlying inflation assumption. Buck has cited 2.50% as the current inflation assumption. In recent years, long-term inflation forecasts have been declining. We do find the assumption to be reasonable at this time, but expect Buck to determine if it should be lowered in the upcoming experience study.

Investment Return Assumption

The nominal investment return assumption is 7.38%. The assumption is net of all investment expenses. The rate is no longer net of administrative expenses. Combined with the 2.50% inflation assumption, this yields a 4.88% real net rate of return. While we find this assumption to still be reasonable, it should be noted that many other large state pension plans are continuing to decrease their return expectations as capital market assumptions are coming in lower. This assumption will need to be very carefully analyzed during the next experience analysis and serious consideration should be given to lowering it.

Member Pay 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.

Base Salary Increase Assumption

The Base Salary Increase Assumption (also known as the wage inflation assumption) is 2.75%. The 2.75% is comprised of 2.50% for general inflation and 0.25% for productivity increases.

Merit, Promotion, and Longevity Pay Increase Assumption

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.

The pay increase assumption will need to be monitored to ensure that any developing patterns of gains or losses do not continue.

We would also offer that the manner in which pay changes over time for teachers in comparison to public employees tends to differ. Since most teachers have a specific skill set, the approach to their compensation tends to follow a more consistent trend. Public Employees however (except for Peace officers and Firefighters) tend to represent a multitude of different skills – from a more generalized, labor intensive capacity (e.g., custodial) to more specialized training (ex. Accounting).

COLA and PRPA

We find these assumptions to be reasonable. The inflation rate is a component of investment return, salary increase and the PRPA, so it has a ripple effect throughout all the economic assumptions.

Demographic Assumptions

Healthy mortality during active service and after termination

The RP-2014 tables with MP 2017 generational improvement (and with the various credibility adjustments) are reasonable. We expect Buck to examine the more recent PUB-2010 tables released by the SOA to determine if they may be more appropriate.

Disabled mortality

The RP 2014 disabled table with MP 2017 generational improvement (and with the various credibility adjustments) is reasonable. We expect Buck to examine the more recent PUB-2010 tables released by the SOA to determine if they may be more appropriate.

Withdrawal from service before retirement (termination)

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

Retirement

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

Disability
The rates look reasonable based on the data presented in the most recent experience study report.

Withdrawal of contributions at termination
The rates look reasonable based on the data presented in the most recent experience study report.

Payroll Growth

Contribution rates are based on a percent of total DB and DCR payroll. The assumption used in the valuation is that payroll will grow at a rate of 2.75 percent per year. In 2021, the total payroll, based on the annualized earnings for the fiscal year ending on the valuation date, grew by about 1%. The following table 9 shows the payroll growth over the past ten years.

Table 9-Historical Payroll Growth			
Year	DB Plans Only	DCR Plans Only	Combined DB and DCR
2021	-7%	7%	1%
2020	-7%	8%	1%
2019	-5%	9%	2%
2018	-7%	8%	0%
2017	-7%	7%	0%
2016	-5%	10%	1%
2015	-6%	12%	1%
2014	-5%	14%	1%
2013	-4%	17%	2%
2012	-3%	20%	3%

Payroll growth is significant because the unfunded accrued liability (UAL) is amortized as a level percentage of pay. That is the same as expecting all future amortization payments to grow at the same rate as total payroll. When payroll does not grow as assumed then the UAL is not going to be paid off as assumed. In order for the UAL to be paid off according to the current amortization schedule, payroll must grow at the assumed payroll growth rate. If payroll does not grow at that rate, as has been the case for the last nine years, there will be upward pressure on the contribution rate because contributions that are less than anticipated are flowing in the plan. We expect Buck to examine this assumption in more detail during the upcoming experience study and consider lowering it.

SUMMARY

Based on the last experience study, the assumptions and methods are reasonable. However, there are now several years of experience with the current assumptions and some biased patterns may be starting to develop. Furthermore, the economic environment has continued to evolve and change. We expect the upcoming experience study to further examine all of the assumptions and determine their effectiveness with regards to valuing plan costs.

Review of Health Care Cost Assumptions

General

Change in Data

Data was received from a data warehouse, and in the 2021 valuation report Buck has provided a reconciliation of the data provided. Buck still must estimate the number of members with dual coverage and the dependent's Medicare status.

Table 10 below shows the distribution of these counts by coverage and then by Medicare status.

Table 10-Summary of Retiree Medical Data Received

	PERS		TRS		Total	
	Total for 2020	Total for 2021	Total for 2020	Total for 2021	Total for 2020	Total for 2021
Retiree coverage only	21,341	21,574	7,963	8,048	29,304	29,622
Retiree and spouse	28,477	28,575	8,361	8,472	36,838	37,047
Retiree and children and other dependents	795	825	373	372	1,168	1,197
Family	2,651	2,658	1,163	1,144	3,814	3,802
Total by Coverage	**53,264**	**53,632**	**17,860**	**18,036**	**71,124**	**71,668**
Pre-Medicare	19,653	18,559	5,292	5,132	24,945	23,691
Medicare A & B	33,370	34,793	12,340	12,662	45,710	47,455
Medicare part B only	241	280	228	242	469	522
Total by Medicare Status	**53,264**	**53,632**	**17,860**	**18,036**	**71,124**	**71,668**

On page 84 of the PERS DB valuation report, the total incurred claims are spread over the eligible population. For Fiscal Year 2021, the average enrollment for the pre-Medicare group is 18,106 and for the Medicare group is 47,025. The total average enrollment for fiscal 2021 is the sum of these two groups, or 65,131. The counts in the table above include deferred members. When these counts are adjusted for deferred members, it demonstrates the claims are being spread over the appropriate eligible group.

Claims Cost and Medicare Offset

We analyzed the trend in the per capita claim costs over the last 14 years. Table 11(a) below shows the per capita claim costs since 2009. Table 11(b) shows the change year over year. A change in per capita claim costs also includes changes due to changes in the population as well as the method changes that have been used to estimate the eligible population. Thus, it is important not to read these results as strictly changes in the cost of health care since so much of the change is due to the changes in the population counts. Table 11(c) summarizes the overall changes in claim costs and the impact on the valuation results.

Table 11(a)-PERS and TRS Age 65 Per Capitas for Fiscal Year Ending														
Medicare Status:	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Medical: Pre-Medicare	7,670	7,503	8,606	9,497	9,856	11,125	12,362	11,724	14,380	13,682	13,535	14,464	15,360	15,926
Medical: Medicare A&B only	1,296	1,336	1,563	1,551	1,628	1,726	1,657	1,461	1,707	1,485	1,468	1,534	1,618	1,619
Medical: Medicare B only	3,384	4,754	6,654	6,936	6,219	6,676	7,920	6,700	8,562	4,722	4,667	4,880	5,340	5,341
Rx - Medicare	2,379	2,419	2,600	2,799	2,736	2,621	2,624	2,753	3,320	3,706	3,764	3,501	3,340	3,474

Table 11(b)-PERS and TRS Health Care Cost Trend Year over Year Changes														
Medicare Status:	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	Avg.
Medical: Pre-Medicare	-2.2%	14.7%	10.4%	3.8%	12.9%	11.1%	-5.2%	22.7%	-4.9%	-1.1%	6.9%	6.2%	3.7%	**6.3%**
Medical: Medicare A&B only	3.1%	17.0%	-0.8%	5.0%	6.0%	-4.0%	-11.8%	16.8%	-13.0%	-1.1%	4.5%	5.5%	0.1%	**1.9%**
Medical: Medicare B only	40.5%	40.0%	4.2%	-10.3%	7.3%	18.6%	-15.4%	27.8%	-44.8%	-1.2%	4.6%	9.4%	0.0%	**3.9%**
Rx - Medicare	1.7%	7.5%	7.7%	-2.3%	-4.2%	0.1%	4.9%	20.6%	11.6%	1.6%	-7.0%	-4.6%	4.0%	**3.2%**

Table 11(c)-PERS and TRS Health Care Cost Trend Actual to Assumed			
Medicare Status:	21-22 Actual	21-22 Assumed	Gain/ Loss
Medical: Pre-Medicare	3.7%	6.5%	Gain
Medical: Medicare A&B only	0.1%	5.4%	Gain
Medical: Medicare B only	0.0%	5.4%	Gain
Rx - Medicare	4.0%	7.5%	Gain

While all costs increased less than assumed, leading to gains, the largest decrease was to Medicare costs and is the primary reason for the very large gain seen in the previous section. Note that these per capita claims costs are after both adjustments for some plan changes, as well as the 4% load for COVID-19 experience, discussed further below. We recommend Buck continue to track the medical claims experience closely, particularly any further impact from the plan changes or COVID-19 experience.

Healthcare Trend Assumptions

The healthcare trend rates follow the Society of Actuaries' Healthcare Cost Trend model and the model has been populated with assumptions that are specific to the State of Alaska. The trend rates are reasonable.

EGWP assumption

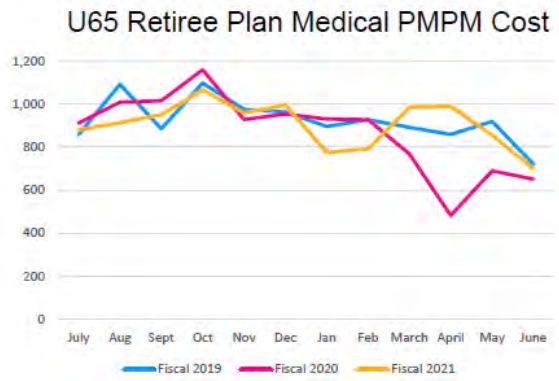
We understand Alaska has moved to an EGWP effective January 1, 2019. Buck obtained a savings estimate from the EGWP vendor and used that as the basis for the valuation. We concur with that approach. Buck is assuming the EGWP subsidy will last in perpetuity. While this is not an unreasonable approach, we would recommend that Buck detail the risk associated with this assumption, especially if EGWP subsidies wear away over time. Furthermore, we recommend that Buck monitor the estimated savings each year and determine if an update to their model is necessary.

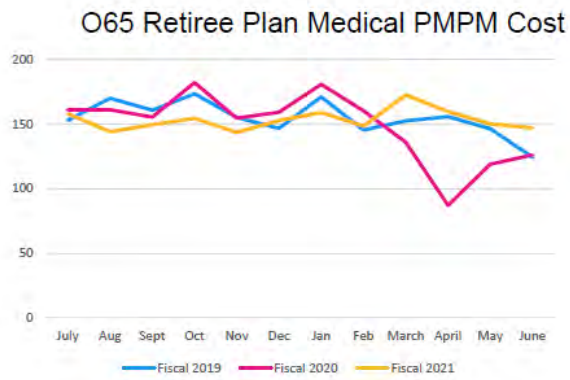
Medicare Part B Assumption

In 2018, Buck used a new methodology for determining the number of members eligible for Part B only, where 5% of pre-Medicare members are assumed to be eligible for Part B only. This change in assumption is reasonable, but created large gains in 2018 and we recommended that Buck explicitly track the experience of this assumption and provide a gain/loss item in the report each year, which they have done since then. The gains have continued each year, so we recommend this assumption be carefully examined in the upcoming experience study to see if it should be lowered.

COVID-19 Experience

The global pandemic caused by COVID-19 continues to impact healthcare plans, including PERS and TRS. The graphs below were put together by Buck and show medical claims in 2019 - 2022 for the under 65 and over 65 retiree health plans. As you can see, actual claims during 2021 are generally lower than they were in 2019 and 2020.





As vaccinations continue to be distributed and normal behavior returns when the pandemic ends, these decreases in claims are not expected to continue and do not represent future expectations. To account for this, Buck has adjusted the fiscal 2021 claims used in setting the claims cost assumption to be 4% higher. We agree that this is a reasonable and necessary adjustment to make.

It should also be noted that there was a small spike in prescription drug claims in March of 2020, as people were presumably stocking up on medications, but claims decreased back to expectations shortly thereafter that trend continued during fiscal 2021. Buck felt the overall prescription drug experience during fiscal 2021 did not require any COVID-19 adjustments for setting future expectations of those claims.

Buck will need to continue to analyze the claims experience in the next few years to determine if any further adjustments need to be made to account for behavior that may not be expected to continue in the future.

DCR Base Claims Cost Adjustments

These relative values for the DCR plans did not change from the June 30, 2020 valuation to the June 30, 2021 valuation. Relative value refers to the value of the DCR retiree medical benefits compared to those provided by the Defined Benefit retiree medical plan. Since the DCR plan does not yet have enough membership to create credible experience, they use the same claims costs developed under the DB plan, adjusted by the assumed relative value factors. Based on additional information provided by Buck last year, we find these relative value factors to be reasonable.

The basis for these relative value factors rests with higher initial copays, deductibles, out of pocket limits and member cost sharing compared to the DB medical plan. As experience emerges we recommend the discount from the DB plan to the DCR plan continue to be tested to ensure this assumption is supporting the liabilities of the plan. When the DCR plans have enough credible claims experience, they should have their own claim cost assumptions set.

SECTION 5

REVIEW OF ACTUARIAL VALUATION METHODS AND PROCEDURES

Review of Actuarial Valuation Methods and Procedures

I. Background

An actuarial valuation is a detailed statistical simulation of the future operation of a retirement system using the set of actuarial assumptions adopted by the Board.

The actuarial values generated from this process are based not only on these assumptions, but also on the additional assumptions built into each actuarial firm's pension valuation software.

Our scope for performing the review did not include a complete replication of the valuation results as determined by Buck at June 30, 2021. Rather, we reviewed a number of sample test lives from Buck in great detail, and made our determinations as to whether the methods and assumptions being employed were being done so properly. We also reviewed the report in order to examine the aggregate results and conclusions of this actuarial valuation.

Though this approach is not intended to meet the rigors of a full scale replication of results – it still serves as a strong indicator of the appropriateness of the assumptions and methods being used to value the liabilities and determine the costs for these plans.

II. Process:

Our review process can be summarized as follows:

Computation: Valuation Liabilities

We analyzed test cases to compare the Actuarial Liability under the EAN funding method for the test cases of the PERS and TRS Systems. As a starting point, we first replicate Buck test case liabilities by using their assumptions and methods to ensure that the computations were in sync with the descriptions listed in the valuation report.

When conducting an actuarial audit, and reviewing the testlives, we look at the projected benefits at each age for each decrement type. We also look at the component of the benefit (final average earnings and years of service). This is critical to understanding what the valuation system is actually valuing and making sure that the valuation is not "right for the wrong reasons", (meaning, errors could occur in two different directions making total liabilities approximate a correct value.)

We also review the construction of the commutation functions- the varying probabilities for each decrement and the discounting to the valuation date.

A more detailed analysis of the test lives we reviewed and our findings is shown in the next section.

Tying Test Lives to Total Liabilities

The basis of the audit is that the test lives reviewed tie directly to the liabilities being submitted in the valuation. As a result of learning of a discrepancy discovered a few years ago, we now request that Buck also supply a list of every member with their total liability. We check that the total

liability on the test life matches that from the larger group, and the larger group matches the total in the valuation report. That way we can be certain that the test life we review is directly tied to the final liabilities.

Actuarial Method:

Findings:

An actuarial cost method is a mathematical process for allocating the dollar amount of the total present value of plan benefits (PVB) between future normal costs and actuarial accrued liability (AAL). The retained actuary uses the Entry Age Normal actuarial cost method (EAN Method), characterized by:

(1) Normal Cost – the level percent of payroll contribution, paid from each participant's date of hire to date of retirement, which will accumulate enough assets at retirement to fund the participant's projected benefits from retirement to death.

(2) Actuarial Accrued Liability – the assets which would have accumulated to date had contributions been made at the level of the normal cost since the date of the first benefit accrual, if all actuarial assumptions had been exactly realized, and there had been no benefit changes.

The EAN Method is the most prevalent funding method in the public sector. It is appropriate for the public sector because it produces costs that remain stable as a percentage of payroll over time, resulting in intergenerational equity for taxpayers and budget predictability. The recent Public Fund Survey included 199 retirement systems (mostly statewide). Over 82% of the plans reported using the EAN Method. Therefore, the retained actuary's stated funding methods for TRS and PERS are certainly in line with national trends.

Application of Cost Method

In order to determine the normal cost as a level percentage of pay, the valuation must first determine the future compensation that each individual member is expected to receive over the course of their career (which is also the compensation used to generate contributions). The projection of the future compensation should be based on the salary that the participant is expected to receive according to the timing of the expected departures from active service (or, decrements).

Conclusion:

The level percent of pay method for both amortization of the unfunded accrued liability and the normal cost are both appropriate as a funding policy, considering that the payroll is not closed (as promulgated under SB 123.)

SECTION 6

SAMPLE LIFE REVIEW – PERS DB AND TRS DB

Sample Life Review – PERS DB and TRS DB

Background

We reviewed sample test cases used for the June 30, 2021 valuation draft reports. In order to perform the review, we requested a number of sample cases from Buck. We combined this with our understanding of the plan provisions and reviewed the liability values produced by Buck for these sample cases only.

Note that the active test lives analyzed are not necessarily exposed to all of the possible benefits under the plans (i.e. already beyond the eligibility period for certain benefits, or not eligible for particular benefits). Therefore, findings may occur for these other benefits in future audits depending on the set of test lives chosen for review at that time. However, the vast majority of the liability for each plan is due to the retirement benefits (included for all active test lives), and retirement-related withdrawal benefits (one active test life included per plan), so any future findings are also expected to be de minimus. Also, the impact for any one test life may not be representative of the impact on the total plan.

When employing Buck's methods and assumptions, we matched the present value of benefits in total closely for the test cases submitted under the Pension plans for PERS and TRS, and present value of retirement benefits under the PERS and TRS Retiree Health plan. In addition, we have analyzed the calculations of the ancillary benefits and have provided a summary of this detailed analysis at the end of this section. These exhibits provide a comparison of the calculations by decrement provided to us from Buck against our replication of those benefits as we interpret them from the plan provisions and assumptions.

In matching the present value of benefits, it is being determined that all benefits are being valued, and that the valuation of the liability for those benefits is consistent with the stated assumptions and methods.

Findings

Generally speaking, the assumptions and methods were employed properly. The test lives chosen this year did have some unique characteristics. As a result, we identified the following four minor findings related to the valuation of certain ancillary benefits or members with unique service amounts:

1. **Administration of Claimed Service** – An active PERS DB Peace Officer/Firefighter member who has 5 years of claimed service has this amount being included in credited service and excluded from eligibility service. Additionally, the early retirement reduction factors (ERFs) being used for this member are based on the credited service with the claimed service included. We recommend Buck confirm this treatment is consistent with how the Alaska DRB is administrating the benefits for members that have claimed service.

2. **Retirement Benefit for PERS DB Peace Officer/Firefighter Occupational Disability** – Based on one of our agreed upon recommendations from last year, for DB PERS Peace Officer/Firefighter members, we expected to see an increase to the deferred retirement benefit for the occupational disability piece by the same accumulative PRPA percentage that was applied to the disability benefit. However, a DB PERS Peace Officer/Firefighter member is only having the benefit

increased until age 55, rather than their assumed retirement age of 57. We recommend Buck increase this benefit until the assumed retirement age for each member.

3. **Occupational Death COLA Benefit for PERS DB Peace Officer/Firefighter** – PERS DB Peace Officer/Firefighter members have a 10% Alaska COLA benefit amount (before applying any decrements, assumptions, or payment forms) for the deferred occupational married death benefit piece not equal to 10% of the regular benefit amount for this piece. We recommend Buck update this 10% Alaska COLA benefit component to be 10% of the regular benefit amount or provide an explanation as to why it is not.

4. **Service Eligibility for TRS DB** – A TRS DB member has different service amounts being used for death benefits eligibility. We recommend Buck confirm which of these service amounts the Alaska DRB uses for eligibility and use that service amount consistently across all benefits.

We provided these findings to Buck. For item 1, Buck confirmed that the ERFs should be based on eligibility service without the claimed service included and their calculations should be updated. Buck also agreed their calculations need updated as we recommended for items 2, 3, & 4.

We believe that while the impacts of these recommendation will be immaterial, they should, at the very least, be updated in future valuations, subject to Actuarial Committee discretion.

When performing the replication, we were able to match the total present value of future benefits all test cases (active and inactive, PERS and TRS, pension and healthcare) closely. This would be considered as an overall match for purposes of the valuation.

Actuarial Review - June 30, 2021
Comparison of Present Value of Benefits

Active Pension		GRS	Buck	% Diff
TRS	Active Test Case 1 - Tier 1	262,599	262,296	0.1%
TRS	Active Test Case 2 - Tier 2	76,667	76,554	0.1%
TRS	Active Test Case 3 - Tier 2	184,181	184,118	0.0%
PERS	Active Test Case 1 - P/F Tier 2	491,870	491,554	0.1%
PERS	Active Test Case 2 - Other Tier 3	86,229	86,237	0.0%
PERS	Active Test Case 3 - P/F Tier 3	220,264	220,290	0.0%
Inactive Pension		GRS	Buck	% Diff
TRS	TRS - Retiree - Female, Tier 1	443,684	443,684	0.0%
TRS	TRS - DV - Female, Tier 2	70,976	70,658	0.5%
TRS	TRS - Beneficiary - Female, Tier 2	199,134	199,067	0.0%
PERS	PERS Peace Officer/Firefighter - Retiree	558,060	558,060	0.0%
PERS	PERS Peace Officer/Firefighter - Beneficiary	463,295	463,061	0.1%
PERS	PERS Peace Officer/Firefighter - DV	78,936	78,522	0.5%
PERS	PERS Others - Retiree	692,135	692,135	0.0%
PERS	PERS Others - Beneficiary	82,712	82,712	0.0%
PERS	PERS Others - DV	57,846	57,499	0.6%
Active Healthcare		GRS	Buck	% Diff
TRS	Active Test Case 1 - Tier 1	120,615	120,609	0.0%
TRS	Active Test Case 2 - Tier 2	116,169	114,196	1.7%
PERS	Active Test Case 1 - P/F Tier 2	254,232	250,708	1.4%
PERS	Active Test Case 2 - Other Tier 3	44,029	44,007	0.1%
PERS	Active Test Case 3 - P/F Tier 3	139,542	136,164	2.5%
Inactive Healthcare		GRS	Buck	% Diff
TRS	TRS - Retiree - Female, Tier 1	180,702	180,677	0.0%
TRS	TRS - DV - Female, Tier 2	191,153	193,435	-1.2%
TRS	TRS - Beneficiary - Female, Tier 2	174,434	172,511	1.1%
PERS	PERS Peace Officer/Firefighter - Retiree	305,408	305,377	0.0%
PERS	PERS Peace Officer/Firefighter - Beneficiary	156,465	156,432	0.0%
PERS	PERS Peace Officer/Firefighter - DV	170,838	171,857	-0.6%
PERS	PERS Others - Retiree	87,500	87,486	0.0%
PERS	PERS Others - Beneficiary	92,909	92,894	0.0%
PERS	PERS Others - DV	225,975	230,674	-2.0%

NOTE

Ancillary or non-retirement benefits such as death and disability tend to be low probability events (and hence low liability) and they also tend to have many “bells and whistles” which can be valued in different ways by different actuaries. When looking at the test life results, it may be most informative to review the decrement (retirement, termination, disability, death) totals rather than each particular segment of the decrement (married non-occupational death, etc.). For all ancillary benefits comprising less than 0.1% of the total PVB for that individual, we checked the amounts for reasonableness, but did not always replicate.

ALASKA RETIREMENT MANAGEMENT BOARD

Actuarial Review of Pension and Health Plans - June 30, 2021

Comparison of Present Value of Benefits - **TRS Active Pension**

Active Test Case 1 - Tier 1

Basic Data:	Current Age	Credited Service	Gender
	69.0	12.6	Female
Present Value of Benefits (PVB)	**GRS**	**Buck**	**% Diff**
Retirement:			
Main Retirement Benefit	247,510	247,510	0.0%
AK COLA	12,877	12,877	0.0%
Total Retirement PVB	**260,387**	**260,387**	**0.0%**
Withdrawal:			
Non Vested Term	-	-	0.0%
Vested Term	-	-	0.0%
Vested Term AK COLA	-	-	0.0%
Vested Term (take LS)	-	-	0.0%
Vested Term (death during deferral)	-	-	0.0%
Vested Term (death during deferral AK COLA)	-	-	0.0%
Vested Term (death single)	-	-	0.0%
Total Withdrawal PVB	-	-	**0.0%**
Death:			
Non Vested LS Death	-	22	-100.0%
Non Vested Refund	-	696	-100.0%
NonOcc Single LS Dth	8	3	214.6%
NonOcc Dth Marr	1,207	408	195.9%
NonOcc Dth Marr AK COLA	64	22	193.0%
NonOcc Single Refund	287	112	155.3%
Occ Dth Marr (Pre-NR Conversion Benefit)	-	-	0.0%
Occ Dth Marr (Post-NR Conversion Benefit)	613	613	0.0%
Occ Dth Marr AK COLA (Post-NR)	32	32	0.0%
Total Death PVB	**2,212**	**1,908**	**15.9%**
Disability:			
Non-vested LS Ben	-	-	0.0%
NonOcc Dis	-	-	0.0%
NonOcc Dis AK COLA	-	-	0.0%
Occ Dis (Pre-NR Conversion Benefit)	-	-	0.0%
Occ Dis (Post-NR Conversion Benefit)	-	-	0.0%
Occ Dis AK COLA (Pre-NR)	-	-	0.0%
Occ Dis AK COLA (Post-NR)	-	-	0.0%
Dis Death Ben	-	-	0.0%
Dis Death Ben AK COLA	-	-	0.0%
Total Disability PVB	-	-	**0.0%**
GRAND TOTAL PVB	**262,599**	**262,296**	**0.1%**

Comparison of Present Value of Benefits - **TRS Active Pension**
Active Test Case 2 - Tier 2

Basic Data:	Current Age 42.4	Credited Service 3.5	Gender Female
Present Value of Benefits (PVB)	**GRS**	**Buck**	**% Diff**
Retirement:			
Main Retirement Benefit	50,304	50,304	0.0%
AK COLA	1,897	1,897	0.0%
Total Retirement PVB	**52,201**	**52,201**	**0.0%**
Withdrawal:			
Non Vested Term	10,660	10,660	0.0%
Vested Term	10,705	10,705	0.0%
Vested Term AK COLA	351	351	0.0%
Vested Term (take LS)	22	22	0.0%
Vested Term (death during deferral)	38	38	-0.3%
Vested Term (death during deferral AK COLA)	1	1	-1.2%
Total Withdrawal PVB	**21,778**	**21,778**	**0.0%**
Death:			
Non Vested LS Death	3	3	-0.2%
Non Vested Refund	61	61	0.0%
NonOcc Single LS Dth	2	2	0.4%
NonOcc Dth Marr	330	330	0.0%
NonOcc Dth Marr AK COLA	10	10	0.7%
NonOcc Single Refund	90	90	0.0%
Occ Dth Marr (Pre-NR Conversion Benefit)	137	137	0.0%
Occ Dth Marr (Post-NR Conversion Benefit)	198	175	13.5%
Occ Dth Marr AK COLA (Post-NR)	4	6	-33.9%
Total Death PVB	**835**	**814**	**2.6%**
Disability:			
Non-vested LS Ben	33	33	0.0%
Dis (Pre-NR Conversion Benefit)	1,138	1,138	0.0%
Dis (Post-NR Conversion Benefit)	574	488	17.6%
Dis AK COLA (Pre-NR)	63	63	0.0%
Dis AK COLA (Post-NR)	29	25	17.7%
Dis Death Ben	7	6	17.8%
Dis Death Ben AK COLA	0	0	20.3%
Dis Child Ben	8	8	0.0%
Dis Child Ben AK COLA	0	1	-0.4%
Total Disability PVB	**1,853**	**1,762**	**5.2%**
GRAND TOTAL PVB	**76,667**	**76,554**	**0.1%**

Comparison of Present Value of Benefits - **TRS Active Pension**
Active Test Case 3 - Tier 2

Basic Data:	Current Age 47.8	Credited Service 7.0	Gender Female
Present Value of Benefits (PVB)	**GRS**	**Buck**	**% Diff**
Retirement:			
Main Retirement Benefit	145,227	145,227	0.0%
AK COLA	5,556	5,556	0.0%
Total Retirement PVB	**150,782**	**150,782**	**0.0%**
Withdrawal:			
Non Vested Term	2,365	2,365	0.0%
Vested Term	25,573	25,573	0.0%
Vested Term AK COLA	841	841	0.0%
Vested Term (take LS)	45	45	0.0%
Vested Term (death during deferral)	92	92	-0.2%
Vested Term (death during deferral AK COLA)	3	3	-0.9%
Total Withdrawal PVB	**28,919**	**28,919**	**0.0%**
Death:			
Non Vested LS Death	1	1	-0.2%
Non Vested Refund	25	25	0.0%
NonOcc Single LS Dth	4	4	0.5%
NonOcc Dth Marr	906	906	0.0%
NonOcc Dth Marr AK COLA	27	27	-0.1%
NonOcc Single Refund	221	221	0.0%
Occ Dth Marr (Pre-NR Conversion Benefit)	175	175	-0.1%
Occ Dth Marr (Post-NR Conversion Benefit)	460	450	2.4%
Occ Dth Marr AK COLA (Post-NR)	17	16	2.2%
Total Death PVB	**1,836**	**1,825**	**0.6%**
Disability:			
Non-vested LS Ben	-	-	0.0%
Dis (Pre-NR Conversion Benefit)	1,479	1,481	-0.1%
Dis (Post-NR Conversion Benefit)	1,026	975	5.3%
Dis AK COLA (Pre-NR)	83	83	-0.1%
Dis AK COLA (Post-NR)	52	50	5.3%
Dis Death Ben	3	3	7.1%
Dis Death Ben AK COLA	0	0	13.2%
Dis Child Ben	-	-	0.0%
Dis Child Ben AK COLA	-	-	0.0%
Total Disability PVB	**2,644**	**2,591**	**2.0%**
GRAND TOTAL PVB	**184,181**	**184,118**	**0.0%**

Comparison of Present Value of Benefits - **PERS Active Pension**
Active Test Case 1 - P/F Tier 2

Basic Data:	Current Age	Credited Service	Gender
	57.6	15.5	Male
Present Value of Benefits (PVB)	**GRS**	**Buck**	**% Diff**
Retirement:			
Main Retirement Benefit	463,267	463,266	0.0%
AK COLA	18,880	18,880	0.0%
Total Retirement PVB	**482,147**	**482,146**	**0.0%**
Withdrawal:			
Non Vested Term	-	-	0.0%
Vested Term	-	-	0.0%
Vested Term AK COLA	-	-	0.0%
Vested Term (take LS)	-	-	0.0%
Vested Term (death during deferral)	-	-	0.0%
Vested Term (death during deferral AK COLA)	-	-	0.0%
Total Withdrawal PVB	**-**	**-**	**0.0%**
Death:			
Non Vested NonOcc <1 svc LS Dth	-	-	0.0%
Non Vested NonOcc 1<svc<5 LS Dth	-	-	0.0%
NonOcc Dth Marr	995	997	-0.2%
NonOcc Dth Marr AK COLA	41	41	0.3%
NonOcc Married LS Dth	76	76	0.1%
NonOcc Single LS Dth	134	134	0.0%
Occ Dth Marr (Pre-NR Conversion Benefit)	197	190	3.7%
Occ Dth Marr (Post-NR Conversion Benefit)	7,467	7,280	2.6%
Occ Dth Marr AK COLA (Post-NR)	411	286	43.6%
Occ Single LS Dth	403	403	-0.2%
Total Death PVB	**9,724**	**9,407**	**3.4%**
Disability:			
Non-vested LS Ben	-	-	0.0%
NonOcc Dis	-	-	0.0%
NonOcc Dis AK COLA	-	-	0.0%
Occ Dis (Pre-NR Conversion Benefit)	-	-	0.0%
Occ Dis (Post-NR Conversion Benefit)	-	-	0.0%
Occ Dis AK COLA (Pre-NR)	-	-	0.0%
Occ Dis AK COLA (Post-NR)	-	-	0.0%
Dis Death Ben	-	-	0.0%
Dis Death Ben AK COLA	-	-	0.0%
Total Disability PVB	**-**	**-**	**0.0%**
GRAND TOTAL PVB	**491,870**	**491,554**	**0.1%**

Comparison of Present Value of Benefits - **PERS Active Pension**
Active Test Case 2 - Other Tier 3

Basic Data:	Current Age 67.3	Credited Service 6.7	Gender Female
Present Value of Benefits (PVB)	**GRS**	**Buck**	**% Diff**
Retirement:			
Main Retirement Benefit	80,134	80,134	0.0%
AK COLA	4,839	4,839	0.0%
Total Retirement PVB	**84,972**	**84,972**	**0.0%**
Withdrawal:			
Non Vested Term	-	-	0.0%
Vested Term	-	-	0.0%
Vested Term AK COLA	-	-	0.0%
Vested Term (take LS)	-	-	0.0%
Vested Term (death during deferral)	-	-	0.0%
Vested Term (death during deferral AK COLA)	-	-	0.0%
Total Withdrawal PVB	**-**	**-**	**0.0%**
Death:			
Non Vested NonOcc <1 svc LS Dth	-	-	0.0%
Non Vested NonOcc 1<svc<5 LS Dth	-	-	0.0%
NonOcc Dth Marr	417	417	0.0%
NonOcc Dth Marr AK COLA	26	26	0.0%
NonOcc Married LS Dth	21	22	-2.0%
NonOcc Single LS Dth	183	187	-2.0%
Occ Dth Marr (Pre-NR Conversion Benefit)	-	-	0.0%
Occ Dth Marr (Post-NR Conversion Benefit)	459	459	0.0%
Occ Dth Marr AK COLA (Post-NR)	28	28	-0.5%
Occ Single LS Dth	122	125	-2.0%
Total Death PVB	**1,257**	**1,265**	**-0.6%**
Disability:			
Non-vested LS Ben	-	-	0.0%
NonOcc Dis	-	-	0.0%
NonOcc Dis AK COLA	-	-	0.0%
Occ Dis (Pre-NR Conversion Benefit)	-	-	0.0%
Occ Dis (Post-NR Conversion Benefit)	-	-	0.0%
Occ Dis AK COLA (Pre-NR)	-	-	0.0%
Occ Dis AK COLA (Post-NR)	-	-	0.0%
Dis Death Ben	-	-	0.0%
Dis Death Ben AK COLA	-	-	0.0%
Total Disability PVB	**-**	**-**	**0.0%**
GRAND TOTAL PVB	**86,229**	**86,237**	**0.0%**

Comparison of Present Value of Benefits - **PERS Active Pension**
Active Test Case 3 - P/F Tier 3

Basic Data:	Current Age	Credited Service	Gender
	42.2	5.2	Male
Present Value of Benefits (PVB)	**GRS**	**Buck**	**% Diff**
Retirement:			
Main Retirement Benefit	171,611	171,610	0.0%
AK COLA	5,880	5,880	0.0%
Total Retirement PVB	**177,490**	**177,490**	**0.0%**
Withdrawal:			
Non Vested Term	-	-	0.0%
Vested Term	27,646	27,646	0.0%
Vested Term AK COLA	969	969	0.0%
Vested Term (take LS)	1,715	1,715	0.0%
Vested Term (death during deferral)	244	245	-0.6%
Vested Term (death during deferral AK COLA)	9	8	3.9%
Total Withdrawal PVB	**30,583**	**30,584**	**0.0%**
Death:			
Non Vested NonOcc <1 svc LS Dth	-	-	0.0%
Non Vested NonOcc 1<svc<5 LS Dth	-	-	0.0%
NonOcc Dth Marr	578	578	0.0%
NonOcc Dth Marr AK COLA	15	14	6.9%
NonOcc Married LS Dth	37	37	0.1%
NonOcc Single LS Dth	65	65	0.0%
Occ Dth Marr (Pre-NR Conversion Benefit)	1,830	1,870	-2.1%
Occ Dth Marr (Post-NR Conversion Benefit)	4,104	4,102	0.1%
Occ Dth Marr AK COLA (Post-NR)	129	130	-0.8%
Occ Single LS Dth	196	196	0.1%
Total Death PVB	**6,955**	**6,994**	**-0.6%**
Disability:			
Non-vested LS Ben	-	-	0.0%
NonOcc Dis	794	794	0.0%
NonOcc Dis AK COLA	43	43	0.0%
Occ Dis (Pre-NR Conversion Benefit)	1,920	1,920	0.0%
Occ Dis (Post-NR Conversion Benefit)	2,179	2,178	0.0%
Occ Dis AK COLA (Pre-NR)	117	117	0.0%
Occ Dis AK COLA (Post-NR)	120	109	9.9%
Dis Death Ben	60	59	2.2%
Dis Death Ben AK COLA	3	3	3.0%
Total Disability PVB	**5,236**	**5,223**	**0.2%**
GRAND TOTAL PVB	**220,264**	**220,290**	**0.0%**

Actuarial Review of Pension and Health Plans Active Pension Test Case Legend	
Benefit	**Extended Description**
Retirement:	
Main Retirement Benefit	Early/Normal Retirement (base) Benefit
AK COLA	Alaska Cost of Living Allowance (10% of Ret base benefit)
Withdrawal:	
Non Vested Term	Refund of employee contributions upon termination of non-vested member
Vested Term	Deferred retirement (base) Benefit (deferred to early retirement eligibility)
Vested Term AK COLA	Alaska Cost of Living Allowance (10% of Term base benefit)
Vested Term (take LS)	Refund of employee contributions upon termination of (vested) member
Vested Term (death during deferral)	Death (base) Benefit payable upon death after withdrawal but before benefit commencement
Vested Term (death during deferral AK COLA)	Alaska Cost of Living Allowance (10% of DV Dth base benefit)
Vested Term (death, single)	Return of employee contributions upon death during deferral period for single members
Death:	
Non Vested NonOcc 1<svc<5 LS Dth	Refund of employee contributions upon death of non-vested member
NonOcc Dth Marr	Non-Occupational Death (base) benefit
NonOcc Dth Marr AK COLA	Alaska Cost of Living Allowance (10% of Non-Occupational Dth base benefit)
NonOcc Married LS Dth	Refund of employee contributions upon non-occupational death of married (vested) member
NonOcc Single LS Dth	Refund of employee contributions upon non-occupational death of single (vested) member
Occ Dth Marr (Pre-NR Conversion Benefit)	Occupational Death (base) benefit until normal retirement conversion
Occ Dth Marr (Post-NR Conversion Benefit)	Occupational Death (base) benefit after normal retirement conversion
Occ Dth Marr AK COLA (Pre-NR)	Alaska Cost of Living Allowance (10% of Occupational Dth base benefit pre-conversion)
Occ Dth Marr AK COLA (Post-NR)	Alaska Cost of Living Allowance (10% of Occupational Dth base benefit post-conversion)
Occ Single LS Dth	Refund of employee contributions upon occupational death of single (vested) member
Disability:	
Non-vested LS Ben	Refund of employee contributions payable upon disability before vested
Dis (Pre-NR Conversion Benefit)	Disability benefit prior to normal retirement conversion
Dis (Post-NR Conversion Benefit)	Disability benefit after normal retirement conversion
Dis AK COLA (Pre-NR)	Alaska Cost of Living Allowance (10% of pre-conversion disability benefit)
Dis AK COLA (Post-NR)	Alaska Cost of Living Allowance (10% of post-conversion disability benefit)
Dis Death Ben	Death (base) Benefit payable upon death after disability
Dis Death Ben AK COLA	Alaska Cost of Living Allowance (10% of Dis Dth base benefit)
Dis Child Ben	Disability (base) Child Benefit payable until eligible for normal retirement
Dis Child Ben AK COLA	Alaska Cost of Living Allowance (10% of Temp Dis Child base benefit)

Actuarial Review of Pension and Health Plans - June 30, 2021

Comparison of Present Value of Benefits - **TRS Retiree Health**

Actives	Test Case 1 - Tier 1			Test Case 2 - Tier 2			Test Case 3 - Tier 2		
Basic Data:									
Sex	Female			Female			Female		
Current Age	69.00			47.75			42.43		
Current Credited Service	12.60			7.00			3.50		
Present Value of Benefits (PVB)	**GRS**	**Buck**	**% Diff**	**GRS**	**Buck**	**% Diff**	**GRS**	**Buck**	**% Diff**
Retirement:									
Tier x <Member>	98,578	98,570	0.0%	90,701	90,683	0.0%	49,227	49,217	0.0%
Tier x <Spouse>	50,812	50,811	0.0%	45,053	43,094	4.5%	24,528	23,409	4.8%
Post 65 Part D Tier x <Member>	(19,010)	(19,009)	0.0%	(11,634)	(11,632)	0.0%	(6,257)	(6,256)	0.0%
Post 65 Part D Tier x <Spouse>	(9,764)	(9,764)	0.0%	(6,804)	(6,803)	0.0%	(3,680)	(3,680)	0.0%
Contrib <Member>	-	-	0.0%	(718)	(717)	0.0%	(366)	(366)	0.0%
Contrib <Spouse>	-	-	0.0%	(429)	(429)	0.0%	(219)	(219)	0.0%
Total Retirement PVB	**120,615**	**120,609**	**0.0%**	**116,169**	**114,196**	**1.7%**	**63,232**	**62,105**	**1.8%**

Inactives - PVB	**GRS**	**Buck**	**% Diff**
Retiree - Male	180,702	180,677	0.0%
Vested Termination -Male	191,153	193,435	-1.2%
Retiree - Male	174,434	172,511	1.1%

Benefits - Buck Valuation Terminology	**Description**
Retirement:	
Tier x <Member>	Base Benefit Paid to Employee
Tier x <Spouse>	Base Benefit Paid to Spouse
Contrib <Member>	Employee Pre-Retirement Contributions
Contrib <Spouse>	Spouse Pre-Retirement Contributions
Post 65 Part D <Member>	Employee Post-Age 65 Medicare Part D Reimbursement
Post 65 Part D <Spouse>	Spouse Post-Age 65 Medicare Part D Reimbursement

Comparison of Present Value of Benefits - **PERS Retiree Health**

Actives	**Test Case 1 - PF Tier 1**			**Test Case 2 - Other Tier 2**			**Test Case 3 - P/F Tier 3**		
Basic Data:									
Sex	Male			Female			Male		
Current Age	57.57			67.30			42.24		
Current Credited Service	20.47			6.74			5.19		
Present Value of Benefits (PVB)	**GRS***	**Buck**	**% Diff**	**GRS**	**Buck**	**% Diff**	**GRS**	**Buck**	**% Diff**
Retirement:									
Tier x <Member>	147,044	147,026	0.0%	35,847	35,845	0.0%	81,402	81,387	0.0%
Tier x <Spouse>	139,495	135,988	2.6%	18,673	18,651	0.1%	75,128	71,763	4.7%
Contrib Tier x <Member>	-	-	0.0%	-	-	0.0%	900	899	0.0%
Contrib Tier x <Spouse>	-	-	0.0%	-	-	0.0%	677	677	0.0%
Post 65 Part D Tier x <Member>	18,460	18,459	0.0%	6,915	6,914	0.0%	8,897	8,896	0.0%
Post 65 Part D Tier x <Spouse>	13,847	13,846	0.0%	3,576	3,576	0.0%	6,514	6,513	0.0%
Total Retirement PVB	**254,232**	**250,708**	**1.4%**	**44,029**	**44,007**	**0.1%**	**139,542**	**136,164**	**2.5%**

Inactives - PVB	**GRS**	**Buck**	**% Diff**
Retiree - P/F Tier 2 - Female	305,408	305,377	0.0%
Beneficiary - P/F Tier 2 - Female	156,465	156,432	0.0%
Vested Termination - P/F Tier 3 - Male	170,838	171,857	-0.6%
Retiree - Other Tier 2 - Female	87,500	87,486	0.0%
Beneficiary - Other Tier 1 - Male	92,909	92,894	0.0%
Vested Termination - Other Tier 1 - Male	225,975	230,674	-2.0%

Benefits - Buck Valuation Terminology	**Description**
Retirement:	
Tier x <Member>	Base Benefit Paid to Employee
Tier x <Spouse>	Base Benefit Paid to Spouse
Contrib <Member>	Employee Pre-Retirement Contributions
Contrib <Spouse>	Spouse Pre-Retirement Contributions
Post 65 Part D <Member>	Employee Post-age 65 Medicare Part D Reimbursement
Post 65 Part D <Spouse>	Spouse Post-age 65 Medicare Part D Reimbursement

SECTION 7

SAMPLE LIFE REVIEW – PERS DCR AND TRS DCR

Sample Life Review – PERS DCR and TRS DCR

We reviewed sample test cases used for the DCR June 30, 2021, valuation draft reports. In order to accomplish this, we requested a number of sample cases from Buck with intermediate statistics to assist us in analyzing the results.

We combined this with our understanding of the plan provisions in an attempt to analyze the liability values produced by Buck for these sample cases only.

Conclusion and Results:

The exhibits that follow provide a comparison of the calculations by decrement provided to us from Buck against our replication of those benefits as we interpret them from the plan provisions and assumptions. We completed this detail for three active test lives under the PERS and TRS DCR and for three disabled test lives.

Findings

Generally speaking, the assumptions and methods were employed properly. We did identify one potential minor finding:

1. **Occupational Disability Benefit for PERS PF DCR OD&D** – A PERS DCR Peace Officer/Firefighter occupational disability member has their benefit being calculated assuming the service amount provided by the Alaska DRB is as of the date of disability. We recommend Buck confirm with the Alaska DRB that this service amount is as of the date of disability, and not as of the valuation date.

We provided this finding to Buck. They confirmed with the Alaska DRB that the service amount provided is as of the valuation date, so the benefit being calculated should be updated.

We believe that while the impact of this recommendations will be immaterial, it should, at the very least, be updated in future valuations, subject to Actuarial Committee discretion.

Comparison of Present Value of Benefits - **DCR PERS and TRS Pension**

Actives	**Test Case 1 - PERS Other**		
Basic Data:		*Basic Data:*	
Sex	Female	Tier	4
Current Age	56.139	Full time %	100%
Current Credited Service	6.66		
Present Value of Benefits (PVB)	**GRS***	**Buck**	**% Diff**
Disability:			
DCR	1,014	1,014	0.0%
DCR Death during Disability	33	34	-1.6%
Total Disability PVB	**1,048**	**1,048**	**-0.1%**
Death:			
DCR - married only	391	391	0.0%
Total Death PVB	**391**	**391**	**0.0%**
GRAND TOTAL PVB	**1,438**	**1,439**	**0.0%**

Actives	**Test Case 2 - PERS PF**		
Basic Data:		*Basic Data:*	
Sex	Male	Tier	4
Current Age	37.73	Full time %	100%
Current Credited Service	8.26		
Present Value of Benefits (PVB)	**GRS***	**Buck**	**% Diff**
Disability:			
DCR Deferred - single	718	718	0.0%
DCR Deferred - married	4,983	4,983	0.0%
DCR Immediate	2,056	2,056	0.0%
DCR Imm. Death during Disability	154	154	0.0%
Total Disability PVB	**7,911**	**7,911**	**0.0%**
Death:			
DCR - married only	1,885	1,885	0.0%
Total Death PVB	**1,885**	**1,885**	**0.0%**
GRAND TOTAL PVB	**9,796**	**9,796**	**0.0%**

Actives	**Test Case 3 - TRS**		
Basic Data:		*Basic Data:*	
Sex	Female	Tier	3
Current Age	49.33	Full time %	100%
Current Credited Service	10.00		
Present Value of Benefits (PVB)	**GRS***	**Buck**	**% Diff**
Disability:			
DCR	386	386	0.0%
DCR Death during Disability	18	18	0.0%
Total Disability PVB	**404**	**404**	**0.0%**
Death:			
DCR - married only	232	233	0.0%
Total Death PVB	**232**	**233**	**0.0%**
GRAND TOTAL PVB	**637**	**637**	**0.0%**

Benefits - Buck Valuation Terminology	
Disability:	
DCR Deferred Ben	Disability benefit payable upon eligibility for retirement (based on ret plan formula)
DCR Immed Ben	Disability benefit payable until eligible for normal retirement (based on ret plan formula)
DCR	Occupational base disability benefit based on percent of pay (40% of salary)
DCR Death during Disable	Death benefit payable upon death while on disability
Death:	
DCR - married only	Occupational death benefit payable as annuity to spouse

** GRS' audit of Buck's calculation includes review of the benefit amounts, annuity values, assumptions and other factors related to the PVB calculation at each projected age. Differences may exist due to different interpretations of the statutes, as well as additional items as discussed throughout this audit report.*

Comparison of Present Value of Benefits - **DCR PERS and TRS Retiree Health**

Actives	**Test Case 1 - PERS Other**		
Basic Data:		*Basic Data:*	
Sex	Female	Tier	4
Current Age	56.14	Full time %	100%
Current Credited Service	6.16		
Present Value of Benefits (PVB)	**GRS***	**Buck**	**% Diff**
Retirement:			
Post 65 DCR <Member>	23,695	23,736	-0.2%
Post 65 DCR <Spouse>	12,758	12,780	-0.2%
Contrib DCR <Member>	(5,591)	(5,599)	-0.1%
Contrib DCR <Spouse>	(3,012)	(3,017)	-0.1%
Post 65 Part D DCR <Member>	3,763	3,886	-3.2%
Post 65 Part D DCR <Spouse>	2,006	2,087	-3.9%
Total Retirement PVB	**33,619**	**33,874**	**-0.8%**

Actives	**Test Case 2 - PERS PF**		
Basic Data:		*Basic Data:*	
Sex	Male	Tier	4
Current Age	37.73	Full time %	100%
Current Credited Service	8.26		
Present Value of Benefits (PVB)	**GRS***	**Buck**	**% Diff**
Retirement:			
Post 65 DCR <Member>	12,727	12,587	1.1%
Post 65 DCR <Spouse>	12,974	12,813	1.3%
Contrib DCR <Member>	(1,501)	(1,314)	14.2%
Contrib DCR <Spouse>	(1,560)	(1,345)	16.0%
Post 65 Part D DCR <Member>	2,469	2,430	1.6%
Post 65 Part D DCR <Spouse>	1,900	1,872	1.5%
Total Retirement PVB	**27,010**	**27,042**	**-0.1%**

Actives	**Test Case 3 - TRS**		
Basic Data:		*Basic Data:*	
Sex	Female	Tier	3
Current Age	49.33	Full time %	100%
Part-Time Credited Service	10.00		
Present Value of Benefits (PVB)	**GRS***	**Buck**	**% Diff**
Retirement:			
Post 65 DCR <Member>	15,737	15,769	-0.2%
Post 65 DCR <Spouse>	8,459	8,477	-0.2%
Contrib DCR <Member>	(2,140)	(2,086)	2.6%
Contrib DCR <Spouse>	(1,152)	(1,123)	2.5%
Post 65 Part D DCR <Member>	2,911	2,929	-0.6%
Post 65 Part D DCR <Spouse>	1,563	1,573	-0.6%
Total Retirement PVB	**25,379**	**25,539**	**-0.6%**

Benefits - Buck Valuation Terminology	
Retirement:	
Post 65 DCR <Member>	Base benefit paid to employee while employee is at least 65
Post 65 DCR <Spouse>	Base benefit paid to spouse while employee is at least 65
Contrib DCR <Member>	Employee pre-retirement contributions
Contrib DCR <Spouse>	Spouse pre-retirement contributions
Post 65 Part D DCR <Member>	Employee post-age 65 Medicare Part D reimbursement
Post 65 Part D DCR <Spouse>	Spouse post-age 65 Medicare Part D reimbursement

** GRS' audit of Buck's calculation includes review of the benefit amounts, annuity values, assumptions and other factors related to the PVB calculation at each projected age. Differences may exist due to different interpretations of the statutes, as well as additional items as discussed throughout this audit report.*

Comparison of Present Value of Benefits - **DCR PERS Disability**

Retirees	**Test Case 4 - PERS Other**		
Basic Data:		*Basic Data:*	
Sex	Male	Tier	4
Current Age	55.186	Type	Disability
Annual Benefit	14,329.06	Stop date	4/30/2031
	GRS*	**Buck**	**% Diff**
PVB - Disability Benefit	104,971	105,056	-0.1%
PVB - Post-retirement Medical Benefits	72,971	75,240	-3.0%

Retirees	**Test Case 5 - PERS PF**		
Basic Data:		*Basic Data:*	
Sex	Male	Tier	4
Current Age	46.123	Type	Disability
Annual Benefit	48,746.33	Stop date	9/28/2036
	GRS*	**Buck**	**% Diff**
PVB - Disability Benefit	640,779	640,657	0.0%
PVB - Post-retirement Medical Benefits	67,965	69,620	-2.4%

Retirees	**Test Case 6 - TRS**		
Basic Data:		*Basic Data:*	
Sex	Male	Tier	3
Current Age	55.454	Type	Disability
Annual Benefit	24,286.44	Stop date	Occ Disabled
	GRS*	**Buck**	**% Diff**
PVB - Disability Benefit	184,263	176,511	4.4%
PVB - Post-retirement Medical Benefits	75,217	77,396	-2.8%

** GRS' audit of Buck's calculation includes review of the benefit amounts, annuity values, assumptions and other factors related to the PVB calculation at each projected age. Differences may exist due to different interpretations of the statutes, as well as additional items as discussed throughout this audit report.*

SECTION 8

REVIEW OF CONTRIBUTION RATE DETERMINATION

Review of Contribution Rate Determination

Beginning with the actuarial valuations as of June 30, 2014, in accordance with Senate Bill 119 and House Bill 385, a contribution calculation methodology was incorporated in order to recognize the timing lag and recognize expected changes in the unfunded liability during the two-year delay.

GRS analyzed the roll forward methodology for the FY2024 Contribution Rate Calculation and verified the contribution rate computation (as shown in pages 21 - 24 of the PERS valuation report and pages 13 - 16 of the TRS valuation report). We verified the calculation of the layered amortization amount for FY24.

As noted in the Buck report, the compensation used to develop the rates is a combination of both this plan's compensation, as well as the DCR compensation.

Finally, Buck has determined two different compensation amounts-the "valuation" compensation which is the compensation used to determine future plan benefits and the liabilities for those benefits. This compensation annualizes permanent-part timer pay. The "rate" payroll is the payroll upon which the contributions are expected to be made, and does not annualize permanent part timer pay.

Findings:

The calculations were generally reasonable and consistent with actuarial practice.

SECTION 9

REVIEW OF ACTUARIAL VALUATION REPORT

Review of Actuarial Valuation Report

Valuation Report:

GRS reviewed the June 30, 2021 valuation report for scope as well as content to determine if actuarial statistics were being reflected fairly and if the details of the plan were being correctly communicated. GRS did not review GASB 67/68/74/75 Accounting Information.

We consider the scope and content of Buck's report to be effective in communicating the financial position and contribution requirements of PERS and TRS.

We recommend the following in order to better communicate the benefits for PERS and TRS:

- Based on one of our agreed upon recommendations from last year, for DB PERS Peace Officer/Firefighter members, the deferred retirement benefit for the occupational disability piece is increased by the same accumulative PRPA percentage that was applied to the disability benefit. We recommend Buck add language about this to the plan provision section of the PERS DB report, similar to how they have language about this in the PERS DCR report.
- In the plan provisions section of the PERS DB report, it states that members may receive "…early, actuarially reduced benefits when the reach early retirement age…", but the early retirement benefits for PERS are reduced by 6% per year, not by actuarial equivalence. We recommend Buck update the PERS DB report to correctly state how PERS early retirement benefits are reduced.

Alaska Retirement Management Board

Actuarial Review of the
National Guard and Naval Militia Retirement System Pension Plan; and
Judicial Retirement System Pension and Health Plans
Roll-Forward Actuarial Valuations
May 20, 2022

P: 720.274.7270 | www.grsconsulting.com

May 20, 2022

Mr. Zach Hanna
Chief Investment Officer
Department of Revenue, Treasury Division
Alaska Retirement Management Board
P.O. Box 110405
Juneau, AK 99811-0405

Subject: **Actuarial Review of the Roll-Forward June 30, 2021 valuations for the State of Alaska National Guard and Naval Militia Retirement System (NGNMRS) and Judicial Retirement System (JRS)**

Dear Zach:

We have performed an actuarial review of the June 30, 2021 Roll-Forward Actuarial Valuation for NGNMRS and JRS.

This audit includes a review of the results of the roll forward calculations using actuarial methods, assumptions and procedures from the most recent actuarial valuation reports and the Buck letter dated January 6, 2022 (re: Judicial Retirement System and National Guard and Naval Militia Retirement System Roll-Forward Actuarial Valuations as of June 30, 2021). The steps of the process of our audit, including potential areas for future review, are as follows:

1. Reviewing the calculations shown in the Roll-Forward letter to confirm that the results shown as of June 30, 2020 in the Roll-Forward letter match Buck's June 30, 2020 actuarial valuation reports. We confirmed that the results do match.

2. Calculating the actuarial value of assets as of June 30, 2021 using the financial statements provided and the historical gains and losses shown in the June 30, 2020 report. We matched the results very closely.

3. Verifying Buck's June 30, 2021 Roll-Forward calculations using information from the most recent June 30, 2020 Buck actuarial valuations, the Roll Forward letter, and the financial statements for the fiscal year ending June 30, 2021. We completed this review by estimating these results using the appropriate methods, assumptions and procedure. Our audit results were very close for the NGNMRS and JRS Pension plans.

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4. Auditing the contribution rate calculations using the past service base and payment information, and estimating the FY21 Gain/Loss noted in Buck's Roll Forward letter. Overall, we found the results to be reasonable and were able to match them closely for the NGNMRS and JRS Pension plans.

5. Reviewing the Roll-Forward letter to determine if the details of the calculations were being communicated correctly and effectively. While we found that the most of the necessary information is reflected fairly, in order to improve communication and provide additional details on the calculations, we recommend the following for JRS:

    - Disclose the assumed benefit payments used in the roll forward calculation of the healthcare benefits.
    - Disclose the assumed timing of the state assistance contributions used for the expected return calculations in the development of the actuarial value of assets.
    - Break out the actuarial gains/(losses) between pension and healthcare.

In general, the roll forward procedures and results were reasonable.

We wish to thank the staff of the State of Alaska Treasury Division and Buck without whose willing cooperation this review could not have been completed.

Sincerely,

Gabriel, Roeder, Smith & Company

Paul Wood, ASA, FCA, MAAA
Senior Consultant

Bill Detweiler, ASA, EA, FCA, MAAA
Consultant

State of Alaska

Summary of Changes From Draft June 30, 2021 Actuarial Valuation Reports

PERS

- Added wording regarding reduction for early retirement in Section 5.1.
- Added “Salaries are subject to compensation limits under IRC 401(a)(17) for members first hired on or after July 1, 1996. Retirement benefit amounts are subject to IRC 415(b) limits regardless of hire date.” in Section 5.1.
- Added wording regarding increases for Peace/Fire retirement benefits after occupational disability in Section 5.1.
- Added “Disability rates cease once a member is eligible for retirement.” in Section 5.3.
- Modified language for Retired Member Contributions for Medical Benefits in Section 5.3.
- Added the disability decrement rates after age 54 in Section 5.3.

TRS

- Added “Salaries are subject to compensation limits under IRC 401(a)(17) for members first hired on or after July 1, 1996. Retirement benefit amounts are subject to IRC 415(b) limits regardless of hire date.” in Section 5.1.
- Added “Disability rates cease once a member is eligible for retirement.” in Section 5.3.
- Modified language for Retired Member Contributions for Medical Benefits in Section 5.3.
- Added the disability decrement rates after age 54 in Section 5.3.

PERS DCR and TRS DCR

- Removed investment expense percentage in Executive Summary.
- Added “For retiree medical benefits, the disability rates cease once a member is eligible for retirement. However, the disability rates continue after retirement eligibility for occupational death & disability benefits.” in Section 4.3.
- Modified Retiree Medical Participation table headers in Section 4.3.
- Added the disability decrement rates after age 54 in Section 4.3.

BUCK

State of Alaska

Public Employees' Retirement System

Actuarial Valuation Report
As of June 30, 2021

May 2022

May 12, 2022

State of Alaska
The Alaska Retirement Management Board
The Department of Revenue, Treasury Division
The Department of Administration, Division of Retirement and Benefits
P.O. Box 110203
Juneau, AK 99811-0203

Certification of Actuarial Valuation

Dear Members of The Alaska Retirement Management Board, The Department of Revenue and The Department of Administration:

This report summarizes the annual actuarial valuation results of the State of Alaska Public Employees' Retirement System (PERS) as of June 30, 2021 performed by Buck Global, LLC (Buck).

The actuarial valuation is based on financial information provided in the financial statements audited by KPMG LLP, member data provided by the Division of Retirement and Benefits, and medical enrollment data provided by the healthcare claims administrator (Aetna), as summarized in this report. The benefits considered are those delineated in Alaska statutes effective June 30, 2021. The actuary did not verify the data submitted, but did perform tests for consistency and reasonableness.

All costs, liabilities and other factors under PERS were determined in accordance with generally accepted actuarial principles and procedures. An actuarial cost method is used to measure the actuarial liabilities which we believe is reasonable. Buck is solely responsible for the actuarial data and actuarial results presented in this report. This report fully and fairly discloses the actuarial position of PERS as of June 30, 2021.

PERS is funded by Employer, State, and Member Contributions in accordance with the funding policy adopted by the Alaska Retirement Management Board (Board) and as required by Alaska state statutes. The funding objective for PERS is to pay required contributions that remain level as a percent of total PERS compensation. The Board has also established a funding policy objective that the required contributions be sufficient to pay the Normal Costs of active plan members, plan expenses, and amortize the Unfunded Actuarial Accrued Liability (UAAL) as a level percentage of total PERS compensation over a closed 25-year period as required by Alaska state statutes. The closed 25-year period was originally established effective June 30, 2014. Effective June 30, 2018, the Board adopted a 25-year layered UAAL amortization method as described in Section 5.2. The UAAL amortization continues to be on a level percent of pay basis. The compensation used to determine required contributions is the total compensation of all active members in PERS, including those hired after July 1, 2006 who are members of the Defined Contribution Retirement (DCR) Plan. This objective is currently being met and is projected to continue to be met. Absent future gains/losses, actuarially determined contributions are expected to remain level as a percent of pay and the overall funded status (on a combined pension/healthcare basis) is expected to increase to 100% in FY26 (the funded status of the pension trust is expected to increase to 100% in FY38).

SB 55 was effective July 1, 2021. Under SB 55:

- The State-as-an-Employer contributes the full actuarial contribution rate based on the DB/DCR payroll of its employees (which is approximately 50% of the total PERS DB/DCR payroll).
- Non-State employers continue to contribute 22% of their DB/DCR payroll.
- The Additional State Contributions are based on the excess of the DB actuarial contribution rate and the DB contributions made by non-State employers.

The Board and staff of the State of Alaska may use this report for the review of the operations of PERS. Use of this report for any other purpose or by anyone other than the Board or staff of the State of Alaska may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, you should ask Buck to review any statement you wish to make on the results contained in this report. Buck will not accept any liability for any such statement made without the review by Buck.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the actuarial assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. In particular, retiree group benefits models necessarily rely on the use of approximations and estimates and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements. An analysis of the potential range of such future differences is beyond the scope of this valuation.

In our opinion, the actuarial assumptions used are reasonable, taking into account the experience of the plan and reasonable long-term expectations, and represent our best estimate of the anticipated long-term experience under the plan. The actuary performs an analysis of plan experience periodically and recommends changes if, in the opinion of the actuary, assumption changes are needed to more accurately reflect expected future experience. The last full experience analysis was performed for the period July 1, 2013 to June 30, 2017. Based on that experience study, the Board adopted new assumptions effective beginning with the June 30, 2018 valuation to better reflect expected future experience. Based on our annual analysis of recent claims experience, changes were made to the per capita claim cost rates effective June 30, 2021 to better reflect expected future healthcare experience. A summary of the actuarial assumptions and methods used in this actuarial valuation is shown in Sections 5.2 and 5.3. We certify that the assumptions and methods described in Sections 5.2 and 5.3 of this report meet the requirements of all applicable Actuarial Standards of Practice.

Governmental Accounting Standards Board (GASB) Statement No. 67 (GASB 67) was effective for PERS beginning with fiscal year ending June 30, 2014, and Statement No. 74 (GASB 74) was effective for PERS beginning with fiscal year ending June 30, 2017. Separate GASB 67 and GASB 74 reports as of June 30, 2021 have been prepared. We have also prepared the member data tables shown in Section 4 of this report for the Statistical Section of the ACFR, as well as the summary of actuarial assumptions and analysis of financial experience for the Actuarial Section of the ACFR. Please see our separate GASB 67 and GASB 74 reports for other information needed for the ACFR.

Assessment of Risks

Actuarial Standard of Practice No. 51 (ASOP 51) applies to actuaries performing funding calculations related to a pension plan. ASOP 51 does not apply to actuaries performing services in connection with other post-employment benefits, such as medical benefits. Accordingly, ASOP 51 does not apply to the healthcare portion of PERS. See Section 6 of this report for further details regarding ASOP 51.

Use of Models

Actuarial Standard of Practice No. 56 (ASOP 56) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of the plan using data and assumptions as of the measurement date under the funding methods specified in this report. The output from the third-party vendor software is used as input to internally developed models that apply applicable funding methods and policies to the derived liabilities and other inputs, such as plan assets and contributions, to generate many of the exhibits found in this report. Buck has an extensive review process in which the results of the liability calculations are checked using detailed sample life output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other funding outputs and the internal models are similarly reviewed in detail and at a higher level for accuracy, reasonability, and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software. This review is performed by experts within Buck who are familiar with applicable funding methods, as well as the manner in which the model generates its output. If significant changes are made to the internal models, extra checking and review are completed. Significant changes to the internal models that are applicable to multiple clients are generally developed, checked, and reviewed by multiple experts within Buck who are familiar with the details of the required changes.

Additional models used in valuing health benefits are described later in the report.

COVID-19

The potential impact of the ongoing COVID-19 pandemic on costs and liabilities was considered and an adjustment was made in setting the medical per capita claims cost assumption. FY20 medical claims were adjusted for a COVID-19 related decline in claims during the last four months (March – June) of FY20. FY21 medical claims were adjusted for a COVID-19 related decline in those claims during the fiscal year. A more detailed explanation on these adjustments is shown in Section 5.2.

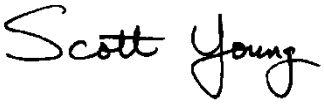
This report was prepared under my supervision and in accordance with all applicable Actuarial Standards of Practice. I am a Fellow of the Society of Actuaries, an Enrolled Actuary, a Fellow of the Conference of Consulting Actuaries, and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

I am available to discuss this report with you at your convenience. I can be reached at 602-803-6174.

Respectfully submitted,

David J. Kershner, FSA, EA, MAAA, FCA
Principal
Buck

The undersigned actuary is responsible for all assumptions related to the average annual per capita health claims cost and the health care cost trend rates, and hereby affirms his qualification to render opinions in such matters in accordance with the Qualification Standards of the American Academy of Actuaries.



Scott Young, FSA, EA, MAAA, FCA
Director
Buck

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Executive Summary

Overview

The State of Alaska Public Employees' Retirement System (PERS) provides pension and postemployment healthcare benefits to eligible participants. The Commissioner of the Department of Administration is responsible for administering the plan. The Alaska Retirement Management Board has fiduciary responsibility over the assets of the plan. This report presents the results of the actuarial valuation of PERS as of the valuation date of June 30, 2021.

Purpose

An actuarial valuation is performed on the plan annually as of the end of the fiscal year. The main purposes of the actuarial valuation detailed in this report are:

1. To determine the Employer/State contribution necessary to meet the Board's funding policy for the plan;
2. To disclose the funding assets and liability measures as of the valuation date;
3. To review the current funded status of the plan and assess the funded status as an appropriate measure for determining future actuarially determined contributions;
4. To compare actual and expected experience under the plan during the last fiscal year; and
5. To report trends in contributions, assets, liabilities, and funded status over the last several years.

The actuarial valuation provides a "snapshot" of the funded position of PERS based on the plan provisions, membership data, assets, and actuarial methods and assumptions as of the valuation date.

Actuarial projections are also performed to provide a long-term view of the expected future funded status and contribution patterns (see Section 3). The future funded status and contribution patterns would be different than those shown in Section 3 if future experience does not match the actuarial assumptions used in the projections.

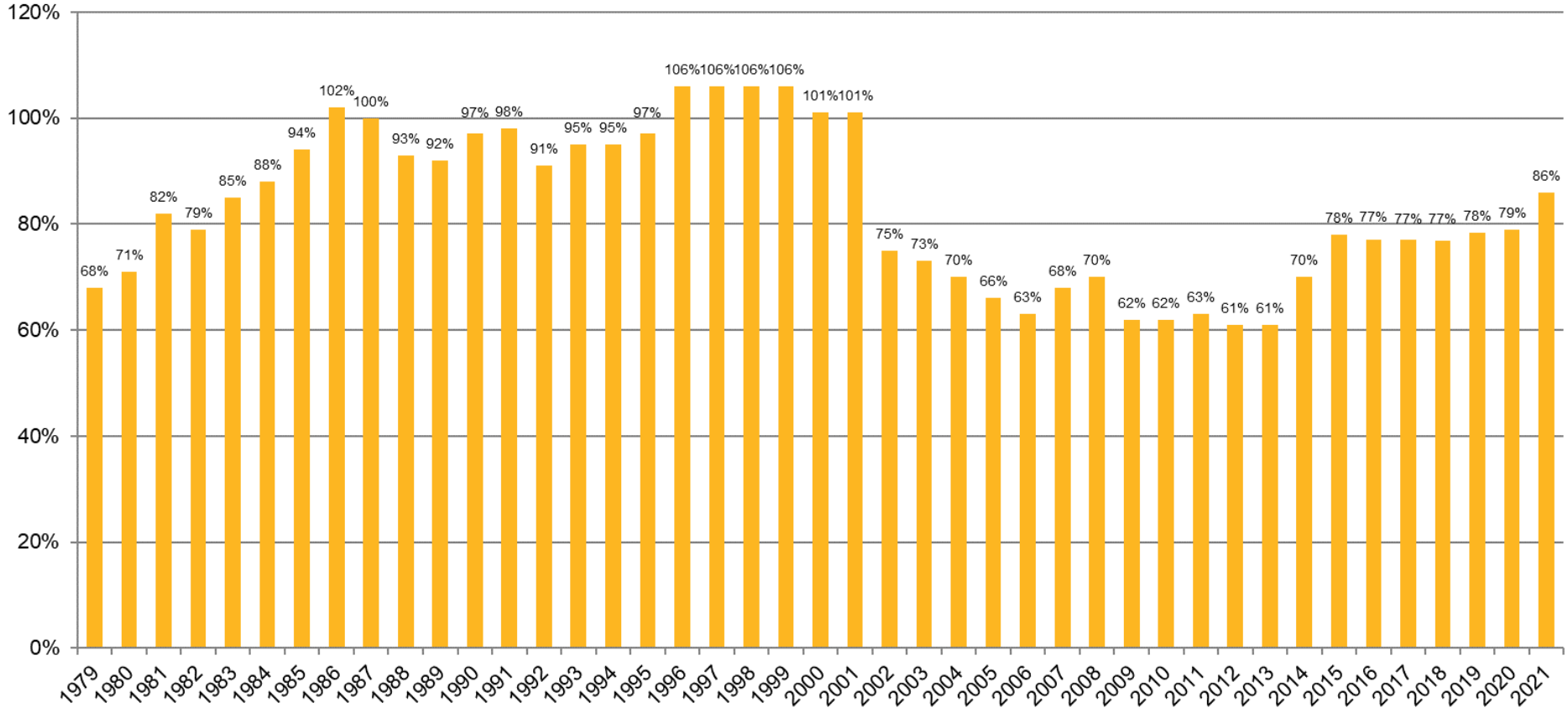
Retiree group benefits models necessarily rely on the use of approximations and estimates, and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements.

Funded Status

Where presented, references to "funded ratio" and "unfunded actuarial accrued liability" typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

Funded Status as of June 30 ($'s in 000's)		2020	2021
Pension			
a.	Actuarial Accrued Liability	$ 15,279,525	$ 15,419,975
b.	Valuation Assets	9,713,710	10,466,709
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ 5,565,815	$ 4,953,266
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	63.6%	67.9%
e.	Fair Value of Assets	$ 9,469,161	$ 11,912,309
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	62.0%	77.3%
Healthcare			
a.	Actuarial Accrued Liability	$ 7,036,550	$ 6,856,170
b.	Valuation Assets	7,989,358	8,581,155
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ (952,808)	$ (1,724,985)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	113.5%	125.2%
e.	Fair Value of Assets	$ 7,813,511	$ 9,784,141
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	111.0%	142.7%
Total			
a.	Actuarial Accrued Liability	$ 22,316,075	$ 22,276,145
b.	Valuation Assets	17,703,068	19,047,864
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ 4,613,007	$ 3,228,281
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	79.3%	85.5%
e.	Fair Value of Assets	$ 17,282,672	$ 21,696,450
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	77.4%	97.4%

Funded Ratio History (Based on Valuation Assets)



The key reasons for the change in the funded status are explained below. The funded status for healthcare benefits is not necessarily an appropriate measure to confirm that assets are sufficient to settle health plan obligations as there are no available financial instruments for purchase. Future experience is likely to vary from assumptions, so there is potential for actuarial gains or losses.

1. Investment Experience

The actuarial asset value was reinitialized to equal fair value of assets as of June 30, 2014. Beginning in FY15, the asset valuation method recognizes 20% of the investment gain or loss each year, for a period of five years. The FY21 investment return based on fair value of assets was approximately 30.0% compared to the expected investment return of 7.38% (net of investment expenses). This resulted in a market asset gain of approximately $3,834 million. Due to the recognition of investment gains and losses over a 5-year period, the FY21 investment return based on actuarial value of assets was approximately 11.6%, which resulted in an actuarial asset gain of approximately $734 million.

2. Salary Increases

Salary increases for continuing active members during FY21 were higher than expected based on the valuation assumptions, resulting in a liability loss of approximately $17 million.

3. Demographic Experience

Section 4 provides statistics on active and inactive participants. The number of active participants decreased 10.4% from 11,033 at June 30, 2020 to 9,888 at June 30, 2021 due to active members exiting the plan during the year (due to retirement, termination, death, and disability) and the closure of the plan to new entrants as of July 1, 2006. The average age of active participants increased from 53.21 to 53.51 and average credited service increased from 18.38 to 18.96 years.

The number of benefit recipients increased 1.6% from 37,106 to 37,717 and their average age increased from 70.77 to 71.17. The number of vested terminated participants decreased 3.6% from 5,327 to 5,135. Their average age increased from 53.52 to 53.92.

The overall effect of the demographic experience during FY21 was a liability gain of approximately $4.3 million (pension) and a liability gain of approximately $30.3[1] million (healthcare).

4. COLA / PRPA Experience

The cost-of-living increases (COLA) for benefit recipients during FY21 were less than expected based on the valuation assumptions, resulting in a liability gain of approximately $6 million. The postretirement pension adjustments (PRPA) were also less than expected, resulting in a liability gain of approximately $149 million.

5. Retiree Medical Claims Experience

As described in Section 5.2, recent medical claims experience and changes in healthcare enrollment data provided to us for the June 30, 2021 valuation generated a liability gain of approximately $272 million. Reduced claims during FY21, largely attributable to medical claims impacted by COVID-19, generated a liability gain of approximately $21 million.

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[1] Includes the effects of changes in dependent coverage elections and Medicare Part B only experience.

6. Changes in Methods Since the Prior Valuation

There were no changes in actuarial methods since the prior valuation.

7. Changes in Assumptions Since the Prior Valuation

Healthcare claim costs are updated annually as described in Section 5.2. The amounts included in the Normal Cost for administrative expenses were updated based on the last two years of actual administrative expenses paid from plan assets. There were no other changes in actuarial assumptions since the prior valuation.

8. Changes in Benefit Provisions Since the Prior Valuation

Starting in 2022, prior authorization will be required for certain specialty medications for all participants, and certain preventive benefits for pre-Medicare participants will now be covered by the plan. These changes created an actuarial gain of approximately $62 million.

Under SB 55 that was effective July 1, 2021: (i) The State-as-an-Employer contributes the full actuarial contribution rate based on the DB/DCR payroll of its employees (which is approximately 50% of the total PERS DB/DCR payroll); (ii) Non-State employers continue to contribute 22% of their DB/DCR payroll; (iii) the Additional State Contributions are based on the excess of the DB actuarial contribution rate and the DB contributions made by non-State employers.

There have been no other changes in benefit provisions valued since the prior valuation.

Projections

Absent future asset (and/or liability) losses, changes in plan provisions or actuarial assumptions, the $3,834 million FY21 market asset gain has a significant impact on the projections shown in Section 3. For example, the pension trust is currently projected to reach a funded status of 100% in FY38. Based on the 2020 valuation projections, the funded status of the pension trust was projected to be only 85% in FY38.

Once the pension trust is projected to reach of funded status of 100%, it may be reasonable to assume that all remaining pension unfunded liability layered amortization amounts should be reduced to zero. Since the healthcare trust is currently more than 100% funded, the healthcare unfunded liability amortization amounts would also be reduced to zero if the Board decides to implement this change (this does not impact the projections shown in Section 3.6 since the healthcare Normal Cost is assumed to be contributed as a minimum in all years after FY23 per Alaska state statutes).

We have shown the table of projected figures in Section 3.6 two ways:

a) Section 3.6A – No changes to the pension unfunded liability layered amortization amounts. In this case, Additional State Contributions totaling approximately $59 million are projected for FY38-FY39, even though the pension trust is projected to be 100% funded in FY38.
b) Section 3.6B – Eliminate the pension unfunded liability layered amortization amounts when the pension trust is projected to be 100% funded. In this case, the Additional State Contributions are projected to be zero after FY37.

The pros and cons of these two methods can be discussed further upon request.

In both cases, the pension Normal Cost is assumed to be contributed as a minimum based on Alaska state statutes. (The healthcare trust is currently over 100% funded, so the healthcare Normal Cost is also assumed to be contributed as a minimum based on Alaska state statutes.)

Sections 3.3 through 3.5 are based on the projections shown in Section 3.6A.

Comparative Summary of Contribution Rates

Pension	Actual FY 2023	Estimated FY 2024
a. Normal Cost Rate Net of Member Contributions	2.37%	2.14%
b. Past Service Cost Rate	16.01%	14.38%
c. Total Employer/State Contribution Rate, (a) + (b), not less than (a)[1]	18.38%	16.52%

Healthcare	Actual FY 2023	Estimated FY 2024
a. Normal Cost Rate	2.84%	2.50%
b. Past Service Cost Rate	(4.94%)	(7.45%)
c. Total Employer/State Contribution Rate, (a) + (b), not less than (a)[1]	2.84%	2.50%

Total	Actual FY 2023	Estimated FY 2024
a. Normal Cost Rate Net of Member Contributions	5.21%	4.64%
b. Past Service Cost Rate	16.01%	14.38%
c. Total Employer/State Contribution Rate, (a) + (b)[1]	21.22%	19.02%
d. Board Adopted Total Employer/State Contribution Rate	18.38%[2]	TBD
e. Defined Contribution Retirement (DCR) Rate Paid by Employers	6.41%	6.63%
f. Board Adopted Total Rate, Including DCR Rate Paid by Employers, (d) + (e)	24.79%	TBD

Contribution rates are based on total (DB and DCR) payroll. The contribution rates shown above for FY24 are estimated assuming no actuarial gains/losses during FY22 and FY23. Actual FY24 contribution rates will be adopted by the Board in September 2022 reflecting FY22 asset experience.

Contribution rates include Employer contribution rates as limited by Alaska state statutes and the Additional State Contribution required under SB 125.

[1] Beginning with the June 30, 2014 valuation, contribution rates for FY17 and beyond are determined using new methodology in accordance with 2014 legislation under HB 385 and SB 119, 2014 Alaska Laws, which changed the amortization methodology to a closed 25-year period as a level percentage of pay, and eliminated the time lag on the contribution rate calculation by using a 2-year “roll-forward” approach assuming 0% population growth. Investment gains and losses are recognized over a 5-year period beginning in FY15. Beginning with the June 30, 2018 valuation, the UAAL amortization was changed as described in Section 5.2.

[2] The FY23 contribution rates adopted by the Board in October 2021 were 18.38% for Pension and 0.00% for Healthcare.

Summary of Actuarial Accrued Liability Gain/(Loss) and Other Changes During the Year

The following table summarizes the sources of change in the total Employer/State contribution rate as of June 30, 2020 and June 30, 2021 based on DB and DCR payroll combined:

	Pension	Healthcare	Total
1. Total Employer/State Contribution Rate as of June 30, 2020	20.54%	3.57%	24.11%
2. Change due to:			
a. Health Claims Experience	N/A	(0.12)%	(0.12)%
b. Salary Increases	0.05%	N/A	0.05%
c. Investment Experience	(1.06)%	0.00%	(1.06)%
d. Demographic Experience and Miscellaneous [1]	(0.54)%	(0.26)%	(0.80)%
e. Actual vs Expected Contributions	(0.06)%	0.00%	(0.06)%
f. Assumption/Method Changes	0.00%	0.00%	0.00%
g. Plan Changes	0.00%	(0.03)%	(0.03)%
h. Total Change, (a) + (b) + (c) + (d) + (e) + (f) + (g)	(1.61)%	(0.41)%	(2.02)%
3. Total Employer/State Contribution Rate as of June 30, 2021, (1) + (2)(h)	18.93%	3.16%	22.09%

The following table shows the FY21 gain/(loss) on actuarial accrued liability as of June 30, 2021 ($'s in 000's):

	Pension	Healthcare	Total
Retirement Experience	$ (7,211)	$ 7,125	$ (86)
Termination Experience	(7,963)	(10,409)	(18,372)
Disability Experience	6,650	10,858	17,508
Active Mortality Experience	14,401	(745)	13,656
Inactive Mortality Experience	(1,576)	2,684	1,108
Salary Increases	(17,126)	N/A	(17,126)
Rehires (Net of Rehire Load)	15,067	14,045	29,112
Transfers between Peace/Fire and Others	(1,706)	(161)	(1,867)
COLA Increases	5,956	N/A	5,956
PRPA Increases	149,186	N/A	149,186
Benefit Payments Different than Expected	19,147	21,107	40,254
Per Capita Claims Cost	N/A	272,205	272,205
Medical and Prescription Drug Plan Changes	N/A	61,807	61,807
Medicare Part B Only Experience	N/A	5,743	5,743
Changes in Dependent Coverage Elections	N/A	15,017	15,017
Programming Changes[2]	(512)	N/A	(512)
Miscellaneous[3]	(13,480)	(15,552)	(29,032)
Total	$ 160,833	$ 383,724	$ 544,557

[1] Includes the effects of census data changes between the two valuations.

[2] Includes adjustments to (a) the 10% COLA to apply immediately for all disabled members, and (b) the PRPA increases for Peace Officer/Firefighters who retire from occupational disability.

[3] Includes the effects of various data changes that are typical when new census data is received for the annual valuation, as well as other items that do not fit neatly into any of the other categories. The pension amount includes a loss of $10,900 for unexpected beneficiaries and QDRO's based on last year's data, and the healthcare amount includes a loss of $10,592 for changes in spouses' dates of birth in the data.

The rehire gain/(loss) amount shown on the previous page is the difference between (i) the increase in Actuarial Accrued Liability at June 30, 2021 due to rehires during the most recent plan year, and (ii) the load that was added to the June 30, 2020 Normal Cost based on the rehire load assumption used in the June 30, 2020 valuation. The development of the FY21 rehire gain/(loss) amount is shown in the table below ($'s in 000's):

	Pension	Healthcare	Total
1. Increase/(Decrease) in Actuarial Accrued Liability at June 30, 2021 due to Rehires	$ 7,095	$ (1,523)	$ 5,572
2. June 30, 2020 Normal Cost Rehire Load, with interest to June 30, 2021	$ 22,162	$ 12,522	$ 34,684
3. Rehire Gain/(Loss), (2) - (1)	$ 15,067	$ 14,045	$ 29,112

Section 1: Actuarial Funding Results

Section 1.1: Actuarial Liabilities and Normal Cost ($'s in 000's)

Peace Officer / Firefighter

As of June 30, 2021	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Retirement Benefits	$ 877,332	$ 783,315
Termination Benefits	9,109	1,315
Disability Benefits	1,259	(1,287)
Death Benefits	9,057	5,989
Return of Contributions	1,243	(4,141)
Medical and Prescription Drug Benefits	356,026	305,813
Medicare Part D Subsidy	(30,079)	(25,883)
Indebtedness	(4,797)	(4,797)
Subtotal	$ 1,219,150	$ 1,060,324
Inactive Members		
Not Vested	$ 2,487	$ 2,487
Vested Terminations		
- Retirement Benefits	35,573	35,573
- Medical and Prescription Drug Benefits	95,523	95,523
- Medicare Part D Subsidy	(9,689)	(9,689)
- Indebtedness	(475)	(475)
Retirees & Beneficiaries		
- Retirement Benefits	1,730,944	1,730,944
- Medical and Prescription Drug Benefits	590,605	590,605
- Medicare Part D Subsidy	(79,219)	(79,219)
Subtotal	$ 2,365,749	$ 2,365,749
Total	**$ 3,584,899**	**$ 3,426,073**
Total Pension	**$ 2,661,732**	**$ 2,548,923**
Total Medical, Net of Part D Subsidy	**$ 923,167**	**$ 877,150**
Total Medical, Gross of Part D Subsidy	**$ 1,042,154**	**$ 991,941**

Peace Officer / Firefighter

As of June 30, 2021	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
By Tier		
Tier 1		
- Pension	$ 989,348	$ 988,683
- Medical, Net of Part D Subsidy	272,846	272,432
Tier 2		
- Pension	694,313	683,185
- Medical, Net of Part D Subsidy	265,750	261,524
Tier 3		
- Pension	978,071	877,055
- Medical, Net of Part D Subsidy	384,571	343,194
Total	**$ 3,584,899**	**$ 3,426,073**

As of June 30, 2021	Normal Cost
Active Members	
Retirement Benefits	$ 17,624
Termination Benefits	1,528
Disability Benefits	495
Death Benefits	612
Return of Contributions	1,029
Medical and Prescription Drug Benefits	9,196
Medicare Part D Subsidy	(788)
Rehire Assumption (Pension)	3,996
Rehire Assumption (Medical)	1,437
Administrative Expenses (Pension)	1,615
Administrative Expenses (Medical)	773
Total	**$ 37,517**
Total Pension	**$ 26,899**
Total Medical, Net of Part D Subsidy	**$ 10,618**
Total Medical, Gross of Part D Subsidy	**$ 11,406**
By Tier	
Tier 1	
- Pension	$ 310
- Medical, Net of Part D Subsidy	204
Tier 2	
- Pension	3,601
- Medical, Net of Part D Subsidy	1,332
Tier 3	
- Pension	22,988
- Medical, Net of Part D Subsidy	9,082
Total	**$ 37,517**

Section 1.1: Actuarial Liabilities and Normal Cost ($'s in 000's)

Others

As of June 30, 2021	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Retirement Benefits	$ 3,314,325	$ 3,021,247
Termination Benefits	213,325	120,766
Disability Benefits	16,937	5,047
Death Benefits	45,609	36,004
Return of Contributions	14,215	(28,530)
Medical and Prescription Drug Benefits	1,848,190	1,513,162
Medicare Part D Subsidy	(234,865)	(197,726)
Indebtedness	(39,283)	(39,283)
Subtotal	$ 5,178,453	$ 4,430,687
Inactive Members		
Not Vested	$ 73,923	$ 73,923
Vested Terminations		
- Retirement Benefits	651,624	651,624
- Medical and Prescription Drug Benefits	930,456	930,456
- Medicare Part D Subsidy	(102,384)	(102,384)
- Indebtedness	(12,942)	(12,942)
Retirees & Beneficiaries		
- Retirement Benefits	9,043,196	9,043,196
- Medical and Prescription Drug Benefits	4,572,277	4,572,277
- Medicare Part D Subsidy	(736,765)	(736,765)
Subtotal	$ 14,419,385	$ 14,419,385
Total	**$ 19,597,838**	**$ 18,850,072**
Total Pension	**$ 13,320,929**	**$ 12,871,052**
Total Medical, Net of Part D Subsidy	**$ 6,276,909**	**$ 5,979,020**
Total Medical, Gross of Part D Subsidy	**$ 7,350,923**	**$ 7,015,895**

Others

As of June 30, 2021	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
By Tier		
Tier 1		
- Pension	$ 6,024,842	$ 6,001,018
- Medical, Net of Part D Subsidy	2,358,156	2,335,845
Tier 2		
- Pension	3,811,976	3,721,454
- Medical, Net of Part D Subsidy	1,873,154	1,810,864
Tier 3		
- Pension	3,484,111	3,148,580
- Medical, Net of Part D Subsidy	2,045,599	1,832,311
Total	**$ 19,597,838**	**$ 18,850,072**

As of June 30, 2021	Normal Cost
Active Members	
Retirement Benefits	$ 53,983
Termination Benefits	14,497
Disability Benefits	1,969
Death Benefits	1,742
Return of Contributions	7,031
Medical and Prescription Drug Benefits	58,336
Medicare Part D Subsidy	(6,562)
Rehire Assumption (Pension)	14,870
Rehire Assumption (Medical)	8,848
Administrative Expenses (Pension)	6,010
Administrative Expenses (Medical)	4,758
Total	**$ 165,482**
Total Pension	**$ 100,102**
Total Medical, Net of Part D Subsidy	**$ 65,380**
Total Medical, Gross of Part D Subsidy	**$ 71,942**
By Tier	
Tier 1	
- Pension	$ 8,729
- Medical, Net of Part D Subsidy	8,011
Tier 2	
- Pension	23,906
- Medical, Net of Part D Subsidy	15,939
Tier 3	
- Pension	67,467
- Medical, Net of Part D Subsidy	41,430
Total	**$ 165,482**

Section 1.1: Actuarial Liabilities and Normal Cost ($'s in 000's)

All Members

As of June 30, 2021	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Retirement Benefits	$ 4,191,657	$ 3,804,562
Termination Benefits	222,434	122,081
Disability Benefits	18,196	3,760
Death Benefits	54,666	41,993
Return of Contributions	15,458	(32,671)
Medical and Prescription Drug Benefits	2,204,216	1,818,975
Medicare Part D Subsidy	(264,944)	(223,609)
Indebtedness	(44,080)	(44,080)
Subtotal	$ 6,397,603	$ 5,491,011
Inactive Members		
Not Vested	$ 76,410	$ 76,410
Vested Terminations		
- Retirement Benefits	687,197	687,197
- Medical and Prescription Drug Benefits	1,025,979	1,025,979
- Medicare Part D Subsidy	(112,073)	(112,073)
- Indebtedness	(13,417)	(13,417)
Retirees & Beneficiaries		
- Retirement Benefits	10,774,140	10,774,140
- Medical and Prescription Drug Benefits	5,162,882	5,162,882
- Medicare Part D Subsidy	(815,984)	(815,984)
Subtotal	$ 16,785,134	$ 16,785,134
Total	**$ 23,182,737**	**$ 22,276,145**
Total Pension	**$ 15,982,661**	**$ 15,419,975**
Total Medical, Net of Part D Subsidy	**$ 7,200,076**	**$ 6,856,170**
Total Medical, Gross of Part D Subsidy	**$ 8,393,077**	**$ 8,007,836**

All Members

As of June 30, 2021	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
By Tier		
Tier 1		
- Pension	$ 7,014,190	$ 6,989,701
- Medical, Net of Part D Subsidy	2,631,002	2,608,277
Tier 2		
- Pension	4,506,289	4,404,639
- Medical, Net of Part D Subsidy	2,138,904	2,072,388
Tier 3		
- Pension	4,462,182	4,025,635
- Medical, Net of Part D Subsidy	2,430,170	2,175,505
Total	**$ 23,182,737**	**$ 22,276,145**

As of June 30, 2021	Normal Cost
Active Members	
Retirement Benefits	$ 71,607
Termination Benefits	16,025
Disability Benefits	2,464
Death Benefits	2,354
Return of Contributions	8,060
Medical and Prescription Drug Benefits	67,532
Medicare Part D Subsidy	(7,350)
Rehire Assumption (Pension)	18,866
Rehire Assumption (Medical)	10,285
Administrative Expenses (Pension)	7,625
Administrative Expenses (Medical)	5,531
Total	**$ 202,999**
Total Pension	**$ 127,001**
Total Medical, Net of Part D Subsidy	**$ 75,998**
Total Medical, Gross of Part D Subsidy	**$ 83,348**
By Tier	
Tier 1	
- Pension	$ 9,039
- Medical, Net of Part D Subsidy	8,215
Tier 2	
- Pension	27,507
- Medical, Net of Part D Subsidy	17,271
Tier 3	
- Pension	90,455
- Medical, Net of Part D Subsidy	50,512
Total	**$ 202,999**

Section 1.2: Actuarial Contributions as of June 30, 2021 ($'s in 000's)

Peace Officer / Firefighter

Normal Cost Rate	Pension	Healthcare	Total
1. Total Normal Cost	$ 26,899	$ 10,618	$ 37,517
2. DB Rate Payroll Projected for FY22	147,739	147,739	147,739
3. DCR Rate Payroll Projected for FY22	220,974	220,974	220,974
4. Total Rate Payroll Projected for FY22	368,713	368,713	368,713
5. Normal Cost Rate			
a. Based on DB Rate Payroll, (1) ÷ (2)	18.21%	7.19%	25.39%
b. Based on Total Rate Payroll, (1) ÷ (4)	7.30%	2.88%	10.18%
6. Average Member Contribution Rate	3.01%	0.00%	3.01%
7. Employer Normal Cost, (5)(b) - (6)	4.29%	2.88%	7.17%

Past Service Rate	Pension	Healthcare	Total
1. Actuarial Accrued Liability	$ 2,548,923	$ 877,150	$ 3,426,073
2. Valuation Assets[1]	1,730,148	1,097,837	2,827,985
3. Unfunded Actuarial Accrued Liability, (1) - (2)	$ 818,775	$ (220,687)	$ 598,088
4. Funded Ratio, (2) ÷ (1)	67.9%	125.2%	82.5%
5. Past Service Cost Amortization Payment	63,731	(14,845)	48,886
6. Total Rate Payroll Projected for FY22	368,713	368,713	368,713
7. Past Service Rate, (5) ÷ (6)	17.28%	(4.03%)	17.28%
Total Employer / State Contribution Rate, not less than Normal Cost Rate	**21.57%**	**2.88%**	**24.45%**
Normal Cost Rate by Tier (Total Employer and Member)[2]			
Tier 1	20.67%	13.60%	34.27%
Tier 2	17.94%	6.64%	24.58%
Tier 3	18.22%	7.20%	25.42%

[1] Allocated between Peace Officer / Firefighter and Others in proportion to Actuarial Accrued Liability.

[2] Rates determined considering the payroll for members in each tier. DCR payroll is excluded from these calculations.

Peace Officer / Firefighter

Schedule of Past Service Cost Amortizations - Pension ($'s in 000's)

	Amortization Period		Balances		
Layer	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	18	$ 731,232	$ 719,620	$ 56,655
Change in Assumptions	6/30/2018	22	88,162	88,911	6,175
FY19 Loss	6/30/2019	23	61,980	62,436	4,225
FY20 Loss	6/30/2020	24	31,158	31,297	2,067
FY21 Gain	6/30/2021	25	(83,489)	(83,489)	(5,391)
Total				**$ 818,775**	**$ 63,731**

Schedule of Past Service Cost Amortizations - Healthcare ($'s in 000's)

	Amortization Period		Balances		
Layer	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	18	$ (30,991)	$ (30,499)	$ (2,401)
Change in Assumptions/Methods/EGWP	6/30/2018	22	27,556	27,790	1,930
FY19 Gain	6/30/2019	23	(77,575)	(78,145)	(5,288)
FY20 Gain	6/30/2020	24	(38,036)	(38,206)	(2,524)
Medical and Prescription Drug Plan Chang	6/30/2021	25	(7,361)	(7,361)	(475)
FY21 Gain	6/30/2021	25	(94,266)	(94,266)	(6,087)
Total				**$ (220,687)**	**$ (14,845)**

Schedule of Past Service Cost Amortizations - Total ($'s in 000's)

	Amortization Period		Balances		
Layer	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	18	$ 700,241	$ 689,121	$ 54,254
Change in Assumptions/Methods/EGWP	6/30/2018	22	115,718	116,701	8,105
FY19 Gain	6/30/2019	23	(15,595)	(15,709)	(1,063)
FY20 Gain	6/30/2020	24	(6,878)	(6,909)	(457)
Medical and Prescription Drug Plan Chang	6/30/2021	25	(7,361)	(7,361)	(475)
FY21 Gain	6/30/2021	25	(177,755)	(177,755)	(11,478)
Total				**$ 598,088**	**$ 48,886**

Section 1.2: Actuarial Contributions as of June 30, 2021 ($'s in 000's)

Others

Normal Cost Rate	Pension	Healthcare	Total
1. Total Normal Cost	$ 100,102	$ 65,380	$ 165,482
2. DB Rate Payroll Projected for FY22	710,902	710,902	710,902
3. DCR Rate Payroll Projected for FY22	1,327,142	1,327,142	1,327,142
4. Total Rate Payroll Projected for FY22	2,038,044	2,038,044	2,038,044
5. Normal Cost Rate			
a. Based on DB Rate Payroll, (1) ÷ (2)	14.08%	9.20%	23.28%
b. Based on Total Rate Payroll, (1) ÷ (4)	4.91%	3.21%	8.12%
6. Average Member Contribution Rate	2.38%	0.00%	2.38%
7. Employer Normal Cost, (5)(b) - (6)	2.53%	3.21%	5.74%

Past Service Rate	Pension	Healthcare	Total
1. Actuarial Accrued Liability	$ 12,871,052	$ 5,979,020	$ 18,850,072
2. Valuation Assets[1]	8,736,561	7,483,318	16,219,879
3. Unfunded Actuarial Accrued Liability, (1) - (2)	$ 4,134,491	$ (1,504,298)	$ 2,630,193
4. Funded Ratio, (2) ÷ (1)	67.9%	125.2%	86.0%
5. Past Service Cost Amortization Payment	324,336	(99,791)	224,545
6. Total Rate Payroll Projected for FY22	2,038,044	2,038,044	2,038,044
7. Past Service Rate, (5) ÷ (6)	15.91%	(4.90%)	15.91%
Total Employer / State Contribution Rate, not less than Normal Cost Rate	**18.44%**	**3.21%**	**21.65%**
Normal Cost Rate by Tier (Total Employer and Member)[2]			
Tier 1	18.20%	16.71%	34.91%
Tier 2	13.31%	8.87%	22.18%
Tier 3	13.96%	8.57%	22.53%

[1] Allocated between Peace Officer / Firefighter and Others in proportion to Actuarial Accrued Liability.

[2] Rates determined considering the payroll for members in each tier. DCR payroll is excluded from these calculations.

