

ALASKA RETIREMENT MANAGEMENT BOARD

JUNE 18-19,
2020

BOARD OF TRUSTEES MEETING

TELECONFERENCE: 1-907-202-7104

JUNE 18TH ACCESS CODE: 584 991 567#

JUNE 19TH ACCESS CODE: 255 321 876#

THURSDAY, JUNE 18, 2020

- 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. Approval of Minutes – May 1, 2020**
- VII. 9:10 Staff Reports**
 - 1. Retirement & Benefits Division Report
 - A. Buck Consulting Invoices (informational)
 - B. Membership Statistics
 - C. HRA FY 2021 Contribution Information
 - D. DRB Update / Legislation Summary*Ajay Desai, Director, Division of Retirement & Benefits*
Kevin Worley, CFO, Division of Retirement & Benefits
 - 2. Treasury Division Report
Pamela Leary, Director, Treasury Division
 - 3. Calendar/Disclosure
Stephanie Alexander, ARMB Liaison Officer
 - 4. CIO Report
Bob Mitchell, Chief Investment Officer
 - 5. Fund Financial Presentation
Kayla Wisner, Comptroller
Kevin Worley, CFO, Division of Retirement & Benefits
- VIII. 9:45 Trustee Reports**
 - 6. Chair Report, *Rob Johnson*
 - 7. Committee Reports
 - A. Audit Committee, *Rob Johnson, Chair*
 - B. Actuarial Committee, *Norm West, Chair*
 - C. DC Plan Committee, *Bob Williams, Chair*
 - D. Operations Committee, *Tom Brice, Chair*
 - E. Alaska Retiree Health Plan Advisory Board,
Gayle Harbo, ARMB Member

8. Legal Report, *Stuart Goering, ARMB Legal Counsel*

- 10:20-10:50** 9. Actuarial Review/Acceptance-Certification of
FY2019 Review Reports and Valuations
Norm West, Chair, Actuarial Committee

*Action: Board Acceptance of GRS Certification for
FY2019 PERS, TRS, NGNMRS, JRS, and DC Plan Valuations*

*Action: Board Acceptance of FY2019 Buck Valuations for
PERS, TRS, NGNMRS, JRS, and DC Plan Valuations*

10:50AM – 10 MINUTE BREAK

- 11:00-11:30** 10. Overview of Environmental, Social, and Governance (ESG)
Tom Shingler, Callan LLC

- 11:30-12:00** 11. Fiduciary/Legal Education
Stuart Goering, ARMB Legal Counsel

LUNCH – 12:00PM - 1:15PM

- 1:15-1:45** 12. To what extent should ESG be incorporated into the
investment decision making process?
Zach Hanna, Deputy CIO

- 1:45-2:15** 13. ISS Presentation
Brian Walker, Institutional Shareholder Services
Chris Miller, Institutional Shareholder Services
Jack Ferdon, Institutional Shareholder Services

- 2:15-3:00** 14. Performance Measurement – 1st Quarter
Paul Erlendson, Callan LLC
Steve Center, Callan LLC

3:00PM – 10 MINUTE BREAK

- 3:10-3:40** 15. Asset Allocation Discussion
Bob Mitchell, Chief Investment Officer
Jay Kloepfer, Callan LLC

FRIDAY, JUNE 19, 2020

9:00-9:30 16. Portfolio Update
Bob Mitchell, Chief Investment Officer

9:30-10:15 17. Change Scientific Beta Indices
Greg Behar, Legal & General Investment Management
Melissa Ruffel, Legal & General Investment Management

Action: Scientific Beta Index Change
Bob Mitchell, Chief Investment Officer

10:15AM – 10 MINUTE BREAK

10:25-10:55 18. Review of Opportunistic Investments
Steve Sikes, Manager of Opportunistic Strategies and Real Assets

10:55-11:25 19. Real Assets Manager Structure
Steve Sikes, Manager of Opportunistic Strategies and Real Assets

Action: Real Assets Manager Structure Changes

Action: Farmland Guidelines

Resolution 2020-02

Action: Timberland Guidelines

Resolution 2020-03

11:25- 20. Investment Actions/Information Items
A. Asset Allocation Adoption
B. Comparison of FX Conversion Costs
C. Adopt SmartSpending
D. Convert to Lendable SSGA Indices
E. Opportunistic Benchmark Change
F. U.S. Equity Guidelines Modification
G. Domestic Fixed Income Guidelines Update
Bob Mitchell, Chief Investment Officer

IX. Unfinished Business

X. New Business

XI. Other Matters to Properly Come Before the Board

XII. Public/Member Comments

- XIII. Investment Advisory Council Comments**
- XIV. Trustee Comments**
- XV. Future Agenda Items**
- XVI. Adjournment**

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

**State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
MEETING**

Videoconference

**MINUTES OF
May 1, 2020**

Friday, May 1, 2020

CALL TO ORDER

CHAIR ROBERT JOHNSON 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

Robert Johnson, *Chair*
Tom Brice, *Vice-Chair*
Gayle Harbo, *Secretary*
Lorne Bretz
Allen Hippler
Commissioner Lucinda Mahoney
Commissioner Kelly Tshibaka
Norman West
Bob Williams

Board Members Absent

None

Investment Advisory Council Members Present

Dr. William Jennings
Dr. Jerry Mitchell
Ruth Ryerson

Department of Revenue Staff Present

Bob Mitchell, Chief Investment Officer
Pamela Leary, Director, Treasury Division

Kayla Wisner, State Comptroller
Zachary Hanna, Deputy Chief Investment Officer
Scott Jones, State Investment Officer
Stephanie Alexander, Board Liaison
Steve Sikes
Michelle Prebula
Grant Ficek
Sean Howard
Shane Carson
Ryan Kauzlarich

Department of Administration Staff Present

Kevin Worley, Chief Financial Officer, Division of Retirement & Benefits
Ajay Desai, Director, Division of Retirement & Benefits

Consultants, Invited Participants, and Others Present

Stuart Goering, Department of Law, Assistant Attorney General
Paul Erlendson, Callan Associates, Inc.
Steve Center, Callan Associates, Inc.
Erick Shirbini, Scientific Beta
Mark Zeigler, Scientific Beta
Henry Disano, State Street
Molly Soares, State Street
Elaine Schroeder
Doug Woodby
Rick Steiner

PUBLIC MEETING NOTICE

Board Liaison STEPHANIE ALEXANDER confirmed that public meeting notice requirements had been met.

APPROVAL OF AGENDA

MS. HARBO moved to approve the agenda. MR. WEST seconded the motion.

With no objections, the agenda was approved.

APPROVAL OF MINUTES

MS. HARBO moved to approve the minutes of the March 19, 2020 meeting of the ARM Board. MR. WEST seconded the motion.

With no objections, the minutes were approved.

PUBLIC/MEMBER PARTICIPATION, COMMUNICATIONS AND APPEARANCES

MS. ALEXANDER stated that there were no communications the Board needed to know of, and there were three people who wanted to testify.

DOUG WOODEBY said that he and his wife are beneficiaries of the TRS and PERS pension programs, and they thank the Board for their efforts to protect and grow these pension funds. He said he hoped they had seen his written comments that he submitted Wednesday, and requested that his full comments be included in the minutes, noting that he submitted comments for the March meeting, and they were not included in the minutes.