Others

Schedule of Past Service Cost Amortizations - Pension ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	18	$ 3,889,167	$ 3,827,409	$ 301,329
Change in Assumptions	6/30/2018	22	467,280	471,245	32,732
FY19 Loss	6/30/2019	23	235,559	237,288	16,059
FY20 Loss	6/30/2020	24	93,343	93,760	6,193
FY21 Gain	6/30/2021	25	(495,211)	(495,211)	(31,977)
Total				**$ 4,134,491**	**$ 324,336**

Schedule of Past Service Cost Amortizations - Healthcare ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	18	$ (47,263)	$ (46,513)	$ (3,662)
Change in Assumptions/Methods/EGWP	6/30/2018	22	22,293	22,482	1,562
FY19 Gain	6/30/2019	23	(553,265)	(557,331)	(37,718)
FY20 Gain	6/30/2020	24	(253,711)	(254,843)	(16,833)
Medical and Prescription Drug Plan Chang	6/30/2021	25	(54,446)	(54,446)	(3,516)
FY21 Gain	6/30/2021	25	(613,647)	(613,647)	(39,624)
Total				**$ (1,504,298)**	**$ (99,791)**

Schedule of Past Service Cost Amortizations - Total ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	18	$ 3,841,904	$ 3,780,896	$ 297,667
Change in Assumptions/Methods/EGWP	6/30/2018	22	489,573	493,727	34,294
FY19 Gain	6/30/2019	23	(317,706)	(320,043)	(21,659)
FY20 Gain	6/30/2020	24	(160,368)	(161,083)	(10,640)
Medical and Prescription Drug Plan Chang	6/30/2021	25	(54,446)	(54,446)	(3,516)
FY21 Gain	6/30/2021	25	(1,108,858)	(1,108,858)	(71,601)
Total				**$ 2,630,193**	**$ 224,545**

Section 1.2: Actuarial Contributions as of June 30, 2021 ($'s in 000's)

All Members

Normal Cost Rate	Pension	Healthcare	Total
1. Total Normal Cost	$ 127,001	$ 75,998	$ 202,999
2. DB Rate Payroll Projected for FY22	858,641	858,641	858,641
3. DCR Rate Payroll Projected for FY22	1,548,116	1,548,116	1,548,116
4. Total Rate Payroll Projected for FY22	2,406,757	2,406,757	2,406,757
5. Normal Cost Rate			
a. Based on DB Rate Payroll, (1) ÷ (2)	14.79%	8.85%	23.64%
b. Based on Total Rate Payroll, (1) ÷ (4)	5.28%	3.16%	8.44%
6. Average Member Contribution Rate[1]	2.47%	0.00%	2.47%
7. Employer Normal Cost, (5)(b) - (6)	2.81%	3.16%	5.97%

Past Service Rate	Pension	Healthcare	Total
1. Actuarial Accrued Liability	$ 15,419,975	$ 6,856,170	$ 22,276,145
2. Valuation Assets	10,466,709	8,581,155	19,047,864
3. Unfunded Actuarial Accrued Liability, (1) - (2)	$ 4,953,266	$ (1,724,985)	$ 3,228,281
4. Funded Ratio, (2) ÷ (1)	67.9%	125.2%	85.5%
5. Past Service Cost Amortization Payment	388,067	(114,636)	273,431
6. Total Rate Payroll Projected for FY22	2,406,757	2,406,757	2,406,757
7. Past Service Rate, (5) ÷ (6)	16.12%	(4.76%)	16.12%
Total Employer / State Contribution Rate, not less than Normal Cost Rate	**18.93%**	**3.16%**	**22.09%**
Normal Cost Rate by Tier (Total Employer and Member)[2]			
Tier 1	18.28%	16.61%	34.89%
Tier 2	13.78%	8.65%	22.43%
Tier 3	14.84%	8.29%	23.13%

[1] 7.5% for Peace Officer / Firefighter and 6.82% weighted average for Others

[2] Rates determined considering the payroll for members in each tier. DCR payroll is excluded from these calculations.

All Members

Schedule of Past Service Cost Amortizations - Pension ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	18	$ 4,620,399	$ 4,547,029	$ 357,984
Change in Assumptions	6/30/2018	22	555,442	560,156	38,907
FY19 Loss	6/30/2019	23	297,539	299,724	20,284
FY20 Loss	6/30/2020	24	124,501	125,057	8,260
FY21 Gain	6/30/2021	25	(578,700)	(578,700)	(37,368)
Total				**$ 4,953,266**	**$ 388,067**

Schedule of Past Service Cost Amortizations - Healthcare ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	18	$ (78,254)	$ (77,012)	$ (6,063)
Change in Assumptions/Methods/EGWP	6/30/2018	22	49,849	50,272	3,492
FY19 Gain	6/30/2019	23	(630,840)	(635,476)	(43,006)
FY20 Gain	6/30/2020	24	(291,747)	(293,049)	(19,357)
Medical and Prescription Drug Plan Chang	6/30/2021	25	(61,807)	(61,807)	(3,991)
FY21 Gain	6/30/2021	25	(707,913)	(707,913)	(45,711)
Total				**$ (1,724,985)**	**$ (114,636)**

Schedule of Past Service Cost Amortizations - Total ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	18	$ 4,542,145	$ 4,470,017	$ 351,921
Change in Assumptions/Methods/EGWP	6/30/2018	22	605,291	610,428	42,399
FY19 Gain	6/30/2019	23	(333,301)	(335,752)	(22,722)
FY20 Gain	6/30/2020	24	(167,246)	(167,992)	(11,097)
Medical and Prescription Drug Plan Chang	6/30/2021	25	(61,807)	(61,807)	(3,991)
FY21 Gain	6/30/2021	25	(1,286,613)	(1,286,613)	(83,079)
Total				**$ 3,228,281**	**$ 273,431**

Section 1.3: Roll-Forward Contribution Rate Calculation for FY24 ($'s in 000's)

	Pension	Healthcare	Total
1. Liability Roll Forward			
a. Actuarial Accrued Liability as of June 30, 2021	**$ 15,419,975**	**$ 6,856,170**	**$ 22,276,145**
b. Normal Cost	119,376	70,467	189,843
c. Interest on (a) and (b) at 7.38%	1,146,804	511,186	1,657,990
d. Estimated Benefit Payments	(974,479)	(410,194)	(1,384,673)
e. Interest on (d) at 7.38%, adjusted for timing	(38,319)	(14,867)	(53,186)
f. Expected Actuarial Accrued Liability as of June 30, 2022	**$ 15,673,357**	**$ 7,012,762**	**$ 22,686,119**
g. Projected Normal Cost	106,811	63,186	169,997
h. Interest on (f) and (g) at 7.38%	1,164,576	522,205	1,686,781
i. Estimated Benefit Payments	(1,023,259)	(429,353)	(1,452,612)
j. Interest on (i) at 7.38%, adjusted for timing	(40,237)	(15,561)	(55,798)
k. Expected Actuarial Accrued Liability as of June 30, 2023	**$ 15,881,248**	**$ 7,153,239**	**$ 23,034,487**
2. Asset Roll Forward			
a. Actuarial Value of Assets as of June 30, 2021	**$ 10,466,709**	**$ 8,581,155**	**$ 19,047,864**
b. Interest on (a) at 7.38%	772,443	633,289	1,405,732
c. Employee Contributions	65,405	0	65,405
d. Employer Contributions	404,768	75,091	479,859
e. State Assistance Contributions	97,700	0	97,700
f. Interest on (c) thru (e) at 7.38%, adjusted for timing*	24,251	2,722	26,973
g. Estimated Benefit Payments	(974,479)	(410,194)	(1,384,673)
h. Administrative Expenses	(7,625)	(5,531)	(13,156)
i. Interest on (g) and (h) at 7.38%, adjusted for timing	(38,595)	(15,067)	(53,662)
j. AVA Adjustments	441,594	371,829	813,423
k. Expected Actuarial Value of Assets as of June 30, 2022	**$ 11,252,171**	**$ 9,233,294**	**$ 20,485,465**
l. Interest on (k) at 7.38%	830,410	681,417	1,511,827
m. Employee Contributions	60,574	0	60,574
n. Employer Contributions	410,773	0	410,773
o. State Assistance Contributions**	33,933	0	33,933
p. Interest on (m) thru (o) at 7.38%, adjusted for timing*	19,587	0	19,587
q. Estimated Benefit Payments	(1,023,259)	(429,353)	(1,452,612)
r. Administrative Expenses	(6,877)	(4,996)	(11,873)
s. Interest on (q) and (r) at 7.38%, adjusted for timing	(40,486)	(15,742)	(56,228)
t. AVA Adjustments	413,313	344,736	758,049
u. Expected Actuarial Value of Assets as of June 30, 2023	**$ 11,950,139**	**$ 9,809,356**	**$ 21,759,495**
3. Expected Unfunded Actuarial Accrued Liability as of June 30, 2023, 1(k) - 2(u)	**$ 3,931,109**	**$ (2,656,117)**	**$ 1,274,992**

* Employee and Employer Contributions are paid throughout the year. State Assistance Contributions are assumed to be paid on July 1, 2021 for FY22, and July 1, 2022 for FY23.

** The FY23 State Assistance Contribution is expected to be contributed 100% to pension.

	Pension	Healthcare	Total
4. Expected Annual Rate Payroll for FY24			
a. Defined Benefit Members			$ 711,617
b. Defined Contribution Retirement Members			1,726,002
c. Total Rate Payroll			**$ 2,437,619**
5. Expected FY24 Contribution Rate Calculation			
a. Projected Normal Cost for FY24	$ 101,319	$ 60,964	$ 162,283
b. Projected Normal Cost Rate for FY24	4.16%	2.50%	6.66%
c. Expected Member Contribution Rate for FY24	(2.02%)	0.00%	(2.02%)
d. Expected Employer Normal Cost Rate for FY24	**2.14%**	**2.50%**	**4.64%**
e. Expected Unfunded Liability as of June 30, 2023	$ 3,931,109	$ (2,656,117)	$ 1,274,992
f. FY24 Layered Amortization of Expected Unfunded Liability	350,577	(181,538)	169,039
g. Expected Past Service Cost Contribution Rate for FY24	**14.38%**	**(7.45%)**	**14.38%**
h. Expected Total Contribution Rate for FY24, not less than Normal Cost Rate	**16.52%**	**2.50%**	**19.02%**

The components of the expected FY24 amortization amounts are shown below (totals may not add due to rounding):

Expected FY24 Schedule of Past Service Cost Amortizations - Pension ($'s in 000's)

	Amortization Period		Balances		
Layer	Date Created	Years Remaining at 6/30/23	Initial	Outstanding at 6/30/23	Beginning-of-Year Payment for FY24
Initial Amount	6/30/2018	16	$ 4,620,399	$ 4,435,190	$ 377,944
Change in Assumptions	6/30/2018	20	555,442	558,096	41,076
FY19 Loss	6/30/2019	21	297,539	299,829	21,415
FY20 Loss	6/30/2020	22	124,501	125,558	8,721
FY21 Gain	6/30/2021	23	(578,700)	(582,952)	(39,451)
Expected FY22 Gain	6/30/2022	24	(480,925)	(483,071)	(31,908)
Expected FY23 Gain	6/30/2023	25	(421,541)	(421,541)	(27,220)
Total				**$ 3,931,109**	**$ 350,577**

Expected FY24 Schedule of Past Service Cost Amortizations - Healthcare ($'s in 000's)

	Amortization Period		Balances		
Layer	Date Created	Years Remaining at 6/30/23	Initial	Outstanding at 6/30/23	Beginning-of-Year Payment for FY24
Initial Amount	6/30/2018	16	$ (78,254)	$ (75,118)	$ (6,401)
Change in Assumptions/Methods/EGWP	6/30/2018	20	49,849	50,086	3,686
FY19 Gain	6/30/2019	21	(630,840)	(635,696)	(45,403)
FY20 Gain	6/30/2020	22	(291,747)	(294,222)	(20,436)
Medical and Prescription Drug Plan Chang	6/30/2021	23	(61,807)	(62,261)	(4,213)
FY21 Gain	6/30/2021	23	(707,913)	(713,116)	(48,260)
Expected FY22 Gain	6/30/2022	24	(491,339)	(493,531)	(32,599)
Expected FY23 Gain	6/30/2023	25	(432,259)	(432,259)	(27,912)
Total				**$ (2,656,117)**	**$ (181,538)**

The components of the expected FY24 amortization amounts are shown below (totals may not add due to rounding):

Expected FY24 Schedule of Past Service Cost Amortizations - Total ($'s in 000's)

	Amortization Period		Balances		
Layer	Date Created	Years Remaining at 6/30/23	Initial	Outstanding at 6/30/23	Beginning-of-Year Payment for FY24
Initial Amount	6/30/2018	16	$ 4,542,145	$ 4,360,072	$ 371,543
Change in Assumptions/Methods/EGWP	6/30/2018	20	605,291	608,182	44,762
FY19 Gain	6/30/2019	21	(333,301)	(335,867)	(23,988)
FY20 Gain	6/30/2020	22	(167,246)	(168,664)	(11,715)
Medical and Prescription Drug Plan Chang	6/30/2021	23	(61,807)	(62,261)	(4,213)
FY21 Gain	6/30/2021	23	(1,286,613)	(1,296,068)	(87,711)
Expected FY22 Gain	6/30/2022	24	(972,264)	(976,602)	(64,507)
Expected FY23 Gain	6/30/2023	25	(853,800)	(853,800)	(55,132)
Total				**$ 1,274,992**	**$ 169,039**

Section 1.4: Actuarial Gain/(Loss) for FY21 ($'s in 000's)

	Pension	Healthcare	Total
1. Expected Actuarial Accrued Liability			
a. Actuarial Accrued Liability as of June 30, 2020	$ 15,279,525	$ 7,036,550	$ 22,316,075
b. Normal Cost	130,592	79,891	210,483
c. Interest on (a) and (b) at 7.38%	1,137,267	525,193	1,662,460
d. Employer Group Waiver Plan	0	52,545	52,545
e. Benefit Payments	(921,899)	(440,234)	(1,362,133)
f. Refund of Contributions	(8,107)	0	(8,107)
g. Interest on (d) thru (f) at 7.38%, adjusted for timing	(36,570)	(14,051)	(50,621)
h. Assumptions/Methods Changes	0	0	0
i. Expected Actuarial Accrued Liability as of June 30, 2021 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	$ 15,580,808	$ 7,239,894	$ 22,820,702
2. Actual Actuarial Accrued Liability as of June 30, 2021	15,419,975	6,856,170	22,276,145
3. Liability Gain/(Loss), (1)(i) - (2)	**$ 160,833**	**$ 383,724**	**$ 544,557**
4. Expected Actuarial Asset Value			
a. Actuarial Value of Assets as of June 30, 2020	$ 9,713,710	$ 7,989,358	$ 17,703,068
b. Interest on (a) at 7.38%	716,872	589,615	1,306,487
c. Employee Contributions	70,614	0	70,614
d. Employer Contributions	312,538	68,191	380,729
e. State Assistance Contributions	203,585	0	203,585
f. Employer Group Waiver Plan	0	52,545	52,545
g. Interest on (c) thru (f) at 7.38%, adjusted for timing	28,911	4,376	33,287
h. Benefit Payments	(921,899)	(440,234)	(1,362,133)
i. Refund of Contributions	(8,107)	0	(8,107)
j. Administrative Expenses	(8,232)	(4,859)	(13,091)
k. Interest on (h) thru (j) at 7.38%, adjusted for timing	(36,868)	(16,132)	(53,000)
l. Expected Actuarial Asset Value as of June 30, 2021 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h) + (i) + (j) + (k)	$ 10,071,124	$ 8,242,860	$ 18,313,984
5. Actual Actuarial Asset Value as of June 30, 2021	10,466,709	8,581,155	19,047,864
6. Actuarial Asset Value Gain/(Loss), (5) - (4)(l)	**$ 395,585**	**$ 338,295**	**$ 733,880**
7. Total Actuarial Gain/(Loss), (3) + (6)	**$ 556,418**	**$ 722,019**	**$ 1,278,437**
8. Contribution Gain/(Loss)	**$ 23,056**	**$ 47,438**	**$ 70,494**
9. Administrative Expense Gain/(Loss)	**$ (774)**	**$ 263**	**$ (511)**
10. FY21 Gain/(Loss), (7) + (8) + (9)	**$ 578,700**	**$ 769,720**	**$ 1,348,420**

Section 1.5: Development of Change in Unfunded Liability During FY21 ($'s in 000's)

	Pension	Healthcare	Total
1. 2020 Unfunded Liability	$ 5,565,815	$ (952,808)	$ 4,613,007
a. Interest on Unfunded Liability at 7.38%	$ 410,757	$ (70,317)	$ 340,440
b. Normal Cost	130,592	79,891	210,483
c. Employee Contributions	(70,614)	0	(70,614)
d. Employer Contributions	(312,538)	(68,191)	(380,729)
e. State Assistance Contributions	(203,585)	0	(203,585)
f. Administrative Expenses	8,232	4,859	13,091
g. Interest on (b) thru (f) at 7.38%, adjusted for timing	(18,975)	3,600	(15,375)
h. Assumptions/Methods Changes	0	0	0
i. Expected Change in Unfunded Liability During FY21 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	$ (56,131)	$ (50,158)	$ (106,289)
2. Expected 2021 Unfunded Liability, (1) + (1)(i)	$ 5,509,684	$ (1,002,966)	$ 4,506,718
a. Liability (Gain)/Loss During FY21	$ (160,833)	$ (383,724)	$ (544,557)
b. Actuarial Assets (Gain)/Loss During FY21	(395,585)	(338,295)	(733,880)
c. Total Actuarial (Gain)/Loss During FY21	$ (556,418)	$ (722,019)	$ (1,278,437)
3. Actual 2021 Unfunded Liability, (2) + (2)(c)	$ 4,953,266	$ (1,724,985)	$ 3,228,281

Section 1.6: Analysis of Financial Experience

Pension
Change in Employer / State Contribution Rate as of Valuation Date
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

	Change in Employer / State Contribution Rate During Fiscal Year				
	Pension				
Type of (Gain) or Loss	**2017**	**2018**	**2019**	**2020**	**2021**
1. Health Claims	N/A	N/A	N/A	N/A	N/A
2. Salary Experience	(0.36%)	(0.30%)	0.16%	(0.03%)	0.05%
3. Investment Experience	0.64%	0.52%	0.50%	0.44%	(1.06%)
4. Demographic Experience and Miscellaneous	(0.19%)	0.26%	(0.45%)	(0.19%)	(0.54%)
5. Actual vs Expected Contributions	0.15%	0.14%	0.11%	0.15%	(0.06%)
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	0.24%	0.62%	0.32%	0.37%	(1.61%)
7. Assumptions / Method Changes	0.00%	1.65%	0.00%	0.00%	0.00%
8. Plan Changes	0.00%	0.00%	0.00%	0.00%	0.00%
9. Composite (Gain) or Loss During Year, (6) + (7) + (8)	0.24%	2.27%	0.32%	0.37%	(1.61%)
10. Beginning Total Employer / State Contribution Rate	17.34%	17.58%	19.85%	20.17%	20.54%
11. Ending Valuation Year Employer / State Contribution Rate, (9) + (10)	17.58%	19.85%	20.17%	20.54%	18.93%
12. Fiscal Year Rates Adopted by ARMB					
a. Fiscal Year Employer / State Contribution Rate	18.29%	20.66%	20.89%	18.38%	16.52% *
b. Fiscal Year for which Rate Applies	FY20	FY21	FY22	FY23	FY24

* Expected rate. Actual rate to be determined

Healthcare
Change in Employer / State Contribution Rate as of Valuation Date
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

	Change in Employer / State Contribution Rate During Fiscal Year				
	Healthcare				
Type of (Gain) or Loss	**2017**	**2018**	**2019**	**2020**	**2021**
1. Health Claims	(2.46%)	(1.51%)	(2.39%)	(0.87%)	(0.12%)
2. Salary Experience	N/A	N/A	N/A	N/A	N/A
3. Investment Experience	0.51%	0.40%	0.38%	0.31%	0.00%
4. Demographic Experience and Miscellaneous	(0.48%)	(1.08%)	1.16%	0.38%	(0.26%)
5. Actual vs Expected Contributions	(0.12%)	0.06%	0.02%	(0.16%)	0.00%
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	(2.55%)	(2.13%)	(0.83%)	(0.34%)	(0.38%)
7. Assumptions / Method Changes	2.89%	2.20%	0.00%	0.00%	0.00%
8. Plan Changes	0.00%	0.00%	0.00%	0.00%	(0.03%)
9. Composite (Gain) or Loss During Year, (6) + (7) + (8)	0.34%	0.07%	(0.83%)	(0.34%)	(0.41%)
10. Beginning Total Employer / State Contribution Rate	4.33%	4.67%	4.74%	3.91%	3.57%
11. Ending Valuation Year Employer / State Contribution Rate, (9) + (10)	4.67%	4.74%	3.91%	3.57%	3.16%
12. Fiscal Year Rates Adopted by ARMB					
a. Fiscal Year Employer / State Contribution Rate	4.89%	4.27%	3.12%	0.00%	2.50% *
b. Fiscal Year for which Rate Applies	FY20	FY21	FY22	FY23	FY24

* Expected rate. Actual rate to be determined

Total
Change in Employer / State Contribution Rate as of Valuation Date
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

	Change in Employer / State Contribution Rate During Fiscal Year				
	Total				
Type of (Gain) or Loss	**2017**	**2018**	**2019**	**2020**	**2021**
1. Health Claims	(2.46%)	(1.51%)	(2.39%)	(0.87%)	(0.12%)
2. Salary Experience	(0.36%)	(0.30%)	0.16%	(0.03%)	0.05%
3. Investment Experience	1.15%	0.92%	0.88%	0.75%	(1.06%)
4. Demographic Experience and Miscellaneous	(0.67%)	(0.82%)	0.71%	0.19%	(0.80%)
5. Actual vs Expected Contributions	0.03%	0.20%	0.13%	(0.01%)	(0.06%)
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	(2.31%)	(1.51%)	(0.51%)	0.03%	(1.99%)
7. Assumptions / Method Changes	2.89%	3.85%	0.00%	0.00%	0.00%
8. Plan Changes	0.00%	0.00%	0.00%	0.00%	(0.03%)
9. Composite (Gain) or Loss During Year, (6) + (7) + (8)	0.58%	2.34%	(0.51%)	0.03%	(2.02%)
10. Beginning Total Employer / State Contribution Rate	21.67%	22.25%	24.59%	24.08%	24.11%
11. Ending Valuation Year Employer / State Contribution Rate, (9) + (10)	22.25%	24.59%	24.08%	24.11%	22.09%
12. Fiscal Year Rates Adopted by ARMB					
a. Fiscal Year Employer / State Contribution Rate	23.18%	24.93%	24.01%	18.38%	19.02% *
b. Fiscal Year for which Rate Applies	FY20	FY21	FY22	FY23	FY24

* Expected rate. Actual rate to be determined

Section 1.7: History of Unfunded Liability and Funded Ratio ($'s in 000's)

Valuation Date	Total Actuarial Accrued Liability	Valuation Assets	Assets as a Percent of Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability (UAAL)
June 30, 2003	$ 10,561,653	$ 7,687,281	72.8%	$ 2,874,372
June 30, 2004	11,443,916	8,030,414	70.2%	3,413,502
June 30, 2005	12,844,841	8,442,919	65.7%	4,401,922
June 30, 2006	14,388,413	9,040,908	62.8%	5,347,505
June 30, 2007	14,570,933	9,900,960	68.0%	4,669,973
June 30, 2008	15,888,141	11,040,106	69.5%	4,848,035
June 30, 2009	16,579,371	10,242,978	61.8%	6,336,393
June 30, 2010	18,132,492	11,157,464	61.5%	6,975,028
June 30, 2011	18,740,550	11,813,774	63.0%	6,926,776
June 30, 2012	19,292,361	11,832,030	61.3%	7,460,331
June 30, 2013	19,992,759	12,162,626	60.8%	7,830,133
June 30, 2014	20,897,372	14,644,598	70.1%	6,252,774
June 30, 2015	20,648,663	16,173,459	78.3%	4,475,204
June 30, 2016	21,369,490	16,467,992	77.1%	4,901,498
June 30, 2017	21,881,395	16,786,771	76.7%	5,094,624
June 30, 2018	22,264,137	17,116,701	76.9%	5,147,436
June 30, 2019	22,190,874	17,387,184	78.4%	4,803,690
June 30, 2020	22,316,075	17,703,068	79.3%	4,613,007
June 30, 2021	22,276,145	19,047,864	85.5%	3,228,281

Section 2: Plan Assets

Section 2.1: Summary of Fair Value of Assets ($'s in 000's)

As of June 30, 2021	Pension	Healthcare	Total	Allocation Percent
Cash and Short-Term Investments				
- Cash and Cash Equivalents	$ 136,182	$ 99,250	$ 235,432	1.2%
- Subtotal	$ 136,182	$ 99,250	$ 235,432	1.2%
Fixed Income Investments				
- Domestic Fixed Income Pool	$ 2,413,353	$ 1,994,752	$ 4,408,105	20.2%
- International Fixed Income Pool	0	0	0	0.0%
- Tactical Fixed Income Pool	0	0	0	0.0%
- High Yield Pool	0	0	0	0.0%
- Treasury Inflation Protection Pool	0	0	0	0.0%
- Emerging Debt Pool	0	0	0	0.0%
- Subtotal	$ 2,413,353	$ 1,994,752	$ 4,408,105	20.2%
Equity Investments				
- Domestic Equity Pool	$ 3,265,330	$ 2,698,953	$ 5,964,283	27.4%
- International Equity Pool	1,799,583	1,487,442	3,287,025	15.1%
- Private Equity Pool	1,770,792	1,463,644	3,234,436	14.9%
- Emerging Markets Equity Pool	382,294	315,985	698,279	3.2%
- Alternative Equity Strategies	695,474	574,842	1,270,316	5.8%
- Subtotal	$ 7,913,473	$ 6,540,866	$ 14,454,339	66.4%
Other Investments				
- Real Estate Pool	$ 732,171	$ 606,137	$ 1,338,308	6.1%
- Other Investments Pool	731,828	604,892	1,336,720	6.1%
- Absolute Return Pool	0	0	0	0.0%
- Other Assets	17	967	984	0.0%
- Subtotal	$ 1,464,016	$ 1,211,996	$ 2,676,012	12.2%
Total Cash and Investments	$ 11,927,024	$ 9,846,864	$ 21,773,888	100.0%
Net Accrued Receivables	(14,715)	(62,723)	(77,438)	
Net Assets	$ 11,912,309	$ 9,784,141	$ 21,696,450	

Section 2.2: Changes in Fair Value of Assets During FY21 ($'s in 000's)

Fiscal Year 2021	Pension	Healthcare	Total
1. Fair Value of Assets as of June 30, 2020	$ 9,469,161	$ 7,813,511	$ 17,282,672
2. Additions:			
a. Employee Contributions	$ 70,614	$ 0	$ 70,614
b. Employer Contributions	312,538	68,191	380,729
c. State Assistance Contributions	203,585	0	203,585
d. Interest and Dividend Income	132,757	109,764	242,521
e. Net Appreciation / Depreciation in Fair Value of Investments	2,688,309	2,206,395	4,894,704
f. Employer Group Waiver Plan	0	52,545	52,545
g. Other	537	596	1,133
h. Total Additions	$ 3,408,340	$ 2,437,491	$ 5,845,831
3. Deductions:			
a. Medical Benefits	$ 0	$ 440,234	$ 440,234
b. Retirement Benefits	921,899	0	921,899
c. Refund of Contributions	8,107	0	8,107
d. Investment Expenses	26,954	21,768	48,722
e. Administrative Expenses	8,232	4,859	13,091
f. Total Deductions	$ 965,192	$ 466,861	$ 1,432,053
4. Fair Value of Assets as of June 30, 2021	$ 11,912,309	$ 9,784,141	$ 21,696,450
5. Approximate Fair Value Investment Return Rate during FY21 Net of Investment Expenses	30.1%	30.0%	30.0%

Section 2.3: Development of Actuarial Value of Assets ($'s in 000's)

The actuarial value of asset was set equal to the fair value as of June 30, 2014 and the 20% corridor was eliminated. Investment gains and losses after June 30, 2014 are recognized 20% per year over 5 years.

	Pension	Healthcare	Total
1. Deferral of Investment Gain / (Loss) for FY21			
a. Fair Value of Assets as of June 30, 2020	$ 9,469,161	$ 7,813,511	$ 17,282,672
b. Contributions	586,737	68,191	654,928
c. Employer Group Waiver Plan	0	52,545	52,545
d. Benefit Payments	930,006	440,234	1,370,240
e. Administrative Expenses	8,232	4,859	13,091
f. Actual Investment Return (net of investment expenses)	2,794,649	2,294,987	5,089,636
g. Expected Return Rate (net of investment expenses)	7.38%	7.38%	7.38%
h. Expected Return, Weighted for Timing	690,867	564,881	1,255,748
i. Investment Gain / (Loss) for the Year, (f) - (h)	2,103,782	1,730,106	3,833,888
2. Actuarial Value as of June 30, 2021			
a. Fair Value as of June 30, 2021	$ 11,912,309	$ 9,784,141	$ 21,696,450
b. Deferred Investment Gain / (Loss)	1,445,600	1,202,986	2,648,586
c. Actuarial Value as of June 30, 2021, (a) - (b)	10,466,709	8,581,155	19,047,864
3. Ratio of Actuarial Value of Assets to Fair Value of Assets	87.9%	87.7%	87.8%
4. Approximate Actuarial Value Investment Return Rate during FY21 Net of Investment Expenses	11.6%	11.7%	11.6%

The tables below show the development of the gains/(losses) to be recognized in the current year ($'s in 000's):

Pension				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2017	$ 393,607	$ 314,884	$ 78,723	$ 0
June 30, 2018	17,834	10,701	3,567	3,566
June 30, 2019	(136,242)	(54,496)	(27,248)	(54,498)
June 30, 2020	(310,824)	(62,165)	(62,165)	(186,494)
June 30, 2021	2,103,782	0	420,756	1,683,026
Total	**$ 2,068,157**	**$ 208,924**	**$ 413,633**	**$ 1,445,600**

Healthcare				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2017	$ 341,151	$ 272,920	$ 68,231	$ 0
June 30, 2018	30,997	18,597	6,199	6,201
June 30, 2019	(101,128)	(40,452)	(20,226)	(40,450)
June 30, 2020	(244,753)	(48,952)	(48,951)	(146,850)
June 30, 2021	1,730,106	0	346,021	1,384,085
Total	**$ 1,756,373**	**$ 202,113**	**$ 351,274**	**$ 1,202,986**

Total				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2017	$ 734,758	$ 587,804	$ 146,954	$ 0
June 30, 2018	48,831	29,298	9,766	9,767
June 30, 2019	(237,370)	(94,948)	(47,474)	(94,948)
June 30, 2020	(555,577)	(111,117)	(111,116)	(333,344)
June 30, 2021	3,833,888	0	766,777	3,067,111
Total	**$ 3,824,530**	**$ 411,037**	**$ 764,907**	**$ 2,648,586**

Section 2.4: Historical Asset Rates of Return

	Actuarial Value		Fair Value	
Year Ending	Annual	Cumulative*	Annual	Cumulative*
June 30, 2005	8.7%	8.7%	8.5%	8.5%
June 30, 2006	9.3%	9.0%	11.4%	9.9%
June 30, 2007	11.6%	9.9%	18.5%	12.7%
June 30, 2008	10.0%	9.9%	(3.1%)	8.5%
June 30, 2009	(7.3%)	6.2%	(20.5%)	2.0%
June 30, 2010	7.2%	6.4%	10.2%	3.3%
June 30, 2011	7.2%	6.5%	20.4%	5.6%
June 30, 2012	1.2%	5.8%	0.2%	4.9%
June 30, 2013	4.0%	5.6%	12.1%	5.7%
June 30, 2014	21.9%	7.1%	18.1%	6.9%
June 30, 2015	7.0%	7.1%	2.9%	6.5%
June 30, 2016	5.0%	6.9%	(0.7%)	5.9%
June 30, 2017	5.4%	6.8%	12.8%	6.4%
June 30, 2018	6.1%	6.8%	8.2%	6.5%
June 30, 2019	5.5%	6.7%	6.0%	6.5%
June 30, 2020	5.8%	6.6%	4.1%	6.3%
June 30, 2021	11.6%	6.9%	30.0%	7.6%

* Cumulative since fiscal year ending June 30, 2005

Section 3: Projections

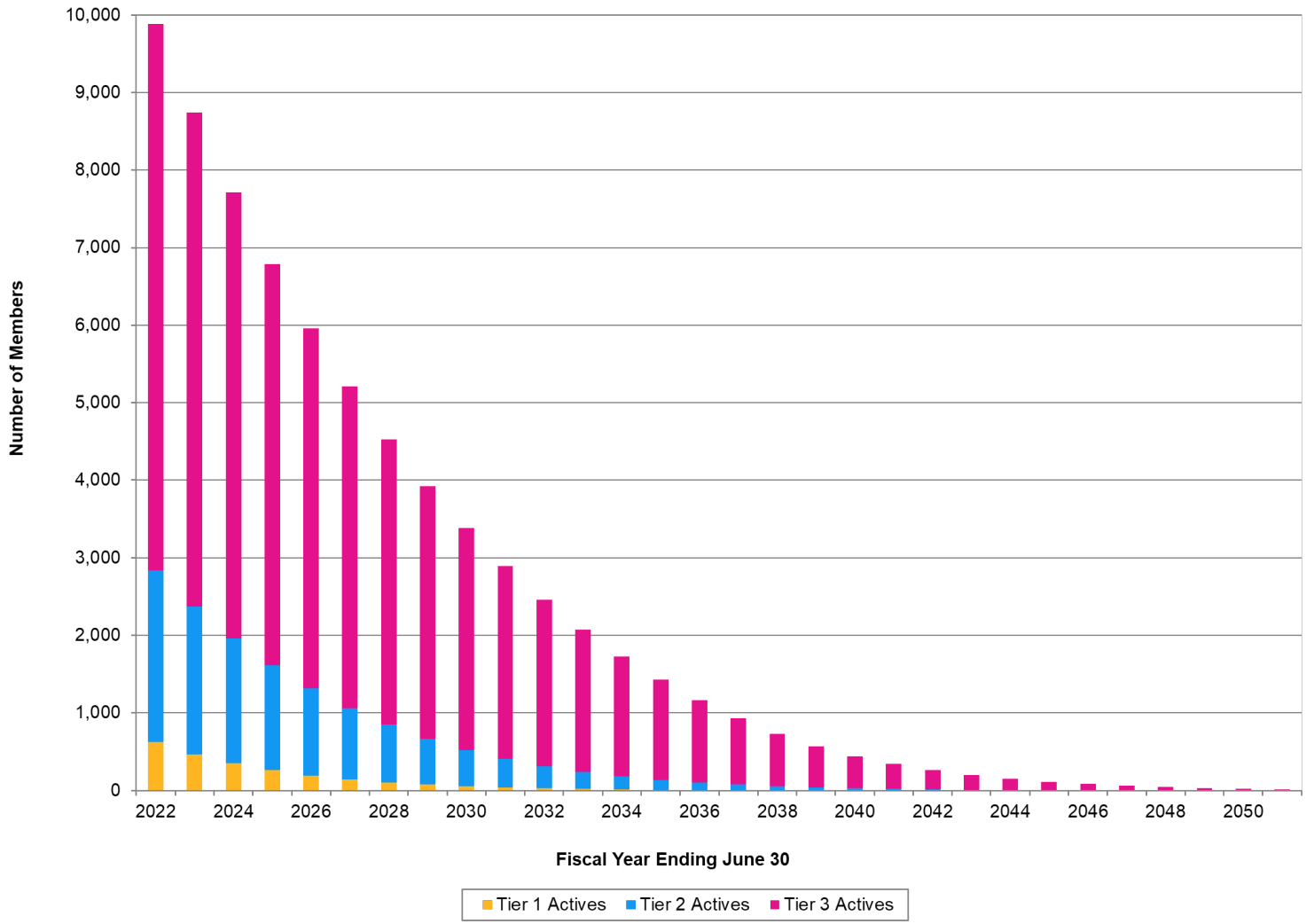
Section 3.1: Projection Assumptions and Methods

Key Assumptions

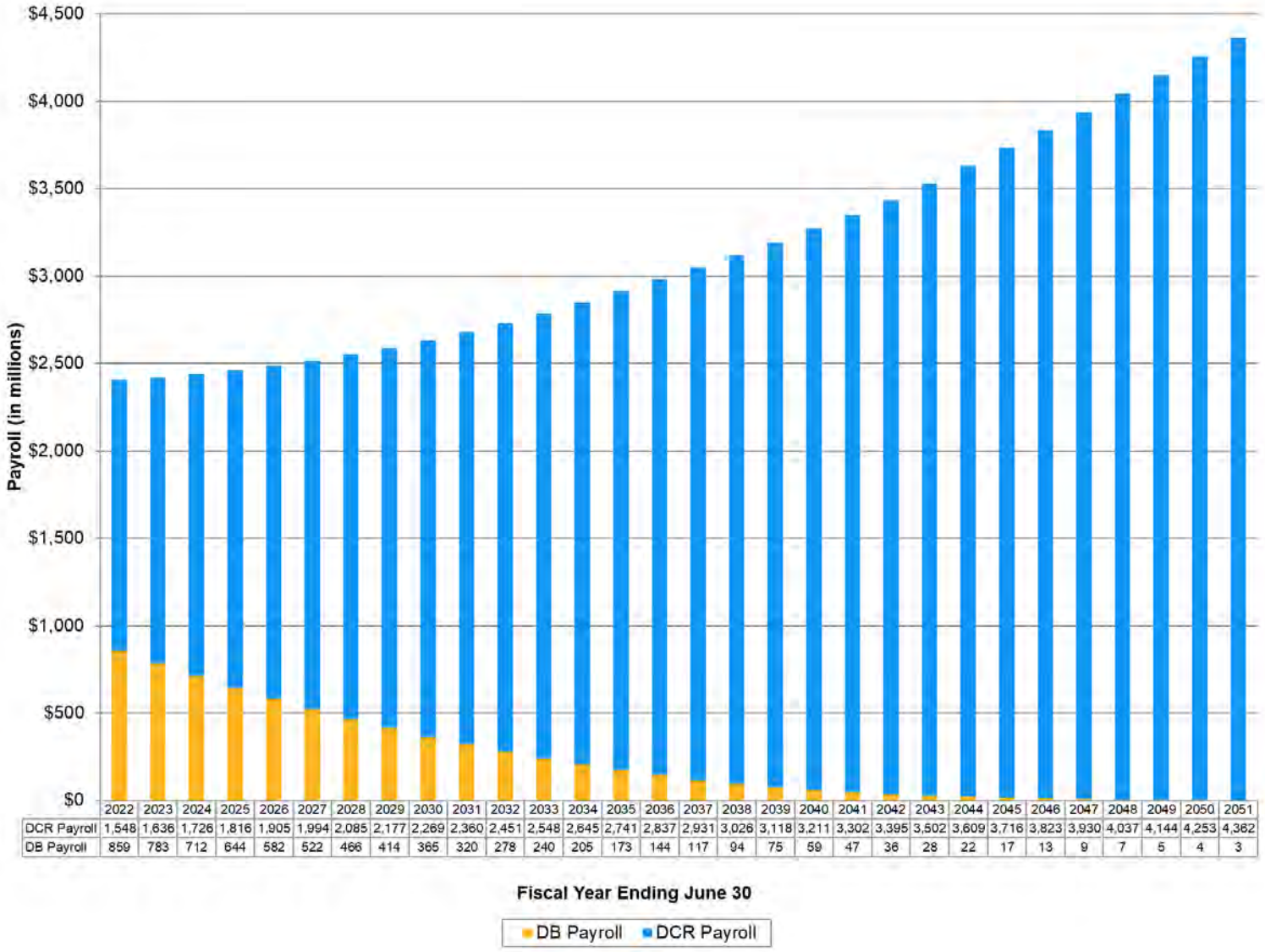
- 7.38% investment return (net of investment expenses) on the Fair Value of Assets in all future years.
- The Actuarial Value of Assets was re-initialized to Fair Value as of June 30, 2014. The Actuarial Value of Assets after June 30, 2014 reflects the deferred gains and losses generated by the smoothing method. The current deferred amount is recognized in the first four years of the projections.
- Actuarial assumptions and methods as described in Section 5. No actuarial gains/losses are assumed after June 30, 2021.
- The actuarially calculated contribution rate using a two-year roll-forward approach is adopted each year.
- Projections assume a 0% increase in the total active member population. All new members are expected to enter the DCR plan.
- Contribution rates are determined as a percent of total DB and DCR payroll.
- The DCR contribution rate determined as of June 30, 2021 is assumed to remain constant in all future years.
- The active rehire assumption shown in Section 5 is assumed to grade to zero on a uniform basis over 20 years.
- The Normal Cost is increased by the administrative expenses shown in Section 5. For future years, the percent increase is assumed to remain constant.
- The % of total DB/DCR payroll represented by the State's employees based on the June 30, 2021 data was assumed to remain constant in all future years.
- In Section 3.6B, we assumed all remaining pension unfunded liability layered amortization amounts would be zero after the pension trust is projected to reach a funded status of 100%.

Section 3.2: Membership Projection

Projected Active Member Count

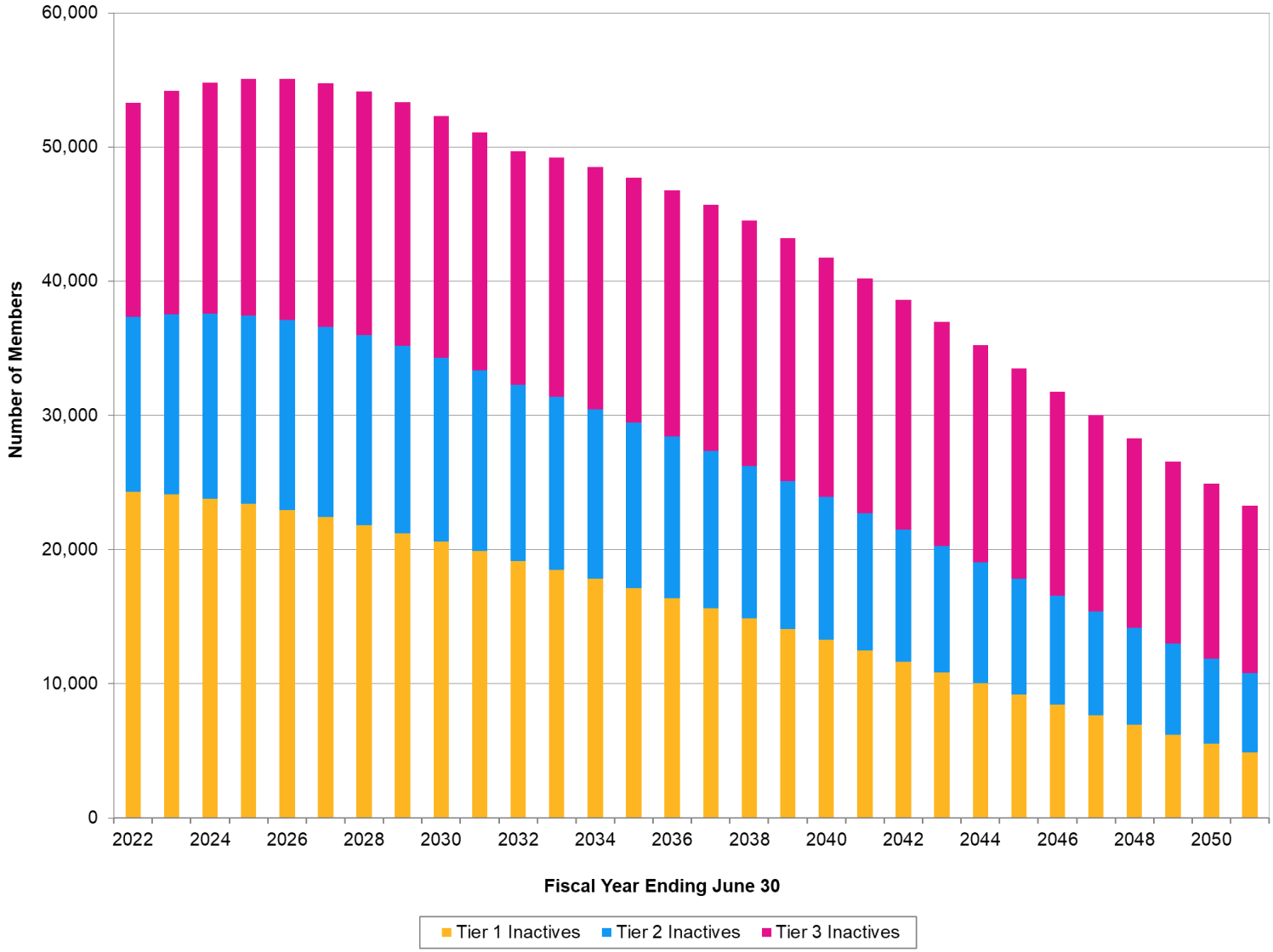


Projected DB and DCR Payroll



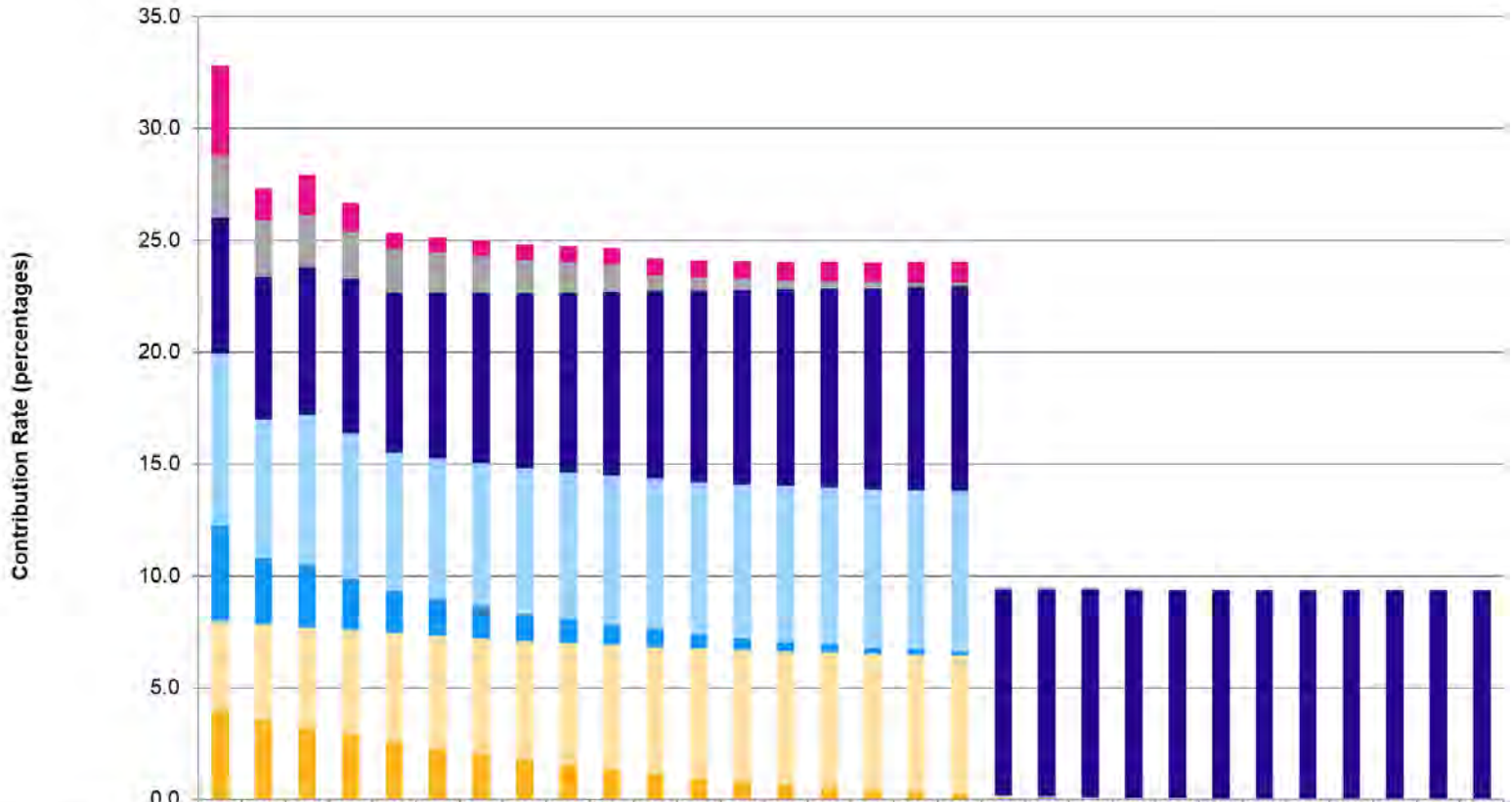
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051
DCR Payroll	1,548	1,636	1,726	1,816	1,905	1,994	2,085	2,177	2,269	2,360	2,451	2,548	2,645	2,741	2,837	2,931	3,026	3,118	3,211	3,302	3,395	3,502	3,609	3,716	3,823	3,930	4,037	4,144	4,253	4,362
DB Payroll	859	783	712	644	582	522	466	414	365	320	278	240	205	173	144	117	94	75	59	47	36	28	22	17	13	9	7	5	4	3

Projected Inactive Member Count



Section 3.3: Projected Employer/State Contribution Rates

Based on Total DB and DCR Payroll

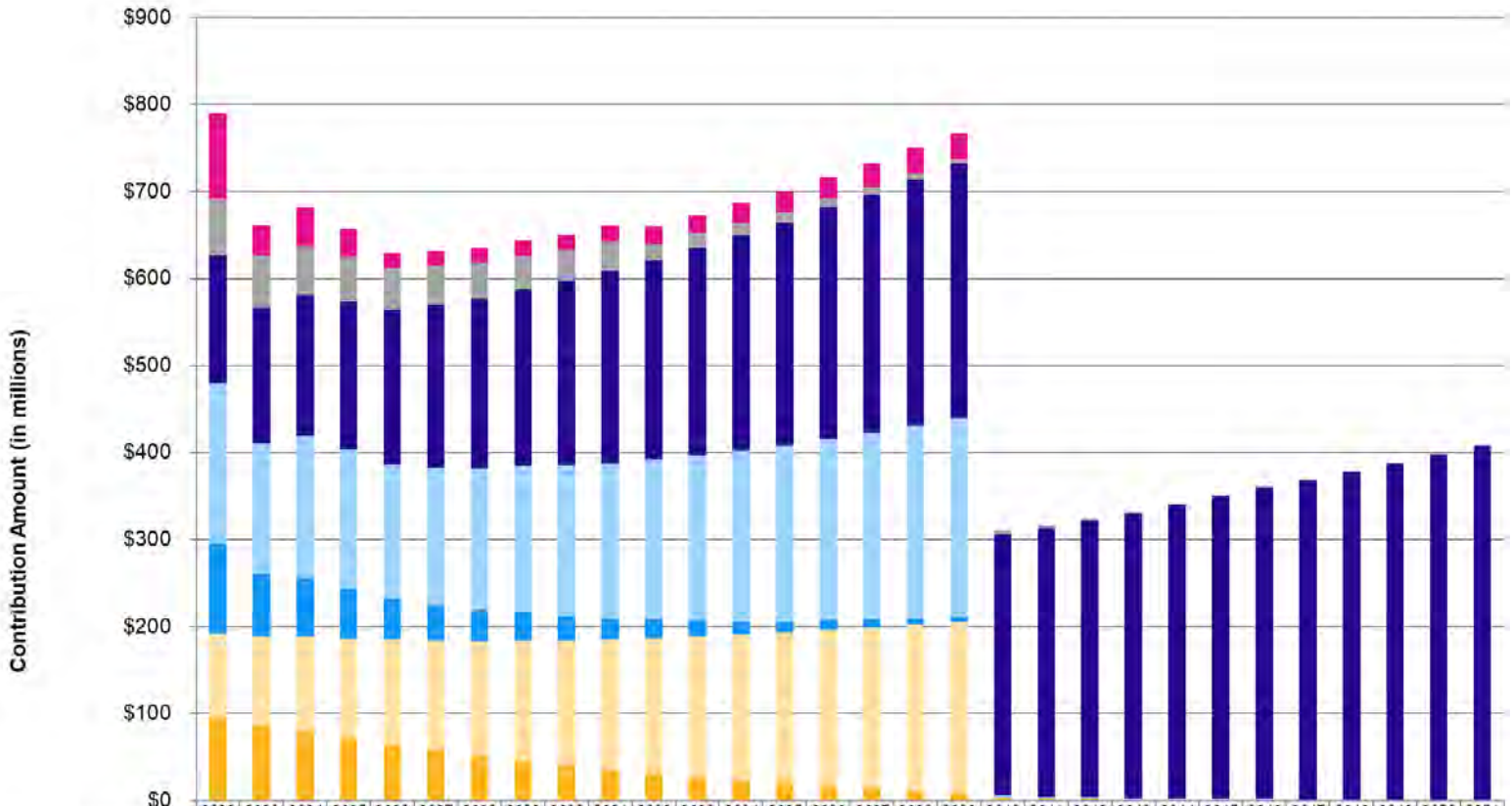


	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051
State Assistance	4.07	1.40	1.83	1.29	0.69	0.69	0.68	0.68	0.70	0.72	0.74	0.76	0.79	0.82	0.85	0.88	0.91	0.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DB EE Contributions	2.72	2.50	2.30	2.11	1.94	1.77	1.62	1.48	1.35	1.24	0.71	0.60	0.50	0.41	0.33	0.27	0.21	0.16	0.13	0.10	0.07	0.06	0.04	0.03	0.02	0.02	0.01	0.01	0.01	0.00
DCR ER Contributions	6.10	6.41	6.63	6.91	7.17	7.42	7.65	7.86	8.06	8.24	8.40	8.55	8.69	8.80	8.91	9.00	9.08	9.14	9.19	9.23	9.26	9.28	9.30	9.32	9.33	9.34	9.34	9.35	9.35	9.35
State as ER on DCR Pay	7.69	6.19	6.71	6.49	6.18	6.29	6.39	6.48	6.57	6.66	6.74	6.81	6.88	6.95	7.01	7.06	7.12	7.17	0.09	0.07	0.06	0.04	0.03	0.02	0.01	0.01	0.01	0.00	0.00	0.00
State as ER on DB Pay	4.26	2.96	2.76	2.30	1.89	1.65	1.43	1.23	1.06	0.90	0.77	0.64	0.53	0.44	0.36	0.28	0.22	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DB ER Contributions on DCR Pay	4.04	4.25	4.49	4.68	4.86	5.03	5.19	5.33	5.47	5.59	5.70	5.80	5.89	5.97	6.04	6.10	6.16	6.20	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DB ER Contributions on DB Pay	3.94	3.58	3.22	2.89	2.58	2.29	2.02	1.76	1.53	1.32	1.13	0.95	0.79	0.65	0.53	0.42	0.33	0.26	0.09	0.07	0.05	0.04	0.03	0.02	0.02	0.01	0.01	0.01	0.00	0.00

Fiscal Year Ending June 30

DB ER Contributions on DB Pay · DB ER Contributions on DCR Pay · State as ER on DB Pay · State as ER on DCR Pay · DCR ER Contributions · DB EE Contributions · State Assistance

Section 3.4: Projected Employer/State Contribution Amounts

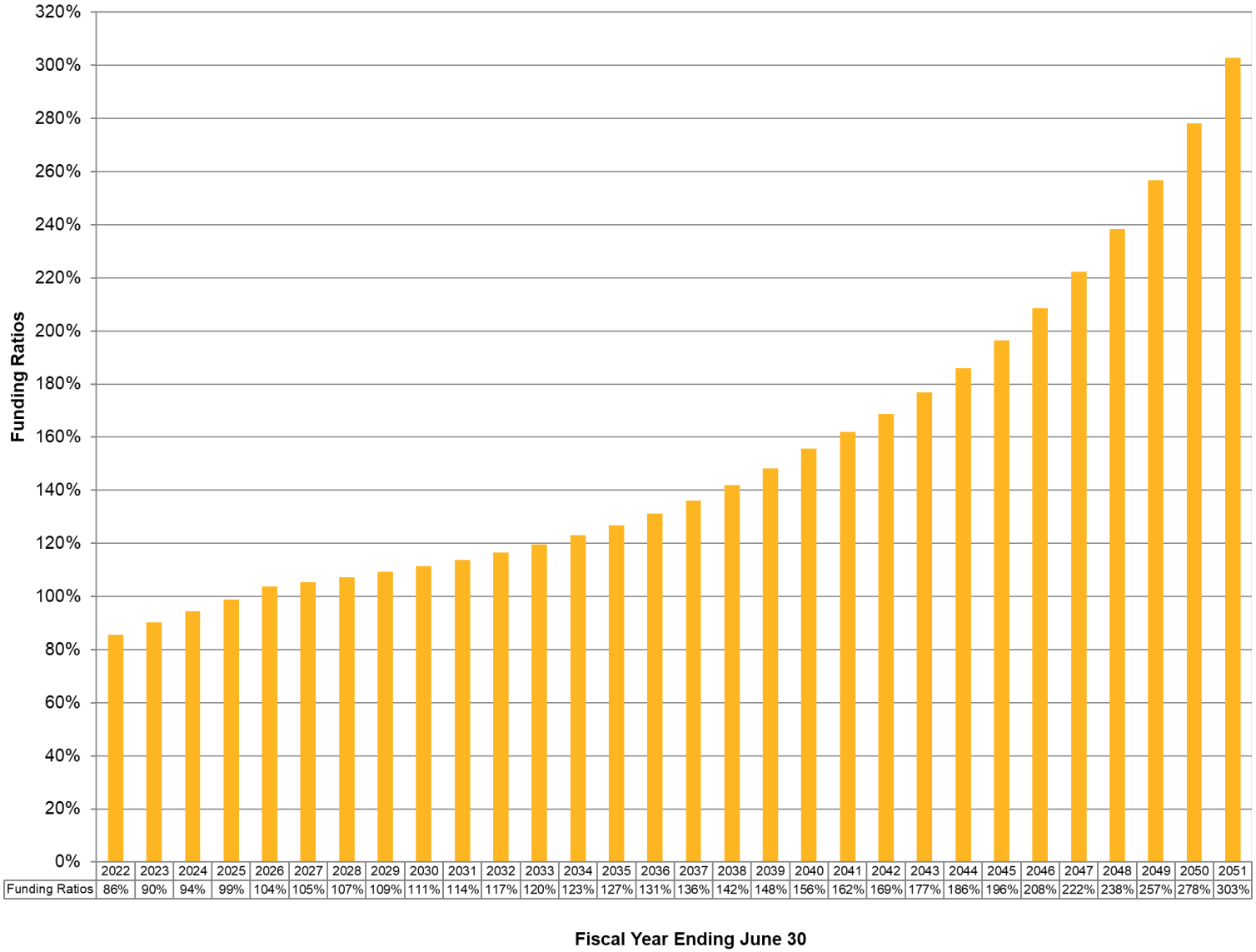


	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051
State Assistance	98	34	45	32	17	17	17	18	18	19	20	21	23	24	25	27	29	30	0	0	0	0	0	0	0	0	0	0	0	0
DB EE Contributions	65	61	56	52	48	45	41	38	36	33	19	17	14	12	10	8	7	5	4	3	2	2	1	1	1	1	0	0	0	0
DCR ER Contributions	147	155	162	170	178	187	195	204	212	221	229	238	248	256	266	274	283	292	300	309	318	328	338	348	358	368	378	388	398	408
State as ER on DCR Pay	185	150	163	160	154	158	163	168	173	179	184	190	196	202	209	215	222	229	3	2	2	1	1	1	1	0	0	0	0	0
State as ER on DB Pay	103	72	67	57	47	41	36	32	28	24	21	18	15	13	11	9	7	5	0	0	0	0	0	0	0	0	0	0	0	0
DB ER Contributions on DCR Pay	97	103	110	115	121	126	132	138	144	150	156	162	168	174	180	186	192	198	0	0	0	0	0	0	0	0	0	0	0	0
DB ER Contributions on DB Pay	95	86	79	71	64	58	51	46	40	35	31	27	23	19	16	13	10	8	3	2	2	1	1	1	1	0	0	0	0	0

Fiscal Year Ending June 30

DB ER Contributions on DB Pay · DB ER Contributions on DCR Pay · State as ER on DB Pay · State as ER on DCR Pay · DCR ER Contributions · DB EE Contributions · State Assistance

Section 3.5: Projection of Funded Ratios



	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051
Funding Ratios	86%	90%	94%	99%	104%	105%	107%	109%	111%	114%	117%	120%	123%	127%	131%	136%	142%	148%	156%	162%	169%	177%	186%	196%	208%	222%	238%	257%	278%	303%

Section 3.6A: Table of Projected Actuarial Results ($'s in 000's)

Fiscal Year End	Valuation Amounts on July 1 (Beginning of FY)				Cash Flow Amounts during Following 12 Months										Deferred Asset Gain / (Loss)
						Actuarial Contrib. Rates			DB Contributions						
	Actuarial Assets	Accrued Liability	Funding Ratio	Unfunded Liability / (Surplus)	Total Salaries	DB	DCR	Total	Non-State Employers	State as an Employer	State Assistance	Employee	Total	Benefit Payments	
2022	$ 19,047,864	$ 22,276,145	85.5%	$ 3,228,281	$ 2,406,757	24.01%	6.10%	30.11%	$ 192,141	$ 287,718	$ 97,700	$ 65,405	$ 642,964	$ 1,384,673	$ 2,030,628
2023	20,485,465	22,686,119	90.3%	2,200,654	2,419,276	18.38%	6.41%	24.79%	189,375	221,398	33,933	60,574	505,280	1,452,612	1,422,440
2024	21,759,495	23,034,487	94.5%	1,274,992	2,437,619	19.02%	6.63%	25.65%	188,118	230,844	44,673	56,077	519,712	1,519,487	766,777
2025	23,077,297	23,325,864	98.9%	248,567	2,459,924	17.66%	6.91%	24.57%	186,380	216,299	31,743	51,849	486,271	1,581,069	0
2026	24,457,146	23,553,712	103.8%	(903,434)	2,486,407	16.20%	7.17%	23.37%	185,141	200,553	17,103	48,126	450,923	1,639,102	0
2027	25,019,087	23,722,456	105.5%	(1,296,631)	2,515,962	15.95%	7.42%	23.37%	184,183	199,805	17,307	44,634	445,929	1,691,307	0
2028	25,564,111	23,834,711	107.3%	(1,729,400)	2,551,387	15.70%	7.65%	23.35%	183,830	199,443	17,294	41,406	441,973	1,743,410	0
2029	26,092,076	23,888,351	109.2%	(2,203,725)	2,591,246	15.49%	7.86%	23.35%	183,971	199,848	17,564	38,407	439,790	1,792,657	0
2030	26,606,454	23,882,931	111.4%	(2,723,523)	2,634,091	15.33%	8.06%	23.39%	184,367	201,056	18,384	35,618	439,425	1,841,559	0
2031	27,108,439	23,815,895	113.8%	(3,292,544)	2,680,313	15.20%	8.24%	23.44%	185,180	202,848	19,379	33,314	440,721	1,888,399	0
2032	27,600,920	23,686,165	116.5%	(3,914,755)	2,729,431	15.08%	8.40%	23.48%	186,380	204,935	20,283	19,379	430,977	1,921,262	0
2033	28,086,220	23,492,795	119.6%	(4,593,425)	2,788,219	14.97%	8.55%	23.52%	188,295	207,822	21,279	16,729	434,125	1,962,656	0
2034	28,568,243	23,233,706	123.0%	(5,334,537)	2,849,691	14.89%	8.69%	23.58%	190,443	211,269	22,607	14,248	438,567	1,997,145	0
2035	29,055,213	22,912,291	126.8%	(6,142,922)	2,913,742	14.83%	8.80%	23.63%	193,114	215,146	23,847	11,946	444,053	2,027,268	0
2036	29,553,053	22,529,016	131.2%	(7,024,037)	2,980,267	14.79%	8.91%	23.70%	195,878	219,465	25,439	9,835	450,617	2,052,266	0
2037	30,068,967	22,085,105	136.2%	(7,983,862)	3,048,570	14.75%	9.00%	23.75%	198,989	223,888	26,787	8,231	457,895	2,073,075	0
2038	30,609,336	21,582,882	141.8%	(9,026,454)	3,119,617	14.74%	9.08%	23.82%	202,374	228,950	28,508	6,551	466,383	2,084,652	0
2039	31,186,769	21,027,265	148.3%	(10,159,504)	3,192,990	14.75%	9.14%	23.89%	206,171	234,494	30,300	5,109	476,074	2,090,235	0
2040	31,811,419	20,421,271	155.8%	(11,390,148)	3,269,593	0.19%	9.19%	9.38%	3,119	3,093	0	4,250	10,462	2,085,624	0
2041	32,003,567	19,772,369	161.9%	(12,231,198)	3,349,104	0.15%	9.23%	9.38%	2,523	2,502	0	3,349	8,374	2,073,472	0
2042	32,220,543	19,085,708	168.8%	(13,134,835)	3,431,102	0.12%	9.26%	9.38%	2,067	2,050	0	2,402	6,519	2,052,889	0
2043	32,473,140	18,370,562	176.8%	(14,102,578)	3,530,182	0.08%	9.28%	9.36%	1,419	1,407	0	2,118	4,944	2,025,256	0
2044	32,771,570	17,627,087	185.9%	(15,144,483)	3,630,726	0.06%	9.30%	9.36%	1,094	1,085	0	1,452	3,631	1,985,697	0
2045	33,131,835	16,868,565	196.4%	(16,263,270)	3,732,491	0.05%	9.32%	9.37%	937	930	0	1,120	2,987	1,940,818	0
2046	33,564,699	16,099,675	208.5%	(17,465,024)	3,835,282	0.03%	9.33%	9.36%	578	573	0	767	1,918	1,889,001	0
2047	34,082,265	15,327,056	222.4%	(18,755,209)	3,939,244	0.02%	9.34%	9.36%	396	392	0	788	1,576	1,830,189	0
2048	34,698,782	14,557,874	238.4%	(20,140,908)	4,044,148	0.02%	9.34%	9.36%	406	402	0	404	1,212	1,769,122	0
2049	35,423,864	13,794,868	256.8%	(21,628,996)	4,149,573	0.01%	9.35%	9.36%	208	207	0	415	830	1,704,173	0
2050	36,269,528	13,042,643	278.1%	(23,226,885)	4,256,510	0.01%	9.35%	9.36%	214	212	0	426	852	1,639,176	0
2051	37,245,140	12,302,143	302.8%	(24,942,997)	4,365,118	0.01%	9.35%	9.36%	219	217	0	0	436	1,571,836	0
								Total	**$ 3,437,510**	**$ 3,918,851**	**$ 514,130**	**$ 584,929**			

Pension unfunded liability layered amortization amounts are maintained after the pension trust is projected to be 100% funded.

Section 3.6A: Table of Projected Actuarial Results ($'s in 000's) (continued)

Fiscal Year End	Valuation Amounts on July 1 (Beginning of FY)					
	Funding Ratio			Unfunded Liability / (Surplus)		
	Pension	Healthcare	Total	Pension	Healthcare	Total
2022	67.9%	125.2%	85.5%	$ 4,953,266	$ (1,724,985)	$ 3,228,281
2023	71.8%	131.7%	90.3%	4,421,186	(2,220,532)	2,200,654
2024	75.2%	137.1%	94.5%	3,931,109	(2,656,117)	1,274,992
2025	78.5%	144.0%	98.9%	3,447,316	(3,198,749)	248,567
2026	82.1%	151.6%	103.8%	2,902,436	(3,805,870)	(903,434)
2027	82.8%	154.7%	105.5%	2,789,764	(4,086,395)	(1,296,631)
2028	83.7%	158.2%	107.3%	2,658,891	(4,388,291)	(1,729,400)
2029	84.6%	161.9%	109.2%	2,508,543	(4,712,268)	(2,203,725)
2030	85.6%	166.1%	111.4%	2,337,173	(5,060,696)	(2,723,523)
2031	86.7%	170.7%	113.8%	2,142,666	(5,435,210)	(3,292,544)
2032	88.0%	175.8%	116.5%	1,922,957	(5,837,712)	(3,914,755)
2033	89.4%	181.5%	119.6%	1,675,797	(6,269,222)	(4,593,425)
2034	91.0%	187.9%	123.0%	1,398,102	(6,732,639)	(5,334,537)
2035	92.9%	195.1%	126.8%	1,087,337	(7,230,259)	(6,142,922)
2036	95.1%	203.1%	131.2%	741,041	(7,765,078)	(7,024,037)
2037	97.6%	212.2%	136.2%	355,919	(8,339,781)	(7,983,862)
2038	100.5%	222.5%	141.8%	(70,737)	(8,955,717)	(9,026,454)
2039	103.9%	234.2%	148.3%	(542,888)	(9,616,616)	(10,159,504)
2040	107.9%	247.4%	155.8%	(1,064,015)	(10,326,133)	(11,390,148)
2041	108.8%	262.5%	161.9%	(1,143,242)	(11,087,956)	(12,231,198)
2042	109.9%	279.6%	168.8%	(1,228,723)	(11,906,112)	(13,134,835)
2043	111.0%	299.1%	176.8%	(1,320,548)	(12,782,030)	(14,102,578)
2044	112.4%	321.5%	185.9%	(1,419,202)	(13,725,281)	(15,144,483)
2045	114.0%	347.0%	196.4%	(1,525,307)	(14,737,963)	(16,263,270)
2046	115.8%	376.0%	208.5%	(1,639,585)	(15,825,439)	(17,465,024)
2047	117.9%	409.0%	222.4%	(1,762,076)	(16,993,133)	(18,755,209)
2048	120.4%	446.5%	238.4%	(1,893,634)	(18,247,274)	(20,140,908)
2049	123.2%	489.1%	256.8%	(2,035,226)	(19,593,770)	(21,628,996)
2050	126.6%	537.5%	278.1%	(2,187,088)	(21,039,797)	(23,226,885)
2051	130.5%	592.8%	302.8%	(2,350,329)	(22,592,668)	(24,942,997)

Pension unfunded liability layered amortization amounts are maintained after the pension trust is projected to be 100% funded.

Section 3.6B: Table of Projected Actuarial Results ($'s in 000's)

Fiscal Year End	Valuation Amounts on July 1 (Beginning of FY)				Cash Flow Amounts during Following 12 Months										Deferred Asset Gain / (Loss)
						Actuarial Contrib. Rates			DB Contributions						
	Actuarial Assets	Accrued Liability	Funding Ratio	Unfunded Liability / (Surplus)	Total Salaries	DB	DCR	Total	Non-State Employers	State as an Employer	State Assistance	Employee	Total	Benefit Payments	
2022	$ 19,047,864	$ 22,276,145	85.5%	$ 3,228,281	$ 2,406,757	24.01%	6.10%	30.11%	$ 192,141	$ 287,718	$ 97,700	$ 65,405	$ 642,964	$ 1,384,673	$ 2,030,628
2023	20,485,465	22,686,119	90.3%	2,200,654	2,419,276	18.38%	6.41%	24.79%	189,375	221,398	33,933	60,574	505,280	1,452,612	1,422,440
2024	21,759,495	23,034,487	94.5%	1,274,992	2,437,619	19.02%	6.63%	25.65%	188,118	230,844	44,673	56,077	519,712	1,519,487	766,777
2025	23,077,297	23,325,864	98.9%	248,567	2,459,924	17.66%	6.91%	24.57%	186,380	216,299	31,743	51,849	486,271	1,581,069	0
2026	24,457,146	23,553,712	103.8%	(903,434)	2,486,407	16.20%	7.17%	23.37%	185,141	200,553	17,103	48,126	450,923	1,639,102	0
2027	25,019,087	23,722,456	105.5%	(1,296,631)	2,515,962	15.95%	7.42%	23.37%	184,183	199,805	17,307	44,634	445,929	1,691,307	0
2028	25,564,111	23,834,711	107.3%	(1,729,400)	2,551,387	15.70%	7.65%	23.35%	183,830	199,443	17,294	41,406	441,973	1,743,410	0
2029	26,092,076	23,888,351	109.2%	(2,203,725)	2,591,246	15.49%	7.86%	23.35%	183,971	199,848	17,564	38,407	439,790	1,792,657	0
2030	26,606,454	23,882,931	111.4%	(2,723,523)	2,634,091	15.33%	8.06%	23.39%	184,367	201,056	18,384	35,618	439,425	1,841,559	0
2031	27,108,439	23,815,895	113.8%	(3,292,544)	2,680,313	15.20%	8.24%	23.44%	185,180	202,848	19,379	33,314	440,721	1,888,399	0
2032	27,600,920	23,686,165	116.5%	(3,914,755)	2,729,431	15.08%	8.40%	23.48%	186,380	204,935	20,283	19,379	430,977	1,921,262	0
2033	28,086,220	23,492,795	119.6%	(4,593,425)	2,788,219	14.97%	8.55%	23.52%	188,295	207,822	21,279	16,729	434,125	1,962,656	0
2034	28,568,243	23,233,706	123.0%	(5,334,537)	2,849,691	14.89%	8.69%	23.58%	190,443	211,269	22,607	14,248	438,567	1,997,145	0
2035	29,055,213	22,912,291	126.8%	(6,142,922)	2,913,742	14.83%	8.80%	23.63%	193,114	215,146	23,847	11,946	444,053	2,027,268	0
2036	29,553,053	22,529,016	131.2%	(7,024,037)	2,980,267	14.79%	8.91%	23.70%	195,878	219,465	25,439	9,835	450,617	2,052,266	0
2037	30,068,967	22,085,105	136.2%	(7,983,862)	3,048,570	14.75%	9.00%	23.75%	198,989	223,888	26,787	8,231	457,895	2,073,075	0
2038	30,609,336	21,582,882	141.8%	(9,026,454)	3,119,617	0.34%	9.08%	9.42%	5,326	5,281	0	6,551	17,158	2,084,652	0
2039	30,720,192	21,027,265	146.1%	(9,692,927)	3,192,990	0.26%	9.14%	9.40%	4,168	4,134	0	5,109	13,411	2,090,235	0
2040	30,829,839	20,421,271	151.0%	(10,408,568)	3,269,593	0.19%	9.19%	9.38%	3,119	3,093	0	4,250	10,462	2,085,624	0
2041	30,949,547	19,772,369	156.5%	(11,177,178)	3,349,104	0.15%	9.23%	9.38%	2,523	2,502	0	3,349	8,374	2,073,472	0
2042	31,088,736	19,085,708	162.9%	(12,003,028)	3,431,102	0.12%	9.26%	9.38%	2,067	2,050	0	2,402	6,519	2,052,889	0
2043	31,257,806	18,370,562	170.2%	(12,887,244)	3,530,182	0.08%	9.28%	9.36%	1,419	1,407	0	2,118	4,944	2,025,256	0
2044	31,466,545	17,627,087	178.5%	(13,839,458)	3,630,726	0.06%	9.30%	9.36%	1,094	1,085	0	1,452	3,631	1,985,697	0
2045	31,730,499	16,868,565	188.1%	(14,861,934)	3,732,491	0.05%	9.32%	9.37%	937	930	0	1,120	2,987	1,940,818	0
2046	32,059,944	16,099,675	199.1%	(15,960,269)	3,835,282	0.03%	9.33%	9.36%	578	573	0	767	1,918	1,889,001	0
2047	32,466,459	15,327,056	211.8%	(17,139,403)	3,939,244	0.02%	9.34%	9.36%	396	392	0	788	1,576	1,830,189	0
2048	32,963,730	14,557,874	226.4%	(18,405,856)	4,044,148	0.02%	9.34%	9.36%	406	402	0	404	1,212	1,769,122	0
2049	33,560,765	13,794,868	243.3%	(19,765,897)	4,149,573	0.01%	9.35%	9.36%	208	207	0	415	830	1,704,173	0
2050	34,268,932	13,042,643	262.7%	(21,226,289)	4,256,510	0.01%	9.35%	9.36%	214	212	0	426	852	1,639,176	0
2051	35,096,900	12,302,143	285.3%	(22,794,757)	4,365,118	0.01%	9.35%	9.36%	219	217	0	0	436	1,571,836	0
								Total	**$ 3,038,459**	**$ 3,464,822**	**$ 455,322**	**$ 584,929**			

Pension unfunded liability layered amortization amounts are reduced to zero when the pension trust is projected to be 100% funded. The healthcare unfunded liability amortization amounts would also be reduced to zero since the healthcare trust is currently more than 100% funded.

Section 3.6B: Table of Projected Actuarial Results ($'s in 000's) (continued)

Fiscal Year End	Valuation Amounts on July 1 (Beginning of FY)					
	Funding Ratio			Unfunded Liability / (Surplus)		
	Pension	Healthcare	Total	Pension	Healthcare	Total
2022	67.9%	125.2%	85.5%	$ 4,953,266	$ (1,724,985)	$ 3,228,281
2023	71.8%	131.7%	90.3%	4,421,186	(2,220,532)	2,200,654
2024	75.2%	137.1%	94.5%	3,931,109	(2,656,117)	1,274,992
2025	78.5%	144.0%	98.9%	3,447,316	(3,198,749)	248,567
2026	82.1%	151.6%	103.8%	2,902,436	(3,805,870)	(903,434)
2027	82.8%	154.7%	105.5%	2,789,764	(4,086,395)	(1,296,631)
2028	83.7%	158.2%	107.3%	2,658,891	(4,388,291)	(1,729,400)
2029	84.6%	161.9%	109.2%	2,508,543	(4,712,268)	(2,203,725)
2030	85.6%	166.1%	111.4%	2,337,173	(5,060,696)	(2,723,523)
2031	86.7%	170.7%	113.8%	2,142,666	(5,435,210)	(3,292,544)
2032	88.0%	175.8%	116.5%	1,922,957	(5,837,712)	(3,914,755)
2033	89.4%	181.5%	119.6%	1,675,797	(6,269,222)	(4,593,425)
2034	91.0%	187.9%	123.0%	1,398,102	(6,732,639)	(5,334,537)
2035	92.9%	195.1%	126.8%	1,087,337	(7,230,259)	(6,142,922)
2036	95.1%	203.1%	131.2%	741,041	(7,765,078)	(7,024,037)
2037	97.6%	212.2%	136.2%	355,919	(8,339,781)	(7,983,862)
2038	100.5%	222.5%	141.8%	(70,737)	(8,955,717)	(9,026,454)
2039	100.6%	234.2%	146.1%	(76,311)	(9,616,616)	(9,692,927)
2040	100.6%	247.4%	151.0%	(82,435)	(10,326,133)	(10,408,568)
2041	100.7%	262.5%	156.5%	(89,222)	(11,087,956)	(11,177,178)
2042	100.8%	279.6%	162.9%	(96,916)	(11,906,112)	(12,003,028)
2043	100.9%	299.1%	170.2%	(105,214)	(12,782,030)	(12,887,244)
2044	101.0%	321.5%	178.5%	(114,177)	(13,725,281)	(13,839,458)
2045	101.1%	347.0%	188.1%	(123,971)	(14,737,963)	(14,861,934)
2046	101.3%	376.0%	199.1%	(134,830)	(15,825,439)	(15,960,269)
2047	101.5%	409.0%	211.8%	(146,270)	(16,993,133)	(17,139,403)
2048	101.7%	446.5%	226.4%	(158,582)	(18,247,274)	(18,405,856)
2049	102.0%	489.1%	243.3%	(172,127)	(19,593,770)	(19,765,897)
2050	102.3%	537.5%	262.7%	(186,492)	(21,039,797)	(21,226,289)
2051	102.6%	592.8%	285.3%	(202,089)	(22,592,668)	(22,794,757)

Pension unfunded liability layered amortization amounts are reduced to zero when the pension trust is projected to be 100% funded. The healthcare unfunded liability amortization amounts would also be reduced to zero since the healthcare trust is currently more than 100% funded.

Section 3.7: Projected Pension Benefit Recipients and Amounts ($'s in 000's)

Fiscal Year End	Pension		Fiscal Year End	Pension	
	Recipient Counts	Benefit Amounts		Recipient Counts	Benefit Amounts
2022	37,717	$ 974,479	2064	4,967	$ 433,043
2023	39,219	1,023,259	2065	4,396	395,909
2024	40,483	1,070,386	2066	3,878	360,533
2025	41,478	1,114,086	2067	3,411	326,935
2026	42,213	1,154,914	2068	2,989	295,126
2027	42,715	1,194,307	2069	2,609	265,117
2028	42,995	1,232,455	2070	2,268	236,912
2029	43,078	1,267,441	2071	1,962	210,515
2030	43,000	1,300,547	2072	1,690	185,925
2031	42,776	1,330,695	2073	1,447	163,136
2032	42,387	1,345,678	2074	1,232	142,139
2033	41,884	1,368,593	2075	1,042	122,918
2034	41,242	1,387,229	2076	876	105,446
2035	40,483	1,401,876	2077	731	89,683
2036	39,591	1,413,159	2078	604	75,579
2037	38,627	1,420,047	2079	496	63,070
2038	37,549	1,421,411	2080	403	52,079
2039	36,347	1,417,753	2081	325	42,522
2040	35,040	1,407,945	2082	259	34,303
2041	33,642	1,393,880	2083	204	27,322
2042	32,180	1,374,647	2084	159	21,469
2043	30,677	1,350,546	2085	122	16,633
2044	29,118	1,322,273	2086	93	12,693
2045	27,551	1,289,338	2087	70	9,539
2046	25,964	1,252,998	2088	52	7,052
2047	24,386	1,213,386	2089	38	5,130
2048	22,812	1,171,109	2090	28	3,669
2049	21,266	1,126,517	2091	20	2,583
2050	19,762	1,080,001	2092	14	1,789
2051	18,303	1,032,106	2093	11	1,222
2052	16,890	983,276	2094	7	826
2053	15,533	933,864	2095	5	553
2054	14,234	884,229	2096	4	370
2055	12,998	834,705	2097	3	249
2056	11,828	785,605	2098	2	170
2057	10,728	737,196	2099	2	118
2058	9,699	689,711	2100	1	85
2059	8,741	643,344	2101	1	62
2060	7,853	598,258	2102	1	48
2061	7,035	554,586	2103	1	38
2062	6,283	512,440	2104	0	0
2063	5,594	471,903	2105	0	0

Counts include retirees, disabilitants, and beneficiaries.

Section 4: Member Data

Section 4.1: Summary of Members Included

As of June 30	2017	2018	2019	2020	2021
Active Members					
1. Number	14,719	13,434	12,152	11,033	9,888[1]
2. Average Age	52.10	52.52	52.84	53.21	53.51
3. Average Credited Service	16.57	17.21	17.80	18.38	18.96
4. Average Entry Age	35.53	35.30	35.04	34.83	34.55
5. Average Annual Earnings	$ 76,902	$ 77,813	$ 82,192	$ 83,757	$ 86,316
6. Number Vested	14,314	13,103	11,868	10,791	9,675
7. Percent Who Are Vested	97.2%	97.5%	97.7%	97.8%	97.8%
Retirees, Disabilitants, and Beneficiaries					
1. Number	34,347	35,454	36,310	37,106	37,717
2. Average Age	69.42	69.85	70.29	70.77	71.17
3. Average Years Since Retirement	11.71	11.87	12.14	12.45	12.66
4. Average Monthly Pension Benefit					
a. Base	$ 1,574	$ 1,616	$ 1,660	$ 1,704	$ 1,752
b. COLA[2]	93	94	92	93	94
c. PRPA[2]	230	222	241	244	230
d. Adjustment	1	1	1	0	0
e. Total	$ 1,898	$ 1,933	$ 1,994	$ 2,041	$ 2,076
Vested Terminations (vested at termination, not refunded contributions, or commenced benefit)					
1. Number	5,962	5,660	5,499	5,327	5,135
2. Average Age	52.45	52.56	53.06	53.52	53.92
3. Average Monthly Pension Benefit	$ 1,080	$ 1,087	$ 1,123	$ 1,158	$ 1,205
Non-Vested Terminations (not vested at termination, not refunded contributions)					
1. Number	11,506	11,192	10,921	10,642	10,432
2. Average Account Balance	$ 6,462	$ 6,558	$ 6,923	$ 7,060	$ 7,325
Total Number of Members	**66,534**	**65,740**	**64,882**	**64,108**	**63,172**

[1] Includes 4,643 male active members and 5,245 female active members.

[2] Calculated by taking the average of the data field, as provided by the State of Alaska, for all participants in the group.

Summary of Members Included

As of June 30, 2021	DB Tier 1	DB Tier 2	DB Tier 3	DB Total	DCR Tier 4	Grand Total
Active Members						
1. Number	622	2,219	7,047	9,888	23,933	33,821
2. Average Age	63.38	56.77	51.61	53.51	41.26	44.84
3. Average Credited Service	23.72	23.30	17.17	18.96	4.93	9.03
4. Average Entry Age	39.66	33.47	34.44	34.55	36.33	35.81
5. Annual Earnings						
a. Total (000's)	$ 49,598	$ 198,403	$ 605,488	$ 853,489	$ 1,530,905	$ 2,384,394
b. Average	$ 79,740	$ 89,411	$ 85,921	$ 86,316	$ 63,966	$ 70,500

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

As of June 30, 2021	Tier 1	Tier 2	Tier 3	Total
Retirees, Disabilitants, and Beneficiaries				
1. Number	23,077	9,340	5,300	37,717
2. Average Age	72.84	69.13	67.42	71.17
3. Average Years Since Retirement	15.90	8.64	5.59	12.66
4. Average Monthly Pension Benefit				
a. Base	$ 1,766	$ 1,913	$ 1,405	$ 1,752
b. COLA	119	59	46	94
c. PRPA	325	100	43	230
d. Adjustment	0	1	1	0
e. Total	$ 2,210	$ 2,073	$ 1,495	$ 2,076

Summary of Members Included

As of June 30, 2021	Active Members	Inactive Members				
		Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members
Retiree Medical Participants						
1. Retiree Coverage Only	9,817	19,421	0	0	2,153	21,574
2. Retiree + Spouse	0	12,647	12,647	0	3,281	28,575
3. Retiree + Children / Dependents	0	413	0	412	0	825
4. Family	0	773	773	1,112	0	2,658
5. Total	9,817	33,254	13,420	1,524	5,434	53,632

As of June 30, 2021	Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members
Retiree Medical Participants					
1. Pre-Medicare	7,134	4,641	1,524	5,260	18,559
2. Medicare Part A & B	25,889	8,730	0	174	34,793
3. Medicare Part B Only	231	49	0	0	280
4. Total	33,254	13,420	1,524	5,434	53,632

As of June 30, 2021	Retirees
Summary of Retiree Medical Data Received	
1. Retiree records on pension data	37,717
2. Remove duplicates on pension data	(1,163)
3. Valued in a different retiree healthcare plan[1]	(1,146)
4. Records without medical coverage	(2,305)
5. Medical only retirees	151
6. Total	33,254

[1] Each member's retiree medical benefits are valued in the plan indicated in the data from Aetna

Summary of Members Included

Active Members – DB Only

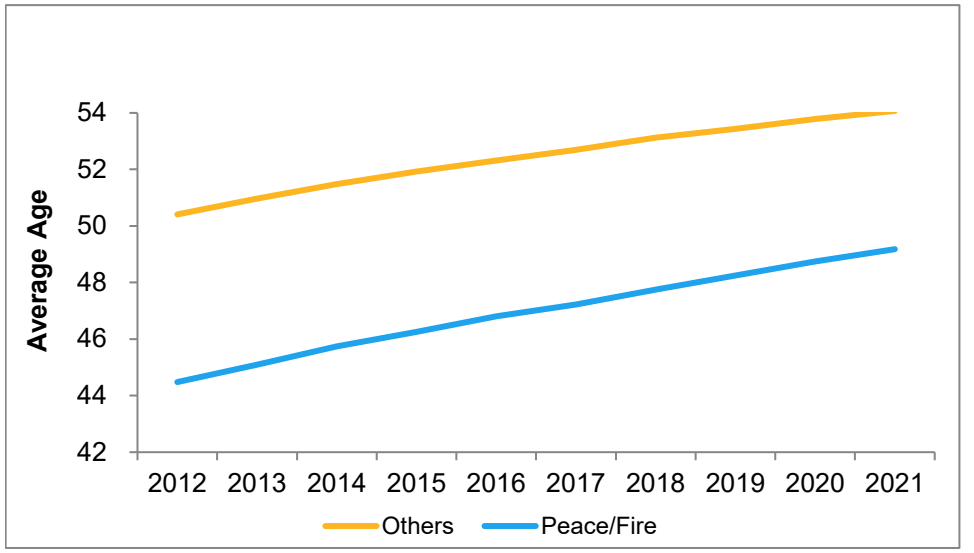
As of June 30	2017	2018	2019	2020	2021
Peace Officer / Firefighter					
1. Number	1,606	1,507	1,382	1,266	1,137 [1]
2. Average Age	47.22	47.75	48.25	48.74	49.18
3. Average Credited Service	17.41	18.15	18.90	19.45	20.15
4. Average Entry Age	29.81	29.60	29.35	29.29	29.03
5. Average Annual Earnings	$ 106,987	$ 108,580	$ 120,089	$ 123,436	$ 127,327
6. Number Vested	1,599	1,500	1,374	1,260	1,134
7. Percent Who Are Vested	99.6%	99.5%	99.4%	99.5%	99.7%
Others					
1. Number	13,113	11,927	10,770	9,767	8,751 [2]
2. Average Age	52.70	53.12	53.43	53.79	54.07
3. Average Credited Service	16.47	17.09	17.66	18.24	18.80
4. Average Entry Age	36.23	36.03	35.77	35.55	35.27
5. Average Annual Earnings	$ 73,218	$ 73,926	$ 77,329	$ 78,613	$ 80,987
6. Number Vested	12,715	11,603	10,494	9,531	8,541
7. Percent Who Are Vested	97.0%	97.3%	97.4%	97.6%	97.6%
Total					
1. Number	14,719	13,434	12,152	11,033	9,888
2. Average Age	52.10	52.52	52.84	53.21	53.51
3. Average Credited Service	16.57	17.21	17.80	18.38	18.96
4. Average Entry Age	35.53	35.30	35.04	34.83	34.55
5. Average Annual Earnings	$ 76,902	$ 77,813	$ 82,192	$ 83,757	$ 86,316
6. Number Vested	14,314	13,103	11,868	10,791	9,675
7. Percent Who Are Vested	97.2%	97.5%	97.7%	97.8%	97.8%

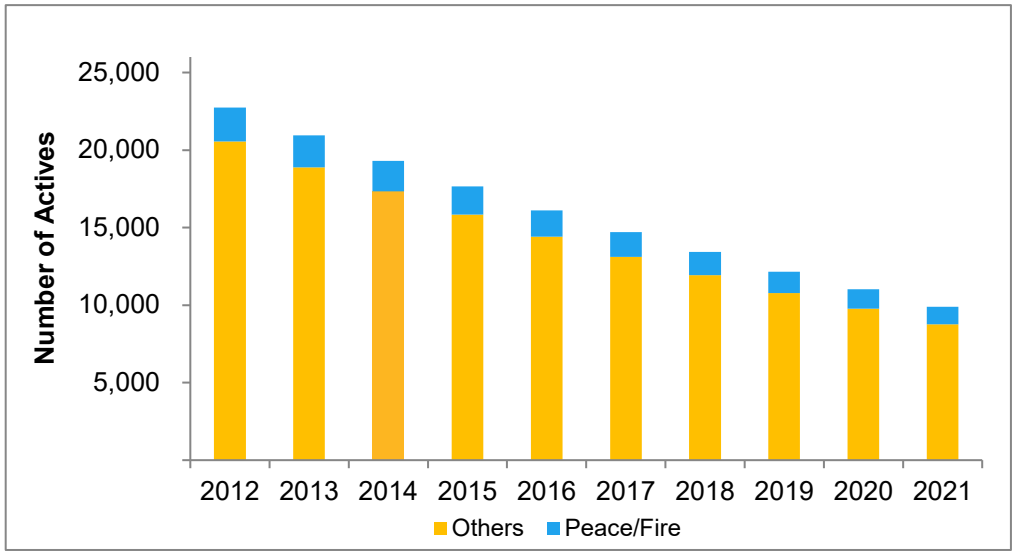
Average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

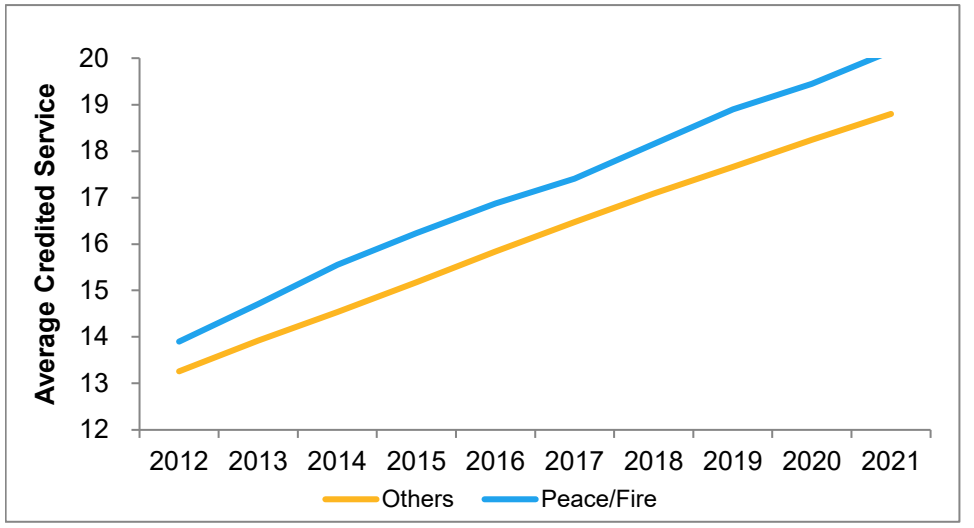
[1] Includes 975 male active members and 162 female active members.

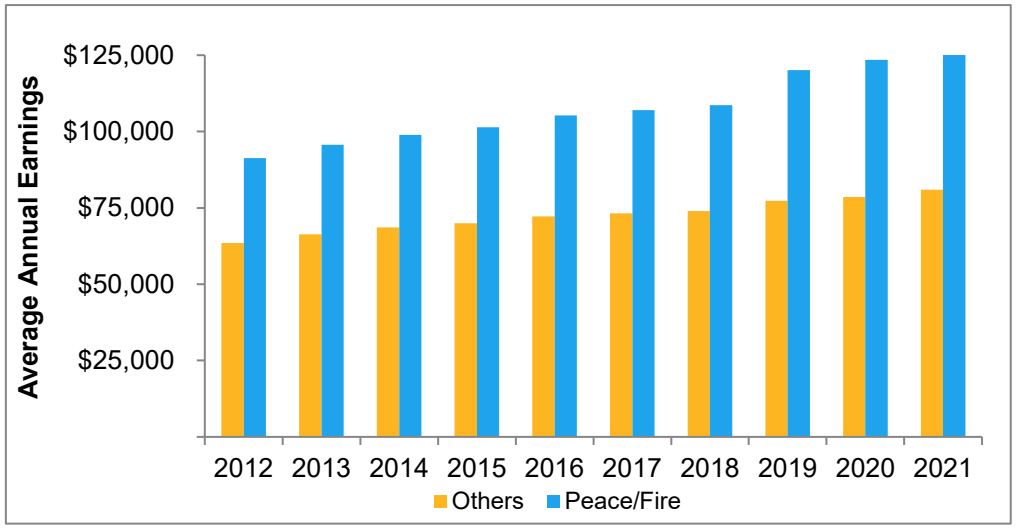
[2] Includes 3,668 male active members and 5,083 female active members.

Summary of Members Included - Active Members at June 30









Average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

Section 4.2: Age and Service Distribution of Active Members

Peace Officer / Firefighter

Annual Earnings by Age

Age	Number	Total Annual Earnings	Average Annual Earnings
0 - 19	0	$ 0	$ 0
20 - 24	0	0	0
25 - 29	0	0	0
30 - 34	1	149,735	149,735
35 - 39	82	10,000,382	121,956
40 - 44	211	27,523,104	130,441
45 - 49	342	44,289,542	129,502
50 - 54	298	38,709,607	129,898
55 - 59	154	18,406,191	119,521
60 - 64	39	4,580,412	117,446
65 - 69	9	1,003,897	111,544
70 - 74	0	0	0
75+	1	108,235	108,235
Total	**1,137**	**$ 144,771,105**	**$ 127,327**

Annual Earnings by Credited Service

Years of Service	Number	Total Annual Earnings	Average Annual Earnings
0	0	$ 0	$ 0
1	0	0	0
2	2	112,128	56,064
3	0	0	0
4	1	72,120	72,120
0 - 4	**3**	**$ 184,248**	**$ 61,416**
5 - 9	14	1,250,847	89,346
10 - 14	64	6,186,036	96,657
15 - 19	520	64,179,398	123,422
20 - 24	372	50,328,887	135,293
25 - 29	137	19,319,401	141,018
30 - 34	24	2,885,555	120,231
35 - 39	1	201,624	201,624
40+	2	235,109	117,555
Total	**1,137**	**$ 144,771,105**	**$ 127,327**

Years of Credited Service by Age

	Years of Service									
Age	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40+**	**Total**
0 - 19	0	0	0	0	0	0	0	0	0	0
20 - 24	0	0	0	0	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0	0	0	0	0
30 - 34	0	0	0	1	0	0	0	0	0	1
35 - 39	0	6	10	65	1	0	0	0	0	82
40 - 44	1	3	11	143	52	1	0	0	0	211
45 - 49	1	1	12	145	143	40	0	0	0	342
50 - 54	0	2	15	87	124	64	6	0	0	298
55 - 59	1	2	11	64	44	23	9	0	0	154
60 - 64	0	0	4	12	7	8	7	0	1	39
65 - 69	0	0	1	3	1	1	2	1	0	9
70 - 74	0	0	0	0	0	0	0	0	0	0
75+	0	0	0	0	0	0	0	0	1	1
Total	**3**	**14**	**64**	**520**	**372**	**137**	**24**	**1**	**2**	**1,137**

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

Age and Service Distribution of Active Members

Others

Annual Earnings by Age

Age	Number	Total Annual Earnings	Average Annual Earnings
0 - 19	0	$ 0	$ 0
20 - 24	0	0	0
25 - 29	0	0	0
30 - 34	21	1,707,881	81,328
35 - 39	381	29,552,174	77,565
40 - 44	946	78,062,108	82,518
45 - 49	1,375	116,242,301	84,540
50 - 54	1,770	149,031,703	84,199
55 - 59	2,222	178,695,225	80,421
60 - 64	1,345	103,071,893	76,633
65 - 69	513	39,229,659	76,471
70 - 74	143	10,647,337	74,457
75+	35	2,477,974	70,799
Total	**8,751**	**$ 708,718,255**	**$ 80,987**

Annual Earnings by Credited Service

Years of Service	Number	Total Annual Earnings	Average Annual Earnings
0	14	$ 610,926	$ 43,638
1	21	950,377	45,256
2	51	2,731,908	53,567
3	51	2,643,493	51,833
4	55	3,225,895	58,653
0 - 4	**192**	**$ 10,162,599**	**$ 52,930**
5 - 9	478	29,009,387	60,689
10 - 14	1,287	86,078,633	66,883
15 - 19	3,388	273,611,478	80,759
20 - 24	2,024	179,443,910	88,658
25 - 29	982	92,070,037	93,758
30 - 34	310	29,705,129	95,823
35 - 39	69	6,757,881	97,940
40+	21	1,879,201	89,486
Total	**8,751**	**$ 708,718,255**	**$ 80,987**

Years of Credited Service by Age

	Years of Service									
Age	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40+**	**Total**
0 - 19	0	0	0	0	0	0	0	0	0	0
20 - 24	0	0	0	0	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0	0	0	0	0
30 - 34	1	6	11	3	0	0	0	0	0	21
35 - 39	26	45	114	193	3	0	0	0	0	381
40 - 44	34	74	191	532	114	1	0	0	0	946
45 - 49	33	86	201	611	377	66	1	0	0	1,375
50 - 54	36	96	227	642	500	225	44	0	0	1,770
55 - 59	28	83	293	722	565	401	118	12	0	2,222
60 - 64	21	55	175	467	323	186	89	27	2	1,345
65 - 69	11	21	55	167	111	83	44	15	6	513
70 - 74	2	11	16	38	23	18	13	11	11	143
75+	0	1	4	13	8	2	1	4	2	35
Total	**192**	**478**	**1,287**	**3,388**	**2,024**	**982**	**310**	**69**	**21**	**8,751**

Total and average annual earnings (“valuation pay”) are the annualized earnings for the fiscal year ending on the valuation date.

Section 4.3: Member Data Reconciliation

Pension

		Inactive Members					
	Active Members	Due a Refund	Deferred Benefits	Retired Members	Disabled Members	Bene-ficiaries	Total
As of June 30, 2020	**11,033**	**10,642**	**5,327**	**32,536 ***	**149**	**4,436**	**64,123**
Vested Terminations	(366)	(8)	376	0	(2)	0	0
Non-Vested Terminations	(37)	37	0	0	0	0	0
Refund of Contributions	(10)	(152)	(31)	0	0	(6)	(199)
Disability Retirements	(12)	0	(6)	0	18	0	0
Age Retirements	(873)	(17)	(406)	1,316	(20)	0	0
Deaths With Beneficiary	(15)	1	(10)	(357)	(3)	384	0
Deaths Without Beneficiary	(13)	(26)	(7)	(469)	(3)	(266)	(784)
Expired Benefits	(2)	0	0	0	0	(3)	(5)
Data Corrections	0	(7)	(5)	1	0	(18)	(29)
Converted To DCR Plan	0	0	0	0	0	0	0
Transfers In/Out	2	0	(2)	(3)	0	(1)	(4)
Rehires	177	(62)	(102)	(12)	0	0	1
Pick Ups***	4	24	1	3	0	52	84
Net Change	**(1,145)**	**(210)**	**(192)**	**479**	**(10)**	**142**	**(936)**
As of June 30, 2021	**9,888**	**10,432**	**5,135**	**33,015 ****	**139**	**4,578**	**63,187**

* Includes 15 medical only retirees
** Includes 15 medical only retirees
*** Pickup beneficiaries are primarily new DROs.

Member Data Reconciliation

Healthcare

		Inactive Members				
	Active Members	Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members
As of June 30, 2020	**10,908**	**32,857**	**13,323**	**1,493**	**5,591**	**53,264**
Vested Terminations	(340)	0	0	0	340	340
Non-Vested Terminations	(36)	0	0	0	0	0
Refund of Contributions	(10)	0	0	0	(27)	(27)
Disability Retirements	(12)	12	8	1	0	21
Age Retirements	(757)	757	386	118	0	1,261
Deferred Retirements	0	286	143	32	(286)	175
Retired without Medical Coverage	(86)	0	0	0	86	86
Deceased	(25)	(913)	(91)	(13)	(27)	(1,044)
New Beneficiaries	0	153	(153)	0	0	0
Added Retiree Medical Coverage	0	113	46	5	(113)	51
Added Dependent Coverage	0	0	110	83	0	193
Dropped Retiree Medical Coverage	0	(12)	(4)	(4)	12	(8)
Dropped Dependent Coverage	0	0	(345)	(190)	0	(535)
Rehires	177	(12)	(3)	(2)	(142)	(159)
Transfers In/Out	(2)	13	0	1	0	14
Net Change	**(1,091)**	**397**	**97**	**31**	**(157)**	**368**
As of June 30, 2021	**9,817**	**33,254**	**13,420**	**1,524**	**5,434**	**53,632**

Section 4.4: Schedule of Active Member Data

Peace Officer / Firefighter

Valuation Date	Number	Annual Earnings (000's)	Annual Average Earnings	Percent Increase in Average Earnings	Number of Participating Employers
June 30, 2021	1,137	$ 144,771	$ 127,327	3.2%	151
June 30, 2020	1,266	156,271	123,436	2.8%	153
June 30, 2019	1,382	165,963	120,089	10.6%	155
June 30, 2018	1,507	163,630	108,580	1.5%	155
June 30, 2017	1,606	171,821	106,987	1.6%	155
June 30, 2016	1,704	179,461	105,317	3.8%	155
June 30, 2015	1,827	185,350	101,450	2.5%	159
June 30, 2014	1,958	193,737	98,946	3.4%	159
June 30, 2013	2,065	197,534	95,658	4.8%	159
June 30, 2012	2,164	197,544	91,287	4.1%	160

Others

Valuation Date	Number	Annual Earnings (000's)	Annual Average Earnings	Percent Increase in Average Earnings	Number of Participating Employers
June 30, 2021	8,751	$ 708,718	$ 80,987	3.0%	151
June 30, 2020	9,767	767,817	78,613	1.7%	153
June 30, 2019	10,770	832,832	77,329	4.6%	155
June 30, 2018	11,927	881,716	73,926	1.0%	155
June 30, 2017	13,113	960,106	73,218	1.4%	155
June 30, 2016	14,401	1,039,960	72,214	3.2%	155
June 30, 2015	15,833	1,108,218	69,994	2.1%	159
June 30, 2014	17,339	1,188,918	68,569	3.4%	159
June 30, 2013	18,890	1,252,786	66,320	4.5%	159
June 30, 2012	20,566	1,305,337	63,471	4.6%	160

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

Section 4.5: Active Member Payroll Reconciliation

Payroll Field	Payroll Data (000's)
a) DRB actual reported salaries FY21 in employer list	$ 2,242,794
b) DRB actual reported salaries FY21 in valuation data	2,186,265
c) Annualized valuation data	2,384,394
d) Valuation payroll as of June 30, 2021	2,480,990
e) Rate payroll for FY22	2,406,757
f) Rate payroll for FY24	2,437,619

a) Actual reported salaries from DRB employer listing showing all payroll paid during FY21, including those who were not active as of June 30, 2021
b) Payroll from valuation data for people who are in active status as of June 30, 2021
c) Payroll from (b) annualized for both new entrants and part-timers
d) Payroll from (c) with one year of salary scale applied to estimate salaries payable for the upcoming year
e) Payroll from (d) with the part-timer annualization removed
f) Payroll from (e) with two years of assumed decrements and salary scale, and 0% population growth

Section 4.6: Summary of New Pension Benefit Recipients

Peace Officer / Firefighter

During the Year Ending June 30	2017	2018	2019	2020	2021
Service					
1. Number	119	105	109	118	129
2. Average Age at Commencement	56.65	55.70	55.61	55.52	55.30
3. Average Monthly Pension Benefit	$ 4,166	$ 4,519	$ 4,412	$ 5,199	$ 5,248
Survivor (including surviving spouse and DROs)					
1. Number	42	44	36	43	58
2. Average Age at Commencement	62.88	63.76	68.19	67.92	64.58
3. Average Monthly Pension Benefit	$ 1,797	$ 2,187	$ 1,842	$ 1,785	$ 1,971
Disability					
1. Number	4	4	4	3	4
2. Average Age at Commencement	49.33	46.56	50.44	51.72	52.10
3. Average Monthly Pension Benefit	$ 2,427	$ 3,230	$ 3,071	$ 5,276	$ 2,890
Total					
1. Number	165	153	149	164	191
2. Average Age at Commencement	58.06	57.78	58.51	58.70	58.05
3. Average Monthly Pension Benefit	$ 3,521	$ 3,814	$ 3,755	$ 4,305	$ 4,204

Summary of New Pension Benefit Recipients

Peace Officer / Firefighter

	Years of Credited Service						
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+
Period 7/1/2020 – 6/30/2021:							
Average Monthly Pension	$ 2,612	$ 767	$ 1,619	$ 3,711	$ 5,196	$ 6,960	$ 7,970
Number of Recipients	2	5	9	26	42	40	9
Period 7/1/2019 – 6/30/2020:							
Average Monthly Pension	$ 0	$ 694	$ 2,212	$ 3,626	$ 5,531	$ 6,829	$ 8,636
Number of Recipients	0	6	11	23	40	32	9
Period 7/1/2018 – 6/30/2019:							
Average Monthly Pension	$ 0	$ 651	$ 1,933	$ 3,362	$ 4,786	$ 6,196	$ 5,688
Number of Recipients	0	5	11	25	38	26	6
Period 7/1/2017 – 6/30/2018:							
Average Monthly Pension	$ 0	$ 1,063	$ 2,133	$ 3,747	$ 4,847	$ 6,024	$ 7,717
Number of Recipients	0	4	18	19	35	30	3
Period 7/1/2016 – 6/30/2017:							
Average Monthly Pension	$ 0	$ 686	$ 2,075	$ 3,234	$ 4,462	$ 5,151	$ 6,376
Number of Recipients	0	8	9	28	41	23	14
Period 7/1/2015 – 6/30/2016:							
Average Monthly Pension	$ 0	$ 958	$ 1,742	$ 3,347	$ 4,622	$ 5,778	$ 7,221
Number of Recipients	0	6	11	19	30	28	16
Period 7/1/2014 – 6/30/2015:							
Average Monthly Pension	$ 0	$ 1,173	$ 1,621	$ 3,632	$ 4,436	$ 5,457	$ 6,863
Number of Recipients	0	8	9	26	24	25	7
Period 7/1/2013 – 6/30/2014:							
Average Monthly Pension	$ 290	$ 1,423	$ 2,002	$ 2,902	$ 4,014	$ 5,464	$ 6,299
Number of Recipients	1	9	10	14	22	16	7
Period 7/1/2012 – 6/30/2013:							
Average Monthly Pension	$ 0	$ 865	$ 1,779	$ 2,762	$ 3,793	$ 4,983	$ 4,911
Number of Recipients	0	9	8	19	31	18	4
Period 7/1/2011 – 6/30/2012:							
Average Monthly Pension	$ 0	$ 1,159	$ 1,161	$ 3,142	$ 3,504	$ 4,673	$ 5,079
Number of Recipients	0	13	13	12	20	17	7

"Average Monthly Pension" includes postretirement pension adjustments and cost-of-living increases.

Beneficiaries are not included in the table above.

Summary of New Pension Benefit Recipients

Others

During the Year Ending June 30	2017	2018	2019	2020	2021
Service					
1. Number	1,393	1,419	1,288	1,166	1,171
2. Average Age at Commencement	61.40	62.19	61.38	61.70	62.03
3. Average Monthly Pension Benefit	$ 2,404	$ 2,477	$ 2,540	$ 2,701	$ 2,693
Survivor (including surviving spouse and DROs)					
1. Number	292	261	238	297	391
2. Average Age at Commencement	67.12	70.38	69.25	72.09	72.34
3. Average Monthly Pension Benefit	$ 1,150	$ 1,120	$ 1,249	$ 1,204	$ 1,265
Disability					
1. Number	14	28	17	9	14
2. Average Age at Commencement	52.43	53.80	52.95	54.21	53.39
3. Average Monthly Pension Benefit	$ 2,405	$ 1,896	$ 2,313	$ 2,422	$ 2,587
Total					
1. Number	1,699	1,708	1,543	1,472	1,576
2. Average Age at Commencement	62.31	63.31	62.50	63.75	64.51
3. Average Monthly Pension Benefit	$ 2,189	$ 2,260	$ 2,339	$ 2,397	$ 2,338

Summary of New Pension Benefit Recipients

Others

	Years of Credited Service						
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+
Period 7/1/2020 – 6/30/2021:							
Average Monthly Pension	$ 553	$ 628	$ 1,317	$ 2,213	$ 3,091	$ 4,607	$ 6,054
Number of Recipients	17	163	228	281	194	188	114
Period 7/1/2019 – 6/30/2020:							
Average Monthly Pension	$ 492	$ 601	$ 1,311	$ 2,065	$ 3,040	$ 4,686	$ 6,213
Number of Recipients	32	165	218	258	183	197	122
Period 7/1/2018 – 6/30/2019:							
Average Monthly Pension	$ 652	$ 646	$ 1,301	$ 2,071	$ 3,058	$ 4,596	$ 5,685
Number of Recipients	21	190	266	289	222	205	105
Period 7/1/2017 – 6/30/2018:							
Average Monthly Pension	$ 414	$ 607	$ 1,299	$ 1,982	$ 3,034	$ 4,475	$ 6,085
Number of Recipients	26	221	351	280	223	214	127
Period 7/1/2016 – 6/30/2017:							
Average Monthly Pension	$ 381	$ 640	$ 1,271	$ 2,067	$ 3,119	$ 4,579	$ 6,224
Number of Recipients	27	254	375	233	212	191	115
Period 7/1/2015 – 6/30/2016:							
Average Monthly Pension	$ 434	$ 660	$ 1,240	$ 2,017	$ 3,059	$ 4,158	$ 6,583
Number of Recipients	30	323	387	266	192	161	135
Period 7/1/2014 – 6/30/2015:							
Average Monthly Pension	$ 430	$ 685	$ 1,260	$ 2,008	$ 3,086	$ 4,544	$ 6,195
Number of Recipients	42	284	304	213	198	169	98
Period 7/1/2013 – 6/30/2014:							
Average Monthly Pension	$ 503	$ 700	$ 1,189	$ 2,065	$ 3,021	$ 4,439	$ 5,490
Number of Recipients	48	347	319	241	214	224	121
Period 7/1/2012 – 6/30/2013:							
Average Monthly Pension	$ 414	$ 650	$ 1,179	$ 1,925	$ 2,879	$ 4,356	$ 5,208
Number of Recipients	59	349	365	257	206	209	132
Period 7/1/2011 – 6/30/2012:							
Average Monthly Pension	$ 407	$ 610	$ 1,147	$ 1,931	$ 2,805	$ 4,214	$ 5,076
Number of Recipients	67	351	314	204	208	188	106

“Average Monthly Pension” includes postretirement pension adjustments and cost-of-living increases.

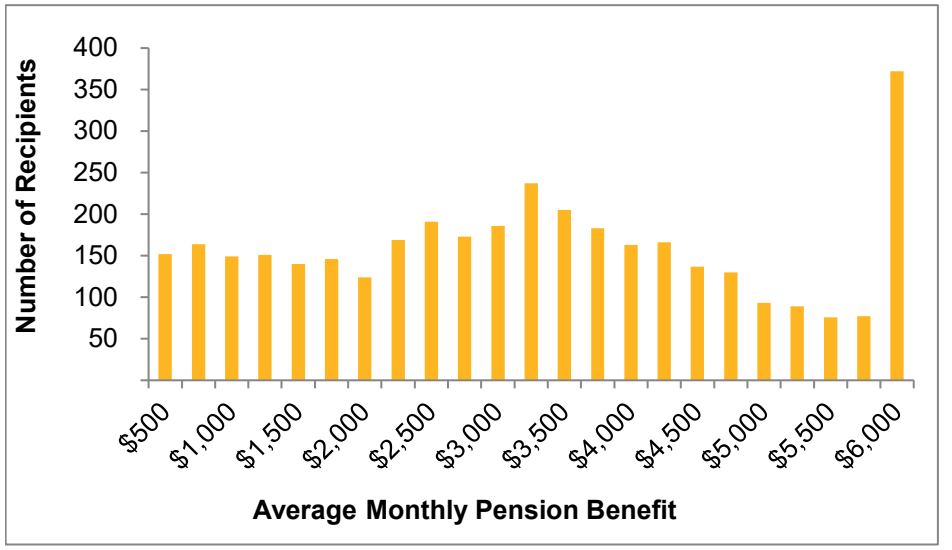
Beneficiaries are not included in the table above.

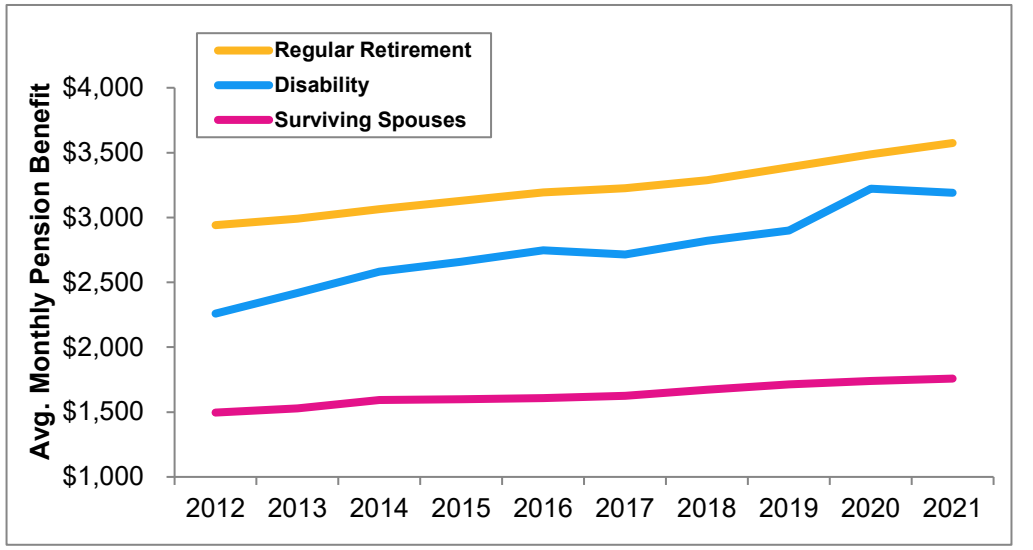
Section 4.7: Summary of All Pension Benefit Recipients

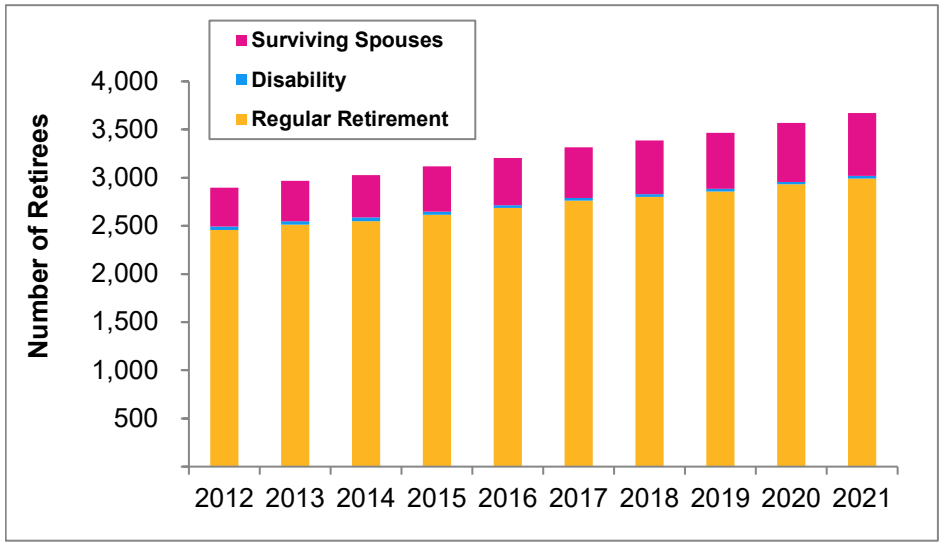
	Peace Officer / Firefighter	Others
Service		
1. Number as of June 30, 2020	2,931	29,590
2. Net Change During FY21	60	419
3. Number as of June 30, 2021	2,991	30,009
4. Average Age at Commencement	53.21	58.45
5. Average Current Age	68.46	71.24
6. Average Monthly Pension Benefit	$ 3,574	$ 2,057
Survivors (including surviving spouses and DROs)		
1. Number as of June 30, 2020	611	3,825
2. Net Change During FY21	45	97
3. Number as of June 30, 2021	656	3,922
4. Average Age at Commencement	57.93	63.52
5. Average Current Age	69.52	73.48
6. Average Monthly Pension Benefit	$ 1,758	$ 1,120
Disability		
1. Number as of June 30, 2020	26	123
2. Net Change During FY21	0	(10)
3. Number as of June 30, 2021	26	113
4. Average Age at Commencement	46.32	46.10
5. Average Current Age	51.35	55.06
6. Average Monthly Pension Benefit	$ 3,189	$ 1,970
Total		
1. Number as of June 30, 2020	3,568	33,538
2. Net Change During FY21	105	506
3. Number as of June 30, 2021	3,673	34,044
4. Average Age at Commencement	54.00	58.99
5. Average Current Age	68.53	71.44
6. Average Monthly Pension Benefit	$ 3,247	$ 1,949

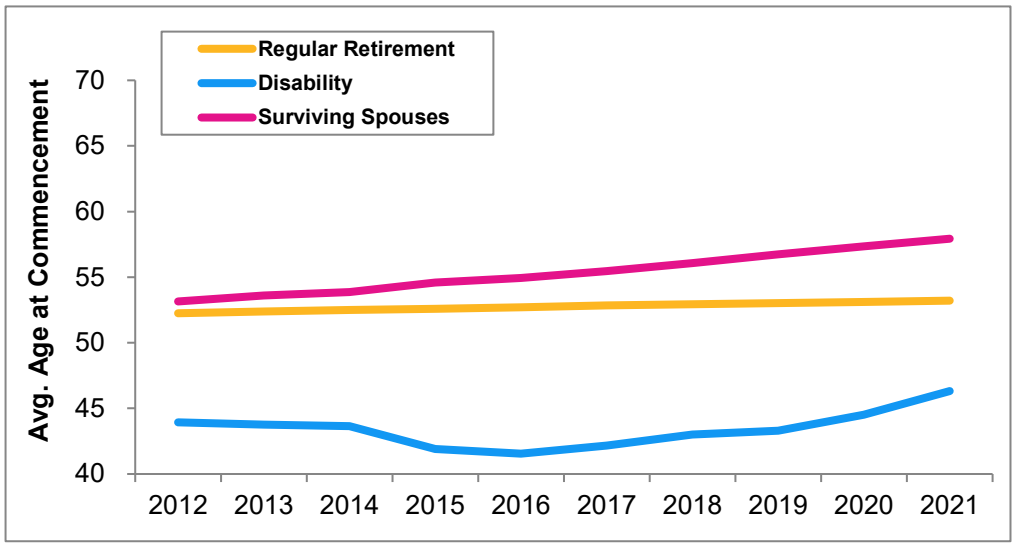
Summary of All Pension Benefit Recipients

Peace Officer / Firefighter



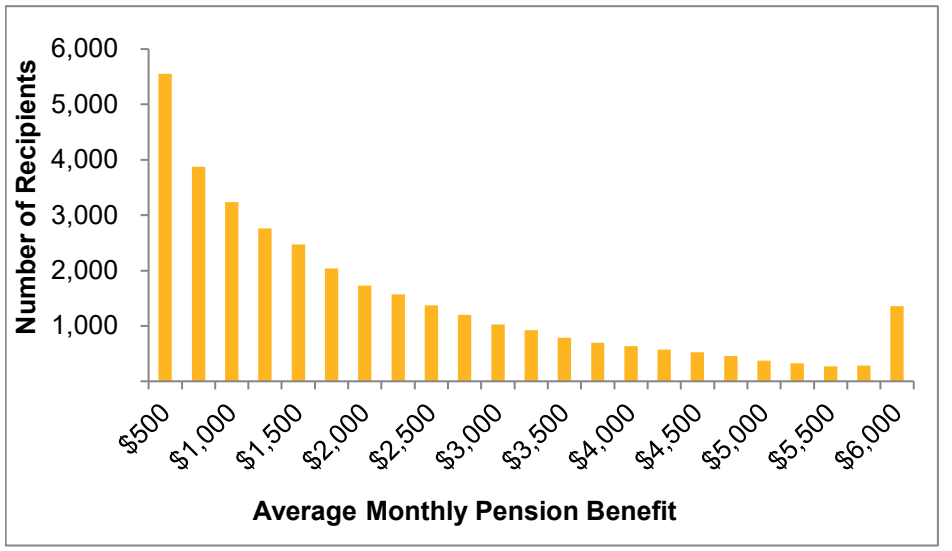


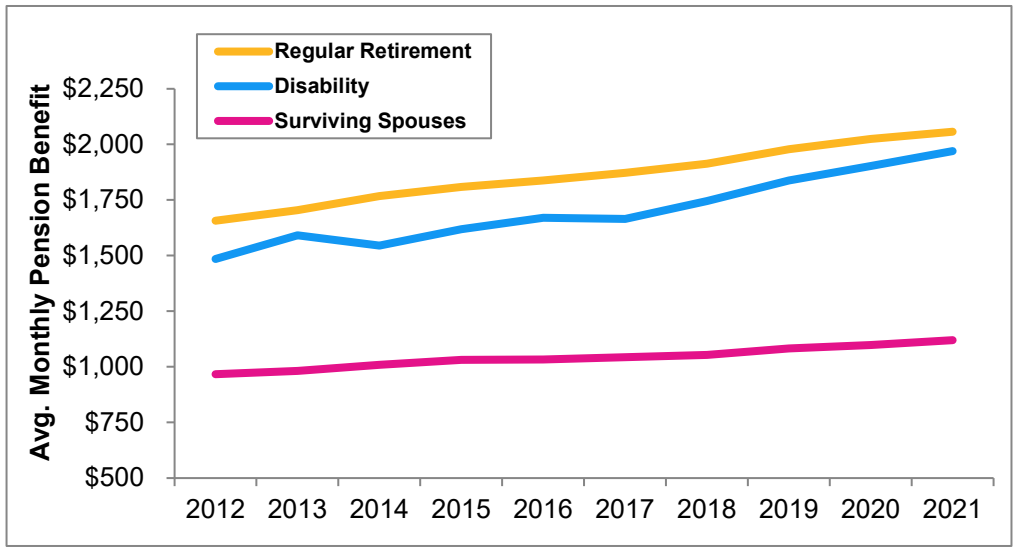


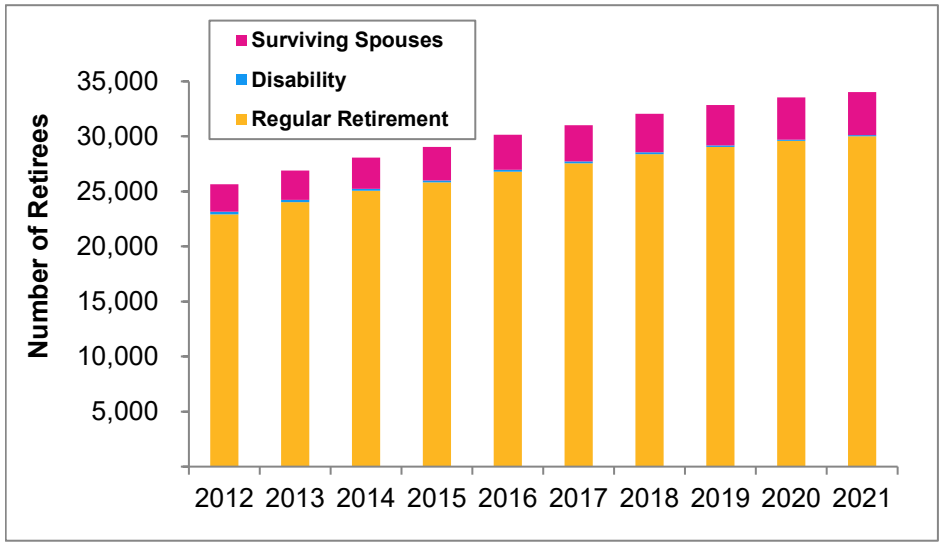


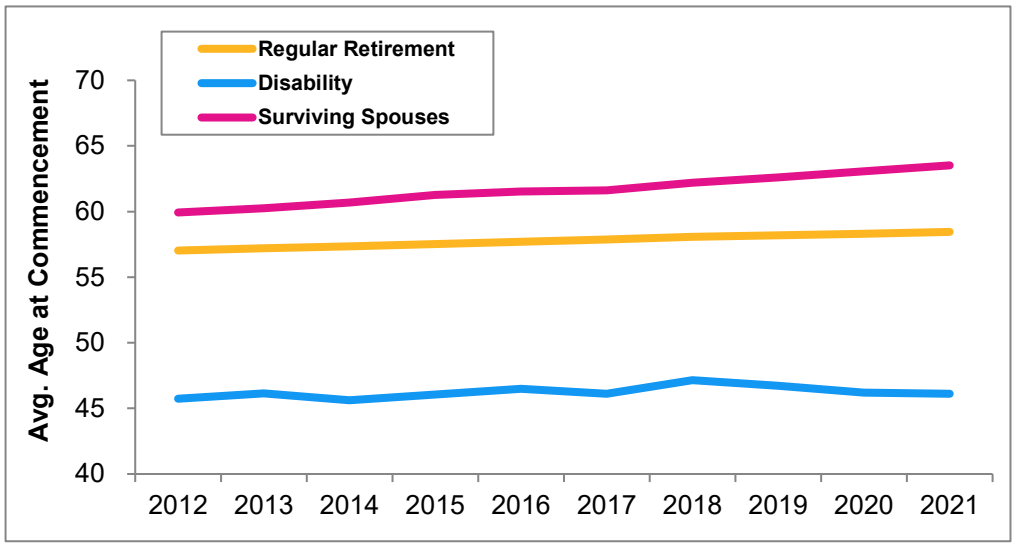
Summary of All Pension Benefit Recipients

Others









Summary of All Pension Benefit Recipients

Peace Officer / Firefighter

Annual Pension Benefit by Age

Age	Number	Total Annual Pension Benefit	Average Annual Pension Benefit
0 - 19	0	$ 0	$ 0
20 - 24	0	0	0
25 - 29	0	0	0
30 - 34	0	0	0
35 - 39	1	57,465	57,465
40 - 44	13	583,451	44,881
45 - 49	78	4,380,328	56,158
50 - 54	215	12,336,820	57,381
55 - 59	324	16,323,478	50,381
60 - 64	607	23,982,868	39,510
65 - 69	777	27,706,706	35,659
70 - 74	803	28,357,790	35,315
75+	855	29,388,739	34,373
Total	**3,673**	**$ 143,117,645**	**$ 38,965**

Annual Pension Benefit by Years Since Commenced

Years Since Comm.	Number	Total Annual Pension Benefit	Average Annual Pension Benefit
0	200	$ 10,277,339	$ 51,387
1	155	8,093,071	52,213
2	152	6,797,168	44,718
3	133	6,097,594	45,847
4	169	7,165,651	42,400
0 - 4	**809**	**$ 38,430,823**	**$ 47,504**
5 - 9	581	23,847,931	41,046
10 - 14	545	16,936,288	31,076
15 - 19	630	20,887,127	33,154
20 - 24	621	22,321,128	35,944
25 - 29	203	7,853,908	38,689
30 - 34	212	9,808,110	46,265
35 - 39	45	2,108,485	46,855
40+	27	923,845	34,216
Total	**3,673**	**$ 143,117,645**	**$ 38,965**

Years Since Commencement by Age

	Years Since Commencement									
Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total
0 - 19	0	0	0	0	0	0	0	0	0	0
20 - 24	0	0	0	0	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0	0	0	0	0
30 - 34	0	0	0	0	0	0	0	0	0	0
35 - 39	1	0	0	0	0	0	0	0	0	1
40 - 44	10	1	2	0	0	0	0	0	0	13
45 - 49	63	14	1	0	0	0	0	0	0	78
50 - 54	153	49	11	0	2	0	0	0	0	215
55 - 59	180	87	39	14	2	2	0	0	0	324
60 - 64	195	148	112	122	30	0	0	0	0	607
65 - 69	92	168	162	200	135	15	2	2	1	777
70 - 74	52	66	162	193	215	74	31	5	5	803
75+	63	48	56	101	237	112	179	38	21	855
Total	**809**	**581**	**545**	**630**	**621**	**203**	**212**	**45**	**27**	**3,673**

Summary of All Pension Benefit Recipients

Others

Annual Pension Benefit by Age

Age	Number	Total Annual Pension Benefit	Average Annual Pension Benefit
0 - 19	0	$ 0	$ 0
20 - 24	0	0	0
25 - 29	0	0	0
30 - 34	2	70,193	35,097
35 - 39	5	75,774	15,155
40 - 44	9	130,847	14,539
45 - 49	34	450,340	13,245
50 - 54	158	4,979,060	31,513
55 - 59	1,196	38,955,221	32,571
60 - 64	5,770	162,252,318	28,120
65 - 69	8,778	215,609,089	24,562
70 - 74	8,228	183,341,302	22,283
75+	9,864	190,225,443	19,285
Total	**34,044**	**$ 796,089,587**	**$ 23,384**

Annual Pension Benefit by Years Since Commenced

Years Since Comm.	Number	Total Annual Pension Benefit	Average Annual Pension Benefit
0	1,681	$ 47,044,071	$ 27,986
1	1,416	41,473,469	29,289
2	1,516	42,241,297	27,864
3	1,469	40,628,509	27,657
4	1,617	43,823,763	27,102
0 - 4	**7,699**	**$ 215,211,109**	**$ 27,953**
5 - 9	7,894	200,110,996	25,350
10 - 14	6,483	144,288,042	22,256
15 - 19	5,276	109,883,248	20,827
20 - 24	3,850	76,656,753	19,911
25 - 29	1,381	24,178,292	17,508
30 - 34	1,155	21,111,290	18,278
35 - 39	249	3,779,040	15,177
40+	57	870,817	15,277
Total	**34,044**	**$ 796,089,587**	**$ 23,384**

Years Since Commencement by Age

	Years Since Commencement									
Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total
0 - 19	0	0	0	0	0	0	0	0	0	0
20 - 24	0	0	0	0	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0	0	0	0	0
30 - 34	1	1	0	0	0	0	0	0	0	2
35 - 39	1	4	0	0	0	0	0	0	0	5
40 - 44	4	3	2	0	0	0	0	0	0	9
45 - 49	17	10	5	2	0	0	0	0	0	34
50 - 54	108	25	15	7	2	1	1	0	0	159
55 - 59	869	248	47	13	14	3	1	0	0	1,195
60 - 64	3,342	1,780	569	51	11	12	4	0	1	5,770
65 - 69	1,924	3,385	2,545	849	55	12	6	2	0	8,778
70 - 74	759	1,671	2,176	2,580	1,005	17	13	5	2	8,228
75+	674	767	1,124	1,774	2,763	1,336	1,130	242	54	9,864
Total	**7,699**	**7,894**	**6,483**	**5,276**	**3,850**	**1,381**	**1,155**	**249**	**57**	**34,044**

Section 4.8: Pension Benefit Recipients by Type of Benefit and Option Elected

Peace Officer / Firefighter

Amount of Monthly Pension Benefit	Number of Recipients	Type of Pension Benefit			Option Selected				
		1	2	3	1	2	3	4	5
$ 1 – 300	55	16	39	0	42	4	0	2	7
301 – 600	175	110	65	0	97	37	22	7	12
601 – 900	182	100	81	1	109	43	11	12	7
901 – 1,200	167	89	78	0	108	30	16	6	7
1,201 – 1,500	178	111	66	1	105	39	19	6	9
1,501 – 1,800	172	124	48	0	93	45	22	8	4
1,801 – 2,100	156	106	49	1	70	41	33	7	5
2,101 – 2,400	240	177	60	3	113	70	32	12	13
2,401 – 2,700	193	163	26	4	74	63	38	13	5
2,701 – 3,000	228	199	27	2	78	97	34	11	8
3,001 – 3,300	283	249	31	3	98	107	57	12	9
3,301 – 3,600	231	199	29	3	84	92	32	13	10
3,601 – 3,900	206	184	19	3	75	87	30	10	4
3,901 – 4,200	202	191	9	2	64	87	35	12	4
4,200+	1,005	972	30	3	271	479	179	67	9
Total	3,673	2,990	657	26	1,481	1,321	560	198	113

Type of Pension Benefit
1. Regular Retirement
2. Survivor Payment
3. Disability

Option Selected
1. Whole Life Annuity
2. 75% Joint and Contingent Annuity
3. 50% Joint and Contingent Annuity
4. 66 2/3% Joint and Survivor Annuity
5. Level Income Option

Pension Benefit Recipients by Type of Benefit and Option Elected

Others

Amount of Monthly Pension Benefit	Number of Recipients	Type of Pension Benefit			Option Selected				
		1	2	3	1	2	3	4	5
$ 1 – 300	2,112	1,553	558	1	1,038	386	282	62	344
301 – 600	5,102	4,260	836	6	2,709	1,170	814	256	153
601 – 900	4,240	3,530	700	10	2,238	1,030	675	181	116
901 – 1,200	3,491	3,004	480	7	1,738	843	669	160	81
1,201 – 1,500	2,972	2,587	368	17	1,480	750	563	109	70
1,501 – 1,800	2,378	2,113	254	11	1,103	672	462	84	57
1,801 – 2,100	2,049	1,836	197	16	951	550	396	93	59
2,101 – 2,400	1,759	1,599	149	11	781	504	348	81	45
2,401 – 2,700	1,475	1,357	101	17	648	415	307	57	48
2,701 – 3,000	1,270	1,181	86	3	552	392	254	41	31
3,001 – 3,300	1,084	1,026	56	2	429	352	233	42	28
3,301 – 3,600	918	877	38	3	365	288	202	45	18
3,601 – 3,900	791	762	27	2	313	273	156	34	15
3,901 – 4,200	717	690	27	0	284	229	158	30	16
4,200+	3,686	3,634	45	7	1,269	1,296	865	207	49
Total	34,044	30,009	3,922	113	15,898	9,150	6,384	1,482	1,130

Type of Pension Benefit
1. Regular Retirement
2. Survivor Payment
3. Disability

Option Selected
1. Whole Life Annuity
2. 75% Joint and Contingent Annuity
3. 50% Joint and Contingent Annuity
4. 66 2/3% Joint and Survivor Annuity
5. Level Income Option

Section 4.9: Pension Benefit Recipients Added to and Removed from Rolls

Peace Officer / Firefighter

Year Ended	Added to Rolls		Removed from Rolls		Rolls at End of Year		Percent Increase in Annual Pension Benefits	Average Annual Pension Benefit
	No.[1]	Annual Pension Benefits[1]	No.[1]	Annual Pension Benefits[1]	No.	Annual Pension Benefits		
June 30, 2021	191	$ 9,635,568	86	$ 2,931,719	3,673	$ 143,117,645	4.9%	$ 38,965
June 30, 2020	164	8,472,240	61	1,078,932	3,568	136,413,796	5.7%	38,233
June 30, 2019	149	6,713,940	71	233,335	3,465	129,020,488	5.3%	37,235
June 30, 2018	153	7,002,504	81	2,573,694	3,387	122,539,883	3.7%	36,179
June 30, 2017	165	6,971,580	54	2,132,027	3,315	118,111,073	4.3%	35,629
June 30, 2016	137	6,618,744	49	1,594,394	3,204	113,271,520	4.6%	35,353
June 30, 2015	136	5,617,344	46	633,046	3,116	108,247,168	4.8%	34,739
June 30, 2014	109	4,270,620	50	(145,771)	3,026	103,262,870	4.5%	34,125
June 30, 2013	113	4,162,920	42	240,775	2,967	98,846,479	4.1%	33,315
June 30, 2012	179	5,246,271	41	(177,568)	2,896	94,924,334	6.1%	32,778

[1] Numbers are estimated, and include other internal transfers.

Pension Benefit Recipients Added to and Removed from Rolls

Others

Year Ended	Added to Rolls		Removed from Rolls		Rolls at End of Year		Percent Increase in Annual Pension Benefits	Average Annual Pension Benefit
	No.[1]	Annual Pension Benefits[1]	No.[1]	Annual Pension Benefits[1]	No.	Annual Pension Benefits		
June 30, 2021	1,576	$ 44,216,256	1,070	$ 20,522,550	34,044	$ 796,089,587	3.1%	$ 23,384
June 30, 2020	1,472	42,340,608	779	9,911,423	33,538	772,395,881	4.4%	23,030
June 30, 2019	1,543	43,301,707	765	3,096,594	32,845	739,966,696	5.7%	22,529
June 30, 2018	1,708	46,316,673	673	10,533,376	32,067	699,761,583	5.4%	21,823
June 30, 2017	1,699	44,619,382	816	14,610,212	31,032	663,978,286	4.7%	21,397
June 30, 2016	1,780	44,409,702	660	12,099,362	30,149	633,969,116	5.4%	21,028
June 30, 2015	1,583	39,939,292	627	7,232,812	29,029	601,658,776	5.7%	20,726
June 30, 2014	1,778	44,823,611	603	3,011,383	28,073	568,952,296	7.9%	20,267
June 30, 2013	1,808	43,247,667	554	4,861,626	26,898	527,140,068	7.9%	19,598
June 30, 2012	1,679	37,855,250	636	5,344,239	25,644	488,754,027	7.1%	19,059

[1] Numbers are estimated, and include other internal transfers.

Section 5: Basis of the Actuarial Valuation

Section 5.1: Summary of Plan Provisions

Effective Date

January 1, 1961, with amendments through June 30, 2021. Chapter 82, 1986 Session Laws of Alaska, created a two-tier retirement system. Members who were first hired under PERS before July 1, 1986 (Tier 1) are eligible for different benefits than members hired after June 30, 1986 (Tier 2). Chapter 4, 1996 Session Laws of Alaska created a third tier for members who were first hired after June 30, 1996 (Tier 3). Chapter 9, 2005 Session Laws of Alaska, closed the plan to new members hired after June 30, 2006.

Administration of Plan

The Commissioner of Administration or the Commissioner's designee is the administrator of the system. The Attorney General of the state is the legal counsel for the system and shall advise the administrator and represent the system in legal proceedings.

Prior to June 30, 2005, the Public Employees' Retirement Board prescribed policies and adopted regulations and performed other activities necessary to carry out the provisions of the system. The Alaska State Pension Investment Board, Department of Revenue, Treasury Division was responsible for investing PERS funds.

On July 27, 2005, Senate Bill 141, enacted as Chapter 9, 2005 Session laws of Alaska, replaced the Public Employees' Retirement Board and the Alaska State Pension Investment Board with the Alaska Retirement Management Board.

Employers Included

Currently there are 151 employers participating in PERS, including the State of Alaska and 150 political subdivisions and public organizations. Two additional political subdivisions participate in PERS for healthcare benefits only.

Membership

PERS membership is mandatory for all permanent full-time and part-time employees of the State of Alaska and participating political subdivisions and public organizations, unless they are specifically excluded by Alaska Statute or employer participation agreements. Employees participating in the University of Alaska's Optional Retirement Plan or other retirement plans funded by the State are not covered by PERS. Elected officials may waive PERS membership.

Certain members of the Alaska Teachers' Retirement System (TRS) are eligible for PERS retirement benefits for their concurrent elected public official service with municipalities. In addition, employees who work half-time in PERS and TRS simultaneously are eligible for half-time PERS and TRS credit.

Senate Bill 141, signed into law on July 27, 2005, closes the plan effective July 1, 2006, to new members first hired on or after July 1, 2006.

Credited Service

Permanent employees who work at least 30 hours a week earn full-time credit; part-time employees working between 15 and 30 hours a week earn partial credit based upon the number of hours worked. Members receiving PERS occupational disability benefits continue to earn PERS credit while disabled. Survivors who are receiving occupational death benefits continue to earn PERS service credit while occupational survivor benefits are being paid.

Members may claim other types of service, including:

- part-time State of Alaska service rendered after December 31, 1960, and before January 1, 1976;
- service with the State, former Territory of Alaska, or U.S. Government in Alaska before January 1, 1961;
- past Peace Officer, correctional officer, fire fighter, and special officer service after January 1, 1961;
- military service (not more than five years may be claimed);
- temporary service after December 31, 1960;
- elected official service before January 1, 1981;
- Alaska Bureau of Indian Affairs service;
- past service rendered by employees who worked half-time in PERS and TRS simultaneously;
- leave without pay service after June 13, 1987, while receiving Workers' Compensation;
- Village Public Safety Officer service; and
- service as a temporary employee of the legislature before July 1, 1979, but this service must have been claimed no later than July 1, 2003, or by the date of retirement, if sooner (not more than ten years may be claimed).

Except for service before January 1, 1961, with the State, former Territory of Alaska, or U.S. Government in Alaska, contributions are required for all past service.

Past employment with participating political subdivisions that occurred before the employers joined PERS is creditable if the employers agree to pay the required contributions.

At the election of certain PERS members, certain service may be credited in the same fashion as members in TRS.

Members employed as dispatchers or within a state correctional facility may, at retirement, elect to convert their dispatcher or correctional facility service from “all other” service to Peace Officer/Firefighter service and retire under the 20-year retirement option. Members pay the full actuarial cost of conversion.

Employer Contributions

PERS employers contribute the amounts required, in addition to employees’ contributions, to fund the benefits of the system.

The normal cost rate is a uniform rate for all participating employers (less the value of members’ contributions).

The past service rate is a uniform rate for all participating employers to amortize the unfunded past service liability with payments that are a level percentage of payroll amount over a closed 25-year period starting June 30, 2014. Effective June 30, 2018, each future year’s unfunded service liability is separately amortized on a level percent of pay basis over 25 years.

Employer rates cannot be less than the normal cost rate.

Pursuant to AS 39.35.255 effective July 1, 2008 and subsequently amended on July 1, 2021, each non-state PERS employer will pay a simple uniform contribution rate of 22% of non-state member payroll and

the State as an employer will pay the total contribution rate, adopted by the Board, of State member payroll.

Additional State Contributions

Pursuant to AS 39.35.280 effective July 1, 2008, the State shall contribute an amount (in addition to the State contribution as an employer) that, when combined with the total employer contributions, will be sufficient to pay the total contribution rate adopted by the Board.

Member Contributions

Mandatory Contributions: Peace Officer/Firefighter members are required to contribute 7.5% of their compensation; all Others contribute 6.75%. Those all Others who have elected to have their service calculated under TRS rules contribute 9.76% of their compensation. Members' contributions are deducted from gross wages before federal income taxes are withheld.

Contributions for Claimed Service: Member contributions are also required for most of the claimed service described above.

Voluntary Contributions: Members may voluntarily contribute up to 5% of their salary on an after-tax basis. Voluntary contributions are recorded in a separate account and are payable to the:

a. member in lump sum payment upon termination of employment;
b. member's beneficiary if the member dies; or
c. member in a lump sum, life annuity, or payments over a designated period of time when the member retires.

Interest: Members' contributions earn 4.5% interest, compounded semiannually on June 30 and December 31.

Refund of Contributions: Terminated members may receive refunds of their member contribution accounts which includes their mandatory and voluntary contributions, indebtedness payments, and interest earned. Terminated members' accounts may be attached to satisfy claims under Alaska Statute 09.38.065, federal income tax levies, and valid Qualified Domestic Relations Orders.

Reinstatement of Contributions: Refunded accounts and the corresponding PERS service may be reinstated upon reemployment in PERS prior to July 1, 2010. Interest accrues on refunds until paid in full or members retire.

Retirement Benefits

Eligibility

a. Members, including deferred vested members, are eligible for normal retirement at age 55 or early retirement at age 50 if they were hired before July 1, 1986 (Tier 1), and age 60 or early retirement at age 55 if they were hired on or after July 1, 1986 (Tiers 2 & 3). Additionally, they must have at least:
   (i) five years of paid-up PERS service;
   (ii) 60 days of paid-up PERS service as employees of the legislature during each of five legislative sessions and they were first hired by the legislature before May 30, 1987;
   (iii) 80 days of paid-up PERS service as employees of the legislature during each of five legislative sessions and they were first hired by the legislature after May 29, 1987;
   (iv) two years of paid-up PERS service and they are vested in TRS; or
   (v) two years of paid-up PERS service and a minimum three years of TRS service to qualify for a public service benefit.

b. Members may retire at any age when they have:
   (i) 20 paid-up years of PERS Peace Officer/Firefighter service; or
   (ii) 30 paid-up years of PERS "all other" or "elected official" service.

Benefit Type

Lifetime benefits are paid to members. Eligible members may receive normal, unreduced benefits when they (1) reach normal retirement age and complete the service required; or (2) satisfy the minimum service requirements under the "20 and out" or "30 and out" provisions. Members may receive early, reduced benefits when they reach early retirement age and complete the service required. Benefits are reduced by 6% per year prior to a member's normal retirement date.

Members may select a joint and survivor option. Members who entered PERS prior to July 1, 1996 may also select a 66-2/3 last survivor option or a level income option. Under these options and early retirement, benefits are actuarially adjusted so that members receive the actuarial equivalents of their normal benefit amounts.

Benefit Calculations

Retirement benefits are calculated by multiplying the average monthly compensation (AMC) times credited PERS service times the percentage multiplier. The AMC is determined by averaging the salaries earned during the five highest (three highest for Peace Officer/Firefighter members or members hired prior to July 1, 1996) consecutive payroll years. Members must earn at least 115 days of credit in the last year worked to include it in the AMC calculation. PERS pays a minimum benefit of $25.00 per month for each year of service when the calculated benefit is less.

The percentage multipliers for Peace Officer/Firefighter members are 2% for the first ten years of service and 2.5% for all service over ten years.

The percentage multipliers for all Others are 2% for the first ten years, 2.25% for the next ten years, and 2.5% for all remaining service earned on or after July 1, 1986. All service before that date is calculated at 2%.

Salaries are subject to compensation limits under IRC 401(a)(17) for members first hired on or after July 1, 1996. Retirement benefit amounts are subject to IRC 415(b) limits regardless of hire date.

Indebtedness

Members who terminate and refund their PERS contributions are not eligible to retire unless they return to PERS employment and pay back their refunds plus interest or accrue additional service which qualifies them for retirement. PERS refunds must be paid in full if the corresponding service is to count toward the minimum service requirements for retirement. Refunded PERS service is included in total service for the purpose of calculating retirement benefits. However, when refunds are not completely paid before retirement, benefits are actuarially reduced for life. Indebtedness balances may also be created when a member purchases qualified claimed service.

Reemployment of Retired Members

Retirement and retiree healthcare benefits are suspended while retired members are reemployed under PERS. During reemployment, members earn additional PERS service and contributions are withheld from their wages. A member who retired with a normal retirement benefit can elect to waive payment of PERS contributions. The waiver allows the member to continue receiving the retirement benefit during the period of reemployment. Members who elect the waiver option do not earn additional PERS service. The Waiver Option first became effective July 1, 2005 and applies to reemployment periods after that date. The Waiver Option is not available to members who retired early or under the Retirement Incentive Programs (RIPs). The Waiver Option is no longer available after June 30, 2009.

Members retired under the Retirement Incentive Programs (RIPs) who return to employment will:

a. forfeit the three years of incentive credits that they received;

b. owe PERS 150% of the benefits that they received for state and political subdivision members, and 110% for school district employees, under the 1996-2000 RIP, which may include costs for health insurance, excluding amounts that they paid to participate for the 1986 and 1989 RIPs. Under prior RIPs, the penalty is 110% of the benefits received; and

c. be charged 7% interest from the date that they are reemployed until their indebtedness is paid in full or they retire again. If the indebtedness is not completely paid, future benefits will be actuarially reduced for life.

Employers make contributions to the unfunded liability of the plan on behalf of rehired retired members at the rate the employer is making contributions to the unfunded liability of the plan for other members.

Postemployment Healthcare Benefits

Major medical benefits are provided to retirees and their surviving spouses by PERS for all employees hired before July 1, 1986 (Tier 1) and disabled retirees. Employees hired after June 30, 1986 (Tier 2) and their surviving spouses with five years of credited service (or ten years of credited service for those first hired after June 30, 1996 (Tier 3)) must pay the full monthly premium if they are under age sixty and will receive benefits paid by PERS if they are over age sixty. Tier 3 Members with between five and ten years of credited service must pay the full monthly premium regardless of their age. Tier 2 and Tier 3 Members with less than five years of credited service are not eligible for postemployment healthcare benefits. Tier 2 Members who are receiving a conditional benefit and are age eligible are eligible for postemployment healthcare benefits. In addition, Peace Officers and their surviving spouses with twenty-five years of Peace Officer membership service, Other employees and their surviving spouses with thirty years of membership service, and any disabled member receive benefits paid by PERS, regardless of their age or date of hire.

Medical, prescription drug, dental, vision and audio coverage is provided through the AlaskaCare Retiree Health Plan. Health plan provisions do not vary by retirement tier or age, except for Medicare coordination. Participants in dental, vision, and audio coverage pay a full self-supporting rate and those benefits are not included in this valuation.

Starting in 2022, prior authorization will be required for certain specialty medications for all participants. There is no change to the medications that are covered by the plan.

Starting in 2022, certain preventive benefits for pre-Medicare participants will now be covered by the plan.

Surviving spouses continue coverage only if a pension payment form that provided survivor benefits was elected. Alternate payees (i.e. individuals who are the subject of a domestic relations order or DRO) are allowed to participate in the plan, but must pay the full cost.

Where premiums are required prior to age 60, the valuation bases this payment upon the age of the retiree.

Participants in the defined benefit plan are covered under the following benefit design:

Plan Feature	Amounts
Deductible (single/family)	$150 / $450
Coinsurance (most services)	20%
Outpatient surgery/testing	0%
Maximum Out-of-Pocket (single/family, excluding deductible)	$800 / $2,400
Rx Copays (generic/brand/mail-order), does not apply to OOP max	$4 / $8 / $0
Lifetime Maximum	$2,000,000

The plan coordinates with Medicare on a traditional Coordination of Benefits Method. Starting in 2019, the prescription drug coverage is through a Medicare Part D EGWP arrangement.

Disability Benefits

Monthly disability benefits are paid to permanently disabled members until they die, recover, or become eligible for normal retirement. Members are appointed to normal retirement on the first of the month after they become eligible.

Occupational Disability

Members are not required to satisfy age or service requirements to be eligible for occupational disability. Monthly benefits are equal to 40% of their gross monthly compensation on the date of their disability. Members on occupational disability continue to earn PERS service until they become eligible for normal retirement. Peace Officer/Firefighter members may elect to retain the disability benefit formula for the calculation of their normal retirement benefits.

At the time a disabled Peace Officer/Firefighter member retires, the retirement benefit will be increased by a percentage equal to the total cumulative percentage that has been applied to the disability benefit.

Non-occupational Disability

Members must be vested (five paid up years of PERS service) to be eligible for non-occupational disability benefits. Monthly benefits are calculated based on the member's average monthly compensation and PERS service on the date of termination from employment because of disability. Members do not earn PERS service while on non-occupational disability.

Death Benefits

Monthly death benefits may be paid to a spouse or dependent children upon the death of a member. If monthly benefits are not payable under the occupational and non-occupational death provisions, the designated beneficiary receives the lump sum benefit described below.

Occupational Death

When an active member (vested or non-vested) dies from occupational causes, a monthly survivor's pension may be paid to the spouse. The pension equals 40% of the member's gross monthly compensation on the date of death or disability, if earlier. If there is no spouse, the pension may be paid to the member's dependent children. On the member's normal retirement date, the benefit converts to a normal retirement benefit. The normal benefit is based on the member's salary on the date of death and service, including service accumulated from the date of the member's death to the normal retirement date. Survivors of Peace Officer/Firefighter members receive the greater of 50% of the member's gross monthly compensation on the date of death or disability, or 75% of the member's monthly normal retirement benefit (including service projected to Normal Retirement). If the member is unmarried with no children, a refund of contributions is payable to the estate.

Death after Occupational Disability

When a member dies while occupationally disabled, benefits are paid as described above in Occupational Death.

Non-Occupational Death

When a vested member dies from non-occupational causes, the surviving spouse may elect to receive a monthly 50% joint and survivor benefit or a lump sum benefit. The monthly benefit is calculated on the member's average monthly compensation and PERS service at the time of termination or death.

Lump Sum Non-Occupational Death Benefit

Upon the death of a member who has less than one year of service, the designated beneficiary receives the member's contribution account, which includes mandatory and voluntary contributions, indebtedness payments, and interest earned. If the member has more than one year of PERS service or is vested, the beneficiary also receives $1,000 and $100 for each year of PERS service.

Death After Retirement

When a retired member dies, the designated beneficiary receives the member's contribution account, less any benefits already paid and the member's last benefit check. If the member selected a survivor option at retirement, the eligible spouse receives continuing, lifetime monthly benefits.

Postretirement Pension Adjustments

Postretirement pension adjustments (PRPAs) are granted annually to eligible benefit recipients when the consumer price index (CPI) for urban wage earners and clerical workers for Anchorage increases during the preceding calendar year. PRPAs are calculated by multiplying the recipient's base benefit including past PRPAs, but excluding the Alaska COLA, times:

a. The lesser of 75% of the CPI increase in the preceding calendar year or 9%, if the recipient is at least age 65 or on PERS disability; or
b. The lesser of 50% of the CPI increase in the preceding calendar year or 6%, if the recipient is at least age 60, or under age 60 if the recipient has been receiving benefits for at least five years.

Ad hoc PRPAs, up to a maximum of 4%, may be granted to eligible recipients who were first hired before July 1, 1986 (Tier 1) if the CPI increases and the funded ratio is at least 105%.

In a year where an ad hoc PRPA is granted, eligible recipients will receive the higher of the two calculations.

Alaska Cost-of-Living Allowance (COLA)

Eligible benefit recipients who reside in Alaska receive an Alaska COLA equal to 10% of their base benefits or $50, whichever is more. The following benefit recipients are eligible:

a. members who first entered PERS before July 1, 1986 (Tier 1) and their survivors;
b. members who first entered PERS after June 30, 1986 (Tiers 2 & 3) and their survivors if they are at least age 65; and
c. all disabled members.

Changes in Benefit Provisions Valued Since the Prior Valuation

Starting in 2022, prior authorization will be required for certain specialty medications for all participants, and certain preventive benefits for pre-Medicare participants will now be covered by the plan.

Under SB 55 that was effective July 1, 2021: (i) The State-as-an-Employer contributes the full actuarial contribution rate based on the DB/DCR payroll of its employees (which is approximately 50% of the total PERS DB/DCR payroll); (ii) Non-State employers continue to contribute 22% of their DB/DCR payroll; (iii) the Additional State Contributions are based on the excess of the DB actuarial contribution rate and the DB contributions made by non-State employers.

There were no other changes in benefit provisions since the prior valuation.

Section 5.2: Description of Actuarial Methods and Valuation Procedures

The funding method used in this valuation was adopted by the Board in October 2006. Changes in methods were adopted by the Board in January 2019 based on the experience study for the period July 1, 2013 to June 30, 2017. The asset smoothing method used to determine valuation assets was changed effective June 30, 2014.

Benefits valued are those delineated in Alaska State statutes as of the valuation date. Changes in State statutes effective after the valuation date are not taken into consideration in setting the assumptions and methods.

Actuarial Cost Method

Liabilities and contributions shown in the report are computed using the Entry Age Normal Actuarial Cost Method, level percent of pay.

Effective June 30, 2018, the Board adopted a layered UAAL amortization method: Layer #1 equals the sum of (i) the UAAL at June 30, 2018 based on the 2017 valuation, plus (ii) the FY18 experience gain/loss. Layer #1 is amortized over the remainder of the 25-year closed period that was originally established in 2014[1]. Layer #2 equals the change in UAAL at June 30, 2018 due to the experience study and EGWP implementation. Layer #2 is amortized over a separate closed 25-year period starting in 2018. Future layers will be created each year based on the difference between actual and expected UAAL occurring that year, and will be amortized over separate closed 25-year periods. The UAAL amortization continues to be on a level percent of pay basis. State statutes allow the contribution rate to be determined on payroll for all members, defined benefit and defined contribution member payroll combined.

Projected pension and postemployment healthcare benefits were determined for all active members. Cost factors designed to produce annual costs as a constant percentage of each member's expected compensation in each year from the assumed entry age to the assumed retirement age were applied to the projected benefits to determine the normal cost (the portion of the total cost of the plan allocated to the current year under the method). The normal cost is determined by summing intermediate results for active members and determining an average normal cost rate which is then related to the total payroll of active members. The actuarial accrued liability for active members (the portion of the total cost of the plan allocated to prior years under the method) was determined as the excess of the actuarial present value of projected benefits over the actuarial present value of future normal costs.

The actuarial accrued liability for retired members and their beneficiaries currently receiving benefits, terminated vested members and disabled members not yet receiving benefits was determined as the actuarial present value of the benefits expected to be paid. No future normal costs are payable for these members.

The actuarial accrued liability under this method at any point in time is the theoretical amount of the fund that would have been accumulated had annual contributions equal to the normal cost been made in prior years (it does not represent the liability for benefits accrued to the valuation date). The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over the actuarial value of plan assets measured on the valuation date.

Under this method, experience gains or losses, i.e., decreases or increases in accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the unfunded actuarial accrued liability.

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[1] Layer #1 is referred to as “initial amount” in Sections 1.2 and 1.3.

Valuation of Assets

The actuarial asset value was reinitialized to equal Fair Value of Assets as of June 30, 2014. Beginning in FY15, the asset valuation method recognizes 20% of the gain or loss each year, for a period of five years. All assets are valued at fair value. Assets are accounted for on an accrued basis and are taken directly from financial statements audited by KPMG LLP.

Changes in Methods Since the Prior Valuation

There were no changes in the asset or valuation methods since the prior valuation.

Valuation of Retiree Medical and Prescription Drug Benefits

This section outlines the detailed methodology used in the internal model developed by Buck to calculate the initial per capita claims cost rates for the PERS postemployment healthcare plan. Note that the methodology reflects the results of our annual experience rate update for the period from July 1, 2020 to June 30, 2021.

Base claims cost rates are incurred healthcare costs expressed as a rate per member per year. Ideally, claims cost rates should be derived for each significant component of cost that can be expected to require differing projection assumptions or methods (i.e., medical claims, prescription drug claims, administrative costs, etc). Separate analysis is limited by the availability and historical credibility of cost and enrollment data for each component of cost. This valuation reflects non-prescription claims separated by Medicare status, including eligibility for free Part A coverage. Prescription costs are analyzed separately as in prior valuations. Administrative costs are assumed in the final per capita claims cost rates used for valuation purposes, as described below. Analysis to date on Medicare Part A coverage is limited since Part A claim data is not available by individual, nor is this status incorporated into historical claim data.

<u>Benefits</u>

Medical, prescription drug, dental, vision and audio coverage is provided through the AlaskaCare Retiree Health Plan and is available to employees of the State and subdivisions who meet retirement criteria based on the retirement plan tier in effect at their date of hire. Health plan provisions do not vary by retirement tier or age, except for Medicare coordination for those Medicare-eligible. Dental, vision and audio claims (DVA) are excluded from data analyzed for this valuation because those are retiree-pay all benefits where rates are assumed to be self-supporting. Buck relies upon rates set by a third-party for the DVA benefits. Buck reviewed historical rate-setting information and views contribution rate adjustments made are not unreasonable.

<u>Administration and Data Sources</u>

The plan was administered by Wells Fargo Insurance Services (acquired by HealthSmart, in January 2012) from July 1, 2009 through December 31, 2013 and by Aetna effective January 1, 2014.

Claims incurred for the period from July 2019 through June 2021 (FY20 through FY21) were provided by the State of Alaska from reports extracted from their data warehouse, which separated claims by Medicare status. Monthly enrollment data for the same period was provided by Aetna.

Aetna also provided census information identifying Medicare Part B only participants. These participants are identified when hospital claims are denied by Medicare; Aetna then flags that participant as a Part B only participant. Buck added newly identified participants to our list of Medicare Part B only participants. Buck assumes that once identified as Part B only, that participant remains in that status until we are notified otherwise.

Aetna provided a snapshot file as of July 1, 2021 of retirees and dependents that included a coverage level indicator. The monthly enrollment data includes double coverage participants. These are participants whereby both the retiree and spouse are retirees from the State and both are reflected with Couple coverage in the enrollment. In this case, such a couple would show up as four members in the

monthly enrollment (each would be both a retiree and a spouse). As a result, the snapshot census file was used to adjust the total member counts in the monthly enrollment reports to estimate the number of unique participants enrolled in coverage. Based on the snapshot files from the last two valuations, the total member count in the monthly enrollment reports needs to be reduced by approximately 13% to account for the number of participants with double coverage.

Aetna does not provide separate experience by Medicare status in standard reporting so the special reports mentioned above from the data warehouse were used this year to obtain that information and incorporate it into the per capita rate development for each year of experience (with corresponding weights applied in the final per capita cost).

Methodology

Buck projected historical claim data to FY22 for retirees using the following summarized steps:

1. Develop historical annual incurred claim cost rates – an analysis of medical costs was completed based on claims information and enrollment data provided by the State of Alaska and Aetna for each year in the experience period of FY20 through FY21.
    - Costs for medical services and prescriptions were analyzed separately, and separate trend rates were developed to project expected future medical and prescription costs for the valuation year (e.g. from the experience period up through FY22).
    - Because the reports provided reflected incurred claims, no additional adjustment was needed to determine incurred claims to be used in the valuation.
    - An offset for costs expected to be reimbursed by Medicare was incorporated beginning at age 65. Alaska retirees who do not have 40 quarters of Medicare-covered compensation do not qualify for Medicare Part A coverage free of charge. This is a relatively small and closed group. Medicare was applied to State employment for all employees hired after March 31, 1986. For the “no-Part A” individuals who are required to enroll in Medicare Part B, the State is the primary payer for hospital bills and other Part A services. Claim experience is not available separately for participants with both Medicare Parts A and B and those with Part B only. For Medicare Part B only participants, a lower average claims cost was applied to retirees covered by both Medicare Part A and B vs. retirees covered only by Medicare Part B based upon manual rate models that estimate the Medicare covered proportion of medical costs. To the extent that no-Part A claims can be isolated and applied strictly to the appropriate closed group, actuarial accrued liability will be more accurate.
    - Based on census data received from Aetna, less than 1% of the current retiree population was identified as having coverage only under Medicare Part B. We assume that 5% of actives hired before April 1, 1986 and current retirees who are not yet Medicare eligible will not be eligible for Medicare Part A.
    - Based upon a reconciliation of valuation census data to the snapshot eligibility files provided by Aetna as of July 1, 2020, and July 1, 2021, Buck adjusted member counts used for duplicate records where participants have double coverage; i.e. primary coverage as a retiree and secondary coverage as the covered spouse of another retiree. This is to reflect the total cost per distinct individual/member which is then applied to distinct members in the valuation census.
    - Buck understands that pharmacy claims reported do not reflect rebates. Based on actual pharmacy rebate information provided by Optum, rebates were assumed to be 19.5% of prescription drug claims for FY20, 16.2% of pre-Medicare, and 14.3% of Medicare prescription drug claims for FY21.
2. Develop estimated EGWP reimbursements – Segal provided estimated 2022 EGWP subsidies, developed with the assistance of OptumRx. These amounts are applicable only to Medicare-eligible participants.

3. Adjust for claim fluctuation, anomalous experience, etc. – explicit adjustments are often made for anticipated large claims or other anomalous experience. FY19 and FY20 experience were compared to assess the impact of COVID-19 and whether an adjustment to FY20 claims was indicated for use in the June 30, 2020 valuation. A material decrease in medical claims during March 2020 to June 2020 was experienced due to COVID-19. Therefore, an adjustment was made for those months to adjust for the decrease that is not expected to continue in future years. There was an observed spike in prescription drug claims in March 2020; however, the FY20 prescription drug experience appears reasonable to use without adjustment for COVID-19. To adjust for the decrease in medical claims due to COVID-19 during the last 4 months of FY20, the per capita cost during the first 8 months was used as the basis for estimating claims that would have occurred in the absence of COVID-19. FY21 experience was also thoroughly reviewed to assess the impact of COVID-19 and whether an adjustment to FY21 claims was appropriate for use in the June 30, 2021 valuation. FY21 medical per capita claims were noticeably lower than expected, so a 4% load was added to the FY21 medical claims used in the per capita claims cost development to better reflect future expected long-term costs of the plan. Total prescription drug claims experience for FY21 was reasonable and consistent with FY19 and FY20 experience. Therefore no adjustment was made to FY21 prescription drug claims. Due to group size and demographics, we did not make any additional large claim adjustments. We do blend both Alaska plan-specific and national trend factors as described below. Buck compared data utilized to lag reports and quarterly plan experience presentations provided by the State and Aetna to assess accuracy and reasonableness of data.

4. Trend all data points to the projection period – project prior years' experience forward to FY22 for retiree benefits on an incurred claim basis. Trend factors derived from historical Alaska-specific experience and national trend factors are shown in the table in item 5 below.

5. Apply credibility to prior experience – adjust prior year's data by assigning weight to recent periods, as shown at the right of the table below. The Board approved a change in the weighting of experience periods beginning with the June 30, 2017 valuation as outlined below. Note also that for FY20 to FY21 medical and both years of prescription drugs we averaged projected plan costs using Alaska-specific trend factors and national trend factors, assigning 75% weight to Alaska-specific trends and 25% to national trends. For FY21 to FY22 medical we applied 100% weight to national trends because the Alaska-specific trends were impacted by COVID-19:

Alaska-Specific and National Average Weighted Trend from Experience Period to Valuation Year

Experience Period	Medical	Prescription	Weighting Factors
FY20 to FY21	6.3% Pre-Medicare / 5.2% Medicare	7.6%	50%
FY21 to FY22	8.1% Pre-Medicare / 4.8% Medicare	8.0%	50%

Trend assumptions used for rate development are assessed annually and as additional/improved reporting becomes available, we will incorporate into rate development as appropriate.

6. Starting in 2022, prior authorization will be required for certain specialty medications. There is no change to the medications that are covered by the plan. Segal provided an estimate of the impact of this change to the DB retiree health plan cost for calendar year 2022. The DB base claims costs for pre-Medicare prescription drug, Medicare prescription drug, and EGWP were adjusted to reflect this change. Additionally, starting in 2022, certain preventive benefits for pre-Medicare participants will now be covered by the plan. Segal provided an estimate of the impact of this change to the DB retiree health plan cost for calendar year 2022. The DB base claims cost for pre-Medicare medical was adjusted to reflect this change.

7. Develop separate administration costs – no adjustments were made for internal administrative costs. Third party retiree plan administration fees for FY22 are based upon total fees projected to 2022 by Segal based on actual FY21 fees. The annual per participant per year administrative cost rate for medical and prescription benefits is $493.

Healthcare Reform

Healthcare Reform legislation passed on March 23, 2010 included several provisions with potential implications for the State of Alaska Retiree Health Plan liability. Buck evaluated the impact due to these provisions.

Because the State plan is retiree-only, and was in effect at the time the legislation was enacted, not all provisions of the health reform legislation apply to the State plan. Unlimited lifetime benefits and dependent coverage to age 26 are two of these provisions. We reviewed the impact of including these provisions, but there was no decision made to adopt them, and no requirement to do so.

Because Transitional Reinsurance fees are only in effect until 2016, we excluded these for valuation purposes.

The Further Consolidated Appropriations Act, 2020 passed in December 2019 repealed several healthcare-related taxes, including the Cadillac Tax.

The Tax Cuts and Jobs Act passed in December 2017 included the elimination of the individual mandate penalty and changed the inflation measure for purposes of determining the limits for the High Cost Excise Tax to use chained CPI. It is our understanding the law does not directly impact other provisions of the ACA. While the nullification of the ACA's individual mandate penalty does not directly impact employer group health plans, it could contribute to the destabilization of the individual market and increase the number of uninsured. Such destabilization could translate to increased costs for employers. We have considered this when setting our healthcare cost trend assumptions and will continue to monitor this issue.

We have not identified any other specific provisions of healthcare reform or its potential repeal that would be expected to have a significant impact on the measured obligation. We will continue to monitor legislative activity.

Data

In accordance with actuarial standards, we note the following specific data sources and steps taken to value retiree medical benefits:

The Division of Retirement and Benefits provided pension valuation census data, which for people currently in receipt of healthcare benefits was supplemented by coverage data from the healthcare claims administrator (Aetna).

Certain adjustments and assumptions were made to prepare the data for valuation:

- All records provided with retiree medical coverage on the Aetna data were included in this valuation and we relied on the Aetna data as the source of medical coverage for current retirees and their dependents.
- Some records in the Aetna data were duplicates due to the double coverage (i.e. coverage as a retiree and as a spouse of another retiree) allowed under the plan. Records were adjusted for these members so that each member was only valued once. Any additional value of the double coverage (due to coordination of benefits) is small and reflected in the per capita costs.
- Covered children included in the Aetna data were valued until age 23, unless disabled. We assumed that those dependents over 23 were only eligible and valued due to being disabled.
- For individuals included in the pension data expecting a future pension, we valued health benefits starting at the same point that the pension benefit is assumed to start.

We are not aware of any other data issues that would be expected to have a material impact on the results and there are no unresolved matters related to the data.

The chart below shows the basis of setting the per capita claims cost assumption, which includes both PERS and TRS.

	Medical		Prescription Drugs (Rx)	
	Pre-Medicare	Medicare	Pre-Medicare	Medicare
A. Fiscal 2020				
1. Incurred Claims	$ 229,531,664	$ 89,497,345	$ 64,442,660	$ 188,022,328
2. Adjustments for Rx Rebates	0	0	(12,566,319)	(36,664,354)
3. Net incurred claims	$ 229,531,664	$ 89,497,345	$ 51,876,341	$ 151,357,974
4. Average Enrollment	19,354	44,965	19,354	44,965
5. Claim Cost Rate (3) / (4)	11,860	1,990	2,680	3,366
6. Trend to Fiscal 2022	1.149	1.103	1.162	1.162
7. Fiscal 2022 Incurred Cost Rate (5) x (6)	$ 13,630	$ 2,195	$ 3,116	$ 3,912
B. Fiscal 2021				
1. Incurred Claims	$ 196,566,470	$ 86,512,435	$ 60,691,609	$ 207,822,858
2. Adjustments for Rx Rebates and COVID (Medical only)	7,862,659	3,460,497	(9,832,041)	(29,718,669)
3. Net incurred claims	$ 204,429,129	$ 89,972,933	$ 50,859,568	$ 178,104,189
4. Average Enrollment	18,106	47,025	18,106	47,025
5. Claim Cost Rate (3) / (4)	11,291	1,913	2,809	3,787
6. Trend to Fiscal 2022	1.081	1.048	1.080	1.080
7. Fiscal 2022 Incurred Cost Rate (5) x (6)	$ 12,205	$ 2,005	$ 3,034	$ 4,090

	Medical		Prescription Drugs (Rx)	
	Pre-Medicare	Medicare	Pre-Medicare	Medicare
C. Incurred Cost Rate by Fiscal Year				
1. Fiscal 2020 A.(7)	13,630	2,195	3,116	3,912
2. Fiscal 2021 B.(7)	12,205	2,005	3,034	4,090
D. Weighting by Fiscal Year				
1. Fiscal 2020	50%	50%	50%	50%
2. Fiscal 2021	50%	50%	50%	50%
E. Fiscal 2022 Incurred Cost Rate				
1. Rate at Average Age C x D	$ 12,918	$ 2,100	$ 3,075	$ 4,001
2. Average Aging Factor	0.822	1.271	0.832	1.124
3. Rate at Age 65 (1) / (2)	$ 15,708	$ 1,652	$ 3,695	$ 3,560
F. Development of Part A&B and Part B Only Cost from Pooled Rate Above				
1. Part A&B Average Enrollment		46,602		
2. Part B Only Average Enrollment		423		
3. Total Medicare Average Enrollment B(4)		47,025		
4. Cost ratio for those with Part B only to those with Parts A&B		3.300		
5. Factor to determine cost for those with Parts A&B (2) / (3) x (4) + (1) / (3) x 1.00		1.021		
6. Medicare per capita cost for all participants: E(3)		$ 1,652		
7. Cost for those eligible for Parts A&B: (6) / (5)		$ 1,619		
8. Cost for those eligible for Part B only: (7) x (4)		$ 5,341		

	Medical		Prescription Drugs (Rx)	
	Pre-Medicare	Medicare	Pre-Medicare	Medicare
1. Rate at Age 65	$ 15,708	$ 1,619	$ 3,695	$ 3,560
2. Adjustment factor for plan changes	1.39%	0.00%	-8.67%	-2.41%
3. Adjusted Rate at Age 65 (1) x [1 + (2)]	$ 15,926	$ 1,619	$ 3,375	$ 3,474

Following the development of total projected costs, a distribution of per capita claims cost was developed. This was accomplished by allocating total projected costs to the population census used in the valuation. The allocation was done separately for each of prescription drugs and medical costs for the Medicare eligible and pre-Medicare populations. The allocation weights were developed using participant counts by age and assumed morbidity and aging factors. Results were tested for reasonableness based on historical trend and external benchmarks for costs paid by Medicare.

Below are the results of this analysis:

Distribution of Per Capita Claims Cost by Age for the Period July 1, 2021 through June 30, 2022

Age	Medical and Medicare Parts A & B	Medical and Medicare Part B Only	Prescription Drug	Medicare EGWP Subsidy
45	$ 9,719	$ 9,719	$ 2,062	$ 0
50	10,996	10,996	2,449	0
55	12,441	12,441	2,908	0
60	14,076	14,076	3,133	0
65	1,619	5,341	3,474	1,131
70	1,877	6,192	3,836	1,249
75	2,176	7,178	4,235	1,379
80	2,402	7,925	4,130	1,345

Section 5.3: Summary of Actuarial Assumptions

The demographic and economic assumptions used in the June 30, 2021 valuation are described below. Unless noted otherwise, these assumptions were adopted by the Board in January 2019 based on the experience study for the period July 1, 2013 to June 30, 2017.

Investment Return

7.38% per year, net of investment expenses.

Salary Scale

Salary scale rates based upon the 2013-2017 actual experience (see Table 1).

Inflation – 2.50% per year.

Productivity – 0.25% per year.

Payroll Growth

2.75% per year (inflation + productivity).

Total Inflation

Total inflation as measured by the Consumer Price Index for urban and clerical workers for Anchorage is assumed to increase 2.50% annually.

Mortality (Pre-Commencement)

Mortality rates based upon the 2013-2017 actual experience.

RP-2014 employee table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Deaths are assumed to result from occupational causes 75% of the time for Peace Officer/Firefighters, and 40% of the time for Others.

Mortality (Post-Commencement)

Mortality rates based upon the 2013-2017 actual experience.

91% of male and 96% of female rates of RP-2014 healthy annuitant table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Turnover

Select and ultimate rates based upon the 2013-2017 actual experience (see Tables 2a and 2b).

Disability

Incidence rates based upon the 2013-2017 actual experience (see Tables 3a and 3b). Disability rates cease once a member is eligible for retirement.

Post-disability mortality in accordance with the RP-2014 disabled table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement. Disabilities are assumed to be occupational 75% of the time for Peace Officer/Firefighters, and 40% of the time for Others.

Retirement

Retirement rates based upon the 2013-2017 actual experience (see Tables 4a and 4b).

Deferred vested members are assumed to retire at their earliest unreduced retirement date.

The modified cash refund annuity is valued as a three-year certain and life annuity.

Spouse Age Difference

Males are assumed to be three years older than their wives. Females are assumed to be two years younger than husbands.

Percent Married for Pension

For Others, 75% of male members and 70% of female members are assumed to be married. For Peace Officer/Firefighters, 85% of male members and 60% of female members are assumed to be married.

Dependent Spouse Medical Coverage Election

Applies to members who do not have double medical coverage. For Others, 65% of male members and 60% of female members are assumed to be married and cover a dependent spouse. For Peace Officer/Firefighters, 75% of male members and 50% of female members are assumed to be married and cover a dependent spouse.

Dependent Children

- Pension: None
- Healthcare: Benefits for dependent children have been valued only for members currently covering their dependent children. These benefits are only valued through the dependent children's age 23 (unless the child is disabled).

Contribution Refunds

For Others, 5% of terminating members with vested benefits are assumed to have their contributions refunded.

For Peace Officers/Firefighters, 10% of terminating members with vested benefits are assumed to have their contributions refunded.

100% of those with non-vested benefits are assumed to have their contributions refunded.

Imputed Data

Data changes from the prior year which are deemed to have an immaterial impact on liabilities and contribution rates are assumed to be correct in the current year's client data. Non-vested terminations with appropriate refund dates are assumed to have received a full refund of contributions. Active members with missing salary and service are assumed to be terminated with status based on their vesting percentage.

Active Rehire Assumption

The Normal Cost used for determining contribution rates and in the projections includes a rehire assumption to account for anticipated rehires. The Normal Cost shown in the report includes the following assumptions (which were developed based on the five years of rehire loss experience through June 30, 2017). For projections, these assumptions were assumed to grade to zero uniformly over a 20-year period.

- Pension: 18.77%
- Healthcare: 17.09%

Re-Employment Option

All re-employed retirees are assumed to return to work under the Standard Option.

Active Data Adjustment

No adjustment was made to reflect participants who terminate employment before the valuation date and are subsequently rehired after the valuation date.

Alaska Cost-of-Living Adjustments (COLA)

Of those benefit recipients who are eligible for the Alaska COLA, 70% of Others and 65% of Peace Officers/Firefighters are assumed to remain in Alaska and receive the COLA.

Postretirement Pension Adjustment (PRPA)

50% and 75% of assumed inflation, or 1.25% and 1.875% respectively, is valued for the annual automatic PRPA as specified in the statute.

Expenses

The investment return assumption is net of investment expenses.

The Normal Cost as of June 30, 2021 was increased by the following amounts for administrative expenses (for projections, the percent increase was assumed to remain constant in future years):

- Pension: $7,625,000
- Healthcare: $5,531,000

Part-Time Status

Part-time employees are assumed to earn 1.00 years of credited service per year for Peace Officer/Firefighter and 0.75 years of credited service per year for Other members.

Service

Total credited service is provided by the State. This service is assumed to be the only service that should be used to calculate benefits. Additionally, the State provides claimed service (including Bureau of Indian Affairs Service). Claimed service is used for vesting and eligibility purposes as described in Section 5.1.

Final Average Earnings

Final Average Earnings is provided on the data for active members. This amount is used as a minimum in the calculation of the average earnings in the future.

Per Capita Claims Cost

Sample claims cost rates adjusted to age 65 for FY22 medical and prescription drugs are shown below. The prescription drug costs reflect the plan change to require prior authorization for certain specialty medications. The pre-Medicare medical cost reflects the coverage of additional preventive benefits.

	Medical	Prescription Drugs
Pre-Medicare	$ 15,926	$ 3,375
Medicare Parts A & B	$ 1,619	$ 3,474
Medicare Part B Only	$ 5,341	$ 3,474
Medicare Part D – EGWP	N/A	$ 1,131

Members are assumed to attain Medicare eligibility at age 65. All costs are for the 2022 fiscal year (July 1, 2021 – June 30, 2022).

The EGWP subsidy is assumed to increase in future years by the trend rates shown on the following pages. No future legislative changes or other events are anticipated to impact the EGWP subsidy. If any legislative or other changes occur in the future that impact the EGWP subsidy (which could either increase or decrease the plan's Actuarial Accrued Liability), those changes will be evaluated and quantified when they occur.

Third Party Administrator Fees

$493 per person per year; assumed to increase at 4.5% per year.

Medicare Part B Only

We assume that 5% of actives hired before April 1, 1986 and current retirees who are not yet Medicare eligible will not be eligible for Medicare Part A.

Healthcare Cost Trend

The table below shows the rate used to project the cost from the shown fiscal year to the next fiscal year. For example, 6.3% is applied to the FY22 pre-Medicare medical claims costs to get the FY23 medical claims costs.

	Medical Pre-65	Medical Post-65	Prescription Drugs / EGWP
FY22	6.3%	5.4%	7.1%
FY23	6.1%	5.4%	6.8%
FY24	5.9%	5.4%	6.4%
FY25	5.8%	5.4%	6.1%
FY26	5.6%	5.4%	5.7%
FY27-FY40	5.4%	5.4%	5.4%
FY41	5.3%	5.3%	5.3%
FY42	5.2%	5.2%	5.2%
FY43	5.1%	5.1%	5.1%
FY44	5.1%	5.1%	5.1%
FY45	5.0%	5.0%	5.0%
FY46	4.9%	4.9%	4.9%
FY47	4.8%	4.8%	4.8%
FY48	4.7%	4.7%	4.7%
FY49	4.6%	4.6%	4.6%
FY50+	4.5%	4.5%	4.5%

For the June 30, 2014 valuation and later, the updated Society of Actuaries' Healthcare Cost Trend Model is used to project medical and prescription drug costs. This model estimates trend amounts that are projected out for 80 years. The model has been populated with assumptions that are specific to the State of Alaska.

Aging Factors

Age	Medical	Prescription Drugs
0 – 44	2.0%	4.5%
45 – 54	2.5%	3.5%
55 – 64	2.5%	1.5%
65 – 74	3.0%	2.0%
75 – 84	2.0%	-0.5%
85 – 94	0.3%	-2.5%
95+	0.0%	0.0%

Retired Member Contributions for Medical Benefits

Currently contributions are required for PERS members who are under age 60 and have less than 30 years of service (25 for Peace Officer/Firefighter). Eligible Tier 1 members are exempt from contribution requirements. Annual FY22 contributions based on monthly rates shown below for calendar 2022 are assumed based on the coverage category for current retirees. The retiree only rate shown is used for current active and inactive members and spouses in Tier 2 or 3 who are assumed to retire prior to age 60 with less than 30 years of service and who are not disabled. For dependent children, we value 1/3 of the annual retiree contribution to estimate the per child rate based upon the assumed number of children in rates where children are covered.

Coverage Category	Calendar 2022 Annual Contribution	Calendar 2022 Monthly Contribution	Calendar 2021 Monthly Contribution
Retiree Only	$ 8,448	$ 704	$ 704
Retiree and Spouse	$ 16,896	$ 1,408	$ 1,408
Retiree and Child(ren)	$ 11,940	$ 995	$ 995
Retiree and Family	$ 20,388	$ 1,699	$ 1,699
Composite	$ 12,552	$ 1,046	$ 1,046

Trend Rate for Retired Member Medical Contributions

The table below shows the rate used to project the retired member medical contributions from the shown fiscal year to the next fiscal year. For example, 0.0% is applied to the FY22 retired member medical contributions to get the FY23 retired member medical contributions.

Trend Assumptions	
FY22	0.0%
FY23+	4.0%

Graded trend rates for retired member medical contributions are consistent with the rates used for the June 30, 2020 valuation. Actual FY22 retired member medical contributions are reflected in the valuation.

Healthcare Participation

100% of system paid members and their spouses are assumed to elect healthcare benefits as soon as they are eligible. 20% of non-system paid members and their spouses are assumed to elect healthcare benefits as soon as they are eligible.

Changes in Assumptions Since the Prior Valuation

Healthcare claim costs are updated annually as described in Section 5.2. The amounts included in the Normal Cost for administrative expenses were changed from $7,223,000 to $7,625,000 for pension, and from $4,934,000 to $5,531,000 for healthcare (based on the most recent two years of actual administrative expenses paid from plan assets).

Table 1: Salary Scales

Peace Officer / Firefighter		Others	
Years of Service	Percent Increase	Years of Service	Percent Increase
0	7.75%	0	6.75%
1	7.25%	1	6.25%
2	6.75%	2	5.75%
3	6.25%	3	5.25%
4	5.75%	4	4.75%
5	5.25%	5	4.25%
6	4.75%	6	3.75%
7	4.25%	7	3.65%
8	3.75%	8	3.55%
9	3.65%	9	3.45%
10	3.55%	10	3.35%
11	3.45%	11	3.25%
12	3.35%	12	3.15%
13	3.25%	13	3.05%
14	3.15%	14	2.95%
15	3.05%	15	2.85%
16	2.95%	16	2.75%
17	2.85%	17	2.75%
18+	2.75%	18+	2.75%

Table 2a: Turnover Rates for Peace Officer / Firefighter

Select Rates during the First 5 Years of Employment

Years of Service	Male	Female
0	15.00%	15.00%
1	12.00%	8.00%
2	7.20%	6.40%
3	5.67%	5.60%
4	6.48%	7.20%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female	Age	Male	Female
< 23	4.70%	6.80%	39	2.04%	2.98%
23	4.46%	6.80%	40	1.68%	3.39%
24	4.22%	6.80%	41	1.67%	3.37%
25	3.98%	6.80%	42	1.67%	3.36%
26	3.74%	6.80%	43	1.71%	3.33%
27	3.50%	6.80%	44	1.76%	3.31%
28	3.32%	6.63%	45	1.81%	3.28%
29	3.14%	6.46%	46	1.85%	3.25%
30	2.96%	6.29%	47	1.90%	3.23%
31	2.79%	6.12%	48	2.22%	3.19%
32	2.61%	5.95%	49	2.53%	3.15%
33	2.50%	5.36%	50	3.18%	6.42%
34	2.39%	4.77%	51	4.24%	6.32%
35	2.28%	4.18%	52	4.24%	6.19%
36	2.17%	3.60%	53	4.24%	6.04%
37	2.06%	3.01%	54	4.24%	3.00%
38	2.05%	2.99%	55+	3.00%	2.00%

Table 2b: Turnover Rates for Others

Select Rates during the First 5 Years of Employment

Hire Age Under 35			Hire Age Over 35		
Years of Service	Male	Female	Years of Service	Male	Female
0	29.00%	29.00%	0	20.00%	20.00%
1	16.25%	20.00%	1	12.00%	15.00%
2	13.00%	16.00%	2	10.00%	12.50%
3	10.40%	12.80%	3	8.50%	10.00%
4	8.45%	10.40%	4	8.50%	9.00%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female	Age	Male	Female
< 23	11.40%	12.99%	39	5.47%	5.23%
23	10.83%	12.21%	40	4.86%	5.65%
24	10.26%	11.43%	41	4.71%	5.51%
25	9.69%	10.65%	42	4.56%	5.38%
26	9.12%	9.87%	43	4.50%	5.19%
27	8.55%	9.09%	44	4.44%	4.99%
28	8.30%	8.72%	45	4.39%	4.80%
29	8.05%	8.34%	46	4.33%	4.60%
30	7.80%	7.97%	47	4.27%	4.41%
31	7.54%	7.60%	48	4.26%	4.40%
32	7.29%	7.23%	49	4.24%	4.39%
33	6.99%	6.88%	50	3.63%	4.45%
34	6.69%	6.53%	51	3.60%	4.43%
35	6.39%	6.17%	52	3.56%	4.40%
36	6.10%	5.82%	53	3.52%	4.37%
37	5.80%	5.47%	54	4.17%	6.20%
38	5.63%	5.35%	55+	3.00%	5.00%

Table 3a: Disability Rates for Peace Officer / Firefighter

Age	Male	Female	Age	Male	Female
< 23	0.0179%	0.0112%	46	0.1247%	0.0780%
23	0.0244%	0.0153%	47	0.1337%	0.0836%
24	0.0310%	0.0194%	48	0.1462%	0.0914%
25	0.0374%	0.0234%	49	0.1588%	0.0993%
26	0.0440%	0.0275%	50	0.1714%	0.1071%
27	0.0505%	0.0316%	51	0.1839%	0.1150%
28	0.0526%	0.0329%	52	0.1965%	0.1228%
29	0.0548%	0.0343%	53	0.2294%	0.1434%
30	0.0570%	0.0356%	54	0.2624%	0.1640%
31	0.0591%	0.0370%	55	0.2954%	0.1846%
32	0.0612%	0.0383%	56	0.3283%	0.2052%
33	0.0634%	0.0397%	57	0.3613%	0.2258%
34	0.0657%	0.0411%	58	0.4112%	0.2570%
35	0.0679%	0.0425%	59	0.4611%	0.2882%
36	0.0702%	0.0439%	60	0.5110%	0.3194%
37	0.0724%	0.0453%	61	0.5610%	0.3506%
38	0.0757%	0.0473%	62	0.6109%	0.3818%
39	0.0789%	0.0493%	63	0.6109%	0.3818%
40	0.0822%	0.0514%	64	0.6109%	0.3818%
41	0.0854%	0.0534%	65	0.6109%	0.3818%
42	0.0886%	0.0554%	66	0.6109%	0.3818%
43	0.0977%	0.0611%	67	0.6109%	0.3818%
44	0.1066%	0.0667%	68	0.4073%	0.2546%
45	0.1157%	0.0723%	69	0.2036%	0.1273%
			70+	0.2036%	0.1273%

Table 3b: Disability Rates for Others

Age	Male	Female	Age	Male	Female
< 23	0.0327%	0.0376%	46	0.1125%	0.1154%
23	0.0360%	0.0400%	47	0.1208%	0.1236%
24	0.0392%	0.0424%	48	0.1329%	0.1360%
25	0.0425%	0.0448%	49	0.1451%	0.1484%
26	0.0456%	0.0472%	50	0.1572%	0.1608%
27	0.0489%	0.0496%	51	0.1694%	0.1734%
28	0.0501%	0.0510%	52	0.1815%	0.1858%
29	0.0513%	0.0524%	53	0.2132%	0.2168%
30	0.0524%	0.0538%	54	0.2450%	0.2478%
31	0.0536%	0.0554%	55	0.2766%	0.2788%
32	0.0548%	0.0568%	56	0.3084%	0.3098%
33	0.0566%	0.0586%	57	0.3401%	0.3408%
34	0.0584%	0.0606%	58	0.4068%	0.4096%
35	0.0602%	0.0624%	59	0.4736%	0.4784%
36	0.0620%	0.0644%	60	0.5405%	0.5470%
37	0.0638%	0.0662%	61	0.6072%	0.6158%
38	0.0669%	0.0696%	62	0.6740%	0.6844%
39	0.0701%	0.0728%	63	0.8526%	0.8450%
40	0.0734%	0.0762%	64	1.0314%	1.0054%
41	0.0765%	0.0794%	65	1.2101%	1.1660%
42	0.0797%	0.0826%	66	1.3889%	1.3264%
43	0.0879%	0.0908%	67	1.5675%	1.4870%
44	0.0962%	0.0990%	68	1.0451%	0.9914%
45	0.1043%	0.1072%	69	0.5225%	0.4956%
			70+	0.5225%	0.4956%

Table 4a: Retirement Rates for Peace Officer / Firefighter

	Reduced		Unreduced	
Age	Male	Female	Male	Female
< 47	N/A	N/A	8.80%	6.00%
47	N/A	N/A	8.80%	15.00%
48	N/A	N/A	14.30%	15.00%
49	N/A	N/A	14.30%	15.00%
50	5.00%	5.00%	16.50%	15.00%
51	5.00%	7.00%	16.50%	15.00%
52	7.00%	7.00%	20.35%	15.00%
53	7.00%	7.00%	20.35%	15.00%
54	7.00%	35.00%	20.35%	25.00%
55	7.00%	8.00%	27.50%	20.00%
56	7.00%	8.00%	27.50%	15.00%
57	7.00%	8.00%	27.50%	15.00%
58	7.00%	8.00%	27.50%	15.00%
59	20.00%	20.00%	27.50%	15.00%
60	N/A	N/A	33.00%	25.00%
61	N/A	N/A	27.50%	20.00%
62	N/A	N/A	27.50%	30.00%
63	N/A	N/A	27.50%	50.00%
64	N/A	N/A	22.00%	50.00%
65	N/A	N/A	22.00%	50.00%
66	N/A	N/A	27.50%	50.00%
67	N/A	N/A	55.00%	50.00%
68	N/A	N/A	55.00%	50.00%
69	N/A	N/A	55.00%	50.00%
70+	N/A	N/A	100.00%	100.00%

Table 4b: Retirement Rates for Others

	Reduced		Unreduced	
Age	Male	Female	Male	Female
< 50	N/A	N/A	11.00%	11.00%
50	6.00%	8.00%	33.00%	38.50%
51	6.00%	8.00%	35.75%	38.50%
52	9.00%	8.00%	35.75%	38.50%
53	6.00%	8.00%	35.75%	38.50%
54	20.00%	15.00%	38.50%	38.50%
55	6.00%	6.00%	33.00%	33.00%
56	6.00%	6.00%	22.00%	22.00%
57	6.00%	6.00%	22.00%	19.80%
58	6.00%	6.00%	22.00%	19.80%
59	15.00%	20.00%	22.00%	19.80%
60	N/A	N/A	22.00%	23.10%
61	N/A	N/A	22.00%	22.00%
62	N/A	N/A	22.00%	22.00%
63	N/A	N/A	22.00%	22.00%
64	N/A	N/A	22.00%	22.00%
65	N/A	N/A	24.75%	28.60%
66	N/A	N/A	27.50%	28.60%
67	N/A	N/A	22.00%	24.20%
68	N/A	N/A	24.75%	24.20%
69	N/A	N/A	27.50%	24.20%
70	N/A	N/A	27.50%	24.20%
71	N/A	N/A	27.50%	24.20%
72	N/A	N/A	27.50%	27.50%
73	N/A	N/A	27.50%	27.50%
74	N/A	N/A	27.50%	38.50%
75	N/A	N/A	55.00%	55.00%
76	N/A	N/A	55.00%	55.00%
77	N/A	N/A	55.00%	55.00%
78	N/A	N/A	55.00%	55.00%
79	N/A	N/A	55.00%	55.00%
80+	N/A	N/A	100.00%	100.00%

Section 6: Actuarial Standard of Practice No. 51

Funding future retirement benefits prior to when those benefits become due involves assumptions regarding future economic and demographic experience. These assumptions are applied to calculate actuarial liabilities, current contribution requirements, and the funded status of the plan. However, to the extent future experience deviates from the assumptions used, variations will occur in these calculated values. These variations create risk to the plan. Understanding the risks to the funding of the plan is important.

Actuarial Standard of Practice No. 51 (ASOP 51)[1] requires certain disclosures of potential risks to the plan and provides useful information for intended users of actuarial reports that determine plan contributions or evaluate the adequacy of specified contribution levels to support benefit provisions.

Under ASOP 51, risk is defined as the potential of actual future measurements deviating from expected future measurements resulting from actual future experience deviating from actuarially assumed experience.

It is important to note that not all risk is negative, but all risk should be understood and accepted based on knowledge, judgement, and educated decisions. Future measurements may deviate in ways that produce positive or negative financial impacts to the plan.

In the actuary's professional judgment, the following risks may reasonably be anticipated to significantly affect the pension plan's future financial condition and contribution requirements.

- Investment Risk – potential that the investment return will be different than the 7.38% expected in the actuarial valuation
- Contribution Risk – potential that the contribution actually made will be different than the actuarially determined contribution
- Long-Term Return on Investment Risk – potential that changes in long-term capital market assumptions or the plan's asset allocation will create the need to update the long-term return on investment assumption
- Longevity Risk – potential that participants live longer than expected compared to the valuation mortality assumptions
- Salary Increase Risk – potential that future salaries will be different than expected in the actuarial valuation
- Inflation Risk – potential that the consumer price index (CPI) for urban wage earners and clerical workers for Anchorage is different than the 2.5% assumed in the valuation
- Other Demographic Risk – potential that other demographic experience will be different than expected

The following information is provided to comply with ASOP 51 and furnish beneficial information on potential risks to the plan. **This list is not all-inclusive**; it is an attempt to identify the more significant risks and how those risks might affect the results shown in this report.

Note that ASOP 51 does not require the actuary to evaluate the ability or willingness of the plan sponsor to make contributions to the plan when due, or to assess the likelihood or consequences of potential future changes in law. In addition, this valuation report is not intended to provide investment advice or to provide guidance on the management or reduction of risk.

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[1] ASOP 51 does not apply to the healthcare portion of the plan. Accordingly, all figures in this section relate to the pension portion.

Assessment of Risks

Investment Risk

Plan costs are very sensitive to the market return.

- Any return on assets lower than assumed will increase costs.
- The plan uses an actuarial value of assets that smooths gains and losses on market returns over a five-year period to help control some of the volatility in costs due to investment risk.
- Historical experience of actual returns is shown in Section 2.4 of this report. This historical experience illustrates how returns can vary over time.

Contribution Risk

There is a risk to the plan when the employer's and/or State's actual contribution amount and the actuarially determined contribution differ.

- If the actual contribution is lower than the actuarially determined contribution, the plan may not be sustainable in the long term.
- Any underpayment of the contribution will increase future contribution amounts to help pay off the additional Unfunded Actuarial Accrued Liability associated with the underpayment(s).
- As long as the Board consistently adopts the actuarially determined contributions, this risk is mitigated due to Alaska statutes requiring the State to contribute additional funds necessary to pay the total contributions adopted by the Board.

Long-Term Return on Investment Risk

Inherent in the long-term return on investment assumption is the expectation that the current rate will be used until the last benefit payment of the plan is made. There is a risk that sustained changes in economic conditions, changes in long-term future capital market assumptions, or changes to the plan's asset allocation will necessitate an update to the long-term return on investment assumption used.

- Under a lower long-term return on investment assumption, less investment return is available to pay plan benefits. This may lead to a need for increased employer contributions.
- The liabilities will be higher at a lower assumed rate of return because future benefits will have a lower discount rate applied when calculating the present value.
- A 1% decrease in the long-term return on investment assumption will increase actuarial accrued liability by approximately 11%.
- This risk may be increased due to the plan being closed to new entrants. As the plan continues to mature, the magnitude of negative cash flow discussed in the Plan Maturity Measures later in this section will grow, thereby creating a need for more liquid assets that may not garner the same long-term return as currently assumed.

Longevity Risk

Plan costs will be increased as participants are expected to live longer.

- Benefits are paid over a longer lifetime when life expectancy is expected to increase. The longer duration of payments leads to higher liabilities.
- Health care has been improving, which affects the life expectancy of participants. As health care improves, leading to longer life expectancies, costs to the plan could increase.

- The mortality assumption for the plan mitigates this risk by assuming future improvement in mortality. However, any improvement in future mortality greater than that expected by the current mortality assumption would lead to increased costs for the plan.
- The Postretirement Pension Adjustments and Alaska Cost-of-Living Allowance increase longevity risk because members who live longer than expected will incur more benefit payment increases than expected and therefore increase costs.

Salary Increase Risk

Plan costs will be increased if actual salary increases are larger than expected.

- Higher-than-expected salary increases will produce higher benefits.
- The higher benefits may be partially offset by increased employee contributions due to higher salaries.
- If future payroll grows at a rate different than assumed, contributions as a percentage of payroll will be affected.

Inflation Risk

Plan costs will be increased if the actual CPI for Anchorage is greater than the 2.5% assumed in the valuation.