He said the gist of it is his belief that the defined benefit fund, and all funds under their purview, should be cleansed of fossil-fuel-related investments, because performance data are clear. Traditional energy investments have seriously underperformed the overall market for at least a decade, and they've been in a downward trend for four years, punctuated by the recent collapse. He said the numbers justify divestment for fiduciary reasons alone, not to be confused with environmental, social, and governance concerns. He said his submitted testimony includes graphics showing why the divestment is justified, and lists seven types of fiduciary risk that the Board now faces if the funds continue to be invested in fossil fuels. MR. WOODEBY said that neglecting those risks may constitute a breach of fiduciary duty, while divestment would be an important step to protect the long-term value of the funds. Thus, the question could be raised as to why, from a fiduciary neglect perspective, pension funds continue to have investments in fossil fuels.

ELAINE SCHROEDER from Juneau said that her husband is retired from the Alaska Department of Fish and Game, and they are beneficiaries of PERS. As a beneficiary, she is naturally concerned about the performance of the pension fund, especially in light of the many years of poor energy sector performance, not to mention the current crash of fossil fuel stocks. She said the growing awareness of climate risk to public funds has motivated a growing number of pension funds in the U.S to divest from fossil fuels. She quoted a couple of statutes, and said that as co-chair of the nonprofit 350 Juneau, they have requested information about the ARM Board's energy sector assets, about their climate risk assessment process, and about the performance of all energy sector holdings of the fund over time. They have not yet received a response, and are asking again for this information, emphasizing that this is for financial reasons and not for ESG concerns at this time.

MS. SCHROEDER noted that regarding fiduciary neglect risk, there are institutionally respected tools to assess climate risk, and backward looking fiduciary assessments may be legitimately faulted for neglect of the state of knowledge.

MS. SCHROEDER asked that the ARM Board demonstrate transparency and responsivity to the concerns of beneficiaries by responding to their request for information. She thanked the Board for their efforts to protect pensions, for the long hours they spend ensuring the financial security of Alaska retirees, and for their attention to beneficiaries' concerns.

RICK STEINER said he is a TRS retiree from the University of Alaska, and he echoed what MS. SCHROEDER and MR. WOODEBY said, and encouraged the Board to take their suggestions very

seriously. He said that he too would like the funds that the ARM Board manages to divest of all fossil fuel holdings as a fiduciary obligation. He said they've been asking for this with the Permanent Fund and DOR funds for over 25 years, and they did receive a letter in 1997 from the Commissioner of Revenue laying out the fiduciary obligations of the State of Alaska in managing these funds. At that time, he said, it may have made sense to hold fossil fuel investments because they were a growing asset class, but in the last decade they have been losing value considerably, particularly in the past few months. MR. STEINER said that many funds have divested of fossil fuels because of the financial risk, and the Permanent Fund has admitted that they have been losing money in fossil fuel investments, but have not yet divested. In closing, he asked the Board to put this issue on their agenda for the next meeting, and between now and then to direct staff to analyze and report the performance of their fossil fuel holdings and analyze the future risk of them, and to have an action item on the agenda to consider divestiture.

CHAIR REPORT

CHAIR JOHNSON said his report was encapsulated in a letter drafted largely by CIO MITCHELL and MS. LEARY, included on the website for the ARM Board, which is to beneficiaries and members of the funds regarding the impact of COVID on investment and going forward.

CHAIR JOHNSON thanked MS. ALEXANDER and other DOR members who have been so helpful in creating the teleconference mechanisms, and said the Board appreciates the efforts of all the state employees, including DOR and DRB staff who are working diligently from home.

COMMITTEE AND LEGAL REPORTS

1. AUDIT COMMITTEE

CHAIR JOHNSON said the Audit Committee had a brief and informative meeting the previous day, with the primary purpose of getting a rundown on further employer audits. He said that some participants in the plan have been negligent in tendering funds back to PERS, not only employer contributions but also monies withheld from employees. CHAIR JOHNSON reported that steps are being taken to determine the best and most appropriate way of actually taking definitive action regarding some of these non-payers, and of course, notice to employees is an important part.

CHAIR JOHNSON said they heard further reports from MR. WORLEY regarding GASB 68 and 75 reports concerning benefit payments and adjustments, and they heard that the audit process was going to be started earlier so as to be completed sooner than in the past. Also, MR. MCKNIGHT of the DOR provided a compliance report and update, and KAYLA WISNER, Treasury Department Comptroller, provided a further update on indirect foreign exchange services, the point of which was that the expenditures for the FX plan that is underway are comparable with other alternatives.

2. OPERATIONS COMMITTEE

MR. BRICE reported that the Operations Committee had a two-hour meeting with presentations from MS. LEARY on legislative actions and on the expenses for the ARM Board's operation. Also, he

said that SCOTT JONES gave an update on the Middle Office reorganization, and it seems like that strategy will be helpful to ongoing operations, and DOUG PETERSEN at Empower spoke on cybersecurity.

MR. BRICE said the Operations Committee also had a couple of action items, one about revising the Board policy manual to clarify some confusing language about travel, and one relating to the establishment of an Investment Committee.

3. DEFINED CONTRIBUTION PLAN COMMITTEE

MR. WILLIAMS said the DC Committee had a fantastic, exciting meeting, the longest ever at three and a half hours. He said that Chief Pension Officer KATHY LEA presented twice on her last day of work, and she also shared a lot of information on how to sign up for the State of Alaska's 457 plan. He said they also got updates from Empower on how their efforts to increase participation are going, and they had a presentation from EMILY RICCI on the DC Health Plan and from KEVIN WORLEY on the HRA plan and the associated interest, which hadn't been tallied since the plan started 14 years ago, but now has. A question was raised about how members can mitigate risk in their own accounts as they approach retirement.

MR. WILLIAMS said they also had a presentation with a possible action item for offering a Secure Foundation option, but it didn't pass. He said there is interest in some sort of guaranteed lifetime benefit, but they didn't think this was the best option.

MR. WILLIAMS said they had an overview from Callan on the stand-alone REIT, and discussion led to the idea that offering a brokerage window may be a better option to make such specialized investments available to members, and there will be an action item later.

MR. WILLIAMS said they had received public testimony about difficulty trying to withdraw money from just one investment account instead of having the withdrawal distributed equally among, for example, stocks and bonds. He hopes to have R&B address this issue, maybe by the next Board meeting.

4. ACTUARIAL COMMITTEE

MR. WEST reported that the Actuarial Committee had reviewed the current draft of all the various actuarial valuations, which incorporated the items brought up by GRS, and the final reports will be ready by the next meeting. Also, Buck went through their timeline for next year, and they reviewed some questions about the experience gains that the plans had as a result of changes in the prescription drug contract. The gains were over \$900 million, and Buck did a fairly extensive mathematical presentation on how those numbers were developed. They also answered the question of what portion of the retirement benefits were actually paid for by retirees, employers, and the state.

MR. WEST said that Buck presented a really cool actuarial dashboard that they've created, which the committee can't wait to have available to the Board and the staff and administration.

MR. WEST said the committee took up a proposal from DIRECTOR LEARY to extend the review actuarial contract pursuant to the options contained in the initial contract and to extend it for one year. That resolution was passed unanimously by the committee. MR. WEST moved on behalf of the Actuarial Committee for the approval of the GRS one-year extension.