- Retirement benefits will be greater than expected if the CPI is greater than the assumed rate, which will increase costs.
- This risk is mitigated by the 75% and 50% of CPI provisions and the 9% and 6% maximums.
- This risk is also mitigated by the age and time in payment requirements to receive an increase.
- Inflation risk may be associated with the interaction of inflation with other assumptions, but this is not significant as a standalone assumption, and therefore is considered as part of the associated assumption risk instead of being discussed here.

Other Demographic Risk

The plan is subject to risks associated with other demographic assumptions (e.g., retirement, termination, and retired members remaining in Alaska assumptions). Differences between actual and expected experience for these assumptions tend to have less impact on the overall costs of the plan. The demographic assumptions used in the valuation are re-evaluated regularly as part of the four-year experience studies to ensure the assumptions are consistent with long-term expectations.

Historical Information

Monitoring certain information over time may help understand risks faced by the plan. Historical information is included throughout this report. Some examples are:

- Funded Ratio History shown in the Executive Summary illustrates how the plan's funded status (comparison of actuarial accrued liabilities to actuarial value of assets) has changed over time.
- Section 1.6 shows historical analysis of financial experience including how contribution rates have changed over time.
- Section 2.4 shows the volatility of asset returns over time.
- Section 4 includes various historical information showing how member census data has changed over time.

Plan Maturity Measures

There are certain measures that may aid in understanding the significant risks to the plan.

Ratio of Retired Liability to Total Liability ($'s in $000's)	June 30, 2020	June 30, 2021
1. Retiree and Beneficiary Accrued Liability	$ 10,472,466	$ 10,774,140
2. Total Accrued Liability	$ 15,279,525	$ 15,419,975
3. Ratio, (1) ÷ (2)	68.5%	69.9%

A high percentage of liability concentrated on participants in pay status indicates a mature plan (often a ratio above 60% - 65%). Because the plan was closed to new entrants in 2006, we expect the percentage in item #3 to continue to increase over time. An increasing percentage may indicate a need for a less risky asset allocation, which may lead to a lower long-term return on asset assumption and increased costs. Higher percentages may also indicate greater investment risk as benefit payments may be greater than contributions creating an increased reliance on investment returns. This ratio should be monitored each year in the future.

Ratio of Cash Flow to Assets ($'s in $000's)	FYE June 30, 2020	FYE June 30, 2021
1. Contributions	$ 504,029	$ 586,737
2. Benefit Payments	895,523	930,006
3. Cash Flow, (1) - (2)	$ (391,494)	$ (343,269)
4. Fair Value of Assets	$ 9,469,161	$ 11,912,309
5. Ratio, (3) ÷ (4)	(4.1%)	(2.9%)

When this cash flow ratio is negative, more cash is being paid out than deposited in the trust. Negative cash flow indicates the trust needs to rely on investment returns to cover benefit payments and / or may need to invest in more liquid assets to cover the benefit payments. More liquid assets may not generate the same returns as less liquid assets, which can increase the investment risk. Currently, the low magnitude of the ratio implies there may already be enough liquid assets to cover the benefit payments, less investment return is needed to cover the shortfall, or only a small portion of assets will need to be converted to cash. Therefore, the investment risk is likely not amplified at this time. However, due to the plan being closed, we expect this measure to become increasingly negative over time. This maturity measure should be monitored in the future.

Contribution Volatility ($'s in $000's)	June 30, 2020	June 30, 2021
1. Fair Value of Assets	$ 9,469,161	$ 11,912,309
2. DB/DCR Payroll	$ 2,373,078	$ 2,406,757
3. Asset to Payroll Ratio, (1) ÷ (2)	399.0%	495.0%
4. Accrued Liability	$ 15,279,525	$ 15,419,975
5. Liability to Payroll Ratio, (4) ÷ (2)	643.9%	640.7%

Plans that have higher asset-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to investment return. For example, a plan with an asset-to-payroll ratio of 10% may experience twice the contribution volatility due to investment return volatility than a plan with an asset-to-payroll ratio of 5%. Plans that have higher liability-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to changes in liability. For example, if an assumption change increases the liability of two plans by the same percent, the plan with a liability-to-payroll ratio of 10% may experience twice the contribution volatility than a plan with a liability-to-payroll ratio of 5%.

Glossary of Terms

Actuarial Accrued Liability

Total accumulated cost to fund pension or postemployment benefits arising from service in all prior years.

Actuarial Cost Method

Technique used to assign or allocate, in a systematic and consistent manner, the expected cost of a pension or postemployment plan for a group of plan members to the years of service that give rise to that cost.

Actuarial Present Value of Projected Benefits

Amount which, together with future interest, is expected to be sufficient to pay all future benefits.

Actuarial Valuation

Study of probable amounts of future pension or postemployment benefits and the necessary amount of contributions to fund those benefits.

Actuary

Person who performs mathematical calculations pertaining to pension and insurance benefits based on specific procedures and assumptions.

GASB 67 and 68

Governmental Accounting Standards Board Statement Number 67 amends Number 25 effective for the fiscal year beginning after June 15, 2013 and defines new financial reporting requirements for public pension plans.

Governmental Accounting Standards Board Statement Number 68 amends Number 27 effective for fiscal years beginning after June 15, 2014 and defines new accounting and financial reporting requirements for employers sponsoring public pension plans.

GASB 74 and 75

Governmental Accounting Standards Board Statement Number 74 amends Number 43 effective for the fiscal year beginning after June 15, 2016 and defines new financial reporting requirements for public postemployment benefit plans.

Governmental Accounting Standards Board Statement Number 75 amends Number 45 effective for fiscal years beginning after June 15, 2017 and defines new accounting and financial reporting requirements for employers sponsoring public postemployment benefit plans.

Normal Cost

That portion of the actuarial present value of benefits assigned to a particular year in respect to an individual participant or the plan as a whole.

Rate Payroll

Members' earnings used to determine contribution rates.

Unfunded Actuarial Accrued Liability (UAAL)

The portion of the actuarial accrued liability not offset by plan assets.

Valuation Payroll

Members' earnings used to determine Normal Cost and Actuarial Accrued Liability.

Vested Benefits

Benefits which are unconditionally guaranteed regardless of employment.

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BUCK

State of Alaska

Public Employees' Retirement System Defined Contribution Retirement Plan

For Occupational Death & Disability and Retiree Medical Benefits

Actuarial Valuation Report

As of June 30, 2021

May 2022

May 12, 2022

State of Alaska
The Alaska Retirement Management Board
The Department of Revenue, Treasury Division
The Department of Administration, Division of Retirement and Benefits
P.O. Box 110203
Juneau, AK 99811-0203

Certification of Actuarial Valuation

Dear Members of The Alaska Retirement Management Board, The Department of Revenue and The Department of Administration:

This report summarizes the annual actuarial valuation results of the State of Alaska Public Employees' Retirement System Defined Contribution Retirement (PERS DCR) Plan as of June 30, 2021 performed by Buck Global, LLC (Buck).

The actuarial valuation is based on financial information provided in the financial statements audited by KPMG LLP, member data provided by the Division of Retirement and Benefits, and medical enrollment data provided by the healthcare claims administrator (Aetna), as summarized in this report. The benefits considered are those delineated in Alaska statutes effective June 30, 2021. The actuary did not verify the data submitted, but did perform tests for consistency and reasonableness.

All costs, liabilities and other factors under PERS DCR were determined in accordance with generally accepted actuarial principles and procedures. An actuarial cost method is used to measure the actuarial liabilities which we believe is reasonable. Buck is solely responsible for the actuarial data and actuarial results presented in this report. This report fully and fairly discloses the actuarial position of PERS DCR as of June 30, 2021.

PERS DCR is funded by Employer Contributions in accordance with the funding policy adopted by the Alaska Retirement Management Board (Board). The funding objective for PERS DCR is to pay required contributions that remain level as a percent of PERS DCR compensation. The Board has also established a funding policy objective that the required contributions be sufficient to pay the Normal Costs of active plan members, plan expenses, and amortize the Unfunded Actuarial Accrued Liability as a level percent of PERS DCR compensation over closed layered 25-year periods. This objective is currently being met and is projected to continue to be met as required by the Alaska State statutes. Absent future gains/losses, actuarially determined contributions are expected to remain level as a percent of pay and the overall funded status is expected to remain at or above 100%.

The Board and staff of the State of Alaska may use this report for the review of the operations of PERS DCR. Use of this report for any other purpose or by anyone other than the Board or staff of the State of Alaska may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, you should ask Buck to review any statement you wish to make on the results contained in this report. Buck will not accept any liability for any such statement made without the review by Buck.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the actuarial assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. In particular, retiree group benefits models necessarily rely on the use of approximations and estimates and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements. An analysis of the potential range of such future differences is beyond the scope of this valuation.

In our opinion, the actuarial assumptions used are reasonable, taking into account the experience of the plan and reasonable long-term expectations, and represent our best estimate of the anticipated long-term experience under the plan. The actuary performs an analysis of plan experience periodically and recommends changes if, in the opinion of the actuary, assumption changes are needed to more accurately reflect expected future experience. The last full experience analysis was performed for the period July 1, 2013 to June 30, 2017. Based on that experience study, the Board adopted new assumptions effective beginning with the June 30, 2018 valuation to better reflect expected future experience. Based on our annual analysis of recent claims experience, changes were made to the per capita claims cost rates effective June 30, 2021 to better reflect expected future healthcare experience. A summary of the actuarial assumptions and methods used in this actuarial valuation is shown in Sections 4.2 and 4.3. We certify that the assumptions and methods described in Sections 4.2 and 4.3 of this report meet the requirements of all applicable Actuarial Standards of Practice.

Governmental Accounting Standards Board (GASB) Statement No. 74 (GASB 74) was effective for PERS DCR beginning with fiscal year ending June 30, 2017, and GASB 75 was effective beginning with fiscal year ending June 30, 2018. Separate GASB 74 and GASB 75 reports have been prepared.

Assessment of Risks

Actuarial Standard of Practice No. 51 (ASOP 51) applies to actuaries performing funding calculations related to a pension plan. ASOP 51 does not apply to actuaries performing services in connection with other post-employment benefits, such as medical benefits. Accordingly, ASOP 51 does not apply to the retiree medical portion of PERS DCR. We also believe ASOP 51 does not apply to the occupational death & disability portion of PERS DCR. Therefore, information related to ASOP 51 is not included in this report. However, it may be beneficial to review the ASOP 51 information provided in the PERS valuation report for information on risks that may also relate to the occupational death & disability benefits provided by this plan.

Use of Models

Actuarial Standard of Practice No. 56 (ASOP 56) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of the plan using data and assumptions as of the measurement date under the funding methods specified in this report. The output from the third-party vendor software is used as input to an internally developed model that applies applicable funding methods and policies to the derived liabilities and other inputs, such as plan assets and contributions, to generate many of the exhibits found in this report. Buck has an extensive review process in which the results of the liability calculations are checked using detailed sample life output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other funding outputs and the internal model are similarly reviewed in detail and at a higher level for accuracy, reasonability, and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software. This review is performed by experts

within Buck who are familiar with applicable funding methods, as well as the manner in which the model generates its output. If significant changes are made to the internal model, extra checking and review are completed. Significant changes to the internal model that are applicable to multiple clients are generally developed, checked, and reviewed by multiple experts within Buck who are familiar with the details of the required changes.

Buck used manual rate models to determine relative plan values for the defined benefit (DB) retiree medical plan and the DCR retiree medical plan, and to reflect the different Medicare coordination methods between the two plans. The manual rate models are intended to provide benchmark data and pricing capabilities, calculate per capita costs, and calculate actuarial values of different commercial health plans. Buck relied on the models, which were developed using industry data by actuaries and consultants at OptumInsight.

COVID-19

The potential impact of the ongoing COVID-19 pandemic on costs and liabilities was considered and an adjustment was made in setting the medical per capita claims cost assumption. FY20 medical claims were adjusted for a COVID-19 related decline in claims during the last four months (March – June) of FY20. FY21 medical claims were adjusted for a COVID-19 related decline in those claims during the fiscal year. A more detailed explanation on these adjustments is shown in Sections 4.2 and 4.3 and in the valuation report for the DB plan.

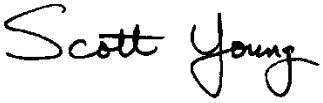
This report was prepared under my supervision and in accordance with all applicable Actuarial Standards of Practice. I am a Fellow of the Society of Actuaries, an Enrolled Actuary, a Fellow of the Conference of Consulting Actuaries, and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

I am available to discuss this report with you at your convenience. I can be reached at 602-803-6174.

Respectfully submitted,

David J. Kershner, FSA, EA, MAAA, FCA
Principal
Buck

The undersigned actuary is responsible for all assumptions related to the average annual per capita health claims cost and the health care cost trend rates, and hereby affirms his qualification to render opinions in such matters in accordance with the Qualification Standards of the American Academy of Actuaries.



Scott Young, FSA, EA, MAAA, FCA
Director
Buck

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Executive Summary

Overview

The State of Alaska Public Employees' Retirement System Defined Contribution Retirement (PERS DCR) Plan provides occupational death & disability and retiree medical benefits to eligible members hired after June 30, 2006 or who have elected participation in this plan. The Commissioner of the Department of Administration is responsible for administering the plan. The Alaska Retirement Management Board has fiduciary responsibility over the assets of the plan. This report presents the results of the actuarial valuation of PERS DCR as of the valuation date of June 30, 2021.

Purpose

An actuarial valuation is performed on the plan annually as of the end of the fiscal year. The main purposes of the actuarial valuation detailed in this report are:

1. To determine the Employer contribution necessary to meet the Board's funding policy for the plan;
2. To disclose the funding assets and liability measures as of the valuation date;
3. To review the current funded status of the plan and assess the funded status as an appropriate measure for determining actuarially determined contributions;
4. To compare actual and expected experience under the plan during the last fiscal year; and
5. To report trends in contributions, assets, liabilities, and funded status over the last several years.

The actuarial valuation provides a "snapshot" of the funded position of PERS DCR based on the plan provisions, membership data, assets, and actuarial methods and assumptions as of the valuation date.

Funded Status

Where presented, references to "funded ratio" and "unfunded actuarial accrued liability" typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

Funded Status as of June 30 ($'s in 000's)		2020	2021
Occupational Death & Disability			
a.	Actuarial Accrued Liability	$ 10,634	$ 11,740
b.	Valuation Assets	43,029	53,075
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ (32,395)	$ (41,335)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	404.6%	452.1%
e.	Fair Value of Assets	$ 42,091	$ 60,145
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	395.8%	512.3%

Funded Status as of June 30 ($'s in 000's)		2020	2021
Retiree Medical			
a.	Actuarial Accrued Liability	$ 150,701	$ 168,472
b.	Valuation Assets	144,747	180,536
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ 5,954	$ (12,064)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	96.0%	107.2%
e.	Fair Value of Assets	$ 141,569	$ 204,555
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	93.9%	121.4%
Total			
a.	Actuarial Accrued Liability	$ 161,335	$ 180,212
b.	Valuation Assets	187,776	233,611
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ (26,441)	$ (53,399)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	116.4%	129.6%
e.	Fair Value of Assets	$ 183,660	$ 264,700
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	113.8%	146.9%

The key reasons for the change in the funded status are explained below. The funded status for healthcare benefits is not necessarily an appropriate measure to confirm that assets are sufficient to settle health plan obligations as there are no available financial instruments for purchase. Future experience is likely to vary from assumptions so there is potential for actuarial gains or losses.

1. **Investment Experience**

   The approximate FY21 investment return based on fair value of assets was 29.6% compared to the expected investment return of 7.38% (net of investment expenses). This resulted in a gain of approximately $43,414,000 to the plan from investment experience. The asset valuation method recognizes 20% of this gain ($8,683,000) this year and an additional 20% in each of the next 4 years. In addition, 20% of the FY17 investment gain, 20% of the FY18 investment loss, 20% of the FY19 investment loss, and 20% of the FY20 investment loss were recognized this year. The approximate FY21 asset return based on actuarial value of assets was 11.3% compared to the expected asset return of 7.38% (net of investment expenses).

2. **Salary Increases**

   Salary increases for continuing active members during FY21 were higher than anticipated based on the valuation assumptions, resulting in a liability loss of approximately $8,000.

3. **Demographic Experience**

   The number of active members increased 4.4% from 22,923 at June 30, 2020 to 23,933 at June 30, 2021. The average age of active members increased from 41.21 to 41.26 and average credited service increased from 4.66 to 4.93 years.

   The demographic experience gains/losses are shown on page 4.

4. **Retiree Medical Claims Experience**

   Please refer to the State of Alaska Public Employees' Retirement System (PERS) Defined Benefit Plan Actuarial Valuation Report as of June 30, 2021 for a full description of the assumptions and costs of the retiree medical plan. Adjustments to these costs and assumptions are described in this report.

The recent claims experience described in Section 4.2 of this report (Section 5.2 of the PERS report) created an actuarial gain of approximately $7,066,000.

5. **Changes in Methods Since the Prior Valuation**

   There were no changes in actuarial methods since the prior valuation.

6. **Changes in Assumptions Since the Prior Valuation**

   Healthcare claim costs are updated annually as described in Section 4.2. The amounts included in Normal Cost for administrative expenses were updated based on the last two years of actual administrative expenses paid from plan assets. There were no other changes in actuarial assumptions since the prior valuation.

7. **Changes in Benefit Provisions Since the Prior Valuation**

   Starting in 2022, prior authorization will be required for certain specialty medications. This change created an actuarial gain of approximately $2,029,000. There have been no other changes in benefit provisions valued since the prior valuation.

Comparative Summary of Contribution Rates

Occupational Death & Disability	FY 2023	FY 2024
Peace Officer/Firefighter		
a. Employer Normal Cost Rate	0.68%	0.68%
b. Past Service Cost Rate	(0.19)%	(0.24)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	0.68%	0.68%
Others		
a. Employer Normal Cost Rate	0.30%	0.30%
b. Past Service Cost Rate	(0.16)%	(0.19)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	0.30%	0.30%

Retiree Medical	FY 2023	FY 2024
a. Employer Normal Cost Rate	1.05%	1.01%
b. Past Service Cost Rate	0.05%	(0.02)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	1.10%	1.01%

Total	FY 2023	FY 2024
Peace Officer/Firefighter		
a. Employer Normal Cost Rate	1.73%	1.69%
b. Past Service Cost Rate	0.05%	(0.02)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	1.78%	1.69%
Others		
a. Employer Normal Cost Rate	1.35%	1.31%
b. Past Service Cost Rate	0.05%	(0.02)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	1.40%	1.31%

The exhibit below shows the historical Board-adopted employer contribution rates for PERS DCR.

		Total Employer Contribution Rate		
Valuation Date	Fiscal Year	Occupational Death & Disability (PF / Others)	Retiree Medical	Total (PF / Others)
June 30, 2008	FY11	1.18% / 0.31%	0.55%	1.73% / 0.86%
June 30, 2009	FY12	0.97% / 0.11%	0.51%	1.48% / 0.62%
June 30, 2010	FY13	0.99% / 0.14%	0.48%	1.47% / 0.62%
June 30, 2011	FY14	1.14% / 0.20%	0.48%	1.62% / 0.68%
June 30, 2012	FY15	1.06% / 0.22%	1.66%	2.72% / 1.88%
June 30, 2013	FY16	1.05% / 0.22%	1.68%	2.73% / 1.90%
June 30, 2014	FY17	0.49% / 0.17%	1.18%	1.67% / 1.35%
June 30, 2015	FY18	0.43% / 0.16%	1.03%	1.46% / 1.19%
June 30, 2016	FY19	0.76% / 0.26%	0.94%	1.70% / 1.20%
June 30, 2017	FY20	0.72% / 0.26%	1.32%	2.04% / 1.58%
June 30, 2018	FY21	0.70% / 0.31%	1.27%	1.97% / 1.58%
June 30, 2019	FY22	0.68% / 0.31%	1.07%	1.75% / 1.38%
June 30, 2020	FY23	0.68% / 0.30%	1.10%	1.78% / 1.40%
June 30, 2021	FY24	TBD	TBD	TBD

Summary of Actuarial Accrued Liability Gain/(Loss)

The following table shows the FY21 gain/(loss) on actuarial accrued liability as of June 30, 2021 ($'s in 000's):

	Occupational Death & Disability	Retiree Medical	Total
Retirement Experience	$ 0	$ (521)	$ (521)
Termination Experience	(90)	2,669	2,579
Disability Experience	3,346	341	3,687
Active Mortality Experience	1,900	104	2,004
Inactive Mortality Experience	(21)	432	411
Salary Increases	(8)	N/A	(8)
New Entrants	(89)	(1,320)	(1,409)
Rehires	(47)	(3,068)	(3,115)
Transfers Between P/F and Others	(31)	(52)	(83)
Benefit Payments Different than Expected	145	209	354
Per Capita Claims Costs	N/A	7,066	7,066
Prescription Drug Plan Changes	N/A	2,029	2,029
Miscellaneous[1]	(362)	1,560	1,198
Total	$ 4,743	$ 9,449	$ 14,192

[1] Includes the effects of various data changes that are typical when new census data is received for the annual valuation, as well as other items that do not fit neatly into any of the other categories.

Section 1: Actuarial Funding Results

Section 1.1: Actuarial Liabilities and Normal Cost ($'s in 000's)

Peace Officer / Firefighter

As of June 30, 2021	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Occupational Death Benefits	$ 3,705	$ (12)
Occupational Disability Benefits	12,254	3,750
Medical and Prescription Drug Benefits	43,037	22,460
Medicare Part D Subsidy	(8,159)	(4,294)
Subtotal	$ 50,837	$ 21,904
Benefit Recipients		
Survivor Benefits	$ 323	$ 323
Disability Benefits	4,865	4,865
Medical and Prescription Drug Benefits	788	788
Medicare Part D Subsidy	(138)	(138)
Subtotal	$ 5,838	$ 5,838
Total	**$ 56,675**	**$ 27,742**
Total Occupational Death & Disability	**$ 21,147**	**$ 8,926**
Total Retiree Medical, Net of Part D Subsidy	**$ 35,528**	**$ 18,816**
Total Retiree Medical, Gross of Part D Subsidy	**$ 43,825**	**$ 23,248**

As of June 30, 2021	Normal Cost
Active Members	
Occupational Death Benefits	$ 485
Occupational Disability Benefits	1,019
Medical and Prescription Drug Benefits	2,300
Medicare Part D Subsidy	(434)
Subtotal	$ 3,370
Administrative Expense Load	
Occupational Death & Disability	$ 4
Retiree Medical	7
Subtotal	$ 11
Total	**$ 3,381**
Total Occupational Death & Disability	**$ 1,508**
Total Retiree Medical, Net of Part D Subsidy	**$ 1,873**
Total Retiree Medical, Gross of Part D Subsidy	**$ 2,307**

Section 1.1: Actuarial Liabilities and Normal Cost ($'s in 000's)

Others

As of June 30, 2021	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Occupational Death Benefits	$ 9,151	$ 641
Occupational Disability Benefits	16,372	1,618
Medical and Prescription Drug Benefits	286,967	182,893
Medicare Part D Subsidy	(59,007)	(37,778)
Subtotal	$ 253,483	$ 147,374
Benefit Recipients		
Survivor Benefits	$ 0	$ 0
Disability Benefits	555	555
Medical and Prescription Drug Benefits	5,746	5,746
Medicare Part D Subsidy	(1,205)	(1,205)
Subtotal	$ 5,096	$ 5,096
Total	**$ 258,579**	**$ 152,470**
Total Occupational Death & Disability	**$ 26,078**	**$ 2,814**
Total Retiree Medical, Net of Part D Subsidy	**$ 232,501**	**$ 149,656**
Total Retiree Medical, Gross of Part D Subsidy	**$ 292,713**	**$ 188,639**

As of June 30, 2021	Normal Cost
Active Members	
Occupational Death Benefits	$ 1,449
Occupational Disability Benefits	2,503
Medical and Prescription Drug Benefits	17,248
Medicare Part D Subsidy	(3,527)
Subtotal	$ 17,673
Administrative Expense Load	
Occupational Death & Disability	$ 12
Retiree Medical	17
Subtotal	$ 29
Total	**$ 17,702**
Total Occupational Death & Disability	**$ 3,964**
Total Retiree Medical, Net of Part D Subsidy	**$ 13,738**
Total Retiree Medical, Gross of Part D Subsidy	**$ 17,265**

Section 1.1: Actuarial Liabilities and Normal Cost ($'s in 000's)

All Members

As of June 30, 2021	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Occupational Death Benefits	$ 12,856	$ 629
Occupational Disability Benefits	28,626	5,368
Medical and Prescription Drug Benefits	330,004	205,353
Medicare Part D Subsidy	(67,166)	(42,072)
Subtotal	$ 304,320	$ 169,278
Benefit Recipients		
Survivor Benefits	$ 323	$ 323
Disability Benefits	5,420	5,420
Medical and Prescription Drug Benefits	6,534	6,534
Medicare Part D Subsidy	(1,343)	(1,343)
Subtotal	$ 10,934	$ 10,934
Total	**$ 315,254**	**$ 180,212**
Total Occupational Death & Disability	**$ 47,225**	**$ 11,740**
Total Retiree Medical, Net of Part D Subsidy	**$ 268,029**	**$ 168,472**
Total Retiree Medical, Gross of Part D Subsidy	**$ 336,538**	**$ 211,887**

As of June 30, 2021	Normal Cost
Active Members	
Occupational Death Benefits	$ 1,934
Occupational Disability Benefits	3,522
Medical and Prescription Drug Benefits	19,548
Medicare Part D Subsidy	(3,961)
Subtotal	$ 21,043
Administrative Expense Load	
Occupational Death & Disability	$ 16
Retiree Medical	24
Subtotal	$ 40
Total	**$ 21,083**
Total Occupational Death & Disability	**$ 5,472**
Total Retiree Medical, Net of Part D Subsidy	**$ 15,611**
Total Retiree Medical, Gross of Part D Subsidy	**$ 19,572**

Section 1.2: Actuarial Contributions as of June 30, 2021 for FY24 ($'s in 000's)

Peace Officer / Firefighter

Normal Cost Rate	Occupational Death & Disability	Retiree Medical	Total
1. Total Normal Cost	$ 1,508	$ 1,873	$ 3,381
2. DCR Plan Rate Payroll Projected for FY22	220,974	220,974	220,974
3. Employer Normal Cost Rate, (1) ÷ (2)	0.68%	0.85%	1.53%
Past Service Rate			
1. Actuarial Accrued Liability	$ 8,926	$ 18,816	$ 27,742
2. Valuation Assets	15,959	20,163	36,122
3. Unfunded Actuarial Accrued Liability, (1) - (2)	$ (7,033)	$ (1,347)	$ (8,380)
4. Funded Ratio based on Valuation Assets	178.8%	107.2%	130.2%
5. Past Service Cost Amortization Payment	(522)	(47)	(569)
6. DCR Plan Rate Payroll Projected for FY22	220,974	220,974	220,974
7. Past Service Cost Rate, (5) ÷ (6)	(0.24%)	(0.02%)	(0.26%)
Total Employer Contribution Rate, not less than Normal Cost Rate	**0.68%**	**0.85%**	**1.53%**

The table below shows the total employer contribution rate based on total DB and DCR Plan payroll for informational purposes.

Total Employer Contribution Rate as Percent of Total Payroll	Occupational Death & Disability	Retiree Medical	Total
1. Total Normal Cost	$ 1,508	$ 1,873	$ 3,381
2. Total DB and DCR Plan Rate Payroll Projected for FY22	368,713	368,713	368,713
3. Employer Normal Cost Rate, (1) ÷ (2)	0.41%	0.51%	0.92%
4. Past Service Cost Amortization Payment	(522)	(47)	(569)
5. Past Service Cost Rate, (4) ÷ (2)	(0.14%)	(0.01%)	(0.15%)
Total Employer Contribution Rate, not less than Normal Cost Rate	**0.41%**	**0.51%**	**0.92%**

Peace Officer / Firefighter

Schedule of Past Service Cost Amortizations - Occupational Death & Disability ($'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Unfunded Liability	06/30/2007	11	$ (100)	$ (93)	$ (10)
FY08 Gain	06/30/2008	12	(586)	(555)	(58)
Change in Assumptions	06/30/2009	13	(104)	(101)	(10)
FY09 Loss	06/30/2009	13	446	433	43
Change in Assumptions	06/30/2010	14	79	77	7
FY10 Gain	06/30/2010	14	(282)	(280)	(26)
FY11 Loss	06/30/2011	15	73	70	6
FY12 Gain	06/30/2012	16	(349)	(354)	(30)
FY13 Gain	06/30/2013	17	(204)	(207)	(17)
Change in Assumptions	06/30/2014	18	(1,274)	(1,303)	(103)
PRPA Modification	06/30/2014	18	(91)	(92)	(7)
FY14 Gain	06/30/2014	18	(95)	(98)	(8)
FY15 Gain	06/30/2015	19	(664)	(679)	(52)
FY16 Loss	06/30/2016	20	4	4	0
FY17 Gain	06/30/2017	21	(525)	(534)	(38)
FY18 Gain	06/30/2018	22	(262)	(264)	(18)
Change in Assumptions	06/30/2018	22	(633)	(639)	(44)
FY19 Loss	06/30/2019	23	219	220	15
FY20 Gain	06/30/2020	24	(792)	(796)	(53)
FY21 Gain	06/30/2021	25	(1,842)	(1,842)	(119)
Total				**$ (7,033)**	**$ (522)**

Peace Officer / Firefighter

Schedule of Past Service Cost Amortizations - Retiree Medical ($'s in 000's)

	Amortization Period		Balances		
Layer	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Unfunded Liability	06/30/2007	11	$ (21)	$ (23)	$ (3)
Change in Assumptions	06/30/2008	12	17	15	2
FY08 Gain	06/30/2008	12	(62)	(59)	(6)
Change in Assumptions	06/30/2009	13	(8)	(8)	(1)
FY09 Gain	06/30/2009	13	(38)	(38)	(4)
Change in Assumptions	06/30/2010	14	41	40	4
FY10 Gain	06/30/2010	14	(46)	(42)	(4)
FY11 Loss	06/30/2011	15	70	68	6
Change in Assumptions	06/30/2012	16	3,085	3,122	266
FY12 Gain	06/30/2012	16	(273)	(275)	(23)
FY13 Loss	06/30/2013	17	880	897	73
Change in Assumptions	06/30/2014	18	(3,034)	(3,100)	(244)
FY14 Loss	06/30/2014	18	1,213	1,240	98
FY15 Gain	06/30/2015	19	(712)	(727)	(55)
EGWP Gain	06/30/2016	20	(1,675)	(1,711)	(126)
FY16 Loss	06/30/2016	20	1,116	1,140	84
Change in Assumptions	06/30/2017	21	2,244	2,280	163
FY17 Gain	06/30/2017	21	(50)	(52)	(4)
FY18 Gain	06/30/2018	22	(231)	(233)	(16)
Change in Assumptions/Methods	06/30/2018	22	(649)	(654)	(45)
FY19 Gain	06/30/2019	23	(1,291)	(1,300)	(88)
Change in Assumptions	06/30/2020	24	1,116	1,121	74
FY20 Gain	06/30/2020	24	(1,082)	(1,087)	(72)
Prescription Drug Plan Changes	06/30/2021	25	(235)	(235)	(15)
FY21 Gain	06/30/2021	25	(1,726)	(1,726)	(111)
Total				**$ (1,347)**	**$ (47)**

Peace Officer / Firefighter

Schedule of Past Service Cost Amortizations - Total ($'s in 000's)

	Amortization Period		Balances		
Layer	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Unfunded Liability	06/30/2007	11	$ (121)	$ (116)	$ (13)
Change in Assumptions	06/30/2008	12	17	15	2
FY08 Gain	06/30/2008	12	(648)	(614)	(64)
Change in Assumptions	06/30/2009	13	(112)	(109)	(11)
FY09 Loss	06/30/2009	13	408	395	39
Change in Assumptions	06/30/2010	14	120	117	11
FY10 Gain	06/30/2010	14	(328)	(322)	(30)
FY11 Loss	06/30/2011	15	143	138	12
Change in Assumptions	06/30/2012	16	3,085	3,122	266
FY12 Gain	06/30/2012	16	(622)	(629)	(53)
FY13 Loss	06/30/2013	17	676	690	56
Change in Assumptions	06/30/2014	18	(4,308)	(4,403)	(347)
PRPA Modification	06/30/2014	18	(91)	(92)	(7)
FY14 Loss	06/30/2014	18	1,118	1,142	90
FY15 Gain	06/30/2015	19	(1,376)	(1,406)	(107)
EGWP Gain	06/30/2016	20	(1,675)	(1,711)	(126)
FY16 Loss	06/30/2016	20	1,120	1,144	84
Change in Assumptions	06/30/2017	21	2,244	2,280	163
FY17 Gain	06/30/2017	21	(575)	(586)	(42)
FY18 Gain	06/30/2018	22	(493)	(497)	(34)
Change in Assumptions/Methods	06/30/2018	22	(1,282)	(1,293)	(89)
FY19 Gain	06/30/2019	23	(1,072)	(1,080)	(73)
Change in Assumptions	06/30/2020	24	1,116	1,121	74
FY20 Gain	06/30/2020	24	(1,874)	(1,883)	(125)
Prescription Drug Plan Changes	06/30/2021	25	(235)	(235)	(15)
FY21 Gain	06/30/2021	25	(3,568)	(3,568)	(230)
Total				**$ (8,380)**	**$ (569)**

Section 1.2: Actuarial Contributions as of June 30, 2021 for FY24 ($'s in 000's)

Others

Normal Cost Rate	Occupational Death & Disability	Retiree Medical	Total
1. Total Normal Cost	$ 3,964	$ 13,738	$ 17,702
2. DCR Plan Rate Payroll Projected for FY22	1,327,142	1,327,142	1,327,142
3. Employer Normal Cost Rate, (1) ÷ (2)	0.30%	1.03%	1.33%

Past Service Rate			
1. Actuarial Accrued Liability	$ 2,814	$ 149,656	$ 152,470
2. Valuation Assets	37,116	160,373	197,489
3. Unfunded Actuarial Accrued Liability, (1) - (2)	$ (34,302)	$ (10,717)	$ (45,019)
4. Funded Ratio based on Valuation Assets	1,319.0%	107.2%	129.5%
5. Past Service Cost Amortization Payment	(2,515)	(323)	(2,838)
6. DCR Plan Rate Payroll Projected for FY22	1,327,142	1,327,142	1,327,142
7. Past Service Cost Rate, (5) ÷ (6)	(0.19%)	(0.02%)	(0.21%)
Total Employer Contribution Rate, not less than Normal Cost Rate	**0.30%**	**1.03%**	**1.33%**

The table below shows the total employer contribution rate based on total DB and DCR Plan payroll for informational purposes.

Total Employer Contribution Rate as Percent of Total Payroll	Occupational Death & Disability	Retiree Medical	Total
1. Total Normal Cost	$ 3,964	$ 13,738	$ 17,702
2. Total DB and DCR Plan Rate Payroll Projected for FY22	2,038,044	2,038,044	2,038,044
3. Employer Normal Cost Rate, (1) ÷ (2)	0.19%	0.68%	0.87%
4. Past Service Cost Amortization Payment	(2,515)	(323)	(2,838)
5. Past Service Cost Rate, (4) ÷ (2)	(0.12%)	(0.02%)	(0.14%)
Total Employer Contribution Rate, not less than Normal Cost Rate	**0.19%**	**0.68%**	**0.87%**

Others

Schedule of Past Service Cost Amortizations - Occupational Death & Disability ($'s in 000's)

	Amortization Period		Balances		
Layer	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Unfunded Liability	06/30/2007	11	$ (40)	$ (38)	$ (5)
FY08 Gain	06/30/2008	12	(318)	(303)	(32)
Change in Assumptions	06/30/2009	13	(92)	(89)	(9)
FY09 Gain	06/30/2009	13	(1,924)	(1,865)	(185)
Change in Assumptions	06/30/2010	14	24	25	3
FY10 Gain	06/30/2010	14	(994)	(982)	(92)
FY11 Gain	06/30/2011	15	(1,184)	(1,182)	(105)
FY12 Gain	06/30/2012	16	(1,233)	(1,246)	(106)
FY13 Gain	06/30/2013	17	(779)	(794)	(65)
Change in Assumptions	06/30/2014	18	(51)	(51)	(4)
PRPA Modification	06/30/2014	18	(27)	(28)	(2)
FY14 Gain	06/30/2014	18	(2,003)	(2,044)	(161)
FY15 Gain	06/30/2015	19	(1,850)	(1,890)	(143)
FY16 Gain	06/30/2016	20	(2,361)	(2,409)	(177)
FY17 Gain	06/30/2017	21	(2,377)	(2,413)	(172)
FY18 Gain	06/30/2018	22	(2,590)	(2,613)	(182)
Change in Assumptions	06/30/2018	22	(272)	(275)	(19)
FY19 Gain	06/30/2019	23	(3,984)	(4,013)	(272)
FY20 Gain	06/30/2020	24	(4,803)	(4,824)	(318)
FY21 Gain	06/30/2021	25	(7,268)	(7,268)	(469)
Total				**$ (34,302)**	**$ (2,515)**

Others

Schedule of Past Service Cost Amortizations - Retiree Medical ($'s in 000's)

	Amortization Period		Balances		
Layer	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Unfunded Liability	06/30/2007	11	$ (335)	$ (308)	$ (34)
Change in Assumptions	06/30/2008	12	165	157	16
FY08 Gain	06/30/2008	12	(702)	(664)	(70)
Change in Assumptions	06/30/2009	13	(122)	(118)	(11)
FY09 Gain	06/30/2009	13	(438)	(425)	(42)
Change in Assumptions	06/30/2010	14	(572)	(564)	(53)
FY10 Loss	06/30/2010	14	579	567	53
FY11 Loss	06/30/2011	15	820	823	73
Change in Assumptions	06/30/2012	16	25,180	25,475	2,171
FY12 Loss	06/30/2012	16	1,451	1,466	124
FY13 Loss	06/30/2013	17	9,974	10,159	831
Change in Assumptions	06/30/2014	18	(21,822)	(22,303)	(1,756)
FY14 Loss	06/30/2014	18	7,002	7,157	563
FY15 Gain	06/30/2015	19	(8,726)	(8,923)	(679)
EGWP Gain	06/30/2016	20	(17,884)	(18,239)	(1,342)
FY16 Loss	06/30/2016	20	10,367	10,573	778
Change in Assumptions	06/30/2017	21	21,288	21,613	1,544
FY17 Gain	06/30/2017	21	(1,658)	(1,682)	(120)
FY18 Loss	06/30/2018	22	118	119	8
Change in Assumptions/Methods	06/30/2018	22	(8,993)	(9,070)	(630)
FY19 Gain	06/30/2019	23	(10,841)	(10,922)	(739)
Change in Assumptions	06/30/2020	24	6,369	6,398	423
FY20 Gain	06/30/2020	24	(6,288)	(6,316)	(417)
Prescription Drug Plan Changes	06/30/2021	25	(1,794)	(1,794)	(116)
FY21 Gain	06/30/2021	25	(13,896)	(13,896)	(898)
Total				**$ (10,717)**	**$ (323)**

Others

Schedule of Past Service Cost Amortizations - Total ($'s in 000's)

	Amortization Period		Balances		
Layer	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Unfunded Liability	06/30/2007	11	$ (375)	$ (346)	$ (39)
Change in Assumptions	06/30/2008	12	165	157	16
FY08 Gain	06/30/2008	12	(1,020)	(967)	(102)
Change in Assumptions	06/30/2009	13	(214)	(207)	(20)
FY09 Gain	06/30/2009	13	(2,362)	(2,290)	(227)
Change in Assumptions	06/30/2010	14	(548)	(539)	(50)
FY10 Gain	06/30/2010	14	(415)	(415)	(39)
FY11 Gain	06/30/2011	15	(364)	(359)	(32)
Change in Assumptions	06/30/2012	16	25,180	25,475	2,171
FY12 Loss	06/30/2012	16	218	220	18
FY13 Loss	06/30/2013	17	9,195	9,365	766
Change in Assumptions	06/30/2014	18	(21,873)	(22,354)	(1,760)
PRPA Modification	06/30/2014	18	(27)	(28)	(2)
FY14 Loss	06/30/2014	18	4,999	5,113	402
FY15 Gain	06/30/2015	19	(10,576)	(10,813)	(822)
EGWP Gain	06/30/2016	20	(17,884)	(18,239)	(1,342)
FY16 Loss	06/30/2016	20	8,006	8,164	601
Change in Assumptions	06/30/2017	21	21,288	21,613	1,544
FY17 Gain	06/30/2017	21	(4,035)	(4,095)	(292)
FY18 Gain	06/30/2018	22	(2,472)	(2,494)	(174)
Change in Assumptions/Methods	06/30/2018	22	(9,265)	(9,345)	(649)
FY19 Gain	06/30/2019	23	(14,825)	(14,935)	(1,011)
Change in Assumptions	06/30/2020	24	6,369	6,398	423
FY20 Gain	06/30/2020	24	(11,091)	(11,140)	(735)
Prescription Drug Plan Changes	06/30/2021	25	(1,794)	(1,794)	(116)
FY21 Gain	06/30/2021	25	(21,164)	(21,164)	(1,367)
Total				**$ (45,019)**	**$ (2,838)**

Section 1.2: Actuarial Contributions as of June 30, 2021 for FY24 ($'s in 000's)

All Members

Normal Cost Rate	Occupational Death & Disability	Retiree Medical	Total
1. Total Normal Cost	$ 5,472	$ 15,611	$ 21,083
2. DCR Plan Rate Payroll Projected for FY22	1,548,116	1,548,116	1,548,116
3. Employer Normal Cost Rate, (1) ÷ (2)	0.35%	1.01%	1.36%

Past Service Rate			
1. Actuarial Accrued Liability	$ 11,740	$ 168,472	$ 180,212
2. Valuation Assets	53,075	180,536	233,611
3. Unfunded Actuarial Accrued Liability, (1) - (2)	$ (41,335)	$ (12,064)	$ (53,399)
4. Funded Ratio based on Valuation Assets	452.1%	107.2%	129.6%
5. Past Service Cost Amortization Payment	(3,037)	(370)	(3,407)
6. DCR Plan Rate Payroll Projected for FY22	1,548,116	1,548,116	1,548,116
7. Past Service Cost Rate, (5) ÷ (6)	(0.20%)	(0.02%)	(0.22%)
Total Employer Contribution Rate, not less than Normal Cost Rate	**0.35%**	**1.01%**	**1.36%**

The table below shows the total employer contribution rate based on total DB and DCR Plan payroll for informational purposes.

Total Employer Contribution Rate as Percent of Total Payroll	Occupational Death & Disability	Retiree Medical	Total
1. Total Normal Cost	$ 5,472	$ 15,611	$ 21,083
2. Total DB and DCR Plan Rate Payroll Projected for FY22	2,406,757	2,406,757	2,406,757
3. Employer Normal Cost Rate, (1) ÷ (2)	0.23%	0.65%	0.88%
4. Past Service Cost Amortization Payment	(3,037)	(370)	(3,407)
5. Past Service Cost Rate, (4) ÷ (2)	(0.13%)	(0.01%)	(0.14%)
Total Employer Contribution Rate, not less than Normal Cost Rate	**0.23%**	**0.65%**	**0.88%**

All Members

Schedule of Past Service Cost Amortizations - Occupational Death & Disability ($'s in 000's)

	Amortization Period		Balances		
Layer	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Unfunded Liability	06/30/2007	11	$ (140)	$ (131)	$ (15)
FY08 Gain	06/30/2008	12	(904)	(858)	(90)
Change in Assumptions	06/30/2009	13	(196)	(190)	(19)
FY09 Gain	06/30/2009	13	(1,478)	(1,432)	(142)
Change in Assumptions	06/30/2010	14	103	102	10
FY10 Gain	06/30/2010	14	(1,276)	(1,262)	(118)
FY11 Gain	06/30/2011	15	(1,111)	(1,112)	(99)
FY12 Gain	06/30/2012	16	(1,582)	(1,600)	(136)
FY13 Gain	06/30/2013	17	(983)	(1,001)	(82)
Change in Assumptions	06/30/2014	18	(1,325)	(1,354)	(107)
PRPA Modification	06/30/2014	18	(118)	(120)	(9)
FY14 Gain	06/30/2014	18	(2,098)	(2,142)	(169)
FY15 Gain	06/30/2015	19	(2,514)	(2,569)	(195)
FY16 Gain	06/30/2016	20	(2,357)	(2,405)	(177)
FY17 Gain	06/30/2017	21	(2,902)	(2,947)	(210)
FY18 Gain	06/30/2018	22	(2,852)	(2,877)	(200)
Change in Assumptions	06/30/2018	22	(905)	(914)	(63)
FY19 Gain	06/30/2019	23	(3,765)	(3,793)	(257)
FY20 Gain	06/30/2020	24	(5,595)	(5,620)	(371)
FY21 Gain	06/30/2021	25	(9,110)	(9,110)	(588)
Total				**$ (41,335)**	**$ (3,037)**

All Members

Schedule of Past Service Cost Amortizations - Retiree Medical ($'s in 000's)

	Amortization Period		Balances		
Layer	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Unfunded Liability	06/30/2007	11	$ (356)	$ (331)	$ (37)
Change in Assumptions	06/30/2008	12	182	172	18
FY08 Gain	06/30/2008	12	(764)	(723)	(76)
Change in Assumptions	06/30/2009	13	(130)	(126)	(12)
FY09 Gain	06/30/2009	13	(476)	(463)	(46)
Change in Assumptions	06/30/2010	14	(531)	(524)	(49)
FY10 Loss	06/30/2010	14	533	525	49
FY11 Loss	06/30/2011	15	890	891	79
Change in Assumptions	06/30/2012	16	28,265	28,597	2,437
FY12 Loss	06/30/2012	16	1,178	1,191	101
FY13 Loss	06/30/2013	17	10,854	11,056	904
Change in Assumptions	06/30/2014	18	(24,856)	(25,403)	(2,000)
FY14 Loss	06/30/2014	18	8,215	8,397	661
FY15 Gain	06/30/2015	19	(9,438)	(9,650)	(734)
EGWP Gain	06/30/2016	20	(19,559)	(19,950)	(1,468)
FY16 Loss	06/30/2016	20	11,483	11,713	862
Change in Assumptions	06/30/2017	21	23,532	23,893	1,707
FY17 Gain	06/30/2017	21	(1,708)	(1,734)	(124)
FY18 Gain	06/30/2018	22	(113)	(114)	(8)
Change in Assumptions/Methods	06/30/2018	22	(9,642)	(9,724)	(675)
FY19 Gain	06/30/2019	23	(12,132)	(12,222)	(827)
Change in Assumptions	06/30/2020	24	7,485	7,519	497
FY20 Gain	06/30/2020	24	(7,370)	(7,403)	(489)
Prescription Drug Plan Changes	06/30/2021	25	(2,029)	(2,029)	(131)
FY21 Gain	06/30/2021	25	(15,622)	(15,622)	(1,009)
Total				**$ (12,064)**	**$ (370)**

All Members

Schedule of Past Service Cost Amortizations - Total ($'s in 000's)

	Amortization Period		Balances		
Layer	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Unfunded Liability	06/30/2007	11	$ (496)	$ (462)	$ (52)
Change in Assumptions	06/30/2008	12	182	172	18
FY08 Gain	06/30/2008	12	(1,668)	(1,581)	(166)
Change in Assumptions	06/30/2009	13	(326)	(316)	(31)
FY09 Gain	06/30/2009	13	(1,954)	(1,895)	(188)
Change in Assumptions	06/30/2010	14	(428)	(422)	(39)
FY10 Gain	06/30/2010	14	(743)	(737)	(69)
FY11 Gain	06/30/2011	15	(221)	(221)	(20)
Change in Assumptions	06/30/2012	16	28,265	28,597	2,437
FY12 Gain	06/30/2012	16	(404)	(409)	(35)
FY13 Loss	06/30/2013	17	9,871	10,055	822
Change in Assumptions	06/30/2014	18	(26,181)	(26,757)	(2,107)
PRPA Modification	06/30/2014	18	(118)	(120)	(9)
FY14 Loss	06/30/2014	18	6,117	6,255	492
FY15 Gain	06/30/2015	19	(11,952)	(12,219)	(929)
EGWP Gain	06/30/2016	20	(19,559)	(19,950)	(1,468)
FY16 Loss	06/30/2016	20	9,126	9,308	685
Change in Assumptions	06/30/2017	21	23,532	23,893	1,707
FY17 Gain	06/30/2017	21	(4,610)	(4,681)	(334)
FY18 Gain	06/30/2018	22	(2,965)	(2,991)	(208)
Change in Assumptions/Methods	06/30/2018	22	(10,547)	(10,638)	(738)
FY19 Gain	06/30/2019	23	(15,897)	(16,015)	(1,084)
Change in Assumptions	06/30/2020	24	7,485	7,519	497
FY20 Gain	06/30/2020	24	(12,965)	(13,023)	(860)
Prescription Drug Plan Changes	06/30/2021	25	(2,029)	(2,029)	(131)
FY21 Gain	06/30/2021	25	(24,732)	(24,732)	(1,597)
Total				**$ (53,399)**	**$ (3,407)**

Section 1.3: Actuarial Gain/(Loss) for FY21 ($'s in 000's)

	Occupational Death & Disability	Retiree Medical	Total
1. Expected Actuarial Accrued Liability			
a. Actuarial Accrued Liability as of June 30, 2020	$ 10,634	$ 150,701	$ 161,335
b. Normal Cost	5,133	15,162	20,295
c. Interest on (a) and (b) at 7.38%	1,164	12,241	13,405
d. Employer Group Waiver Plan	0	60	60
e. Benefit Payments	(431)	(237)	(668)
f. Interest on (d) and (e) at 7.38%, adjusted for timing	(17)	(6)	(23)
g. Assumption/Method Changes	0	0	0
h. Expected Actuarial Accrued Liability as of June 30, 2021 (a) + (b) + (c) + (d) + (e) + (f) + (g)	$ 16,483	$ 177,921	$ 194,404
2. Actual Actuarial Accrued Liability as of June 30, 2021	11,740	168,472	180,212
3. Liability Gain/(Loss), (1)(h) - (2)	**$ 4,743**	**$ 9,449**	**$ 14,192**
4. Expected Actuarial Asset Value			
a. Actuarial Asset Value as of June 30, 2020	$ 43,029	$ 144,747	$ 187,776
b. Interest on (a) at 7.38%	3,176	10,682	13,858
c. Employer Contributions	5,334	18,559	23,893
d. Employer Group Waiver Plan	0	60	60
e. Interest on (c) and (d) at 7.38%, adjusted for timing	193	675	868
f. Benefit Payments	(431)	(237)	(668)
g. Administrative Expenses	(32)	(22)	(54)
h. Interest on (f) and (g) at 7.38%, adjusted for timing	(18)	(9)	(27)
i. Expected Actuarial Asset Value as of June 30, 2021 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	$ 51,251	$ 174,455	$ 225,706
5. Actuarial Asset Value as of June 30, 2021	53,075	180,536	233,611
6. Actuarial Asset Gain/(Loss), (5) - (4)(i)	**$ 1,824**	**$ 6,081**	**$ 7,905**
7. Total Actuarial Gain/(Loss), (3) + (6)	**$ 6,567**	**$ 15,530**	**$ 22,097**
8. Contribution Gain/(Loss)	**$ 2,575**	**$ 2,122**	**$ 4,697**
9. Administrative Expense Gain/(Loss)	**$ (32)**	**$ (1)**	**$ (33)**
10. FY21 Gain/(Loss), (7) + (8) + (9)	**$ 9,110**	**$ 17,651**	**$ 26,761**

Section 1.4: History of Unfunded Liability and Funded Ratio ($'s in 000's)

Valuation Date	Total Actuarial Accrued Liability	Valuation Assets	Assets as a Percent of Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability (UAAL)
June 30, 2007	$ 759	$ 1,255	165.3%	$ (496)
June 30, 2008	2,018	4,007	198.6%	(1,989)
June 30, 2009	4,316	8,613	199.6%	(4,297)
June 30, 2010	8,038	13,568	168.8%	(5,530)
June 30, 2011	13,251	19,058	143.8%	(5,807)
June 30, 2012	46,921	24,915	53.1%	22,006
June 30, 2013	63,885	31,709	49.6%	32,176
June 30, 2014	53,844	41,461	77.0%	12,383
June 30, 2015	63,732	63,202	99.2%	530
June 30, 2016	77,052	87,027	112.9%	(9,975)
June 30, 2017	117,243	108,503	92.5%	8,740
June 30, 2018	126,311	131,058	103.8%	(4,747)
June 30, 2019	134,720	155,484	115.4%	(20,764)
June 30, 2020	161,335	187,776	116.4%	(26,441)
June 30, 2021	180,212	233,611	129.6%	(53,399)

Section 2: Plan Assets

Section 2.1: Summary of Fair Value of Assets ($'s in 000's)

As of June 30, 2021	Occupational Death & Disability	Retiree Medical	Total	Allocation Percent
Cash and Short-Term Investments				
- Cash and Cash Equivalents	$ 772	$ 2,614	$ 3,386	1.3%
- Subtotal	$ 772	$ 2,614	$ 3,386	1.3%
Fixed Income Investments				
- Domestic Fixed Income Pool	$ 12,129	$ 41,250	$ 53,379	20.2%
- International Fixed Income Pool	0	0	0	0.0%
- Tactical Fixed Income Pool	0	0	0	0.0%
- High Yield Pool	0	0	0	0.0%
- Treasury Inflation Protection Pool	0	0	0	0.0%
- Emerging Debt Pool	0	0	0	0.0%
- Subtotal	$ 12,129	$ 41,250	$ 53,379	20.2%
Equity Investments				
- Domestic Equity Pool	$ 16,411	$ 55,812	$ 72,223	27.3%
- International Equity Pool	9,045	30,759	39,804	15.1%
- Private Equity Pool	8,900	30,267	39,167	14.8%
- Emerging Markets Equity Pool	1,921	6,534	8,455	3.3%
- Alternative Equity Strategies	3,495	11,886	15,381	5.8%
- Subtotal	$ 39,772	$ 135,258	$ 175,030	66.3%
Other Investments				
- Real Estate Pool	$ 3,686	$ 12,534	$ 16,220	6.1%
- Other Investments Pool	3,679	12,508	16,187	6.1%
- Absolute Return Pool	0	0	0	0.0%
- Other Assets	0	0	0	0.0%
- Subtotal	$ 7,365	$ 25,042	$ 32,407	12.2%
Total Cash and Investments	$ 60,038	$ 204,164	$ 264,202	100.0%
Net Accrued Receivables	107	391	498	
Net Assets	$ 60,145	$ 204,555	$ 264,700	
Peace Officer / Firefighter	$ 18,085	N/A	N/A	
Others	42,060	N/A	N/A	
All Members	$ 60,145	$ 204,555	$ 264,700	

Section 2.2: Changes in Fair Value of Assets During FY21 ($'s in 000's)

Fiscal Year 2021	Occupational Death & Disability	Retiree Medical	Total
1. Fair Value of Assets as of June 30, 2020	$ 42,091	$ 141,569	$ 183,660
2. Additions:			
a. Member Contributions	$ 0	$ 0	$ 0
b. Employer Contributions	5,334	18,559	23,893
c. Interest and Dividend Income	626	2,120	2,746
d. Net Appreciation/(Depreciation) in Fair Value of Investments	12,678	42,913	55,591
e. Employer Group Waiver Plan	0	60	60
f. Other	2	7	9
g. Total Additions	$ 18,640	$ 63,659	$ 82,299
3. Deductions:			
a. Medical Benefits	$ 0	$ 237	$ 237
b. Death & Disability Benefits	431	0	431
c. Investment Expenses	123	414	537
d. Administrative Expenses	32	22	54
e. Total Deductions	$ 586	$ 673	$ 1,259
4. Fair Value of Assets as of June 30, 2021	$ 60,145	$ 204,555	$ 264,700
5. Approximate Fair Value Investment Return Rate during FY21 Net of Investment Expenses	29.6%	29.6%	29.6%

Section 2.3: Development of Actuarial Value of Assets ($'s in 000's)

The actuarial value of assets and the fair value were $0 at June 30, 2006. Investment gains and losses are recognized 20% per year over 5 years. In no event may valuation assets be less than 80% or more than 120% of fair value as of the current valuation date.

	Occupational Death & Disability	Retiree Medical	Total
1. Investment Gain/(Loss) for FY21			
a. Fair Value as of June 30, 2020	$ 42,091	$ 141,569	$ 183,660
b. Contributions	5,334	18,559	23,893
c. Employer Group Waiver Plan	0	60	60
d. Benefit Payments	431	237	668
e. Administrative Expenses	32	22	54
f. Actual Investment Return (net of investment expenses)	13,183	44,626	57,809
g. Expected Return Rate (net of investment expenses)	7.38%	7.38%	7.38%
h. Expected Return	3,282	11,113	14,395
i. Investment Gain/(Loss) for the Year (f) - (h)	9,901	33,513	43,414
2. Actuarial Value as of June 30, 2021			
a. Fair Value as of June 30, 2021	$ 60,145	$ 204,555	$ 264,700
b. Deferred Investment Gain/(Loss)	7,070	24,019	31,089
c. Preliminary Actuarial Value as of June 30, 2021, (a) - (b)	53,075	180,536	233,611
d. Upper Limit: 120% of Fair Value as of June 30, 2021	72,174	245,466	317,640
e. Lower Limit: 80% of Fair Value as of June 30, 2021	48,116	163,644	211,760
f. Actuarial Value at June 30, 2021, (c) limited by (d) and (e)	53,075	180,536	233,611
3. Ratio of Actuarial Value of Assets to Fair Value of Assets	88.2%	88.3%	88.3%
4. Approximate Actuarial Value Investment Return Rate during FY21 Net of Investment Expenses	11.4%	11.3%	11.3%
5. Actuarial Value Allocation[1]			
a. Peace Officer / Firefighter	$ 15,959	$ 20,163	$ 36,122
b. Others	37,116	160,373	197,489
c. All Members	$ 53,075	$ 180,536	$ 233,611

[1] Occupational death & disability allocated using fair value of assets. Retiree medical allocated based on retiree medical actuarial accrued liability.

The tables below show the development of the gains/(losses) to be recognized in the current year ($'s in 000's):

Occupational Death & Disability				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2017	$ 1,090	$ 872	$ 218	$ 0
June 30, 2018	23	15	5	3
June 30, 2019	(370)	(148)	(74)	(148)
June 30, 2020	(1,178)	(236)	(236)	(706)
June 30, 2021	9,901	0	1,980	7,921
Total	**$ 9,466**	**$ 503**	**$ 1,893**	**$ 7,070**

Retiree Medical				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2017	$ 3,156	$ 2,524	$ 632	$ 0
June 30, 2018	(58)	(36)	(12)	(10)
June 30, 2019	(1,212)	(484)	(242)	(486)
June 30, 2020	(3,825)	(765)	(765)	(2,295)
June 30, 2021	33,513	0	6,703	26,810
Total	**$ 31,574**	**$ 1,239**	**$ 6,316**	**$ 24,019**

Total				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2017	$ 4,246	$ 3,396	$ 850	$ 0
June 30, 2018	(35)	(21)	(7)	(7)
June 30, 2019	(1,582)	(632)	(316)	(634)
June 30, 2020	(5,003)	(1,001)	(1,001)	(3,001)
June 30, 2021	43,414	0	8,683	34,731
Total	**$ 41,040**	**$ 1,742**	**$ 8,209**	**$ 31,089**

Section 2.4: Historical Asset Rates of Return

	Actuarial Value		Fair Value	
Year Ending	Annual	Cumulative*	Annual	Cumulative*
June 30, 2008	5.0%	5.0%	(7.1%)	(7.1%)
June 30, 2009	2.4%	3.7%	(13.0%)	(10.1%)
June 30, 2010	3.9%	3.8%	6.6%	(4.8%)
June 30, 2011	7.3%	4.6%	19.2%	0.7%
June 30, 2012	6.9%	5.1%	2.0%	0.9%
June 30, 2013	7.9%	5.5%	11.8%	2.7%
June 30, 2014	10.9%	6.3%	18.0%	4.7%
June 30, 2015	9.5%	6.7%	3.3%	4.6%
June 30, 2016	6.7%	6.7%	0.2%	4.1%
June 30, 2017	7.8%	6.8%	12.6%	4.9%
June 30, 2018	7.9%	6.9%	7.9%	5.2%
June 30, 2019	6.6%	6.9%	6.2%	5.2%
June 30, 2020	6.4%	6.8%	4.3%	5.2%
June 30, 2021	11.3%	7.2%	29.6%	6.7%

* Cumulative since fiscal year ending June 30, 2008

Section 3: Member Data

Section 3.1: Summary of Members Included

As of June 30	2017	2018	2019	2020	2021
Active Members - Peace Officer / Firefighter					
1. Number	1,701	1,905	2,038	2,228	2,350[1]
2. Average Age	35.59	35.63	35.76	35.92	36.40
3. Average Credited Service	4.65	4.83	5.09	5.36	5.71
4. Average Entry Age	30.94	30.80	30.67	30.56	30.69
5. Average Annual Earnings	$ 77,800	$ 78,603	$ 84,593	$ 87,365	$ 90,022
Active Members - Others					
1. Number	17,470	18,473	19,864	20,695	21,583[2]
2. Average Age	41.22	41.34	41.49	41.78	41.79
3. Average Credited Service	3.83	4.08	4.25	4.59	4.84
4. Average Entry Age	37.39	37.26	37.24	37.19	36.95
5. Average Annual Earnings	$ 56,100	$ 57,349	$ 58,223	$ 59,603	$ 61,129
Active Members - Total					
1. Number	19,171	20,378	21,902	22,923	23,933[3]
2. Average Age	40.72	40.80	40.96	41.21	41.26
3. Average Credited Service	3.90	4.15	4.33	4.66	4.93
4. Average Entry Age	36.82	36.65	36.63	36.55	36.33
5. Average Annual Earnings	$ 58,025	$ 59,336	$ 60,676	$ 62,302	$ 63,966
Disabilitants and Beneficiaries (Occupational Death & Disability)					
1. Number	14	15	16	15	14
2. Average Age	42.37	43.66	42.28	44.66	47.27
3. Average Monthly Death & Disability Benefit	$ 2,199	$ 2,285	$ 2,404	$ 2,698	$ 2,601
Retirees, Surviving Spouses, and Dependent Spouses (Retiree Medical)					
1. Number	9	23	43	66	93
2. Average Age	70.76	69.97	69.72	68.85	69.75
Total Number of Members	**19,194**	**20,416**	**21,961**	**23,004**	**24,040**

Average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

[1] Includes 1,966 male active members and 384 female active members.

[2] Includes 9,309 male active members and 12,274 female active members.

[3] Includes 11,275 male active members and 12,658 female active members.

Section 3.2: Age and Service Distribution of Active Members

Annual Earnings by Age

Age	Number	Total Annual Earnings	Average Annual Earnings
0 - 19	118	$ 4,365,252	$ 36,994
20 - 24	1,300	59,848,610	46,037
25 - 29	3,113	178,588,359	57,369
30 - 34	3,947	253,180,514	64,145
35 - 39	3,912	268,741,119	68,697
40 - 44	3,031	206,711,466	68,199
45 - 49	2,518	165,069,623	65,556
50 - 54	2,178	143,486,833	65,880
55 - 59	1,845	121,517,531	65,863
60 - 64	1,361	89,532,606	65,784
65 - 69	457	30,885,212	67,583
70 - 74	118	7,109,810	60,253
75+	35	1,868,090	53,374
Total	**23,933**	**$1,530,905,025**	**$ 63,966**

Annual Earnings by Credited Service

Years of Service	Number	Total Annual Earnings	Average Annual Earnings
0	4,026	$ 200,461,317	$ 49,792
1	3,075	165,422,602	53,796
2	2,898	169,417,994	58,460
3	2,274	138,590,119	60,946
4	1,768	113,814,667	64,375
0 - 4	**14,041**	**$ 787,706,699**	**$ 56,100**
5 - 9	6,695	478,308,411	71,443
10 - 14	3,192	264,443,776	82,846
15 - 19	5	446,141	89,228
20 - 24	0	0	0
25 - 29	0	0	0
30 - 34	0	0	0
35 - 39	0	0	0
40+	0	0	0
Total	**23,933**	**$1,530,905,027**	**$ 63,966**

Years of Credited Service by Age

	Years of Service									
Age	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40+**	**Total**
0 - 19	118	0	0	0	0	0	0	0	0	118
20 - 24	1,293	7	0	0	0	0	0	0	0	1,300
25 - 29	2,673	435	5	0	0	0	0	0	0	3,113
30 - 34	2,528	1,190	229	0	0	0	0	0	0	3,947
35 - 39	2,029	1,244	639	0	0	0	0	0	0	3,912
40 - 44	1,511	924	594	2	0	0	0	0	0	3,031
45 - 49	1,248	793	476	1	0	0	0	0	0	2,518
50 - 54	1,038	738	402	0	0	0	0	0	0	2,178
55 - 59	777	652	416	0	0	0	0	0	0	1,845
60 - 64	596	483	282	0	0	0	0	0	0	1,361
65 - 69	168	171	116	2	0	0	0	0	0	457
70 - 74	49	41	28	0	0	0	0	0	0	118
75+	13	17	5	0	0	0	0	0	0	35
Total	**14,041**	**6,695**	**3,192**	**5**	**0**	**0**	**0**	**0**	**0**	**23,933**

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

Section 3.3: Member Data Reconciliation

	Actives	Retirees and Surviving Spouses	Dependent Spouses	OD&D Disabilitants	OD&D Beneficiaries	Total
As of June 30, 2020 [1]	**22,923**	**50**	**16**	**13**	**2**	**23,004**
New Entrants	3,809	0	0	0	0	3,809
Rehires	635	0	0	0	0	635
Vested Terminations	(633)	0	0	0	0	(633)
Non-Vested Terminations	(2,174)	0	0	0	0	(2,174)
Refund of Contributions	(590)	0	0	0	0	(590)
Disability Retirements	0	0	0	0	0	0
Age Retirements	(24)	24	10	0	0	10
Deaths With Beneficiary	(29)	(1)	0	0	0	(30)
Deaths Without Beneficiary	0	(1)	0	0	0	(1)
Converted To/From DB Plan	0	0	0	0	0	0
Added Dependent Coverage	0	0	1	0	0	1
Dropped Dependent Coverage	0	0	0	0	0	0
Transfers In/Out	16	(5)	0	0	0	11
Data Corrections	0	0	(1)	0	(1)	(2)
Net Change	**1,010**	**17**	**10**	**0**	**(1)**	**1,036**
As of June 30, 2021 [2]	**23,933**	**67**	**26**	**13**	**1**	**24,040**

[1] 114 participants are expected to receive retiree medical benefits in a different plan and are included for OD&D benefits only.

[2] 89 participants are expected to receive retiree medical benefits in a different plan and are included for OD&D benefits only.

Section 3.4: Schedule of Active Member Data

Valuation Date	Number	Annual Earnings (000's)	Annual Average Earnings	Percent Increase in Average Earnings	Number of Participating Employers
June 30, 2021	23,933	$ 1,530,905	$ 63,966	2.7%	151
June 30, 2020	22,923	1,428,140	62,302	2.7%	153
June 30, 2019	21,902	1,328,934	60,676	2.3%	155
June 30, 2018	20,378	1,209,152	59,336	2.3%	155
June 30, 2017	19,171	1,112,398	58,025	1.5%	157
June 30, 2016	18,215	1,041,437	57,175	3.4%	157
June 30, 2015	17,098	945,496	55,299	1.9%	159
June 30, 2014	15,800	857,150	54,250	3.7%	159
June 30, 2013	14,316	748,658	52,295	4.7%	159
June 30, 2012	12,597	629,128	49,943	4.5%	160

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

Section 3.5: Active Member Payroll Reconciliation

Payroll Field	Payroll Data (000's)
a) DRB actual reported salaries FY21 in employer list	$ 1,427,348
b) DRB actual reported salaries FY21 in valuation data	1,357,501
c) Annualized valuation data	1,530,905
d) Valuation payroll as of June 30, 2021	1,603,885
e) Rate payroll for FY22	1,548,116

a) Actual reported salaries from DRB employer listing showing all payroll paid during FY21, including those who were not active as of June 30, 2021
b) Payroll from valuation data for people who are in active status as of June 30, 2021
c) Payroll from (b) annualized for both new entrants and part-timers
d) Payroll from (c) with one year of salary scale applied to estimate salaries payable for the upcoming year
e) Payroll from (d) with the part-timer annualization removed

Section 4: Basis of the Actuarial Valuation

Section 4.1: Summary of Plan Provisions

Effective Date

July 1, 2006, with amendments through June 30, 2021.

Administration of Plan

The Commissioner of Administration or the Commissioner's designee is the administrator of the Plan. The Attorney General of the state is the legal counsel for the Plan and shall advise the administrator and represent the Plan in legal proceedings.

The Alaska Retirement Management Board prescribes policies, adopts regulations, invests the funds, and performs other activities necessary to carry out the provisions of the Plan.

Employers Included

Currently there are 151 employers participating in PERS DCR, including the State of Alaska, and 150 political subdivisions and public organizations.

Membership

An employee of a participating employer who first enters service on or after July 1, 2006, or a member of the defined benefit plan who works for an employer who began participation on or after July 1, 2006, and meets the following criteria is a member in the Plan:

- Permanent full-time or part-time employees of the State of Alaska, participating political subdivisions or public organizations. An employee must be regularly scheduled to work 30 or more hours per week to be considered full-time by the PERS. An employee must be regularly scheduled to work 15 or more hours per week but less than 30 hours to be considered a part-time employee for PERS purposes.
- Elected state officials.
- Elected municipal officials who are compensated and receive at least $2,001.00 per month.

Members can convert to PERS DCR if they are an eligible non-vested member of the PERS defined benefit plan whose employer consents to transfers to the defined contribution plan and they elect to transfer his or her account balance to PERS DCR.

Member Contributions

Other than the member-paid premiums discussed later in this section, there are no member contributions for the occupational death & disability and retiree medical benefits.

Retiree Medical Benefits

- Member must retire directly from the plan to be eligible for retiree medical coverage. Normal retirement eligibility is the earlier of a) 25 years of service as a peace officer or firefighter and 30 years of service for any other employee or b) Medicare eligible and 10 years of service.
- No subsidized retiree medical benefits are provided until normal retirement eligibility. The member's and any covered dependent's premium is 100% until the member is Medicare eligible. Upon the member's Medicare-eligibility, the required contribution will follow the service-based schedule shown below.
- Coverage cannot be denied except for failure to pay premium.
- Members who are receiving disability benefits or survivors who are receiving monthly survivor benefits are not eligible until the member meets, or would have met if he/she had lived, the normal retirement eligibility requirements.
- The following is a summary of the medical benefit design adopted in July 2016. The plan description below is used for valuation purposes and indicates participant cost-sharing. Please refer to the benefit handbook for more details.

Plan Design Feature	In-Network[1]	Out-of-Network[1] [2]
Deductible (single / family)	$300 / $600	
Medical services (participant share)	20%	40%
Emergency Room Copay (non-emergent use)	$100	$100
Medical Out-of-Pocket Maximum (single / family, including deductible)	$1,500 / $3,000	$3,000 / $6,000
Medicare Coordination	Exclusion	Exclusion
Pharmacy	No Deductible	No Deductible
Retail Generic (per 30-day fill)	20% $10 min / $50 max	
Retail Non-Formulary Brand (per 30-day fill)	25% $25 min / $75 max	40%
Retail Formulary Brand (per 30-day fill)	35% $80 min / $150 max	
Mail-Order Generic	$20 copay	
Mail-Order Non-Formulary Brand	$50 copay	40%
Mail-Order Formulary Brand	$100 copay	
Pharmacy Out-of-Pocket Max (single / family)	$1,000 / $2,000	
Medicare Pharmacy Arrangement	Retiree Drug Subsidy / Employer Group Waiver Plan effective 1/1/2019	
Wellness / Preventative	100% covered, not subject to deductible	20%, after deductible

[1] Section 1.1 of the AlaskaCare Defined Contribution Retiree Benefit Plan states that this health plan shall be updated from time to time to reflect changes in benefits, including annual adjustments to the premium, deductible, coinsurance, medical out-of-pocket limit, and prescription drug out-of-pocket limit.

[2] OON applies only to non-Medicare eligible participants.

- Buck used manual rate models to determine relative plan values for the defined benefit (DB) retiree medical plan and the DCR retiree medical plan outlined above. We applied the ratio of the DCR retiree medical plan value to the DB retiree medical plan value to the per capita costs determined for each of pre/post-Medicare medical and pharmacy benefits to estimate corresponding values for the DCR retiree medical plan design. These factors are noted in Section 4.3. We further adjusted the Medicare medical manual rate to reflect the Medicare coordination method adopted. The estimated 2022 reimbursements under EGWP were provided by Segal Consulting (who worked with the EGWP administrator, Optum, to develop those estimates). We reflect estimated discounts and pharmacy rebates in the defined benefit medical cost so no further adjustment was needed for the DCR retiree medical plan. The medical network differential is reflected in the relative plan value adjustments.
- Starting in 2022, prior authorization will be required for certain specialty medications. There is no change to the medications that are covered by the plan.
- The retiree medical plan's coverage is supplemental to Medicare. Medicare coordination is described in the DCR Plan Handbook, referred to in the industry as exclusion coordination: Medicare payment is deducted from the Medicare allowable expense and plan parameters are applied to the remaining amount. Starting in 2019, the prescription drug coverage is through a Medicare Part D EGWP arrangement.
- The premium for Medicare-eligible retirees will be based on the member's years of service. The percentage of premium paid by the member is as follows:

Years of Service	Percent of Premium Paid by Member
< 15	30%
15 – 19	25%
20 – 24	20%
25 – 29	15%
30+	10%

- The premium for dependents who are not eligible for Medicare aligns with the member's subsidy. While a member is not Medicare-eligible, premiums are 100% of the estimated cost.
- Members have a separate defined contribution Health Reimbursement Arrangement account, which is not reflected in this valuation, that can be used to pay for premiums or other medical expenses.
- For valuation purposes, retiree premiums were assumed to equal the percentages outlined in the table above times the age-related plan costs. Future premiums calculated and charged to DCR participants will need to be determined reflecting any appropriate adjustments to the defined benefit (DB) plan data because current DB premiums were determined using information based upon enrollment with members who have double coverage.
- Coverage will continue for surviving spouses of covered retired members.

Occupational Disability Benefits

- Benefit is 40% of salary at date of disability.
- For Peace Officer and Firefighters there is a Disability Benefit Adjustment such that:
  - The disability benefit is increased by 75% of the cost of living increase in the preceding calendar year or 9%, whichever is less.
  - At the time the disabled member retires, the retirement benefit will be increased by a percentage equal to the total cumulative percentage that has been applied to the disability benefit. Monthly annuity payments are made from the member's contribution balance until the fund is exhausted, at which the plan pays all remaining payments.
- For Others, there is no increase in the occupational disability benefit after commencement.
- Member earns service while on occupational disability.
- Benefits cease when the member becomes eligible for normal retirement at Medicare-eligible age and 10 years of service, or at any age with 30 years of service for Others members or 25 years of service for Peace Officer/Firefighter members.
- Peace Officer/Firefighter members may select the defined contribution account or the monthly benefit payable as if they were retiring under Tier 3 (service continues during disability, final average salary is as of date of disability), but with payments first made from the member's DC account until it's exhausted.
- No subsidized retiree medical benefits are provided until normal retirement eligibility. The member's premium is 100% of the estimated cost until they are Medicare eligible. Medicare-eligible premiums follow the service-based schedule above.

Occupational Death Benefits

- Benefit is 40% of salary for Others members and 50% of salary for Peace Officer/Firefighter members.
- Survivor's Pension Adjustment: A survivor's pension is increased by 50% of the cost of living increase in the preceding calendar year or 6%, whichever is less, if the recipient is at least age 60 on July 1, or under age 60 if the recipient has been receiving PERS benefits for at least 5 years as of July 1.
- Benefits cease when the member would have become eligible for normal retirement.
- The period during which the survivor is receiving benefits is counted as service credit toward retiree medical benefits.
- No subsidized retiree medical benefits are provided until the member would have been eligible for normal retirement. The surviving spouse's premium is 100% of the estimated cost until the member would have been Medicare eligible. Medicare-eligible premiums follow the service-based schedule above.

Changes Since the Prior Valuation

Starting in 2022, prior authorization will be required for certain specialty medications. There have been no other changes in PERS DCR benefit provisions valued since the prior valuation.

Section 4.2: Description of Actuarial Methods and Valuation Procedures

The funding method used in this valuation was adopted by the Board in October 2006, and was modified as part of the experience study for the period July 1, 2013 to June 30, 2017. The asset smoothing method used to determine valuation assets was implemented effective June 30, 2006.

Benefits valued are those delineated in Alaska State statutes as of the valuation date. Changes in State statutes effective after the valuation date are not taken into consideration in setting the assumptions and methods.

Actuarial Cost Method

Liabilities and contributions shown in the report are computed using the Entry Age Normal Actuarial Cost Method, level percent of pay. Each year's difference between actual and expected unfunded actuarial accrued liability is amortized over 25 years as a level percentage of expected payroll.

Cost factors designed to produce annual costs as a constant percentage of each member's expected compensation in each year for death & disability benefits and retiree medical benefits, from the assumed entry age to the last age with a future benefit were applied to the projected benefits to determine the normal cost (the portion of the total cost of the plan allocated to the current year under the method). The normal cost is determined by summing intermediate results for active members and determining an average normal cost rate which is then related to the total DCR Plan payroll of active members. The actuarial accrued liability for active members (the portion of the total cost of the plan allocated to prior years under the method) was determined as the excess of the actuarial present value of projected benefits over the actuarial present value of future normal costs.

The actuarial accrued liability for beneficiaries and disabled members currently receiving benefits (if any) was determined as the actuarial present value of the benefits expected to be paid. No future normal costs are payable for these members.

The actuarial accrued liability under this method at any point in time is the theoretical amount of the fund that would have been accumulated had annual contributions equal to the normal cost been made in prior years (it does not represent the liability for benefits accrued to the valuation date). The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over the actuarial value of plan assets measured on the valuation date.

Under this method, experience gains or losses, i.e., decreases or increases in accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the unfunded actuarial accrued liability.

Valuation of Assets

Effective June 30, 2006, the asset valuation method recognizes 20% of the investment gain or loss in each of the current and preceding four years. This method was phased in over five years. Fair Value of Assets was $0 as of June 30, 2006. All assets are valued at fair value. Assets are accounted for on an accrued basis and are taken directly from financial statements audited by KPMG LLP. Valuation assets are constrained to a range of 80% to 120% of the fair value of assets.

Changes in Methods Since the Prior Valuation

There were no changes in the asset or valuation methods since the prior valuation.

Valuation of Retiree Medical and Prescription Drug Benefits

The methodology used for the valuation of the retiree medical benefits is described in Section 5.2 of the State of Alaska Public Employees' Retirement System Defined Benefit Plan Actuarial Valuation Report as of June 30, 2021.

Starting in 2022, prior authorization will be required for certain specialty medications. There is no change to the medications that are covered by the plan. Segal provided an estimate of the impact of this change to the DB retiree health plan cost for calendar year 2022. The DB base claims costs for pre-Medicare prescription drug, Medicare prescription drug, and EGWP were adjusted to reflect this change. Those base claims costs were used for the DCR valuation with further adjustments as noted below. Additionally, starting in 2022, certain common preventive benefits will be covered for the DB plan. However, preventive benefits are already covered under the DCR plan so no adjustment is needed for that change. Therefore, the base claims cost for the DB plan prior to reflecting the addition of preventive benefits was used for the DCR valuation with further adjustments as noted below.

Due to the lack of experience for the DCR retiree medical plan, base claims costs are based on those described in the actuarial valuation as of June 30, 2021 for the Defined Benefit (DB) retiree medical plan covering TRS and PERS. The DB rates were used with some adjustments. The claims costs were adjusted to reflect the differences between the DCR medical plan and the DB medical plan. These differences include network steerage, different coverage levels, different Medicare coordination for medical benefits, and an indexing of the retiree out-of-pocket dollar amounts. To account for higher initial copays, deductibles and out-of-pocket limits, projected FY22 claims costs were reduced 3.1% for medical claims, and 8.9% for prescription drugs. In addition, to account for the difference in Medicare coordination, projected FY22 medical claims costs for Medicare eligible retirees were further reduced 29.5%.

To adjust for the decrease in medical claims due to COVID-19 during the last 4 months of FY20, the per capita cost during the first 8 months was used as the basis for estimating claims that would have occurred in the absence of COVID-19. FY21 experience was also thoroughly reviewed to assess the impact of COVID-19 and whether an adjustment to FY21 claims was appropriate for use in the June 30, 2021 valuation. FY21 medical per capita claims were noticeably lower than expected, so a 4% load was added to the FY21 medical claims used in the per capita claims cost development to better reflect future expected long-term costs of the plan.

No implicit subsidies are assumed. Employees projected to retire with 30 years of service (25 years of service for Peace/Fire) prior to Medicare are valued with commencement deferred to Medicare eligibility because those members will be required to pay the full plan premium prior to Medicare. Explicit subsidies for disabled and normal retirement are determined using the plan-defined percentages of age-related total projected plan costs, again with no implicit subsidy assumed.

The State transitioned to an Employer Group Waiver Program (EGWP) for DCR participants effective January 1, 2019. The estimated 2022 reimbursements under EGWP were provided by Segal Consulting (who worked with the EGWP administrator, Optum, to develop those estimates).

Healthcare Reform

Healthcare Reform legislation passed on March 23, 2010 included several provisions with potential implications for the State of Alaska Retiree Health Plan liability. Buck evaluated the impact due to these provisions.

Because the State plan is retiree-only, not all provisions are required. Unlimited lifetime benefits and dependent coverage to age 26 are two of these provisions. The adopted DCR plan does not place lifetime limits on benefits, but does restrict dependent child coverage.

The Further Consolidated Appropriations Act, 2020 passed in December 2019 repealed several healthcare-related taxes, including the Cadillac Tax.

The Tax Cuts and Jobs Act passed in December 2017 included the elimination of the individual mandate penalty and changed the inflation measure for purposes of determining the limits for the High Cost Excise Tax to use chained CPI. It is our understanding the law does not directly impact other provisions of the ACA. While the nullification of the ACA's individual mandate penalty does not directly impact employer group health plans, it could contribute to the destabilization of the individual market and increase the number of uninsured. Such destabilization could translate to increased costs for employers. We have considered this when setting our healthcare cost trend assumptions and will continue to monitor this issue.

We have not identified any other specific provisions of healthcare reform or its potential repeal that would be expected to have a significant impact on the measured obligation. We will continue to monitor legislative activity.

Section 4.3: Summary of Actuarial Assumptions

The demographic and economic assumptions used in the June 30, 2021 valuation are described below. Unless noted otherwise, these assumptions were adopted by the Board in January 2019 based on the experience study for the period July 1, 2013 to June 30, 2017.

Investment Return

7.38% per year, net of investment expenses.

Salary Scale

Salary scale rates based upon the 2013-2017 actual experience (see Table 1).

Inflation – 2.50% per year.

Productivity – 0.25% per year.

Payroll Growth

2.75% per year (inflation + productivity).

Total Inflation

Total inflation as measured by the Consumer Price Index for urban and clerical workers for Anchorage is assumed to increase 2.50% annually.

Mortality (Pre-Commencement)

Mortality rates based upon the 2013-2017 actual experience.

100% (male and female) of RP-2014 employee table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Deaths are assumed to result from occupational causes 75% of the time for Peace Officer/Firefighters, and 40% of the time for Others.

Mortality (Post-Commencement)

Mortality rates based upon the 2013-2017 actual experience.

91% of male and 96% of female rates of RP-2014 healthy annuitant table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Turnover

Select and ultimate rates based upon the 2013-2017 actual experience (see Tables 2a and 2b).

Disability

Incidence rates based upon the 2013-2017 actual experience (see Tables 3a and 3b). For retiree medical benefits, the disability rates cease once a member is eligible for retirement. However, the disability rates continue after retirement eligibility for occupational death & disability benefits.

Disabilities are assumed to be occupational 75% of the time for Peace Officer/Firefighters, and 40% of the time for Others. For Peace Officer/Firefighters, members are assumed to take the monthly annuity 100% of the time.

Post-disability mortality in accordance with the RP-2014 disabled table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Retirement

Retirement rates based upon the 2013-2017 actual experience (see Table 4).

Spouse Age Difference

Males are assumed to be three years older than their wives. Females are assumed to be two years younger than husbands.

Percent Married for Occupational Death & Disability

For Others, 75% of male members and 70% of female members are assumed to be married. For Peace Officer/Firefighters, 85% of male members and 60% of female members are assumed to be married.

Dependent Spouse Medical Coverage Election

Applies to members who do not have double medical coverage. For Others, 65% of male members and 60% of female members are assumed to be married and cover a dependent spouse. For Peace Officer/Firefighters, 75% of male members and 50% of female members are assumed to be married and cover a dependent spouse.

Part-Time Status

Part-time employees are assumed to earn 1.00 years of credited service per year for Peace Officer/Firefighter and 0.75 years of credited service per year for Other members.

Peace Officer / Firefighter Occupational Disability Retirement Benefit Commencement

The occupational disability retirement benefit is assumed to be first payable from the member's DC account and the retirement benefit payable from the occupational death & disability trust will commence five years later.

Per Capita Claims Cost

Sample claims cost rates (before base claims cost adjustments described below) adjusted to age 65 for FY22 medical and prescription drugs are shown below. The prescription drug costs reflect the plan change to require prior authorization for certain specialty medications.

	Medical	Prescription Drugs
Pre-Medicare	$ 15,708	$ 3,375
Medicare Parts A & B	$ 1,619	$ 3,474
Medicare Part D – EGWP	N/A	$ 1,131

Members are assumed to attain Medicare eligibility at age 65. All costs are for the 2022 fiscal year (July 1, 2021 – June 30, 2022).

The EGWP subsidy is assumed to increase in future years by the trend rates shown on the following pages. No future legislative changes or other events are anticipated to impact the EGWP subsidy. If any legislative or other changes occur in the future that impact the EGWP subsidy (which could either increase or decrease the plan's Actuarial Accrued Liability), those changes will be evaluated and quantified when they occur.

Third Party Administrator Fees

$493 per person per year; assumed to increase at 4.5% per year.

Base Claims Cost Adjustments

Due to higher initial copays, deductibles, out-of-pocket limits and member cost sharing compared to the DB medical plan, the following cost adjustments are applied to the per capita claims cost rates above:

- 0.969 for the pre-Medicare plan.
- 0.674 for both the Medicare medical plan and Medicare coordination method (3.1% reduction for the medical plan and 29.5% reduction for the coordination method).
- 0.911 for the prescription drug plan.

Administrative Expenses

Beginning with the June 30, 2018 valuation, the Normal Cost is increased for administrative expenses expected to be paid from plan assets during the year. The amounts included in the June 30, 2021 Normal Cost, which are based on the average of actual administrative expenses during the last two fiscal years, are $16,000 for occupational death & disability and $24,000 for retiree medical.

Healthcare Cost Trend

The table below shows the rate used to project the cost from the shown fiscal year to the next fiscal year. For example, 6.3% is applied to the FY22 pre-Medicare medical claims costs to get the FY23 medical claims costs.

	Medical Pre-65	Medical Post-65	Prescription Drugs / EGWP
FY22	6.3%	5.4%	7.1%
FY23	6.1%	5.4%	6.8%
FY24	5.9%	5.4%	6.4%
FY25	5.8%	5.4%	6.1%
FY26	5.6%	5.4%	5.7%
FY27-FY40	5.4%	5.4%	5.4%
FY41	5.3%	5.3%	5.3%
FY42	5.2%	5.2%	5.2%
FY43	5.1%	5.1%	5.1%
FY44	5.1%	5.1%	5.1%
FY45	5.0%	5.0%	5.0%
FY46	4.9%	4.9%	4.9%
FY47	4.8%	4.8%	4.8%
FY48	4.7%	4.7%	4.7%
FY49	4.6%	4.6%	4.6%
FY50+	4.5%	4.5%	4.5%

For the June 30, 2014 valuation and later, the updated Society of Actuaries' Healthcare Cost Trend Model is used to project medical and prescription drug costs. This model estimates trend amounts that are projected out for 80 years. The model has been populated with assumptions that are specific to the State of Alaska.

Aging Factors

Age	Medical	Prescription Drugs
0 – 44	2.0%	4.5%
45 – 54	2.5%	3.5%
55 – 64	2.5%	1.5%
65 – 74	3.0%	2.0%
75 – 84	2.0%	-0.5%
85 – 94	0.3%	-2.5%
95+	0.0%	0.0%

Retiree Medical Participation

Death / Disability Decrement		Retirement Decrement	
Age	Percent Participation	Age	Percent Participation*
< 56	75.0%	55	50.0%
56	77.5%	56	55.0%
57	80.0%	57	60.0%
58	82.5%	58	65.0%
59	85.0%	59	70.0%
60	87.5%	60	75.0%
61	90.0%	61	80.0%
62	92.5%	62	85.0%
63	95.0%	63	90.0%
64	97.5%	64	95.0%
65+	100.0%	65+	**Years of Service**
			< 15 75.0%
			15 – 19 80.0%
			20 – 24 85.0%
			25 – 29 90.0%
			30+ 95.0%

* Participation assumption is a combination of (i) the service-based rates for retirement from employment at age 65+ and (ii) the age-based rates for retirement from employment before age 65. These rates reflect the expected plan election rate that varies by reason for decrement, duration that a member may pay full cost prior to Medicare eligibility, and availability of alternative and/or lower cost options, particularly in the Medicare market. This assumption is based on observed trends in participation from a range of other plans.

Imputed Data

Data changes from the prior year which are deemed to have immaterial impact on liabilities and contribution rates are assumed to be correct in the current year's client data. Non-vested terminations with appropriate refund dates are assumed to have received a full refund of contributions. Active members with missing salary and service are assumed to be terminated with status based on their vesting percentage.

Changes in Assumptions Since the Prior Valuation

The amounts included in the Normal Cost for administrative expenses were changed from $1,000 to $16,000 for occupational death & disability, and from $20,000 to $24,000 for retiree medical (based on the most recent two years of actual administrative expenses paid from plan assets). The per capita claims cost assumption is updated annually.

Table 1: Salary Scales

Peace Officer / Firefighter		Others	
Years of Service	Percent Increase	Years of Service	Percent Increase
0	7.75%	0	6.75%
1	7.25%	1	6.25%
2	6.75%	2	5.75%
3	6.25%	3	5.25%
4	5.75%	4	4.75%
5	5.25%	5	4.25%
6	4.75%	6	3.75%
7	4.25%	7	3.65%
8	3.75%	8	3.55%
9	3.65%	9	3.45%
10	3.55%	10	3.35%
11	3.45%	11	3.25%
12	3.35%	12	3.15%
13	3.25%	13	3.05%
14	3.15%	14	2.95%
15	3.05%	15	2.85%
16	2.95%	16	2.75%
17	2.85%	17	2.75%
18+	2.75%	18+	2.75%

Table 2a: Turnover Rates for Peace Officer / Firefighter

Select Rates during the First 5 Years of Employment

Years of Service	Male	Female
0	18.90%	20.63%
1	14.18%	16.50%
2	10.50%	13.75%
3	9.45%	12.38%
4	8.40%	11.00%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female	Age	Male	Female
< 23	5.52%	11.97%	44	5.78%	11.09%
23	5.65%	11.97%	45	5.71%	11.03%
24	5.78%	11.97%	46	5.64%	10.98%
25	5.91%	11.97%	47	5.57%	10.92%
26	6.04%	11.97%	48	6.01%	10.84%
27	6.16%	11.97%	49	6.45%	10.75%
28	6.16%	11.94%	50	6.89%	10.67%
29	6.15%	11.91%	51	7.32%	10.58%
30	6.14%	11.88%	52	7.76%	10.50%
31	6.14%	11.84%	53	7.97%	10.66%
32	6.12%	11.81%	54	8.18%	10.82%
33	6.11%	11.79%	55	8.38%	10.98%
34	6.09%	11.77%	56	8.59%	11.15%
35	6.08%	11.75%	57	8.80%	11.31%
36	6.07%	11.72%	58	9.03%	11.47%
37	6.05%	11.70%	59	9.25%	11.63%
38	6.03%	11.60%	60	9.48%	11.79%
39	6.00%	11.50%	61	9.71%	11.95%
40	5.98%	11.40%	62	9.94%	12.12%
41	5.95%	11.30%	63	12.37%	12.28%
42	5.93%	11.20%	64	14.81%	12.44%
43	5.85%	11.14%	65+	17.25%	12.60%

Table 2b: Turnover Rates for Others

Select Rates during the First 5 Years of Employment

Years of Service	Male	Female
0	24.36%	27.98%
1	21.00%	22.31%
2	16.80%	17.85%
3	13.44%	14.28%
4	9.45%	12.34%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female	Age	Male	Female
< 23	13.71%	16.50%	44	7.83%	8.22%
23	13.71%	16.51%	45	7.72%	7.90%
24	13.71%	16.51%	46	7.60%	7.58%
25	13.71%	16.52%	47	7.48%	7.26%
26	13.71%	16.53%	48	7.68%	7.23%
27	13.71%	16.54%	49	7.87%	7.20%
28	13.41%	15.94%	50	8.07%	7.17%
29	13.21%	15.34%	51	8.26%	7.14%
30	12.82%	17.75%	52	8.46%	7.11%
31	12.52%	14.15%	53	8.46%	7.26%
32	12.22%	13.55%	54	8.47%	7.42%
33	11.65%	12.90%	55	8.48%	7.57%
34	11.09%	12.24%	56	8.48%	7.72%
35	10.52%	11.58%	57	8.49%	7.88%
36	9.95%	10.92%	58	8.77%	8.15%
37	9.39%	10.26%	59	9.08%	8.42%
38	9.12%	9.98%	60	9.32%	8.69%
39	8.86%	9.70%	61	9.60%	8.96%
40	8.60%	9.42%	62	9.88%	9.24%
41	8.32%	9.14%	63	10.28%	10.51%
42	8.07%	8.86%	64	10.68%	11.78%
43	7.95%	8.54%	65+	11.08%	13.05%

Table 3a: Disability Rates for Peace Officer / Firefighter

Age	Male	Female	Age	Male	Female
< 23	0.0179%	0.0112%	46	0.1247%	0.0780%
23	0.0244%	0.0153%	47	0.1337%	0.0836%
24	0.0310%	0.0194%	48	0.1462%	0.0914%
25	0.0374%	0.0234%	49	0.1588%	0.0993%
26	0.0440%	0.0275%	50	0.1714%	0.1071%
27	0.0505%	0.0316%	51	0.1839%	0.1150%
28	0.0526%	0.0329%	52	0.1965%	0.1228%
29	0.0548%	0.0343%	53	0.2294%	0.1434%
30	0.0570%	0.0356%	54	0.2624%	0.1640%
31	0.0591%	0.0370%	55	0.2954%	0.1846%
32	0.0612%	0.0383%	56	0.3283%	0.2052%
33	0.0634%	0.0397%	57	0.3613%	0.2258%
34	0.0657%	0.0411%	58	0.4112%	0.2570%
35	0.0679%	0.0425%	59	0.4611%	0.2882%
36	0.0702%	0.0439%	60	0.5110%	0.3194%
37	0.0724%	0.0453%	61	0.5610%	0.3506%
38	0.0757%	0.0473%	62	0.6109%	0.3818%
39	0.0789%	0.0493%	63	0.6109%	0.3818%
40	0.0822%	0.0514%	64	0.6109%	0.3818%
41	0.0854%	0.0534%	65	0.6109%	0.3818%
42	0.0886%	0.0554%	66	0.6109%	0.3818%
43	0.0977%	0.0611%	67	0.6109%	0.3818%
44	0.1066%	0.0667%	68	0.4073%	0.2546%
45	0.1157%	0.0723%	69	0.2036%	0.1273%
			70+	0.2036%	0.1273%

Table 3b: Disability Rates for Others

Age	Male	Female	Age	Male	Female
< 23	0.0327%	0.0376%	46	0.1125%	0.1154%
23	0.0360%	0.0400%	47	0.1208%	0.1236%
24	0.0392%	0.0424%	48	0.1329%	0.1360%
25	0.0425%	0.0448%	49	0.1451%	0.1484%
26	0.0456%	0.0472%	50	0.1572%	0.1608%
27	0.0489%	0.0496%	51	0.1694%	0.1734%
28	0.0501%	0.0510%	52	0.1815%	0.1858%
29	0.0513%	0.0524%	53	0.2132%	0.2168%
30	0.0524%	0.0538%	54	0.2450%	0.2478%
31	0.0536%	0.0554%	55	0.2766%	0.2788%
32	0.0548%	0.0568%	56	0.3084%	0.3098%
33	0.0566%	0.0586%	57	0.3401%	0.3408%
34	0.0584%	0.0606%	58	0.4068%	0.4096%
35	0.0602%	0.0624%	59	0.4736%	0.4784%
36	0.0620%	0.0644%	60	0.5405%	0.5470%
37	0.0638%	0.0662%	61	0.6072%	0.6158%
38	0.0669%	0.0696%	62	0.6740%	0.6844%
39	0.0701%	0.0728%	63	0.8526%	0.8450%
40	0.0734%	0.0762%	64	1.0314%	1.0054%
41	0.0765%	0.0794%	65	1.2101%	1.1660%
42	0.0797%	0.0826%	66	1.3889%	1.3264%
43	0.0879%	0.0908%	67	1.5675%	1.4870%
44	0.0962%	0.0990%	68	1.0451%	0.9914%
45	0.1043%	0.1072%	69	0.5225%	0.4956%
			70+	0.5225%	0.4956%

Table 4: Retirement Rates

Age	Rate
< 55	2.0%
55	3.0%
56	3.0%
57	3.0%
58	3.0%
59	3.0%
60	5.0%
61	5.0%
62	10.0%
63	5.0%
64	5.0%
65	25.0%
66	25.0%
67	25.0%
68	20.0%
69	20.0%
70+	100.0%

Glossary of Terms

Actuarial Accrued Liability

Total accumulated cost to fund pension or postemployment benefits arising from service in all prior years.

Actuarial Cost Method

Technique used to assign or allocate, in a systematic and consistent manner, the expected cost of a pension or postemployment plan for a group of plan members to the years of service that give rise to that cost.

Actuarial Present Value of Projected Benefits

Amount which, together with future interest, is expected to be sufficient to pay all future benefits.

Actuarial Valuation

Study of probable amounts of future pension or postemployment benefits and the necessary amount of contributions to fund those benefits.

Actuary

Person who performs mathematical calculations pertaining to pension and insurance benefits based on specific procedures and assumptions.

GASB 74 and 75

Governmental Accounting Standards Board Statement Number 74 amends Number 43 effective for the fiscal year beginning after June 15, 2016 and defines new financial reporting requirements for public postemployment benefit plans. Governmental Accounting Standards Board Statement Number 75 amends Number 45 effective for fiscal years beginning after June 15, 2017 and defines new accounting and financial reporting requirements for employers sponsoring public postemployment benefit plans.

Normal Cost

That portion of the actuarial present value of benefits assigned to a particular year in respect to an individual participant or the plan as a whole.

Rate Payroll

Members' earnings used to determine contribution rates.

Unfunded Actuarial Accrued Liability (UAAL)

The portion of the actuarial accrued liability not offset by plan assets.

Valuation Payroll

Members' earnings used to determine Normal Cost and Actuarial Accrued Liability.

Vested Benefits

Benefits which are unconditionally guaranteed regardless of employment.

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BUCK

State of Alaska

Teachers' Retirement System

Actuarial Valuation Report
As of June 30, 2021

May 2022

May 12, 2022

State of Alaska
The Alaska Retirement Management Board
The Department of Revenue, Treasury Division
The Department of Administration, Division of Retirement and Benefits
P.O. Box 110203
Juneau, AK 99811-0203

Certification of Actuarial Valuation

Dear Members of The Alaska Retirement Management Board, The Department of Revenue and The Department of Administration:

This report summarizes the annual actuarial valuation results of the State of Alaska Teachers' Retirement System (TRS) as of June 30, 2021 performed by Buck Global, LLC (Buck).