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

5. RETIREE HEALTH PLAN ADVISORY BOARD

MS. HARBO submitted a written report, which was included in the meeting packet. She added that she wanted to thank the Division of Retirement and Benefits, and particularly the healthcare team, for the excellent town halls, which have kept retirees up to date on happenings like changes from Aetna and Medicare. She thanked EMILY RICCI and all the people on the healthcare team with DRB.

6. LEGAL REPORT

STUART GOERING noted that it was Law Day, commenting that the robust legal system supports economic activity and makes it possible for people to do business with one another in an organized and reliable way.

MR. GOERING said they have a new assistant attorney general who will be handling securities litigation matters on behalf of the ARM Board and the Alaska Permanent Fund Corporation. His name is BEN HOFMEISTER, based in Juneau, and he probably won't be interacting with the Board very much initially, but there has been a large increase in litigation involving securities fraud, including overseas, and it has become difficult for MR. GOERING and CHRIS POAG to deal with, so now they have some help. He said this position is funded in large part by APSC.

MR. GOERING said he had three cases to report on, none of which the ARM Board is a party to but which are of interest. The first is *Metcalf v. State*, which was argued in February and is still pending in the Alaska Supreme Court. This involves the claim that former plan participants who cashed out of DB plans might have the ability to come back into the plans in the future.

Two trial cases are pending, one involving changing retiree dental benefits, which is in the post-judgment phase, and another in the discovery phase involving retiree health benefits that arose out of the 2014 change to Aetna as the third party administrator.

MS. HARBO asked if they know how many people could potentially be affected by the *Metcalf* case; MR. GOERING replied that they don't know how many of them are still alive, or whether they would be eligible for reemployment, or whether they would seek reemployment, so it is extremely difficult to assess the potential impact. He noted that the case was decided on summary judgment, and the Supreme Court will decide whether the summary judgment will stand. If it doesn't, they will have to go back through the discovery process and a trial, so they would have a lot more information before there would be a potential judgment that would be adverse to the state. MS. HARBO asked if they knew how many people had withdrawn their money; MR. GOERING replied that he doesn't, but he would follow up on that.

MINUTES, CALENDAR/DISCLOSURES, AND STAFF REPORTS

7. APPROVAL OF MINUTES: March 19, 2020

The minutes were taken up out of order, after approval of the agenda.

8. CALENDAR UPDATE

MS. ALEXANDER stated that the 2020 meeting calendar is in the packet, but it is still uncertain whether the June meeting will be in-person or similar to this videoconference.

CHAIR JOHNSON noted that staff reports would normally include a report from DRB and from MR. JONES and others, but those were delivered at the March 19 teleconference. MS. HARBO requested a quick update on the amount of money in the funds and the amount that is managed internally; MR. MITCHELL said the balance of the plans is over \$25 billion, with approximately half managed by internal staff.

EXISTING BUSINESS

9. PORTFOLIO UPDATE

CIO BOB MITCHELL started by saying that the intent of this meeting is to get some of the business done that was scheduled for the original March meeting, and because of how quickly things are changing, he has taken on the task of providing updates on the portfolio. He said he would review what's been happening with the fundamentals of the economy and policy reactions, review the impact on the markets, discuss challenges with managing portfolios primarily with illiquid assets in them during periods like this, review the asset allocation, and finish with a list of current projects that staff is working on.

MR. MITCHELL showed some charts, acknowledging that information is quickly becoming outdated these days, and stated that in six weeks, 10 million more jobs have been lost than were generated in the economy in the past decade. Estimates of impact on GDP growth vary, but have dropped from pre-COVID estimates of over 3 percent growth to projections of negative 4 to 5 percent. Estimates for the second quarter vary from down 30 to down 40 percent, which is a significant and unprecedented drop for one quarter. However, he said, generally speaking, forecasts are calling for an improvement in the economy in the second half of 2020 and into 2021, though not a full recovery. He reviewed fiscal support measures taken in a variety of countries, with very swift and strong responses, and went over what the Fed has done in the U.S. He reviewed market impacts and interest rate declines, noting that at one point for the first time ever, Treasury yields were below 1 percent, though they have since normalized a bit to 1.2 percent for long bonds.

MR. MITCHELL went over all yields, showing how they have varied over time with high yield being more volatile than investment-grade bonds. He said that roughly 11 percent of the high-yield market is comprised of energy-related bonds, which are very likely to experience impairment in the current environment. He reviewed the performance of equities, and showed charts demonstrating the

volatility of late, which though significant is not unprecedented in history. He said that liquidity had diminished significantly, but has come back in part because of the Fed's actions to purchase a variety of bonds. He noted that there were points when Treasuries were trading by appointment, which is unthinkable from a liquidity perspective, since those are the most liquid instruments in the marketplace. He emphasized that the performance for the market value of illiquid assets will likely be slower to reflect the recent changes. He said that managing a portfolio with illiquid assets makes it more difficult to assess asset allocation relative to target, and it's important to communicate how staff is approaching the portfolio allocation. He said they are being mindful of liquidity, and if they want to make changes, they are spreading them over several days, and they are managing from a risk perspective, striving to maintain a risk posture that is similar to that of the strategic asset allocation.

MR. MITCHELL then discussed current staff initiatives. IAC, Callan, and staff have been talking about the annual asset allocation exercise, which will be brought to the Board in June. They've been going through manager structure with the implementation of investments in various asset classes, and real assets is the next to do, but they are going to wait for liquidity to improve before they come to the Board with recommendations on that. He also said he's asked the head of Opportunistic, STEVE SIKES, to do a review, which may be presented in June, and said that staff has concluded their evaluation of active currency overlay managers and are not recommending engaging such a strategy now because the return would be relatively low and doesn't justify the increase in complexity. Regarding risk parity, the first quarter is presenting a good lab experiment to see how those strategies did, and he expects staff to complete their review in the next week or two, then depending on their conclusions, may recommend hiring one or more managers or not pursuing that strategy at this time.

MR. MITCHELL said that the Board would get a rather detailed explanation at this meeting of equity factor implementation, which is a significant part of their manager structure in public equities, so it's important to periodically review it, and in June staff may recommend some adjustments to the implementation. He also noted that in December, Acting Commissioner Mike Barnhill asked staff to evaluate ARM Board's foreign currency execution against peers, and they are also working on the question of how ESG considerations should be incorporated into the investment decision-making process. Finally, he added that each June he asks STUART GOERING to provide a brief overview of Trustees' fiduciary responsibilities, which will also be at the next meeting.

CHAIR JOHNSON recessed the meeting from 10:30 a.m. until 10:45 a.m.

10. SECURITIES LENDING UPDATE

MICHELLE PREBULA said that the ARM Board has been in and out of securities lending since 1991, in from '91 to '95, in from 2001 to 2008, and they restarted the program in 2017. She introduced HENRY DISANO, manager of the relationship management team at State Street, to explain what they are currently doing in the program.

MR. DISANO said that one of the main reasons their clients participate in securities lending is to gain additional alpha. The revenue helps offset custody costs and outperform peers. He said the vast majority of state pension plans are involved in securities lending, which adds liquidity to the various markets.

MR. DISANO explained that securities lending entails transferring ownership to one of the borrowers in State Street's program, while still retaining the rights of ownership. The borrower is always contractually obligated to return securities at any point that the lender needs them back, and the securities that State Street lends are always collateralized with cash.

CHAIR JOHNSON asked about the risks to the lender if the borrower were to go into bankruptcy; MR. DISANO said that the industry has evolved to the point that he believes every single provider of securities lending offers counterparty default indemnification, plus they have the cash collateral. However, if the borrower were to go bankrupt and the security was worth more than the collateral, State Street would make up the difference.

MR. DISANO then described how the transaction is carried out, and how the collateral would be invested in the lender's cash collateral vehicle, which in this case is the Navigator government money market fund. If the price of the security appreciated, the lender would receive additional collateral, which is now done automatically. At the end of the transaction, the securities lender returns the cash collateral but keeps the income they've made by investing it, which is split 80/20 with State Street.

MR. DISANO said that State Street is the most experienced securities lending agent in the business, with 45 years of experience, and currently about \$4.5 trillion in lendable assets. He said they currently have 251 active clients, with 157 borrowers, and they are lending in 34 markets in a global program.

MOLLY SOARES then discussed the Alaska securities lending program, started in February of 2017, and accepting only cash collateral. MS. SOARES said Alaska is currently only lending to non-GMSLA, or Global Master Securities Lending Agreement, borrowers. Since inception, Alaska has generated a little over \$6.5 million in revenue, with \$1.3 million in 2019. She said that as of March 31, 2020, they had \$10.8 billion in lendable assets and \$22.8 million on loan, and currently they are returning about 220 basis points. She said the ARM Board currently has 50 funds that are authorized to lend, and nine of those have active balances as of March 2020.

MS. SOARES showed a performance summary, with a dip in lendable assets when the program was restructured in late 2019, which in conjunction with muted borrower demand resulted in lower Q1 numbers, which she said would probably be what could be expected going forward.

MR. DISANO then talked about risks to consider, including the reinvestment risk, which is the main one, though Alaska is invested in their most conservative investment vehicle. Other risks are credit risk, operational risk, and legal risk. MR. DISANO described resources State Street has dedicated to risk management, and said the program has certainly been tested over the years, including with the current crisis, and they have not seen any impacts to their overall securities lending program.

11. EXECUTIVE SESSION

The executive session was off record from 11:16 a.m. until 12:00 p.m.

After the Executive Session, roll call was taken again. All Trustees except COMMISSIONER

TSHIBAKA were present.

In response to a realization by CHAIR JOHNSON, MR. GOERING explained that the Board had not voted to go into Executive Session; what should have happened is the Board should have entertained a motion to go into Executive Session, and the reasons for the Executive Session should have been stated, probably in this case for consideration of matters the immediate knowledge of which would clearly have an adverse effect on the finances of the public entity. The effect of that defect is that any action taken is voidable; however, the same section of statute provides that if the governmental body has violated or is alleged to have violated the Open Meetings Act, the entity can cure the violation by holding another meeting that is in compliance with the notice. MR. GOERING said that in this case, the Board could vote now to go into Executive Session and to ratify the decision effective to the beginning of the Executive Session.

MS. HARBO moved to go into Executive Session concerning matters the immediate knowledge of which would clearly have an adverse effect upon the finances of the public entity. MR. WILLIAMS seconded the motion. A roll call vote was taken, and the motion was unanimously approved.

CHAIR JOHNSON stated for the record that no directions or decisions were made in the Executive Session. MR. GOERING added for the record that his advice on the subject was based on the fact that the ARM Board has very consistently followed the Open Meetings Act with respect to Executive Sessions in the past. CHAIR JOHNSON said the lack of a vote to go into Executive Session prior to the session was an error of the Chair, and it wouldn't be done routinely.

CHAIR JOHNSON recessed the meeting from 12:08 p.m. to 1:00 p.m.

12. REFLECTIONS

DR. JENNINGS shared some historical reflections. He explained that he started on the IAC for SPIB in 2003 in the academic slot, and he is also on four investment committees, and he advises a CFO who has sole responsibility as the trustee of a \$2 million pension, so he sees both the pension side and the nonprofit investing side. He said he appreciated the recent renewal of his relationship with the Board.

DR. JENNINGS said that “issue zero” for financial matters is that owners think differently than agents, and the principal/agent conflict colors pretty much all financial decision-making. The solution to the agency problem is to only take on relationships where the incentives are well-aligned. He said he realizes that he is an agent of the Board, and he thinks all members of the IAC understand their duty of loyalty to the Board. He said he thinks the IAC has gotten better during the second half of his time on it in understanding that they could and should spend time with Callan and with staff learning some details of the investment program and their ways of thinking. He noted that he wants to be involved with organizations that work to improve their investment operation, and he thinks the ARM Board is doing good things. He said there are times when it feels like the IAC isn't contributing, but then there will suddenly be an occasion where they are heavily engaged. He noted that investment committee expertise is different than investment expertise, and the thing to aspire to is good governance.

DR. JENNINGS reviewed the Board's history, noting that GAYLE HARBO and ROB JOHNSON, as well as JERRY MITCHELL and some staff, have been involved with ASPIB and the ARM Board over the whole timeline; also, the strategic asset allocation has not changed dramatically, and he said he is struck by that stability, and thinks it's good. However, he added that there has been change as in adding more international and alternatives and considering a lot of possibilities. The private programs have been built out, and real assets is now larger and more nuanced.

DR. JENNINGS commented that he attended the Defined Contribution Committee meeting the previous day, and he was struck by how much progress there has been on that front, with better, cheaper, and more understandable investment programs which he thinks participants will highly appreciate. He referred to an article by Jonathan Clements characterizing defined contribution as if a passenger were on an airplane, and suddenly were sent to the cockpit to fly the plane. Most people would be terrified.

Offering a bit of perspective, DR. JENNINGS said he thinks they've solved the first problem of fewer and bigger manager allocations, and they've made progress on the governance questions. He thinks it is appropriate to dig into particular topics in great depth, and he said he will continue to be an advocate for indexing and for more and more staff expertise. He noted that one of RUTH RYERSON's predecessors in that slot on the IAC, TIM O'BRIEN, had a list of questions to ask for new investments, which DR. JENNINGS expanded upon in his presentation.

Under thoughts for the future, DR. JENNINGS said it's important to focus on costs and oversight of internal management. He concluded by saying that he is optimistic and encouraged; he said he believes public funds, and particularly the ARM Board, can compete, and they are fortunate that the state makes its contributions, that they have a harmonious and functional board and good staff, and the size of the investment pool is large enough to be able to do some interesting value-added things, but not so big that they can't move the needle with significant allocations.

MR. BRICE thanked DR. JENNINGS for the analogy of flying a plane, saying that he's glad to hear that the IAC and others recognize that a major part of what the ARM Board needs to be doing or encouraging is educating people about their options. DR. JENNINGS noted that the target date funds are a good default option, but the menu can be a bit intimidating.

MR. WEST said he gets asked all the time, what is in those target date funds, who is managing it, and why should somebody trust them? But he noted that people have different comfort levels, and some people want different things, and some aren't afraid to fly the plane.

MS. HARBO thanked DR. JENNINGS and JERRY MITCHELL, both of whom she has known since 2003. She said she has always valued DR. JENNINGS' counsel and advice, and especially his willingness to serve on this board for so long, and she hopes he stays another 10 or 15 years.