The actuarial valuation is based on financial information provided in the financial statements audited by KPMG LLP, member data provided by the Division of Retirement and Benefits, and medical enrollment data provided by the healthcare claims administrator (Aetna), as summarized in this report. The benefits considered are those delineated in Alaska statutes effective June 30, 2021. The actuary did not verify the data submitted, but did perform tests for consistency and reasonableness.

All costs, liabilities, and other factors under TRS were determined in accordance with generally accepted actuarial principles and procedures. An actuarial cost method is used to measure the actuarial liabilities which we believe is reasonable. Buck is solely responsible for the actuarial data and actuarial results presented in this report. This report fully and fairly discloses the actuarial position of TRS as of June 30, 2021.

TRS is funded by Employer, State, and Member Contributions in accordance with the funding policy adopted by the Alaska Retirement Management Board (Board) and as required by Alaska state statutes. The funding objective for TRS is to pay required contributions that remain level as a percent of total TRS compensation. The Board has also established a funding policy objective that the required contributions be sufficient to pay the Normal Costs of active plan members, plan expenses, and amortize the Unfunded Actuarial Accrued Liability (UAAL) as a level percentage of total TRS compensation over a closed 25-year period as required by Alaska state statutes. The closed 25-year period was originally established effective June 30, 2014. Effective June 30, 2018, the Board adopted a 25-year layered UAAL amortization method as described in Section 5.2. The UAAL amortization continues to be on a level percent of pay basis. The compensation used to determine required contributions is the total compensation of all active members in TRS, including those hired after July 1, 2006 who are members of the Defined Contribution Retirement (DCR) Plan. This objective is currently being met and is projected to continue to be met. Absent future gains/losses, actuarially determined contributions are expected to remain level as a percent of pay and the overall funded status (on a combined pension/healthcare basis) is expected to increase to 100% in FY24 (the funded status of the pension trust is expected to increase to 100% in FY33).

The Board and staff of the State of Alaska may use this report for the review of the operations of TRS. Use of this report for any other purpose or by anyone other than the Board or staff of the State of Alaska may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, you should ask Buck to review any statement you wish to make on the results contained in this report. Buck will not accept any liability for any such statement made without the review by Buck.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the actuarial assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. In particular, retiree group benefits models necessarily rely on the use of approximations and estimates and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements. An analysis of the potential range of such future differences is beyond the scope of this valuation.

In our opinion, the actuarial assumptions used are reasonable, taking into account the experience of the plan and reasonable long-term expectations, and represent our best estimate of the anticipated long-term experience under the plan. The actuary performs an analysis of plan experience periodically and recommends changes if, in the opinion of the actuary, assumption changes are needed to more accurately reflect expected future experience. The last full experience analysis was performed for the period July 1, 2013 to June 30, 2017. Based on that experience study, the Board adopted new assumptions effective beginning with the June 30, 2018 valuation to better reflect expected future experience. Based on our annual analysis of recent claims experience, changes were made to the per capita claim cost rates effective June 30, 2021 to better reflect expected future healthcare experience. A summary of the actuarial assumptions and methods used in this actuarial valuation is shown in Sections 5.2 and 5.3. We certify that the assumptions and methods described in Sections 5.2 and 5.3 of this report meet the requirements of all applicable Actuarial Standards of Practice.

Governmental Accounting Standards Board (GASB) Statement No. 67 (GASB 67) was effective for TRS beginning with fiscal year ending June 30, 2014, and Statement No. 74 (GASB 74) was effective for TRS beginning with fiscal year ending June 30, 2017. Separate GASB 67 and GASB 74 reports as of June 30, 2021 have been prepared. We have also prepared the member data tables shown in Section 4 of this report for the Statistical Section of the ACFR, as well as the summary of actuarial assumptions and analysis of financial experience for the Actuarial Section of the ACFR. Please see our separate GASB 67 and GASB 74 reports for other information needed for the ACFR.

Assessment of Risks

Actuarial Standard of Practice No. 51 (ASOP 51) applies to actuaries performing funding calculations related to a pension plan. ASOP 51 does not apply to actuaries performing services in connection with other post-employment benefits, such as medical benefits. Accordingly, ASOP 51 does not apply to the healthcare portion of TRS. See Section 6 of this report for further details regarding ASOP 51.

Use of Models

Actuarial Standard of Practice No. 56 (ASOP 56) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of the plan using data and assumptions as of the measurement date under

the funding methods specified in this report. The output from the third-party vendor software is used as input to internally developed models that apply applicable funding methods and policies to the derived liabilities and other inputs, such as plan assets and contributions, to generate many of the exhibits found in this report. Buck has an extensive review process in which the results of the liability calculations are checked using detailed sample life output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other funding outputs and the internal models are similarly reviewed in detail and at a higher level for accuracy, reasonability, and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software. This review is performed by experts within Buck who are familiar with applicable funding methods, as well as the manner in which the model generates its output. If significant changes are made to the internal models, extra checking and review are completed. Significant changes to the internal models that are applicable to multiple clients are generally developed, checked, and reviewed by multiple experts within Buck who are familiar with the details of the required changes.

Additional models used in valuing health benefits are described later in the report.

COVID-19

The potential impact of the ongoing COVID-19 pandemic on costs and liabilities was considered and an adjustment was made in setting the medical per capita claims cost assumption. FY20 medical claims were adjusted for a COVID-19 related decline in claims during the last four months (March – June) of FY20. FY21 medical claims were adjusted for a COVID-19 related decline in those claims during the fiscal year. A more detailed explanation on these adjustments is shown in Section 5.2.

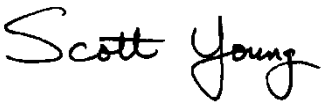
This report was prepared under my supervision and in accordance with all applicable Actuarial Standards of Practice. I am a Fellow of the Society of Actuaries, an Enrolled Actuary, a Fellow of the Conference of Consulting Actuaries, and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

I am available to discuss this report with you at your convenience. I can be reached at 602-803-6174.

Respectfully submitted,

David J. Kershner, FSA, EA, MAAA, FCA
Principal
Buck

The undersigned actuary is responsible for all assumptions related to the average annual per capita health claims cost and the health care cost trend rates, and hereby affirms his qualification to render opinions in such matters in accordance with the Qualification Standards of the American Academy of Actuaries.



Scott Young, FSA, EA, MAAA, FCA
Director
Buck

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Executive Summary

Overview

The State of Alaska Teachers' Retirement System (TRS) provides pension and postemployment healthcare benefits to teachers and other eligible participants. The Commissioner of the Department of Administration is responsible for administering the plan. The Alaska Retirement Management Board has fiduciary responsibility over the assets of the plan. This report presents the results of the actuarial valuation of TRS as of the valuation date of June 30, 2021.

Purpose

An actuarial valuation is performed on the plan annually as of the end of the fiscal year. The main purposes of the actuarial valuation detailed in this report are:

1. To determine the Employer/State contribution necessary to meet the Board's funding policy for the plan;
2. To disclose the funding assets and liability measures as of the valuation date;
3. To review the current funded status of the plan and assess the funded status as an appropriate measure for determining future actuarially determined contributions;
4. To compare actual and expected experience under the plan during the last fiscal year; and
5. To report trends in contributions, assets, liabilities, and funded status over the last several years.

The actuarial valuation provides a "snapshot" of the funded position of TRS based on the plan provisions, membership data, assets, and actuarial methods and assumptions as of the valuation date.

Actuarial projections are also performed to provide a long-term view of the expected future funded status and contribution patterns (see Section 3). The future funded status and contribution patterns would be different than those shown in Section 3 if future experience does not match the actuarial assumptions used in the projections.

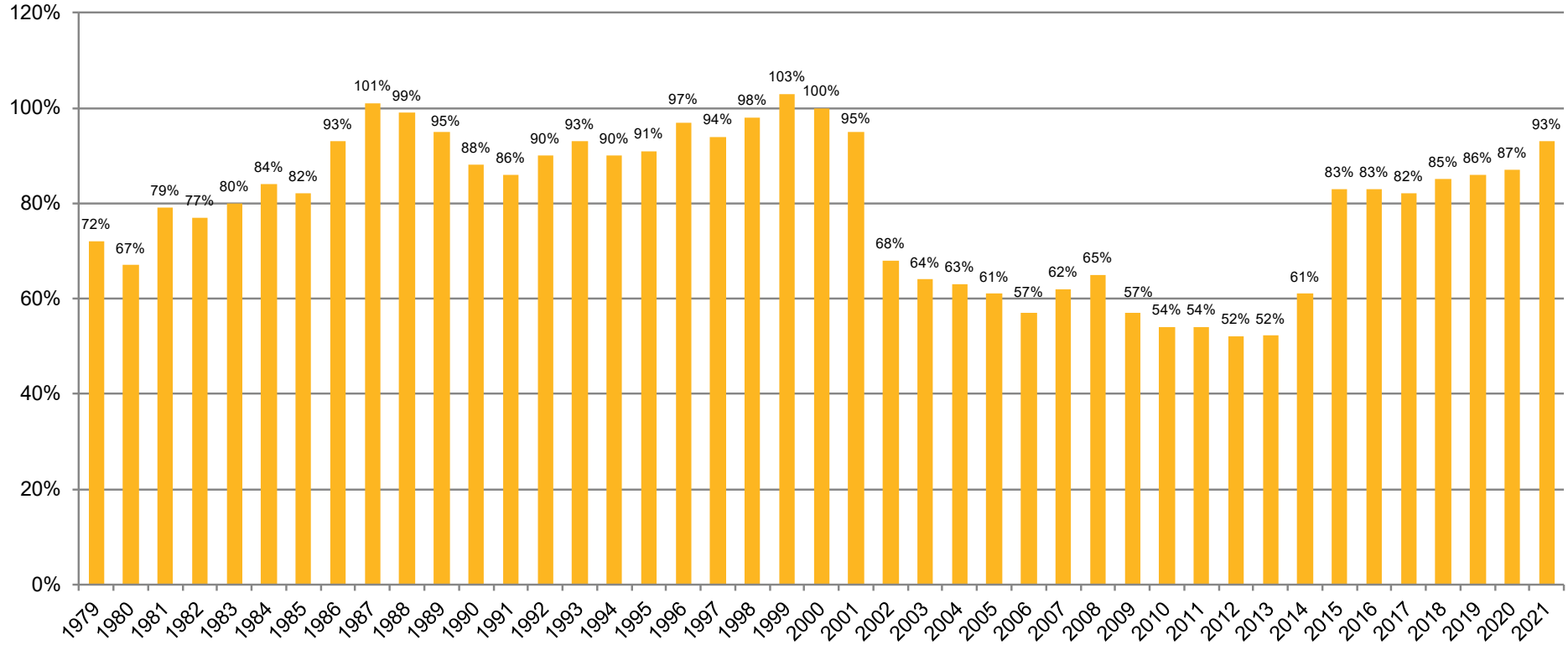
Retiree group benefits models necessarily rely on the use of approximations and estimates, and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements.

Funded Status

Where presented, references to "funded ratio" and "unfunded actuarial accrued liability" typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

Funded Status as of June 30 ($'s in 000's)		2020	2021
Pension			
a.	Actuarial Accrued Liability	$ 7,447,036	$ 7,471,887
b.	Valuation Assets	5,587,064	5,910,369
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ 1,859,972	$ 1,561,518
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	75.0%	79.1%
e.	Fair Value of Assets	$ 5,444,799	$ 6,731,481
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	73.1%	90.1%
Healthcare			
a.	Actuarial Accrued Liability	$ 2,489,675	$ 2,439,603
b.	Valuation Assets	3,021,283	3,267,737
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ (531,608)	$ (828,134)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	121.4%	133.9%
e.	Fair Value of Assets	$ 2,953,461	$ 3,723,031
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	118.6%	152.6%
Total			
a.	Actuarial Accrued Liability	$ 9,936,711	$ 9,911,490
b.	Valuation Assets	8,608,347	9,178,106
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ 1,328,364	$ 733,384
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	86.6%	92.6%
e.	Fair Value of Assets	$ 8,398,260	$ 10,454,512
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	84.5%	105.5%

Funded Ratio History (Based on Valuation Assets)



The key reasons for the change in the funded status are explained below. The funded status for healthcare benefits is not necessarily an appropriate measure to confirm that assets are sufficient to settle health plan obligations as there are no available financial instruments for purchase. Future experience is likely to vary from assumptions so there is potential for actuarial gains or losses.

1. Investment Experience

The actuarial asset value was reinitialized to equal fair value of assets as of June 30, 2014. Beginning in FY15, the asset valuation method recognizes 20% of the investment gain or loss each year, for a period of five years. The FY21 investment return based on fair value of assets was approximately 30.1% compared to the expected investment return of 7.38% (net of investment expenses). This resulted in a market asset gain of approximately $1,856 million. Due to the recognition of investment gains and losses over a 5-year period, the FY21 investment return based on actuarial value of assets was approximately 11.6%, which resulted in an actuarial asset gain of approximately $354 million.

2. Salary Increases

Salary increases for continuing active members during FY21 were higher than expected based on the valuation assumptions, resulting in a liability loss of approximately $29 million.

3. Demographic Experience

Section 4 provides statistics on active and inactive participants. The number of active participants decreased 10.4% from 3,789 at June 30, 2020 to 3,396 at June 30, 2021 due to active members exiting the plan during the year (due to retirement, termination, death, and disability) and the closure of the plan to new entrants as of July 1, 2006. The average age of active participants increased from 51.92 to 52.14 and average credited service increased from 19.76 to 20.31 years.

The number of benefit recipients increased 2.1% from 13,689 to 13,972, and their average age increased from 71.85 to 72.26. The number of vested terminated participants decreased 4.8% from 764 to 727. Their average age increased from 52.37 to 52.68.

The overall effect of the demographic experience during FY21 was a liability loss of approximately $7 million (pension) and a liability gain of approximately $3[1] million (healthcare).

4. COLA / PRPA Experience

The cost-of-living increases (COLA) for benefit recipients during FY21 were less than expected based on the valuation assumptions, resulting in a liability gain of approximately $0.3 million. The postretirement pension adjustments (PRPA) were also less than expected, resulting in a liability gain of approximately $81 million.

5. Retiree Medical Claims Experience

As described in Section 5.2, recent medical claims experience and changes in healthcare enrollment data provided to us for the June 30, 2021 valuation generated a liability gain of approximately $97 million. Reduced claims during FY21, largely attributable to medical claims impacted by COVID-19, generated a liability gain of approximately $11 million.

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[1] Includes the effects of changes in dependent coverage elections and Medicare Part B only experience.

6. Changes in Methods Since the Prior Valuation

There were no changes in actuarial methods since the prior valuation.

7. Changes in Assumptions Since the Prior Valuation

Healthcare claim costs are updated annually as described in Section 5.2. The amounts included in the Normal Cost for administrative expenses were updated based on the last two years of actual administrative expenses paid from plan assets. There were no other changes in actuarial assumptions since the prior valuation.

8. Changes in Benefit Provisions Since the Prior Valuation

Starting in 2022, prior authorization will be required for certain specialty medications for all participants, and certain preventive benefits for pre-Medicare participants will now be covered by the plan. These changes created an actuarial gain of approximately $22 million. There have been no other changes in benefit provisions valued since the prior valuation.

Projections

Absent future asset (and/or liability) losses, changes in plan provisions or actuarial assumptions, the $1,856 million FY21 market asset gain has a significant impact on the projections shown in Section 3. For example, the pension trust is currently projected to reach a funded status of 100% in FY33. Based on the 2020 valuation projections, the funded status of the pension trust was projected to be only 80% in FY33.

Once the pension trust is projected to reach a funded status of 100%, it may be reasonable to assume that all remaining pension unfunded liability layered amortization amounts should be reduced to zero. Since the healthcare trust is currently more than 100% funded, the healthcare unfunded liability amortization amounts would also be reduced to zero if the Board decides to implement this change (this does not impact the projections shown in Section 3.6 since the healthcare Normal Cost is assumed to be contributed as a minimum in all years after FY23 per Alaska state statutes).

We have shown the table of projected figures in Section 3.6 two ways:

a) Section 3.6A – No changes to the pension unfunded liability layered amortization amounts. In this case, Additional State Contributions totaling approximately $553 million are projected for FY33 through FY39, even though the pension trust is projected to be 100% funded by FY33.

b) Section 3.6B – Eliminate the pension unfunded liability layered amortization amounts when the pension trust is projected to be 100% funded. In this case, the Additional State Contributions are projected to be zero after FY32.

The pros and cons of these two methods can be discussed further upon request.

In both cases, the pension Normal Cost is assumed to be contributed as a minimum based on Alaska state statutes. (The healthcare trust is currently over 100% funded, so the healthcare Normal Cost is also assumed to be contributed as a minimum based on Alaska state statutes.)

Sections 3.3 through 3.5 are based on the projections shown in Section 3.6A.

Comparative Summary of Contribution Rates

Pension	Actual FY 2023	Estimated FY 2024
a. Normal Cost Rate Net of Member Contributions	2.24%	2.05%
b. Past Service Cost Rate	15.66%	12.90%
c. Total Employer/State Contribution Rate, (a) + (b), not less than (a)[1]	17.90%	14.95%

Healthcare	Actual FY 2023	Estimated FY 2024
a. Normal Cost Rate	2.72%	2.41%
b. Past Service Cost Rate	(7.93)%	(11.03)%
c. Total Employer/State Contribution Rate, (a) + (b), not less than (a)[1]	2.72%	2.41%

Total	Actual FY 2023	Estimated FY 2024
a. Normal Cost Rate Net of Member Contributions	4.96%	4.46%
b. Past Service Cost Rate	15.66%	12.90%
c. Total Employer/State Contribution Rate, (a) + (b)[1]	20.62%	17.36%
d. Board Adopted Total Employer/State Contribution Rate	17.90%[2]	TBD
e. Defined Contribution Retirement (DCR) Rate Paid by Employers	6.72%	7.03%
f. Board Adopted Total Rate, Including DCR Rate Paid by Employers, (d) + (e)	24.62%	TBD

Contribution rates are based on total (DB and DCR) payroll. The contribution rates shown above for FY24 are estimated assuming no actuarial gains/losses during FY22 and FY23. Actual FY24 contribution rates will be adopted by the Board in September 2022 reflecting FY22 asset experience.

Contribution rates include Employer contribution rates as limited by Alaska state statutes and the Additional State Contribution required under SB 125.

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[1] Beginning with the June 30, 2014 valuation, contribution rates for FY17 and beyond are determined using new methodology in accordance with 2014 legislation under HB 385 and SB 119, 2014 Alaska Laws, which changed the amortization methodology to a closed 25-year period as a level percentage of pay, and eliminated the time lag on the contribution rate calculation by using a 2-year “roll-forward” approach assuming 0% population growth. Investment gains and losses are recognized over a 5-year period beginning in FY15. Beginning with the June 30, 2018 valuation, the UAAL amortization was changed as described in Section 5.2.

[2] The FY23 contribution rates adopted by the Board in October 2021 were 17.90% for Pension and 0.00% for Healthcare.

Summary of Actuarial Accrued Liability Gain/(Loss) and Other Changes During the Year

The following table summarizes the sources of change in the total Employer/State contribution rate as of June 30, 2020 and June 30, 2021 based on DB and DCR payroll combined:

	Pension	Healthcare	Total
1. Total Employer/State Contribution Rate as of June 30, 2020	21.73%	3.30%	25.03%
2. Change due to:			
a. Health Claims Experience	N/A	(0.11)%	(0.11)%
b. Salary Increases	0.25%	N/A	0.25%
c. Investment Experience	(1.95)%	0.00%	(1.95)%
d. Demographic Experience and Miscellaneous[1]	(0.68)%	(0.23)%	(0.91)%
e. Actual vs Expected Contributions	(0.03)%	0.00%	(0.03)%
f. Assumption/Method Changes	0.00%	0.00%	0.00%
g. Plan Changes	0.00%	(0.02)%	(0.02)%
h. Total Change, (a) + (b) + (c) + (d) + (e) + (f) + (g)	(2.41)%	(0.36)%	(2.77)%
3. Total Employer/State Contribution Rate as of June 30, 2021, (1) + (2)(h)	19.32%	2.94%	22.26%

The following table shows the FY21 gain/(loss) on actuarial accrued liability as of June 30, 2021 ($'s in 000's):

	Pension	Healthcare	Total
Retirement Experience	$ 4,502	$ (2,282)	$ 2,220
Termination Experience	(7,088)	(2,979)	(10,067)
Disability Experience	(103)	220	117
Active Mortality Experience	311	(2,709)	(2,398)
Inactive Mortality Experience	(5,089)	269	(4,820)
Salary Increases	(29,192)	N/A	(29,192)
Rehires (Net of Rehire Load)	3,085	3,476	6,561
COLA Increases	293	N/A	293
PRPA Increases	81,362	N/A	81,362
Benefit Payments Different than Expected	14,033	10,592	24,625
Per Capita Claims Cost	N/A	96,861	96,861
Medical and Prescription Drug Plan Changes	N/A	21,763	21,763
Medicare Part B Only Experience	N/A	1,278	1,278
Changes in Dependent Coverage Elections	N/A	9,126	9,126
Programming Changes[2]	(227)	N/A	(227)
Miscellaneous[3]	(6,320)	(4,278)	(10,598)
Total	$ 55,567	$ 131,337	$ 186,904

[1] Includes the effects of census data changes between the two valuations.
[2] Includes the adjustment to the COLA for Tier 2 disabilities to commence immediately.
[3] Includes the effects of various data changes that are typical when new census data is received for the annual valuation, as well as other items that do not fit neatly into any of the other categories.

The rehire gain/(loss) amount shown on the previous page is the difference between (i) the increase in Actuarial Accrued Liability at June 30, 2021 due to rehires during the most recent plan year, and (ii) the load that was added to the June 30, 2020 Normal Cost based on the rehire load assumption used in the June 30, 2020 valuation. The development of the FY21 rehire gain/(loss) amount is shown in the table below ($'s in 000's):

	Pension	Healthcare	Total
1. Increase/(Decrease) in Actuarial Accrued Liability at June 30, 2021 due to Rehires	$ 3,917	$ (817)	$ 3,100
2. June 30, 2020 Normal Cost Rehire Load, with interest to June 30, 2021	$ 7,002	$ 2,659	$ 9,661
3. Rehire Gain/(Loss), (2) - (1)	$ 3,085	$ 3,476	$ 6,561

Section 1: Actuarial Funding Results

Section 1.1: Actuarial Liabilities and Normal Cost ($'s in 000's)

As of June 30, 2021	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Retirement Benefits	$ 1,842,511	$ 1,682,831
Termination Benefits	24,805	5,215
Disability Benefits	1,745	(1,845)
Death Benefits	12,117	10,274
Return of Contributions	2,130	(31,947)
Medical and Prescription Drug Benefits	863,878	743,380
Medicare Part D Subsidy	(95,180)	(82,422)
Indebtedness	(26,453)	(26,453)
Subtotal	$ 2,625,553	$ 2,299,033
Inactive Members		
Not Vested	$ 39,268	$ 39,268
Vested Terminations		
- Retirement Benefits	141,625	141,625
- Medical and Prescription Drug Benefits	261,528	261,528
- Medicare Part D Subsidy	(29,859)	(29,859)
- Indebtedness	(4,137)	(4,137)
Retirees & Beneficiaries		
- Retirement Benefits	5,657,056	5,657,056
- Medical and Prescription Drug Benefits	1,836,116	1,836,116
- Medicare Part D Subsidy	(289,140)	(289,140)
Subtotal	$ 7,612,457	$ 7,612,457
Total	**$ 10,238,010**	**$ 9,911,490**
Total Pension	**$ 7,690,667**	**$ 7,471,887**
Total Medical, Net of Part D Subsidy	**$ 2,547,343**	**$ 2,439,603**
Total Medical, Gross of Part D Subsidy	**$ 2,961,522**	**$ 2,841,024**

As of June 30, 2021	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
By Tier		
Tier 1		
- Pension	$ 4,372,747	$ 4,366,405
- Medical, Net of Part D Subsidy	1,077,186	1,074,462
Tier 2		
- Pension	3,317,920	3,105,482
- Medical, Net of Part D Subsidy	1,470,157	1,365,141
Total	**$ 10,238,010**	**$ 9,911,490**

As of June 30, 2021	Normal Cost
Active Members	
Retirement Benefits	$ 28,231
Termination Benefits	3,445
Disability Benefits	628
Death Benefits	344
Return of Contributions	6,053
Medical and Prescription Drug Benefits	20,441
Medicare Part D Subsidy	(2,209)
Rehire Assumption (Pension)	6,026
Rehire Assumption (Medical)	2,193
Administrative Expenses (Pension)	3,217
Administrative Expenses (Medical)	1,604
Total	**$ 69,973**
Total Pension	**$ 47,944**
Total Medical, Net of Part D Subsidy	**$ 22,029**
Total Medical, Gross of Part D Subsidy	**$ 24,238**
By Tier	
Tier 1	
- Pension	$ 2,260
- Medical, Net of Part D Subsidy	903
Tier 2	
- Pension	45,684
- Medical, Net of Part D Subsidy	21,126
Total	**$ 69,973**

Section 1.2: Actuarial Contributions as of June 30, 2021 ($'s in 000's)

Normal Cost Rate	Pension	Healthcare	Total
1. Total Normal Cost	$ 47,944	$ 22,029	$ 69,973
2. DB Rate Payroll Projected for FY22	326,551	326,551	326,551
3. DCR Rate Payroll Projected for FY22	423,783	423,783	423,783
4. Total Rate Payroll Projected for FY22	750,334	750,334	750,334
5. Normal Cost Rate			
a. Based on DB Rate Payroll, (1) ÷ (2)	14.68%	6.75%	21.43%
b. Based on Total Rate Payroll, (1) ÷ (4)	6.39%	2.94%	9.33%
6. Average Member Contribution Rate[1]	3.76%	0.00%	3.76%
7. Employer Normal Cost, (5)(b) - (6)	2.63%	2.94%	5.57%

Past Service Rate	Pension	Healthcare	Total
1. Actuarial Accrued Liability	$ 7,471,887	$ 2,439,603	$ 9,911,490
2. Valuation Assets	5,910,369	3,267,737	9,178,106
3. Unfunded Actuarial Accrued Liability, (1) - (2)	$ 1,561,518	$ (828,134)	$ 733,384
4. Funded Ratio, (2) ÷ (1)	79.1%	133.9%	92.6%
5. Past Service Cost Amortization Payment	125,231	(55,785)	69,446
6. Total Rate Payroll Projected for FY22	750,334	750,334	750,334
7. Past Service Rate, (5) ÷ (6)	16.69%	(7.43%)	9.26%
Total Employer / State Contribution Rate, not less than Normal Cost Rate	**19.32%**	**2.94%**	**22.26%**
Normal Cost Rate by Tier (Total Employer and Member)[2]			
Tier 1	15.35%	6.13%	21.49%
Tier 2	14.65%	6.77%	21.42%

[1] Assumes no member contributions from members in the DCR plan, 9.65% contributions for Tier 1 members who elected supplemental coverage, and 8.65% for the remaining members.

[2] Rates determined considering the payroll for members in each tier. DCR payroll is excluded from these calculations.

Schedule of Past Service Cost Amortizations - Pension ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	18	$ 1,720,344	$ 1,693,026	$ 133,291
Change in Assumptions	6/30/2018	22	14,346	14,467	1,005
FY19 Loss	6/30/2019	23	94,314	95,008	6,430
FY20 Loss	6/30/2020	24	44,395	44,593	2,945
FY21 Gain	6/30/2021	25	(285,576)	(285,576)	(18,440)
Total				**$ 1,561,518**	**$ 125,231**

Schedule of Past Service Cost Amortizations - Healthcare ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	18	$ (48,285)	$ (47,519)	$ (3,741)
Change in Assumptions/Methods/EGWP	6/30/2018	22	(166,274)	(167,686)	(11,647)
FY19 Gain	6/30/2019	23	(213,757)	(215,328)	(14,572)
FY20 Gain	6/30/2020	24	(101,507)	(101,961)	(6,735)
Medical/Prescription Drug Plan Changes	6/30/2021	25	(21,763)	(21,763)	(1,405)
FY21 Gain	6/30/2021	25	(273,877)	(273,877)	(17,685)
Total				**$ (828,134)**	**$ (55,785)**

Schedule of Past Service Cost Amortizations - Total ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	18	$ 1,672,059	$ 1,645,507	$ 129,550
Change in Assumptions/Methods/EGWP	6/30/2018	22	(151,928)	(153,219)	(10,642)
FY19 Gain	6/30/2019	23	(119,443)	(120,320)	(8,142)
FY20 Gain	6/30/2020	24	(57,112)	(57,368)	(3,790)
Medical/Prescription Drug Plan Changes	6/30/2021	25	(21,763)	(21,763)	(1,405)
FY21 Gain	6/30/2021	25	(559,453)	(559,453)	(36,125)
Total				**$ 733,384**	**$ 69,446**

Section 1.3: Roll-Forward Contribution Rate Calculation for FY24 ($'s in 000's)

	Pension	Healthcare	Total
1. Liability Roll Forward			
a. Actuarial Accrued Liability as of June 30, 2021	**$ 7,471,887**	**$ 2,439,603**	**$ 9,911,490**
b. Normal Cost	44,727	20,425	65,152
c. Interest on (a) and (b) at 7.38%	554,726	181,550	736,276
d. Estimated Benefit Payments	(523,901)	(134,643)	(658,544)
e. Interest on (d) at 7.38%, adjusted for timing	(20,601)	(4,880)	(25,481)
f. Expected Actuarial Accrued Liability as of June 30, 2022	**$ 7,526,838**	**$ 2,502,055**	**$ 10,028,893**
g. Projected Normal Cost	40,486	18,726	59,212
h. Interest on (f) and (g) at 7.38%	558,469	186,034	744,503
i. Estimated Benefit Payments	(541,571)	(140,701)	(682,272)
j. Interest on (i) at 7.38%, adjusted for timing	(21,296)	(5,099)	(26,395)
k. Expected Actuarial Accrued Liability as of June 30, 2023	**$ 7,562,926**	**$ 2,561,015**	**$ 10,123,941**
2. Asset Roll Forward			
a. Actuarial Value of Assets as of June 30, 2021	**$ 5,910,369**	**$ 3,267,737**	**$ 9,178,106**
b. Interest on (a) at 7.38%	436,185	241,159	677,344
c. Employee Contributions	31,383	0	31,383
d. Employer Contributions	24,161	22,360	46,521
e. State Assistance Contributions	142,665	0	142,665
f. Interest on (c) thru (e) at 7.38%, adjusted for timing*	12,542	810	13,352
g. Estimated Benefit Payments	(523,901)	(134,643)	(658,544)
h. Administrative Expenses	(3,217)	(1,604)	(4,821)
i. Interest on (g) and (h) at 7.38%, adjusted for timing	(20,717)	(4,938)	(25,655)
j. AVA Adjustments	250,511	140,417	390,928
k. Expected Actuarial Value of Assets as of June 30, 2022	**$ 6,259,981**	**$ 3,531,298**	**$ 9,791,279**
l. Interest on (k) at 7.38%	461,987	260,610	722,597
m. Employee Contributions	29,220	0	29,220
n. Employer Contributions	44,104	0	44,104
o. State Assistance Contributions**	91,029	0	91,029
p. Interest on (m) thru (o) at 7.38%, adjusted for timing*	9,375	0	9,375
q. Estimated Benefit Payments	(541,571)	(140,701)	(682,272)
r. Administrative Expenses	(2,932)	(1,478)	(4,410)
s. Interest on (q) and (r) at 7.38%, adjusted for timing	(21,402)	(5,153)	(26,555)
t. AVA Adjustments	233,895	130,611	364,506
u. Expected Actuarial Value of Assets as of June 30, 2023	**$ 6,563,686**	**$ 3,775,187**	**$ 10,338,873**
3. Expected Unfunded Actuarial Accrued Liability as of June 30, 2023, 1(k) - 2(u)	**$ 999,240**	**$ (1,214,172)**	**$ (214,932)**

* Employee and Employer Contributions are paid throughout the year. State Assistance Contributions are assumed to be paid on July 1, 2021 for FY22, and July 1, 2022 for FY23.

** The FY23 State Assistance Contribution is expected to be contributed 100% to pension.

	Pension	Healthcare	Total
4. Expected Annual Rate Payroll for FY24			
a. Defined Benefit Members			$ 270,617
b. Defined Contribution Retirement Members			491,467
c. Total Rate Payroll			**$ 762,084**
5. Expected FY24 Contribution Rate Calculation			
a. Projected Normal Cost for FY24	$ 39,024	$ 18,394	$ 57,418
b. Projected Normal Cost Rate for FY24	5.12%	2.41%	7.53%
c. Expected Member Contribution Rate for FY24	(3.07%)	0.00%	(3.07%)
d. Expected Employer Normal Cost Rate for FY24	**2.05%**	**2.41%**	**4.46%**
e. Expected Unfunded Liability as of June 30, 2023	$ 999,240	$ (1,214,172)	$ (214,932)
f. FY24 Layered Amortization of Expected Unfunded Liability	98,310	(84,064)	14,246
g. Expected Past Service Cost Contribution Rate for FY24	**12.90%**	**(11.03%)**	**12.90%**
h. Expected Total Contribution Rate for FY24, not less than Normal Cost Rate	**14.95%**	**2.41%**	**17.36%**

The components of the expected FY24 amortization amounts are shown below (totals may not add due to rounding):

Expected FY24 Schedule of Past Service Cost Amortizations - Pension ($'s in 000's)

	Amortization Period		Balances		
Layer	Date Created	Years Remaining at 6/30/23	Initial	Outstanding at 6/30/23	Beginning-of-Year Payment for FY24
Initial Amount	6/30/2018	16	$ 1,720,344	$ 1,651,383	$ 140,722
Change in Assumptions	6/30/2018	20	14,346	14,414	1,061
FY19 Loss	6/30/2019	21	94,314	95,041	6,788
FY20 Loss	6/30/2020	22	44,395	44,772	3,110
FY21 Gain	6/30/2021	23	(285,576)	(287,675)	(19,468)
Expected FY22 Gain	6/30/2022	24	(275,429)	(276,658)	(18,274)
Expected FY23 Gain	6/30/2023	25	(242,037)	(242,037)	(15,629)
Total				**$ 999,240**	**$ 98,310**

Expected FY24 Schedule of Past Service Cost Amortizations - Healthcare ($'s in 000's)

	Amortization Period		Balances		
Layer	Date Created	Years Remaining at 6/30/23	Initial	Outstanding at 6/30/23	Beginning-of-Year Payment for FY24
Initial Amount	6/30/2018	16	$ (48,285)	$ (46,351)	$ (3,950)
Change in Assumptions/Methods/EGWP	6/30/2018	20	(166,274)	(167,070)	(12,296)
FY19 Gain	6/30/2019	21	(213,757)	(215,403)	(15,385)
FY20 Gain	6/30/2020	22	(101,507)	(102,370)	(7,110)
Medical/Prescription Drug Plan Changes	6/30/2021	23	(21,763)	(21,923)	(1,484)
FY21 Gain	6/30/2021	23	(273,877)	(275,889)	(18,671)
Expected FY22 Gain	6/30/2022	24	(199,895)	(200,787)	(13,262)
Expected FY23 Gain	6/30/2023	25	(184,379)	(184,379)	(11,906)
Total				**$ (1,214,172)**	**$ (84,064)**

The components of the expected FY24 amortization amounts are shown below (totals may not add due to rounding):

Expected FY24 Schedule of Past Service Cost Amortizations - Total ($'s in 000's)

	Amortization Period		Balances		
Layer	Date Created	Years Remaining at 6/30/23	Initial	Outstanding at 6/30/23	Beginning-of-Year Payment for FY24
Initial Amount	6/30/2018	16	$ 1,672,059	$ 1,605,032	$ 136,772
Change in Assumptions/Methods/EGWP	6/30/2018	20	(151,928)	(152,656)	(11,235)
FY19 Gain	6/30/2019	21	(119,443)	(120,362)	(8,597)
FY20 Gain	6/30/2020	22	(57,112)	(57,598)	(4,000)
Medical/Prescription Drug Plan Changes	6/30/2021	23	(21,763)	(21,923)	(1,484)
FY21 Gain	6/30/2021	23	(559,453)	(563,564)	(38,139)
Expected FY22 Gain	6/30/2022	24	(475,324)	(477,445)	(31,536)
Expected FY23 Gain	6/30/2023	25	(426,416)	(426,416)	(27,535)
Total				**$ (214,932)**	**$ 14,246**

Section 1.4: Actuarial Gain/(Loss) for FY21 ($'s in 000's)

	Pension	Healthcare	Total
1. Expected Actuarial Accrued Liability			
a. Actuarial Accrued Liability as of June 30, 2020	$ 7,447,036	$ 2,489,675	$ 9,936,711
b. Normal Cost	48,401	23,057	71,458
c. Interest on (a) and (b) at 7.38%	553,163	185,440	738,603
d. Employer Group Waiver Plan	0	18,355	18,355
e. Benefit Payments	(499,942)	(141,137)	(641,079)
f. Refund of Contributions	(1,487)	0	(1,487)
g. Interest on (d) thru (f) at 7.38%, adjusted for timing	(19,717)	(4,450)	(24,167)
h. Assumptions/Methods Changes	0	0	0
i. Expected Actuarial Accrued Liability as of June 30, 2021 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	$ 7,527,454	$ 2,570,940	$ 10,098,394
2. Actual Actuarial Accrued Liability as of June 30, 2021	7,471,887	2,439,603	9,911,490
3. Liability Gain/(Loss), (1)(i) - (2)	**$ 55,567**	**$ 131,337**	**$ 186,904**
4. Expected Actuarial Asset Value			
a. Actuarial Value of Assets as of June 30, 2020	$ 5,587,064	$ 3,021,283	$ 8,608,347
b. Interest on (a) at 7.38%	412,325	222,971	635,296
c. Employee Contributions	33,342	0	33,342
d. Employer Contributions	28,430	24,700	53,130
e. State Assistance Contributions	134,976	0	134,976
f. Employer Group Waiver Plan	0	18,355	18,355
g. Interest on (c) thru (f) at 7.38%, adjusted for timing	12,200	1,560	13,760
h. Benefit Payments	(499,942)	(141,137)	(641,079)
i. Refund of Contributions	(1,487)	0	(1,487)
j. Administrative Expenses	(3,446)	(1,836)	(5,282)
k. Interest on (h) thru (j) at 7.38%, adjusted for timing	(19,842)	(5,182)	(25,024)
l. Expected Actuarial Asset Value as of June 30, 2021 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h) + (i) + (j) + (k)	$ 5,683,620	$ 3,140,714	$ 8,824,334
5. Actual Actuarial Asset Value as of June 30, 2021	5,910,369	3,267,737	9,178,106
6. Actuarial Asset Value Gain/(Loss), (5) - (4)(l)	**$ 226,749**	**$ 127,023**	**$ 353,772**
7. Total Actuarial Gain/(Loss), (3) + (6)	**$ 282,316**	**$ 258,360**	**$ 540,676**
8. Contribution Gain/(Loss)	**$ 3,606**	**$ 37,720**	**$ 41,326**
9. Administrative Expense Gain/(Loss)	**$ (346)**	**$ (440)**	**$ (786)**
10. FY21 Gain/(Loss), (7) + (8) + (9)	**$ 285,576**	**$ 295,640**	**$ 581,216**

Section 1.5: Development of Change in Unfunded Liability During FY21 ($'s in 000's)

	Pension	Healthcare	Total
1. 2020 Unfunded Liability	$ 1,859,972	$ (531,608)	$ 1,328,364
a. Interest on Unfunded Liability at 7.38%	$ 137,266	$ (39,233)	$ 98,033
b. Normal Cost	48,401	23,057	71,458
c. Employee Contributions	(33,342)	0	(33,342)
d. Employer Contributions	(28,430)	(24,700)	(53,130)
e. State Assistance Contributions	(134,976)	0	(134,976)
f. Administrative Expenses	3,446	1,836	5,282
g. Interest on (b) thru (f) at 7.38%, adjusted for timing	(8,503)	874	(7,629)
h. Assumptions/Methods Changes	0	0	0
i. Expected Change in Unfunded Liability During FY21 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	$ (16,138)	$ (38,166)	$ (54,304)
2. Expected 2021 Unfunded Liability, (1) + (1)(i)	$ 1,843,834	$ (569,774)	$ 1,274,060
a. Liability (Gain)/Loss During FY21	$ (55,567)	$ (131,337)	$ (186,904)
b. Actuarial Assets (Gain)/Loss During FY21	(226,749)	(127,023)	(353,772)
c. Total Actuarial (Gain)/Loss During FY21	$ (282,316)	$ (258,360)	$ (540,676)
3. Actual 2021 Unfunded Liability, (2) + (2)(c)	$ 1,561,518	$ (828,134)	$ 733,384

Section 1.6: Analysis of Financial Experience

Pension
Change in Employer / State Contribution Rate as of Valuation Date
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

	Change in Employer / State Contribution Rate During Fiscal Year				
	Pension				
Type of (Gain) or Loss	**2017**	**2018**	**2019**	**2020**	**2021**
1. Health Claims	N/A	N/A	N/A	N/A	N/A
2. Salary Experience	(0.34%)	(0.39%)	(0.06%)	(0.06%)	0.25%
3. Investment Experience	1.12%	0.91%	0.93%	0.83%	(1.95%)
4. Demographic Experience and Miscellaneous	(0.47%)	0.37%	0.75%	(0.28%)	(0.68%)
5. Actual vs Expected Contributions	(0.07%)	(0.03%)	(0.15%)	(0.17%)	(0.03%)
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	0.24%	0.86%	1.47%	0.32%	(2.41%)
7. Assumptions / Method Changes	0.00%	(0.32%)	0.00%	0.00%	0.00%
8. Plan Changes	0.00%	0.00%	0.00%	0.00%	0.00%
9. Composite (Gain) or Loss During Year, (6) + (7) + (8)	0.24%	0.54%	1.47%	0.32%	(2.41%)
10. Beginning Total Employer / State Contribution Rate	19.16%	19.40%	19.94%	21.41%	21.73%
11. Ending Valuation Year Employer / State Contribution Rate, (9) + (10)	19.40%	19.94%	21.41%	21.73%	19.32%
12. Fiscal Year Rates Adopted by ARMB					
a. Fiscal Year Employer / State Contribution Rate	20.71%	20.94%	22.51%	17.90%	14.95% *
b. Fiscal Year for which Rate Applies	FY20	FY21	FY22	FY23	FY24

* Expected rate. Actual rate to be determined

Healthcare
Change in Employer / State Contribution Rate as of Valuation Date
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

	Change in Employer / State Contribution Rate During Fiscal Year				
	Healthcare				
Type of (Gain) or Loss	**2017**	**2018**	**2019**	**2020**	**2021**
1. Health Claims	(2.32%)	(1.58%)	(2.51%)	(0.95%)	(0.11%)
2. Salary Experience	N/A	N/A	N/A	N/A	N/A
3. Investment Experience	0.56%	0.45%	0.45%	0.38%	0.00%
4. Demographic Experience and Miscellaneous	(0.71%)	1.49%	1.60%	0.49%	(0.23%)
5. Actual vs Expected Contributions	(0.11%)	0.05%	(0.02%)	(0.19%)	0.00%
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	(2.58%)	0.41%	(0.48%)	(0.27%)	(0.34%)
7. Assumptions / Method Changes	3.41%	0.24%	0.00%	0.00%	0.00%
8. Plan Changes	0.00%	0.00%	0.00%	0.00%	(0.02%)
9. Composite (Gain) or Loss During Year, (6) + (7) + (8)	0.83%	0.65%	(0.48%)	(0.27%)	(0.36%)
10. Beginning Total Employer / State Contribution Rate	2.57%	3.40%	4.05%	3.57%	3.30%
11. Ending Valuation Year Employer / State Contribution Rate, (9) + (10)	3.40%	4.05%	3.57%	3.30%	2.94%
12. Fiscal Year Rates Adopted by ARMB					
a. Fiscal Year Employer / State Contribution Rate	3.91%	3.40%	2.98%	0.00%	2.41% *
b. Fiscal Year for which Rate Applies	FY20	FY21	FY22	FY23	FY24

* Expected rate. Actual rate to be determined

Total
Change in Employer / State Contribution Rate as of Valuation Date
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

	Change in Employer / State Contribution Rate During Fiscal Year				
	Total				
Type of (Gain) or Loss	**2017**	**2018**	**2019**	**2020**	**2021**
1. Health Claims	(2.32%)	(1.58%)	(2.51%)	(0.95%)	(0.11%)
2. Salary Experience	(0.34%)	(0.39%)	(0.06%)	(0.06%)	0.25%
3. Investment Experience	1.68%	1.36%	1.38%	1.21%	(1.95%)
4. Demographic Experience and Miscellaneous	(1.18%)	1.86%	2.35%	0.21%	(0.91%)
5. Actual vs Expected Contributions	(0.18%)	0.02%	(0.17%)	(0.36%)	(0.03%)
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	(2.34%)	1.27%	0.99%	0.05%	(2.75%)
7. Assumptions / Method Changes	3.41%	(0.08%)	0.00%	0.00%	0.00%
8. Plan Changes	0.00%	0.00%	0.00%	0.00%	(0.02%)
9. Composite (Gain) or Loss During Year, (6) + (7) + (8)	1.07%	1.19%	0.99%	0.05%	(2.77%)
10. Beginning Total Employer / State Contribution Rate	21.73%	22.80%	23.99%	24.98%	25.03%
11. Ending Valuation Year Employer / State Contribution Rate, (9) + (10)	22.80%	23.99%	24.98%	25.03%	22.26%
12. Fiscal Year Rates Adopted by ARMB					
a. Fiscal Year Employer / State Contribution Rate	24.62%	24.34%	25.49%	17.90%	17.36% *
b. Fiscal Year for which Rate Applies	FY20	FY21	FY22	FY23	FY24

* Expected rate. Actual rate to be determined

Section 1.7: History of Unfunded Liability and Funded Ratio ($'s in 000's)

Valuation Date	Total Actuarial Accrued Liability	Valuation Assets	Assets as a Percent of Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability (UAAL)
June 30, 2003	$ 5,835,609	$ 3,752,285	64.3%	$ 2,083,324
June 30, 2004	6,123,600	3,845,370	62.8%	2,278,230
June 30, 2005	6,498,556	3,958,939	60.9%	2,539,617
June 30, 2006	7,229,851	4,141,700	57.3%	3,088,151
June 30, 2007	7,189,403	4,424,399	61.5%	2,765,004
June 30, 2008	7,619,178	4,936,976	64.8%	2,682,202
June 30, 2009	7,847,514	4,472,958	57.0%	3,374,556
June 30, 2010	8,847,788	4,739,128	53.6%	4,108,660
June 30, 2011	9,128,795	4,937,937	54.1%	4,190,858
June 30, 2012	9,346,444	4,869,154	52.1%	4,477,290
June 30, 2013	9,592,107	4,974,076	51.9%	4,618,031
June 30, 2014	9,841,032	6,019,274	61.2%	3,821,758
June 30, 2015	9,729,117	8,108,923	83.3%	1,620,194
June 30, 2016	9,907,624	8,200,391	82.8%	1,707,233
June 30, 2017	10,144,618	8,313,637	82.0%	1,830,981
June 30, 2018	9,960,440	8,440,309	84.7%	1,520,131
June 30, 2019	9,906,664	8,511,493	85.9%	1,395,171
June 30, 2020	9,936,711	8,608,347	86.6%	1,328,364
June 30, 2021	9,911,490	9,178,106	92.6%	733,384

Section 2: Plan Assets

Section 2.1: Summary of Fair Value of Assets ($'s in 000's)

As of June 30, 2021	Pension	Healthcare	Total	Allocation Percent
Cash and Short-Term Investments				
- Cash and Cash Equivalents	$ 72,735	$ 38,232	$ 110,967	1.1%
- Subtotal	$ 72,735	$ 38,232	$ 110,967	1.1%
Fixed Income Investments				
- Domestic Fixed Income Pool	$ 1,365,542	$ 758,389	$ 2,123,931	20.3%
- International Fixed Income Pool	0	0	0	0.0%
- Tactical Fixed Income Pool	0	0	0	0.0%
- High Yield Pool	0	0	0	0.0%
- Treasury Inflation Protection Pool	0	0	0	0.0%
- Emerging Debt Pool	0	0	0	0.0%
- Subtotal	$ 1,365,542	$ 758,389	$ 2,123,931	20.3%
Equity Investments				
- Domestic Equity Pool	$ 1,847,616	$ 1,026,121	$ 2,873,737	27.4%
- International Equity Pool	1,018,255	565,514	1,583,769	15.1%
- Private Equity Pool	1,001,964	556,466	1,558,430	14.9%
- Emerging Markets Equity Pool	216,313	120,135	336,448	3.2%
- Alternative Equity Strategies	393,518	218,551	612,069	5.8%
- Subtotal	$ 4,477,666	$ 2,486,787	$ 6,964,453	66.4%
Other Investments				
- Real Estate Pool	$ 414,283	$ 230,449	$ 644,732	6.1%
- Other Investments Pool	414,089	229,975	644,064	6.1%
- Absolute Return Pool	0	0	0	0.0%
- Other Assets	0	318	318	0.0%
- Subtotal	$ 828,372	$ 460,742	$ 1,289,114	12.2%
Total Cash and Investments	$ 6,744,315	$ 3,744,150	$ 10,488,465	100.0%
Net Accrued Receivables	(12,834)	(21,119)	(33,953)	
Net Assets	$ 6,731,481	$ 3,723,031	$ 10,454,512	

Section 2.2: Changes in Fair Value of Assets During FY21 ($'s in 000's)

Fiscal Year 2021	Pension	Healthcare	Total
1. Fair Value of Assets as of June 30, 2020	$ 5,444,799	$ 2,953,461	$ 8,398,260
2. Additions:			
a. Employee Contributions	$ 33,342	$ 0	$ 33,342
b. Employer Contributions	28,430	24,700	53,130
c. State Assistance Contributions	134,976	0	134,976
d. Interest and Dividend Income	75,824	41,567	117,391
e. Net Appreciation / Depreciation in Fair Value of Investments	1,534,132	835,912	2,370,044
f. Employer Group Waiver Plan	0	18,355	18,355
g. Other	273	247	520
h. Total Additions	$ 1,806,977	$ 920,781	$ 2,727,758
3. Deductions:			
a. Medical Benefits	$ 0	$ 141,137	$ 141,137
b. Retirement Benefits	499,942	0	499,942
c. Refund of Contributions	1,487	0	1,487
d. Investment Expenses	15,420	8,238	23,658
e. Administrative Expenses	3,446	1,836	5,282
f. Total Deductions	$ 520,295	$ 151,211	$ 671,506
4. Fair Value of Assets as of June 30, 2021	$ 6,731,481	$ 3,723,031	$ 10,454,512
5. Approximate Fair Value Investment Return Rate during FY21 Net of Investment Expenses	30.1%	29.9%	30.1%

Section 2.3: Development of Actuarial Value of Assets ($'s in 000's)

The actuarial value of asset was set equal to the fair value as of June 30, 2014 and the 20% corridor was eliminated. Investment gains and losses after June 30, 2014 are recognized 20% per year over 5 years.

	Pension	Healthcare	Total
1. Deferral of Investment Gain / (Loss) for FY21			
a. Fair Value of Assets as of June 30, 2020	$ 5,444,799	$ 2,953,461	$ 8,398,260
b. Contributions	196,748	24,700	221,448
c. Employer Group Waiver Plan	0	18,355	18,355
d. Benefit Payments	501,429	141,137	642,566
e. Administrative Expenses	3,446	1,836	5,282
f. Actual Investment Return (net of investment expenses)	1,594,809	869,488	2,464,297
g. Expected Return Rate (net of investment expenses)	7.38%	7.38%	7.38%
h. Expected Return, Weighted for Timing	394,184	214,344	608,528
i. Investment Gain / (Loss) for the Year, (f) - (h)	1,200,625	655,144	1,855,769
2. Actuarial Value as of June 30, 2021			
a. Fair Value as of June 30, 2021	$ 6,731,481	$ 3,723,031	$ 10,454,512
b. Deferred Investment Gain / (Loss)	821,112	455,294	1,276,406
c. Actuarial Value as of June 30, 2021, (a) - (b)	5,910,369	3,267,737	9,178,106
3. Ratio of Actuarial Value of Assets to Fair Value of Assets	87.8%	87.8%	87.8%
4. Approximate Actuarial Value Investment Return Rate during FY21 Net of Investment Expenses	11.6%	11.7%	11.6%

The tables below show the development of the gains/(losses) to be recognized in the current year ($'s in 000's):

Pension				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2017	$ 236,679	$ 189,344	$ 47,335	$ 0
June 30, 2018	13,001	7,800	2,600	2,601
June 30, 2019	(82,246)	(32,898)	(16,449)	(32,899)
June 30, 2020	(181,816)	(36,363)	(36,363)	(109,090)
June 30, 2021	1,200,625	0	240,125	960,500
Total	**$ 1,186,243**	**$ 127,883**	**$ 237,248**	**$ 821,112**

Healthcare				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2017	$ 126,053	$ 100,843	$ 25,210	$ 0
June 30, 2018	9,619	5,772	1,924	1,923
June 30, 2019	(38,309)	(15,324)	(7,662)	(15,323)
June 30, 2020	(92,367)	(18,473)	(18,473)	(55,421)
June 30, 2021	655,144	0	131,029	524,115
Total	**$ 660,140**	**$ 72,818**	**$ 132,028**	**$ 455,294**

Total				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2017	$ 362,732	$ 290,187	$ 72,545	$ 0
June 30, 2018	22,620	13,572	4,524	4,524
June 30, 2019	(120,555)	(48,222)	(24,111)	(48,222)
June 30, 2020	(274,183)	(54,836)	(54,836)	(164,511)
June 30, 2021	1,855,769	0	371,154	1,484,615
Total	**$ 1,846,383**	**$ 200,701**	**$ 369,276**	**$ 1,276,406**

Section 2.4: Historical Asset Rates of Return

	Actuarial Value		Fair Value	
Year Ending	Annual	Cumulative*	Annual	Cumulative*
June 30, 2005	9.1%	9.1%	8.5%	8.5%
June 30, 2006	9.6%	9.3%	11.4%	9.9%
June 30, 2007	11.9%	10.2%	18.5%	12.7%
June 30, 2008	10.2%	10.2%	(3.0%)	8.6%
June 30, 2009	(7.9%)	6.3%	(21.0%)	1.9%
June 30, 2010	8.1%	6.6%	10.6%	3.3%
June 30, 2011	6.9%	6.6%	20.5%	5.6%
June 30, 2012	0.7%	5.9%	0.2%	4.9%
June 30, 2013	3.7%	5.6%	12.2%	5.7%
June 30, 2014	22.7%	7.2%	18.2%	6.9%
June 30, 2015	7.2%	7.2%	3.2%	6.5%
June 30, 2016	5.1%	7.1%	(0.7%)	5.9%
June 30, 2017	5.6%	6.9%	12.9%	6.4%
June 30, 2018	6.2%	6.9%	8.2%	6.6%
June 30, 2019	5.5%	6.8%	5.9%	6.5%
June 30, 2020	5.8%	6.7%	4.1%	6.4%
June 30, 2021	11.6%	7.0%	30.1%	7.6%

* Cumulative since fiscal year ending June 30, 2005

Section 3: Projections

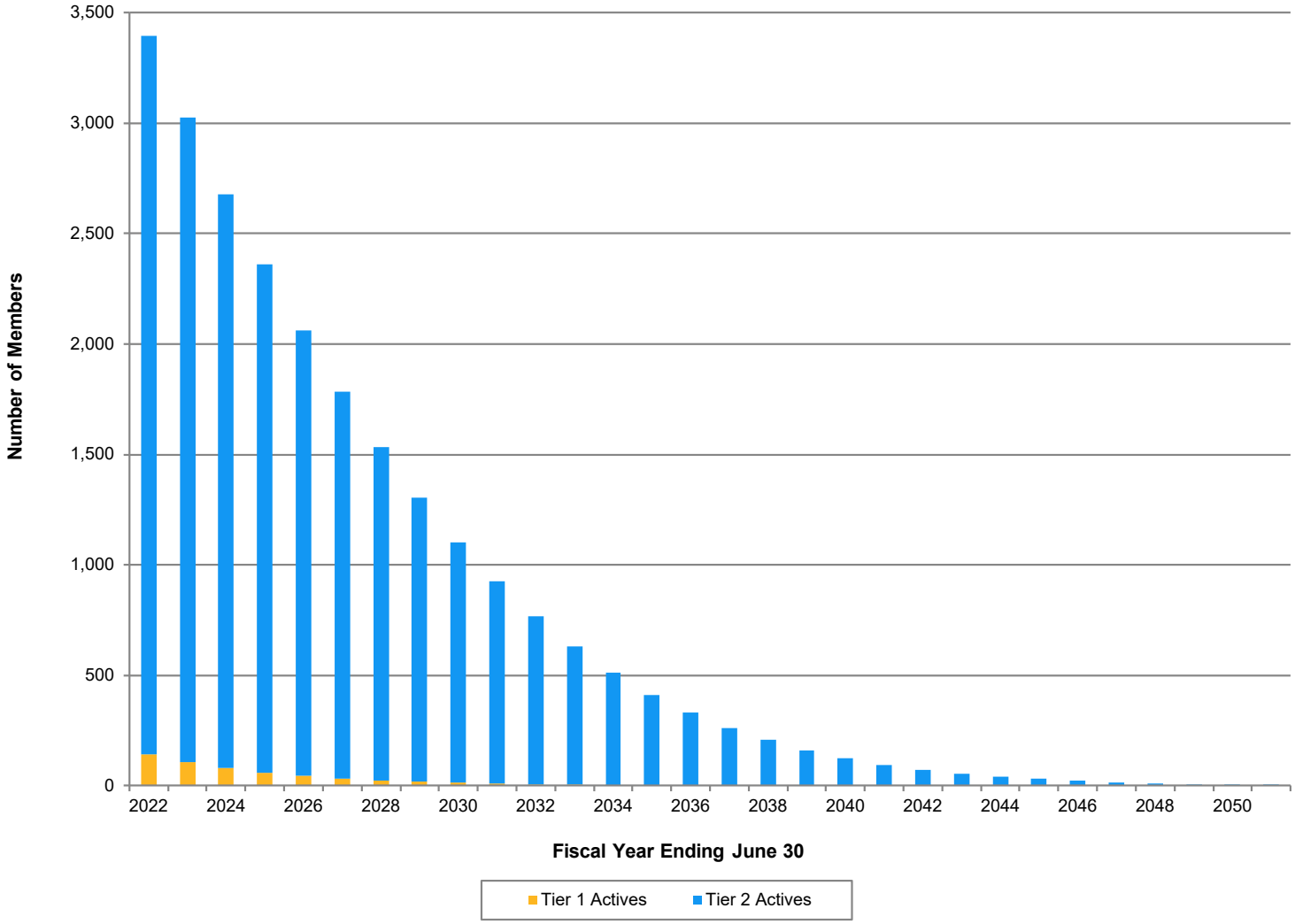
Section 3.1: Projection Assumptions and Methods

Key Assumptions

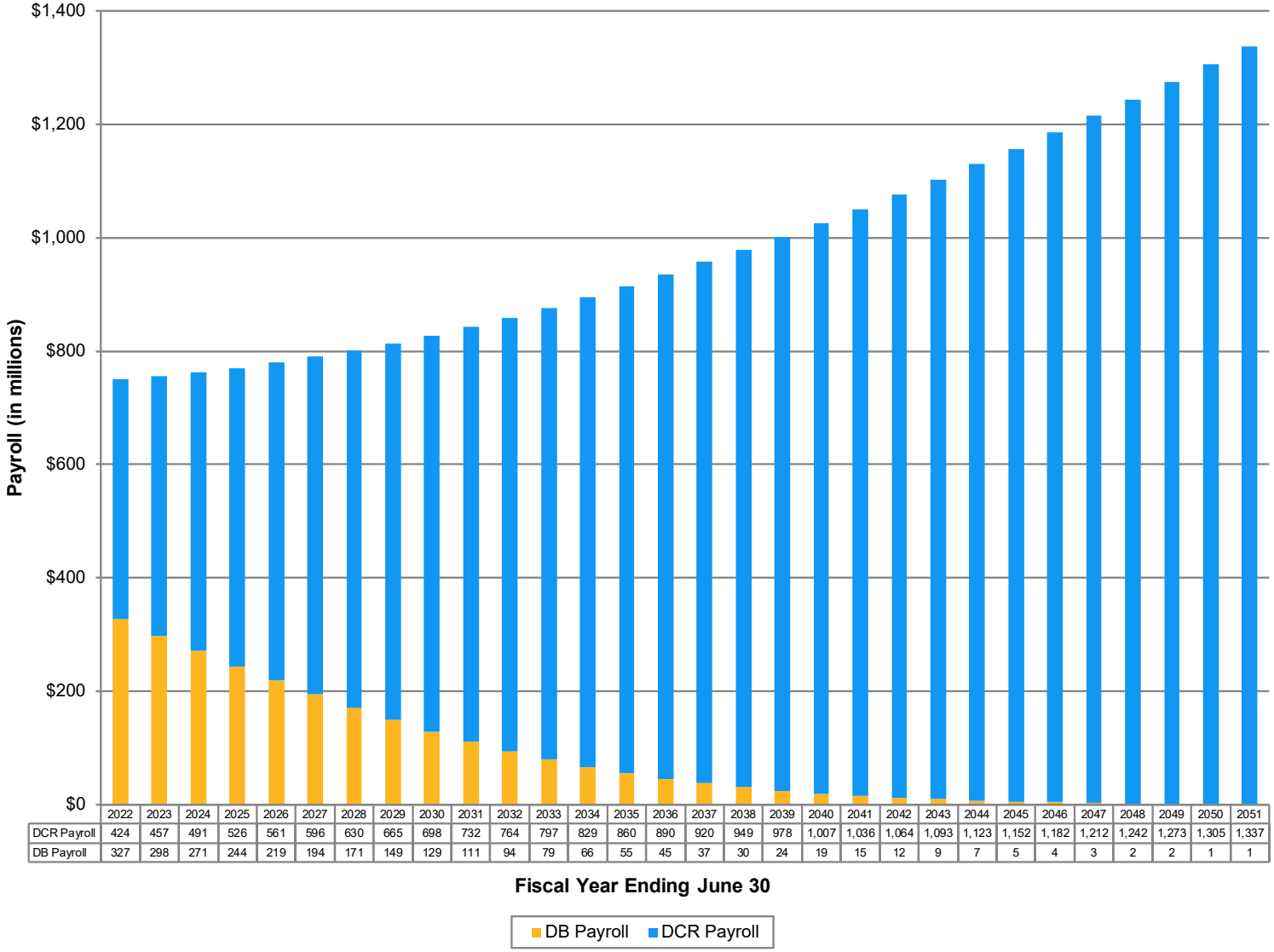
- 7.38% investment return (net of investment expenses) on the Fair Value of Assets in all future years.
- The Actuarial Value of Assets was re-initialized to Fair Value as of June 30, 2014. The Actuarial Value of Assets after June 30, 2014 reflects the deferred gains and losses generated by the smoothing method. The current deferred amount is recognized in the first four years of the projections.
- Actuarial assumptions and methods as described in Section 5. No actuarial gains/losses are assumed after June 30, 2021.
- The actuarially calculated contribution rate using a two-year roll-forward approach is adopted each year.
- Projections assume a 0% increase in the total active member population. All new members are expected to enter the DCR plan.
- Contribution rates are determined as a percent of total DB and DCR payroll.
- The DCR contribution rate determined as of June 30, 2021 is assumed to remain constant in all future years.
- The active rehire assumption shown in Section 5 is assumed to grade to zero on a uniform basis over 20 years.
- The Normal Cost is increased by the administrative expenses shown in Section 5. For future years, the percent increase is assumed to remain constant.
- In Section 3.6B, we assumed all remaining pension unfunded liability layered amortization amounts would be zero after the pension trust is projected to reach a funded status of 100%.

Section 3.2: Membership Projection

Projected Active Member Count

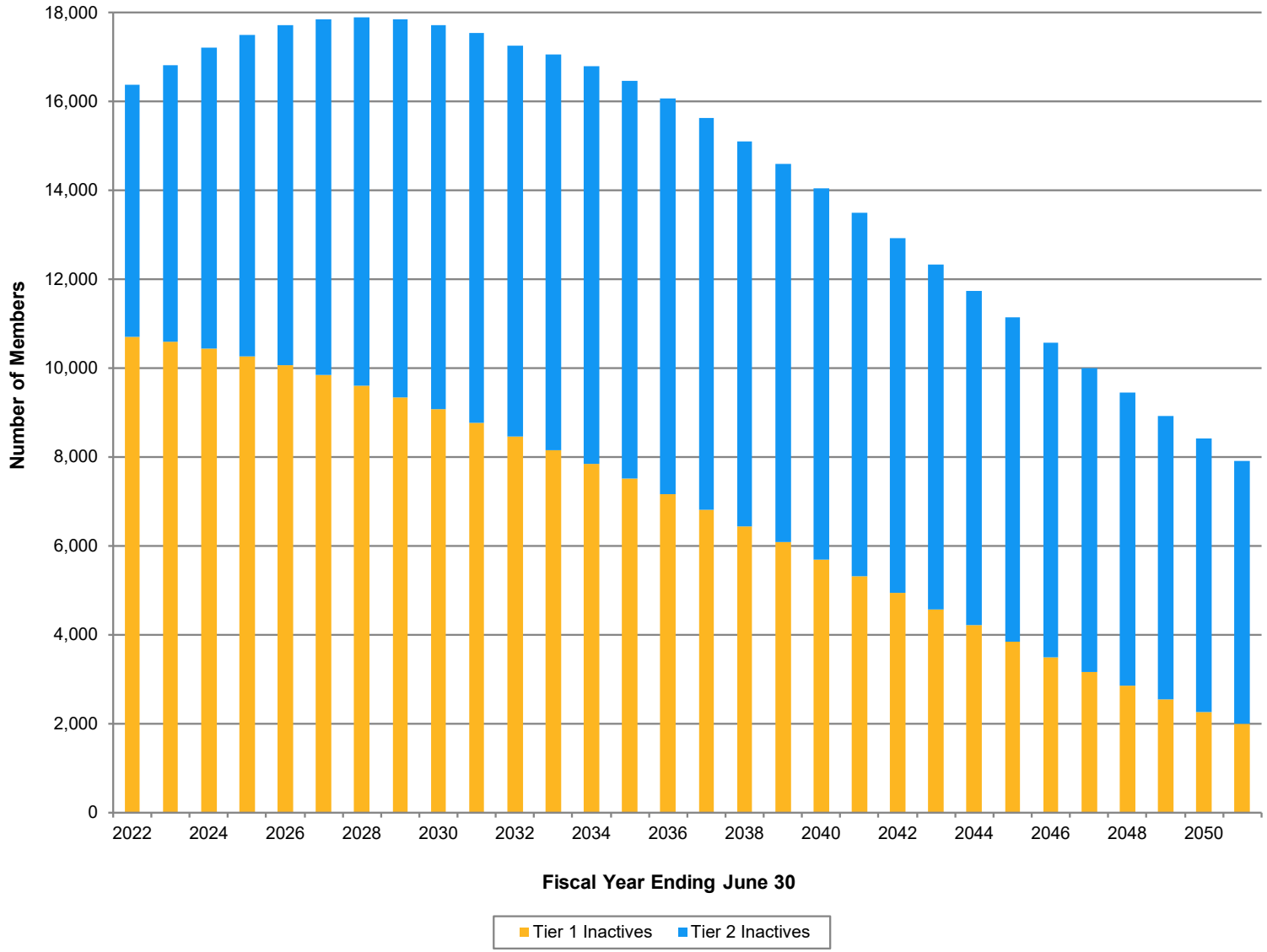


Projected DB and DCR Payroll



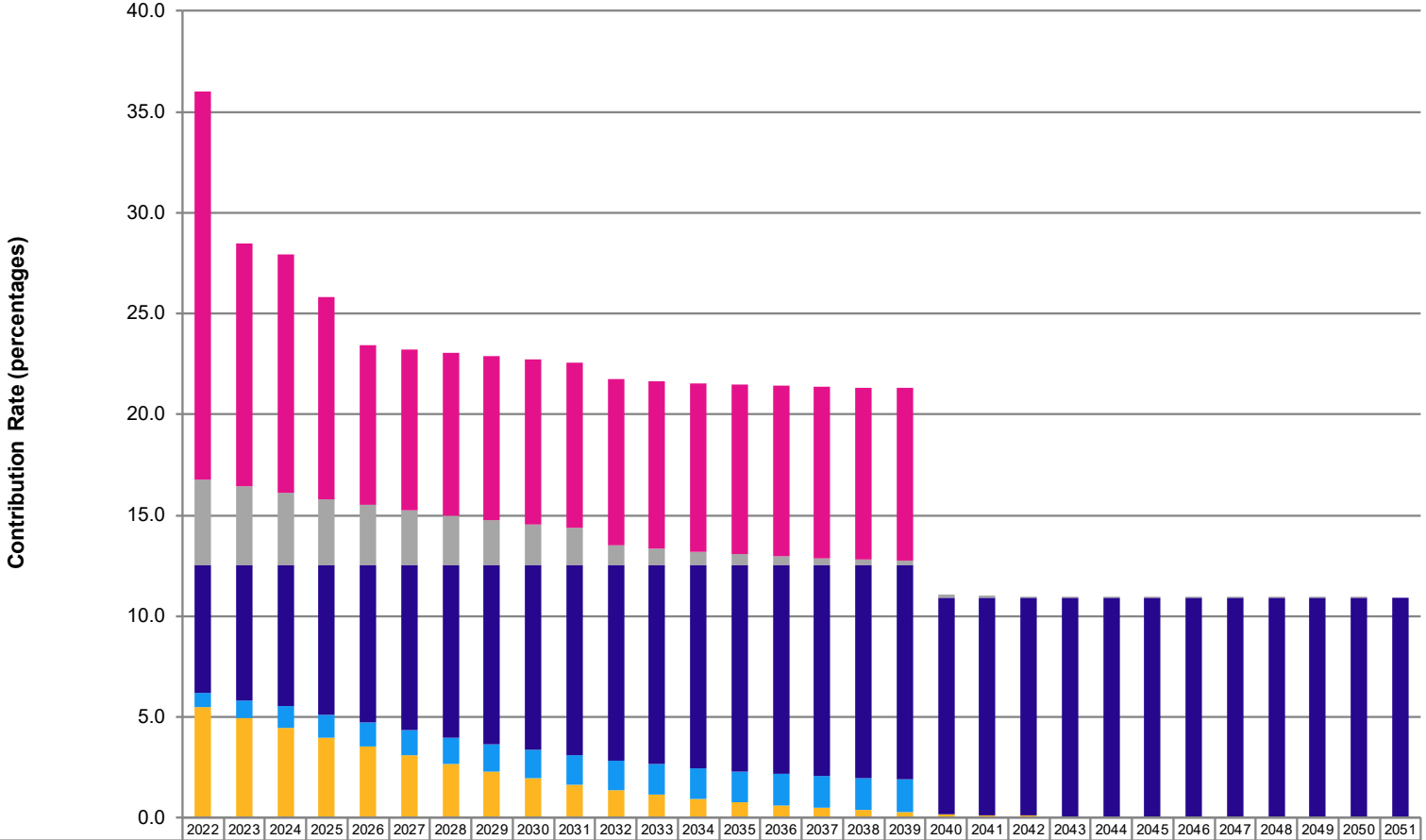
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051
DCR Payroll	424	457	491	526	561	596	630	665	698	732	764	797	829	860	890	920	949	978	1,007	1,036	1,064	1,093	1,123	1,152	1,182	1,212	1,242	1,273	1,305	1,337
DB Payroll	327	298	271	244	219	194	171	149	129	111	94	79	66	55	45	37	30	24	19	15	12	9	7	5	4	3	2	2	1	1

Projected Inactive Member Count



Section 3.3: Projected Employer/State Contribution Rates

Based on Total DB and DCR Payroll

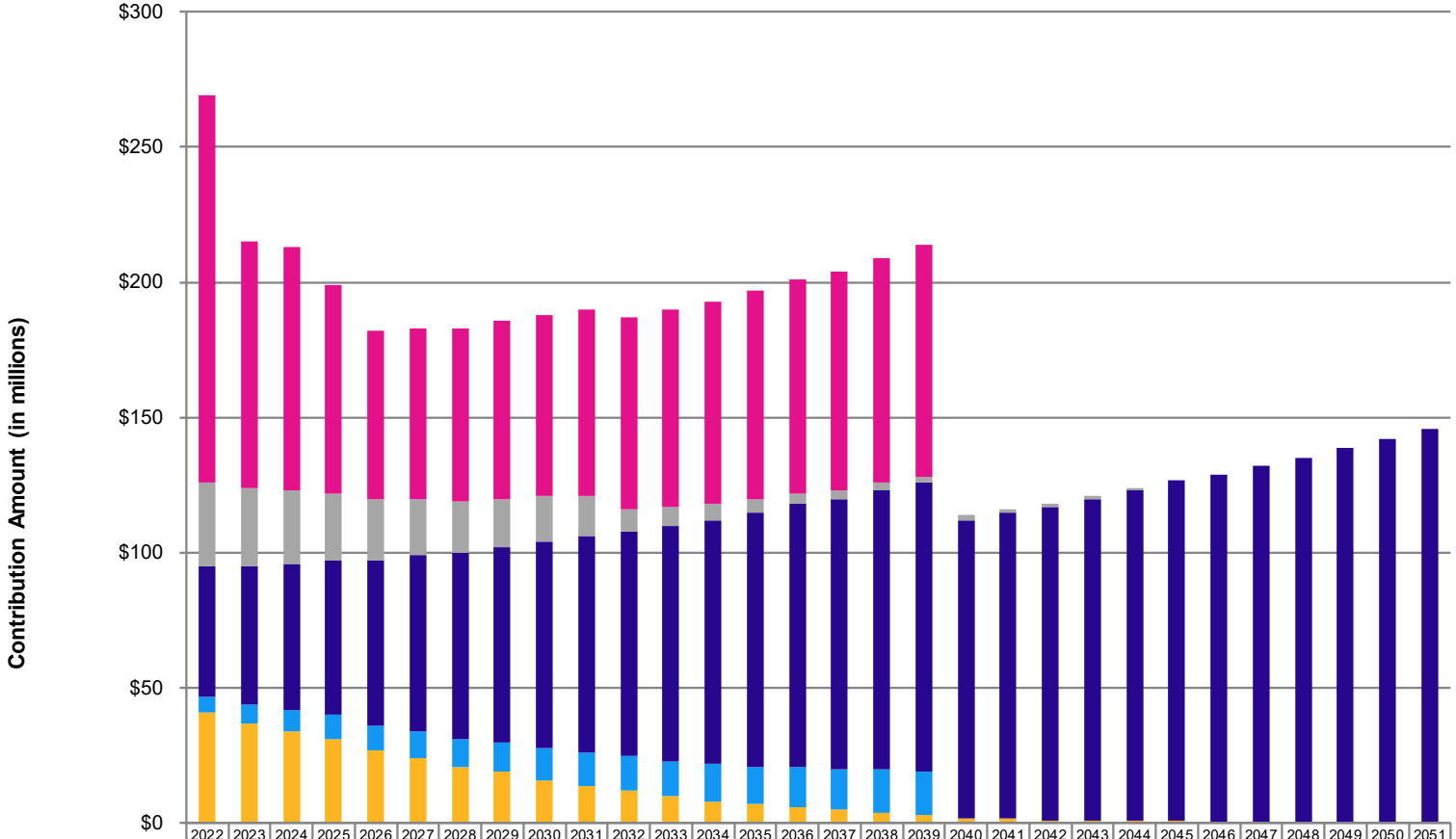


	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051
State Assistance	19.29	12.06	11.83	9.99	7.92	7.98	8.05	8.10	8.15	8.20	8.25	8.30	8.33	8.39	8.43	8.47	8.51	8.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DB EE Contributions	4.18	3.87	3.55	3.24	2.96	2.68	2.43	2.21	2.01	1.83	0.95	0.78	0.64	0.52	0.42	0.33	0.26	0.20	0.16	0.12	0.09	0.07	0.05	0.04	0.03	0.02	0.01	0.01	0.01	0.00
DCR ER Contributions	6.36	6.72	7.03	7.45	7.84	8.23	8.58	8.91	9.20	9.47	9.71	9.91	10.09	10.25	10.38	10.48	10.57	10.64	10.70	10.75	10.78	10.81	10.83	10.85	10.86	10.87	10.88	10.89	10.89	10.89
DB ER Contributions on DCR Pay	0.73	0.88	1.07	1.13	1.20	1.25	1.31	1.35	1.40	1.44	1.47	1.51	1.54	1.56	1.58	1.60	1.61	1.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DB ER Contributions on DB Pay	5.47	4.96	4.46	3.98	3.52	3.08	2.67	2.30	1.96	1.65	1.38	1.14	0.93	0.75	0.60	0.48	0.38	0.30	0.20	0.15	0.11	0.09	0.06	0.05	0.03	0.03	0.02	0.01	0.01	0.01

Fiscal Year Ending June 30

DB ER Contributions on DB Pay | DB ER Contributions on DCR Pay | DCR ER Contributions | DB EE Contributions | State Assistance

Section 3.4: Projected Employer/State Contribution Amounts

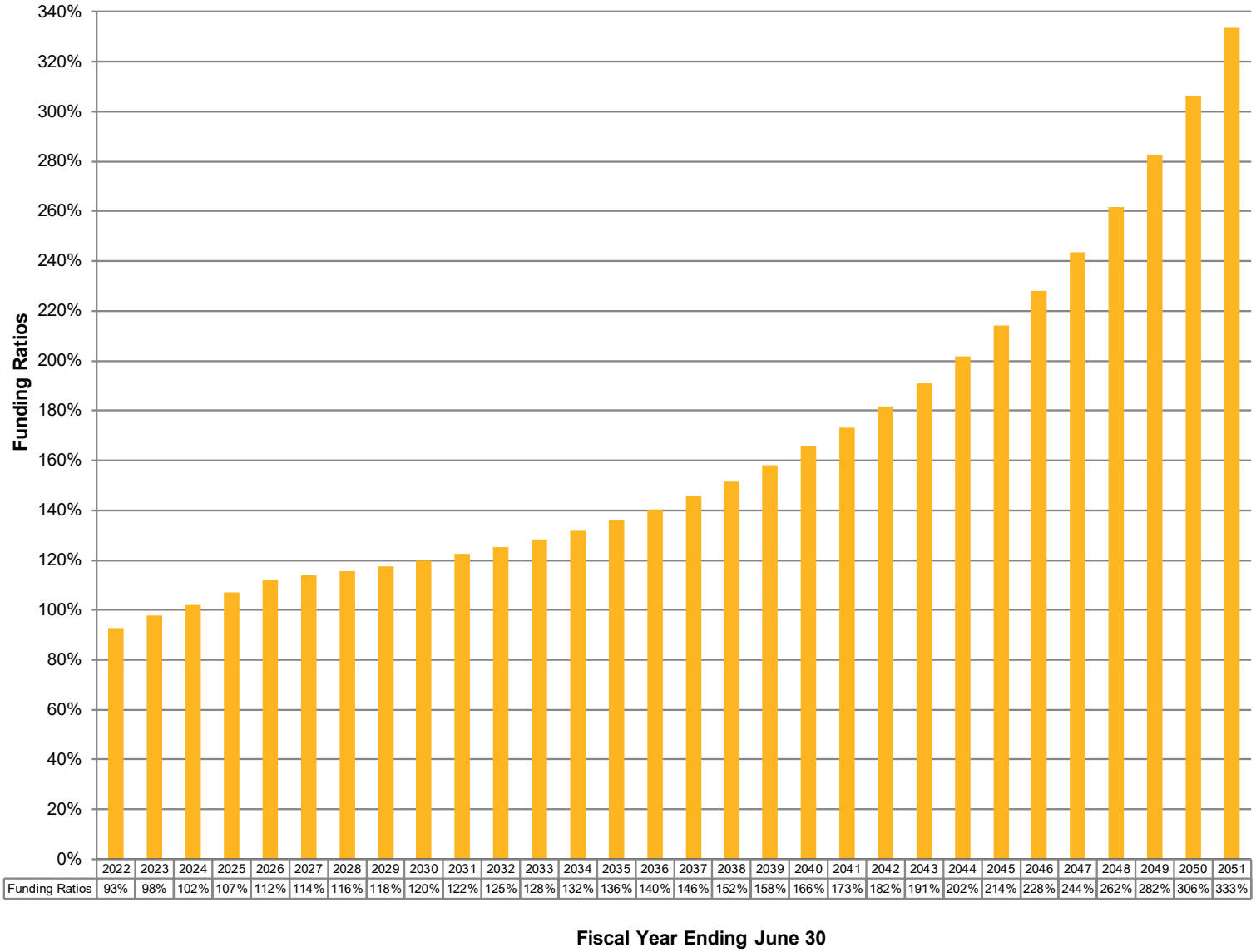


	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051
State Assistance	143	91	90	77	62	63	64	66	67	69	71	73	75	77	79	81	83	86	0	0	0	0	0	0	0	0	0	0	0	0
DB EE Contributions	31	29	27	25	23	21	19	18	17	15	8	7	6	5	4	3	3	2	2	1	1	1	1	0	0	0	0	0	0	0
DCR ER Contributions	48	51	54	57	61	65	69	72	76	80	83	87	90	94	97	100	103	107	110	113	116	119	122	126	129	132	135	139	142	146
DB ER Contributions on DCR Pay	6	7	8	9	9	10	10	11	12	12	13	13	14	14	15	15	16	16	0	0	0	0	0	0	0	0	0	0	0	0
DB ER Contributions on DB Pay	41	37	34	31	27	24	21	19	16	14	12	10	8	7	6	5	4	3	2	2	1	1	1	1	0	0	0	0	0	0

Fiscal Year Ending June 30

DB ER Contributions on DB Pay | DB ER Contributions on DCR Pay | DCR ER Contributions | DB EE Contributions | State Assistance

Section 3.5: Projection of Funded Ratios



	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051
Funding Ratios	93%	98%	102%	107%	112%	114%	116%	118%	120%	122%	125%	128%	132%	136%	140%	146%	152%	158%	166%	173%	182%	191%	202%	214%	228%	244%	262%	282%	306%	333%

Section 3.6A: Table of Projected Actuarial Results ($'s in 000's)

Fiscal Year End	Valuation Amounts on July 1 (Beginning of FY)				Cash Flow Amounts during Following 12 Months									Deferred Asset Gain / (Loss)
						Actuarial Contrib. Rates			DB Contributions					
	Actuarial Assets	Accrued Liability	Funding Ratio	Unfunded Liability / (Surplus)	Total Salaries	DB	DCR	Total	Employer	State Assistance	Employee	Total	Benefit Payments	
2022	$ 9,178,106	$ 9,911,490	92.6%	$ 733,384	$ 750,334	25.49%	6.36%	31.85%	$ 46,521	$ 142,665	$ 31,383	$ 220,569	$ 658,544	$ 979,677
2023	9,791,279	10,028,893	97.6%	237,614	755,203	17.90%	6.72%	24.62%	44,104	91,029	29,220	164,353	682,272	687,471
2024	10,338,873	10,123,941	102.1%	(214,932)	762,084	17.36%	7.03%	24.39%	42,143	90,155	27,025	159,323	706,663	371,154
2025	10,899,272	10,193,784	106.9%	(705,488)	770,330	15.10%	7.45%	22.55%	39,364	76,956	24,990	141,310	730,156	0
2026	11,489,368	10,240,200	112.2%	(1,249,168)	779,629	12.64%	7.84%	20.48%	36,799	61,747	23,100	121,646	753,067	0
2027	11,680,120	10,261,023	113.8%	(1,419,097)	789,757	12.31%	8.23%	20.54%	34,197	63,023	21,189	118,409	774,027	0
2028	11,860,260	10,256,329	115.6%	(1,603,931)	801,009	12.03%	8.58%	20.61%	31,880	64,481	19,496	115,857	795,147	0
2029	12,029,532	10,225,194	117.6%	(1,804,338)	813,553	11.75%	8.91%	20.66%	29,695	65,898	17,944	113,537	815,453	0
2030	12,188,201	10,166,564	119.9%	(2,021,637)	827,298	11.51%	9.20%	20.71%	27,797	67,425	16,615	111,837	833,857	0
2031	12,338,080	10,080,920	122.4%	(2,257,160)	842,250	11.29%	9.47%	20.76%	26,025	69,065	15,430	110,520	850,139	0
2032	12,481,100	9,969,584	125.2%	(2,511,516)	858,486	11.10%	9.71%	20.81%	24,466	70,825	8,156	103,447	858,425	0
2033	12,619,080	9,832,428	128.3%	(2,786,652)	876,187	10.95%	9.91%	20.86%	23,219	72,724	6,834	102,777	870,267	0
2034	12,754,565	9,669,875	131.9%	(3,084,690)	894,739	10.80%	10.09%	20.89%	22,100	74,532	5,726	102,358	878,203	0
2035	12,891,657	9,484,401	135.9%	(3,407,256)	914,255	10.70%	10.25%	20.95%	21,119	76,706	4,754	102,579	882,220	0
2036	13,035,192	9,278,669	140.5%	(3,756,523)	934,724	10.61%	10.38%	20.99%	20,377	78,797	3,926	103,100	883,293	0
2037	13,188,986	9,054,611	145.7%	(4,134,375)	956,215	10.55%	10.48%	21.03%	19,889	80,991	3,156	104,036	881,551	0
2038	13,357,129	8,814,138	151.5%	(4,542,991)	978,629	10.50%	10.57%	21.07%	19,475	83,281	2,544	105,300	876,734	0
2039	13,544,196	8,559,463	158.2%	(4,984,733)	1,001,616	10.47%	10.64%	21.11%	19,231	85,638	2,003	106,872	870,111	0
2040	13,753,765	8,291,660	165.9%	(5,462,105)	1,025,544	0.20%	10.70%	10.90%	2,051	0	1,641	3,692	861,473	0
2041	13,877,722	8,012,059	173.2%	(5,865,663)	1,050,331	0.15%	10.75%	10.90%	1,575	0	1,260	2,835	848,623	0
2042	14,023,350	7,724,346	181.5%	(6,299,004)	1,075,968	0.11%	10.78%	10.89%	1,183	0	968	2,151	832,948	0
2043	14,195,351	7,431,010	191.0%	(6,764,341)	1,102,329	0.09%	10.81%	10.90%	992	0	772	1,764	813,044	0
2044	14,400,354	7,136,152	201.8%	(7,264,202)	1,129,431	0.06%	10.83%	10.89%	678	0	565	1,243	791,506	0
2045	14,642,346	6,841,474	214.0%	(7,800,872)	1,157,134	0.05%	10.85%	10.90%	578	0	463	1,041	767,682	0
2046	14,926,751	6,549,448	227.9%	(8,377,303)	1,185,529	0.03%	10.86%	10.89%	356	0	356	712	744,305	0
2047	15,256,103	6,259,887	243.7%	(8,996,216)	1,214,554	0.03%	10.87%	10.90%	364	0	243	607	720,850	0
2048	15,634,029	5,973,113	261.7%	(9,660,916)	1,244,336	0.02%	10.88%	10.90%	248	0	124	372	698,677	0
2049	16,062,648	5,688,055	282.4%	(10,374,593)	1,274,685	0.01%	10.89%	10.90%	127	0	127	254	676,267	0
2050	16,546,068	5,405,124	306.1%	(11,140,944)	1,305,812	0.01%	10.89%	10.90%	131	0	131	262	654,115	0
2051	17,088,195	5,124,249	333.5%	(11,963,946)	1,337,788	0.01%	10.89%	10.90%	134	0	0	134	631,192	0
								Total	**$ 536,818**	**$ 1,415,938**	**$ 270,141**	**$ 2,222,897**		

Pension unfunded liability layered amortization amounts are maintained after the pension trust is projected to be 100% funded.

Section 3.6A: Table of Projected Actuarial Results ($'s in 000's) (continued)

Fiscal Year End	Valuation Amounts on July 1 (Beginning of FY)					
	Funding Ratio			Unfunded Liability / (Surplus)		
	Pension	Healthcare	Total	Pension	Healthcare	Total
2022	79.1%	133.9%	92.6%	$ 1,561,518	$ (828,134)	$ 733,384
2023	83.2%	141.1%	97.6%	1,266,857	(1,029,243)	237,614
2024	86.8%	147.4%	102.1%	999,240	(1,214,172)	(214,932)
2025	90.3%	155.1%	106.9%	733,329	(1,438,817)	(705,488)
2026	94.2%	163.5%	112.2%	437,124	(1,686,292)	(1,249,168)
2027	94.8%	167.2%	113.8%	392,379	(1,811,476)	(1,419,097)
2028	95.5%	171.2%	115.6%	342,345	(1,946,276)	(1,603,931)
2029	96.2%	175.8%	117.6%	286,499	(2,090,837)	(1,804,338)
2030	97.0%	180.9%	119.9%	224,495	(2,246,132)	(2,021,637)
2031	97.9%	186.6%	122.4%	155,794	(2,412,954)	(2,257,160)
2032	98.9%	192.9%	125.2%	79,928	(2,591,444)	(2,511,516)
2033	100.1%	200.1%	128.3%	(3,860)	(2,782,792)	(2,786,652)
2034	101.4%	208.2%	131.9%	(96,549)	(2,988,141)	(3,084,690)
2035	102.9%	217.3%	135.9%	(198,734)	(3,208,522)	(3,407,256)
2036	104.7%	227.5%	140.5%	(311,256)	(3,445,267)	(3,756,523)
2037	106.8%	239.0%	145.7%	(434,961)	(3,699,414)	(4,134,375)
2038	109.2%	251.9%	151.5%	(570,605)	(3,972,386)	(4,542,991)
2039	112.0%	266.4%	158.2%	(719,254)	(4,265,479)	(4,984,733)
2040	115.2%	282.9%	165.9%	(881,936)	(4,580,169)	(5,462,105)
2041	117.0%	301.5%	173.2%	(947,493)	(4,918,170)	(5,865,663)
2042	119.0%	322.4%	181.5%	(1,017,888)	(5,281,116)	(6,299,004)
2043	121.3%	346.1%	191.0%	(1,093,557)	(5,670,784)	(6,764,341)
2044	124.0%	372.4%	201.8%	(1,174,895)	(6,089,307)	(7,264,202)
2045	127.0%	401.6%	214.0%	(1,262,219)	(6,538,653)	(7,800,872)
2046	130.5%	434.0%	227.9%	(1,356,129)	(7,021,174)	(8,377,303)
2047	134.5%	470.0%	243.7%	(1,456,929)	(7,539,287)	(8,996,216)
2048	139.1%	510.1%	261.7%	(1,565,199)	(8,095,717)	(9,660,916)
2049	144.5%	555.4%	282.4%	(1,681,447)	(8,693,146)	(10,374,593)
2050	150.7%	606.6%	306.1%	(1,806,230)	(9,334,714)	(11,140,944)
2051	157.9%	665.0%	333.5%	(1,940,279)	(10,023,667)	(11,963,946)

Pension unfunded liability layered amortization amounts are maintained after the pension trust is projected to be 100% funded.

Section 3.6B: Table of Projected Actuarial Results ($'s in 000's)

Fiscal Year End	Valuation Amounts on July 1 (Beginning of FY)				Cash Flow Amounts during Following 12 Months									Deferred Asset Gain / (Loss)
						Actuarial Contrib. Rates			DB Contributions					
	Actuarial Assets	Accrued Liability	Funding Ratio	Unfunded Liability / (Surplus)	Total Salaries	DB	DCR	Total	Employer	State Assistance	Employee	Total	Benefit Payments	
2022	$ 9,178,106	$ 9,911,490	92.6%	$ 733,384	$ 750,334	25.49%	6.36%	31.85%	$ 46,521	$ 142,665	$ 31,383	$ 220,569	$ 658,544	$ 979,677
2023	9,791,279	10,028,893	97.6%	237,614	755,203	17.90%	6.72%	24.62%	44,104	91,029	29,220	164,353	682,272	687,471
2024	10,338,873	10,123,941	102.1%	(214,932)	762,084	17.36%	7.03%	24.39%	42,143	90,155	27,025	159,323	706,663	371,154
2025	10,899,272	10,193,784	106.9%	(705,488)	770,330	15.10%	7.45%	22.55%	39,364	76,956	24,990	141,310	730,156	0
2026	11,489,368	10,240,200	112.2%	(1,249,168)	779,629	12.64%	7.84%	20.48%	36,799	61,747	23,100	121,646	753,067	0
2027	11,680,120	10,261,023	113.8%	(1,419,097)	789,757	12.31%	8.23%	20.54%	34,197	63,023	21,189	118,409	774,027	0
2028	11,860,260	10,256,329	115.6%	(1,603,931)	801,009	12.03%	8.58%	20.61%	31,880	64,481	19,496	115,857	795,147	0
2029	12,029,532	10,225,194	117.6%	(1,804,338)	813,553	11.75%	8.91%	20.66%	29,695	65,898	17,944	113,537	815,453	0
2030	12,188,201	10,166,564	119.9%	(2,021,637)	827,298	11.51%	9.20%	20.71%	27,797	67,425	16,615	111,837	833,857	0
2031	12,338,080	10,080,920	122.4%	(2,257,160)	842,250	11.29%	9.47%	20.76%	26,025	69,065	15,430	110,520	850,139	0
2032	12,481,100	9,969,584	125.2%	(2,511,516)	858,486	11.10%	9.71%	20.81%	24,466	70,825	8,156	103,447	858,425	0
2033	12,619,080	9,832,428	128.3%	(2,786,652)	876,187	1.05%	9.91%	10.96%	9,200	0	6,834	16,034	870,267	0
2034	12,661,947	9,669,875	130.9%	(2,992,072)	894,739	0.84%	10.09%	10.93%	7,516	0	5,726	13,242	878,203	0
2035	12,697,059	9,484,401	133.9%	(3,212,658)	914,255	0.68%	10.25%	10.93%	6,217	0	4,754	10,971	882,220	0
2036	12,728,424	9,278,669	137.2%	(3,449,755)	934,724	0.53%	10.38%	10.91%	4,954	0	3,926	8,880	883,293	0
2037	12,758,984	9,054,611	140.9%	(3,704,373)	956,215	0.43%	10.48%	10.91%	4,112	0	3,156	7,268	881,551	0
2038	12,792,076	8,814,138	145.1%	(3,977,938)	978,629	0.33%	10.57%	10.90%	3,229	0	2,544	5,773	876,734	0
2039	12,831,180	8,559,463	149.9%	(4,271,717)	1,001,616	0.26%	10.64%	10.90%	2,605	0	2,003	4,608	870,111	0
2040	12,878,942	8,291,660	155.3%	(4,587,282)	1,025,544	0.20%	10.70%	10.90%	2,051	0	1,641	3,692	861,473	0
2041	12,938,337	8,012,059	161.5%	(4,926,278)	1,050,331	0.15%	10.75%	10.90%	1,575	0	1,260	2,835	848,623	0
2042	13,014,639	7,724,346	168.5%	(5,290,293)	1,075,968	0.11%	10.78%	10.89%	1,183	0	968	2,151	832,948	0
2043	13,112,197	7,431,010	176.5%	(5,681,187)	1,102,329	0.09%	10.81%	10.90%	992	0	772	1,764	813,044	0
2044	13,237,264	7,136,152	185.5%	(6,101,112)	1,129,431	0.06%	10.83%	10.89%	678	0	565	1,243	791,506	0
2045	13,393,420	6,841,474	195.8%	(6,551,946)	1,157,134	0.05%	10.85%	10.90%	578	0	463	1,041	767,682	0
2046	13,585,654	6,549,448	207.4%	(7,036,206)	1,185,529	0.03%	10.86%	10.89%	356	0	356	712	744,305	0
2047	13,816,033	6,259,887	220.7%	(7,556,146)	1,214,554	0.03%	10.87%	10.90%	364	0	243	607	720,850	0
2048	14,087,681	5,973,113	235.9%	(8,114,568)	1,244,336	0.02%	10.88%	10.90%	248	0	124	372	698,677	0
2049	14,402,180	5,688,055	253.2%	(8,714,125)	1,274,685	0.01%	10.89%	10.90%	127	0	127	254	676,267	0
2050	14,763,057	5,405,124	273.1%	(9,357,933)	1,305,812	0.01%	10.89%	10.90%	131	0	131	262	654,115	0
2051	15,173,598	5,124,249	296.1%	(10,049,349)	1,337,788	0.01%	10.89%	10.90%	134	0	0	134	631,192	0
								Total	**$ 429,241**	**$ 863,269**	**$ 270,141**	**$ 1,562,651**		

Pension unfunded liability layered amortization amounts are reduced to zero when the pension trust is projected to be 100% funded. The healthcare unfunded liability amortization amounts would also be reduced to zero since the healthcare trust is currently more than 100% funded.

Section 3.6B: Table of Projected Actuarial Results ($'s in 000's) (continued)

Fiscal Year End	Valuation Amounts on July 1 (Beginning of FY)					
	Funding Ratio			Unfunded Liability / (Surplus)		
	Pension	Healthcare	Total	Pension	Healthcare	Total
2022	79.1%	133.9%	92.6%	$ 1,561,518	$ (828,134)	$ 733,384
2023	83.2%	141.1%	97.6%	1,266,857	(1,029,243)	237,614
2024	86.8%	147.4%	102.1%	999,240	(1,214,172)	(214,932)
2025	90.3%	155.1%	106.9%	733,329	(1,438,817)	(705,488)
2026	94.2%	163.5%	112.2%	437,124	(1,686,292)	(1,249,168)
2027	94.8%	167.2%	113.8%	392,379	(1,811,476)	(1,419,097)
2028	95.5%	171.2%	115.6%	342,345	(1,946,276)	(1,603,931)
2029	96.2%	175.8%	117.6%	286,499	(2,090,837)	(1,804,338)
2030	97.0%	180.9%	119.9%	224,495	(2,246,132)	(2,021,637)
2031	97.9%	186.6%	122.4%	155,794	(2,412,954)	(2,257,160)
2032	98.9%	192.9%	125.2%	79,928	(2,591,444)	(2,511,516)
2033	100.1%	200.1%	128.3%	(3,860)	(2,782,792)	(2,786,652)
2034	100.1%	208.2%	130.9%	(3,931)	(2,988,141)	(2,992,072)
2035	100.1%	217.3%	133.9%	(4,136)	(3,208,522)	(3,212,658)
2036	100.1%	227.5%	137.2%	(4,488)	(3,445,267)	(3,449,755)
2037	100.1%	239.0%	140.9%	(4,959)	(3,699,414)	(3,704,373)
2038	100.1%	251.9%	145.1%	(5,552)	(3,972,386)	(3,977,938)
2039	100.1%	266.4%	149.9%	(6,238)	(4,265,479)	(4,271,717)
2040	100.1%	282.9%	155.3%	(7,113)	(4,580,169)	(4,587,282)
2041	100.1%	301.5%	161.5%	(8,108)	(4,918,170)	(4,926,278)
2042	100.2%	322.4%	168.5%	(9,177)	(5,281,116)	(5,290,293)
2043	100.2%	346.1%	176.5%	(10,403)	(5,670,784)	(5,681,187)
2044	100.2%	372.4%	185.5%	(11,805)	(6,089,307)	(6,101,112)
2045	100.3%	401.6%	195.8%	(13,293)	(6,538,653)	(6,551,946)
2046	100.3%	434.0%	207.4%	(15,032)	(7,021,174)	(7,036,206)
2047	100.4%	470.0%	220.7%	(16,859)	(7,539,287)	(7,556,146)
2048	100.5%	510.1%	235.9%	(18,851)	(8,095,717)	(8,114,568)
2049	100.6%	555.4%	253.2%	(20,979)	(8,693,146)	(8,714,125)
2050	100.7%	606.6%	273.1%	(23,219)	(9,334,714)	(9,357,933)
2051	100.8%	665.0%	296.1%	(25,682)	(10,023,667)	(10,049,349)

Pension unfunded liability layered amortization amounts are reduced to zero when the pension trust is projected to be 100% funded. The healthcare unfunded liability amortization amounts would also be reduced to zero since the healthcare trust is currently more than 100% funded.