MR. WILLIAMS said he really appreciated the presentation, and he's excited that DR. JENNINGS thinks he sees progress in the offerings for defined contribution members. He asked what is best practice for pension boards for oversight of internal managers and how would they know if they were doing it well; DR. JENNINGS said he doesn't have lots of experience with organizations large enough

to have internal management to the degree that the ARM Board does, but he thinks MR. MITCHELL is good about bringing staff to present on various components, and their sessions with Callan's separate analyses are also important. He noted that internal managers aren't subject to the various other scrutinies that external managers are, so it seems right to spend more Board time on that.

CHAIR JOHNSON commented that this is an important question, but nothing about the question of internal management is meant to, in the slightest, suggest that they don't have the highest degree of faith in BOB MITCHELL and his staff.

DR. MITCHELL said there will always be some asset classes where very specialized management is desirable, but he thinks for the most part that staff can do a really good job with the broader asset classes, and he thinks the oversight is sufficient and the results are great.

MS. RYERSON, asked for comment, said that in Wyoming they had started an incentive compensation program, so staff would be aligned to do the absolute best they could within the risk parameters set by the board, and so far it has seemed to work well. She said it's hard to do in a public fund, and it took a couple of years to get the legislature to approve it.

CHAIR JOHNSON thanked DR. JENNINGS for his presentation.

13. PERFORMANCE AUDIT RECOMMENDATIONS

CIO MITCHELL explained that the ARM Board has a statutory requirement to engage with an external or independent performance auditor every four years, and the Board recently contracted with Anodos Advisors to do that. Anodos presented their findings at the December Board meeting, and there were five recommendations. MR. MITCHELL said that after receiving Anodos's recommendations, he engaged with PAUL ERLENDSON at Callan to get their position regarding the recommendations, then staff deliberated and developed the following recommendations.

The first recommendation from Anodos was to create an easy performance dashboard to report to the Board the return and risk elements of the performance of the fund and asset class levels. Callan and staff agree, and MR. MITCHELL said staff's recommendation is to implement a performance dashboard in the performance reports and performance presentations Callan makes to the Board starting with the period ending no later than March 31 of 2020.

The second recommendation was for Callan annually to produce a fee dashboard which noted what the manager's agreed-upon fee is and how the agreed-upon fee compares to other managers within a peer group. Callan and staff agree with that recommendation, so their recommendation is to do this starting with the period ending June 30th, 2020. CHAIR JOHNSON asked if there were any contractual confidentiality issues with that; MR. MITCHELL said he wasn't aware of any, but if there were, they would redact that information.

MR. MITCHELL explained that the third recommendation was a repeat from Anodos's previous recommendations, that for the fixed income managers, Callan include each manager's credit quality, duration, issuer type, and geographic allocation. MR. MITCHELL explained that this would require

the managers to provide this data to Callan quarterly, and Crestline, a private credit manager, can't do that because it is private information, but the internally managed fixed income portfolio can provide that information, as well as the Fidelity tactical bond and real estate income strategies, so they intend to do it. He noted that the reason this was a repeat is that in the past there wouldn't have been much benefit for the trouble of putting all that information into the database because the implementation was against the intermediate Treasury index, but with the restructuring that has been done over the past year, it is now more appropriate to include this information.

MR. MITCHELL said that fourth, Anodos recommended that the ARM Board and Callan reconsider the frequency of valuations, going to daily versus monthly for public assets. MR. MITCHELL explained their current method, which is acceptable industry practice and is compliant. Both Callan and Anodos noted that the performance differences are modest, so Callan questioned the need to incorporate daily data, and they don't think it's worth the additional operational cost to do it, but they offered to lower the threshold from 10 percent to 5 percent.

MR. MITCHELL said that staff's recommendation is to not employ daily chain-link performance for public assets and to lower the cash flow threshold to 5 percent for chain-linking intra-period returns.

MR. WILLIAMS asked if this is best practice, because it seems like a lot of extra work with very little benefit; he questioned whether other pension funds are looking at daily valuations. MR. MITCHELL replied that certainly Anodos's view is that it is best practice, and that's why they recommend it, but he would let Callan speak. MR. ERLENDSON said Callan would agree that blank sheet of paper daily time-weighted rates of return would be the preferred way to do things; however, he said the challenge is that even Anodos's report points out that Callan's calculations are within 5 basis points, where there are exceptions, and where they are not the same, so the incremental advantage is hard to say. But considering the complexity of the program itself, and the additional time, effort, and opportunity for error, they don't see that the benefit outweighs the cost.

MR. CENTER added that currently Callan's performance measurement system doesn't easily take in daily valuations for anything other than publicly traded domestic equities, and it would be a very labor-intensive process, and the benefit from it would only be apparent when there are significant cash flows in and out of the portfolio. He said their current methodology would result in a return figure that is statistically the same as using a daily valuation. He noted that the reason Anodos is recommending this now is because the new global investment performance standards for asset owners recommends the use of daily valuation where available.

MR. MITCHELL said that fifth, Anodos recommended the ARM Board and Callan reconsider the return intervals, monthly versus quarterly, used to calculate standard deviation, because that allows for a more precise risk measurement. MR. MITCHELL said he would argue that using monthly performance periods results in a higher standard deviation as an artifact of the process itself. Another issue is that illiquid asset classes are only valued on a quarterly basis, so enforcing a monthly cycle would not be possible for those, and that Callan currently uses a quarterly process when they calculate the risk profiles of peers, so to the extent the risk statistics from the blended process differed from those, they would be less meaningful.

MR. MITCHELL said that because the ARM Board has illiquid assets that are valued on a quarterly basis, it makes this impractical in practice, and for that reason staff recommends to maintain the existing frequency employed by Callan, which is quarterly.

MR. WEST commented that he totally agrees, that the entire purpose of these valuations is for comparison, and the actual asset managers are watching the underlying returns on a daily basis. He noted that the valuation reports they receive are already out of date, but the comparisons to their indexes, their peers, and their regular risk calculations are what it's all about.

MR. WILLIAMS echoed that, saying that the values compared to peers is more than half the value of what they are doing; he also pointed out that they would have to go backwards in time and recalculate for prior years to be able to see how the ARM Board program itself has changed in risk. He said he is very comfortable with staff's recommendation.

MR. MITCHELL said staff recommends the Alaska Retirement Management Board approve staff's recommendations from its presentation entitled "Review of Performance Audit Recommendations" at its May 2020 meeting.

MS. HARBO so moved. MR. WEST seconded the motion.

CHAIR JOHNSON brought up MR. BRETZ's question about what it means when there is not a specific response to an Anodos recommendation; MR. BRETZ went on to say that he thinks there should be a follow-up on each of the recommendations as to whether or not they are being implemented and why not, or why they are. He said he also thinks they need a recommendation as to whether or not they need to keep this in statute to have a mandatory audit every four years for something that obviously they are getting better at.

MR. MITCHELL said he would agree that the number of recommendations has been declining over time, and he thinks that is in large part because they've been implementing many of the recommendations that have been presented. He said that since they've had continuity in the firm doing the analysis, the most recent analysis would by inference incorporate all of the past recommendations. Thus, if the Board is amenable, he said he would consider amending the recommendation to acknowledge that, by saying something like past performance audit recommendations do not require action or are incorporated by inference. He said he would agree that it shouldn't be a statutory requirement.

CHAIR JOHNSON said he would consider action on the five recommendations, and would suggest that at a forthcoming meeting MR. MITCHELL could run through some sort of a checklist with either global or generalized recommendations or statements; MR. MITCHELL replied that he is concerned about the amount of time that would take, but if it's the will of the Board, staff will do it.

MR. BRETZ pointed out that the report cost \$70,000 and a lot of staff time, so if the mandate could be taken away, it could still be a tool for the Board or management. MS. HARBO commented that she agrees; she noted that this vendor was the only one that bid on it, and they say the ARM Board is getting better, so why spend that money?

A roll call vote was taken, and the motion to adopt staff's recommendations on this subject was adopted unanimously.

14a. PART 1: AN INTRODUCTION TO FACTOR-BASED INVESTING

MR. MITCHELL explained that Scientific Beta is a firm that produces factor-based indices that could be invested in. He said the ARM Board subscribes to multiple factor-based indices, with internal staff managing a domestic equity multifactor strategy, and Legal & General who invest in similar strategies for developed and emerging market equities. He introduced ERIC SHIRBINI to provide a refresher on factor-based investing from Scientific Beta.

MR. SHIRBINI said that Scientific Beta provides indices from a very scientific background; they have been around for about seven years, and \$60 billion are now using their indices to invest in factor strategies. He said he would discuss the case for factor-based investing, what factors are, and how to create a factor-based strategy, then he would discuss the investment philosophy and the implicit risk of factor strategies, and explain how Scientific Beta invests.

He explained the case for factor-based investing, with numerous academic studies showing that the most reliable element of active management comes from exposure to a very small set of systematic risk factors. He suggested that instead of trying to find good managers, investors should try to capture the risk factors, and it could be done through an index. These indexes have been called smart beta portfolios, and the advantages of doing it through an index are transparency and low cost.

MR. SHIRBINI said it's important to understand why the return comes from those factors, and what else an investor exposes themselves to by trying to get exposure to these factors, so implementation is very important. He said the reason factors provide additional risk premia is that they expose investors to some risks that are actually priced in the market. He said that the risk that investors are exposed to by investing in factors tends to materialize during a bad state of the market, so when things are going wrong, factors can hurt. Thus, people expect a higher return for taking on this additional risk. Complementary factors can hurt at different times, so investors shouldn't hold just one factor, and they should hold for long periods to collect the additional premia. He said that by investing in factors in a low-cost way, instead of through active management, Scientific Beta can offer lower costs and be very transparent.

MR. SHIRBINI went over what the factors are and why they exist, and whether they will continue to exist. He said there are six factors by consensus: value, momentum, low risk, size, profitability, and investment. The studies establishing these factors go back over at least 40 or 50 and sometimes 80 years of data. He went over the economic rationale and behavioral explanation for risk factors, and emphasized that risk factors are uncorrelated to each other, so they are different sources of risk.

Next he discussed how to get exposure to these factors, and Scientific Beta's overriding investment philosophy. He said it's important to be very careful in getting exposure to factors, because the more concentrated an investor is in one factor, the more it can hurt. He noted that even cap-weighted indexes are very concentrated, with most of the weights in 130 out of the 500 companies in the S&P

500, for example. If an investor actually made more use of the companies in the cap-weighted index, studies have shown that the more diversified portfolio leads to a higher risk-adjusted return.

MR. SHIRBINI said that in building factor portfolios, they don't want them to be too concentrated; they don't want additional risks that they don't need to hold. There are two sources of outperformance in a factor index: diversification and the factors themselves. Then he demonstrated how they build a single-factor portfolio, because they use the same methodology to build all risk-factor portfolios. He said they want a consistent approach, which will lead to more robust performance over time, so they build six factor portfolios, one for each of the factors they want exposure to. They want to be well-diversified, so they don't want all the value exposure, for example, coming from a few companies, so they rank the companies within the S&P 500 for book-to-market, then keep the 250 with the highest book-to market value; and so on for momentum and other factors.

Once the six factor portfolios are built, they put them together to combine the different factors, so when value isn't working, momentum or some other factor would be. Then they make sure they aren't accidentally exposing themselves to any other risks. MR. SHIRBINI explained that this is done on a regional basis, because stocks in the same region are exposed to the same risks. To avoid negative correlations, they have developed a filtering approach called high factor intensity that takes out about 40 percent of the stocks based on scores in other factors than those they were selected for. By eliminating the bottom 40 percent, they get rid of all the negative exposure, and they get a slight positive exposure to the factors, which adds return.

MR. SHIRBINI gave a quick demonstration of the added value of their approach compared to how others do factor investing, saying that by investing in a factor in a fairly concentrated way, they get an improvement of 15 to 20 percent, but by using their filter, returns go up by another 30 to 35 percent on top of the factor, for an overall improvement of risk-adjusted returns of 60 to 70 percent.

CHAIR JOHNSON recessed the meeting from 2:51 p.m. until 3:05 p.m.

14b. PART 2: AN INTRODUCTION TO FACTOR-BASED INVESTING

MR. SHIRBINI continued by reiterating that single factors can be risky, so they combine them into a multifactor portfolio, explaining that in multifactor approaches, they concentrate on the factor intensity line, which is essentially the beta to the factors, and Scientific Beta has an additional beta of .73, whereas their competitors end up with lower factor exposure.

He said the other important thing is how well spread out the portfolio is across the six different factors; he said that others have a much more concentrated approach, where they try to give five or six factors, but they only end up actually giving you two or three factors. So two important statistics are how much additional factor exposure can they give over and above the market factor intensity, and how well spread out is that factor intensity across the various factors. He showed a comparison of their product with competitors, and said they stand out well.

MR. SHIRBINI said the next part is to identify the important other risks that an investor is exposed to, and how to deal with them. These include geographical risks, sector risks, and market beta bias.

He explained that factor strategies work best when they are applied to companies in an economically integrated region, though in emerging markets that are not highly integrated, and it might be worth going a step further and looking at country neutrality. They want to make sure they don't overweight or underweight any region relative to the cap weight. He said that sector risk is unrewarded, so it should be taken out, but the problem is that sector risks and factor exposures are quite highly aligned, so they also offer a sector-neutral version of their strategies. That is a choice for the investor, he said.

The final risk is the market beta bias. MR. SHIRBINI said that if you build a factor strategy and don't control for the market beta, typically the market beta will be below 1. But the question is, what if you want a factor strategy that gives you the full market exposure percent of the equity market risk premium plus the other factors; in that case, an adjustment must be made, and to bring that up to 1 an overlay could be added through a futures contract. But it's a choice for the investor, he said. An investor may want to take less risk and just collect the additional factor premia.

MR. SHIRBINI said there are three important risks to consider: geographical, sector, and market beta. Then he went over how their multifactor strategy has evolved over time. When they first launched their strategies in 2012, the two factors hadn't been accepted yet academically as being rewarded risk factors. They launched their original index with four factors, and since then have created a six-factor index, and they introduced the filter a couple of years ago. He went over the innovations that are available as options, and said the default option is the six-factor equally weighted index; then he went over returns from the factor index.