Section 3.7: Projected Pension Benefit Recipients and Amounts ($'s in 000's)

Fiscal Year End	Pension	
	Recipient Counts	Benefit Amounts
2022	13,972	$ 523,901
2023	14,475	541,571
2024	14,931	558,743
2025	15,322	574,804
2026	15,654	589,941
2027	15,927	603,906
2028	16,120	616,957
2029	16,245	628,371
2030	16,289	638,195
2031	16,267	646,049
2032	16,156	646,045
2033	15,986	649,844
2034	15,736	651,554
2035	15,417	651,076
2036	15,036	648,676
2037	14,618	644,278
2038	14,136	638,247
2039	13,640	630,181
2040	13,127	620,418
2041	12,587	609,059
2042	12,032	596,090
2043	11,460	581,732
2044	10,885	566,218
2045	10,317	549,623
2046	9,759	532,176
2047	9,212	514,031
2048	8,685	495,291
2049	8,174	476,108
2050	7,678	456,645
2051	7,195	437,031
2052	6,728	417,362
2053	6,277	397,718
2054	5,844	378,168
2055	5,429	358,769
2056	5,032	339,565
2057	4,655	320,596
2058	4,295	301,889
2059	3,953	283,470
2060	3,629	265,363

Fiscal Year End	Pension	
	Recipient Counts	Benefit Amounts
2061	3,322	$ 247,589
2062	3,032	230,176
2063	2,757	213,153
2064	2,498	196,552
2065	2,253	180,409
2066	2,023	164,764
2067	1,808	149,662
2068	1,607	135,141
2069	1,419	121,258
2070	1,246	108,058
2071	1,085	95,589
2072	938	83,897
2073	805	73,022
2074	684	62,995
2075	577	53,829
2076	481	45,531
2077	397	38,093
2078	324	31,501
2079	261	25,726
2080	208	20,732
2081	164	16,473
2082	128	12,898
2083	97	9,943
2084	74	7,541
2085	54	5,622
2086	39	4,118
2087	28	2,963
2088	20	2,092
2089	14	1,450
2090	10	987
2091	7	659
2092	4	434
2093	3	281
2094	2	180
2095	2	114
2096	1	73
2097	1	45
2098	0	0
2099	0	0

Counts include retirees, disabilitants, and beneficiaries.

Section 4: Member Data

Section 4.1: Summary of Members Included

As of June 30	2017	2018	2019	2020	2021
Active Members					
1. Number	4,772	4,418	4,044	3,789	3,396[1]
2. Average Age	50.86	51.13	51.48	51.92	52.14
3. Average Credited Service	18.12	18.62	19.21	19.76	20.31
4. Average Entry Age	32.74	32.51	32.27	32.16	31.83
5. Average Annual Earnings	$ 86,327	$ 87,374	$ 88,879	$ 90,564	$ 94,143
6. Number Vested	4,772	4,418	4,044	3,789	3,396
7. Percent Who Are Vested	100.0%	100.0%	100.0%	100.0%	100.0%
Retirees, Disabilitants, and Beneficiaries					
1. Number	12,983	13,277	13,491	13,689	13,972
2. Average Age	70.36	70.78	71.30	71.85	72.26
3. Average Years Since Retirement	14.13	14.40	14.74	15.06	15.24
4. Average Monthly Pension Benefit					
a. Base	$ 2,228	$ 2,273	$ 2,303	$ 2,330	$ 2,363
b. COLA[2]	128	128	126	126	125
c. PRPA[2]	506	488	518	519	491
d. Adjustment	0	0	0	0	(1)
e. Sick	62	65	67	68	70
f. Total	$ 2,924	$ 2,954	$ 3,014	$ 3,043	$ 3,048
Vested Terminations (vested at termination, not refunded contributions, or commenced benefit)					
1. Number	876	797	812	764	727
2. Average Age	50.82	51.01	51.71	52.37	52.68
3. Average Monthly Pension Benefit	$ 1,441	$ 1,350	$ 1,534	$ 1,579	$ 1,635
Non-Vested Terminations (not vested at termination, not refunded contributions)					
1. Number	1,994	1,900	1,810	1,744	1,679
2. Average Account Balance	$ 20,290	$ 20,872	$ 21,612	$ 22,591	$ 23,388
Total Number of Members	**20,625**	**20,392**	**20,157**	**19,986**	**19,774**

[1] Includes 1,060 male active members and 2,336 female active members.

[2] Calculated by taking the average of the data field, as provided by the State of Alaska, for all participants in the group.

Summary of Members Included

As of June 30, 2021	DB Tier 1	DB Tier 2	DB Total	DCR Tier 3	Grand Total
Active Members					
1. Number	142	3,254	3,396	5,521	8,917
2. Average Age	63.37	51.65	52.14	41.90	45.80
3. Average Credited Service	30.23	19.88	20.31	6.34	11.66
4. Average Entry Age	33.14	31.77	31.83	35.56	34.14
5. Annual Earnings					
a. Total	$ 14,388,684	$ 305,322,636	$ 319,711,320	$ 408,804,718	$ 728,516,038
b. Average	$ 101,329	$ 93,830	$ 94,143	$ 74,045	$ 81,700

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

As of June 30, 2021	Tier 1	Tier 2	Total
Retirees, Disabilitants, and Beneficiaries			
1. Number	10,454	3,518	13,972
2. Average Age	74.32	66.14	72.26
3. Average Years Since Retirement	18.30	6.14	15.24
4. Average Monthly Pension Benefit			
a. Base	$ 2,375	$ 2,329	$ 2,363
b. COLA	148	57	125
c. PRPA	630	77	491
d. Adjustment	(1)	(1)	(1)
e. Sick	69	71	70
f. Total	$ 3,221	$ 2,533	$ 3,048

Summary of Members Included

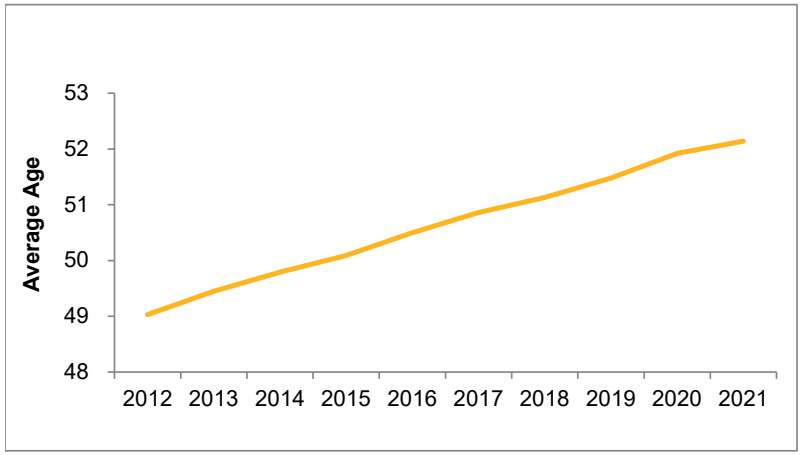
As of June 30, 2021	Active Members	Inactive Members				
		Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members
Retiree Medical Participants						
1. Retiree Coverage Only	3,366	7,679	0	0	369	8,048
2. Retiree + Spouse	0	3,935	3,935	0	602	8,472
3. Retiree + Children / Dependents	0	193	0	179	0	372
4. Family	0	331	331	482	0	1,144
5. Total	3,366	12,138	4,266	661	971	18,036

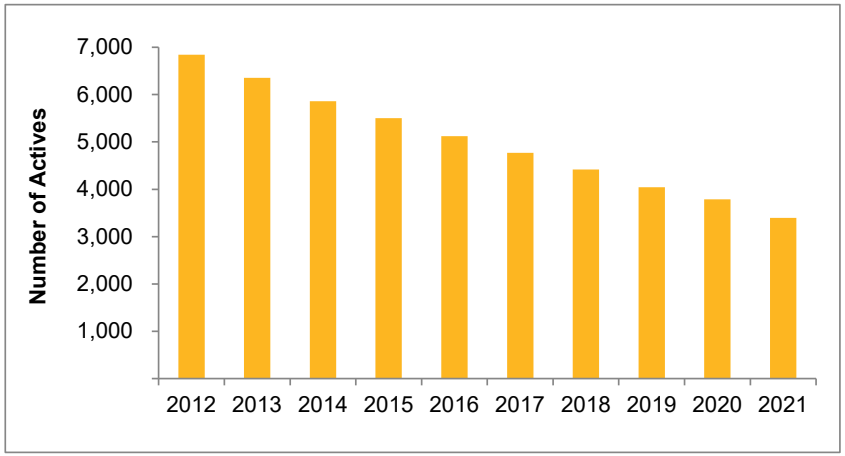
As of June 30, 2021	Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members
Retiree Medical Participants					
1. Pre-Medicare	2,243	1,274	661	954	5,132
2. Medicare Part A & B	9,685	2,960	0	17	12,662
3. Medicare Part B Only	210	32	0	0	242
4. Total	12,138	4,266	661	971	18,036

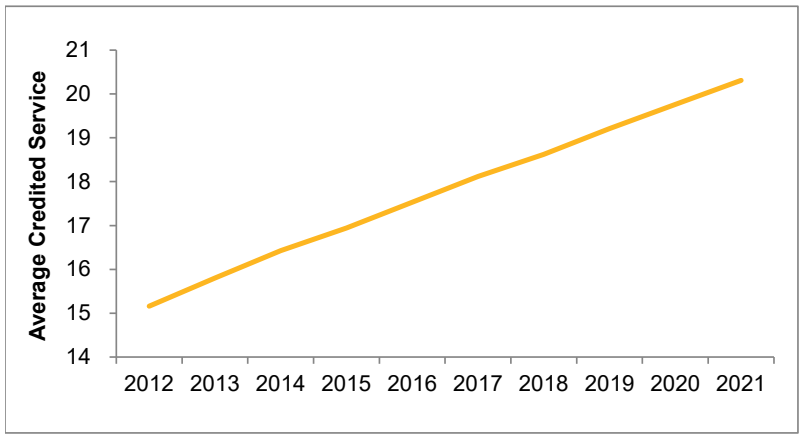
As of June 30, 2021	Retirees
Summary of Retiree Medical Data Received	
1. Retiree records on pension data	13,972
2. Remove duplicates on pension data	(528)
3. Valued in a different retiree healthcare plan[1]	(837)
4. Records without medical coverage	(506)
5. Medical only retirees	37
6. Total	12,138

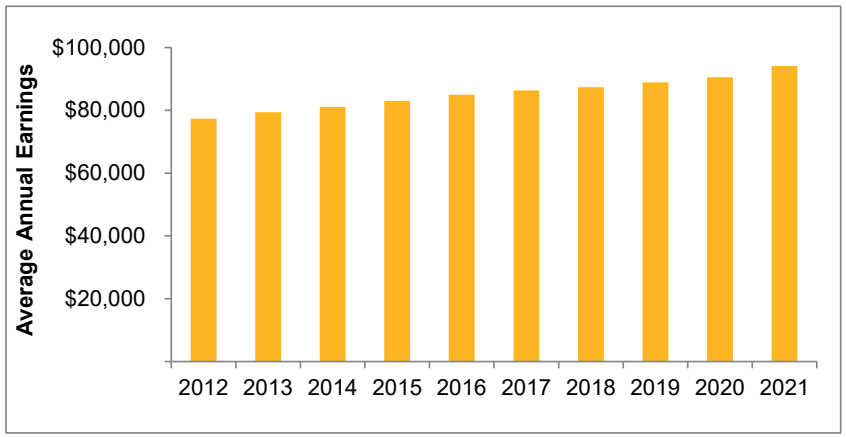
[1] Each member's retiree medical benefits are valued in the plan indicated in the data from Aetna

Summary of Members Included - Active Members at June 30









Average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

Section 4.2: Age and Service Distribution of Active Members

Annual Earnings by Age

Age	Number	Total Annual Earnings	Average Annual Earnings
0 - 19	0	$ 0	$ 0
20 - 24	0	0	0
25 - 29	0	0	0
30 - 34	0	0	0
35 - 39	53	4,432,577	83,634
40 - 44	530	47,463,436	89,554
45 - 49	858	80,163,262	93,430
50 - 54	902	86,221,152	95,589
55 - 59	582	55,038,876	94,569
60 - 64	295	28,816,905	97,684
65 - 69	111	11,205,958	100,955
70 - 74	48	4,616,849	96,184
75+	17	1,752,305	103,077
Total	**3,396**	**$319,711,320**	**$ 94,143**

Annual Earnings by Credited Service

Years of Service	Number	Total Annual Earnings	Average Annual Earnings
0	0	$ 0	$ 0
1	3	158,220	52,740
2	1	44,803	44,803
3	7	484,633	69,233
4	12	801,689	66,807
0 - 4	**23**	**$ 1,489,345**	**$ 64,754**
5 - 9	89	6,523,824	73,301
10 - 14	252	21,173,526	84,022
15 - 19	1,262	116,203,267	92,079
20 - 24	1,208	116,732,875	96,633
25 - 29	397	40,101,280	101,011
30 - 34	129	13,459,854	104,340
35 - 39	24	2,701,868	112,578
40+	12	1,325,481	110,457
Total	**3,396**	**$319,711,320**	**$ 94,143**

Years of Credited Service by Age

	Years of Service									
Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total
0 - 19	0	0	0	0	0	0	0	0	0	0
20 - 24	0	0	0	0	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0	0	0	0	0
30 - 34	0	0	0	0	0	0	0	0	0	0
35 - 39	0	3	13	36	1	0	0	0	0	53
40 - 44	5	30	83	349	63	0	0	0	0	530
45 - 49	1	25	69	346	381	36	0	0	0	858
50 - 54	11	18	46	265	405	141	16	0	0	902
55 - 59	2	9	20	149	204	136	58	4	0	582
60 - 64	3	2	15	72	105	61	29	6	2	295
65 - 69	0	2	4	29	33	13	20	9	1	111
70 - 74	1	0	1	10	13	8	5	4	6	48
75+	0	0	1	6	3	2	1	1	3	17
Total	**23**	**89**	**252**	**1,262**	**1,208**	**397**	**129**	**24**	**12**	**3,396**

Total and average annual earnings (“valuation pay”) are the annualized earnings for the fiscal year ending on the valuation date.

Section 4.3: Member Data Reconciliation

Pension

		Inactive Members					
	Active Members	Due a Refund	Deferred Benefits	Retired Members	Disabled Members	Bene-ficiaries	Total
As of June 30, 2020	**3,789**	**1,744**	**764**	**12,267**	**20**	**1,402**	**19,986**
Vested Terminations	(116)	(3)	119	0	0	0	0
Non-Vested Terminations	(3)	3	0	0	0	0	0
Refund of Contributions	(1)	(41)	(3)	0	0	0	(45)
Disability Retirements	(1)	0	0	0	1	0	0
Age Retirements	(326)	(7)	(113)	447	(1)	0	0
Deaths With Beneficiary	(1)	0	(2)	(127)	0	130	0
Deaths Without Beneficiary	(2)	(4)	(2)	(124)	0	(46)	(178)
Data Corrections	0	(1)	1	0	0	(8)	(8)
Transfers In/Out	0	0	0	0	0	0	0
Rehires	57	(16)	(37)	(4)	0	0	0
Pick Ups*	0	4	0	0	0	15	19
Net Change	**(393)**	**(65)**	**(37)**	**192**	**0**	**91**	**(212)**
As of June 30, 2021	**3,396**	**1,679**	**727**	**12,459**	**20**	**1,493**	**19,774**

* Pickup beneficiaries are primarily new DROs.

Healthcare

		Inactive Members				
	Active Members	Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members
As of June 30, 2020	**3,746**	**12,019**	**4,220**	**669**	**952**	**17,860**
Vested Terminations	(87)	0	0	0	87	87
Non-Vested Terminations	(2)	0	0	0	0	0
Refund of Contributions	(1)	0	0	0	(3)	(3)
Disability Retirements	(1)	1	0	0	0	1
Age Retirements	(257)	257	131	53	0	441
Deferred Retirements	0	51	28	10	(51)	38
Retired without Medical Coverage	(82)	0	0	0	82	82
Deceased	(3)	(259)	(28)	(3)	(8)	(298)
New Beneficiaries	0	40	(40)	0	0	0
Added Retiree Medical Coverage	0	40	13	1	(40)	14
Added Dependent Coverage	0	0	41	27	0	68
Dropped Retiree Medical Coverage	0	(6)	(1)	(1)	6	(2)
Dropped Dependent Coverage	0	0	(97)	(94)	0	(191)
Rehires	55	(3)	(1)	(1)	(52)	(57)
Transfers In/Out	(2)	(2)	0	0	(2)	(4)
Net Change	**(380)**	**119**	**46**	**(8)**	**19**	**176**
As of June 30, 2021	**3,366**	**12,138**	**4,266**	**661**	**971**	**18,036**

Section 4.4: Schedule of Active Member Data

Valuation Date	Number	Annual Earnings (000's)	Annual Average Earnings	Percent Increase in Average Earnings	Number of Participating Employers
June 30, 2021	3,396	$ 319,711	$ 94,143	4.0%	56
June 30, 2020	3,789	343,146	90,564	1.9%	56
June 30, 2019	4,044	359,426	88,879	1.7%	56
June 30, 2018	4,418	386,016	87,373	1.2%	56
June 30, 2017	4,772	411,951	86,327	1.6%	57
June 30, 2016	5,123	435,222	84,955	2.4%	57
June 30, 2015	5,502	456,636	82,995	2.4%	58
June 30, 2014	5,861	474,873	81,023	2.1%	58
June 30, 2013	6,352	504,260	79,386	2.6%	58
June 30, 2012	6,845	529,468	77,351	3.6%	58

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

Section 4.5: Active Member Payroll Reconciliation

Payroll Field	Payroll Data (000's)
a) DRB actual reported salaries FY21 in employer list	$ 806,609
b) DRB actual reported salaries FY21 in valuation data	719,382
c) Annualized valuation data	728,516
d) Valuation payroll as of June 30, 2021	756,805
e) Rate payroll for FY22	750,334
f) Rate payroll for FY24	762,084

a) Actual reported salaries from DRB employer listing showing all payroll paid during FY21, including those who were not active as of June 30, 2021
b) Payroll from valuation data for people who are in active status as of June 30, 2021
c) Payroll from (b) annualized for both new entrants and part-timers
d) Payroll from (c) with one year of salary scale applied to estimate salaries payable for the upcoming year
e) Payroll from (d) with the part-timer annualization removed
f) Payroll from (e) with two years of assumed decrements and salary scale, and 0% population growth

Section 4.6: Summary of New Pension Benefit Recipients

During the Year Ending June 30	2017	2018	2019	2020	2021
Service					
1. Number	376	465	367	331	447
2. Average Age at Commencement	59.77	59.98	59.87	59.71	59.79
3. Average Monthly Pension Benefit	$ 3,300	$ 3,527	$ 3,562	$ 3,693	$ 3,593
Survivor (including surviving spouse and DROs)					
1. Number	108	87	96	127	145
2. Average Age at Commencement	70.57	71.61	74.36	74.16	76.80
3. Average Monthly Pension Benefit	$ 1,643	$ 2,022	$ 1,795	$ 1,903	$ 1,951
Disability					
1. Number	3	3	5	2	1
2. Average Age at Commencement	43.30	49.92	51.51	53.65	54.35
3. Average Monthly Pension Benefit	$ 3,678	$ 3,625	$ 4,182	$ 3,019	$ 4,886
Total					
1. Number	487	555	468	460	593
2. Average Age at Commencement	62.06	61.75	62.75	63.67	63.94
3. Average Monthly Pension Benefit	$ 2,935	$ 3,292	$ 3,206	$ 3,196	$ 3,194

Summary of New Pension Benefit Recipients

Average Pension Benefit Payments

	Years of Credited Service						
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+
Period 7/1/2020 – 6/30/2021:							
Average Monthly Pension	$ 451	$ 764	$ 1,509	$ 2,684	$ 3,625	$ 4,659	$ 6,090
Number of Recipients	8	24	33	83	142	112	46
Period 7/1/2019 – 6/30/2020:							
Average Monthly Pension	$ 243	$ 1,054	$ 1,647	$ 2,600	$ 3,616	$ 4,874	$ 6,772
Number of Recipients	8	19	26	72	90	78	40
Period 7/1/2018 – 6/30/2019:							
Average Monthly Pension	$ 334	$ 891	$ 1,540	$ 2,760	$ 3,567	$ 4,666	$ 6,777
Number of Recipients	4	23	39	87	93	85	41
Period 7/1/2017 – 6/30/2018:							
Average Monthly Pension	$ 204	$ 899	$ 1,583	$ 2,583	$ 3,422	$ 4,580	$ 6,083
Number of Recipients	5	21	61	85	109	130	57
Period 7/1/2016 – 6/30/2017:							
Average Monthly Pension	$ 426	$ 795	$ 1,626	$ 2,433	$ 3,549	$ 4,536	$ 6,351
Number of Recipients	10	22	60	75	100	64	48
Period 7/1/2015 – 6/30/2016:							
Average Monthly Pension	$ 245	$ 1,002	$ 1,535	$ 2,540	$ 3,445	$ 4,472	$ 6,168
Number of Recipients	11	31	82	69	105	74	54
Period 7/1/2014 – 6/30/2015:							
Average Monthly Pension	$ 349	$ 1,041	$ 1,342	$ 2,205	$ 3,267	$ 4,220	$ 5,900
Number of Recipients	11	33	70	67	137	125	94
Period 7/1/2013 – 6/30/2014:							
Average Monthly Pension	$ 235	$ 904	$ 1,435	$ 2,398	$ 3,016	$ 4,073	$ 7,485
Number of Recipients	8	31	31	28	22	18	12
Period 7/1/2012 – 6/30/2013:							
Average Monthly Pension	$ 253	$ 1,030	$ 1,496	$ 2,450	$ 3,281	$ 4,384	$ 6,052
Number of Recipients	10	57	67	90	101	79	64
Period 7/1/2011 – 6/30/2012:							
Average Monthly Pension	$ 353	$ 1,064	$ 1,512	$ 2,241	$ 3,276	$ 4,320	$ 5,739
Number of Recipients	11	43	62	61	118	81	58

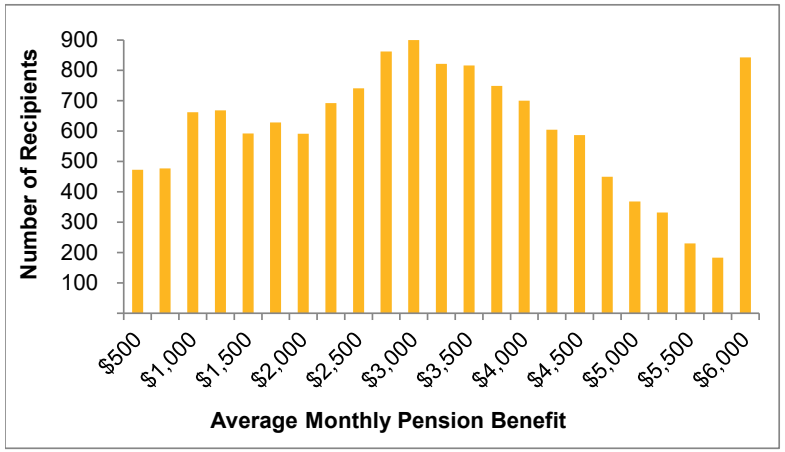
“Average Monthly Pension” includes postretirement pension adjustments and cost-of-living increases.

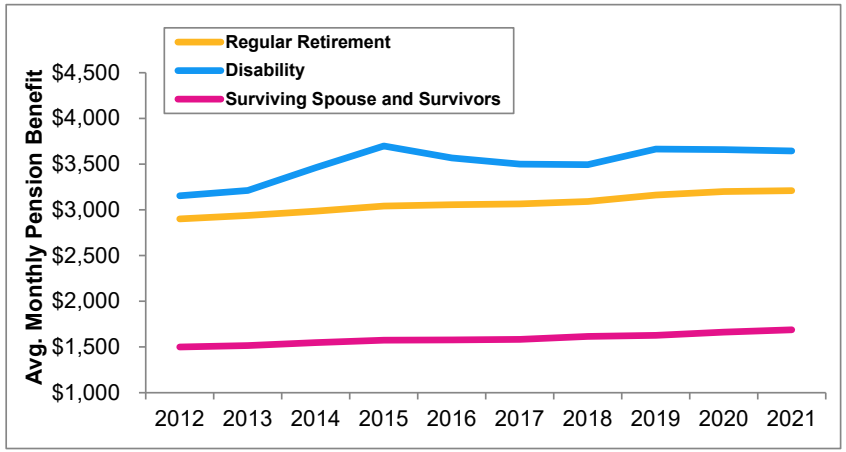
Beneficiaries are not included in the table above.

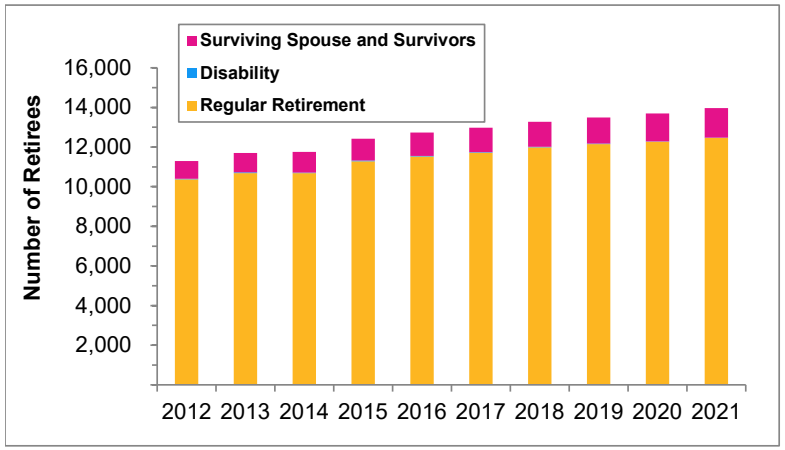
Section 4.7: Summary of All Pension Benefit Recipients

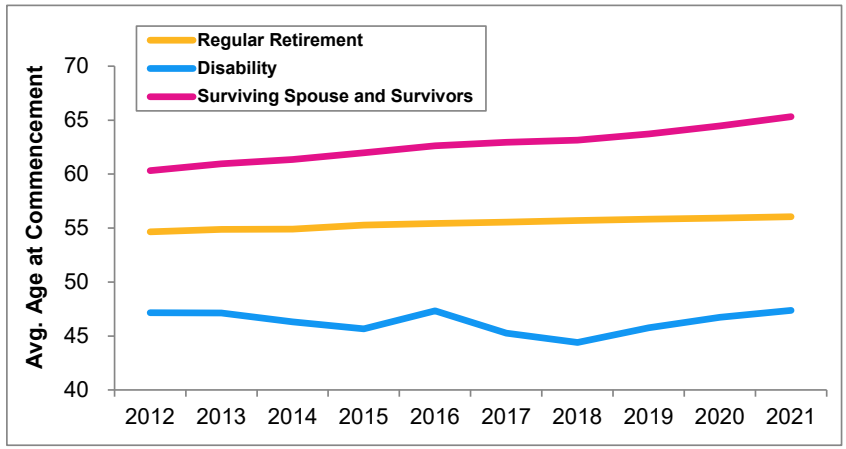
As of June 30	2017	2018	2019	2020	2021
Service					
1. Number, Fiscal Year Start	11,527	11,716	11,988	12,147	12,267
2. Net Change	189	272	159	120	192
3. Number, Fiscal Year End	11,716	11,988	12,147	12,267	12,459
4. Average Age at Commencement	55.55	55.70	55.82	55.93	56.05
5. Average Current Age	70.09	70.50	70.99	71.50	71.85
6. Average Monthly Pension Benefit	$ 3,064	$ 3,093	$ 3,161	$ 3,199	$ 3,210
Surviving Spouse (including DROs)					
1. Number, Fiscal Year Start	1,168	1,237	1,261	1,315	1,400
2. Net Change	69	24	54	85	93
3. Number, Fiscal Year End	1,237	1,261	1,315	1,400	1,493
4. Average Age at Commencement	62.98	63.16	63.73	64.49	65.32
5. Average Current Age	73.42	73.90	74.65	75.26	75.97
6. Average Monthly Pension Benefit	$ 1,584	$ 1,618	$ 1,629	$ 1,665	$ 1,688
Survivor (other than spouse)					
1. Number, Fiscal Year Start	3	3	3	3	2
2. Net Change	0	0	0	(1)	(2)
3. Number, Fiscal Year End	3	3	3	2	0
4. Average Age at Commencement	52.81	53.85	53.85	53.94	0.00
5. Average Current Age	58.22	60.65	61.65	61.56	0.00
6. Average Monthly Pension Benefit	$ 746	$ 749	$ 765	$ 705	$ 0
Disability					
1. Number, Fiscal Year Start	28	27	25	26	20
2. Net Change	(1)	(2)	1	(6)	0
3. Number, Fiscal Year End	27	25	26	20	20
4. Average Age at Commencement	45.25	44.40	45.75	46.74	47.37
5. Average Current Age	50.34	50.02	51.08	51.73	52.85
6. Average Monthly Pension Benefit	$ 3,500	$ 3,494	$ 3,666	$ 3,658	$ 3,643
Total					
1. Number, Fiscal Year Start	12,726	12,983	13,277	13,491	13,689
2. Net Change	257	294	214	198	283
3. Number, Fiscal Year End	12,983	13,277	13,491	13,689	13,972
4. Average Age at Commencement	56.24	56.38	56.56	56.79	57.02
5. Average Current Age	70.36	70.78	71.30	71.85	72.26
6. Average Monthly Pension Benefit	$ 2,924	$ 2,954	$ 3,014	$ 3,043	$ 3,048

Summary of All Pension Benefit Recipients









Summary of All Pension Benefit Recipients

Distribution of Annual Pension Benefits for Benefit Recipients

Annual Pension Benefit by Age

Age	Number	Total Annual Pension Benefit	Average Annual Pension Benefit
0 - 19	0	$ 0	$ 0
20 - 24	0	0	0
25 - 29	0	0	0
30 - 34	0	0	0
35 - 39	0	0	0
40 - 44	6	194,721	32,454
45 - 49	55	1,913,518	34,791
50 - 54	258	11,082,589	42,956
55 - 59	703	30,350,083	43,172
60 - 64	1,729	63,061,790	36,473
65 - 69	2,797	98,633,289	35,264
70 - 74	3,393	118,070,449	34,798
75+	5,031	187,776,040	37,324
Total	**13,972**	**$511,082,479**	**$ 36,579**

Annual Pension Benefit by Years Since Commenced

Years Since Comm.	Number	Total Annual Pension Benefit	Average Annual Pension Benefit
0	514	$ 19,547,143	$ 38,029
1	471	18,221,267	38,686
2	474	18,533,172	39,100
3	488	19,918,428	40,816
4	487	18,219,745	37,412
0 - 4	**2,434**	**$ 94,439,755**	**$ 38,800**
5 - 9	2,517	94,156,710	37,408
10 - 14	2,129	72,087,821	33,860
15 - 19	2,184	70,007,604	32,055
20 - 24	2,175	76,417,673	35,135
25 - 29	1,222	48,723,567	39,872
30 - 34	916	39,327,726	42,934
35 - 39	299	12,721,955	42,548
40+	96	3,199,668	33,330
Total	**13,972**	**$511,082,479**	**$ 36,579**

Years Since Commencement by Age

	Years Since Commencement									
Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total
0 - 19	0	0	0	0	0	0	0	0	0	0
20 - 24	0	0	0	0	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0	0	0	0	0
30 - 34	0	0	0	0	0	0	0	0	0	0
35 - 39	0	0	0	0	0	0	0	0	0	0
40 - 44	3	2	1	0	0	0	0	0	0	6
45 - 49	52	3	0	0	0	0	0	0	0	55
50 - 54	202	49	5	0	2	0	0	0	0	258
55 - 59	416	192	73	20	2	0	0	0	0	703
60 - 64	777	501	274	140	33	3	1	0	0	1,729
65 - 69	430	953	693	462	231	26	1	0	1	2,797
70 - 74	237	514	699	932	720	227	60	2	2	3,393
75+	317	303	384	630	1,187	966	854	297	93	5,031
Total	**2,434**	**2,517**	**2,129**	**2,184**	**2,175**	**1,222**	**916**	**299**	**96**	**13,972**

Section 4.8: Pension Benefit Recipients by Type of Benefit and Option Elected

Amount of Monthly Pension Benefit	Number of Recipients	Type of Pension Benefit			Option Selected			
		1	2	3	1	2	3	4
$ 1 – 300	240	165	75	0	148	46	39	7
301 – 600	405	276	129	0	228	71	84	22
601 – 900	666	510	156	0	366	135	126	39
901 – 1,200	831	651	180	0	496	158	143	34
1,201 – 1,500	730	560	170	0	406	155	148	21
1,501 – 1,800	735	561	174	0	415	159	138	23
1,801 – 2,100	757	598	159	0	406	155	169	27
2,101 – 2,400	846	714	132	0	383	203	227	33
2,401 – 2,700	999	900	99	0	451	237	281	30
2,701 – 3,000	1,079	1,002	72	5	466	256	324	33
3,001 – 3,300	990	944	42	4	395	244	326	25
3,301 – 3,600	955	919	35	1	392	208	328	27
3,601 – 3,900	874	854	18	2	342	186	320	26
3,901 – 4,200	757	735	17	5	312	163	261	21
4,200+	3,108	3,070	35	3	1,173	555	1,277	103
Total	13,972	12,459	1,493	20	6,379	2,931	4,191	471

Type of Pension Benefit
1. Regular Retirement
2. Survivor Payment
3. Disability

Option Selected
1. Whole Life Annuity
2. 75% Joint and Contingent Annuity
3. 50% Joint and Contingent Annuity
4. 66 2/3% Joint and Survivor Annuity

Section 4.9: Pension Benefit Recipients Added to and Removed from Rolls

Year Ended	Added to Rolls		Removed from Rolls		Rolls at End of Year		Percent Increase in Annual Pension Benefits	Average Annual Pension Benefit
	No.[1]	Annual Pension Benefits[1]	No.[1]	Annual Pension Benefits[1]	No.	Annual Pension Benefits		
June 30, 2021	593	$ 22,728,504	310	$ 11,391,465	13,972	$ 511,082,479	2.3%	$ 36,579
June 30, 2020	460	17,641,920	262	5,527,983	13,689	499,745,440	2.5%	36,507
June 30, 2019	468	18,004,896	254	871,684	13,491	487,631,503	3.6%	36,145
June 30, 2018	555	21,924,986	261	6,926,129	13,277	470,498,291	3.3%	35,437
June 30, 2017	487	17,151,684	230	7,736,025	12,983	455,499,434	2.1%	35,084
June 30, 2016	530	18,364,581	222	6,144,109	12,726	446,083,775	2.8%	35,053
June 30, 2015	888	34,120,658	220	3,531,501	12,418	433,863,303	7.6%	34,938
June 30, 2014	226	5,964,256	181	(1,150,187)	11,750	403,274,146	1.8%	34,321
June 30, 2013	576	19,387,542	172	1,652,575	11,705	396,159,703	4.7%	33,845
June 30, 2012	473	17,104,564	188	(617,561)	11,301	378,424,736	4.9%	33,486

[1] Numbers are estimated, and include other internal transfers.

Section 5: Basis of the Actuarial Valuation

Section 5.1: Summary of Plan Provisions

Effective Date

July 1, 1955, with amendments through June 30, 2021. Chapter 97, 1990 Session Laws of Alaska, created a two-tier retirement system. Members who were first hired under TRS before July 1, 1990 (Tier 1) are eligible for different benefits than members hired after June 30, 1990 (Tier 2). Chapter 9, 2005 Session Laws of Alaska, closed the plan to new members hired after June 30, 2006.

Administration of Plan

The Commissioner of Administration or the Commissioner's designee is the administrator of the system. The Attorney General of the state is the legal counsel for the system and shall advise the administrator and represent the system in legal proceedings.

Prior to June 30, 2005, the Teachers' Retirement Board prescribed policies and adopted regulations and performed other activities necessary to carry out the provisions of the system. The Alaska State Pension Investment Board, Department of Revenue, Treasury Division was responsible for investing TRS funds.

On July 27, 2005, Senate Bill 141, enacted as Chapter 9, 2005 Session laws of Alaska, replaced the Teachers' Retirement Board and the Alaska State Pension Investment Board with the Alaska Retirement Management Board.

Employers Included

Currently, there are 56 employers participating in TRS, including the State of Alaska, 52 school districts, and three other eligible organizations.

Membership

Membership in TRS is mandatory for the following employees hired before July 1, 2006:

- certificated full-time and part-time elementary and secondary teachers, certificated school nurses, and certificated employees in positions requiring teaching certificates;
- positions requiring a teaching certificate as a condition of employment in the Department of Education and Early Development and the Department of Labor and Workforce Development;
- University of Alaska full-time and part-time teachers, and full-time administrative employees in positions requiring academic standing if approved by the TRS administrator;
- certain full-time or part-time teachers of Alaska Native language or culture who have elected to be covered under TRS;
- members on approved sabbatical leave under AS 14.20.310;
- certain State legislators who have elected to be covered under TRS; and
- a teacher who has filed for worker's compensation benefits due to an on-the-job assault and who, as a result of the physical injury, is placed on leave without pay.

Employees participating in the University of Alaska's Optional Retirement Plan or other retirement plans funded by the State are not covered by TRS.

Employees who work half-time in TRS and Public Employees' Retirement System (PERS) simultaneously are eligible for half-time TRS and PERS credit.

Senate Bill 141, signed into law on July 27, 2005, closes the plan effective July 1, 2006 to new members first hired on or after July 1, 2006.

Credited Service

TRS members receive a year of membership credit if they work a minimum of 172 days during the school year (July 1 through June 30 of the following year). Fractional credit is determined based on the number of days worked. Part-time members who work at least 50% of full-time receive membership credit for each day in proportion to full-time service. Credit is granted for all Alaskan public school service.

Members may claim other types of service, including:

- Outside teaching service in out-of-state schools or Alaska private schools (not more than ten years may be claimed);
- Military service (not more than five years of military service or ten years of combined outside and military service may be claimed);
- Alaska Bureau of Indian Affairs (BIA) service;
- Retroactive Alaskan service that was not creditable at the time it occurred, but later became creditable because of legislative change;
- Unused sick leave credit after members retire; and
- Leave of absence without pay.

Except for retroactive Alaska service that occurred before July 1, 1955, and unused sick leave, contributions are required for all claimed service.

Members receiving TRS disability benefits continue to earn TRS credit while disabled.

Survivors who are receiving occupational death benefits continue to earn TRS service credit while occupational survivor benefits are being paid.

Employer Contributions

TRS employers contribute the amounts required, in addition to employees' contributions, to fund the benefits of the system.

The normal cost rate is a uniform rate for all participating employers (less the value of members' contributions).

The past service rate is a uniform rate for all participating employers to amortize the unfunded past service liability with payments that are a level percentage of payroll amount over a closed 25-year period starting June 30, 2014. Effective June 30, 2018, each future year's unfunded service liability is separately amortized on a level percent of pay basis over 25 years.

Employer rates cannot be less than the normal cost rate.

Pursuant to AS14.25.070 effective July 1, 2008, each TRS employer will pay a simple uniform contribution rate of 12.56% of member payroll.

Additional State Contributions

Pursuant to AS14.25.085 effective July 1, 2008, the State shall contribute an amount (in addition to the State contribution as an employer) that, when combined with the employer contribution of 12.56%, will be sufficient to pay the total contribution rate adopted by the Board.

Member Contributions

Mandatory Contributions: Members are required to contribute 8.65% of their base salaries. Members' contributions are deducted from gross salaries before federal income taxes are withheld.

Contributions for Claimed Service: Member contributions are also required for most of the claimed service described above.

1% Supplemental Contributions: Members who joined the system before July 1, 1982 and elected to participate in the supplemental contributions provision are required to contribute an additional 1% of their salaries. Supplemental contributions are deducted from gross salaries after federal income taxes are withheld. Under the supplemental provision, an eligible spouse or dependent child will receive a survivor's allowance or spouse's pension if the member dies (see below). Supplemental contributions are only refundable upon death (see below).

Interest: Members' contributions earn 4.5% interest, compounded annually on June 30.

Refund of Contributions: Terminated members may receive refunds of their member contribution accounts which includes their mandatory contributions, indebtedness payments, and interest earned. Terminated members' accounts may be attached to satisfy claims under Alaska Statute 09.38.065, federal income tax levies, and valid Qualified Domestic Relations Orders.

Reinstatement of Contributions: Refunded accounts and the corresponding TRS service may be reinstated upon reemployment in TRS prior to July 1, 2010. Interest accrues on refunds until paid in full or members retire.

Retirement Benefits

Eligibility

a. Members, including deferred vested members, are eligible for normal retirement at age 55 or early retirement at age 50 if they were hired before July 1, 1990 (Tier 1), and age 60 or early retirement at age 55 if they were hired on or after July 1, 1990 (Tier 2). Additionally, they must have at least:
   (i) eight years of paid-up membership service;
   (ii) 15 years of paid-up creditable service, the last five years of which are membership service, and they were first hired under TRS before July 1, 1975;
   (iii) five years of paid-up membership service and three years of paid-up Alaska Bureau of Indian Affairs service;
   (iv) 12 years of combined part-time and full-time paid-up membership service;
   (v) two years of paid-up membership service if they are vested in PERS; or
   (vi) one year of paid-up membership service if they are retired from PERS.

b. Members may retire at any age when they have:
   (i) 25 years of paid-up creditable service, the last five years of which are membership service;
   (ii) 20 years of paid-up membership service;
   (iii) 20 years of combined paid-up membership and Alaska Bureau of Indian Affairs service, the last five years of which are membership service; or
   (iv) 20 years of combined paid-up part-time and full-time membership service.

Benefit Type

Lifetime benefits are paid to members. Eligible members may receive normal, unreduced benefits when they (1) reach normal retirement age and complete the service required; or (2) satisfy the minimum service requirements to retire at any age under (b) above. Members may receive early, actuarially reduced benefits when they reach early retirement age and complete the service required.

Members may select joint and survivor options and a last survivor option. Under these options and early retirement, benefits are actuarially adjusted so that members receive the actuarial equivalents of their normal benefit amounts.

Benefit Calculations

Retirement benefits are calculated by multiplying the average base salary (ABS) times the total TRS service times the percentage multiplier. The ABS is determined by averaging the salaries earned during the three highest school years. Members must earn at least 115 days of credit in a school year to include it in the ABS calculation. TRS pays a minimum benefit of $25.00 per month for each year of service when the calculated benefit is less.

The percentage multipliers are 2% for the first 20 years and 2.5% for all remaining service. Service before July 1, 1990 is calculated at 2%.

Salaries are subject to compensation limits under IRC 401(a)(17) for members first hired on or after July 1, 1996. Retirement benefit amounts are subject to IRC 415(b) limits regardless of hire date.

Indebtedness

Members who terminate and refund their TRS contributions are not eligible to retire unless they return to TRS employment and pay back their refunds plus interest or accrue additional service which qualifies them for retirement. TRS refunds must be paid in full if the corresponding service is to count toward the minimum service requirements for retirement. Refunded TRS service is included in total service for the purpose of calculating retirement benefits. However, when refunds are not completely paid before retirement, benefits are actuarially reduced for life. Indebtedness balances may also be created when a member purchases qualified claimed service.

Reemployment of Retired Members

Retirees who return to work in a permanent full-time or part-time TRS position after a Normal Retirement are eligible to return under the Standard Option.

Under the Standard Option, retirement and retiree healthcare benefits are suspended while retired members are reemployed under TRS. During reemployment, members earn additional TRS service and contributions are withheld from their wages.

Members retired under the Retirement Incentive Programs (RIPs) who return to employment will:

a. forfeit the three years of incentive credits that they received;

b. owe TRS 110% of the benefits that they received under the RIP, which may include costs for health insurance, excluding amounts that they paid to participate; and

c. be charged 7% interest from the date that they are reemployed until their indebtedness is paid in full or they retire again. If the indebtedness is not completely paid, future benefits will be actuarially reduced for life.

Employers make contributions to the unfunded liability of the plan on behalf of rehired retired members at the rate the employer is making contributions to the unfunded liability of the plan for other members.

Postemployment Healthcare Benefits

When pension benefits begin, major medical benefits are provided by TRS to (1) all employees first hired before July 1, 1990 (Tier 1) and their surviving spouses and (2) members and their surviving spouses who have 25 years of membership service, are disabled or age 60 or older, regardless of their initial hire dates. Employees first hired after June 30, 1990 (Tier 2) and their surviving spouses may receive major medical benefits prior to age 60 by paying premiums.

Medical, prescription drug, dental, vision, and audio coverage is provided through the AlaskaCare Retiree Health Plan. Health plan provisions do not vary by retirement tier or age, except for Medicare coordination. Participants in dental, vision, and audio coverage pay a full self-supporting rate and those benefits are not included in this valuation.

Starting in 2022, prior authorization will be required for certain specialty medications for all participants. There is no change to the medications that are covered by the plan.

Starting in 2022, certain preventive benefits for pre-Medicare participants will now be covered by the plan.

Surviving spouses continue coverage only if a pension payment form that provided survivor benefits was elected. Alternate payees (i.e. individuals who are the subject of a domestic relations order or DRO) are allowed to participate in the plan, but must pay the full cost.

Where premiums are required prior to age 60 (Tier 2), the valuation bases this payment upon the age of the retiree.

Participants in the defined benefit plan are covered under the following benefit design:

Plan Feature	Amounts
Deductible (single/family)	$150 / $450
Coinsurance (most services)	20%
Outpatient surgery/testing	0%
Maximum Out-of-Pocket (single/family, excluding deductible)	$800 / $2,400
Rx Copays (generic/brand/mail-order), does not apply to OOP max	$4 / $8 / $0
Lifetime Maximum	$2,000,000

The plan coordinates with Medicare on a traditional Coordination of Benefits Method. Starting in 2019, the prescription drug coverage is through a Medicare Part D EGWP arrangement.

Disability Benefits

Monthly disability benefits are paid to permanently disabled members until they die, recover, or become eligible for normal retirement. To be eligible, members must have at least five years of paid-up membership service.

Disability benefits are equal to 50% of the member's base salary at the time of disability. The benefit is increased by 10% of the base salary for each minor child, up to a maximum of 40%. Members continue to earn TRS service until eligible for normal retirement.

Members are appointed to normal retirement on the first of the month after they become eligible.

Death Benefits

Monthly death benefits may be paid to a spouse or dependent children upon the death of a member. If monthly benefits are not payable under the supplemental contributions provision or occupational and non-occupational death provisions, the designated beneficiary receives the lump sum benefit described below.

Occupational Death

When an active member dies from occupational causes, a monthly survivor's pension may be paid to the spouse, unless benefits are payable under the supplemental contributions provision (see below). The pension equals 40% of the member's base salary on the date of death or disability, if earlier. If there is no spouse, the pension may be paid to the member's dependent children. On the member's normal retirement date, the benefit converts to a normal retirement benefit. The normal benefit is based on the member's average base salary on the date of death and service, including service accumulated from the date of the member's death to the normal retirement date.

Non-Occupational Death

When a vested member dies from non-occupational causes, the surviving spouse may elect to receive a monthly 50% joint and survivor benefit or a lump sum benefit, unless benefits are payable under the supplemental contributions provision (see below). The monthly benefit is calculated on the member's average base salary and TRS service accrued at the time of death.

Lump Sum Benefit

Upon the death of an active member who has less than one year of service or an inactive member who is not vested, the designated beneficiary receives the member's contribution account, which includes mandatory contributions, indebtedness payments, and interest earned. Any supplemental contributions will also be refunded. If the member has more than one year of TRS service or is vested, the beneficiary also receives $1,000 and $100 for each year of TRS service, up to a maximum of $3,000. An additional $500 may be payable if the member is survived by dependent children.

Supplemental Contributions Provision

Members are eligible for supplemental coverage if they joined TRS before July 1, 1982, elected to participate in the supplemental provision, and made the required contributions. A survivor's allowance or spouse's pension (see below) may be payable if the member made supplemental contributions for at least one year and dies while in membership service or while disabled under TRS. In addition, the allowance and pension may be payable if the member dies while retired or in deferred vested status if supplemental contributions were made for at least five years.

a. **Survivor's Allowance:** If the member is survived by dependent children, the surviving spouse and dependent children are entitled to a survivor's allowance. The allowance for the spouse is equal to 35% of the member's base salary at the time of death or disability, plus 10% for each dependent child up to a maximum of 40%. The allowance terminates and a spouse's pension becomes payable when there is no longer an eligible dependent child.

b. **Spouse's Pension:** The spouse's pension is equal to 50% of the retirement benefit that the deceased member was receiving or the unreduced retirement benefit that the deceased member would have received if retired at the time of death. The spouse's pension begins on the first of the month after the member's death or termination of the survivor's allowance.

Death After Retirement

If a joint and survivor option was selected at retirement, the eligible spouse receives continuing, lifetime monthly benefits after the member dies. A survivor's allowance or spouse's pension may be payable if the member participated in the supplemental contributions provision. If a joint and survivor option was not selected and benefits are not payable under the supplemental contributions provision, the designated beneficiary receives the member's contribution account, less any benefits already paid and the member's last benefit check.

Postretirement Pension Adjustments

Postretirement pension adjustments (PRPAs) are granted annually to eligible benefit recipients when the consumer price index (CPI) for urban wage earners and clerical workers for Anchorage increases during the preceding calendar year. PRPAs are calculated by multiplying the recipient's base benefit including past PRPAs, but excluding the Alaska COLA, times:

a. The lesser of 75% of the CPI increase in the preceding calendar year or 9% if the recipient is at least age 65 or on TRS disability; or
b. The lesser of 50% of the CPI increase in the preceding calendar year or 6% if the recipient is at least age 60, or under age 60 if the recipient has been receiving benefits for at least eight years.

Ad hoc PRPAs, up to a maximum of 4%, may be granted to eligible recipients who were first hired before July 1, 1990 (Tier 1) if the CPI increases and the funded ratio is at least 105%.

In a year where an ad hoc PRPA is granted, eligible recipients will receive the higher of the two calculations.

Alaska Cost-of-Living Allowance (COLA)

Eligible benefit recipients who reside in Alaska receive an Alaska COLA equal to 10% of their base benefits. The following benefit recipients are eligible:

a. members who were first hired under TRS before July 1, 1990 (Tier 1) and their survivors;
b. members who were first hired under TRS after June 30, 1990 (Tier 2) and their survivors if they are at least age 65; and
c. all disabled members.

Changes in Benefit Provisions Valued Since the Prior Valuation

Starting in 2022, prior authorization will be required for certain specialty medications for all participants, and certain preventive benefits for pre-Medicare participants will now be covered by the plan. There were no other changes in benefit provisions since the prior valuation.

Section 5.2: Description of Actuarial Methods and Valuation Procedures

The funding method used in this valuation was adopted by the Board in October 2006. Changes in methods were adopted by the Board in January 2019 based on the experience study for the period July 1, 2013 to June 30, 2017. The asset smoothing method used to determine valuation assets was changed effective June 30, 2014.

Benefits valued are those delineated in Alaska State statutes as of the valuation date. Changes in State statutes effective after the valuation date are not taken into consideration in setting the assumptions and methods.

Actuarial Cost Method

Liabilities and contributions shown in the report are computed using the Entry Age Normal Actuarial Cost Method, level percent of pay.

Effective June 30, 2018, the Board adopted a layered UAAL amortization method: Layer #1 equals the sum of (i) the UAAL at June 30, 2018 based on the 2017 valuation, plus (ii) the FY18 experience gain/loss. Layer #1 is amortized over the remainder of the 25-year closed period that was originally established in 2014[1]. Layer #2 equals the change in UAAL at June 30, 2018 due to the experience study and EGWP implementation. Layer #2 is amortized over a separate closed 25-year period starting in 2018. Future layers will be created each year based on the difference between actual and expected UAAL occurring that year, and will be amortized over separate closed 25-year periods. The UAAL amortization continues to be on a level percent of pay basis. State statutes allow the contribution rate to be determined on payroll for all members, defined benefit and defined contribution member payroll combined.

Projected pension and postemployment healthcare benefits were determined for all active members. Cost factors designed to produce annual costs as a constant percentage of each member's expected compensation in each year from the assumed entry age to the assumed retirement age were applied to the projected benefits to determine the normal cost (the portion of the total cost of the plan allocated to the current year under the method). The normal cost is determined by summing intermediate results for active members and determining an average normal cost rate which is then related to the total payroll of active members. The actuarial accrued liability for active members (the portion of the total cost of the plan allocated to prior years under the method) was determined as the excess of the actuarial present value of projected benefits over the actuarial present value of future normal costs.

The actuarial accrued liability for retired members and their beneficiaries currently receiving benefits, terminated vested members and disabled members not yet receiving benefits was determined as the actuarial present value of the benefits expected to be paid. No future normal costs are payable for these members.

The actuarial accrued liability under this method at any point in time is the theoretical amount of the fund that would have been accumulated had annual contributions equal to the normal cost been made in prior years (it does not represent the liability for benefits accrued to the valuation date). The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over the actuarial value of plan assets measured on the valuation date.

Under this method, experience gains or losses, i.e., decreases or increases in accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the unfunded actuarial accrued liability.

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[1] Layer #1 is referred to as "initial amount" in Sections 1.2 and 1.3.

Valuation of Assets

The actuarial asset value was reinitialized to equal Fair Value of Assets as of June 30, 2014. Beginning in FY15, the asset valuation method recognizes 20% of the gain or loss each year, for a period of five years. All assets are valued at fair value. Assets are accounted for on an accrued basis and are taken directly from financial statements audited by KPMG LLP.

Changes in Methods Since the Prior Valuation

There were no changes in the asset or valuation methods since the prior valuation.

Valuation of Retiree Medical and Prescription Drug Benefits

This section outlines the detailed methodology used in the internal model developed by Buck to calculate the initial per capita claims cost rates for the TRS postemployment healthcare plan. Note that the methodology reflects the results of our annual experience rate update for the period from July 1, 2020 to June 30, 2021.

Base claims cost rates are incurred healthcare costs expressed as a rate per member per year. Ideally, claims cost rates should be derived for each significant component of cost that can be expected to require differing projection assumptions or methods (i.e., medical claims, prescription drug claims, administrative costs, etc.). Separate analysis is limited by the availability and historical credibility of cost and enrollment data for each component of cost. This valuation reflects non-prescription claims separated by Medicare status, including eligibility for free Part A coverage. Prescription costs are analyzed separately as in prior valuations. Administrative costs are assumed in the final per capita claims cost rates used for valuation purposes, as described below. Analysis to date on Medicare Part A coverage is limited since Part A claim data is not available by individual, nor is this status incorporated into historical claim data.

<u>Benefits</u>

Medical, prescription drug, dental, vision and audio coverage is provided through the AlaskaCare Retiree Health Plan and is available to employees of the State and subdivisions who meet retirement criteria based on the retirement plan tier in effect at their date of hire. Health plan provisions do not vary by retirement tier or age, except for Medicare coordination for those Medicare-eligible. Dental, vision and audio claims (DVA) are excluded from data analyzed for this valuation because those are retiree-pay all benefits where rates are assumed to be self-supporting. Buck relies upon rates set by a third-party for the DVA benefits. Buck reviewed historical rate-setting information and views contribution rate adjustments made are not unreasonable.

<u>Administration and Data Sources</u>

The plan was administered by Wells Fargo Insurance Services (acquired by HealthSmart, in January 2012) from July 1, 2009 through December 31, 2013 and by Aetna effective January 1, 2014.

Claims incurred for the period from July 2019 through June 2021 (FY20 through FY21) were provided by the State of Alaska from reports extracted from their data warehouse, which separated claims by Medicare status. Monthly enrollment data for the same period was provided by Aetna.

Aetna also provided census information identifying Medicare Part B only participants. These participants are identified when hospital claims are denied by Medicare; Aetna then flags that participant as a Part B only participant. Buck added newly identified participants to our list of Medicare Part B only participants. Buck assumes that once identified as Part B only, that participant remains in that status until we are notified otherwise.

Aetna provided a snapshot file as of July 1, 2021 of retirees and dependents that included a coverage level indicator. The monthly enrollment data includes double coverage participants. These are participants whereby both the retiree and spouse are retirees from the State and both are reflected with Couple coverage in the enrollment. In this case, such a couple would show up as four members in the

monthly enrollment (each would be both a retiree and a spouse). As a result, the snapshot census file was used to adjust the total member counts in the monthly enrollment reports to estimate the number of unique participants enrolled in coverage. Based on the snapshot files from the last two valuations, the total member count in the monthly enrollment reports needs to be reduced by approximately 13% to account for the number of participants with double coverage.

Aetna does not provide separate experience by Medicare status in standard reporting so the special reports mentioned above from the data warehouse were used this year to obtain that information and incorporate it into the per capita rate development for each year of experience (with corresponding weights applied in the final per capita cost).

Methodology

Buck projected historical claim data to FY22 for retirees using the following summarized steps:

1. Develop historical annual incurred claim cost rates – an analysis of medical costs was completed based on claims information and enrollment data provided by the State of Alaska and Aetna for each year in the experience period of FY20 through FY21.
    - Costs for medical services and prescriptions were analyzed separately, and separate trend rates were developed to project expected future medical and prescription costs for the valuation year (e.g. from the experience period up through FY22).
    - Because the reports provided reflected incurred claims, no additional adjustment was needed to determine incurred claims to be used in the valuation.
    - An offset for costs expected to be reimbursed by Medicare was incorporated beginning at age 65. Alaska retirees who do not have 40 quarters of Medicare-covered compensation do not qualify for Medicare Part A coverage free of charge. This is a relatively small and closed group. Medicare was applied to State employment for all employees hired after March 31, 1986. For the “no-Part A” individuals who are required to enroll in Medicare Part B, the State is the primary payer for hospital bills and other Part A services. Claim experience is not available separately for participants with both Medicare Parts A and B and those with Part B only. For Medicare Part B only participants, a lower average claims cost was applied to retirees covered by both Medicare Part A and B vs. retirees covered only by Medicare Part B based upon manual rate models that estimate the Medicare covered proportion of medical costs. To the extent that no-Part A claims can be isolated and applied strictly to the appropriate closed group, actuarial accrued liability will be more accurate.
    - Based on census data received from Aetna, less than 1% of the current retiree population was identified as having coverage only under Medicare Part B. We assume that 5% of actives hired before April 1, 1986 and current retirees who are not yet Medicare eligible will not be eligible for Medicare Part A.
    - Based upon a reconciliation of valuation census data to the snapshot eligibility files provided by Aetna as of July 1, 2020, and July 1, 2021, Buck adjusted member counts used for duplicate records where participants have double coverage; i.e. primary coverage as a retiree and secondary coverage as the covered spouse of another retiree. This is to reflect the total cost per distinct individual/member which is then applied to distinct members in the valuation census.
    - Buck understands that pharmacy claims reported do not reflect rebates. Based on actual pharmacy rebate information provided by Optum, rebates were assumed to be 19.5% of prescription drug claims for FY20, 16.2% of pre-Medicare, and 14.3% of Medicare prescription drug claims for FY21.
2. Develop estimated EGWP reimbursements – Segal provided estimated 2022 EGWP subsidies, developed with the assistance of OptumRx. These amounts are applicable only to Medicare-eligible participants.

3. Adjust for claim fluctuation, anomalous experience, etc. – explicit adjustments are often made for anticipated large claims or other anomalous experience. FY19 and FY20 experience were compared to assess the impact of COVID-19 and whether an adjustment to FY20 claims was indicated for use in the June 30, 2020 valuation. A material decrease in medical claims during March 2020 to June 2020 was experienced due to COVID-19. Therefore, an adjustment was made for those months to adjust for the decrease that is not expected to continue in future years. There was an observed spike in prescription drug claims in March 2020; however, the FY20 prescription drug experience appears reasonable to use without adjustment for COVID-19. To adjust for the decrease in medical claims due to COVID-19 during the last 4 months of FY20, the per capita cost during the first 8 months was used as the basis for estimating claims that would have occurred in the absence of COVID-19. FY21 experience was also thoroughly reviewed to assess the impact of COVID-19 and whether an adjustment to FY21 claims was appropriate for use in the June 30, 2021 valuation. FY21 medical per capita claims were noticeably lower than expected, so a 4% load was added to the FY21 medical claims used in the per capita claims cost development to better reflect future expected long-term costs of the plan. Total prescription drug claims experience for FY21 was reasonable and consistent with FY19 and FY20 experience. Therefore, no adjustment was made to FY21 prescription drug claims. Due to group size and demographics, we did not make any additional large claim adjustments. We do blend both Alaska plan-specific and national trend factors as described below. Buck compared data utilized to lag reports and quarterly plan experience presentations provided by the State and Aetna to assess accuracy and reasonableness of data.

4. Trend all data points to the projection period – project prior years' experience forward to FY22 for retiree benefits on an incurred claim basis. Trend factors derived from historical Alaska-specific experience and national trend factors are shown in the table in item 5 below.

5. Apply credibility to prior experience – adjust prior year's data by assigning weight to recent periods, as shown at the right of the table below. The Board approved a change in the weighting of experience periods beginning with the June 30, 2017 valuation as outlined below. Note also that for FY20 to FY21 medical and both years of prescription drugs we averaged projected plan costs using Alaska-specific trend factors and national trend factors, assigning 75% weight to Alaska-specific trends and 25% to national trends. For FY21 to FY22 medical we applied 100% weight to national trends because the Alaska-specific trends were impacted by COVID-19:

Alaska-Specific and National Average Weighted Trend from Experience Period to Valuation Year

Experience Period	Medical	Prescription	Weighting Factors
FY20 to FY21	6.3% Pre-Medicare / 5.2% Medicare	7.6%	50%
FY21 to FY22	8.1% Pre-Medicare / 4.8% Medicare	8.0%	50%

Trend assumptions used for rate development are assessed annually and as additional/improved reporting becomes available, we will incorporate into rate development as appropriate.

6. Starting in 2022, prior authorization will be required for certain specialty medications. There is no change to the medications that are covered by the plan. Segal provided an estimate of the impact of this change to the DB retiree health plan cost for calendar year 2022. The DB base claims costs for pre-Medicare prescription drug, Medicare prescription drug, and EGWP were adjusted to reflect this change. Additionally, starting in 2022, certain preventive benefits for pre-Medicare participants will now be covered by the plan. Segal provided an estimate of the impact of this change to the DB retiree health plan cost for calendar year 2022. The DB base claims cost for pre-Medicare medical was adjusted to reflect this change.

7. Develop separate administration costs – no adjustments were made for internal administrative costs. Third party retiree plan administration fees for FY22 are based upon total fees projected to 2022 by Segal based on actual FY21 fees. The annual per participant per year administrative cost rate for medical and prescription benefits is $493.

Healthcare Reform

Healthcare Reform legislation passed on March 23, 2010 included several provisions with potential implications for the State of Alaska Retiree Health Plan liability. Buck evaluated the impact due to these provisions.

Because the State plan is retiree-only, and was in effect at the time the legislation was enacted, not all provisions of the health reform legislation apply to the State plan. Unlimited lifetime benefits and dependent coverage to age 26 are two of these provisions. We reviewed the impact of including these provisions, but there was no decision made to adopt them, and no requirement to do so.

Because Transitional Reinsurance fees are only in effect until 2016, we excluded these for valuation purposes.

The Further Consolidated Appropriations Act, 2020 passed in December 2019 repealed several healthcare-related taxes, including the Cadillac Tax.

The Tax Cuts and Jobs Act passed in December 2017 included the elimination of the individual mandate penalty and changed the inflation measure for purposes of determining the limits for the High Cost Excise Tax to use chained CPI. It is our understanding the law does not directly impact other provisions of the ACA. While the nullification of the ACA's individual mandate penalty does not directly impact employer group health plans, it could contribute to the destabilization of the individual market and increase the number of uninsured. Such destabilization could translate to increased costs for employers. We have considered this when setting our healthcare cost trend assumptions and will continue to monitor this issue.

We have not identified any other specific provisions of healthcare reform or its potential repeal that would be expected to have a significant impact on the measured obligation. We will continue to monitor legislative activity.

Data

In accordance with actuarial standards, we note the following specific data sources and steps taken to value retiree medical benefits:

The Division of Retirement and Benefits provided pension valuation census data, which for people currently in receipt of healthcare benefits was supplemented by coverage data from the healthcare claims administrator (Aetna).

Certain adjustments and assumptions were made to prepare the data for valuation:

- All records provided with retiree medical coverage on the Aetna data were included in this valuation and we relied on the Aetna data as the source of medical coverage for current retirees and their dependents.
- Some records in the Aetna data were duplicates due to the double coverage (i.e. coverage as a retiree and as a spouse of another retiree) allowed under the plan. Records were adjusted for these members so that each member was only valued once. Any additional value of the double coverage (due to coordination of benefits) is small and reflected in the per capita costs.
- Covered children included in the Aetna data were valued until age 23, unless disabled. We assumed that those dependents over 23 were only eligible and valued due to being disabled.
- For individuals included in the pension data expecting a future pension, we valued health benefits starting at the same point that the pension benefit is assumed to start.

We are not aware of any other data issues that would be expected to have a material impact on the results and there are no unresolved matters related to the data.

The chart below shows the basis of setting the per capita claims cost assumption, which includes both PERS and TRS.

	Medical		Prescription Drugs (Rx)	
	Pre-Medicare	Medicare	Pre-Medicare	Medicare
A. Fiscal 2020				
1. Incurred Claims	$ 229,531,664	$ 89,497,345	$ 64,442,660	$ 188,022,328
2. Adjustments for Rx Rebates	0	0	(12,566,319)	(36,664,354)
3. Net incurred claims	$ 229,531,664	$ 89,497,345	$ 51,876,341	$ 151,357,974
4. Average Enrollment	19,354	44,965	19,354	44,965
5. Claim Cost Rate (3) / (4)	11,860	1,990	2,680	3,366
6. Trend to Fiscal 2022	1.149	1.103	1.162	1.162
7. Fiscal 2022 Incurred Cost Rate (5) x (6)	$ 13,630	$ 2,195	$ 3,116	$ 3,912
B. Fiscal 2021				
1. Incurred Claims	$ 196,566,470	$ 86,512,435	$ 60,691,609	$ 207,822,858
2. Adjustments for Rx Rebates and COVID (Medical only)	7,862,659	3,460,497	(9,832,041)	(29,718,669)
3. Net incurred claims	$ 204,429,129	$ 89,972,933	$ 50,859,568	$ 178,104,189
4. Average Enrollment	18,106	47,025	18,106	47,025
5. Claim Cost Rate (3) / (4)	11,291	1,913	2,809	3,787
6. Trend to Fiscal 2022	1.081	1.048	1.080	1.080
7. Fiscal 2022 Incurred Cost Rate (5) x (6)	$ 12,205	$ 2,005	$ 3,034	$ 4,090

	Medical		Prescription Drugs (Rx)	
	Pre-Medicare	Medicare	Pre-Medicare	Medicare
C. Incurred Cost Rate by Fiscal Year				
1. Fiscal 2020 A.(7)	13,630	2,195	3,116	3,912
2. Fiscal 2021 B.(7)	12,205	2,005	3,034	4,090
D. Weighting by Fiscal Year				
1. Fiscal 2020	50%	50%	50%	50%
2. Fiscal 2021	50%	50%	50%	50%
E. Fiscal 2022 Incurred Cost Rate				
1. Rate at Average Age C x D	$ 12,918	$ 2,100	$ 3,075	$ 4,001
2. Average Aging Factor	0.822	1.271	0.832	1.124
3. Rate at Age 65 (1) / (2)	$ 15,708	$ 1,652	$ 3,695	$ 3,560
F. Development of Part A&B and Part B Only Cost from Pooled Rate Above				
1. Part A&B Average Enrollment		46,602		
2. Part B Only Average Enrollment		423		
3. Total Medicare Average Enrollment B(4)		47,025		
4. Cost ratio for those with Part B only to those with Parts A&B		3.300		
5. Factor to determine cost for those with Parts A&B (2) / (3) x (4) + (1) / (3) x 1.00		1.021		
6. Medicare per capita cost for all participants: E(3)		$ 1,652		
7. Cost for those eligible for Parts A&B: (6) / (5)		$ 1,619		
8. Cost for those eligible for Part B only: (7) x (4)		$ 5,341		

	Medical		Prescription Drugs (Rx)	
	Pre-Medicare	Medicare	Pre-Medicare	Medicare
1. Rate at Age 65	$ 15,708	$ 1,619	$ 3,695	$ 3,560
2. Adjustment factor for plan changes	1.39%	0.00%	-8.67%	-2.41%
3. Adjusted Rate at Age 65 (1) x [1 + (2)]	$ 15,926	$ 1,619	$ 3,375	$ 3,474

Following the development of total projected costs, a distribution of per capita claims cost was developed. This was accomplished by allocating total projected costs to the population census used in the valuation. The allocation was done separately for each of prescription drugs and medical costs for the Medicare eligible and pre-Medicare populations. The allocation weights were developed using participant counts by age and assumed morbidity and aging factors. Results were tested for reasonableness based on historical trend and external benchmarks for costs paid by Medicare.

Below are the results of this analysis:

Distribution of Per Capita Claims Cost by Age for the Period July 1, 2021 through June 30, 2022

Age	Medical and Medicare Parts A & B	Medical and Medicare Part B Only	Prescription Drug	Medicare EGWP Subsidy
45	$ 9,719	$ 9,719	$ 2,062	$ 0
50	10,996	10,996	2,449	0
55	12,441	12,441	2,908	0
60	14,076	14,076	3,133	0
65	1,619	5,341	3,474	1,131
70	1,877	6,192	3,836	1,249
75	2,176	7,178	4,235	1,379
80	2,402	7,925	4,130	1,345

Section 5.3: Summary of Actuarial Assumptions

The demographic and economic assumptions used in the June 30, 2021 valuation are described below. Unless noted otherwise, these assumptions were adopted by the Board in January 2019 based on the experience study for the period July 1, 2013 to June 30, 2017.

Investment Return

7.38% per year, net of investment expenses.

Salary Scale

Salary scale rates based upon the 2013-2017 actual experience (see Table 1).

Inflation – 2.50% per year.

Productivity – 0.25% per year.

Payroll Growth

2.75% per year (inflation + productivity).

Total Inflation

Total inflation as measured by the Consumer Price Index for urban and clerical workers for Anchorage is assumed to increase 2.50% annually.

Mortality (Pre-Commencement)

Mortality rates based upon the 2013-2017 actual experience.

RP-2014 white-collar employee table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Deaths are assumed to result from occupational causes 15% of the time.

Mortality (Post-Commencement)

Mortality rates based upon the 2013-2017 actual experience.

93% of male and 90% of female rates of RP-2014 white-collar healthy annuitant table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Turnover

Select and ultimate rates based upon the 2013-2017 actual experience (see Table 2).

Disability

Incidence rates based upon the 2013-2017 actual experience (see Table 3). Disability rates cease once a member is eligible for retirement.

Post-disability mortality in accordance with the RP-2014 disabled table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Retirement

Retirement rates based upon the 2013-2017 actual experience (see Table 4).

Deferred vested members are assumed to retire at their earliest unreduced retirement date.

The modified cash refund annuity is valued as a three-year certain and life annuity.

Spouse Age Difference

Males are assumed to be three years older than their wives. Females are assumed to be two years younger than husbands.

Percent Married for Pension

85% of male members and 75% of female members are assumed to be married at termination from active service.

Dependent Spouse Medical Coverage Election

Applies to members who do not have double medical coverage. 65% of male members and 60% of female members are assumed to be married and cover a dependent spouse.

Dependent Children

- Pension: For the participants who are assumed to be married, those between ages 25 and 45 are assumed to have two dependent children.
- Healthcare: Benefits for dependent children have been valued only for members currently covering their dependent children. These benefits are only valued through the dependent children's age 23 (unless the child is disabled).

Contribution Refunds

0% of terminating members with vested benefits are assumed to have their contributions refunded. 100% of those with non-vested benefits are assumed to have their contributions refunded.

Imputed Data

Data changes from the prior year which are deemed to have an immaterial impact on liabilities and contribution rates are assumed to be correct in the current year's client data. Non-vested terminations with appropriate refund dates are assumed to have received a full refund of contributions. Active members with missing salary and service are assumed to be terminated with status based on their vesting percentage.

Active Rehire Assumption

The Normal Cost used for determining contribution rates and in the projections includes a rehire assumption to account for anticipated rehires. The Normal Cost shown in the report includes the following assumptions (which were developed based on the five years of rehire loss experience through June 30, 2017). For projections, these assumptions were assumed to grade to zero uniformly over a 20-year period.

- Pension: 15.57%
- Healthcare: 12.03%

Re-Employment Option

All re-employed retirees are assumed to return to work under the Standard Option.

Active Data Adjustment

No adjustment was made to reflect participants who terminate employment before the valuation date and are subsequently rehired after the valuation date.

Alaska Cost-of-Living Adjustments (COLA)

Of those benefit recipients who are eligible for the Alaska COLA, 60% are assumed to remain in Alaska and receive the COLA.

Postretirement Pension Adjustment (PRPA)

50% and 75% of assumed inflation, or 1.25% and 1.875% respectively, is valued for the annual automatic PRPA as specified in the statute.

Expenses

The investment return assumption is net of investment expenses.

The Normal Cost as of June 30, 2021 was increased by the following amounts for administrative expenses (for projections, the percent increase was assumed to remain constant in future years):

- Pension: $3,217,000
- Healthcare: $1,604,000

Part-Time Status

Part-time employees are assumed to earn 0.75 years of credited service per year.

Sick Leave

4.5 days of unused sick leave for each year of service are assumed to be available to be credited once the member is retired, terminates or dies.

Service

Total credited service is provided by the State. This service is assumed to be the only service that should be used to calculate benefits. Additionally, the State provides claimed service (including Bureau of Indian Affairs Service). Claimed service is used for vesting and eligibility purposes as described in Section 5.1.

Final Average Earnings

Final Average Earnings is provided on the data for active members. This amount is used as a minimum in the calculation of the average earnings in the future.

Per Capita Claims Cost

Sample claims cost rates adjusted to age 65 for FY22 medical and prescription drugs are shown below. The prescription drug costs reflect the plan change to require prior authorization for certain specialty medications. The pre-Medicare medical cost reflects the coverage of additional preventive benefits.

	Medical	Prescription Drugs
Pre-Medicare	$ 15,926	$ 3,375
Medicare Parts A & B	$ 1,619	$ 3,474
Medicare Part B Only	$ 5,341	$ 3,474
Medicare Part D – EGWP	N/A	$ 1,131

Members are assumed to attain Medicare eligibility at age 65. All costs are for the 2022 fiscal year (July 1, 2021 – June 30, 2022).

The EGWP subsidy is assumed to increase in future years by the trend rates shown on the following pages. No future legislative changes or other events are anticipated to impact the EGWP subsidy. If any legislative or other changes occur in the future that impact the EGWP subsidy (which could either increase or decrease the plan's Actuarial Accrued Liability), those changes will be evaluated and quantified when they occur.

Third Party Administrator Fees

$493 per person per year; assumed to increase at 4.5% per year.

Medicare Part B Only

We assume that 5% of actives hired before April 1, 1986 and current retirees who are not yet Medicare eligible will not be eligible for Medicare Part A.

Healthcare Cost Trend

The table below shows the rate used to project the cost from the shown fiscal year to the next fiscal year. For example, 6.3% is applied to the FY22 pre-Medicare medical claims costs to get the FY23 medical claims costs.

	Medical Pre-65	Medical Post-65	Prescription Drugs / EGWP
FY22	6.3%	5.4%	7.1%
FY23	6.1%	5.4%	6.8%
FY24	5.9%	5.4%	6.4%
FY25	5.8%	5.4%	6.1%
FY26	5.6%	5.4%	5.7%
FY27-FY40	5.4%	5.4%	5.4%
FY41	5.3%	5.3%	5.3%
FY42	5.2%	5.2%	5.2%
FY43	5.1%	5.1%	5.1%
FY44	5.1%	5.1%	5.1%
FY45	5.0%	5.0%	5.0%
FY46	4.9%	4.9%	4.9%
FY47	4.8%	4.8%	4.8%
FY48	4.7%	4.7%	4.7%
FY49	4.6%	4.6%	4.6%
FY50+	4.5%	4.5%	4.5%

For the June 30, 2014 valuation and later, the updated Society of Actuaries' Healthcare Cost Trend Model is used to project medical and prescription drug costs. This model estimates trend amounts that are projected out for 80 years. The model has been populated with assumptions that are specific to the State of Alaska.

Aging Factors

Age	Medical	Prescription Drugs
0 – 44	2.0%	4.5%
45 – 54	2.5%	3.5%
55 – 64	2.5%	1.5%
65 – 74	3.0%	2.0%
75 – 84	2.0%	-0.5%
85 – 94	0.3%	-2.5%
95+	0.0%	0.0%

Retired Member Contributions for Medical Benefits

Currently contributions are required for TRS members who are under age 60 and have less than 25 years of service. Eligible Tier 1 members are exempt from contribution requirements. Annual FY22 contributions based on monthly rates shown below for calendar 2022 are assumed based on the coverage category for current retirees. The retiree only rate shown is used for current active and inactive members and spouses in Tier 2 who are assumed to retire prior to age 60 with less than 25 years of service and who are not disabled. For dependent children, we value 1/3 of the annual retiree contribution to estimate the per child rate based upon the assumed number of children in rates where children are covered.

Coverage Category	Calendar 2022 Annual Contribution	Calendar 2022 Monthly Contribution	Calendar 2021 Monthly Contribution
Retiree Only	$ 8,448	$ 704	$ 704
Retiree and Spouse	$ 16,896	$ 1,408	$ 1,408
Retiree and Child(ren)	$ 11,940	$ 995	$ 995
Retiree and Family	$ 20,388	$ 1,699	$ 1,699
Composite	$ 12,552	$ 1,046	$ 1,046

Trend Rate for Retired Member Medical Contributions

The table below shows the rate used to project the retired member medical contributions from the shown fiscal year to the next fiscal year. For example, 0.0% is applied to the FY22 retired member medical contributions to get the FY23 retired member medical contributions.

Trend Assumptions	
FY22	0.0%
FY23+	4.0%

Graded trend rates for retired member medical contributions are consistent with the rates used for the June 30, 2020 valuation. Actual FY22 retired member medical contributions are reflected in the valuation.

Healthcare Participation

100% of system paid members and their spouses are assumed to elect healthcare benefits as soon as they are eligible. 20% of non-system paid members and their spouses are assumed to elect healthcare benefits as soon as they are eligible.

Changes in Assumptions Since the Prior Valuation

Healthcare claim costs are updated annually as described in Section 5.2. The amounts included in the Normal Cost for administrative expenses were changed from $3,003,000 to $3,217,000 for pension, and from $1,362,000 to $1,604,000 for healthcare (based on the most recent two years of actual administrative expenses paid from plan assets).

Table 1: Salary Scale

Years of Service	Percent Increase
0	6.75%
1	6.25%
2	5.75%
3	5.25%
4	4.75%
5	4.25%
6	3.75%
7	3.65%
8	3.55%
9	3.45%
10	3.35%
11	3.25%
12	3.15%
13	3.05%
14	2.95%
15	2.85%
16+	2.75%

Table 2: Turnover Rates

Select Rates during the First 8 Years of Employment

Years of Service	Male	Female
0	20.40%	17.00%
1	20.40%	17.00%
2	16.80%	14.00%
3	14.40%	12.00%
4	12.00%	10.00%
5	10.80%	9.00%
6	9.00%	7.50%
7	7.20%	6.00%

Ultimate Rates after the First 8 Years of Employment

Age	Male	Female	Age	Male	Female
22	2.62%	3.79%	39	2.57%	3.74%
23	2.62%	3.79%	40	2.26%	2.75%
24	2.61%	3.79%	41	2.26%	2.75%
25	2.61%	3.79%	42	2.25%	2.74%
26	2.61%	3.79%	43	2.24%	2.73%
27	2.60%	3.79%	44	2.23%	2.73%
28	2.60%	4.27%	45	2.22%	2.72%
29	2.60%	4.76%	46	2.21%	2.71%
30	2.60%	5.24%	47	2.20%	2.70%
31	2.60%	5.73%	48	2.18%	2.69%
32	2.59%	6.22%	49	2.16%	2.68%
33	2.59%	5.72%	50	3.43%	4.42%
34	2.59%	5.23%	51	3.39%	4.39%
35	2.59%	4.74%	52	3.35%	4.36%
36	2.58%	4.25%	53	3.30%	4.32%
37	2.58%	3.75%	54	3.00%	7.56%
38	2.58%	3.75%	55+	2.00%	5.00%

Table 3: Disability Rates

Age	Male	Female	Age	Male	Female
< 31	0.0337%	0.0612%	50	0.0601%	0.1093%
31	0.0337%	0.0613%	51	0.0634%	0.1152%
32	0.0337%	0.0613%	52	0.0666%	0.1211%
33	0.0342%	0.0622%	53	0.0746%	0.1356%
34	0.0347%	0.0631%	54	0.0826%	0.1501%
35	0.0353%	0.0641%	55	0.0905%	0.1645%
36	0.0357%	0.0650%	56	0.0985%	0.1790%
37	0.0362%	0.0659%	57	0.1064%	0.1935%
38	0.0371%	0.0674%	58	0.1245%	0.2263%
39	0.0379%	0.0689%	59	0.1426%	0.2592%
40	0.0387%	0.0703%	60	0.1606%	0.2920%
41	0.0395%	0.0718%	61	0.1787%	0.3249%
42	0.0403%	0.0733%	62	0.1967%	0.3577%
43	0.0423%	0.0770%	63	0.2253%	0.4096%
44	0.0443%	0.0806%	64	0.2572%	0.4677%
45	0.0464%	0.0843%	65	0.2933%	0.5332%
46	0.0483%	0.0879%	66	0.3343%	0.6079%
47	0.0504%	0.0916%	67	0.3812%	0.6930%
48	0.0536%	0.0975%	68	0.4345%	0.7900%
49	0.0569%	0.1034%	69	0.4953%	0.9006%
			70+	0.5647%	1.0267%

Table 4: Retirement Rates

	Reduced		Unreduced	
Age	Male	Female	Male	Female
< 45	N/A	N/A	3.0%	3.0%
45	N/A	N/A	5.0%	5.0%
46	N/A	N/A	5.0%	8.0%
47	N/A	N/A	5.0%	8.0%
48	N/A	N/A	5.0%	8.0%
49	N/A	N/A	5.0%	8.0%
50	10.0%	10.0%	5.0%	14.0%
51	10.0%	10.0%	8.0%	13.0%
52	10.0%	10.0%	15.0%	13.0%
53	10.0%	12.0%	15.0%	14.0%
54	10.0%	12.0%	15.0%	15.0%
55	15.0%	8.0%	20.0%	17.0%
56	10.0%	8.0%	17.0%	17.0%
57	10.0%	8.0%	15.0%	17.0%
58	10.0%	8.0%	20.0%	17.0%
59	10.0%	8.0%	20.0%	23.0%
60	N/A	N/A	25.0%	23.0%
61	N/A	N/A	18.0%	23.0%
62	N/A	N/A	18.0%	21.0%
63	N/A	N/A	18.0%	21.0%
64	N/A	N/A	18.0%	26.0%
65	N/A	N/A	30.0%	21.0%
66	N/A	N/A	25.0%	21.0%
67	N/A	N/A	25.0%	21.0%
68	N/A	N/A	25.0%	26.0%
69	N/A	N/A	35.0%	26.0%
70	N/A	N/A	30.0%	26.0%
71	N/A	N/A	30.0%	37.0%
72	N/A	N/A	30.0%	37.0%
73	N/A	N/A	30.0%	37.0%
74	N/A	N/A	30.0%	37.0%
75 - 79	N/A	N/A	50.0%	50.0%
80+	N/A	N/A	100.0%	100.0%

Section 6: Actuarial Standard of Practice No. 51

Funding future retirement benefits prior to when those benefits become due involves assumptions regarding future economic and demographic experience. These assumptions are applied to calculate actuarial liabilities, current contribution requirements, and the funded status of the plan. However, to the extent future experience deviates from the assumptions used, variations will occur in these calculated values. These variations create risk to the plan. Understanding the risks to the funding of the plan is important.

Actuarial Standard of Practice No. 51 (ASOP 51)[1] requires certain disclosures of potential risks to the plan and provides useful information for intended users of actuarial reports that determine plan contributions or evaluate the adequacy of specified contribution levels to support benefit provisions.

Under ASOP 51, risk is defined as the potential of actual future measurements deviating from expected future measurements resulting from actual future experience deviating from actuarially assumed experience.

It is important to note that not all risk is negative, but all risk should be understood and accepted based on knowledge, judgement, and educated decisions. Future measurements may deviate in ways that produce positive or negative financial impacts to the plan.

In the actuary's professional judgment, the following risks may reasonably be anticipated to significantly affect the pension plan's future financial condition and contribution requirements.

- Investment Risk – potential that the investment return will be different than the 7.38% expected in the actuarial valuation
- Contribution Risk – potential that the contribution actually made will be different than the actuarially determined contribution
- Long-Term Return on Investment Risk – potential that changes in long-term capital market assumptions or the plan's asset allocation will create the need to update the long-term return on investment assumption
- Longevity Risk – potential that participants live longer than expected compared to the valuation mortality assumptions
- Salary Increase Risk – potential that future salaries will be different than expected in the actuarial valuation
- Inflation Risk – potential that the consumer price index (CPI) for urban wage earners and clerical workers for Anchorage is different than the 2.5% assumed in the valuation
- Other Demographic Risk – potential that other demographic experience will be different than expected

The following information is provided to comply with ASOP 51 and furnish beneficial information on potential risks to the plan. **This list is not all-inclusive**; it is an attempt to identify the more significant risks and how those risks might affect the results shown in this report.

Note that ASOP 51 does not require the actuary to evaluate the ability or willingness of the plan sponsor to make contributions to the plan when due, or to assess the likelihood or consequences of potential future changes in law. In addition, this valuation report is not intended to provide investment advice or to provide guidance on the management or reduction of risk.

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[1] ASOP 51 does not apply to the healthcare portion of the plan. Accordingly, all figures in this section relate to the pension portion.

Assessment of Risks

Investment Risk

Plan costs are very sensitive to the market return.

- Any return on assets lower than assumed will increase costs.
- The plan uses an actuarial value of assets that smooths gains and losses on market returns over a five-year period to help control some of the volatility in costs due to investment risk.
- Historical experience of actual returns is shown in Section 2.4 of this report. This historical experience illustrates how returns can vary over time.

Contribution Risk

There is a risk to the plan when the employer's and/or State's actual contribution amount and the actuarially determined contribution differ.

- If the actual contribution is lower than the actuarially determined contribution, the plan may not be sustainable in the long term.
- Any underpayment of the contribution will increase future contribution amounts to help pay off the additional Unfunded Actuarial Accrued Liability associated with the underpayment(s).
- As long as the Board consistently adopts the actuarially determined contributions, this risk is mitigated due to Alaska statutes requiring the State to contribute additional funds necessary to pay the total contributions adopted by the Board.

Long-Term Return on Investment Risk

Inherent in the long-term return on investment assumption is the expectation that the current rate will be used until the last benefit payment of the plan is made. There is a risk that sustained changes in economic conditions, changes in long-term future capital market assumptions, or changes to the plan's asset allocation will necessitate an update to the long-term return on investment assumption used.

- Under a lower long-term return on investment assumption, less investment return is available to pay plan benefits. This may lead to a need for increased employer contributions.
- The liabilities will be higher at a lower assumed rate of return because future benefits will have a lower discount rate applied when calculating the present value.
- A 1% decrease in the long-term return on investment assumption will increase actuarial accrued liability by approximately 11%.
- This risk may be increased due to the plan being closed to new entrants. As the plan continues to mature, the magnitude of negative cash flow discussed in the Plan Maturity Measures later in this section will grow, thereby creating a need for more liquid assets that may not garner the same long-term return as currently assumed.

Longevity Risk

Plan costs will be increased as participants are expected to live longer.

- Benefits are paid over a longer lifetime when life expectancy is expected to increase. The longer duration of payments leads to higher liabilities.
- Health care has been improving, which affects the life expectancy of participants. As health care improves, leading to longer life expectancies, costs to the plan could increase.

- The mortality assumption for the plan mitigates this risk by assuming future improvement in mortality. However, any improvement in future mortality greater than that expected by the current mortality assumption would lead to increased costs for the plan.
- The Postretirement Pension Adjustments and Alaska Cost-of-Living Allowance increase longevity risk because members who live longer than expected will incur more benefit payment increases than expected and therefore increase costs.

Salary Increase Risk

Plan costs will be increased if actual salary increases are larger than expected.

- Higher-than-expected salary increases will produce higher benefits.
- The higher benefits may be partially offset by increased employee contributions due to higher salaries.
- If future payroll grows at a rate different than assumed, contributions as a percentage of payroll will be affected.

Inflation Risk

Plan costs will be increased if the actual CPI for Anchorage is greater than the 2.5% assumed in the valuation.

- Retirement benefits will be greater than expected if the CPI is greater than the assumed rate, which will increase costs.
- This risk is mitigated by the 75% and 50% of CPI provisions and the 9% and 6% maximums.
- This risk is also mitigated by the age and time in payment requirements to receive an increase.
- Inflation risk may be associated with the interaction of inflation with other assumptions, but this is not significant as a standalone assumption, and therefore is considered as part of the associated assumption risk instead of being discussed here.

Other Demographic Risk

The plan is subject to risks associated with other demographic assumptions (e.g., retirement, termination, and retired members remaining in Alaska assumptions). Differences between actual and expected experience for these assumptions tend to have less impact on the overall costs of the plan. The demographic assumptions used in the valuation are re-evaluated regularly as part of the four-year experience studies to ensure the assumptions are consistent with long-term expectations.

Historical Information

Monitoring certain information over time may help understand risks faced by the plan. Historical information is included throughout this report. Some examples are:

- Funded Ratio History shown in the Executive Summary illustrates how the plan's funded status (comparison of actuarial accrued liabilities to actuarial value of assets) has changed over time.
- Section 1.6 shows historical analysis of financial experience including how contribution rates have changed over time.
- Section 2.4 shows the volatility of asset returns over time.
- Section 4 includes various historical information showing how member census data has changed over time.

Plan Maturity Measures

There are certain measures that may aid in understanding the significant risks to the plan.

Ratio of Retired Liability to Total Liability ($'s in $000's)	June 30, 2020	June 30, 2021
1. Retiree and Beneficiary Accrued Liability	$ 5,570,625	$ 5,657,056
2. Total Accrued Liability	$ 7,447,036	$ 7,471,887
3. Ratio, (1) ÷ (2)	74.8%	75.7%

A high percentage of liability concentrated on participants in pay status indicates a mature plan (often a ratio above 60% - 65%). Because the plan was closed to new entrants in 2006, we expect the percentage in item #3 to continue to increase over time. An increasing percentage may indicate a need for a less risky asset allocation, which may lead to a lower long-term return on asset assumption and increased costs. Higher percentages may also indicate greater investment risk as benefit payments may be greater than contributions creating an increased reliance on investment returns. This ratio should be monitored each year in the future.

Ratio of Cash Flow to Assets ($'s in $000's)	FYE June 30, 2020	FYE June 30, 2021
1. Contributions	$ 207,899	$ 196,748
2. Benefit Payments	490,447	501,429
3. Cash Flow, (1) - (2)	$ (282,548)	$ (304,681)
4. Fair Value of Assets	$ 5,444,799	$ 6,731,481
5. Ratio, (3) ÷ (4)	(5.2%)	(4.5%)

When this cash flow ratio is negative, more cash is being paid out than deposited in the trust. Negative cash flow indicates the trust needs to rely on investment returns to cover benefit payments and / or may need to invest in more liquid assets to cover the benefit payments. More liquid assets may not generate the same returns as less liquid assets, which can increase the investment risk. Currently, the low magnitude of the ratio implies there may already be enough liquid assets to cover the benefit payments, less investment return is needed to cover the shortfall, or only a small portion of assets will need to be converted to cash. Therefore, the investment risk is likely not amplified at this time. However, due to the plan being closed, we expect this measure to become increasingly negative over time. This maturity measure should be monitored in the future.

Contribution Volatility ($'s in $000's)	June 30, 2020	June 30, 2021
1. Fair Value of Assets	$ 5,444,799	$ 6,731,481
2. DB/DCR Payroll	$ 741,090	$ 750,334
3. Asset to Payroll Ratio, (1) ÷ (2)	734.7%	897.1%
4. Accrued Liability	$ 7,447,036	$ 7,471,887
5. Liability to Payroll Ratio, (4) ÷ (2)	1,004.9%	995.8%

Plans that have higher asset-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to investment return. For example, a plan with an asset-to-payroll ratio of 10% may experience twice the contribution volatility due to investment return volatility than a plan with an asset-to-payroll ratio of 5%. Plans that have higher liability-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to changes in liability. For example, if an assumption change increases the liability of two plans by the same percent, the plan with a liability-to-payroll ratio of 10% may experience twice the contribution volatility than a plan with a liability-to-payroll ratio of 5%.

Glossary of Terms

Actuarial Accrued Liability

Total accumulated cost to fund pension or postemployment benefits arising from service in all prior years.

Actuarial Cost Method

Technique used to assign or allocate, in a systematic and consistent manner, the expected cost of a pension or postemployment plan for a group of plan members to the years of service that give rise to that cost.

Actuarial Present Value of Projected Benefits

Amount which, together with future interest, is expected to be sufficient to pay all future benefits.

Actuarial Valuation

Study of probable amounts of future pension or postemployment benefits and the necessary amount of contributions to fund those benefits.

Actuary

Person who performs mathematical calculations pertaining to pension and insurance benefits based on specific procedures and assumptions.

GASB 67 and 68

Governmental Accounting Standards Board Statement Number 67 amends Number 25 effective for the fiscal year beginning after June 15, 2013 and defines new financial reporting requirements for public pension plans.

Governmental Accounting Standards Board Statement Number 68 amends Number 27 effective for fiscal years beginning after June 15, 2014 and defines new accounting and financial reporting requirements for employers sponsoring public pension plans.

GASB 74 and 75

Governmental Accounting Standards Board Statement Number 74 amends Number 43 effective for the fiscal year beginning after June 15, 2016 and defines new financial reporting requirements for public postemployment benefit plans.

Governmental Accounting Standards Board Statement Number 75 amends Number 45 effective for fiscal years beginning after June 15, 2017 and defines new accounting and financial reporting requirements for employers sponsoring public postemployment benefit plans.

Normal Cost

That portion of the actuarial present value of benefits assigned to a particular year in respect to an individual participant or the plan as a whole.

Rate Payroll

Members' earnings used to determine contribution rates.

Unfunded Actuarial Accrued Liability (UAAL)

The portion of the actuarial accrued liability not offset by plan assets.

Valuation Payroll

Members' earnings used to determine Normal Cost and Actuarial Accrued Liability.

Vested Benefits

Benefits which are unconditionally guaranteed regardless of employment.

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BUCK

State of Alaska

Teachers' Retirement System Defined Contribution Retirement Plan

For Occupational Death & Disability and Retiree Medical Benefits

Actuarial Valuation Report

As of June 30, 2021

May 2022

May 12, 2022

State of Alaska
The Alaska Retirement Management Board
The Department of Revenue, Treasury Division
The Department of Administration, Division of Retirement and Benefits
P.O. Box 110203
Juneau, AK 99811-0203

Certification of Actuarial Valuation

Dear Members of The Alaska Retirement Management Board, The Department of Revenue and The Department of Administration:

This report summarizes the annual actuarial valuation results of the State of Alaska Teachers' Retirement System Defined Contribution Retirement (TRS DCR) Plan as of June 30, 2021 performed by Buck Global, LLC (Buck).

The actuarial valuation is based on financial information provided in the financial statements audited by KPMG LLP, member data provided by the Division of Retirement and Benefits, and medical enrollment data provided by the healthcare claims administrator (Aetna), as summarized in this report. The benefits considered are those delineated in Alaska statutes effective June 30, 2021. The actuary did not verify the data submitted, but did perform tests for consistency and reasonableness.

All costs, liabilities and other factors under TRS DCR were determined in accordance with generally accepted actuarial principles and procedures. An actuarial cost method is used to measure the actuarial liabilities which we believe is reasonable. Buck is solely responsible for the actuarial data and actuarial results presented in this report. This report fully and fairly discloses the actuarial position of TRS DCR as of June 30, 2021.

TRS DCR is funded by Employer Contributions in accordance with the funding policy adopted by the Alaska Retirement Management Board (Board). The funding objective for TRS DCR is to pay required contributions that remain level as a percent of TRS DCR compensation. The Board has also established a funding policy objective that the required contributions be sufficient to pay the Normal Costs of active plan members, plan expenses, and amortize the Unfunded Actuarial Accrued Liability as a level percent of TRS DCR compensation over closed layered 25-year periods. This objective is currently being met and is projected to continue to be met as required by the Alaska State statutes. Absent future gains/losses, actuarially determined contributions are expected to remain level as a percent of pay and the overall funded status is expected to remain at or above 100%.

The Board and staff of the State of Alaska may use this report for the review of the operations of TRS DCR. Use of this report for any other purpose or by anyone other than the Board or staff of the State of Alaska may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, you should ask Buck to review any statement you wish to make on the results contained in this report. Buck will not accept any liability for any such statement made without the review by Buck.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the actuarial assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. In particular, retiree group benefits models necessarily rely on the use of approximations and estimates and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements. An analysis of the potential range of such future differences is beyond the scope of this valuation.

In our opinion, the actuarial assumptions used are reasonable, taking into account the experience of the plan and reasonable long-term expectations, and represent our best estimate of the anticipated long-term experience under the plan. The actuary performs an analysis of plan experience periodically and recommends changes if, in the opinion of the actuary, assumption changes are needed to more accurately reflect expected future experience. The last full experience analysis was performed for the period July 1, 2013 to June 30, 2017. Based on that experience study, the Board adopted new assumptions effective beginning with the June 30, 2018 valuation to better reflect expected future experience. Based on our annual analysis of recent claims experience, changes were made to the per capita claims cost rates effective June 30, 2021 to better reflect expected future healthcare experience. A summary of the actuarial assumptions and methods used in this actuarial valuation is shown in Sections 4.2 and 4.3. We certify that the assumptions and methods described in Sections 4.2 and 4.3 of this report meet the requirements of all applicable Actuarial Standards of Practice.

Governmental Accounting Standards Board (GASB) Statement No. 74 (GASB 74) was effective for TRS DCR beginning with fiscal year ending June 30, 2017, and GASB 75 was effective beginning with fiscal year ending June 30, 2018. Separate GASB 74 and GASB 75 reports have been prepared.

Assessment of Risks

Actuarial Standard of Practice No. 51 (ASOP 51) applies to actuaries performing funding calculations related to a pension plan. ASOP 51 does not apply to actuaries performing services in connection with other post-employment benefits, such as medical benefits. Accordingly, ASOP 51 does not apply to the retiree medical portion of TRS DCR. We also believe ASOP 51 does not apply to the occupational death & disability portion of TRS DCR. Therefore, information related to ASOP 51 is not included in this report. However, it may be beneficial to review the ASOP 51 information provided in the TRS valuation report for information on risks that may also relate to the occupational death & disability benefits provided by this plan.

Use of Models

Actuarial Standard of Practice No. 56 (ASOP 56) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of the plan using data and assumptions as of the measurement date under the funding methods specified in this report. The output from the third-party vendor software is used as input to an internally developed model that applies applicable funding methods and policies to the derived liabilities and other inputs, such as plan assets and contributions, to generate many of the exhibits found in this report. Buck has an extensive review process in which the results of the liability calculations are checked using detailed sample life output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other funding outputs and the internal model are similarly reviewed in detail and at a higher level for accuracy, reasonability, and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software. This review is performed by experts

within Buck who are familiar with applicable funding methods, as well as the manner in which the model generates its output. If significant changes are made to the internal model, extra checking and review are completed. Significant changes to the internal model that are applicable to multiple clients are generally developed, checked, and reviewed by multiple experts within Buck who are familiar with the details of the required changes.

Buck used manual rate models to determine relative plan values for the defined benefit (DB) retiree medical plan and the DCR retiree medical plan, and to reflect the different Medicare coordination methods between the two plans. The manual rate models are intended to provide benchmark data and pricing capabilities, calculate per capita costs, and calculate actuarial values of different commercial health plans. Buck relied on the models, which were developed using industry data by actuaries and consultants at OptumInsight.