MR. SHIRBINI concluded by saying that because of their academic origin, Scientific Beta pays a lot of attention to all the latest research, and robustness is very important for them too, therefore there are five key elements in their construction where they pay attention to robustness: how they define the factors; parsimony and simplicity; consistent construction methodology; getting rid of risks that aren't going to pay; and documenting and offering ways to control risk in these strategies.

MR. WILLIAMS asked whether they hold for a long time or are always evaluating their factor strategies, and how much turnover they have as they analyze. He also asked where it falls in terms of fees, more toward active or passive. MR. SHIRBINI said they don't change very often, they stick to the definitions that have explanations, and the only one they are currently appraising is the value factor. He said they don't charge anything like active management fees, maybe one basis point more than existing factor managers, but they justify that by the research they do.

15. RISK REPORTING (truView+)

ZACHARY HANNA, Deputy CIO, said he and SHANE CARSON would go through an update on risk management with most of the information from through the end of 2019. He said that risk to a retirement system is anything that could impact the objective of paying benefits when they are due, and staff has selected a set of risks for discussion that are some of the more impactful. He noted that setting and managing investment risks drives many ARM Board and staff actions. Three important aspects of risk for the pension system are asset allocation, liquidity, and rebalancing.

MR. HANNA stated that over the past year, the ARM Board changed its actuarial assumptions and the system's asset allocation. Both are consistent with the ARM Board's real return target of 4.88 percent and the weighted average life of the pension systems. The most significant asset allocation change was adopting a higher fixed income target of 24 percent, which lowered the level of risk and raised the level of liquidity for the systems. Even with this change, the systems are still equity risk and return dominant.

Refreshing from previous presentations, MR. HANNA showed nominal earnings, inflation, and resulting real return assumptions across public plans and the ARM Board. He said that liquidity is a larger issue for the ARM Board than most plans since the system is closed and more mature. He credited the Board Trustees with focusing attention on the dynamic role liquidity plays over time for a mature plan since it has led to more refined staff thinking and will result in further future evolution. He said that as it stands, ARM Board liquidity should be sufficient, both from the perspective of meeting benefit payments and maintaining the system's risk posture in a downturn like the current one.

MR. HANNA said that staff uses the risk platform truView to assist in the monitoring, which helps staff address questions like: Is the portfolio's risk aligned with the Board's strategic asset allocation? Are there significant contributors of risk that are outside of expectations? What is the probability in magnitude of potential losses? And how would the current portfolio have performed during other periods of market stress? He said that risk systems like truView make heavy use of value-at-risk, or VaR, as a risk metric. He explained VaR as the loss that occurs a certain number of standard deviations below the mean. The approach that truView takes to estimate VaR is historic market conditions, and he showed a histogram of the ARM Board's truView returns. MR. HANNA explained that another important concept is the expected shortfall, which is a measure of how much one could expect to lose during the 5 percent of the time that losses are in excess of the VaR. He explained how to interpret the VaR numbers from truView. He said that applying these concepts to the ARM Board results in an estimated shortfall of 29 percent.

MR. CARSON then reviewed relative asset allocation and volatility. He said there were no unexpected deviations from target allocations, and total portfolio volatility continues to be dominated by growth assets, such as public and private equity. He said that through December it was a relatively low volatility environment, but that changed abruptly in the first quarter of 2020. Focusing on fixed income, he noted that between the June and December reporting dates there had been a structural transition in the aggregate portfolio, as well as the addition of alternative fixed income mandates. This resulted in increasing the fixed income asset class's specific contribution to VaR. But he said he thinks that altogether, since generally fixed income is a diversifier, the total portfolio diversification benefit increased, and that subsequently resulted in a reduction in the total portfolio value at risk.

MR. CARSON said that total equity value at risk had decreased since the June analysis as a result of some structural changes, and he discussed the results of stress-testing the portfolio against significant market events. He said that changes the Board made to the asset allocation and intra-asset class structural changes didn't have a meaningful negative impact on relative performance for any of the scenarios they contemplated, recognizing that the current scenario wasn't on the list.

MR. CARSON concluded by saying that no unexpected risk exposures were identified, and the current asset allocation and the intra-asset class structural changes did lower the absolute and relative portfolio risk, as well as increased the ability of the portfolio to rebalance.

DR. JENNINGS commented that he finds when teaching his students that translating the VaR from percentages to dollar amounts is useful, because the headline is going to read, “Lost X billions of dollars”, not “Lost X percent”.

16. INVESTMENT ACTIONS

Brokerage Window

CHAIR JOHNSON introduced action items, not all of which are investment actions. The first one about the brokerage window option was from the Defined Contribution Committee.

MR. WILLIAMS said that the Defined Contribution Committee recommends the ARM Board approve staff to come up with a brokerage window option for all participant-directed plans by the June meeting. He explained that this came up in 2017, but the committee didn’t bring it forward because there was some evidence that a lot of participants would put money into it but not use it, then it would collect fees. However, they’ve also heard testimony that about 70 percent of pension plans offer something like a brokerage window. Then the discussion of the REIT option brought up the idea that if there were a brokerage window, those that want to could buy a REIT ETF that meets their needs. They would have to sign off that they acknowledge the responsibility they are taking on.

CHAIR JOHNSON noted that this type of recommendation to the DOR would still require a discussion with the DOA to move forward. MR. MITCHELL said yes, as the plan administrator, they would be in a principal position in evaluating those options, and he would envision the DOR would be involved to the extent that the DRB would like them to be.

MR. WILLIAMS explained that the landscape has changed since 2017, so the fees have come down and the product has improved. MR. BOB MITCHELL noted that part of the discussion centered around the degree of freedom that participants would have if a brokerage window were adopted. He said staff would provide both options for review, with restricted versus an unrestricted version in terms of access to outside investments.

A roll call vote was taken, and with six yes votes and one no, the motion passed.

A. Repeal Investment Guidelines

MR. MITCHELL explained that from time to time the ARM Board approves investment guidelines for various strategies or asset classes. Over the course of the past 12 to 18 months, the portfolio has undergone changes that make some of the existing investment guidelines no longer applicable because there are no longer any assets that are invested in adherence to them. So the purpose of this action item is to clean up the set of investment guidelines by deleting those no longer applicable.

MR. MITCHELL said that staff recommends the Alaska Retirement Management Board repeal the

investment guideline resolutions referenced in this document.

MS. HARBO so moved. MR. WEST seconded the motion.

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

B. Clarifying Language for Policy and Procedures Manual

CIO BOB MITCHELL explained that the next action item was the first of two that were addressed in the Operations Committee. He said that the Arm Board Policy and Procedures Manual contain language that describes the conditions under which honoraria are paid to Trustees. The payment of honoraria to Trustees is established in statute, and there has been additional language in the section in the Policy and Procedures Manual that suggests a degree of discretion regarding the payment of honoraria. He said the purpose of this action memo is to remove language to clarify how the law regarding the payment of honoraria will be applied and reduce any misunderstanding of this portion of the Policy and Procedures Manual.

MR. BRICE said that the motion is made by the committee to do this. A roll call vote was taken, and the motion passed unanimously.