COVID-19

The potential impact of the ongoing COVID-19 pandemic on costs and liabilities was considered and an adjustment was made in setting the medical per capita claims cost assumption. FY20 medical claims were adjusted for a COVID-19 related decline in claims during the last four months (March – June) of FY20. FY21 medical claims were adjusted for a COVID-19 related decline in those claims during the fiscal year. A more detailed explanation on these adjustments is shown in Sections 4.2 and 4.3 and in the valuation report for the DB plan.

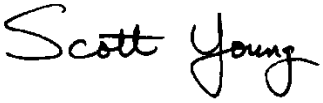
This report was prepared under my supervision and in accordance with all applicable Actuarial Standards of Practice. I am a Fellow of the Society of Actuaries, an Enrolled Actuary, a Fellow of the Conference of Consulting Actuaries, and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

I am available to discuss this report with you at your convenience. I can be reached at 602-803-6174.

Respectfully submitted,

David J. Kershner, FSA, EA, MAAA, FCA
Principal
Buck

The undersigned actuary is responsible for all assumptions related to the average annual per capita health claims cost and the health care cost trend rates, and hereby affirms his qualification to render opinions in such matters in accordance with the Qualification Standards of the American Academy of Actuaries.



Scott Young, FSA, EA, MAAA, FCA
Director
Buck

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Executive Summary

Overview

The State of Alaska Teachers' Retirement System Defined Contribution Retirement (TRS DCR) Plan provides occupational death & disability and retiree medical benefits to teachers and other eligible members hired after June 30, 2006 or who have elected participation in this plan. The Commissioner of the Department of Administration is responsible for administering the plan. The Alaska Retirement Management Board has fiduciary responsibility over the assets of the plan. This report presents the results of the actuarial valuation of TRS DCR as of the valuation date of June 30, 2021.

Purpose

An actuarial valuation is performed on the plan annually as of the end of the fiscal year. The main purposes of the actuarial valuation detailed in this report are:

1. To determine the Employer contribution necessary to meet the Board's funding policy for the plan;
2. To disclose the funding assets and liability measures as of the valuation date;
3. To review the current funded status of the plan and assess the funded status as an appropriate measure for determining actuarially determined contributions;
4. To compare actual and expected experience under the plan during the last fiscal year; and
5. To report trends in contributions, assets, liabilities, and funded status over the last several years.

The actuarial valuation provides a "snapshot" of the funded position of TRS DCR based on the plan provisions, membership data, assets, and actuarial methods and assumptions as of the valuation date.

Funded Status

Where presented, references to "funded ratio" and "unfunded actuarial accrued liability" typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

Funded Status as of June 30 ($'s in 000's)		2020	2021
Occupational Death & Disability			
a.	Actuarial Accrued Liability	$ 223	$ 205
b.	Valuation Assets	4,933	5,843
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ (4,710)	$ (5,638)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	2,212.1%	2,850.2%
e.	Fair Value of Assets	$ 4,823	$ 6,623
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	2,162.8%	3,230.7%

Funded Status as of June 30 ($'s in 000's)		2020	2021
Retiree Medical			
a.	Actuarial Accrued Liability	$ 40,634	$ 44,396
b.	Valuation Assets	49,554	59,380
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ (8,920)	$ (14,984)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	122.0%	133.8%
e.	Fair Value of Assets	$ 48,413	$ 67,278
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	119.1%	151.5%
Total			
a.	Actuarial Accrued Liability	$ 40,857	$ 44,601
b.	Valuation Assets	54,487	65,223
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ (13,630)	$ (20,622)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	133.4%	146.2%
e.	Fair Value of Assets	$ 53,236	$ 73,901
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	130.3%	165.7%

The key reasons for the change in the funded status are explained below. The funded status for healthcare benefits is not necessarily an appropriate measure to confirm that assets are sufficient to settle health plan obligations as there are no available financial instruments for purchase. Future experience is likely to vary from assumptions so there is potential for actuarial gains or losses.

1. **Investment Experience**

   The approximate FY21 investment return based on fair value of assets was 29.5% compared to the expected investment return of 7.38% (net of investment expenses). This resulted in a gain of approximately $12,235,000 to the plan from investment experience. The asset valuation method recognizes 20% of this gain ($2,447,000) this year and an additional 20% in each of the next 4 years. In addition, 20% of the FY17 investment gain, 20% of the FY18 investment loss, 20% of the FY19 investment loss, and 20% of the FY20 investment loss were recognized this year. The approximate FY21 asset return based on actuarial value of assets was 11.3% compared to the expected asset return of 7.38% (net of investment expenses).

2. **Salary Increases**

   Salary increases for continuing active members during FY21 were higher than anticipated based on the valuation assumptions, resulting in a liability loss of approximately $1,000.

3. **Demographic Experience**

   The number of active members increased 3.5% from 5,332 at June 30, 2020 to 5,521 at June 30, 2021. The average age of active members increased from 41.63 to 41.90 and average credited service increased from 6.03 to 6.34 years.

   The demographic experience gains/losses are shown on page 4.

4. **Retiree Medical Claims Experience**

   Please refer to the State of Alaska Teachers' Retirement System (TRS) Defined Benefit Plan Actuarial Valuation Report as of June 30, 2021 for a full description of the assumptions and costs of the retiree medical plan. Adjustments to these costs and assumptions are described in this report.

   The recent claims experience described in Section 4.2 of this report (Section 5.2 of the TRS report) created an actuarial gain of approximately $1,883,000.

5. Changes in Methods Since the Prior Valuation

There were no changes in actuarial methods since the prior valuation.

6. Changes in Assumptions Since the Prior Valuation

Healthcare claim costs are updated annually as described in Section 4.2. The amounts included in Normal Cost for administrative expenses were updated based on the last two years of actual administrative expenses paid from plan assets. There were no other changes in actuarial assumptions since the prior valuation.

7. Changes in Benefit Provisions Since the Prior Valuation

Starting in 2022, prior authorization will be required for certain specialty medications. This change created an actuarial gain of approximately $528,000. There have been no other changes in benefit provisions valued since the prior valuation.

Comparative Summary of Contribution Rates

Occupational Death & Disability	FY 2023	FY 2024
a. Employer Normal Cost Rate	0.08%	0.08%
b. Past Service Cost Rate	(0.10)%	(0.11)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	0.08%	0.08%

Retiree Medical	FY 2023	FY 2024
a. Employer Normal Cost Rate	0.87%	0.82%
b. Past Service Cost Rate	(0.14)%	(0.22)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	0.87%	0.82%

Total	FY 2023	FY 2024
a. Employer Normal Cost Rate	0.95%	0.90%
b. Past Service Cost Rate	(0.24)%	(0.33)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	0.95%	0.90%

The exhibit below shows the historical Board-adopted employer contribution rates for TRS DCR.

		Total Employer Contribution Rate		
Valuation Date	Fiscal Year	Occupational Death & Disability	Retiree Medical	Total
June 30, 2010	FY13	0.00%	0.49%	0.49%
June 30, 2011	FY14	0.00%	0.47%	0.47%
June 30, 2012	FY15	0.00%	2.04%	2.04%
June 30, 2013	FY16	0.00%	2.04%	2.04%
June 30, 2014	FY17	0.00%	1.05%	1.05%
June 30, 2015	FY18	0.00%	0.91%	0.91%
June 30, 2016	FY19	0.08%	0.79%	0.87%
June 30, 2017	FY20	0.08%	1.09%	1.17%
June 30, 2018	FY21	0.08%	0.93%	1.01%
June 30, 2019	FY22	0.08%	0.83%	0.91%
June 30, 2020	FY23	0.08%	0.87%	0.95%
June 30, 2021	FY24	TBD	TBD	TBD

Summary of Actuarial Accrued Liability Gain/(Loss)

The following table shows the FY21 gain/(loss) on actuarial accrued liability as of June 30, 2021 ($'s in 000's):

	Occupational Death & Disability	Retiree Medical	Total
Retirement Experience	$ 0	$ 550	$ 550
Termination Experience	(7)	2,361	2,354
Disability Experience	219	(57)	162
Active Mortality Experience	107	(9)	98
Inactive Mortality Experience	(1)	(30)	(31)
Salary Increases	(1)	N/A	(1)
New Entrants	0	(581)	(581)
Rehires	1	(2,038)	(2,037)
Benefit Payments Different than Expected	18	(101)	(83)
Per Capita Claims Costs	N/A	1,883	1,883
Prescription Drug Plan Changes	N/A	528	528
Miscellaneous[1]	8	195	203
Total	$ 344	$ 2,701	$ 3,045

[1] Includes the effects of various data changes that are typical when new census data is received for the annual valuation, as well as other items that do not fit neatly into any of the other categories.

Section 1: Actuarial Funding Results

Section 1.1: Actuarial Liabilities and Normal Cost ($'s in 000's)

As of June 30, 2021	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Occupational Death Benefits	$ 844	$ 94
Occupational Disability Benefits	1,407	(66)
Medical and Prescription Drug Benefits	83,777	54,549
Medicare Part D Subsidy	(17,536)	(11,418)
Subtotal	$ 68,492	$ 43,159
Benefit Recipients		
Survivor Benefits	$ 0	$ 0
Disability Benefits	177	177
Medical and Prescription Drug Benefits	1,600	1,600
Medicare Part D Subsidy	(335)	(335)
Subtotal	$ 1,442	$ 1,442
Total	**$ 69,934**	**$ 44,601**
Total Occupational Death & Disability	**$ 2,428**	**$ 205**
Total Retiree Medical, Net of Part D Subsidy	**$ 67,506**	**$ 44,396**
Total Retiree Medical, Gross of Part D Subsidy	**$ 85,377**	**$ 56,149**

As of June 30, 2021	Normal Cost
Active Members	
Occupational Death Benefits	$ 118
Occupational Disability Benefits	217
Medical and Prescription Drug Benefits	4,361
Medicare Part D Subsidy	(913)
Subtotal	$ 3,783
Administrative Expense Load	
Occupational Death & Disability	$ 5
Retiree Medical	22
Subtotal	$ 27
Total	**$ 3,810**
Total Occupational Death & Disability	**$ 340**
Total Retiree Medical, Net of Part D Subsidy	**$ 3,470**
Total Retiree Medical, Gross of Part D Subsidy	**$ 4,383**

Section 1.2: Actuarial Contributions as of June 30, 2021 for FY24 ($'s in 000's)

Normal Cost Rate	Occupational Death & Disability	Retiree Medical	Total
1. Total Normal Cost	$ 340	$ 3,470	$ 3,810
2. DCR Plan Rate Payroll Projected for FY22	423,783	423,783	423,783
3. Employer Normal Cost Rate, (1) ÷ (2)	0.08%	0.82%	0.90%
Past Service Cost Rate			
1. Actuarial Accrued Liability	$ 205	$ 44,396	$ 44,601
2. Valuation Assets	5,843	59,380	65,223
3. Unfunded Actuarial Accrued Liability, (1) - (2)	$ (5,638)	$ (14,984)	$ (20,622)
4. Funded Ratio based on Valuation Assets	2,850.2%	133.8%	146.2%
5. Past Service Cost Amortization Payment	(448)	(934)	(1,382)
6. DCR Plan Rate Payroll Projected for FY22	423,783	423,783	423,783
7. Past Service Cost Rate, (5) ÷ (6)	(0.11%)	(0.22%)	(0.33%)
Total Employer Contribution Rate, not less than Normal Cost Rate	**0.08%**	**0.82%**	**0.90%**

The table below shows the total employer contribution rate based on total DB and DCR Plan payroll for informational purposes.

Total Employer Contribution Rate as Percent of Total Payroll	Occupational Death & Disability	Retiree Medical	Total
1. Total Normal Cost	$ 340	$ 3,470	$ 3,810
2. Total DB and DCR Plan Rate Payroll Projected for FY22	750,334	750,334	750,334
3. Employer Normal Cost Rate, (1) ÷ (2)	0.05%	0.46%	0.51%
4. Past Service Cost Amortization Payment	(448)	(934)	(1,382)
5. Past Service Cost Rate, (4) ÷ (2)	(0.06%)	(0.12%)	(0.18%)
Total Employer Contribution Rate, not less than Normal Cost Rate	**0.05%**	**0.46%**	**0.51%**

Schedule of Past Service Cost Amortizations - Occupational Death & Disability ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Unfunded Liability	06/30/2007	11	$ 16	$ 14	$ 2
FY08 Gain	06/30/2008	12	(392)	(367)	(39)
Change in Assumptions	06/30/2009	13	(82)	(78)	(8)
FY09 Gain	06/30/2009	13	(594)	(577)	(57)
Change in Assumptions	06/30/2010	14	(7)	(8)	(1)
FY10 Gain	06/30/2010	14	(479)	(472)	(44)
FY11 Gain	06/30/2011	15	(560)	(559)	(50)
FY12 Gain	06/30/2012	16	(129)	(131)	(11)
FY13 Gain	06/30/2013	17	(149)	(150)	(12)
Change in Assumptions	06/30/2014	18	(50)	(53)	(4)
PRPA Modification	06/30/2014	18	(25)	(25)	(2)
FY14 Gain	06/30/2014	18	(255)	(260)	(20)
FY15 Gain	06/30/2015	19	(275)	(280)	(21)
FY16 Gain	06/30/2016	20	(209)	(215)	(16)
FY17 Gain	06/30/2017	21	(251)	(253)	(18)
Change in Assumptions[1]	06/30/2018	22	0	0	0
FY18 Gain	06/30/2018	22	(257)	(259)	(18)
FY19 Gain	06/30/2019	23	(338)	(340)	(23)
FY20 Gain	06/30/2020	24	(637)	(640)	(42)
FY21 Gain	06/30/2021	25	(985)	(985)	(64)
Total				**$ (5,638)**	**$ (448)**

[1] The net effect of changing assumptions was less than $1,000.

Schedule of Past Service Cost Amortizations - Retiree Medical ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Unfunded Liability	06/30/2007	11	$ (239)	$ (221)	$ (25)
Change in Assumptions	06/30/2008	12	84	83	9
FY08 Gain	06/30/2008	12	(393)	(367)	(39)
Change in Assumptions	06/30/2009	13	(69)	(66)	(7)
FY09 Gain	06/30/2009	13	(281)	(274)	(27)
Change in Assumptions[1]	06/30/2010	14	0	0	0
FY10 Gain	06/30/2010	14	(545)	(537)	(50)
FY11 Gain	06/30/2011	15	(94)	(92)	(8)
Change in Assumptions	06/30/2012	16	11,518	11,654	993
FY12 Gain	06/30/2012	16	(60)	(57)	(5)
FY13 Loss	06/30/2013	17	3,439	3,506	287
Change in Assumptions	06/30/2014	18	(9,736)	(9,951)	(783)
FY14 Loss	06/30/2014	18	1,616	1,650	130
FY15 Gain	06/30/2015	19	(3,485)	(3,562)	(271)
EGWP Impact	06/30/2016	20	(6,400)	(6,528)	(480)
FY16 Loss	06/30/2016	20	958	980	72
Change in Assumptions	06/30/2017	21	7,645	7,761	554
FY17 Gain	06/30/2017	21	(1,451)	(1,473)	(105)
Change in Assumptions/Methods	06/30/2018	22	(9,505)	(9,585)	(666)
FY18 Loss	06/30/2018	22	2,491	2,512	174
FY19 Gain	06/30/2019	23	(4,904)	(4,941)	(334)
Change in Assumptions	06/30/2020	24	2,153	2,163	143
FY20 Gain	06/30/2020	24	(1,655)	(1,662)	(110)
Prescription Drug Plan Changes	06/30/2021	25	(528)	(528)	(34)
FY21 Gain	06/30/2021	25	(5,449)	(5,449)	(352)
Total				**$ (14,984)**	**$ (934)**

[1] The net effect of changing assumptions was less than $1,000. The demographic assumption changes decreased liability by $133,000 and the economic assumptions changes increased the liability by $133,000. Therefore, the net effect of all assumptions changes is $0 for amortization purposes.

Schedule of Past Service Cost Amortizations - Total ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Unfunded Liability	06/30/2007	11	$ (223)	$ (207)	$ (23)
Change in Assumptions	06/30/2008	12	84	83	9
FY08 Gain	06/30/2008	12	(785)	(734)	(78)
Change in Assumptions	06/30/2009	13	(151)	(144)	(15)
FY09 Gain	06/30/2009	13	(875)	(851)	(84)
Change in Assumptions	06/30/2010	14	(7)	(8)	(1)
FY10 Gain	06/30/2010	14	(1,024)	(1,009)	(94)
FY11 Gain	06/30/2011	15	(654)	(651)	(58)
Change in Assumptions	06/30/2012	16	11,518	11,654	993
FY12 Gain	06/30/2012	16	(189)	(188)	(16)
FY13 Loss	06/30/2013	17	3,290	3,356	275
Change in Assumptions	06/30/2014	18	(9,786)	(10,004)	(787)
PRPA Modification	06/30/2014	18	(25)	(25)	(2)
FY14 Loss	06/30/2014	18	1,361	1,390	110
FY15 Gain	06/30/2015	19	(3,760)	(3,842)	(292)
EGWP Impact	06/30/2016	20	(6,400)	(6,528)	(480)
FY16 Loss	06/30/2016	20	749	765	56
Change in Assumptions	06/30/2017	21	7,645	7,761	554
FY17 Gain	06/30/2017	21	(1,702)	(1,726)	(123)
Change in Assumptions/Methods	06/30/2018	22	(9,505)	(9,585)	(666)
FY18 Loss	06/30/2018	22	2,234	2,253	156
FY19 Gain	06/30/2019	23	(5,242)	(5,281)	(357)
Change in Assumptions	06/30/2020	24	2,153	2,163	143
FY20 Gain	06/30/2020	24	(2,292)	(2,302)	(152)
Prescription Drug Plan Changes	06/30/2021	25	(528)	(528)	(34)
FY21 Gain	06/30/2021	25	(6,434)	(6,434)	(416)
Total				**$ (20,622)**	**$ (1,382)**

Section 1.3: Actuarial Gain/(Loss) for FY21 ($'s in 000's)

	Occupational Death & Disability	Retiree Medical	Total
1. Expected Actuarial Accrued Liability			
a. Actuarial Accrued Liability as of June 30, 2020	$ 223	$ 40,634	$ 40,857
b. Normal Cost	312	3,388	3,700
c. Interest on (a) and (b) at 7.38%	39	3,249	3,288
d. Employer Group Waiver Plan	0	3	3
e. Benefit Payments	(24)	(171)	(195)
f. Interest on (d) and (e) at 7.38%, adjusted for timing	(1)	(6)	(7)
g. Assumption/Method Changes	0	0	0
h. Expected Actuarial Accrued Liability as of June 30, 2021 (a) + (b) + (c) + (d) + (e) + (f) + (g)	$ 549	$ 47,097	$ 47,646
2. Actual Actuarial Accrued Liability as of June 30, 2021	205	44,396	44,601
3. Liability Gain/(Loss), (1)(h) - (2)	**$ 344**	**$ 2,701**	**$ 3,045**
4. Expected Actuarial Asset Value			
a. Actuarial Asset Value as of June 30, 2020	$ 4,933	$ 49,554	$ 54,487
b. Interest on (a) at 7.38%	364	3,657	4,021
c. Employer Contributions	362	4,217	4,579
d. Employer Group Waiver Plan	0	3	3
e. Interest on (c) and (d) at 7.38%, adjusted for timing	13	153	166
f. Benefit Payments	(24)	(171)	(195)
g. Administrative Expenses	(9)	(34)	(43)
h. Interest on (f) and (g) at 7.38%, adjusted for timing	(1)	(7)	(8)
i. Expected Actuarial Asset Value as of June 30, 2021 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	$ 5,638	$ 57,372	$ 63,010
5. Actuarial Asset Value as of June 30, 2021	5,843	59,380	65,223
6. Actuarial Asset Gain/(Loss), (5) - (4)(i)	**$ 205**	**$ 2,008**	**$ 2,213**
7. Total Actuarial Gain/(Loss), (3) + (6)	**$ 549**	**$ 4,709**	**$ 5,258**
8. Contribution Gain/(Loss)	**$ 445**	**$ 1,295**	**$ 1,740**
9. Administrative Expense Gain/(Loss)	**$ (9)**	**$ (27)**	**$ (36)**
10. FY21 Gain/(Loss), (7) + (8) + (9)	**$ 985**	**$ 5,977**	**$ 6,962**

Section 1.4: History of Unfunded Liability and Funded Ratio ($'s in 000's)

Valuation Date	Total Actuarial Accrued Liability	Valuation Assets	Assets as a Percent of Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability (UAAL)
June 30, 2007	$ 374	$ 597	159.7%	$ (223)
June 30, 2008	801	1,728	215.7%	(927)
June 30, 2009	1,460	3,424	234.5%	(1,964)
June 30, 2010	2,448	5,472	223.5%	(3,024)
June 30, 2011	3,858	7,566	196.1%	(3,708)
June 30, 2012	16,874	9,285	55.0%	7,589
June 30, 2013	22,138	11,146	50.3%	10,992
June 30, 2014	16,296	13,611	83.5%	2,685
June 30, 2015	19,797	20,847	105.3%	(1,050)
June 30, 2016	22,007	28,733	130.6%	(6,726)
June 30, 2017	33,707	34,586	102.6%	(879)
June 30, 2018	32,459	40,621	125.1%	(8,162)
June 30, 2019	33,221	46,666	140.5%	(13,445)
June 30, 2020	40,857	54,487	133.4%	(13,630)
June 30, 2021	44,601	65,223	146.2%	(20,622)

Section 2: Plan Assets

Section 2.1: Summary of Fair Value of Assets ($'s in 000's)

As of June 30, 2021	Occupational Death & Disability	Retiree Medical	Total	Allocation Percent
Cash and Short-Term Investments				
- Cash and Cash Equivalents	$ 75	$ 757	$ 832	1.1%
- Subtotal	$ 75	$ 757	$ 832	1.1%
Fixed Income Investments				
- Domestic Fixed Income Pool	$ 1,336	$ 13,569	$ 14,905	20.2%
- International Fixed Income Pool	0	0	0	0.0%
- Tactical Fixed Income Pool	0	0	0	0.0%
- High Yield Pool	0	0	0	0.0%
- Treasury Inflation Protection Pool	0	0	0	0.0%
- Emerging Debt Pool	0	0	0	0.0%
- Subtotal	$ 1,336	$ 13,569	$ 14,905	20.2%
Equity Investments				
- Domestic Equity Pool	$ 1,809	$ 18,359	$ 20,168	27.4%
- International Equity Pool	997	10,118	11,115	15.1%
- Private Equity Pool	981	9,956	10,937	14.9%
- Emerging Markets Equity Pool	212	2,150	2,362	3.2%
- Alternative Equity Strategies	385	3,910	4,295	5.8%
- Subtotal	$ 4,384	$ 44,493	$ 48,877	66.4%
Other Investments				
- Real Estate Pool	$ 406	$ 4,124	$ 4,530	6.2%
- Other Investments Pool	406	4,115	4,521	6.1%
- Absolute Return Pool	0	0	0	0.0%
- Other Assets	0	0	0	0.0%
- Subtotal	$ 812	$ 8,239	$ 9,051	12.3%
Total Cash and Investments	$ 6,607	$ 67,058	$ 73,665	100.0%
Net Accrued Receivables	16	220	236	
Net Assets	$ 6,623	$ 67,278	$ 73,901	

Section 2.2: Changes in Fair Value of Assets During FY21 ($'s in 000's)

Fiscal Year 2021	Occupational Death & Disability	Retiree Medical	Total
1. Fair Value of Assets as of June 30, 2020	$ 4,823	$ 48,413	$ 53,236
2. Additions:			
a. Member Contributions	$ 0	$ 0	$ 0
b. Employer Contributions	362	4,217	4,579
c. Interest and Dividend Income	70	707	777
d. Net Appreciation/(Depreciation) in Fair Value of Investments	1,415	14,279	15,694
e. Employer Group Waiver Plan	0	3	3
f. Other	0	2	2
g. Total Additions	$ 1,847	$ 19,208	$ 21,055
3. Deductions:			
a. Medical Benefits	$ 0	$ 171	$ 171
b. Death & Disability Benefits	24	0	24
c. Investment Expenses	14	138	152
d. Administrative Expenses	9	34	43
e. Total Deductions	$ 47	$ 343	$ 390
4. Fair Value of Assets as of June 30, 2021	$ 6,623	$ 67,278	$ 73,901
5. Approximate Fair Value Investment Return Rate during FY21 Net of Investment Expenses	29.5%	29.5%	29.5%

Section 2.3: Development of Actuarial Value of Assets ($'s in 000's)

The actuarial value of assets and the fair value were $0 at June 30, 2006. Investment gains and losses are recognized 20% per year over 5 years. In no event may valuation assets be less than 80% or more than 120% of fair value as of the current valuation date.

	Occupational Death & Disability	Retiree Medical	Total
1. Investment Gain/(Loss) for FY21			
a. Fair Value as of June 30, 2020	$ 4,823	$ 48,413	$ 53,236
b. Contributions	362	4,217	4,579
c. Employer Group Waiver Plan	0	3	3
d. Benefit Payments	24	171	195
e. Administrative Expenses	9	34	43
f. Actual Investment Return (net of investment expenses)	1,471	14,850	16,321
g. Expected Return Rate (net of investment expenses)	7.38%	7.38%	7.38%
h. Expected Return	368	3,718	4,086
i. Investment Gain/(Loss) for the Year (f) - (h)	1,103	11,132	12,235
2. Actuarial Value as of June 30, 2021			
a. Fair Value as of June 30, 2021	$ 6,623	$ 67,278	$ 73,901
b. Deferred Investment Gain/(Loss)	780	7,898	8,678
c. Preliminary Actuarial Value as of June 30, 2021, (a) - (b)	5,843	59,380	65,223
d. Upper Limit: 120% of Fair Value as of June 30, 2021	7,947	80,733	88,680
e. Lower Limit: 80% of Fair Value as of June 30, 2021	5,299	53,823	59,122
f. Actuarial Value at June 30, 2021, (c) limited by (d) and (e)	5,843	59,380	65,223
3. Ratio of Actuarial Value of Assets to Fair Value of Assets	88.2%	88.3%	88.3%
4. Approximate Actuarial Value Investment Return Rate during FY21 Net of Investment Expenses	11.4%	11.3%	11.3%

The tables below show the development of the gains/(losses) to be recognized in the current year ($'s in 000's):

Occupational Death & Disability				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2017	$ 143	$ 115	$ 28	$ 0
June 30, 2018	8	6	2	0
June 30, 2019	(48)	(20)	(10)	(18)
June 30, 2020	(140)	(28)	(28)	(84)
June 30, 2021	1,103	0	221	882
Total	**$ 1,066**	**$ 73**	**$ 213**	**$ 780**

Retiree Medical				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2017	$ 1,184	$ 948	$ 236	$ 0
June 30, 2018	(19)	(12)	(4)	(3)
June 30, 2019	(460)	(184)	(92)	(184)
June 30, 2020	(1,367)	(273)	(273)	(821)
June 30, 2021	11,132	0	2,226	8,906
Total	**$ 10,470**	**$ 479**	**$ 2,093**	**$ 7,898**

Total				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2017	$ 1,327	$ 1,063	$ 264	$ 0
June 30, 2018	(11)	(6)	(2)	(3)
June 30, 2019	(508)	(204)	(102)	(202)
June 30, 2020	(1,507)	(301)	(301)	(905)
June 30, 2021	12,235	0	2,447	9,788
Total	**$ 11,536**	**$ 552**	**$ 2,306**	**$ 8,678**

Section 2.4: Historical Asset Rates of Return

	Actuarial Value		Fair Value	
Year Ending	Annual	Cumulative*	Annual	Cumulative*
June 30, 2008	6.4%	6.4%	(0.3%)	(0.3%)
June 30, 2009	3.2%	4.8%	(12.0%)	(6.3%)
June 30, 2010	4.2%	4.6%	6.4%	(2.3%)
June 30, 2011	7.4%	5.3%	18.9%	2.6%
June 30, 2012	6.9%	5.6%	1.6%	2.4%
June 30, 2013	7.7%	6.0%	11.9%	3.9%
June 30, 2014	10.9%	6.6%	18.0%	5.8%
June 30, 2015	9.5%	7.0%	3.1%	5.5%
June 30, 2016	6.5%	6.9%	(0.1%)	4.9%
June 30, 2017	7.6%	7.0%	12.6%	5.6%
June 30, 2018	7.8%	7.1%	8.0%	5.8%
June 30, 2019	6.4%	7.0%	6.2%	5.9%
June 30, 2020	6.3%	7.0%	4.3%	5.7%
June 30, 2021	11.3%	7.3%	29.5%	7.3%

* Cumulative since fiscal year ending June 30, 2008

Section 3: Member Data

Section 3.1: Summary of Members Included

As of June 30	2017	2018	2019	2020	2021
Active Members					
1. Number	4,694	4,915	4,998	5,332	5,521[1]
2. Average Age	40.21	40.64	41.06	41.63	41.90
3. Average Credited Service	4.88	5.30	5.67	6.03	6.34
4. Average Entry Age	35.33	35.34	35.39	35.60	35.56
5. Average Annual Earnings	$ 66,542	$ 68,119	$ 69,619	$ 71,118	$ 74,045
Disabilitants and Beneficiaries (Occupational Death & Disability)					
1. Number	0	0	1	1	1
2. Average Age	N/A	N/A	53.45	54.45	55.45
3. Average Monthly Death & Disability Benefit	N/A	N/A	$ 2,024	$ 2,024	$ 2,024
Retirees, Surviving Spouses, and Dependent Spouses (Retiree Medical)					
1. Number	4	9	12	17	24
2. Average Age	69.72	68.59	68.54	68.79	67.71
Total Number of Members	**4,698**	**4,924**	**5,011**	**5,350**	**5,546**

Average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

[1] Includes 1,431 male active members and 4,090 female active members.

Section 3.2: Age and Service Distribution of Active Members

Annual Earnings by Age

Age	Number	Total Annual Earnings	Average Annual Earnings
0 - 19	0	$ 0	$ 0
20 - 24	93	4,820,122	51,829
25 - 29	582	35,233,778	60,539
30 - 34	913	62,245,631	68,177
35 - 39	1,122	84,044,406	74,906
40 - 44	897	68,120,327	75,942
45 - 49	632	50,198,959	79,429
50 - 54	521	41,787,962	80,207
55 - 59	404	32,949,416	81,558
60 - 64	245	20,049,134	81,833
65 - 69	87	7,203,861	82,803
70 - 74	21	1,709,445	81,402
75+	4	441,677	110,419
Total	**5,521**	**$ 408,804,718**	**$ 74,045**

Annual Earnings by Credited Service

Years of Service	Number	Total Annual Earnings	Average Annual Earnings
0	134	$ 7,688,581	$ 57,377
1	677	42,392,282	62,618
2	549	36,410,038	66,321
3	516	35,912,821	69,598
4	442	30,921,457	69,958
0 - 4	**2,318**	**$ 153,325,179**	**$ 66,145**
5 - 9	1,864	141,448,230	75,884
10 - 14	1,221	103,476,219	84,747
15 - 19	116	10,364,704	89,351
20 - 24	2	190,386	95,193
25 - 29	0	0	0
30 - 34	0	0	0
35 - 39	0	0	0
40+	0	0	0
Total	**5,521**	**$ 408,804,718**	**$ 74,045**

Years of Credited Service by Age

	Years of Service									
Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total
0 - 19	0	0	0	0	0	0	0	0	0	0
20 - 24	93	0	0	0	0	0	0	0	0	93
25 - 29	485	97	0	0	0	0	0	0	0	582
30 - 34	426	428	59	0	0	0	0	0	0	913
35 - 39	336	405	367	14	0	0	0	0	0	1,122
40 - 44	317	295	255	29	1	0	0	0	0	897
45 - 49	216	207	188	21	0	0	0	0	0	632
50 - 54	173	181	151	15	1	0	0	0	0	521
55 - 59	140	132	116	16	0	0	0	0	0	404
60 - 64	90	77	60	18	0	0	0	0	0	245
65 - 69	30	34	20	3	0	0	0	0	0	87
70 - 74	11	7	3	0	0	0	0	0	0	21
75+	1	1	2	0	0	0	0	0	0	4
Total	**2,318**	**1,864**	**1,221**	**116**	**2**	**0**	**0**	**0**	**0**	**5,521**

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

Section 3.3: Member Data Reconciliation

	Actives	Retirees and Surviving Spouses	Dependent Spouses	OD&D Disabilitants	OD&D Beneficiaries	Total
As of June 30, 2020 [1]	**5,332**	**14**	**3**	**1**	**0**	**5,350**
New Entrants	702	0	0	0	0	702
Rehires	230	0	0	0	0	230
Vested Terminations	(308)	0	0	0	0	(308)
Non-Vested Terminations	(384)	0	0	0	0	(384)
Refund of Contributions	(41)	0	0	0	0	(41)
Disability Retirements	0	0	0	0	0	0
Age Retirements	(6)	6	2	0	0	2
Deaths With Beneficiary	0	0	0	0	0	0
Deaths Without Beneficiary	(8)	0	0	0	0	(8)
Data Corrections	4	0	(1)	0	0	3
Net Change	**189**	**6**	**1**	**0**	**0**	**196**
As of June 30, 2021 [2]	**5,521**	**20**	**4**	**1**	**0**	**5,546**

[1] 125 participants are expected to receive retiree medical benefits in a different plan and are included for OD&D benefits only.

[2] 128 participants are expected to receive retiree medical benefits in a different plan and are included for OD&D benefits only.

Section 3.4: Schedule of Active Member Data

Valuation Date	Number	Annual Earnings (000's)	Annual Average Earnings	Percent Increase in Average Earnings	Number of Participating Employers
June 30, 2021	5,521	$ 408,805	$ 74,045	4.1%	57
June 30, 2020	5,332	379,201	71,118	2.2%	57
June 30, 2019	4,998	347,957	69,619	2.2%	57
June 30, 2018	4,915	334,803	68,119	2.4%	57
June 30, 2017	4,694	312,347	66,542	2.0%	57
June 30, 2016	4,383	285,854	65,219	2.5%	58
June 30, 2015	4,095	260,584	63,635	2.7%	58
June 30, 2014	3,547	219,701	61,940	2.4%	58
June 30, 2013	3,272	197,944	60,496	3.5%	58
June 30, 2012	3,057	178,761	58,476	4.7%	58

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

Section 3.5: Active Member Payroll Reconciliation

Payroll Field	Payroll Data (000's)
a) DRB actual reported salaries FY21 in employer list	$ 451,880
b) DRB actual reported salaries FY21 in valuation data	401,736
c) Annualized valuation data	408,805
d) Valuation payroll as of June 30, 2021	427,762
e) Rate payroll for FY22	423,783

a) Actual reported salaries from DRB employer listing showing all payroll paid during FY21, including those who were not active as of June 30, 2021
b) Payroll from valuation data for people who are in active status as of June 30, 2021
c) Payroll from (b) annualized for both new entrants and part-timers
d) Payroll from (c) with one year of salary scale applied to estimate salaries payable for the upcoming year
e) Payroll from (d) with the part-timer annualization removed

Section 4: Basis of the Actuarial Valuation

Section 4.1: Summary of Plan Provisions

Effective Date

July 1, 2006, with amendments through June 30, 2021.

Administration of Plan

The Commissioner of Administration or the Commissioner's designee is the administrator of the Plan. The Attorney General of the state is the legal counsel for the Plan and shall advise the administrator and represent the Plan in legal proceedings.

The Alaska Retirement Management Board prescribes policies, adopts regulations, invests the funds, and performs other activities necessary to carry out the provisions of the Plan.

Employers Included

Currently there are 57 employers participating in TRS DCR, including the State of Alaska, 53 school districts, and three other eligible organizations.

Membership

An employee of a participating employer who first enters service on or after July 1, 2006, or a member of the defined benefit plan who works for an employer who began participation on or after July 1, 2006, and meets the following criteria is a member in the Plan:

- Permanent full-time or part-time elementary or secondary teachers, school nurses, or a person in a position requiring a teaching certificate as a condition of hire in a public school of the State of Alaska, the Department of Education and Early Development, or in the Department of Labor and Workforce Development.
- Full-time or part-time teachers at the University of Alaska or persons occupying full-time administrative positions requiring academic standing who are not in the University's Optional Retirement Plan.

Members can convert to TRS DCR if they are an eligible non-vested member of the TRS defined benefit plan whose employer consents to transfers to the defined contribution plan and they elect to transfer his or her account balance to TRS DCR.

Member Contributions

Other than the member-paid premiums discussed later in this section, there are no member contributions for the occupational death & disability and retiree medical benefits.

Retiree Medical Benefits

- Member must retire directly from the plan to be eligible for retiree medical coverage. Normal retirement eligibility is the earlier of a) 30 years of service or b) Medicare eligible and 10 years of service.
- No subsidized retiree medical benefits are provided until normal retirement eligibility. The member's and any covered dependent's premium is 100% until the member is Medicare eligible. Upon the member's Medicare-eligibility, the required contribution will follow the service-based schedule shown below.
- Coverage cannot be denied except for failure to pay premium.
- Members who are receiving disability benefits or survivors who are receiving monthly survivor benefits are not eligible until the member meets, or would have met if he/she had lived, the normal retirement eligibility requirements.
- The following is a summary of the medical benefit design adopted in July 2016. The plan description below is used for valuation purposes and indicates participant cost-sharing. Please refer to the benefit handbook for more details.

Plan Design Feature	In-Network[1]	Out-of-Network[1] [2]
Deductible (single / family)	$300 / $600	
Medical services (participant share)	20%	40%
Emergency Room Copay (non-emergent use)	$100	$100
Medical Out-of-Pocket Maximum (single / family, including deductible)	$1,500 / $3,000	$3,000 / $6,000
Medicare Coordination	Exclusion	Exclusion
Pharmacy	No Deductible	No Deductible
Retail Generic (per 30-day fill)	20% $10 min / $50 max	
Retail Non-Formulary Brand (per 30-day fill)	25% $25 min / $75 max	40%
Retail Formulary Brand (per 30-day fill)	35% $80 min / $150 max	
Mail-Order Generic	$20 copay	
Mail-Order Non-Formulary Brand	$50 copay	40%
Mail-Order Formulary Brand	$100 copay	
Pharmacy Out-of-Pocket Max (single / family)	$1,000 / $2,000	
Medicare Pharmacy Arrangement	Retiree Drug Subsidy / Employer Group Waiver Plan effective 1/1/2019	
Wellness / Preventative	100% covered, not subject to deductible	20%, after deductible

[1] Section 1.1 of the AlaskaCare Defined Contribution Retiree Benefit Plan states that this health plan shall be updated from time to time to reflect changes in benefits, including annual adjustments to the premium, deductible, coinsurance, medical out-of-pocket limit, and prescription drug out-of-pocket limit.

[2] OON applies only to non-Medicare eligible participants.

- Buck used manual rate models to determine relative plan values for the defined benefit (DB) retiree medical plan and the DCR retiree medical plan outlined above. We applied the ratio of the DCR retiree medical plan value to the DB retiree medical plan value to the per capita costs determined for each of pre/post-Medicare medical and pharmacy benefits to estimate corresponding values for the DCR retiree medical plan design. These factors are noted in Section 4.3. We further adjusted the Medicare medical manual rate to reflect the Medicare coordination method adopted. The estimated 2022 reimbursements under EGWP were provided by Segal Consulting (who worked with the EGWP administrator, Optum, to develop those estimates). We reflect estimated discounts and pharmacy rebates in the defined benefit medical cost so no further adjustment was needed for the DCR retiree medical plan. The medical network differential is reflected in the relative plan value adjustments.
- Starting in 2022, prior authorization will be required for certain specialty medications. There is no change to the medications that are covered by the plan.
- The retiree medical plan's coverage is supplemental to Medicare. Medicare coordination is described in the DCR Plan Handbook, referred to in the industry as exclusion coordination: Medicare payment is deducted from the Medicare allowable expense and plan parameters are applied to the remaining amount. Starting in 2019, the prescription drug coverage is through a Medicare Part D EGWP arrangement.
- The premium for Medicare-eligible retirees will be based on the member's years of service. The percentage of premium paid by the member is as follows:

Years of Service	Percent of Premium Paid by Member
< 15	30%
15 – 19	25%
20 – 24	20%
25 – 29	15%
30+	10%

- The premium for dependents who are not eligible for Medicare aligns with the member's subsidy. While a member is not Medicare-eligible, premiums are 100% of the estimated cost.
- Members have a separate defined contribution Health Reimbursement Arrangement account, which is not reflected in this valuation, that can be used to pay for premiums or other medical expenses.
- For valuation purposes, retiree premiums were assumed to equal the percentages outlined in the table above times the age-related plan costs. Future premiums calculated and charged to DCR participants will need to be determined reflecting any appropriate adjustments to the defined benefit (DB) plan data because current DB premiums were determined using information based upon enrollment with members who have double coverage.
- Coverage will continue for surviving spouses of covered retired members.

Occupational Disability Benefits

- Benefit is 40% of salary at date of disability.
- Disability Benefit Adjustment: The disability benefit is increased by 75% of the cost of living increase in the preceding calendar year or 9%, whichever is less.
- Member earns service while on occupational disability.
- Benefits cease when the member becomes eligible for normal retirement at Medicare-eligible age and 10 years of service, or at any age with 30 years of service.
- No subsidized retiree medical benefits are provided until normal retirement eligibility. The member's premium is 100% of the estimated cost until they are Medicare eligible. Medicare-eligible premiums follow the service-based schedule above.

Occupational Death Benefits

- Benefit is 40% of salary.
- Survivor's Pension Adjustment: A survivor's pension is increased by 50% of the cost of living increase in the preceding calendar year or 6%, whichever is less, if the recipient is at least age 60 on July 1, or under age 60 if the recipient has been receiving TRS benefits for at least 8 years as of July 1.
- Benefits cease when the member would have become eligible for normal retirement.
- The period during which the survivor is receiving benefits is counted as service credit toward retiree medical benefits.
- No subsidized retiree medical benefits are provided until the member would have been eligible for normal retirement. The surviving spouse's premium is 100% of the estimated cost until the member would have been Medicare eligible. Medicare-eligible premiums follow the service-based schedule above.

Changes Since the Prior Valuation

Starting in 2022, prior authorization will be required for certain specialty medications. There have been no other changes in TRS DCR benefit provisions valued since the prior valuation.

Section 4.2: Description of Actuarial Methods and Valuation Procedures

The funding method used in this valuation was adopted by the Board in October 2006, and was modified as part of the experience study for the period July 1, 2013 to June 30, 2017. The asset smoothing method used to determine valuation assets was implemented effective June 30, 2006.

Benefits valued are those delineated in Alaska State statutes as of the valuation date. Changes in State statutes effective after the valuation date are not taken into consideration in setting the assumptions and methods.

Actuarial Cost Method

Liabilities and contributions shown in the report are computed using the Entry Age Normal Actuarial Cost Method, level percent of pay. Each year's difference between actual and expected unfunded actuarial accrued liability is amortized over 25 years as a level percentage of expected payroll.

Cost factors designed to produce annual costs as a constant percentage of each member's expected compensation in each year for death & disability benefits and retiree medical benefits, from the assumed entry age to the last age with a future benefit were applied to the projected benefits to determine the normal cost (the portion of the total cost of the plan allocated to the current year under the method). The normal cost is determined by summing intermediate results for active members and determining an average normal cost rate which is then related to the total DCR Plan payroll of active members. The actuarial accrued liability for active members (the portion of the total cost of the plan allocated to prior years under the method) was determined as the excess of the actuarial present value of projected benefits over the actuarial present value of future normal costs.

The actuarial accrued liability for beneficiaries and disabled members currently receiving benefits (if any) was determined as the actuarial present value of the benefits expected to be paid. No future normal costs are payable for these members.

The actuarial accrued liability under this method at any point in time is the theoretical amount of the fund that would have been accumulated had annual contributions equal to the normal cost been made in prior years (it does not represent the liability for benefits accrued to the valuation date). The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over the actuarial value of plan assets measured on the valuation date.

Under this method, experience gains or losses, i.e., decreases or increases in accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the unfunded actuarial accrued liability.

Valuation of Assets

Effective June 30, 2006, the asset valuation method recognizes 20% of the investment gain or loss in each of the current and preceding four years. This method was phased in over five years. Fair Value of Assets was $0 as of June 30, 2006. All assets are valued at fair value. Assets are accounted for on an accrued basis and are taken directly from financial statements audited by KPMG LLP. Valuation assets are constrained to a range of 80% to 120% of the fair value of assets.

Changes in Methods Since the Prior Valuation

There were no changes in the asset or valuation methods since the prior valuation.

Valuation of Retiree Medical and Prescription Drug Benefits

The methodology used for the valuation of the retiree medical benefits is described in Section 5.2 of the State of Alaska Teachers' Retirement System Defined Benefit Plan Actuarial Valuation Report as of June 30, 2021.

Starting in 2022, prior authorization will be required for certain specialty medications. There is no change to the medications that are covered by the plan. Segal provided an estimate of the impact of this change to the DB retiree health plan cost for calendar year 2022. The DB base claims costs for pre-Medicare prescription drug, Medicare prescription drug, and EGWP were adjusted to reflect this change. Those base claims costs were used for the DCR valuation with further adjustments as noted below. Additionally, starting in 2022, certain common preventive benefits will be covered for the DB plan. However, preventive benefits are already covered under the DCR plan so no adjustment is needed for that change. Therefore, the base claims cost for the DB plan prior to reflecting the addition of preventive benefits was used for the DCR valuation with further adjustments as noted below.

Due to the lack of experience for the DCR retiree medical plan, base claims costs are based on those described in the actuarial valuation as of June 30, 2021 for the Defined Benefit (DB) retiree medical plan covering TRS and PERS. The DB rates were used with some adjustments. The claims costs were adjusted to reflect the differences between the DCR medical plan and the DB medical plan. These differences include network steerage, different coverage levels, different Medicare coordination for medical benefits, and an indexing of the retiree out-of-pocket dollar amounts. To account for higher initial copays, deductibles and out-of-pocket limits, projected FY22 claims costs were reduced 3.1% for medical claims, and 8.9% for prescription drugs. In addition, to account for the difference in Medicare coordination, projected FY22 medical claims costs for Medicare eligible retirees were further reduced 29.5%.

To adjust for the decrease in medical claims due to COVID-19 during the last 4 months of FY20, the per capita cost during the first 8 months was used as the basis for estimating claims that would have occurred in the absence of COVID-19. FY21 experience was also thoroughly reviewed to assess the impact of COVID-19 and whether an adjustment to FY21 claims was appropriate for use in the June 30, 2021 valuation. FY21 medical per capita claims were noticeably lower than expected, so a 4% load was added to the FY21 medical claims used in the per capita claims cost development to better reflect future expected long-term costs of the plan.

No implicit subsidies are assumed. Employees projected to retire with 30 years of service prior to Medicare are valued with commencement deferred to Medicare eligibility, because those members will be required to pay the full plan premium prior to Medicare. Explicit subsidies for disabled and normal retirement are determined using the plan-defined percentages of age-related total projected plan costs, again with no implicit subsidy assumed.

The State transitioned to an Employer Group Waiver Program (EGWP) for DCR participants effective January 1, 2019. The estimated 2022 reimbursements under EGWP were provided by Segal Consulting (who worked with the EGWP administrator, Optum, to develop those estimates).

Healthcare Reform

Healthcare Reform legislation passed on March 23, 2010 included several provisions with potential implications for the State of Alaska Retiree Health Plan liability. Buck evaluated the impact due to these provisions.

Because the State plan is retiree-only, not all provisions are required. Unlimited lifetime benefits and dependent coverage to age 26 are two of these provisions. The adopted DCR plan does not place lifetime limits on benefits, but does restrict dependent child coverage.

The Further Consolidated Appropriations Act, 2020 passed in December 2019 repealed several healthcare-related taxes, including the Cadillac Tax.

The Tax Cuts and Jobs Act passed in December 2017 included the elimination of the individual mandate penalty and changed the inflation measure for purposes of determining the limits for the High Cost Excise Tax to use chained CPI. It is our understanding the law does not directly impact other provisions of the ACA. While the nullification of the ACA's individual mandate penalty does not directly impact employer group health plans, it could contribute to the destabilization of the individual market and increase the number of uninsured. Such destabilization could translate to increased costs for employers. We have considered this when setting our healthcare cost trend assumptions and will continue to monitor this issue.

We have not identified any other specific provisions of healthcare reform or its potential repeal that would be expected to have a significant impact on the measured obligation. We will continue to monitor legislative activity.

Section 4.3: Summary of Actuarial Assumptions

The demographic and economic assumptions used in the June 30, 2021 valuation are described below. Unless noted otherwise, these assumptions were adopted by the Board in January 2019 based on the experience study for the period July 1, 2013 to June 30, 2017.

Investment Return

7.38% per year, net of investment expenses.

Salary Scale

Salary scale rates based upon the 2013-2017 actual experience (see Table 1).

Inflation – 2.50% per year.

Productivity – 0.25% per year.

Payroll Growth

2.75% per year (inflation + productivity).

Total Inflation

Total inflation as measured by the Consumer Price Index for urban and clerical workers for Anchorage is assumed to increase 2.50% annually.

Mortality (Pre-Commencement)

Mortality rates based upon the 2013-2017 actual experience.

RP-2014 white-collar employee table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Deaths are assumed to result from occupational causes 15% of the time.

Mortality (Post-Commencement)

Mortality rates based upon the 2013-2017 actual experience.

93% of male and 90% of female rates of RP-2014 white-collar healthy annuitant table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Turnover

Select and ultimate rates based upon the 2013-2017 actual experience (see Table 2).

Disability

Incidence rates based upon the 2013-2017 actual experience (see Table 3). For retiree medical benefits, the disability rates cease once a member is eligible for retirement. However, the disability rates continue after retirement eligibility for occupational death & disability benefits.

Disabilities are assumed to be occupational 15% of the time.

Post-disability mortality in accordance with the RP-2014 disabled table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Retirement

Retirement rates based upon the 2013-2017 actual experience (see Table 4).

Spouse Age Difference

Males are assumed to be three years older than their wives. Females are assumed to be two years younger than husbands.

Percent Married for Occupational Death & Disability

85% of male members and 75% of female members are assumed to be married at termination from active service.

Dependent Spouse Medical Coverage Election

Applies to members who do not have double medical coverage. 65% of male members and 60% of female members are assumed to be married and cover a dependent spouse.

Part-Time Status

Part-time employees are assumed to earn 0.75 years of service per year.

Per Capita Claims Cost

Sample claims cost rates (before base claims cost adjustments described below) adjusted to age 65 for FY22 medical and prescription drugs are shown below. The prescription drug costs reflect the plan change to require prior authorization for certain specialty medications.

	Medical	Prescription Drugs
Pre-Medicare	$ 15,708	$ 3,375
Medicare Parts A & B	$ 1,619	$ 3,474
Medicare Part D – EGWP	N/A	$ 1,131

Members are assumed to attain Medicare eligibility at age 65. All costs are for the 2022 fiscal year (July 1, 2021 – June 30, 2022).

The EGWP subsidy is assumed to increase in future years by the trend rates shown on the following pages. No future legislative changes or other events are anticipated to impact the EGWP subsidy. If any legislative or other changes occur in the future that impact the EGWP subsidy (which could either increase or decrease the plan's Actuarial Accrued Liability), those changes will be evaluated and quantified when they occur.

Third Party Administrator Fees

$493 per person per year; assumed to increase at 4.5% per year.

Base Claims Cost Adjustments

Due to higher initial copays, deductibles, out-of-pocket limits and member cost sharing compared to the DB medical plan, the following cost adjustments are applied to the per capita claims cost rates above:

- 0.969 for the pre-Medicare plan.
- 0.674 for both the Medicare medical plan and Medicare coordination method (3.1% reduction for the medical plan and 29.5% reduction for the coordination method).
- 0.911 for the prescription drug plan.

Administrative Expenses

Beginning with the June 30, 2018 valuation, the Normal Cost is increased for administrative expenses expected to be paid from plan assets during the year. The amounts included in the June 30, 2021 Normal Cost, which are based on the average of actual administrative expenses during the last two fiscal years, are $5,000 for occupational death & disability and $22,000 for retiree medical.

Healthcare Cost Trend

The table below shows the rate used to project the cost from the shown fiscal year to the next fiscal year. For example, 6.3% is applied to the FY22 pre-Medicare medical claims costs to get the FY23 medical claims costs.

	Medical Pre-65	Medical Post-65	Prescription Drugs / EGWP
FY22	6.3%	5.4%	7.1%
FY23	6.1%	5.4%	6.8%
FY24	5.9%	5.4%	6.4%
FY25	5.8%	5.4%	6.1%
FY26	5.6%	5.4%	5.7%
FY27-FY40	5.4%	5.4%	5.4%
FY41	5.3%	5.3%	5.3%
FY42	5.2%	5.2%	5.2%
FY43	5.1%	5.1%	5.1%
FY44	5.1%	5.1%	5.1%
FY45	5.0%	5.0%	5.0%
FY46	4.9%	4.9%	4.9%
FY47	4.8%	4.8%	4.8%
FY48	4.7%	4.7%	4.7%
FY49	4.6%	4.6%	4.6%
FY50+	4.5%	4.5%	4.5%

For the June 30, 2014 valuation and later, the updated Society of Actuaries' Healthcare Cost Trend Model is used to project medical and prescription drug costs. This model estimates trend amounts that are projected out for 80 years. The model has been populated with assumptions that are specific to the State of Alaska.

Aging Factors

Age	Medical	Prescription Drugs
0 – 44	2.0%	4.5%
45 – 54	2.5%	3.5%
55 – 64	2.5%	1.5%
65 – 74	3.0%	2.0%
75 – 84	2.0%	-0.5%
85 – 94	0.3%	-2.5%
95+	0.0%	0.0%

Retiree Medical Participation

Death / Disability Decrement		Retirement Decrement	
Age	Percent Participation	Age	Percent Participation*
< 56	75.0%	55	50.0%
56	77.5%	56	55.0%
57	80.0%	57	60.0%
58	82.5%	58	65.0%
59	85.0%	59	70.0%
60	87.5%	60	75.0%
61	90.0%	61	80.0%
62	92.5%	62	85.0%
63	95.0%	63	90.0%
64	97.5%	64	95.0%
65+	100.0%	65+	**Years of Service**
			< 15 75.0%
			15 – 19 80.0%
			20 – 24 85.0%
			25 – 29 90.0%
			30+ 95.0%

* Participation assumption is a combination of (i) the service-based rates for retirement from employment at age 65+ and (ii) the age-based rates for retirement from employment before age 65. These rates reflect the expected plan election rate that varies by reason for decrement, duration that a member may pay full cost prior to Medicare eligibility, and availability of alternative and/or lower cost options, particularly in the Medicare market. This assumption is based on observed trends in participation from a range of other plans.

Imputed Data

Data changes from the prior year which are deemed to have immaterial impact on liabilities and contribution rates are assumed to be correct in the current year's client data. Non-vested terminations with appropriate refund dates are assumed to have received a full refund of contributions. Active members with missing salary and service are assumed to be terminated with status based on their vesting percentage.

Changes in Assumptions Since the Prior Valuation

The amounts included in the Normal Cost for administrative expenses were changed from $0 to $5,000 for occupational death & disability, and from $8,000 to $22,000 for retiree medical (based on the most recent two years of actual administrative expenses paid from plan assets). The per capita claims cost assumption is updated annually.

Table 1: Salary Scale

Years of Service	Percent Increase
0	6.75%
1	6.25%
2	5.75%
3	5.25%
4	4.75%
5	4.25%
6	3.75%
7	3.65%
8	3.55%
9	3.45%
10	3.35%
11	3.25%
12	3.15%
13	3.05%
14	2.95%
15	2.85%
16+	2.75%

Table 2: Turnover Rates

Select Rates during the First 6 Years of Employment

Years of Service	Male	Female
0	20.70%	21.80%
1	19.55%	18.70%
2	16.10%	15.40%
3	13.80%	13.20%
4	11.50%	11.00%
5	7.32%	8.05%

Ultimate Rates after the First 6 Years of Employment

Age	Male	Female	Age	Male	Female
< 26	9.41%	8.31%	45	9.05%	8.09%
26	9.41%	8.32%	46	8.99%	8.07%
27	9.40%	8.33%	47	8.94%	8.04%
28	9.39%	8.32%	48	8.86%	8.00%
29	9.39%	8.32%	49	8.78%	7.95%
30	9.38%	8.31%	50	8.70%	7.91%
31	9.37%	8.31%	51	8.62%	7.86%
32	9.36%	8.30%	52	8.54%	7.82%
33	9.35%	8.29%	53	8.37%	7.73%
34	9.35%	8.28%	54	8.20%	7.64%
35	9.34%	8.27%	55	8.03%	7.55%
36	9.34%	8.26%	56	7.86%	7.46%
37	9.33%	8.25%	57	7.69%	7.36%
38	9.31%	8.24%	58	7.76%	7.50%
39	9.29%	8.22%	59	7.82%	7.64%
40	9.26%	8.21%	60	7.89%	7.78%
41	9.24%	8.19%	61	7.95%	7.92%
42	9.22%	8.17%	62	8.02%	8.05%
43	9.16%	8.15%	63	8.59%	8.29%
44	9.11%	8.12%	64	9.17%	8.52%
			65+	9.75%	8.75%

Table 3: Disability Rates

Age	Male	Female	Age	Male	Female
< 31	0.0337%	0.0612%	50	0.0601%	0.1093%
31	0.0337%	0.0613%	51	0.0634%	0.1152%
32	0.0337%	0.0613%	52	0.0666%	0.1211%
33	0.0342%	0.0622%	53	0.0746%	0.1356%
34	0.0347%	0.0631%	54	0.0826%	0.1501%
35	0.0353%	0.0641%	55	0.0905%	0.1645%
36	0.0357%	0.0650%	56	0.0985%	0.1790%
37	0.0362%	0.0659%	57	0.1064%	0.1935%
38	0.0371%	0.0674%	58	0.1245%	0.2263%
39	0.0379%	0.0689%	59	0.1426%	0.2592%
40	0.0387%	0.0703%	60	0.1606%	0.2920%
41	0.0395%	0.0718%	61	0.1787%	0.3249%
42	0.0403%	0.0733%	62	0.1967%	0.3577%
43	0.0423%	0.0770%	63	0.2253%	0.4096%
44	0.0443%	0.0806%	64	0.2572%	0.4677%
45	0.0464%	0.0843%	65	0.2933%	0.5332%
46	0.0483%	0.0879%	66	0.3343%	0.6079%
47	0.0504%	0.0916%	67	0.3812%	0.6930%
48	0.0536%	0.0975%	68	0.4345%	0.7900%
49	0.0569%	0.1034%	69	0.4953%	0.9006%
			70+	0.5647%	1.0267%

Table 4: Retirement Rates

Age	Rate
< 55	2.0%
55	3.0%
56	3.0%
57	3.0%
58	3.0%
59	3.0%
60	5.0%
61	5.0%
62	10.0%
63	5.0%
64	5.0%
65	25.0%
66	25.0%
67	25.0%
68	20.0%
69	20.0%
70+	100.0%

Glossary of Terms

Actuarial Accrued Liability

Total accumulated cost to fund pension or postemployment benefits arising from service in all prior years.

Actuarial Cost Method

Technique used to assign or allocate, in a systematic and consistent manner, the expected cost of a pension or postemployment plan for a group of plan members to the years of service that give rise to that cost.

Actuarial Present Value of Projected Benefits

Amount which, together with future interest, is expected to be sufficient to pay all future benefits.

Actuarial Valuation

Study of probable amounts of future pension or postemployment benefits and the necessary amount of contributions to fund those benefits.

Actuary

Person who performs mathematical calculations pertaining to pension and insurance benefits based on specific procedures and assumptions.

GASB 74 and 75

Governmental Accounting Standards Board Statement Number 74 amends Number 43 effective for the fiscal year beginning after June 15, 2016 and defines new financial reporting requirements for public postemployment benefit plans. Governmental Accounting Standards Board Statement Number 75 amends Number 45 effective for fiscal years beginning after June 15, 2017 and defines new accounting and financial reporting requirements for employers sponsoring public postemployment benefit plans.

Normal Cost

That portion of the actuarial present value of benefits assigned to a particular year in respect to an individual participant or the plan as a whole.

Rate Payroll

Members' earnings used to determine contribution rates.

Unfunded Actuarial Accrued Liability (UAAL)

The portion of the actuarial accrued liability not offset by plan assets.

Valuation Payroll

Members' earnings used to determine Normal Cost and Actuarial Accrued Liability.

Vested Benefits

Benefits which are unconditionally guaranteed regardless of employment.

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January 6, 2022

State of Alaska
The Alaska Retirement Management Board
The Department of Revenue, Treasury Division
The Department of Administration, Division of Retirement and Benefits
P.O. Box 110203
Juneau, AK 99811-0203

Re: Judicial Retirement System and National Guard and Naval Militia Retirement System Roll-Forward Actuarial Valuations as of June 30, 2021

Dear Members of The Alaska Retirement Management Board, The Department of Revenue and The Department of Administration:

We have completed the roll-forward actuarial valuations for the State of Alaska Judicial Retirement System (JRS) and the National Guard and Naval Militia Retirement System (NGNMRS) as of June 30, 2021. The valuations have been performed by a projection or "roll forward" of results from the last valuation date of June 30, 2020 to June 30, 2021. Actual asset values as of June 30, 2021 were reflected. A summary of results and description of assumptions and methods are included in this report.

The purposes of these roll-forward valuations are to (i) determine the employer contributions necessary to meet the Board's funding policy for each System, (ii) disclose the funding assets and liability measures as of the valuation date, and (iii) review the current funded status of each System and assess the funded status as an appropriate measure for determining future actuarially determined contributions.

The Board and staff of the State of Alaska may use this report for the review of the operations of JRS and NGNMRS. Use of this report for any other purpose or by anyone other than the Board or staff of the State of Alaska may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, you should ask Buck to review any statement you wish to make on the results contained in this report. Buck will not accept any liability for any such statement made without the review by Buck.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the actuarial assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. In particular, retiree group benefits models necessarily rely on the use of approximations and estimates and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements. An analysis of the potential range of such future differences is beyond the scope of these valuations.

Actuarial Assumptions and Methods

In lieu of collecting new participant data as of June 30, 2021 and performing a full actuarial valuation, the actuarial liabilities are projected or “rolled forward” from the June 30, 2020 valuation date to June 30, 2021 by assuming the actuarial assumptions during the year are exactly realized.

The actuarial value of assets was calculated as of June 30, 2021 using actual assets and cash flows during FY21. The asset valuation method recognizes 20% of the investment gain or loss each year, for a period of five years. Valuation assets are constrained to a range of 80% to 120% of the fair value of assets.

All data, actuarial assumptions, methods, and plan provisions are the same as those shown in the June 30, 2020 valuation reports dated May 20, 2021, with the following exceptions:

- For JRS, the amounts included in the Normal Cost for administrative expenses were changed from $83,000 to $102,000 for pension and from $24,000 to $31,000 for healthcare, based on the most recent two years of actual administrative expenses paid from plan assets.
- For NGNMRS, the amount included in the Normal Cost for administrative expenses was changed from $256,000 to $268,000, based on the most recent two years of actual administrative expenses paid from plan assets.
- For NGNMRS, the June 30, 2020 actuarial accrued liability used for the roll-forward valuation reflects a valuation system coding update that was recommended by the reviewing actuary. This update decreased the June 30, 2020 actuarial accrued liability by $38,250.

In our opinion, the actuarial assumptions used are reasonable, taking into account the experience of each System and reasonable long-term expectations, and represent our best estimate of the anticipated long-term experience under each System.

Funded Status

Where presented, references to “funded ratio”, “funded status”, and “unfunded actuarial accrued liability” typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded actuarial accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but make no assessment regarding the funded status of the plans if the plans were to settle (i.e. purchase annuities) for a portion or all of their liabilities.

Summary of Results

The results of the June 30, 2021 roll-forward valuations are shown below (results from the June 30, 2020 valuations are shown for comparison purposes):

	June 30, 2020	June 30, 2021
Judicial Retirement System		
• Funded Status[1]		
o Pension	92.0%	98.6%
o Healthcare	207.6%	211.4%
o Total	100.5%	107.1%
• Employer/State Contribution Rates[2]		
o Pension	63.6%	58.7%
o Healthcare	6.5%	6.5%
o Total	70.1%	65.2%
National Guard and Naval Militia Retirement System		
• Funded Status[1]	191.9%	196.9%
• Actuarially Determined Contribution, not less than zero[3]	$ 0	$ 0

The following table summarizes the FY21 actuarial gains/(losses). Net actuarial gains/losses decrease/increase the unfunded actuarial accrued liability versus what was expected based on the previous valuation.

	JRS	NGNMRS
Asset Gain/(Loss)	$ 9,349,000	$ 1,040,000
Liability Gain/(Loss)	N/A	41,000[4]
Healthcare Benefit Payment Gain/(Loss)	(608,000)	N/A
Contribution Gain/(Loss)	4,665,000	0
Administrative Expense Gain/(Loss)	(19,000)	(41,000)
Total Gain/(Loss)	$ 13,387,000	$ 1,040,000

[1] The funded status shown is based on the actuarial value of assets. The funded status is different based on the fair value of assets.

[2] The June 30, 2020 valuation determined the contribution rates for FY23. The June 30, 2021 valuation determines the contribution rates for FY24. Total contribution rates are not less than the Normal Cost rate.

[3] The June 30, 2020 valuation determined the contribution for FY23. The June 30, 2021 valuation determines the contribution for FY24.

[4] The June 30, 2020 actuarial accrued liability used for the roll-forward valuation reflects a valuation system coding update that was recommended by the reviewing actuary. The amount shown includes interest to June 30, 2021.

Assessment of Risks

Actuarial Standard of Practice No. 51 (ASOP 51) applies to actuaries performing funding calculations related to a pension plan. ASOP 51 does not apply to actuaries performing services in connection with other post-employment benefits, such as medical benefits. Accordingly, ASOP 51 does not apply to the healthcare portion of JRS. See pages 16-18 of this report for further details regarding ASOP 51.

Use of Models

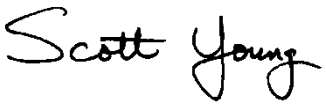
Actuarial Standard of Practice No. 56 (ASOP 56) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of each plan using data and assumptions as of the measurement date under the funding methods specified in this report. The output from the third-party vendor software is used as input to internally developed models that apply applicable funding methods and policies to the derived liabilities and other inputs, such as plan assets and contributions, to generate many of the exhibits found in this report. Buck has an extensive review process in which the results of the liability calculations are checked using detailed sample life output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other funding outputs and the internal models are similarly reviewed in detail and at a higher level for accuracy, reasonability, and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software. This review is performed by experts within Buck who are familiar with applicable funding methods, as well as the manner in which the model generates its output. If significant changes are made to the internal models, extra checking and review are completed. Significant changes to the internal models that are applicable to multiple clients are generally developed, checked, and reviewed by multiple experts within Buck who are familiar with the details of the required changes.

Additional models used in valuing health benefits for JRS are described in Section 4.2 of the June 30, 2020 report dated May 20, 2021.

This report was prepared under our supervision and in accordance with all applicable Actuarial Standards of Practice. We are Fellows of the Society of Actuaries, Enrolled Actuaries, Fellows of the Conference of Consulting Actuaries, and Members of the American Academy of Actuaries. We meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Please let us know if you have any questions or if you would like to discuss these results in more detail. David can be reached at 602-803-6174 and Scott can be reached at 216-315-1929.

Sincerely,



David J. Kershner, FSA, EA, MAAA, FCA
Principal
Buck

Scott Young, FSA, EA, MAAA, FCA
Director
Buck

Attachments

cc: Mr. Kevin Worley, State of Alaska

Judicial Retirement System

Funded Status as of June 30		2020	2021
Pension			
a.	Actuarial Accrued Liability	$ 211,742,043	$ 218,717,460
b.	Valuation Assets	194,788,043	215,641,198
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ 16,954,000	$ 3,076,262
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	92.0%	98.6%
e.	Fair Value of Assets	$ 189,844,025	$ 245,047,997
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	89.7%	112.0%
Healthcare			
a.	Actuarial Accrued Liability	$ 16,763,770	$ 17,920,646
b.	Valuation Assets	34,805,639	37,884,167
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ (18,041,869)	$ (19,963,521)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	207.6%	211.4%
e.	Fair Value of Assets	$ 34,036,503	$ 43,173,349
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	203.0%	240.9%
Total			
a.	Actuarial Accrued Liability	$ 228,505,813	$ 236,638,106
b.	Valuation Assets	229,593,683	253,525,365
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ (1,087,869)	$ (16,887,259)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	100.5%	107.1%
e.	Fair Value of Assets	$ 223,880,528	$ 288,221,346
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	98.0%	121.8%

Comparative Summary of Contribution Rates		FY 2023	FY 2024
Pension			
a.	Normal Cost Rate Net of Member Contributions	38.85%	38.99%
b.	Past Service Cost Rate	24.74%	19.71%
c.	Total Employer/State Contribution Rate, (a) + (b), not less than (a)	63.59%	58.70%
Healthcare			
a.	Normal Cost Rate	6.49%	6.54%
b.	Past Service Cost Rate	(8.24)%	(9.33)%
c.	Total Employer/State Contribution Rate, (a) + (b), not less than (a)	6.49%	6.54%
Total			
a.	Normal Cost Rate Net of Member Contributions	45.34%	45.53%
b.	Past Service Cost Rate	24.74%	19.71%
c.	Total Employer/State Contribution Rate, (a) + (b), not less than (a)	70.08%	65.24%

Judicial Retirement System (continued)

Actuarial Contributions as of June 30, 2021 for FY24	Pension	Healthcare	Total
Normal Cost Rate			
1. Total Normal Cost	$ 5,952,927	$ 860,927	$ 6,813,854
2. Base Salaries for Upcoming Fiscal Year	13,157,172	13,157,172	13,157,172
3. Normal Cost Rate, (1) ÷ (2)	45.24%	6.54%	51.78%
4. Average Member Contribution Rate	6.25%	0.00%	6.25%
5. Employer Normal Cost Rate, (3) - (4)	38.99%	6.54%	45.53%
Past Service Rate			
1. Actuarial Accrued Liability	$ 218,717,460	$ 17,920,646	$ 236,638,106
2. Valuation Assets	215,641,198	37,884,167	253,525,365
3. Unfunded Actuarial Accrued Liability, (1) - (2)	$ 3,076,262	$ (19,963,521)	$ (16,887,259)
4. Funded Ratio, (2) ÷ (1)	98.6%	211.4%	107.1%
5. Past Service Cost Amortization Payment	2,593,806	(1,227,111)	1,366,695
6. Base Salaries for Upcoming Fiscal Year	13,157,172	13,157,172	13,157,172
7. Past Service Rate, (5) ÷ (6)	19.71%	(9.33)%	10.38%
Total Employer Contribution Rate, not less than Normal Cost Rate	58.70%	6.54%	65.24%

Judicial Retirement System (continued)

Schedule of Past Service Cost Amortizations - Pension

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Unfunded Liability[1]	6/30/2002	6	$ 5,864,449	$ 3,943,106	$ 731,664
FY03/04 Loss[1]	6/30/2004	8	855,068	681,204	98,849
Revaluation of Liabilities[1]	6/30/2005	9	9,115,451	7,702,909	1,014,308
FY05/06 Loss[1]	6/30/2006	10	18,186,558	16,102,295	1,947,827
FY07 Loss	6/30/2007	11	1,364,721	1,254,213	140,759
FY08 Gain	6/30/2008	12	(29,014,739)	(27,481,906)	(2,884,889)
FY09 Loss	6/30/2009	13	21,273,454	20,625,359	2,039,004
Change in Assumptions	6/30/2010	14	13,976,981	13,791,031	1,291,385
FY10 Loss	6/30/2010	14	6,474,780	6,388,639	598,229
FY11 Loss	6/30/2011	15	7,397,917	7,407,859	660,308
FY12 Loss	6/30/2012	16	11,916,371	12,057,403	1,027,469
FY13 Loss	6/30/2013	17	7,033,497	6,922,837	566,097
Change in Assumptions	6/30/2014	18	4,219,851	4,312,578	339,526
FY14 Gain	6/30/2014	18	(14,458,986)	(14,776,719)	(1,163,359)
FY15 Gain	6/30/2015	19	(3,325,706)	(3,400,048)	(258,478)
FY16 Gain	6/30/2016	20	(9,932,623)	(10,131,681)	(745,694)
FY17 Gain	6/30/2017	21	(1,137,538)	(1,154,977)	(82,492)
Change in Assumptions	6/30/2018	22	10,343,783	10,431,580	724,547
FY18 Gain	6/30/2018	22	(12,096,419)	(12,199,094)	(847,313)
Change in Assumptions	6/30/2019	23	(14,775,890)	(14,884,472)	(1,007,300)
FY19 Loss	6/30/2019	23	3,344,559	3,369,137	228,005
Change in Assumptions	6/30/2020	24	(21,604,253)	(21,700,673)	(1,433,384)
FY20 Loss	6/30/2020	24	5,424,705	5,448,915	359,915
FY21 Gain	6/30/2021	25	(11,633,233)	(11,633,233)	(751,177)
Total				**$ 3,076,262**	**$ 2,593,806**

[1] The pension and healthcare split was done based on the ratio of unfunded actuarial accrued liability as of June 30, 2006.

Judicial Retirement System (continued)

Schedule of Past Service Cost Amortizations - Healthcare

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Unfunded Liability[1]	6/30/2002	6	$ 2,295,257	$ 1,543,274	$ 286,362
FY03/04 Loss[1]	6/30/2004	8	334,660	266,612	38,688
Revaluation of Liabilities[1]	6/30/2005	9	3,567,649	3,014,800	396,985
FY05/06 Loss[1]	6/30/2006	10	7,117,943	6,302,194	762,350
FY07 Gain	6/30/2007	11	(810,073)	(744,478)	(83,552)
Change in Assumptions	6/30/2008	12	789,072	747,387	78,456
FY08 Gain	6/30/2008	12	(14,011,596)	(13,271,372)	(1,393,151)
FY09 Loss	6/30/2009	13	901,355	873,897	86,393
Change in Assumptions	6/30/2010	14	2,006,196	1,979,505	185,360
FY10 Gain	6/30/2010	14	(1,930,656)	(1,904,968)	(178,380)
FY11 Loss	6/30/2011	15	550,376	551,115	49,124
Change in Assumptions	6/30/2012	16	353,605	357,788	30,489
FY12 Gain	6/30/2012	16	(5,516,210)	(5,581,498)	(475,626)
FY13 Loss	6/30/2013	17	226,259	230,466	18,846
Change in Assumptions	6/30/2014	18	772,305	789,275	62,139
FY14 Gain	6/30/2014	18	(3,342,464)	(3,415,915)	(268,932)
FY15 Gain	6/30/2015	19	(1,416,996)	(1,448,671)	(110,131)
Change in Method	6/30/2016	20	(3,567,789)	(3,639,291)	(267,852)
FY16 Gain	6/30/2016	20	(425,711)	(434,243)	(31,960)
FY17 Gain	6/30/2017	21	(586,113)	(595,099)	(42,504)
Change in Assumptions/ Methods/EGWP	6/30/2018	22	1,009,960	1,018,532	70,744
FY18 Gain	6/30/2018	22	(2,148,478)	(2,166,713)	(150,494)
Change in Assumptions	6/30/2019	23	126,754	127,684	8,641
FY19 Gain	6/30/2019	23	(155,028)	(156,166)	(10,568)
Change in Assumptions	6/30/2020	24	200,955	201,852	13,333
FY20 Gain	6/30/2020	24	(2,842,610)	(2,855,296)	(188,600)
FY21 Gain	6/30/2021	25	(1,754,192)	(1,754,192)	(113,271)
Total				**$ (19,963,521)**	**$ (1,227,111)**

[1] The pension and healthcare split was done based on the ratio of unfunded actuarial accrued liability as of June 30, 2006.

Judicial Retirement System (continued)

Schedule of Past Service Cost Amortizations - Total

	Amortization Period		Balances		
Layer	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Unfunded Liability	6/30/2002	6	$ 8,159,706	$ 5,486,380	$ 1,018,026
FY03/04 Loss	6/30/2004	8	1,189,728	947,816	137,537
Revaluation of Liabilities	6/30/2005	9	12,683,100	10,717,709	1,411,293
FY05/06 Loss	6/30/2006	10	25,304,501	22,404,489	2,710,177
FY07 Loss	6/30/2007	11	554,648	509,735	57,207
Change in Assumptions	6/30/2008	12	789,072	747,387	78,456
FY08 Gain	6/30/2008	12	(43,026,335)	(40,753,278)	(4,278,040)
FY09 Loss	6/30/2009	13	22,174,809	21,499,256	2,125,397
Change in Assumptions	6/30/2010	14	15,983,177	15,770,536	1,476,745
FY10 Loss	6/30/2010	14	4,544,124	4,483,671	419,849
FY11 Loss	6/30/2011	15	7,948,293	7,958,974	709,432
Change in Assumptions	6/30/2012	16	353,605	357,788	30,489
FY12 Loss	6/30/2012	16	6,400,161	6,475,905	551,843
FY13 Loss	6/30/2013	17	7,259,756	7,153,303	584,943
Change in Assumptions	6/30/2014	18	4,992,156	5,101,853	401,665
FY14 Gain	6/30/2014	18	(17,801,450)	(18,192,634)	(1,432,291)
FY15 Gain	6/30/2015	19	(4,742,702)	(4,848,719)	(368,609)
Change in Method	6/30/2016	20	(3,567,789)	(3,639,291)	(267,852)
FY16 Gain	6/30/2016	20	(10,358,334)	(10,565,924)	(777,654)
FY17 Gain	6/30/2017	21	(1,723,651)	(1,750,076)	(124,996)
Change in Assumptions/ Methods/EGWP	6/30/2018	22	11,353,743	11,450,112	795,291
FY18 Gain	6/30/2018	22	(14,244,897)	(14,365,807)	(997,807)
Change in Assumptions	6/30/2019	23	(14,649,136)	(14,756,788)	(998,659)
FY19 Loss	6/30/2019	23	3,189,531	3,212,971	217,437
Change in Assumptions	6/30/2020	24	(21,403,298)	(21,498,821)	(1,420,051)
FY20 Loss	6/30/2020	24	2,582,095	2,593,619	171,315
FY21 Gain	6/30/2021	25	(13,387,425)	(13,387,425)	(864,448)
Total				**$ (16,887,259)**	**$ 1,366,695**

Judicial Retirement System (continued)

Changes in Fair Value of Assets During FY21	Pension	Healthcare	Total
1. Fair Value of Assets as of June 30, 2020	$ 189,844,025	$ 34,036,503	$ 223,880,528
2. Additions:			
a. Employee Contributions	$ 837,686	$ 0	$ 837,686
b. Employer Contributions	6,962,607	654,383	7,616,990
c. State Contributions	5,145,000	0	5,145,000
d. Interest and Dividend Income	2,685,812	478,159	3,163,971
e. Net Appreciation / Depreciation in Fair Value of Investments	54,575,739	9,641,569	64,217,308
f. Employer Group Waiver Plan	0	168,159	168,159
g. Other	7,891	14,345	22,236
h. Total Additions	$ 70,214,735	$ 10,956,615	$ 81,171,350
3. Deductions:			
a. Medical Benefits	$ 0	$ 1,692,383	$ 1,692,383
b. Retirement Benefits	14,368,857	0	14,368,857
c. Refund of Contributions	0	0	0
d. Investment Expenses	544,884	95,170	640,054
e. Administrative Expenses	97,022	32,216	129,238
f. Total Deductions	$ 15,010,763	$ 1,819,769	$ 16,830,532
4. Fair Value of Assets as of June 30, 2021	$ 245,047,997	$ 43,173,349	$ 288,221,346
5. Approximate Fair Value Investment Return Rate during FY21 Net of Investment Expenses	30.0%	29.9%	30.0%

Judicial Retirement System (continued)

Development of Actuarial Value of Assets	Pension	Healthcare	Total
1. Investment Gain / (Loss) for FY21			
a. Fair Value of Assets as of June 30, 2020	$ 189,844,025	$ 34,036,503	$ 223,880,528
b. Contributions	12,945,293	654,383	13,599,676
c. Employer Group Waiver Plan	0	168,159	168,159
d. Benefit Payments	14,368,857	1,692,383	16,061,240
e. Administrative Expenses	97,022	32,216	129,238
f. Actual Investment Return (net of investment expenses)	56,724,558	10,038,903	66,763,461
g. Expected Return Rate (net of investment expenses)	7.38%	7.38%	7.38%
h. Expected Return, Weighted for Timing	14,104,367	2,479,200	16,583,567
i. Investment Gain / (Loss) for the Year, (f) - (h)	42,620,191	7,559,703	50,179,894
2. Actuarial Value as of June 30, 2021			
a. Fair Value as of June 30, 2021	$ 245,047,997	$ 43,173,349	$ 288,221,346
b. Deferred Investment Gain / (Loss)	29,406,799	5,289,182	34,695,981
c. Preliminary Actuarial Value at June 30, 2021, (a) - (b)	215,641,198	37,884,167	253,525,365
d. Lower Limit: 80% of Fair Value as of June 30, 2021	196,038,398	34,538,679	230,577,077
e. Upper Limit: 120% of Fair Value as of June 30, 2021	294,057,596	51,808,019	345,865,615
f. Actuarial Value as of June 30, 2021, (c) limited by (d) and (e)	$ 215,641,198	$ 37,884,167	$ 253,525,365
3. Ratio of Actuarial Value of Assets to Fair Value of Assets	88.0%	87.7%	88.0%
4. Approximate Actuarial Value Investment Return Rate during FY21 Net of Investment Expenses	11.5%	11.6%	11.5%

Judicial Retirement System (continued)

Pension				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2017	$ 7,229,597	$ 5,783,677	$ 1,445,920	$ 0
June 30, 2018	292,590	175,554	58,518	58,518
June 30, 2019	(2,647,188)	(1,058,876)	(529,437)	(1,058,875)
June 30, 2020	(6,148,327)	(1,229,665)	(1,229,665)	(3,688,997)
June 30, 2021	42,620,191	0	8,524,038	30,096,153
Total	**$ 41,346,863**	**$ 3,670,690**	**$ 8,269,374**	**$ 29,406,799**

Healthcare				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2017	$ 1,282,441	$ 1,025,952	$ 256,489	$ 0
June 30, 2018	98,500	59,100	19,700	19,700
June 30, 2019	(409,783)	(163,914)	(81,956)	(163,913)
June 30, 2020	(1,023,945)	(204,789)	(204,789)	(614,367)
June 30, 2021	7,559,703	0	1,511,941	6,047,762
Total	**$ 7,506,916**	**$ 716,349**	**$ 1,501,385**	**$ 5,289,182**

Total				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2017	$ 8,512,038	$ 6,809,629	$ 1,702,409	$ 0
June 30, 2018	391,090	234,654	78,218	78,218
June 30, 2019	(3,056,971)	(1,222,790)	(611,393)	(1,222,788)
June 30, 2020	(7,172,272)	(1,434,454)	(1,434,454)	(4,303,364)
June 30, 2021	50,179,894	0	10,035,979	40,143,915
Total	**$ 48,853,779**	**$ 4,387,039**	**$ 9,770,759**	**$ 34,695,981**

National Guard and Naval Militia Retirement System

Funded Status as of June 30		2020		2021
a.	Actuarial Accrued Liability	$ 22,417,247	$	22,975,269
b.	Valuation Assets	43,020,393		45,248,391
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ (20,603,146)	$	(22,273,122)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	191.9%		196.9%
e.	Fair Value of Assets	$ 42,095,708	$	49,813,036
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	187.8%		216.8%

Actuarial Determined Contribution Amounts		FY 2023		FY 2024
a.	Normal Cost	$ 503,140	$	503,140
b.	Administrative Expense Load	256,000		268,000
c.	Past Service Cost	(3,224,638)		(3,486,009)
d.	Total Annual Contribution, (a) + (b) + (c), not less than 0	$ 0	$	0

National Guard and Naval Militia Retirement System (continued)

Changes in Fair Value of Assets During FY21

1.	Fair Value of Assets as of June 30, 2020	$	42,095,708
2.	Additions:		
	a. Employer Contributions	$	0
	b. Investment Income		9,571,576
	c. Other		1,690
	d. Total Additions	$	9,573,266
3.	Deductions:		
	a. Retirement Benefits	$	1,454,330
	b. Investment Expenses		97,169
	c. Administrative Expenses		304,439
	d. Total Deductions	$	1,855,938
4.	Fair Value of Assets as of June 30, 2021	$	49,813,036
5.	Approximate Fair Value Investment Return Rate during FY21 Net of Investment Expenses		23.0%

National Guard and Naval Militia Retirement System (continued)

Development of Actuarial Value of Assets

1.	Investment Gain / (Loss) for FY21		
	a. Fair Value of Assets as of June 30, 2020	$	42,095,708
	b. Contributions		0
	c. Benefit Payments		1,454,330
	d. Administrative Expenses		304,439
	e. Actual Investment Return (net of investment expenses)		9,476,097
	f. Expected Return Rate (net of investment expenses)		7.00%
	g. Expected Return, Weighted for Timing		2,881,937
	h. Investment Gain / (Loss) for the Year, (e) - (g)		6,594,160
2.	Actuarial Value as of June 30, 2021		
	a. Fair Value as of June 30, 2021	$	49,813,036
	b. Deferred Investment Gain / (Loss)		4,564,645
	c. Preliminary Actuarial Value at June 30, 2021, (a) - (b)		45,248,391
	d. Lower Limit: 80% of Fair Value as of June 30, 2021		39,850,429
	e. Upper Limit: 120% of Fair Value as of June 30, 2021		59,775,643
	f. Actuarial Value as of June 30, 2021, (c) limited by (d) and (e)	$	45,248,391
3.	Ratio of Actuarial Value of Assets to Fair Value of Assets		90.8%
4.	Approximate Actuarial Value Investment Return Rate during FY21 Net of Investment Expenses		9.5%

Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2017	$ 704,309	$ 563,448	$ 140,861	$ 0
June 30, 2018	(681,054)	(408,633)	(136,211)	(136,210)
June 30, 2019	(407,413)	(162,966)	(81,483)	(162,964)
June 30, 2020	(685,847)	(137,169)	(137,169)	(411,509)
June 30, 2021	6,594,160	0	1,318,832	5,275,328
Total	**$ 5,524,155**	**$ (145,320)**	**$ 1,104,830**	**$ 4,564,645**

Actuarial Standard of Practice No. 51

Funding future retirement benefits prior to when those benefits become due involves assumptions regarding future economic and demographic experience. These assumptions are applied to calculate actuarial liabilities, current contribution requirements, and the funded status of the plans. However, to the extent future experience deviates from the assumptions used, variations will occur in these calculated values. These variations create risk to the plans. Understanding the risks to the funding of the plans is important.

Actuarial Standard of Practice No. 51 (ASOP 51)[1] requires certain disclosures of potential risks to the plans and provides useful information for intended users of actuarial reports that determine plan contributions or evaluate the adequacy of specified contribution levels to support benefit provisions.

Under ASOP 51, risk is defined as the potential of actual future measurements deviating from expected future measurements resulting from actual future experience deviating from actuarially assumed experience.

It is important to note that not all risk is negative, but all risk should be understood and accepted based on knowledge, judgement, and educated decisions. Future measurements may deviate in ways that produce positive or negative financial impacts to the plan.

In the actuary's professional judgment, the following risks may reasonably be anticipated to significantly affect the pension plans' future financial condition and contribution requirements.

- Investment Risk – potential that the investment return will be different than the return expected in the actuarial valuation (7.38% for JRS and 7.00% for NGNMRS)
- Contribution Risk – potential that the contribution actually made will be different than the actuarially determined contribution
- Long-Term Return on Investment Risk – potential that changes in long-term capital market assumptions or the plan's asset allocation will create the need to update the long-term return on investment assumption
- Longevity Risk – potential that participants live longer than expected compared to the valuation mortality assumptions
- Salary Increase Risk[2] – potential that future salaries will be different than expected in the actuarial valuation
- Inflation Risk[2] – potential that the consumer price index (CPI) for urban wage earners and clerical workers for Anchorage is different than the 2.5% inflation rate assumed in the valuation
- Other Demographic Risk – potential that other demographic experience will be different than expected

The following information is provided to comply with ASOP 51 and furnish beneficial information on potential risks to the plan. **This list is not all-inclusive**; it is an attempt to identify the more significant risks and how those risks might affect the results shown in this report.

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[1] ASOP 51 does not apply to the healthcare portion of JRS. Accordingly, all comments in this section relate to the pension portion of JRS.

[2] Salary increase risk and inflation risk apply to JRS only.

Note that ASOP 51 does not require the actuary to evaluate the ability or willingness of the plan sponsor to make contributions to the plans when due, or to assess the likelihood or consequences of potential future changes in law. In addition, this valuation report is not intended to provide investment advice or to provide guidance on the management or reduction of risk.

Assessment of Risks

Investment Risk

Plan costs are very sensitive to the market return.

- Any return on assets lower than assumed will increase costs.
- The plans use an actuarial value of assets that smooths gains and losses on market returns over a five-year period to help control some of the volatility in costs due to investment risk.
- Historical experience of actual returns is shown in Section 2.5 (JRS) and Section 2.4 (NGNMRS) of the June 30, 2020 reports dated May 20, 2021. This historical experience illustrates how returns can vary over time.

Contribution Risk

There is a risk to the plans when the employer's and/or State's actual contribution amount and the actuarially determined contribution differ.

- If the actual contributions are lower than the actuarially determined contributions, the plans may not be sustainable in the long term.
- Any underpayment of the contribution will increase future contribution amounts to help pay off the additional Unfunded Actuarial Accrued Liability associated with the underpayment(s).
- As long as the Board consistently adopts the actuarially determined contributions, this risk is mitigated due to Alaska statutes requiring the State to contribute additional funds necessary to pay the total contributions adopted by the Board.

Long-Term Return on Investment Risk

Inherent in the long-term return on investment assumption is the expectation that the current rate will be used until the last benefit payment of the plan is made. There is a risk that sustained changes in economic conditions, changes in long-term future capital market assumptions, or changes to the plans' asset allocations will necessitate an update to the long-term return on investment assumption used.

- Under a lower long-term return on investment assumption, less investment return is available to pay plan benefits. This may lead to a need for increased employer contributions.
- The liabilities will be higher at a lower assumed rate of return because future benefits will have a lower discount rate applied when calculating the present value.
- A 1% decrease in the long-term return on investment assumption will increase the actuarial accrued liability by approximately 11% for JRS and 9% for NGNMRS.

Longevity Risk

Plan costs will be increased as participants are expected to live longer.

- Benefits are paid over a longer lifetime when life expectancy is expected to increase. The longer duration of payments leads to higher liabilities.
- Health care has been improving, which affects the life expectancy of participants. As health care improves, leading to longer life expectancies, costs to the plans could increase.
- The mortality assumptions for the plans mitigates this risk by assuming future improvements in mortality. However, any improvement in future mortality greater than that expected by the current mortality assumptions would lead to increased costs for the plans.

JRS provides cost-of-living adjustments on retirement benefits (based on salary changes of sitting judges) that increase longevity risk, because members who live longer than expected will incur more benefit payment increases than expected and therefore increase costs.

Salary Increase Risk[1]

Plan costs will be increased if actual salary increases are larger than expected.

- Higher-than-expected salary increases will produce higher benefits.
- The higher benefits may be partially offset by increased employee contributions due to higher salaries.
- If future payroll grows at a rate different than assumed, contributions as a percentage of payroll will be affected.

Inflation Risk[1]

Inflation risk may be associated with the interaction of inflation with other assumptions, but this is not significant as a standalone assumption, and therefore is considered as part of the associated assumption risk instead of being discussed here.

Other Demographic Risk

The plans are subject to risks associated with other demographic assumptions (e.g., retirement and termination rates). Differences between actual and expected experience for these assumptions tend to have less impact on the overall costs of the plans. The demographic assumptions used in the valuations are re-evaluated regularly as part of the four-year experience studies to ensure the assumptions are consistent with long-term expectations.

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[1] Salary increase risk and inflation risk apply to JRS only.

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State of Alaska Retirement Systems

Presentation to the Alaska Retirement Management Board (ARMB) Actuarial Committee

Experience Study Recap

June 15, 2022

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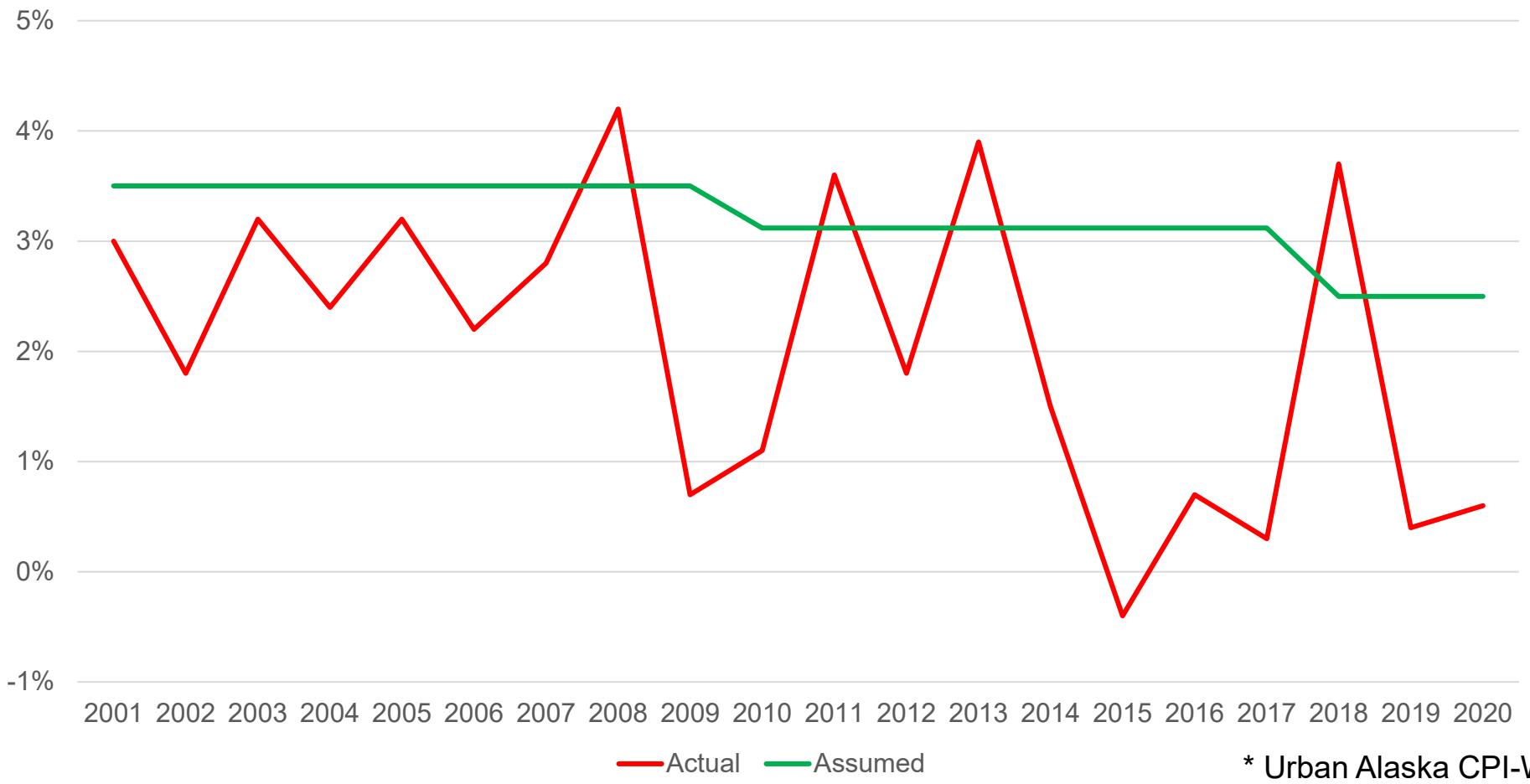
*Asset returns for fiscal years prior to 2005 are based on figures in Mercer's valuation reports stored on the DRB website.

20-Year Historical Data (2001-2020)

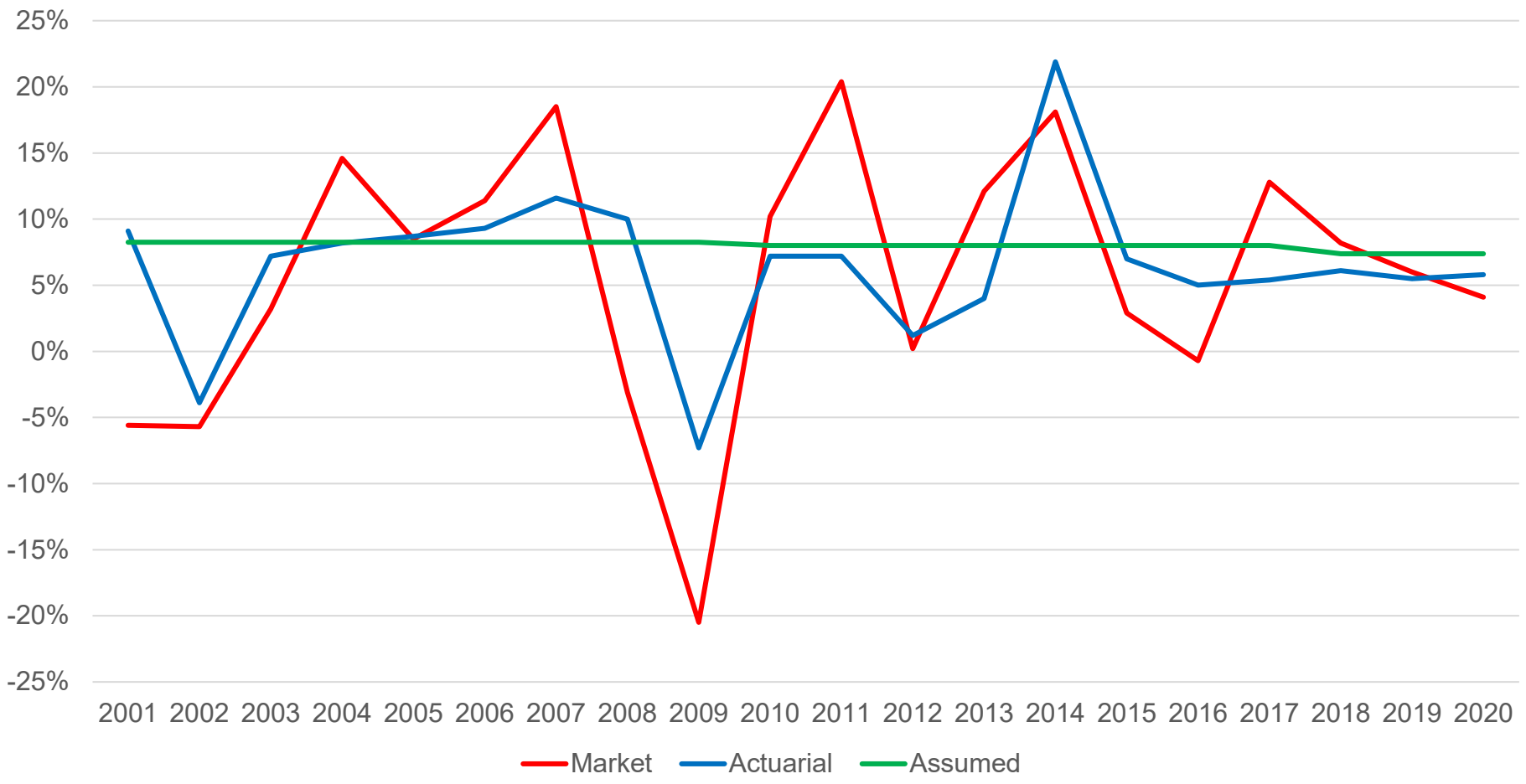
20-Year Historical Data: Inflation*



- Assumed Inflation
  - 2001-2009: 3.50%
  - 2010-2017: 3.12%
  - 2018-2020: 2.50%
- 20-year compound average
  - actual: 2.0%
  - assumed: 3.2%
- Actual was greater than assumed in only 4 of past 20 years

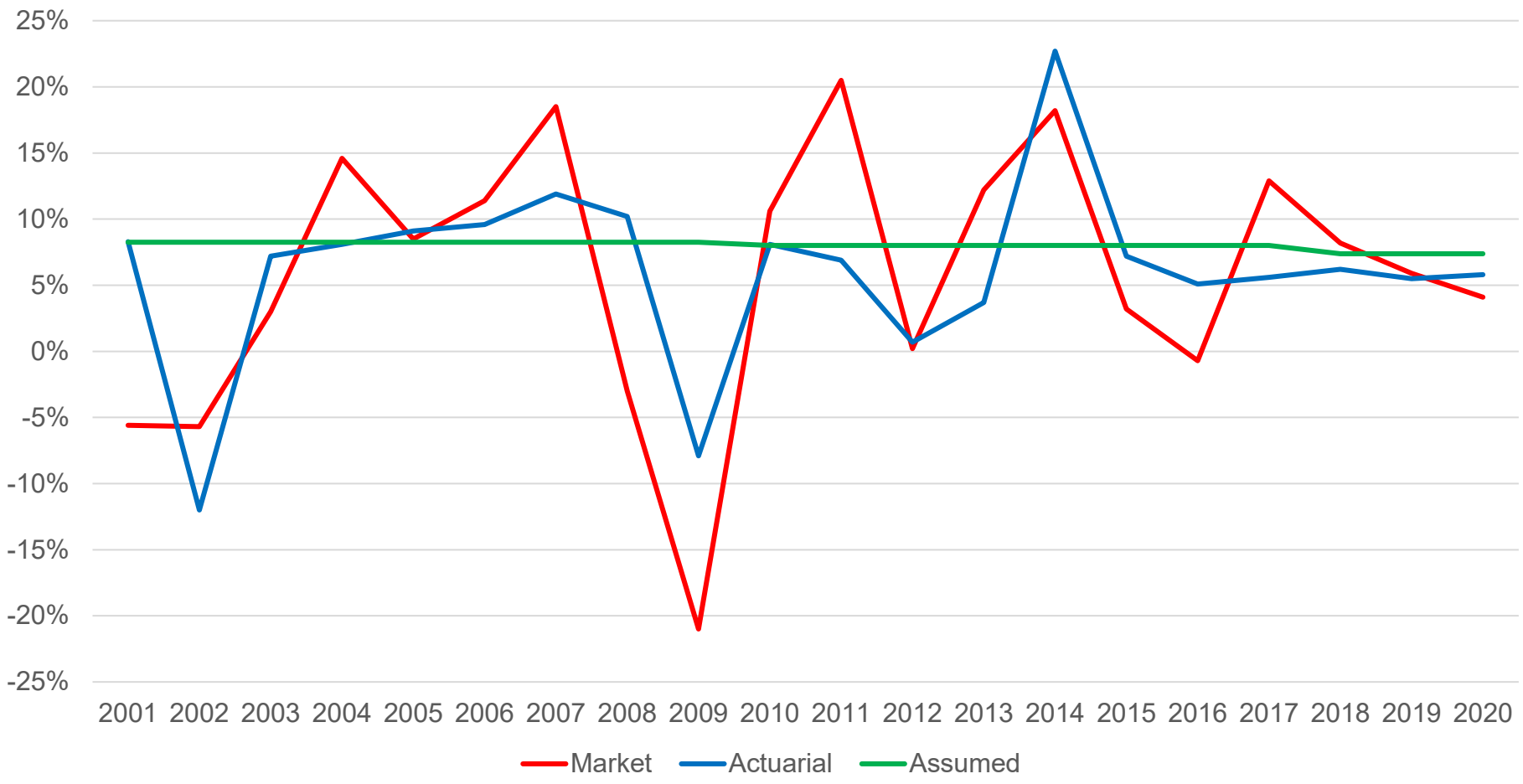
* Urban Alaska CPI-W (1982-1984 = 100)

20-Year Historical Data: Asset Returns – PERS



- Assumed Return
  - 2001-2009: 8.25%
  - 2010-2017: 8.00%
  - 2018-2020: 7.38%
- 20-year compound average
  - market: 5.3%
  - actuarial: 6.3%
  - assumed: 8.0%

20-Year Historical Data: Asset Returns – TRS



- Assumed Return
  - 2001-2009: 8.25%
  - 2010-2017: 8.00%
  - 2018-2020: 7.38%
- 20-year compound average
  - market: 5.3%
  - actuarial: 5.9%
  - assumed: 8.0%

Proposed Assumption Scenarios and Key Metrics

Experience Study – What Have We Done So Far?

- Current study is based on 4 years of experience – 7/1/17 to 6/30/21
- New assumptions adopted by the ARMB will be used beginning with the 2022 valuations
- Economic assumptions were discussed at the December 2021 and March 2022 meetings, and the May 2022 teleconference
- Demographic assumptions were discussed at the March 2022 meeting
- Slides 9 (PERS) and 10 (TRS) summarize the two scenarios (Proposed #1 and Proposed #2) that were discussed in May 2022; Proposed #3 has been added as requested by DOR
- The Appendix contains a summary of the current and proposed economic and demographic assumptions

Summary of Proposed Assumptions and Key Metrics - PERS

	Current	Proposed #1	Proposed #2	Proposed #3
Inflation Rate	2.50%	2.25%	2.50%	2.50%
Nominal Return on Assets	7.38%	7.00%	7.25%	7.00%
Real Rate of Return	4.88%	4.75%	4.75%	4.50%
Payroll Growth Rate	2.75%	2.50%	2.75%	2.75%
Salary Increase Rates	See Appendix	See Appendix	See Appendix	Same as Proposed #2
Healthcare Trend Rates	See Appendix	See Appendix	See Appendix	Same as Proposed #2
Demographic Assumptions	See Appendix	See Appendix	Same as Proposed #1	Same as Proposed #1
Unfunded Actuarial Accrued Liability 6/30/20				
• Pension	5,566	5,954	5,808	6,224
• Healthcare	(953)	(955)	(1,050)	(856)
• Total	4,613	4,999	4,757	5,368
Funded Ratio 6/30/20				
• Pension	63.6%	62.0%	62.6%	60.9%
• Healthcare	113.5%	113.6%	115.1%	112.0%
• Total	79.3%	78.0%	78.8%	76.7%
State/Employer Contribution Rate 6/30/20*	24.11%	25.17%	24.56%	25.87%

*as a percentage of projected DB/DCR pay

Notes:

1. Unfunded Actuarial Accrued Liability is in $M's.
2. Funded Ratio is Actuarial Value of Assets divided by Actuarial Accrued Liability.
3. Figures may not add due to rounding.

Summary of Proposed Assumptions and Key Metrics - TRS

	Current	Proposed #1	Proposed #2	Proposed #3
Inflation Rate	2.50%	2.25%	2.50%	2.50%
Nominal Return on Assets	7.38%	7.00%	7.25%	7.00%
Real Rate of Return	4.88%	4.75%	4.75%	4.50%
Payroll Growth Rate	2.75%	2.50%	2.75%	2.75%
Salary Increase Rates	See Appendix	See Appendix	See Appendix	Same as Proposed #2
Healthcare Trend Rates	See Appendix	See Appendix	See Appendix	Same as Proposed #2
Demographic Assumptions	See Appendix	See Appendix	Same as Proposed #1	Same as Proposed #1
Unfunded Actuarial Accrued Liability 6/30/20				
• Pension	1,860	2,084	2,017	2,214
• Healthcare	(532)	(483)	(518)	(445)
• Total	1,328	1,601	1,498	1,769
Funded Ratio 6/30/20				
• Pension	75.0%	72.8%	73.5%	71.6%
• Healthcare	121.4%	119.0%	120.7%	117.3%
• Total	86.6%	84.3%	85.2%	83.0%
State/Employer Contribution Rate 6/30/20*	25.03%	27.21%	26.42%	28.32%

*as a percentage of projected DB/DCR pay

Notes:

1. Unfunded Actuarial Accrued Liability is in $M's.
2. Funded Ratio is Actuarial Value of Assets divided by Actuarial Accrued Liability.
3. Figures may not add due to rounding.

Appendix

Current vs Proposed Assumptions – Economic

PERS/TRS/JRS

	Current	Proposed #1	Proposed #2
Nominal Return, net of investment expenses	7.38%	7.00%	7.25%
Inflation Rate	2.50%	2.25%	2.50%
Real Rate of Return (nominal return less inflation)	4.88%	4.75%	4.75%
Payroll Growth Rate (inflation plus 25 bp)	2.75%	2.50%	2.75%

NGNMRS

	Current	Proposed #1	Proposed #2
Nominal Return, net of investment expenses	7.00%	5.75%	5.75%
Inflation Rate	2.50%	2.25%	2.50%
Real Rate of Return (nominal return less inflation)	4.50%	3.50%	3.25%

Current vs Proposed Assumptions – Economic (cont'd)

Salary Increase Rates

PERS/PERS DCR – Peace/Fire

Service	Current	Proposed #1 / #2
0	7.75%	8.25% / 8.50%
1	7.25%	7.50% / 7.75%
2	6.75%	7.00% / 7.25%
3	6.25%	6.75% / 7.00%
4	5.75%	6.50% / 6.75%
5	5.25%	6.00% / 6.25%
6	4.75%	5.50% / 5.75%
7	4.25%	5.25% / 5.50%
8	3.75%	5.00% / 5.25%
9	3.65%	4.80% / 5.05%

Service	Current	Proposed #1 / #2
10	3.55%	4.70% / 4.95%
11	3.45%	4.60% / 4.85%
12	3.35%	4.50% / 4.75%
13	3.25%	4.40% / 4.65%
14	3.15%	4.30% / 4.55%
15	3.05%	4.20% / 4.45%
16	2.95%	4.10% / 4.35%
17	2.85%	4.00% / 4.25%
18	2.75%	3.80% / 4.05%
19	2.75%	3.80% / 4.05%
20+	2.75%	3.60% / 3.85%

PERS/PERS DCR - Others

Service	Current	Proposed #1 / #2
0	6.75%	6.50% / 6.75%
1	6.25%	5.75% / 6.00%
2	5.75%	5.25% / 5.50%
3	5.25%	4.75% / 5.00%
4	4.75%	4.50% / 4.75%
5	4.25%	4.00% / 4.25%
6	3.75%	3.80% / 4.05%
7	3.65%	3.70% / 3.95%
8	3.55%	3.50% / 3.75%
9	3.45%	3.30% / 3.55%

Service	Current	Proposed #1 / #2
10	3.35%	3.20% / 3.45%
11	3.25%	3.00% / 3.25%
12	3.15%	2.85% / 3.10%
13	3.05%	2.80% / 3.05%
14	2.95%	2.75% / 3.00%
15	2.85%	2.70% / 2.95%
16	2.75%	2.65% / 2.90%
17+	2.75%	2.60% / 2.85%

Current vs Proposed Assumptions – Economic (cont'd)

Salary Increase Rates (cont'd)

TRS

Service	Current	Proposed #1 / #2
0	6.75%	6.75% / 7.00%
1	6.25%	6.25% / 6.50%
2	5.75%	5.75% / 6.00%
3	5.25%	5.50% / 5.75%
4	4.75%	5.25% / 5.50%
5	4.25%	5.00% / 5.25%
6	3.75%	4.75% / 5.00%
7	3.65%	4.50% / 4.75%
8	3.55%	4.25% / 4.50%
9	3.45%	4.00% / 4.25%
10	3.35%	3.75% / 4.00%

Service	Current	Proposed #1 / #2
11	3.25%	3.50% / 3.75%
12	3.15%	3.25% / 3.50%
13	3.05%	3.20% / 3.45%
14	2.95%	3.10% / 3.35%
15	2.85%	3.00% / 3.25%
16	2.75%	2.90% / 3.15%
17	2.75%	2.80% / 3.05%
18	2.75%	2.75% / 3.00%
19	2.75%	2.70% / 2.95%
20+	2.75%	2.60% / 2.85%

TRS DCR

Service	Current	Proposed #1 / #2
0	6.75%	7.00% / 7.25%
1	6.25%	6.50% / 6.75%
2	5.75%	6.00% / 6.25%
3	5.25%	5.50% / 5.75%
4	4.75%	5.00% / 5.25%
5	4.25%	4.75% / 5.00%
6	3.75%	4.50% / 4.75%
7	3.65%	4.25% / 4.50%
8	3.55%	4.00% / 4.25%
9	3.45%	3.75% / 4.00%
10	3.35%	3.50% / 3.75%

Service	Current	Proposed #1 / #2
11	3.25%	3.25% / 3.50%
12	3.15%	3.00% / 3.25%
13	3.05%	2.80% / 3.05%
14	2.95%	2.75% / 3.00%
15	2.85%	2.70% / 2.95%
16	2.75%	2.65% / 2.90%
17	2.75%	2.60% / 2.85%
18+	2.75%	2.60% / 2.85%

JRS

Current: 0% per year through FY24, 3.62% per year thereafter

Proposed #1: 0% per year through FY24, 2.75% per year thereafter

Proposed #2: 0% per year through FY24, 3.00% per year thereafter

Current vs Proposed Assumptions – Economic (cont'd)

Healthcare Trend Rates

Current

Fiscal Year	Medical Pre-65	Medical Post-65	Prescription Drugs / EGWP
2022	6.30%	5.40%	7.10%
2023	6.10%	5.40%	6.80%
2024	5.90%	5.40%	6.40%
2025	5.80%	5.40%	6.10%
2026	5.60%	5.40%	5.70%
2027-2040	5.40%	5.40%	5.40%
2041	5.30%	5.30%	5.30%
2042	5.20%	5.20%	5.20%
2043	5.10%	5.10%	5.10%
2044	5.10%	5.10%	5.10%
2045	5.00%	5.00%	5.00%
2046	4.90%	4.90%	4.90%
2047	4.80%	4.80%	4.80%
2048	4.70%	4.70%	4.70%
2049	4.60%	4.60%	4.60%
2050+	4.50%	4.50%	4.50%

Current vs Proposed Assumptions – Economic (cont'd)

Healthcare Trend Rates

Proposed #1

Fiscal Year	Medical Pre-65	Medical Post-65	Prescription Drugs / EGWP
2022	6.30%	5.40%	7.10%
2023	7.00%	5.50%	7.50%
2024	6.70%	5.50%	7.20%
2025	6.40%	5.40%	6.90%
2026	6.15%	5.35%	6.60%
2027	5.95%	5.30%	6.30%
2028	5.70%	5.20%	5.95%
2029	5.50%	5.15%	5.65%
2030	5.25%	5.10%	5.35%
2031-2038	5.05%	5.05%	5.05%
2039	5.00%	5.00%	5.00%
2040	4.95%	4.95%	4.95%
2041	4.85%	4.85%	4.85%
2042	4.80%	4.80%	4.80%
2043	4.70%	4.70%	4.70%
2044	4.65%	4.65%	4.65%
2045	4.55%	4.55%	4.55%
2046	4.50%	4.50%	4.50%
2047	4.45%	4.45%	4.45%
2048	4.35%	4.35%	4.35%
2049	4.30%	4.30%	4.30%
2050+	4.25%	4.25%	4.25%

Proposed #2

Fiscal Year	Medical Pre-65	Medical Post-65	Prescription Drugs / EGWP
2022	6.30%	5.40%	7.10%
2023	7.00%	5.50%	7.50%
2024	6.70%	5.50%	7.20%
2025	6.40%	5.40%	6.90%
2026	6.20%	5.40%	6.65%
2027	6.05%	5.35%	6.35%
2028	5.85%	5.35%	6.10%
2029	5.65%	5.30%	5.80%
2030	5.45%	5.30%	5.55%
2031-2038	5.30%	5.30%	5.30%
2039	5.25%	5.25%	5.25%
2040	5.20%	5.20%	5.20%
2041	5.10%	5.10%	5.10%
2042	5.05%	5.05%	5.05%
2043	4.95%	4.95%	4.95%
2044	4.90%	4.90%	4.90%
2045	4.80%	4.80%	4.80%
2046	4.75%	4.75%	4.75%
2047	4.70%	4.70%	4.70%
2048	4.60%	4.60%	4.60%
2049	4.55%	4.55%	4.55%
2050+	4.50%	4.50%	4.50%

The trend rates for the 6/30/21 valuations are not being changed.

The proposed assumptions illustrate the trend rates reflecting ultimate rates of either 4.25% (Proposed #1) or 4.50% (Proposed #2). Short-term trend rates were also adjusted based on market survey data and recent experience.

Current vs Proposed Assumptions – Demographic

Pre-Commencement Mortality

Plan	Current Assumption		Proposed Assumption	
	Base Table	Mortality Improvement	Base Table[1]	Mortality Improvement
PERS and PERS DCR				
- Peace/Fire	RP-2014	MP-2017	Pub-2010 Safety	MP-2021[2]
- Others	RP-2014	MP-2017	Pub-2010 General	MP-2021[2]
TRS and TRS DCR	RP-2014 White Collar	MP-2017	Pub-2010 Teachers	MP-2021[2]
JRS	RP-2014 White Collar	MP-2017	Pub-2010 General Above-Median[3]	MP-2021[2]
NGNMRS	RP-2014	MP-2017	Pub-2010 Safety	MP-2021[2]

1. Amount-weighted version for pension, headcount-weighted version for healthcare.
2. We propose annually updating the mortality improvement scale to the most recently-published scale as of the valuation date. The MP-2021 scale was published in October 2021.
3. Above-Median Income table based on salary of the active participant.

Current vs Proposed Assumptions – Demographic (cont'd)

Post-Commencement Mortality (Pension)

Plan	Current Assumption		Proposed Assumption - Pension	
	Base Table	Mortality Improvement	Base Table[1]	Mortality Improvement
PERS and PERS DCR				
- Peace/Fire	RP-2014 (91% male, 96% female)	MP-2017	Pub-2010 Safety (100% male, 100% female)	MP-2021[2]
- Others	RP-2014 (91% male, 96% female)	MP-2017	Pub-2010 General (98% male, 106% female)	MP-2021[2]
TRS and TRS DCR	RP-2014 White Collar (93% male, 90% female)	MP-2017	Pub-2010 Teachers (97% male, 97% female)	MP-2021[2]
JRS	RP-2014 White Collar (93% male, 90% female)	MP-2017	Pub-2010 General Above-Median[3]	MP-2021[2]
NGNMRS	RP-2014 (91% male, 96% female)	MP-2017	Pub-2010 Safety (100% male, 100% female)	MP-2021[2]

1. Amount-weighted version. For beneficiaries, Contingent Annuitant table will be used with adjusted rates (not shown here) based on experience and partial credibility.
2. We propose annually updating the mortality improvement scale to the most recently-published scale as of the valuation date. The MP-2021 scale was published in October 2021.
3. Above-Median Income table based on benefit of the retired participant.

Current vs Proposed Assumptions – Demographic (cont'd)

Post-Commencement Mortality (Healthcare)

Plan	Current Assumption		Proposed Assumption - Healthcare	
	Base Table	Mortality Improvement	Base Table[1]	Mortality Improvement
PERS and PERS DCR				
- Peace/Fire	RP-2014 (91% male, 96% female)	MP-2017	Pub-2010 Safety (100% male, 100% female)	MP-2021[2]
- Others	RP-2014 (91% male, 96% female)	MP-2017	Pub-2010 General (101% male, 110% female)	MP-2021[2]
TRS and TRS DCR	RP-2014 White Collar (93% male, 90% female)	MP-2017	Pub-2010 Teachers (98% male, 100% female)	MP-2021[2]
JRS	RP-2014 White Collar (93% male, 90% female)	MP-2017	Pub-2010 General Above-Median[3]	MP-2021[2]

1. Headcount-weighted version. For beneficiaries, Contingent Annuitant table will be used with adjusted rates (not shown here) based on experience and partial credibility.
2. We propose annually updating the mortality improvement scale to the most recently-published scale as of the valuation date. The MP-2021 scale was published in October 2021.
3. Above-Median Income table based on benefit of the retired participant.

Current vs Proposed Assumptions – Demographic (cont'd)

Retirement – PERS Peace/Fire

Current

	Reduced		Unreduced	
Age	Male	Female	Male	Female
< 47	N/A	N/A	8.80%	6.00%
47	N/A	N/A	8.80%	15.00%
48	N/A	N/A	14.30%	15.00%
49	N/A	N/A	14.30%	15.00%
50	5.00%	5.00%	16.50%	15.00%
51	5.00%	7.00%	16.50%	15.00%
52	7.00%	7.00%	20.35%	15.00%
53	7.00%	7.00%	20.35%	15.00%
54	7.00%	35.00%	20.35%	25.00%
55	7.00%	8.00%	27.50%	20.00%
56	7.00%	8.00%	27.50%	15.00%
57	7.00%	8.00%	27.50%	15.00%
58	7.00%	8.00%	27.50%	15.00%
59	20.00%	20.00%	27.50%	15.00%
60	N/A	N/A	33.00%	25.00%
61	N/A	N/A	27.50%	20.00%
62	N/A	N/A	27.50%	30.00%
63	N/A	N/A	27.50%	50.00%
64	N/A	N/A	22.00%	50.00%
65	N/A	N/A	22.00%	50.00%
66	N/A	N/A	27.50%	50.00%
67	N/A	N/A	55.00%	50.00%
68	N/A	N/A	55.00%	50.00%
69	N/A	N/A	55.00%	50.00%
70+	N/A	N/A	100.00%	100.00%

Proposed

	Reduced		Unreduced	
Age	Male	Female	Male	Female
< 47	N/A	N/A	9.00%	7.50%
47	N/A	N/A	13.00%	18.50%
48	N/A	N/A	13.00%	18.50%
49	N/A	N/A	13.00%	18.50%
50	5.00%	5.00%	20.00%	21.00%
51	5.00%	5.00%	20.00%	21.00%
52	7.00%	7.00%	20.00%	21.00%
53	7.00%	7.00%	20.00%	21.00%
54	7.00%	7.00%	20.00%	21.00%
55	7.50%	7.50%	29.00%	20.00%
56	7.50%	7.50%	29.00%	20.00%
57	7.50%	7.50%	29.00%	20.00%
58	7.50%	7.50%	29.00%	20.00%
59	20.00%	20.00%	29.00%	20.00%
60	N/A	N/A	29.00%	31.50%
61	N/A	N/A	29.00%	31.50%
62	N/A	N/A	29.00%	31.50%
63	N/A	N/A	29.00%	31.50%
64	N/A	N/A	29.00%	31.50%
65	N/A	N/A	45.00%	45.00%
66	N/A	N/A	45.00%	45.00%
67	N/A	N/A	45.00%	45.00%
68	N/A	N/A	45.00%	45.00%
69	N/A	N/A	45.00%	45.00%
70+	N/A	N/A	100.00%	100.00%

Current vs Proposed Assumptions – Demographic (cont'd)

Retirement – PERS Others

Current

	Reduced		Unreduced	
Age	Male	Female	Male	Female
< 50	N/A	N/A	11.00%	11.00%
50	6.00%	8.00%	33.00%	38.50%
51	6.00%	8.00%	35.75%	38.50%
52	9.00%	8.00%	35.75%	38.50%
53	6.00%	8.00%	35.75%	38.50%
54	20.00%	15.00%	38.50%	38.50%
55	6.00%	6.00%	33.00%	33.00%
56	6.00%	6.00%	22.00%	22.00%
57	6.00%	6.00%	22.00%	19.80%
58	6.00%	6.00%	22.00%	19.80%
59	15.00%	20.00%	22.00%	19.80%
60	N/A	N/A	22.00%	23.10%
61	N/A	N/A	22.00%	22.00%
62	N/A	N/A	22.00%	22.00%
63	N/A	N/A	22.00%	22.00%
64	N/A	N/A	22.00%	22.00%
65	N/A	N/A	24.75%	28.60%
66	N/A	N/A	27.50%	28.60%
67	N/A	N/A	22.00%	24.20%
68	N/A	N/A	24.75%	24.20%
69	N/A	N/A	27.50%	24.20%
70	N/A	N/A	27.50%	24.20%
71	N/A	N/A	27.50%	24.20%
72	N/A	N/A	27.50%	27.50%
73	N/A	N/A	27.50%	27.50%
74	N/A	N/A	27.50%	38.50%
75	N/A	N/A	55.00%	55.00%
76	N/A	N/A	55.00%	55.00%
77	N/A	N/A	55.00%	55.00%
78	N/A	N/A	55.00%	55.00%
79	N/A	N/A	55.00%	55.00%
80+	N/A	N/A	100.00%	100.00%

Proposed

	Reduced		Unreduced	
Age	Male	Female	Male	Female
< 50	N/A	N/A	11.50%	11.50%
50	7.00%	8.50%	37.50%	40.50%
51	7.00%	8.50%	37.50%	40.50%
52	11.00%	8.50%	37.50%	40.50%
53	11.00%	8.50%	37.50%	40.50%
54	24.00%	16.50%	37.50%	40.50%
55	7.00%	6.50%	25.50%	24.00%
56	7.00%	6.50%	25.50%	24.00%
57	7.00%	6.50%	25.50%	24.00%
58	7.00%	6.50%	25.50%	24.00%
59	18.00%	22.00%	25.50%	24.00%
60	N/A	N/A	26.50%	24.50%
61	N/A	N/A	26.50%	24.50%
62	N/A	N/A	26.50%	24.50%
63	N/A	N/A	26.50%	24.50%
64	N/A	N/A	26.50%	24.50%
65	N/A	N/A	30.50%	28.50%
66	N/A	N/A	30.50%	28.50%
67	N/A	N/A	30.50%	28.50%
68	N/A	N/A	30.50%	28.50%
69	N/A	N/A	30.50%	28.50%
70	N/A	N/A	27.50%	27.50%
71	N/A	N/A	27.50%	27.50%
72	N/A	N/A	27.50%	27.50%
73	N/A	N/A	27.50%	27.50%
74	N/A	N/A	27.50%	27.50%
75	N/A	N/A	50.00%	50.00%
76	N/A	N/A	50.00%	50.00%
77	N/A	N/A	50.00%	50.00%
78	N/A	N/A	50.00%	50.00%
79	N/A	N/A	50.00%	50.00%
80+	N/A	N/A	100.00%	100.00%

Current vs Proposed Assumptions – Demographic (cont'd)

Retirement – TRS

Current

	Reduced		Unreduced	
Age	Male	Female	Male	Female
< 45	N/A	N/A	3.0%	3.0%
45	N/A	N/A	5.0%	5.0%
46	N/A	N/A	5.0%	8.0%
47	N/A	N/A	5.0%	8.0%
48	N/A	N/A	5.0%	8.0%
49	N/A	N/A	5.0%	8.0%
50	10.0%	10.0%	5.0%	14.0%
51	10.0%	10.0%	8.0%	13.0%
52	10.0%	10.0%	15.0%	13.0%
53	10.0%	12.0%	15.0%	14.0%
54	10.0%	12.0%	15.0%	15.0%
55	15.0%	8.0%	20.0%	17.0%
56	10.0%	8.0%	17.0%	17.0%
57	10.0%	8.0%	15.0%	17.0%
58	10.0%	8.0%	20.0%	17.0%
59	10.0%	8.0%	20.0%	23.0%
60	N/A	N/A	25.0%	23.0%
61	N/A	N/A	18.0%	23.0%
62	N/A	N/A	18.0%	21.0%
63	N/A	N/A	18.0%	21.0%
64	N/A	N/A	18.0%	26.0%
65	N/A	N/A	30.0%	21.0%
66	N/A	N/A	25.0%	21.0%
67	N/A	N/A	25.0%	21.0%
68	N/A	N/A	25.0%	26.0%
69	N/A	N/A	35.0%	26.0%
70	N/A	N/A	30.0%	26.0%
71	N/A	N/A	30.0%	37.0%
72	N/A	N/A	30.0%	37.0%
73	N/A	N/A	30.0%	37.0%
74	N/A	N/A	30.0%	37.0%
75 - 79	N/A	N/A	50.0%	50.0%
80+	N/A	N/A	100.0%	100.0%

Proposed

	Reduced		Unreduced	
Age	Male	Female	Male	Female
< 45	N/A	N/A	3.00%	3.00%
45	N/A	N/A	5.50%	7.00%
46	N/A	N/A	5.50%	7.00%
47	N/A	N/A	5.50%	7.00%
48	N/A	N/A	5.50%	7.00%
49	N/A	N/A	5.50%	7.00%
50	5.00%	5.00%	12.50%	13.00%
51	5.00%	5.00%	12.50%	13.00%
52	5.00%	10.00%	12.50%	13.00%
53	5.00%	5.00%	12.50%	13.00%
54	10.00%	5.00%	12.50%	13.00%
55	14.50%	11.00%	20.00%	17.50%
56	9.50%	11.00%	20.00%	17.50%
57	9.50%	11.00%	20.00%	17.50%
58	9.50%	11.00%	20.00%	17.50%
59	9.50%	11.00%	20.00%	17.50%
60	N/A	N/A	19.50%	23.50%
61	N/A	N/A	19.50%	23.50%
62	N/A	N/A	19.50%	23.50%
63	N/A	N/A	19.50%	23.50%
64	N/A	N/A	19.50%	23.50%
65	N/A	N/A	28.00%	23.50%
66	N/A	N/A	28.00%	23.50%
67	N/A	N/A	28.00%	23.50%
68	N/A	N/A	28.00%	23.50%
69	N/A	N/A	28.00%	23.50%
70	N/A	N/A	30.00%	36.00%
71	N/A	N/A	30.00%	36.00%
72	N/A	N/A	30.00%	36.00%
73	N/A	N/A	30.00%	36.00%
74	N/A	N/A	30.00%	36.00%
75 - 79	N/A	N/A	50.00%	50.00%
80+	N/A	N/A	100.00%	100.00%

Current vs Proposed Assumptions – Demographic (cont'd)

Retirement – PERS DCR

Current

Age	Rate
< 55	2.0%
55	3.0%
56	3.0%
57	3.0%
58	3.0%
59	3.0%
60	5.0%
61	5.0%
62	10.0%
63	5.0%
64	5.0%
65	25.0%
66	25.0%
67	25.0%
68	20.0%
69	20.0%
70+	100.0%

Proposed

Age	Rate
< 55	2.0%
55	3.0%
56	3.0%
57	3.0%
58	3.0%
59	3.0%
60	5.0%
61	5.0%
62	10.0%
63	5.0%
64	5.0%
65	25.0%
66	25.0%
67	25.0%
68	20.0%
69	20.0%
70+	100.0%

Retirement – TRS DCR

Current

Age	Rate
< 55	2.0%
55	3.0%
56	3.0%
57	3.0%
58	3.0%
59	3.0%
60	5.0%
61	5.0%
62	10.0%
63	5.0%
64	5.0%
65	25.0%
66	25.0%
67	25.0%
68	20.0%
69	20.0%
70+	100.0%

Proposed

Age	Rate
< 55	2.0%
55	3.0%
56	3.0%
57	3.0%
58	3.0%
59	3.0%
60	5.0%
61	5.0%
62	10.0%
63	5.0%
64	5.0%
65	25.0%
66	25.0%
67	25.0%
68	20.0%
69	20.0%
70+	100.0%

Current vs Proposed Assumptions – Demographic (cont'd)

Retirement – NGNMRS

Current

Age	Male	Female
< 51	13.00%	13.00%
51	13.00%	13.00%
52	13.00%	13.00%
53	15.00%	15.00%
54	20.00%	20.00%
55	25.00%	25.00%
56	35.00%	35.00%
57	40.00%	40.00%
58	45.00%	45.00%
59	50.00%	50.00%
60	55.00%	55.00%
61	60.00%	60.00%
62	60.00%	60.00%
63	60.00%	60.00%
64	60.00%	60.00%
65+	100.00%	100.00%

Proposed

Age	Male	Female
< 51	15.34%	18.20%
51	15.34%	18.20%
52	15.34%	18.20%
53	17.70%	21.00%
54	23.60%	28.00%
55	18.50%	16.25%
56	25.90%	22.75%
57	29.60%	26.00%
58	33.30%	29.25%
59	37.00%	32.50%
60	40.70%	35.75%
61	44.40%	35.75%
62	44.40%	35.75%
63	44.40%	35.75%
64	44.40%	35.75%
65+	100.00%	100.00%

Retirement – JRS

Current

Age	Rate
< 59	3%
59	10%
60	20%
61	20%
62	10%
63	10%
64	10%
65	20%
66	20%
67	10%
68	10%
69	10%
70+	100%

Proposed

Age	Rate
< 59	3%
59	10%
60	20%
61	20%
62	10%
63	10%
64	10%
65	20%
66	20%
67	10%
68	10%
69	10%
70+	100%

Current vs Proposed Assumptions – Demographic (cont'd)

Withdrawal – PERS Peace/Fire

Current

Select Rates during the First 5 Years of Employment

Years of Service	Male	Female
0	15.00%	15.00%
1	12.00%	8.00%
2	7.20%	6.40%
3	5.67%	5.60%
4	6.48%	7.20%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female	Age	Male	Female
< 23	4.70%	6.80%	39	2.04%	2.98%
23	4.46%	6.80%	40	1.68%	3.39%
24	4.22%	6.80%	41	1.67%	3.37%
25	3.98%	6.80%	42	1.67%	3.36%
26	3.74%	6.80%	43	1.71%	3.33%
27	3.50%	6.80%	44	1.76%	3.31%
28	3.32%	6.63%	45	1.81%	3.28%
29	3.14%	6.46%	46	1.85%	3.25%
30	2.96%	6.29%	47	1.90%	3.23%
31	2.79%	6.12%	48	2.22%	3.19%
32	2.61%	5.95%	49	2.53%	3.15%
33	2.50%	5.36%	50	3.18%	6.42%
34	2.39%	4.77%	51	4.24%	6.32%
35	2.28%	4.18%	52	4.24%	6.19%
36	2.17%	3.60%	53	4.24%	6.04%
37	2.06%	3.01%	54	4.24%	3.00%
38	2.05%	2.99%	55+	3.00%	2.00%

Proposed

Select Rates during the First 5 Years of Employment

Years of Service	Male	Female
0	15.00%	15.00%
1	12.00%	8.00%
2	7.20%	6.40%
3	5.67%	5.60%
4	6.48%	7.20%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female	Age	Male	Female
< 23	2.40%	5.80%	39	1.60%	3.00%
23	2.40%	5.80%	40	1.30%	3.00%
24	2.40%	5.80%	41	1.30%	3.00%
25	2.40%	5.80%	42	1.30%	3.00%
26	2.40%	5.80%	43	1.30%	3.00%
27	2.40%	5.80%	44	1.30%	3.00%
28	2.40%	5.80%	45	1.50%	2.90%
29	2.40%	5.80%	46	1.50%	2.90%
30	2.00%	5.10%	47	1.50%	2.90%
31	2.00%	5.10%	48	1.50%	2.90%
32	2.00%	5.10%	49	1.50%	2.90%
33	2.00%	5.10%	50	3.00%	5.00%
34	2.00%	5.10%	51	3.00%	5.00%
35	1.60%	3.00%	52	3.00%	5.00%
36	1.60%	3.00%	53	3.00%	5.00%
37	1.60%	3.00%	54	3.00%	5.00%
38	1.60%	3.00%	55+	2.25%	1.80%

Current vs Proposed Assumptions – Demographic (cont'd)

Withdrawal – PERS Others

Current

Select Rates during the First 5 Years of Employment

Hire Age Under 35			Hire Age Over 35		
Years of Service	Male	Female	Years of Service	Male	Female
0	29.00%	29.00%	0	20.00%	20.00%
1	16.25%	20.00%	1	12.00%	15.00%
2	13.00%	16.00%	2	10.00%	12.50%
3	10.40%	12.80%	3	8.50%	10.00%
4	8.45%	10.40%	4	8.50%	9.00%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female	Age	Male	Female
< 23	11.40%	12.99%	39	5.47%	5.23%
23	10.83%	12.21%	40	4.86%	5.65%
24	10.26%	11.43%	41	4.71%	5.51%
25	9.69%	10.65%	42	4.56%	5.38%
26	9.12%	9.87%	43	4.50%	5.19%
27	8.55%	9.09%	44	4.44%	4.99%
28	8.30%	8.72%	45	4.39%	4.80%
29	8.05%	8.34%	46	4.33%	4.60%
30	7.80%	7.97%	47	4.27%	4.41%
31	7.54%	7.60%	48	4.26%	4.40%
32	7.29%	7.23%	49	4.24%	4.39%
33	6.99%	6.88%	50	3.63%	4.45%
34	6.69%	6.53%	51	3.60%	4.43%
35	6.39%	6.17%	52	3.56%	4.40%
36	6.10%	5.82%	53	3.52%	4.37%
37	5.80%	5.47%	54	4.17%	6.20%
38	5.63%	5.35%	55+	3.00%	5.00%

Proposed

Select Rates during the First 5 Years of Employment

Hire Age Under 35			Hire Age Over 35		
Years of Service	Male	Female	Years of Service	Male	Female
0	29.00%	29.00%	0	20.00%	20.00%
1	16.25%	20.00%	1	12.00%	15.00%
2	13.00%	16.00%	2	10.00%	12.50%
3	10.40%	12.80%	3	8.50%	10.00%
4	8.45%	10.40%	4	8.50%	9.00%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female	Age	Male	Female
< 23	7.80%	8.20%	39	5.70%	5.50%
23	7.80%	8.20%	40	4.50%	5.20%
24	7.80%	8.20%	41	4.50%	5.20%
25	7.80%	8.20%	42	4.50%	5.20%
26	7.80%	8.20%	43	4.50%	5.20%
27	7.80%	8.20%	44	4.50%	5.20%
28	7.80%	8.20%	45	4.20%	4.40%
29	7.80%	8.20%	46	4.20%	4.40%
30	7.00%	7.10%	47	4.20%	4.40%
31	7.00%	7.10%	48	4.20%	4.40%
32	7.00%	7.10%	49	4.20%	4.40%
33	7.00%	7.10%	50	3.60%	4.70%
34	7.00%	7.10%	51	3.60%	4.70%
35	5.70%	5.50%	52	3.60%	4.70%
36	5.70%	5.50%	53	3.60%	4.70%
37	5.70%	5.50%	54	3.60%	4.70%
38	5.70%	5.50%	55+	2.90%	4.90%

Current vs Proposed Assumptions – Demographic (cont'd)

Withdrawal – TRS

Current

Select Rates during the First 8 Years of Employment

Years of Service	Male	Female
0	20.40%	17.00%
1	20.40%	17.00%
2	16.80%	14.00%
3	14.40%	12.00%
4	12.00%	10.00%
5	10.80%	9.00%
6	9.00%	7.50%
7	7.20%	6.00%

Ultimate Rates after the First 8 Years of Employment

Age	Male	Female	Age	Male	Female
22	2.62%	3.79%	39	2.57%	3.74%
23	2.62%	3.79%	40	2.26%	2.75%
24	2.61%	3.79%	41	2.26%	2.75%
25	2.61%	3.79%	42	2.25%	2.74%
26	2.61%	3.79%	43	2.24%	2.73%
27	2.60%	3.79%	44	2.23%	2.73%
28	2.60%	4.27%	45	2.22%	2.72%
29	2.60%	4.76%	46	2.21%	2.71%
30	2.60%	5.24%	47	2.20%	2.70%
31	2.60%	5.73%	48	2.18%	2.69%
32	2.59%	6.22%	49	2.16%	2.68%
33	2.59%	5.72%	50	3.43%	4.42%
34	2.59%	5.23%	51	3.39%	4.39%
35	2.59%	4.74%	52	3.35%	4.36%
36	2.58%	4.25%	53	3.30%	4.32%
37	2.58%	3.75%	54	3.00%	7.56%
38	2.58%	3.75%	55+	2.00%	5.00%

Proposed

Select Rates during the First 8 Years of Employment

Years of Service	Male	Female
0	20.40%	17.00%
1	20.40%	17.00%
2	16.80%	14.00%
3	14.40%	12.00%
4	12.00%	10.00%
5	10.80%	9.00%
6	9.00%	7.50%
7	7.20%	6.00%

Ultimate Rates after the First 8 Years of Employment

Age	Male	Female	Age	Male	Female
22	3.60%	4.60%	39	3.60%	3.90%
23	3.60%	4.60%	40	3.10%	2.60%
24	3.60%	4.60%	41	3.10%	2.60%
25	3.60%	4.60%	42	3.10%	2.60%
26	3.60%	4.60%	43	3.10%	2.60%
27	3.60%	4.60%	44	3.10%	2.60%
28	3.60%	4.60%	45	3.10%	2.60%
29	3.60%	4.60%	46	3.10%	2.60%
30	3.60%	5.40%	47	3.10%	2.60%
31	3.60%	5.40%	48	3.10%	2.60%
32	3.60%	5.40%	49	3.10%	2.60%
33	3.60%	5.40%	50	4.60%	4.80%
34	3.60%	5.40%	51	4.60%	4.80%
35	3.60%	3.90%	52	4.60%	4.80%
36	3.60%	3.90%	53	4.60%	4.80%
37	3.60%	3.90%	54	4.60%	4.80%
38	3.60%	3.90%	55+	2.80%	4.80%

Current vs Proposed Assumptions – Demographic (cont'd)

Withdrawal – PERS DCR Peace/Fire

Current

Select Rates during the First 5 Years of Employment

Years of Service	Male	Female
0	18.90%	20.63%
1	14.18%	16.50%
2	10.50%	13.75%
3	9.45%	12.38%
4	8.40%	11.00%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female	Age	Male	Female
< 23	5.52%	11.97%	44	5.78%	11.09%
23	5.65%	11.97%	45	5.71%	11.03%
24	5.78%	11.97%	46	5.64%	10.98%
25	5.91%	11.97%	47	5.57%	10.92%
26	6.04%	11.97%	48	6.01%	10.84%
27	6.16%	11.97%	49	6.45%	10.75%
28	6.16%	11.94%	50	6.89%	10.67%
29	6.15%	11.91%	51	7.32%	10.58%
30	6.14%	11.88%	52	7.76%	10.50%
31	6.14%	11.84%	53	7.97%	10.66%
32	6.12%	11.81%	54	8.18%	10.82%
33	6.11%	11.79%	55	8.38%	10.98%
34	6.09%	11.77%	56	8.59%	11.15%
35	6.08%	11.75%	57	8.80%	11.31%
36	6.07%	11.72%	58	9.03%	11.47%
37	6.05%	11.70%	59	9.25%	11.63%
38	6.03%	11.60%	60	9.48%	11.79%
39	6.00%	11.50%	61	9.71%	11.95%
40	5.98%	11.40%	62	9.94%	12.12%
41	5.95%	11.30%	63	12.37%	12.28%
42	5.93%	11.20%	64	14.81%	12.44%
43	5.85%	11.14%	65+	17.25%	12.60%

Proposed

Select Rates during the First 5 Years of Employment

Years of Service	Male	Female
0	17.00%	27.00%
1	12.00%	21.00%
2	11.00%	15.00%
3	11.00%	13.00%
4	10.00%	9.00%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female	Age	Male	Female
< 23	6.60%	10.20%	44	6.50%	9.50%
23	6.60%	10.20%	45	6.50%	9.30%
24	6.60%	10.20%	46	6.50%	9.30%
25	6.60%	10.20%	47	6.50%	9.30%
26	6.60%	10.20%	48	6.50%	9.30%
27	6.60%	10.20%	49	6.50%	9.30%
28	6.60%	10.20%	50	8.50%	9.10%
29	6.60%	10.20%	51	8.50%	9.10%
30	6.80%	10.00%	52	8.50%	9.10%
31	6.80%	10.00%	53	8.50%	9.10%
32	6.80%	10.00%	54	8.50%	9.10%
33	6.80%	10.00%	55	9.80%	9.60%
34	6.80%	10.00%	56	9.80%	9.60%
35	6.70%	9.90%	57	9.80%	9.60%
36	6.70%	9.90%	58	9.80%	9.60%
37	6.70%	9.90%	59	9.80%	9.60%
38	6.70%	9.90%	60	12.50%	10.30%
39	6.70%	9.90%	61	12.50%	10.30%
40	6.50%	9.50%	62	12.50%	10.30%
41	6.50%	9.50%	63	12.50%	10.30%
42	6.50%	9.50%	64	12.50%	10.30%
43	6.50%	9.50%	65+	19.20%	10.70%

Current vs Proposed Assumptions – Demographic (cont'd)

Withdrawal – PERS DCR Others

Current

Select Rates during the First 5 Years of Employment

Years of Service	Male	Female
0	24.36%	27.98%
1	21.00%	22.31%
2	16.80%	17.85%
3	13.44%	14.28%
4	9.45%	12.34%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female	Age	Male	Female
< 23	13.71%	16.50%	44	7.83%	8.22%
23	13.71%	16.51%	45	7.72%	7.90%
24	13.71%	16.51%	46	7.60%	7.58%
25	13.71%	16.52%	47	7.48%	7.26%
26	13.71%	16.53%	48	7.68%	7.23%
27	13.71%	16.54%	49	7.87%	7.20%
28	13.41%	15.94%	50	8.07%	7.17%
29	13.21%	15.34%	51	8.26%	7.14%
30	12.82%	17.75%	52	8.46%	7.11%
31	12.52%	14.15%	53	8.46%	7.26%
32	12.22%	13.55%	54	8.47%	7.42%
33	11.65%	12.90%	55	8.48%	7.57%
34	11.09%	12.24%	56	8.48%	7.72%
35	10.52%	11.58%	57	8.49%	7.88%
36	9.95%	10.92%	58	8.77%	8.15%
37	9.39%	10.26%	59	9.08%	8.42%
38	9.12%	9.98%	60	9.32%	8.69%
39	8.86%	9.70%	61	9.60%	8.96%
40	8.60%	9.42%	62	9.88%	9.24%
41	8.32%	9.14%	63	10.28%	10.51%
42	8.07%	8.86%	64	10.68%	11.78%
43	7.95%	8.54%	65+	11.08%	13.05%

Proposed

Select Rates during the First 5 Years of Employment

Years of Service	Male	Female
0	28.00%	29.00%
1	20.00%	24.00%
2	16.00%	19.00%
3	14.00%	16.00%
4	12.00%	14.00%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female	Age	Male	Female
< 23	13.70%	15.80%	44	8.50%	10.60%
23	13.70%	15.80%	45	8.90%	8.90%
24	13.70%	15.80%	46	8.90%	8.90%
25	13.70%	15.80%	47	8.90%	8.90%
26	13.70%	15.80%	48	8.90%	8.90%
27	13.70%	15.80%	49	8.90%	8.90%
28	13.70%	15.80%	50	8.40%	8.70%
29	13.70%	15.80%	51	8.40%	8.70%
30	12.20%	11.20%	52	8.40%	8.70%
31	12.20%	11.20%	53	8.40%	8.70%
32	12.20%	11.20%	54	8.40%	8.70%
33	12.20%	11.20%	55	8.70%	9.50%
34	12.20%	11.20%	56	8.70%	9.50%
35	9.70%	10.20%	57	8.70%	9.50%
36	9.70%	10.20%	58	8.70%	9.50%
37	9.70%	10.20%	59	8.70%	9.50%
38	9.70%	10.20%	60	10.10%	11.80%
39	9.70%	10.20%	61	10.10%	11.80%
40	8.50%	10.60%	62	10.10%	11.80%
41	8.50%	10.60%	63	10.10%	11.80%
42	8.50%	10.60%	64	10.10%	11.80%
43	8.50%	10.60%	65+	11.20%	15.70%

Current vs Proposed Assumptions – Demographic (cont'd)

Withdrawal – TRS DCR

Current

Select Rates during the First 6 Years of Employment

Years of Service	Male	Female
0	20.70%	21.80%
1	19.55%	18.70%
2	16.10%	15.40%
3	13.80%	13.20%
4	11.50%	11.00%
5	7.32%	8.05%

Ultimate Rates after the First 6 Years of Employment

Age	Male	Female	Age	Male	Female
< 26	9.41%	8.31%	45	9.05%	8.09%
26	9.41%	8.32%	46	8.99%	8.07%
27	9.40%	8.33%	47	8.94%	8.04%
28	9.39%	8.32%	48	8.86%	8.00%
29	9.39%	8.32%	49	8.78%	7.95%
30	9.38%	8.31%	50	8.70%	7.91%
31	9.37%	8.31%	51	8.62%	7.86%
32	9.36%	8.30%	52	8.54%	7.82%
33	9.35%	8.29%	53	8.37%	7.73%
34	9.35%	8.28%	54	8.20%	7.64%
35	9.34%	8.27%	55	8.03%	7.55%
36	9.34%	8.26%	56	7.86%	7.46%
37	9.33%	8.25%	57	7.69%	7.36%
38	9.31%	8.24%	58	7.76%	7.50%
39	9.29%	8.22%	59	7.82%	7.64%
40	9.26%	8.21%	60	7.89%	7.78%
41	9.24%	8.19%	61	7.95%	7.92%
42	9.22%	8.17%	62	8.02%	8.05%
43	9.16%	8.15%	63	8.59%	8.29%
44	9.11%	8.12%	64	9.17%	8.52%
			65+	9.75%	8.75%

Proposed

Select Rates during the First 6 Years of Employment

Years of Service	Male	Female
0	28.00%	31.00%
1	28.00%	21.00%
2	19.00%	18.00%
3	17.00%	13.00%
4	13.00%	13.00%
5	13.00%	10.00%

Ultimate Rates after the First 6 Years of Employment

Age	Male	Female	Age	Male	Female
< 26	10.50%	8.70%	45	10.00%	8.40%
26	10.50%	8.70%	46	10.00%	8.40%
27	10.50%	8.70%	47	10.00%	8.40%
28	10.50%	8.70%	48	10.00%	8.40%
29	10.50%	8.70%	49	10.00%	8.40%
30	10.50%	8.70%	50	9.50%	8.10%
31	10.50%	8.70%	51	9.50%	8.10%
32	10.50%	8.70%	52	9.50%	8.10%
33	10.50%	8.70%	53	9.50%	8.10%
34	10.50%	8.70%	54	9.50%	8.10%
35	10.40%	8.60%	55	8.80%	7.90%
36	10.40%	8.60%	56	8.80%	7.90%
37	10.40%	8.60%	57	8.80%	7.90%
38	10.40%	8.60%	58	8.80%	7.90%
39	10.40%	8.60%	59	8.80%	7.90%
40	10.30%	8.60%	60	9.30%	8.70%
41	10.30%	8.60%	61	9.30%	8.70%
42	10.30%	8.60%	62	9.30%	8.70%
43	10.30%	8.60%	63	9.30%	8.70%
44	10.30%	8.60%	64	9.30%	8.70%
			65+	10.90%	7.40%

Current vs Proposed Assumptions – Demographic (cont'd)

Withdrawal – JRS

Current

Years of Service	Rate
0	3%
1	3%
2	3%
3	3%
4	3%
5	3%
6	3%
7	3%
8	3%
9	3%
10+	1%

Proposed

Years of Service	Rate
0	3%
1	3%
2	3%
3	3%
4	3%
5	3%
6	3%
7	3%
8	3%
9	3%
10+	1%

Current vs Proposed Assumptions – Demographic (cont'd)

Withdrawal – NGNMRS

Current

Select Rates during the First 5 Years of Employment

Years of Service	Unisex
0	20.00%
1	10.00%
2	10.00%
3	10.00%
4	10.00%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female	Age	Male	Female
20	14.94%	18.92%	40	9.09%	11.52%
21	14.13%	17.90%	41	8.87%	11.24%
22	13.44%	17.03%	42	8.68%	11.00%
23	12.86%	16.29%	43	8.51%	10.78%
24	12.40%	15.70%	44	8.31%	10.53%
25	12.03%	15.24%	45	8.04%	10.18%
26	11.74%	14.87%	46	7.66%	9.70%
27	11.52%	14.59%	47	7.13%	9.03%
28	11.35%	14.37%	48	6.46%	8.19%
29	11.21%	14.20%	49	5.67%	7.18%
30	11.09%	14.05%	50	4.89%	6.19%
31	10.98%	13.91%	51	4.27%	5.42%
32	10.86%	13.76%	52	3.83%	4.85%
33	10.73%	13.59%	53	3.51%	4.45%
34	10.57%	13.39%	54	3.27%	4.15%
35	10.37%	13.14%	55	3.10%	3.93%
36	10.15%	12.85%	56	3.02%	3.82%
37	9.89%	12.53%	57	3.03%	3.84%
38	9.62%	12.18%	58	3.11%	3.94%
39	9.35%	11.84%	59	3.27%	4.14%
			60	3.38%	4.29%

Proposed

Select Rates during the First 5 Years of Employment

Years of Service	Unisex
0	20.00%
1	10.00%
2	10.00%
3	10.00%
4	10.00%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female	Age	Male	Female
20	9.53%	9.94%	40	7.73%	8.06%
21	9.53%	9.94%	41	7.54%	7.87%
22	9.53%	9.94%	42	7.38%	7.70%
23	9.53%	9.94%	43	7.23%	7.55%
24	9.53%	9.94%	44	7.06%	7.37%
25	9.53%	9.94%	45	6.83%	7.13%
26	9.53%	9.94%	46	6.51%	6.79%
27	9.53%	9.94%	47	6.06%	6.32%
28	9.53%	9.94%	48	5.49%	5.73%
29	9.53%	9.94%	49	4.82%	5.03%
30	9.43%	9.84%	50	4.16%	4.33%
31	9.33%	9.74%	51	3.63%	3.79%
32	9.23%	9.63%	52	3.26%	3.40%
33	9.12%	9.51%	53	2.98%	3.12%
34	8.98%	9.37%	54	2.78%	2.91%
35	8.81%	9.20%	55	2.64%	2.75%
36	8.63%	9.00%	56	2.57%	2.67%
37	8.41%	8.77%	57	2.58%	2.69%
38	8.18%	8.53%	58	2.64%	2.76%
39	7.95%	8.29%	59	2.78%	2.90%
			60	2.88%	3.00%

Current vs Proposed Assumptions – Demographic (cont'd)

- **Disability**
  - Insufficient disability experience, so we propose no changes to the current disability rates
- **Occupational-related death and disability**

	Current	Actual	Proposed
PERS – P/F	75%	72%	70%
PERS – Others	40%	36%	35%
TRS	15%	n/a	15%

- **Withdrawal of contributions upon termination**

	Current	Actual	Proposed
PERS – P/F	10%	5%	5%
PERS - Others	5%	4%	5%
TRS	0%	1%	0%

- **Rehires (percentage load to Normal Cost)**

	Current	Actual	Proposed
PERS – pension	18.77%	15.33%	15.30%
PERS – healthcare	17.09%	2.36%	2.40%
TRS – pension	15.57%	11.98%	12.00%
TRS - healthcare	12.03%	0.20%	0.20%

Comments regarding the rehire assumption:

- The current rehire loads for the DB plans, which were developed based on the 5 years of experience ending in 2017, were too high based on the most recent 4 years of rehire experience. The actual liabilities from rehires during the last 4 years were compared to the current rehire loads, and adjustments were made to the current rehire loads to better match recent experience.
- With lower proposed rehire loads for healthcare, a greater portion of the fixed employer contributions (22% for PERS and 12.56% for TRS) will be deposited to the DB pension trusts rather than the DB healthcare trusts. Based on the comparative funded ratios of the DB pension and DB healthcare trusts, we believe it is more prudent to deposit more contributions to the DB pension trusts.
- There have been recent suggestions to implement rehire loads for the DCR plans. Doing so would increase the portion of the fixed employer contributions being deposited to the DCR trusts. Because the DCR trusts are so well funded, they are able to absorb any reasonable losses due to rehires. Therefore, we believe it is more prudent to deposit more contributions to the DB trusts. Accordingly, we are proposing no rehire loads for the DCR plans at this time.

Current vs Proposed Assumptions – Demographic (cont'd)

- **Unused sick days (TRS)**
  - Current: 4.5 days
  - Actual: 5.30 days
  - Proposed: 5.25 days
- **Population growth rate**
  - Current: 0%
  - Actual: -0.05% (PERS); -1.48% (TRS)
  - Proposed: 0%
- **Alaska residency for COLA**

	Current	Actual	Proposed
PERS – P/F	65%	60%	60%
PERS – Others	70%	65%	65%
TRS	60%	59%	60%

- **Part-time service (years)**

	Current	Actual	Proposed
PERS – P/F	1.00	n/a	1.00
PERS – Others	0.75	0.68	0.75
TRS	0.75	0.76	0.75

Current vs Proposed Assumptions – Demographic (cont'd)

- **Percent electing lump sums (NGNMRS)**

	Current	Actual	Proposed
Active	70%	49%	50%
Terminated Vested	70%	52%	50%

- **Healthcare dependent assumptions**
  - **Dependent spouse medical coverage election**

	Current		Actual		Proposed	
	Male	Female	Male	Female	Male	Female
PERS - P/F	75%	50%	72%	45%	75%	50%
PERS - Others	65%	60%	57%	46%	60%	50%
TRS	65%	60%	56%	47%	60%	50%
JRS	90%	70%	69%	17%	80%	60%

  - **Spouse age difference**

	Current		Actual		Proposed	
	Male	Female	Male	Female	Male	Female
PERS – P/F	3	-2	2.7	-2.6	3	-2
PERS – Others	3	-2	3.5	-1.8	3	-2
TRS	3	-2	3.4	-1.7	3	-2
JRS	4	-4	2.5	4.4	4	-4

Current vs Proposed Assumptions – Demographic (cont'd)

- **Healthcare participation**

	Current		Actual		Proposed	
	System paid	Non-System paid	System paid	Non-System paid	System paid	Non-System paid
PERS – P/F	100%	20%	96%	21%	100%	20%
PERS – Others	100%	20%	98%	28%	100%	25%
TRS	100%	20%	94%	22%	100%	20%

- **Medicare Part B only**
  - Current: 5%
  - Actual: 2%
  - Proposed: 2%
- **Healthcare morbidity**

Age	Current		Proposed	
	Medical	Rx	Medical	Rx
0-44	2.0%	4.5%	2.0%	4.5%
45-54	2.5%	3.5%	2.5%	3.5%
55-64	2.5%	1.5%	2.5%	1.0%
65-74	3.0%	2.0%	2.0%	2.1%
75-84	2.0%	-0.5%	2.2%	-0.3%
85-94	0.3%	-2.5%	0.5%	-2.5%
95+	0.0%	0.0%	0.0%	0.0%

Actuarial Certification

Actuarial Certification

The purpose of this presentation is to provide the ARMB with a recap of the experience study analyses that were provided at the December 2021, March 2022, and May 2022 meetings. Use of this presentation, for any other purpose or by anyone other than the ARMB or staff of the State of Alaska may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the presentation for that purpose. Because of the risk of misinterpretation of results, you should ask Buck to review any statement you wish to make on the results contained in this presentation. Buck will not accept any liability for any such statement made without the review by Buck.

The Unfunded Actuarial Accrued Liability and Funded Ratio are based on the June 30, 2020 valuations, and are meant to show the estimated impact of the assumption changes. They are not to be used for determining actual funding contributions.

Please see the June 30, 2021 actuarial valuation reports for a detailed description of risk factors related to future funding of the plans (ASOP 51) and the models used in our analysis (ASOP 56).

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law.

The results shown in this presentation were prepared under the overall direction of David Kershner, who meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. These results have been prepared in accordance with all applicable Actuarial Standards of Practice.

David Kershner
FSA, EA, MAAA, FCA
Principal, Retirement

BUCK

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Alaska Retirement Management Board

Actuarial Audit of Pension and Postemployment Healthcare Plans

May 20, 2022

P: 720.274.7270 | www.grsconsulting.com

May 20, 2022

Alaska Retirement Management Board
P.O. Box 110405
Juneau, AK 99811-0405

Dear Retirement Board Members:

Gabriel, Roeder, Smith & Company (GRS) is pleased to present this report of an actuarial audit of the June 30, 2020 actuarial valuations of the State of Alaska retirement systems. The scope of our actuarial audit included the following plans:

- Public Employees' Retirement System (PERS) Defined Benefit (DB) Pension and Medical
- Teachers' Retirement System (TRS) DB Pension and Medical
- PERS Defined Contribution Retirement (DCR) - Occupational Death & Disability (OD&D) and Medical
- TRS DCR - OD&D and Medical
- Judicial Retirement System DB Pension and Medical
- National Guard & Naval Militia DB Pension

We are grateful to the Alaska staff and Buck, the retained actuary, for their cooperation throughout the actuarial audit process.

This actuarial audit involves an independent verification and analysis of the assumptions, procedures, methods, and conclusions used by the retained actuary for all of these plans, in the actuarial valuations as of June 30, 2020, to ensure that the conclusions are technically sound and conform to the appropriate Standards of Practice as promulgated by the Actuarial Standards Board.

GRS is pleased to report to the Board that, in our professional opinion, the June 30, 2020 actuarial valuations prepared by the retained actuary provide fair and reasonable assessments of the financial position of the plans and are reflectd in the required contribtuion rates.

In this report we have made some suggestions for ways to improve the work product. We hope that the retained actuary and the Board find these items helpful. Thank you for the opportunity to work on this assignment.

7900 East Union Avenue | Suite 650 | Denver, Colorado 80237-2746

Mr. Wood and Mr. Detweiler are Associcates of the Society of Actuaries, and Members of the American Academy of Actuaries. They meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. They are both experienced in performing valuations for large public retirement systems.

Sincerely,

Gabriel, Roeder, Smith & Company

Paul Wood, ASA, FCA, MAAA
Senior Consultant

Bill Detweiler, ASA, EA, FCA, MAAA
Consultant

cc: Ms. Pamela Leary
Mr. Zach Hanna
Ms. Alysia Jones

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SECTION 1

EXECUTIVE SUMMARY

Executive Summary

Gabriel, Roeder, Smith & Co. was engaged by the Alaska Retirement Management Board (ARMB) for an actuarial audit of the June 30, 2020 Actuarial Valuations of the following State of Alaska retirement systems performed by the retained actuary:

- Public Employees' Retirement System (PERS) Defined Benefit (DB) Pension and Medical
- Teachers' Retirement System (TRS) DB Pension and Medical
- PERS Defined Contribution Retirement (DCR) - Occupational Death & Disability (OD&D) and Medical
- TRS DCR - OD&D and Medical
- Judicial Retirement System DB Pension and Medical
- National Guard & Naval Militia DB Pension

The scope of this actuarial audit includes the following:

1. Evaluation of the available data for the performance of such valuation
2. Evaluation of recommended economic and non-economic assumptions and all projections as presented in the Primary Actuary's FY2020 Valuation Reports
3. Perform valuation as of June 30, 2020 using the assumptions, methodologies and funding method used by the Primary Actuary in their performance of the June 30, 2020 valuation of the plans
4. Evaluation of the valuation results and reconciliation of any discrepancies between the findings, assumptions, methodology, rates, and or adjustments of the Contractor and Primary Actuary
5. Assessment of the conclusions of the valuation report for completeness and accuracy
6. Communication of the peer review audit valuation results and the reconciliation of any discrepancies between the findings, assumptions, methodology, rates, and/or adjustments to the Primary Actuary
7. Review format of the valuation report and offer recommendations
8. Provide a report of the work performed along with any opinions and recommendations for improvement, and present findings to the ARMB.

Please note that GRS is also currently the retained review actuary for the ARMB. Certain parts of this scope, such as an analysis of the assumptions and methods, are similar to the annual review completed by GRS. Other parts of this scope, such as a full replication of the liabilities, offer a much more in-depth review of the valuations. GRS was able to use some of the information received as the review actuary for a more complete and accurate audit of the valuations.

Summary of Findings

Based on our review of the census data, experience study documents, liability replication, liability calculations for a sample of members, and the actuarial valuation reports, we believe the June 30, 2020 actuarial valuations for State of Alaska retirement systems are reasonable, are based on appropriate assumptions and methods, and the reports generally comply with the Actuarial Standards of Practice.

We offer the following recommendations based on the valuation methods and assumptions used by the retained actuary in the June 30, 2020 actuarial valuations.

- We recommend Buck consider lowering certain economic assumptions in the next experience study, such as inflation, the assumed investment rate of return, and the total payroll growth assumption.
- We recommend Buck consider the new public sector specific mortality tables, and a more recent generational improvement table in the next experience study.
- We recommend Buck review with the Board whether to implement a new entrant/rehire assumption in the DCR plans and in JRS.
- We recommend that Buck implement the changes to their valuation methods, as detailed in Section 5 of this report.
- We recommend Buck make some small modifications to their valuation reports to improve communication and disclosures, as detailed in Section 6 of this report.

SECTION 2

GENERAL ACTUARIAL AUDIT PROCEDURE

General Actuarial Audit Procedure

GRS received the following information in order to thoroughly review the work product of the retained actuary:

- Actuarial valuation reports for all of the retirement systems as of June 30, 2020,
- Actuarial Experience Study for the period July 1, 2013 to June 30, 2017,
- A preliminary set of census data for all plan participants and beneficiaries as of June 30, 2020 originally provided by Alaska to the retained actuary for the actuarial valuations,
- A final set of census data for all plan participants and beneficiaries as of June 30, 2020 used by the retained actuary for the actuarial valuations,
- Individual present value of benefits for all plan participants and beneficiaries calculated as of June 30, 2020 by the retained actuary for the actuarial valuations,
- Detailed liability calculations from the retained actuary for a sampling of participants in the various retirement systems as of June 30, 2020, and
- Additional information on the most recent claims cost development and other assumptions used for the retiree medical plans as of June 30, 2020

In performing our review, we:

- Reviewed member handbooks and applicable statutes to understand the benefits provided by the Alaska retirement systems,
- Reviewed the appropriateness of the actuarial assumptions and methods,
- Reviewed the actuarial valuation reports,
- Replicated the calculation of the actuarial accrued liabilities in our actuarial valuation software,
- Replicated the contribution requirements, and
- Reviewed the detailed liability calculation of the sample lives, to ensure that the calculations were consistent with the stated plan provisions, actuarial methods and assumptions.

KEY ACTUARIAL CONCEPTS

An actuarial valuation is a detailed statistical simulation of the future operation of a retirement system using the set of actuarial assumptions adopted by the Board. It is designed to simulate all of the dynamics of such a system for each current system member including:

1. Earning future service and making contributions,
2. Receiving changes in compensation,
3. Leaving the system through job change, disablement, death, or retirement, and
4. Determination of and payment of benefits from the System.

This simulated dynamic is applied to each active member of the system. It results in a set of expected future benefit payments to that member. Bringing those expected payments to present value, at the assumed rate of investment return, produces the Present Value (PV) of future Benefits for that member. In like manner, a PV of future salaries is determined.

The PV of future benefits and the PV of future salaries for the entire systems are the total of these values across all members. The remainder of the actuarial valuation process depends upon these building blocks.

Once the basic results are derived, an actuarial method is applied in order to develop information on contribution levels and funding status. An actuarial method splits the PV of future benefits into two components:

1. PV of Future Normal Costs, and
2. Actuarial Accrued Liability ("AAL").

The actuarial method in use by the State of Alaska retirement systems is known as the Entry Age Normal (EAN) method. Under EAN, the Normal Cost for a member is that portion of the PV of the increase in the value of that member's benefit for service during the upcoming year. The AAL is the difference between the total PVB and the PV of all future normal costs.

For the DB plans, the PV of future benefits applies to the following benefits:

- Retirement benefits
- Withdrawal benefits
- Disability benefits
- Death benefits
- Return of contributions
- Medical benefits
- Indebtedness (from contributions which might be redeposited)

For the DCR plans, the actuarial present value of future benefits applies to the following benefits:

- Occupational Disability benefits
- Occupational Death benefits
- Retiree Medical benefits

The medical benefits are based on potential future health care benefits, while the others are a type of post-employment income replacement benefit, based on salary. For the medical benefits, estimates must be made of the future health care costs. This is done by determining current per capita health care claim costs by age of retiree, and projecting them into the future based on anticipated future health care inflation.

Actuarial Qualifications

The June 30, 2020 actuarial valuations were signed by Mr. David J. Kershner, FSA, EA, MAAA, FCA and Mr. Scott Young, FSA, EA, MAAA, FCA. Both Mr. Kershner and Mr. Young have attained the actuarial credentials noted on the signature line of the actuarial valuation reports and are compliant with Society of Actuaries Continuing Professional Development requirement.

In all cases, the actuarial valuation reports indicate that the signing actuaries meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in the actuarial valuation reports.

SECTION 3

ACTUARIAL ASSUMPTIONS

Actuarial Assumptions

Buck released an experience study in 2018 and the Board approved a new assumption set to be used beginning with the actuarial valuation as of June 30, 2018. Experience studies are performed on a reasonable schedule, which ensures none of the assumptions will become outdated. Additionally, some healthcare assumptions are reviewed on an annual basis, as they tend to be more volatile.

Although this audit examines many assumptions and methods, not all of them are equal in terms of their ultimate impact on contribution rates. It is not the intention of this audit to imply that all proposed changes would have a similar impact on the liabilities. For example, the investment return assumption may be the greatest lever in influencing contribution rates. Thus, where options exist for spending time and resources studying assumptions, we recommend studying those with the largest impact first.

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 investment return and assumed rates of future salary increase.

Economic assumptions are normally defined by an underlying inflation assumption. Buck has cited 2.50% as the current inflation assumption. In recent years, long-term inflation forecasts have been declining, but we have seen a very recent spike in inflation leading some investment consultants to increase their long-term expectations. We do find the assumption to be reasonable at this time, but expect Buck to study it in the next experience study.

Investment Return Assumption

The nominal investment return assumption for PERS, TRS, & JRS is 7.38%. The assumption is net of all investment expenses. The rate is no longer net of administrative expenses. Combined with the 2.50% inflation assumption, this yields a 4.88% real net rate of return. While we find this assumption to still be reasonable, it should be noted that many other large state pension plans are continuing to decrease their return expectations as capital market assumptions are coming in lower. This assumption should be carefully analyzed during the next experience study and serious consideration should be given to lowering it.

The nominal investment return assumption for NGNMRS is 7.00%. We also find this assumption to be reasonable, due to a different asset allocation than the other systems.

Member Pay 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.

Base Salary Increase Assumption

The Base Salary Increase Assumption (also known as the wage inflation assumption) is 2.75% for PERS and TRS. The 2.75% is comprised of 2.50% for general inflation and 0.25% for productivity increases. For JRS, the pay increase assumption is 3.62% and was not studied or updated during the last experience study, due to a lack of credible data.

Merit, Promotion, and Longevity Pay Increase Assumption

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.

The pay increase assumption will need to be monitored to ensure that any developing patterns of gains or losses do not continue.

We would also offer that the manner in which pay changes over time for teachers in comparison to public employees tends to differ. Since most teachers have a specific skill set, the approach to their compensation tends to follow a more consistent trend. Public Employees however (except for Peace officers and Firefighters) tend to represent a multitude of different skills – from a more generalized, labor intensive capacity (e.g., custodial) to more specialized training (ex. Accounting).

COLA and PRPA

We find these assumptions to be reasonable. The inflation rate is a component of investment return, salary increase and the PRPA, so it has a ripple effect throughout all the economic assumptions.

Demographic Assumptions

Healthy mortality during active service and after termination

The RP-2014 tables with MP 2017 generational improvement (and with the various credibility adjustments) are reasonable. Since the last experience study, the Society of Actuaries has released new public sector specific mortality tables. We would expect Buck to consider the use of these new tables in the next experience study. We would also expect Buck to consider updating the generational improvement table to a more recent version.

Disabled mortality

The RP 2014 disabled table with MP 2017 generational improvement (and with the various credibility adjustments) is reasonable. Since the last experience study, the Society of Actuaries has released new public sector specific mortality tables. We would expect Buck to consider the use of these new tables in the next experience study. We would also expect Buck to consider updating the generational improvement table to a more recent version.

Withdrawal from service before retirement (termination)

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

Retirement

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

Disability

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

Withdrawal of contributions at termination

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

Payroll Growth

Contribution rates are based on a percent of total DB and DCR payroll. The assumption used in the valuation is that payroll will grow at a rate of 2.75 percent per year. In 2020, the total payroll, based on the annualized earnings for the fiscal year ending on the valuation date, grew by about 1%. The following table shows the payroll growth over the past ten years.

Historical Payroll Growth			
Year	DB Plans Only	DCR Plans Only	Combined DB and DCR
2020	-7%	8%	1%
2019	-5%	9%	2%
2018	-7%	8%	0%
2017	-7%	7%	0%
2016	-5%	10%	1%
2015	-6%	12%	1%
2014	-5%	14%	1%
2013	-4%	17%	2%
2012	-3%	20%	3%
2011	-3%	25%	3%

Payroll growth is significant because the unfunded accrued liability (UAL) is amortized as a level percentage of pay. That is the same as expecting all future amortization payments to grow at the same rate as total payroll. When payroll does not grow as assumed then the UAL is not going to be paid off as

assumed. In order for the UAL to be paid off according to the current amortization schedule, payroll must grow at the assumed payroll growth rate. If payroll does not grow at that rate, as has been the case for the last eight years, there will be upward pressure on the contribution rate because contributions that are less than anticipated are flowing in the plan. We recommend Buck review this assumption in the next experience study and consider lowering it.

Active Rehire Assumption

The assumed increases in normal cost to account for anticipated rehires in the PERS and TRS DB plans are reasonable. No such assumptions exist in the DCR plans or JRS, even though there will always be both rehires and new entrants for these plans. Currently, the entire liability for new entrants and rehires in these plans is being counted as a loss. When these costs are incorporated into the actuarial valuation through an actuarial loss, the liability is added to the existing unfunded actuarial accrues liability and funded over the current amortization period.

It is important to note that the liability associated with the new entrant or rehire normal cost will ultimately be included in the actuarial valuation. However, we believe that the most appropriate approach is to incorporate these costs into the calculation of the normal cost rate for the upcoming year, like they currently are for the PERS and TRS DB plans. This approach allocates those costs to the period where they provided services to taxpayers, prevents the deferral of costs, and keeps the contribution rates more stable. We recommend Buck review with the Board whether to implement a new entrant/rehire assumption in the DCR plans and in JRS.

Medical Claims Cost

Buck provided additional information on their development of the per capita claims costs and we find their approach to be reasonable. We also agree that this assumption should be reviewed each year due to the volatile nature of these costs, as evidenced by the very large gains seen over the last couple years.

Healthcare Trend Assumptions

The healthcare trend rates follow the Society of Actuaries' Healthcare Cost Trend model and the model has been populated with assumptions that are specific to the State of Alaska. The trend rates are reasonable.

EGWP assumption

Alaska moved to an EGWP effective January 1, 2019. Buck obtained a savings estimate from the EGWP vendor and used that as the basis for the valuation. We concur with that approach. Buck is assuming the EGWP subsidy will last in perpetuity. While this is a reasonable approach, we would recommend that Buck detail the risk associated with this assumption, especially if EGWP subsidies wear away over time. Furthermore, we recommend that Buck monitor the estimated savings each year and determine if an update to their model is necessary.

Medicare Part B Assumption

Buck assumes 5% of pre-Medicare members are assumed to be eligible for Part B only. This assumption is reasonable, but we noticed that it is producing gains to the liabilities. We recommend Buck revisit this assumption in the next experience study.

COVID-19 Experience

Like many other retirement systems, the global pandemic caused by COVID-19 caused a noticeable drop in claims during the final quarter of fiscal year 2020. To account for the fact that these decreases in claims are not expected to continue and do not represent future expectations, Buck adjusted the fiscal 2020 claims used in setting the claims cost assumption to more closely resemble claims experience before the pandemic. We agree that this is a reasonable and necessary adjustment to make.

It should also be noted that there was a small spike in prescription drug claims in March of 2020, as people were presumably stocking up on medications, but claims decreased back to expectations shortly thereafter. Buck felt the overall prescription drug experience during fiscal 2020 did not require any COVID-19 adjustments for setting future expectations of those claims.

Buck will need to continue to analyze the claims experience in the next few years to determine if any further adjustments need to be made to account for behavior that may not be expected to continue in the future.

DCR Base Claims Cost Adjustments

Relative value refers to the value of the DCR retiree medical benefits compared to those provided by the Defined Benefit retiree medical plan. Since the DCR plan does not yet have enough membership to create credible experience, they use the same claims costs developed under the DB plan, adjusted by the assumed relative value factors. Based on additional information provided by Buck, we find these relative value factors to be reasonable.

The basis for these relative value factors rests with higher initial copays, deductibles, out of pocket limits and member cost sharing compared to the DB medical plan. As experience emerges we recommend the discount from the DB plan to the DCR plan continue to be tested to ensure this assumption is supporting the liabilities of the plan. When the DCR plans have enough credible claims experience, they should have their own claim cost assumptions set.

SUMMARY

Based on the last experience study and an annual review of the retiree medical claims, the assumptions being used in the June 30, 2020 actuarial valuations are reasonable. However, the economic environment has continued to evolve and change since then. We expect Buck to examine certain assumptions impacted by this, such as inflation, the assumed investment rate of return, and the payroll growth assumption. We also expect Buck to consider the new public sector specific mortality tables, as well as a more recent generational improvement table. Finally, we recommend Buck review with the Board whether to implement a new entrant/rehire assumption in the DCR plans and in JRS, as we believe that would allocate the contributions to the most appropriate period of time and keep the contribution rates more stable.

SECTION 4

ACTUARIAL METHODS

Actuarial Methods

The ultimate cost of the Alaska retirement programs is equal to the benefits paid plus the expenses related to operating the plans. This cost is funded through contributions to the programs plus the investment return on accumulated contributions which are not immediately needed to pay benefits or expenses. The projected level and timing of the contributions needed to fund the ultimate cost are determined by the actuarial assumptions, plan provisions, participant characteristics, investment experience, and the actuarial cost method.

Actuarial Cost Method

An actuarial cost method is a mathematical process for allocating the dollar amount of the total present value of plan benefits (PVB) between future normal costs and actuarial accrued liability (AAL). The retained actuary uses the Entry Age Normal actuarial cost method (EAN Method), characterized by:

(1) Normal Cost – the level percent of payroll contribution, paid from each participant's date of hire to date of retirement, which will accumulate enough assets at retirement to fund the participant's projected benefits from retirement to death.

(2) Actuarial Accrued Liability – the assets which would have accumulated to date had contributions been made at the level of the normal cost since the date of the first benefit accrual, if all actuarial assumptions had been exactly realized, and there had been no benefit changes.

The EAN Method is the most prevalent funding method in the public sector. It is appropriate for the public sector because it produces costs that remain stable as a percentage of payroll over time, resulting in intergenerational equity for taxpayers and budget predictability. The recent Public Fund Survey included 199 retirement systems (mostly statewide). Over 82% of the plans reported using the EAN Method. Therefore, the retained actuary's stated funding methods for TRS and PERS are certainly in line with national trends.

In order to determine the normal cost as a level percentage of pay, the valuation must first determine the future compensation that each individual member is expected to receive over the course of their career (which is also the compensation used to generate contributions). The projection of the future compensation should be based on the salary that the participant is expected to receive according to the timing of the expected departures from active service (or, decrements).

The level percent of pay method for both amortization of the unfunded accrued liability and the normal cost are both appropriate as a funding policy, considering that the payroll is not closed (as promulgated under SB 123.)

Asset Valuation Method

The market value of assets can experience significant short-term swings, which can cause large fluctuations in the development of the actuarially determined contributions required to fund the retirement systems. Thus, many retirement systems use an asset valuation method which dampens these short-term volatilities to achieve more stability in the employer contribution. A good asset valuation method places values on a retirement plan's assets which are related to the current market value, but which will also produce a smoother pattern of costs.

ASOP No. 44, Selection and Use of Asset Valuation Methods for Pension Valuations, provides a framework for the determination of the actuarial value of assets (AVA), emphasizing that the method should: (1) bear a reasonable relationship to the market value of assets (MVA), (2) recognize investment gains and losses over an appropriate time period, and (3) avoid systematic bias that would overstate or understate the AVA in comparison to MVA.

The actuarial valuations of the State of Alaska retirement systems currently uses a smoothed asset valuation method that immediately recognizes income equal to the expected return on market value of assets, based on the assumed valuation interest rate (7.38%). Differences between the assumed investment return and the actual market investment return are recognized over a five-year period. The AVA is not constrained to be within a "corridor" around the MVA.

We believe that that the asset valuation method for the State of Alaska retirement systems comply with ASOP No. 44. Additionally, the method is reasonable and appropriately applied for the valuation.

SUMMARY

We believe that the actuarial methods are reasonable and appropriately applied. As a result, we have no recommendations regarding the application of actuarial methods.

SECTION 5

ACTUARIAL VALUATION RESULTS

Actuarial Valuation Results

Benefits

Every employer is different and every employer's retirement plan is different. Each employer has a set of workforce and financial needs that dictate the type of retirement benefit that is most appropriate for their employees. Additionally, the amount of resources available to allocate to the retirement plan will dictate the level of benefits provided by the retirement plan. Regardless of the reasons for the benefit design, the employer must understand the liability and contribution requirements associated with the benefits promised. As a result, the actuarial valuation and the resulting funding policy contribution must properly reflect the benefit structure of the retirement plan.

In general, the benefits promised by the State of Alaska through the retirement systems were reasonably incorporated in the actuarial valuations of these programs.

Data

As part of our actuarial audit, we received a preliminary set of census data for plan participants and beneficiaries as of June 30, 2020 originally provided by the State of Alaska to the retained actuary for the actuarial valuations. Additionally, we received a final set of census data for plan participants and beneficiaries as of June 30, 2020 used by the retained actuary for the actuarial valuations. Finally, we received a copy of the data questions from the retained actuary with responses.

We used this data, along with the census summaries included in the valuation reports, to review the valuation data process. In total, we believe that the final valuation data used by the retained actuary is reasonable and valid for its purpose.

Actuarial Valuation Results

To verify the accuracy of the retained actuary's valuation results, GRS performed independent valuations, as of June 30, 2020, of the following plans:

- Public Employees' Retirement System (PERS) Defined Benefit (DB) Pension and Medical
- Teachers' Retirement System (TRS) DB Pension and Medical
- PERS Defined Contribution Retirement (DCR) - Occupational Death & Disability (OD&D) and Medical
- TRS DCR - OD&D and Medical
- Judicial Retirement System DB Pension and Medical
- National Guard & Naval Militia DB Pension

The replication valuations were based on the final valuation data provided by the retained actuary. The replication uses the same methods and procedures that were used by the retained actuary. The results show that the retained actuary's numerical results are reproducible within acceptable tolerance ranges.

Generally accepted actuarial standards and practices provide actuaries with the basic mathematics and frameworks for calculating the actuarial results. When it comes to applying those actuarial standards to complex calculations, differences may exist due to individual opinion on the best way to make those complex calculations. This may lead to differences in the calculated results, but these differences should

not be material. Generally, differences in actuarial liabilities of 5% or less are considered within acceptable tolerance ranges.

As the following table shows, our replications of the retained actuary's valuation results are generally well less than 5%, and very often within 1%. As a result, we believe that the actuarial accrued liabilities presented in the retained actuary's valuation reports provide a reasonable representation of the actuarial accrued liability based on the stated assumptions, methods and procedures.

Comparison of Actuarial Valuation Liabilities as of June 30, 2020 ($ in thousands)

	Buck	GRS	Difference
Public Employees' Retirement System - DB			
PVB - Pension	$ 15,904,744	$ 15,900,178	-0.03%
PVB - Medical	7,432,011	7,450,198	0.24%
PVB - Total	23,336,755	23,350,376	0.06%
AAL	$ 22,316,075	$ 22,313,731	-0.01%
AVA	17,703,068	17,703,068	0.00%
UAAL	4,613,007	4,610,663	
Funded Ratio	79.3%	79.3%	
Normal Cost	$ 222,640	$ 226,015	1.52%
Public Employees' Retirement System - DCR			
PVB - OD&D	$ 43,975	$ 43,702	-0.62%
PVB - Medical	247,650	250,528	1.16%
PVB - Total	291,625	294,230	0.89%
AAL	$ 161,335	$ 160,631	-0.44%
AVA	187,776	187,776	0.00%
UAAL	(26,441)	(27,145)	
Funded Ratio	116.4%	116.9%	
Normal Cost	$ 20,316	$ 20,457	0.70%
Judicial Retirement System			
PVB - Pension	$ 249,945,586	$ 248,823,194	-0.45%
PVB - Medical	22,457,366	22,456,334	0.00%
PVB - Total	272,402,952	271,279,528	-0.41%
AAL	$ 228,505,813	$ 224,338,789	-1.82%
AVA	229,593,682	229,593,682	0.00%
UAAL	(1,087,869)	(5,254,893)	
Funded Ratio	100.5%	102.3%	
Normal Cost	$ 6,787,853	$ 7,041,874	3.74%

	Buck	GRS	Difference
Teachers' Retirement System - DB			
PVB - Pension	$ 7,688,262	$ 7,685,168	-0.04%
PVB - Medical	2,614,021	2,620,668	0.25%
PVB - Total	10,302,283	10,305,836	0.03%
AAL	$ 9,936,711	$ 9,931,364	-0.05%
AVA	8,608,347	8,608,347	0.00%
UAAL	1,328,364	1,323,017	
Funded Ratio	86.6%	86.7%	
Normal Cost	$ 75,823	$ 77,579	2.32%
Teachers' Retirement System - DCR			
PVB - OD&D	$ 2,297	$ 2,297	-0.01%
PVB - Medical	63,321	64,039	1.13%
PVB - Total	65,618	66,335	1.09%
AAL	$ 40,857	$ 41,092	0.57%
AVA	54,487	54,487	0.00%
UAAL	(13,630)	(13,395)	
Funded Ratio	133.4%	132.6%	
Normal Cost	$ 3,708	$ 3,751	1.17%
National Guard and Naval Militia Retirement System			
PVB	$ 25,110,009	$ 25,202,489	0.37%
AAL	$ 22,417,247	$ 23,202,753	3.50%
AVA	43,020,393	43,020,393	0.00%
UAAL	(20,603,146)	(19,817,640)	
Funded Ratio	191.9%	185.4%	
Normal Cost	$ 759,140	$ 623,872	-17.82%

PVB = Present Value of Benefits
AAL = Actuarial Accrued Liability
AVA = Actuarial Value of Assets
UAAL = Unfunded Actuarial Accrued Liability
OD&D = Occupational Death & Disability

As part of our replication valuation, GRS examined sample participant calculations received from the retained actuary to ensure that the retained actuary valued the correct benefit levels, used the correct assumptions, and calculated the liabilities correctly on an individual basis. The requested sample participants included active and inactive members from the various retirement systems.

There are a few findings that were discovered during the replication process and subsequent review of the sample participants:

1. **415(b) Limit** – Benefits are currently being limited by the 415(b) limit. We recommend Buck confirm with Alaska staff if benefits in excess of the 415(b) limit are being paid (potentially through an excess benefit account), and if so, how.

2. **Rate Used in Valuation Not Matching Rate Disclosed in Report** – The ultimate termination rate being used for a male in the PERS DCR retiree medical valuation appears to be using the age 64 rate instead of the age 65 rate shown in the report. We recommend Buck verify all decrement rates shown in the reports are consistent with those being used in the calculations.

3. **Retirement Rates Not Being Applied at All Eligible Ages** – A PERS DCR Peace Officer/Firefighter member is eligible to retire at age 44, but retirement rates do not appear to start until age 45, so no retirement rate or termination rate is being used for this member at age 44. We recommend Buck apply retirement rates at all eligible ages.

4. **Spouse Age Assumption** – Benefits for a TRS DCR Occupational Death & Disability member appear to be assuming that male spouses are 3 years older. We recommend Buck update this assumption to be consistent with the most recently adopted assumption that male spouse are 2 years older.

5. **Contribution Refunds Assumption** – Death benefits for a TRS retiree medical non-occupational member appear to include a 95% assumption. We recommend Buck update this assumption to be consistent with the most recently adopted assumption that 0% of terminating members with vested benefits are assumed to have their contributions refunded.

6. **Retiree Medical Children Premiums** – Retiree medical benefits for children in the PERS and TRS DB plans appear to be assuming that premiums will be paid after the retired member turns 60 years old. We recommend Buck update all DB spouse and children retiree medical benefit so that premiums are no longer paid when the retired member turns 60 years old.

We provided these findings to Buck. They are still investigating item 1 with Alaska staff. For item 4, Buck indicated that the age difference is being applied correctly for active members, but will need to be updated for future inactive members, which we agree with. For items 2, 3, 5, & 6, Buck agreed their calculations should be updated as we recommended.

We believe that while the impacts of these recommendations will be immaterial, they should, at the very least, be updated in future valuations, subject to Actuarial Committee discretion.

Contribution Requirements

Beginning with the actuarial valuations as of June 30, 2014, in accordance with Senate Bill 119 and House Bill 385, a contribution calculation methodology was incorporated in order to recognize the timing lag and recognize expected changes in the unfunded liability during the two-year delay.

We replicated the roll forward methodology for the FY2023 Contribution Rate Calculation and verified the contribution rate computation. As the following table shows, our replications of the retained actuary's contributions, both in total dollars and as a percentage of pay, are very close. The minor differences are due to the differences in actuarial accrued liability and normal cost amounts shown in the table above. As noted in the Buck reports, the compensation used to develop the rates for PERS and TRS is a combination of both the DB and DCR compensations.

FY23 Actuarially Determined Employer Contributions ($ in thousands)

	Buck	GRS	Difference
PERS - DB $	$ 442,053	$ 443,256	0.27%
PERS - DB %	18.38%	18.43%	
PERS - DCR $	$ 154,165	$ 154,646	0.31%
PERS - DCR %	6.41%	6.43%	
TRS - DB $	$ 135,109	$ 134,656	-0.34%
TRS - DB %	17.90%	17.84%	
TRS - DCR $	$ 50,723	$ 50,798	0.15%
TRS - DCR %	6.72%	6.73%	
JRS - DB $	$ 9,220,546	$ 9,367,906	1.60%
JRS - DB %	70.08%	71.20%	
NGNMRS - DB $	$ 0	$ 0	0.00%

As a result, we believe that the required contribution rates in the retained actuary's valuation reports accurately reflect the amounts needed to appropriately fund the Alaska retirement systems.

Summary

We believe that the actuarial valuation results were developed in a reasonable manner. In the next actuarial valuation, we recommend that the retained actuary incorporate the findings noted above.

SECTION 6

CONTENT OF THE VALUATION REPORT

Content of the Valuation Report

ASOP No. 4, Measuring Pension Obligations and Determining Pension Plan Costs, provides guidance for performing actuarial valuations of pension plans, and ASOP No. 41, Actuarial Communications, provides guidance for communicating the results. These Standards of Practice list specific elements to be included, either directly or by references to prior communication, in pension actuarial communications. The pertinent items that should be included in an actuarial valuation report on a pension plan should include:

- The name of the person or firm retaining the actuary and the purposes that the communication is intended to serve.
- A statement as to the effective date of the calculations, the date as of which the participant and financial information were compiled, and the sources and adequacy of such information.
- An outline of the benefits being discussed or valued and of any significant benefits not included in the actuarial determinations.
- A summary of the participant information, separated into significant categories such as active, retired, and terminated with future benefits payable. Actuaries are encouraged to include a detailed display of the characteristics of each category and reconciliation with prior reported data.
- A description of the actuarial assumptions, the cost method and the asset valuation method used. Changes in assumptions and methods from those used in previous communications should be stated and their effects noted. If the actuary expects that the long-term trend of costs resulting from the continued use of present assumptions and methods would result in a significantly increased or decreased cost basis, this should also be communicated.
- A summary of asset information and derivation of the actuarial value of assets. Actuaries are encouraged to include an asset summary by category of investment and reconciliation with prior reported assets showing total contributions, benefits, investment return, and any other reconciliation items.
- A statement of the findings, conclusions, or recommendations necessary to satisfy the purpose of the communication and a summary of the actuarial determinations upon which these are based. The communication should include applicable actuarial information regarding financial reporting. Actuaries are encouraged to include derivation of the items underlying these actuarial determinations.
- A disclosure of any facts which, if not disclosed, might reasonably be expected to lead to an incomplete understanding of the communication.
- Cautions about any risk or uncertainty in the results of the actuarial valuation.

Our review of actuarial valuation reports includes the June 30, 2020 valuation reports for the State of Alaska retirement systems. The actuarial valuation reports complied with the applicable Actuarial Standards of Practice and thoroughly communicated the assumptions, methods and plan provisions incorporated into the June 30, 2020 actuarial valuations. The communication of the actuarial valuation results was well organized and provided stakeholders sufficient information to understand how the contribution rates were calculated.

We have noted a few modifications to the actuarial valuation reports that would allow the report to better comply with ASOP Nos. 4 and 41 as well as to more clearly communicate the components of the actuarial valuation.

- We recommend Buck add language to their reports clarifying how they are limiting salaries and benefits according to the 401(a)(17) limit and the 415(b) limit.
- In the assumption section of the PERS and TRS DB reports, its states that the composite retiree medical member contribution amount is being used for a specific group of current active and inactive members, but it appears the retiree only is being valued for all members and covered spouses. We recommend Buck clarify the language in both reports to more accurately reflect how the liabilities are being calculated.
- In the assumption section of the PERS and TRS DCR reports, the retiree medical participation rates show rates for 'Decrement Due to Disability', but these rates appear to be for decrements due to both disability and death. We recommend Buck update this language to clarify what decrements these rates are used for.
- In the PERS and TRS DB & DCR reports, the disability rates are only shown to age 54. We recommend Buck show the disability rates for all ages in their reports.
- Disability rates appear to be applied still after retirement eligibility for the DCR plans, but not the DB plans. We recommend Buck update the language in the reports to clarify whether or not disability rates are still being applied after retirement eligibility.

SUMMARY

In general, the actuarial valuation reports complied with the applicable Actuarial Standards of Practice and thoroughly communicated the assumptions, methods and plan provisions incorporated into the June 30, 2020 actuarial valuations. In order to improve the overall ability of the reports to communicate these items, we recommend that the retained actuary incorporate the noted enhancements above into future actuarial valuation reports.

Defined Benefit

Defined Contribution

Insurance Assets

Nonprofit

Unprecedented Territory—and the Inherent Limits of Diversification

6 min 33 sec

Posted by

Jay Kloepfer

May 13, 2022

Stock and bond markets around the globe were down together for the first four months of 2022. How often does that happen? Is this a normal part of the ups and downs of the capital markets, or is something unusual going on? Did diversification fail us? Or are we misunderstanding how the capital markets interact in the face of stress?

Let's focus on the U.S. market for this exercise, and broad recognizable market benchmarks. The S&P 500 Index was down 4.6% in 1Q22, while the Bloomberg US Aggregate Bond Index fell 5.9%. April was even worse, with the S&P 500 down another 8.7%, and the Aggregate off 3.8%. So for the first four months of the year, the S&P plunged 12.9% and the Aggregate dropped 9.5%. Other segments of the global equity and bond markets suffered similar pain, with the broad developed market MSCI World ex-USA Index down 11.1% and MSCI Emerging Markets down 12.2%, while the Global Aggregate bond index fell 11.3%.

Capital markets abhor uncertainty, and 1Q22 provided plenty. The Russian invasion of Ukraine upended expectations for an orderly slowdown from the surge in economic growth in 2021, and piled onto the spike in inflation that we expected to subside as supply chain bottlenecks cleared. Geopolitical upheaval, humanitarian catastrophe, and a Fed signaling a dedication to fighting inflation led to the down markets for both stocks and bonds.

How Often Stock and Bond Declines Occur

How unusual is this? Turns out, more often than we expected. Using data back to 1926, we found 37 quarters in which returns on stocks and bonds were both negative, just under 10% of all quarters over the period. Before now, the most recent quarter was 1Q18, and before that, the 2nd and 3rd quarters of 2008, as the Global Financial Crisis (GFC) began unfolding. In case you were wondering, the S&P 500 plunged 19.6% in 1Q20, while the Aggregate rose 3.1%. The frequency of down quarters for both stocks and bonds has been much lower since 1990 than in the first 60 years of the data set.

Looking at annual returns, there have been only two calendar years when stocks and bonds were both down, 1931 and 1969 (with a near-miss in 2018). So coincident quarterly declines in stocks and bonds are not that unusual, although more common in the 1970s than any other decade (nine times), and it has happened in only nine quarters in the three-plus decades that started in 1990. To develop a more nuanced look than simply decades, we examined the interest rate environments during this 96-year period.

In the table below we break the history of return data since 1926 into three regimes:

Negative Stock/Bond Returns and Correlations in Different Rate Regimes

Period	Regime Description	Negative Return Frequency	Stock/Bond Correlation
Regime 1: 1926-1965	Low, stable interest rates	7%	0.13
Regime 2: 1966-1981	Secular rate rise	26%	0.48
Regime 3: 1982-present	Secular rate decline	6%	0.05

Sources: Bloomberg, Callan, Ibbotson, S&P Dow Jones Indices

Index Definitions: for stocks, we use what we call the "Ibbotson S&P 500" index, in which we splice the S&P 500 index starting from 1972 with the Ibbotson Large Company stock index back to 1926. For bonds we use the "Ibbotson Aggregate," in which we splice the Bloomberg Aggregate index starting in 1976 with a blend of 35% Ibbotson Corporate Long Term Bond index and 65% Ibbotson Intermediate Government index.

Regime Definitions: The Intermediate Government yield broke 5% for the first time ever in February 1966, so we started Regime 2 at the beginning of 1966. The Agg yield peaked at 16.50% at the end of 3Q81, so Regime 3 begins at the start of 1982.

Regimes 1 and 3 look very similar in terms of both frequency of negative quarters and stock/bond correlation (the two metrics are related but still interesting). In Regime 2 (rising inflation), the stock/bond correlation increases and bonds don't provide nearly as much diversification benefit. The question today is whether we are entering another Regime 2!

While quarters with both stock and bond declines are not unusual, what is truly unprecedented is the depth of negative bond returns for this most recent four months covering January-April 2022. Looking at monthly data back to 1976, which is as far back as the Aggregate data go, the current four-month decline in bonds of 9.5% is the worst four-month return ever. The previous "record" was -8.5% through March 1980. The worst quarterly return was even lower than that, -8.7% also ending March 1980, so December 1979 was actually positive in that rolling 4-month calculation. Surprisingly, the worst calendar year return was just -3.3% in 1969. Even with that terrible first quarter, the return for calendar 1980 was +2.7%, so there's hope for 2022!

The big difference between 1980 (and most of the index's history) and now is the underlying yield. The price changes in 1980 were even greater than now as interest rates were hiked into double digits, but the underlying yield on the bonds helped cushion the return blow. The yield to worst on the Aggregate at the end of April was 3.48%, on a steady climb up from 1.75% at the start of 2022. In comparison, the yield to worst in March 1980 was 14.1%(!), providing an incredible cushion for capital losses due to interest rate hikes. We have no such cushion today, as we embark on a rising rate path starting from a protracted period of zero interest rate policy.

Did diversification fail in the first four months of 2022? The history of quarterly stock and bond returns falling together about 10% of the time suggests this experience is to be expected over the course of the capital markets cycle. For any investor who chose to de-risk during 2021 by reducing equity and increasing fixed income, a simple but broadly powerful method to reduce risk, the returns were essentially the same as if they had made no such move. Shouldn't a low correlation between stocks and bonds lead to guaranteed protection from a stock market decline by holding bonds? Perhaps we can call it the curse of zero correlation. In the dark days for a market drawdown, what investors really want is correlation close to negative one, which indicates that when one asset class is down, the probability that the other asset class is up will be very high. What's available in real life is a correlation closer to zero, which in statistics means there's no discernable pattern between the returns of the two asset classes. Zero correlation indicates that when one asset class is down, the probability that the other asset class is up is actually very similar to the probability that it will be down!

During the onset of COVID in 2020, we saw a similar story play out with alternative risk premia (ARP) strategies. Stocks were down, but so were the ARP strategies. Then stocks recovered, but ARP did not. Now stocks are down this year, but several of the large ARP players are enjoying strong returns; one of the largest manager's mutual funds is up 23.8% year-to-date following a 24.8% gain in 2021.

In normal times, a correlation close to zero suggests a very strong diversification benefit between two asset classes. But it doesn't suggest that one will always move in the opposite direction of the other. Correlation is a slippery topic for many investors to understand. By definition, you need 12 periods minimum to calculate correlation (days, months, quarters), and so the more data one gets to generate a "better" estimate, the more likely you are to smooth out extreme events where correlations go to 1 for a very short period of time, the one thing you thought low correlation was helping to fight.

So you will hate your decision to diversify, but only half of the time. We at Callan believe in diversification, but remind ourselves that a diversified portfolio can still suffer losses in a number of asset classes at the same time, with the expectation that this phenomenon doesn't happen 90% of the time. Diversification is not the same as explicit hedging, a topic for a future blog post.