C. Create Investment Committee

MR. BRICE said that the Operations Committee moved that the Alaska Retirement Management Board create a standing Investment Committee to assist the Board with monitoring and due diligence on investment-related matters. CHAIR JOHNSON noted that at least a couple of the votes were described as being for the purpose of bringing it to the Board for further discussion. MS. HARBO commented that she doesn't think it's necessary, and it would incur extra costs, and she enjoys the presentations from money managers, so she intends to vote no.

MR. BRICE said he gathered that people were saying that the purpose of an Investment Committee would be duplicative of what the entire Board is supposed to do, so it would be redundant and unnecessary. But on the other hand, he said he thinks that committees may be able to go a little deeper into strategies.

COMMISSIONER TSHIBAKA commented that since this was put forward under time constraints for discussion purposes, it seems they might have further discussion in the committee six weeks from now. She added that she thought it might be a more efficient and effective use of time if the committees were divided up so there were fewer members on them; for example, with almost everyone on the Actuarial Committee, that's not so much a committee as the whole Board listening to the actuarial report. Then the committees could overlap their meetings at the same time to thoroughly vet ideas to bring to the Board.

MR. WEST commented that voting no doesn't mean it's a dead issue, and the Operations Committee can take it up again. He said he sees the value of the proposal, but everyone would probably end up attending anyway, because they would want to hear what was going on. There was some discussion

of when this additional committee meeting would be fit into the schedule; CHAIR JOHNSON said he agreed that a fifth committee would be problematic, but he thinks it is worth further conversation. He said the genesis of the idea was to potentially free up the Board's time, but of course they have to remember that they have an obligation to do the work, and investment decisions and contribution rate setting are two of the paramount things they do, so it's important to be careful not to short-circuit discussions at the Board level. He said he would vote against the investment committee in order to foment more and further constructive discussion about it.

MR. WILLIAMS commented that they might see a difference in the quality of presentations if it was just to a committee as opposed to the entire ARM Board. He said he thinks more time is needed to digest the idea, so he would vote no.

A roll call vote was taken, and with 5 no and 2 yes votes, the motion regarding creation of an investment committee failed.

D. Consent Agenda Policy

This was not forwarded from the Operations Committee.

E. SecureFoundation Option

This was not forwarded from the Defined Contribution Committee.

F. Review Actuary – First Annual Renewal Option

This was taken up under No. 4, Actuarial Committee Report.

UNFINISHED BUSINESS

None.

NEW BUSINESS

None.

OTHER MATTERS TO PROPERLY COME BEFORE THE BOARD

MR. BRETZ said he would like to request that when changes are made to the Policy and Procedures Manual, it could be noted at what meeting the change was made. CHAIR JOHNSON commented that he thought that was a great idea, and he asked MS. ALEXANDER if she could find a way to do that; she said she could. MR. WEST concurred that that is a great idea.

PUBLIC/MEMBER COMMENTS

None.

INVESTMENT ADVISORY COUNCIL COMMENTS

DR. MITCHELL thanked MS. ALEXANDER for arranging the audio and visual part of these meetings. He also said he liked DR. JENNINGS' presentation, which he thought was very thoughtful. He commented that he thinks factor investing is a good idea with solid academic backing, but he doesn't think one should go whole hog thinking it's the best way to invest, no matter how compelling the academic studies are.

DR. MITCHELL said that he saw something from Grantham Mayo Van Otterloo with a seven-year return projection, and their latest one so far from the consensus of the consultants is that with large cap U.S. stocks and with U.S. bonds and international bonds, investors are going to lose money for seven years. He said the only refuge seems to be in emerging markets, and that may be way outside the box, but it made him think hard about what if the return environment in the future is very different from the return environment they've had in the past.

MS. RYERSON said she appreciated the technology at this meeting, and she will try to have musings at the next meeting, which she hopes will be in person so she can meet everybody.

TRUSTEE COMMENTS

MS. HARBO thanked GRANT FICEK and STEPHANIE ALEXANDER for all their time and patience working with Trustees to make this meeting smooth. She added that she looks forward to meeting RUTH RYERSON in person, and she's happy that she is joining Bill and Jerry on the IAC.

FUTURE AGENDA ITEMS

CHAIR JOHNSON noted that MR. MITCHELL had presented some future agenda items in Section 9; also, he said he hopes the Board will commence some in-depth discussions on the ESG components that they've been hearing about from beneficiaries. MR. WILLIAMS added that even though the Secure Foundation option didn't pass out of the DC Committee, there is strong interest in further options that have the spirit of what that was trying to do.

ADJOURNMENT

There being no objection and no further business to come before the board, the meeting was adjourned at 4:42 p.m. on May 1, 2020, on a motion made by MS. HARBO and seconded by MR. WEST.

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.

ALASKA RETIREMENT MANAGEMENT BOARD
STAFF REPORT
Division of Retirement & Benefits Report
June 18, 2020

Summary of Monthly Billings – Buck

Attached for your information are the quarterly payments related to actuarial services provided by the Division's consulting actuary, Buck.

Items listed represent regular and non-regular costs incurred under our current contract.

The listed costs are charged to the System or Plan noted on the column headings.

Summary through the nine months ended March 31, 2020

New for this quarter is the Aetna litigation support, JRS effect of zero percent salary assumptions for 2 years and, NGNMRS asset allocation.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Summary of Monthly Billings -
Buck
DATE: June 18, 2020

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 & Benefits provide quarterly summary updates to review billings and services provided for actuarial valuations and other systems’ request.

STATUS:

Attached are the summary totals for the nine months ended March 31, 2020.

Buck
Billing Summary
For the Three Months Ended September 30, 2019

	<u>PERS</u>	<u>TRS</u>	<u>JRS</u>	<u>NGNMRS</u>	<u>EPORS</u>	<u>AHF</u>	<u>RHF</u>	<u>SBS</u>	<u>DCP</u>	<u>TOTAL</u>
Actuarial valuations	\$ 112,879	93,380	16,948	14,876	-	-	-	-	-	\$ 238,083
KPMG audit information request	6,192	2,518	45	177	-	-	-	-	-	8,932
ARMB presentations and meeting attendance	9,270	3,768	69	265	-	-	-	-	-	13,372
FY20 final PERS/TRS contribution rates	8,780	3,563	-	-	-	-	-	-	-	12,343
Unfunded liability article	2,918	1,187	21	87	-	-	-	-	-	4,213
FY20 AlaskaCare rates review	-	-	-	-	-	-	6,786	-	-	6,786
EGWP cost savings analysis	4,951	1,813	13	-	-	-	29	-	-	6,806
Actuarial dashboard	1,576	639	12	45	-	-	1,984	-	-	4,256
Misc emails and phone calls	1,129	798	1	53	-	-	-	-	-	1,981
TOTAL	\$ 147,695	107,666	17,109	15,503	-	-	8,799	-	-	\$ 296,772
For the Three Months Ended September 30, 2018	\$ 242,349	98,967	5,593	16,577	-	-	-	-	-	\$ 363,486

For the Three Months Ended December 31, 2019

	<u>PERS</u>	<u>TRS</u>	<u>JRS</u>	<u>NGNMRS</u>	<u>EPORS</u>	<u>AHF</u>	<u>RHF</u>	<u>SBS</u>	<u>DCP</u>	<u>TOTAL</u>
Actuarial Valuations	\$ 235,644	117,925	12,465	4,013	-	-	-	-	-	\$ 370,047
KPMG audit information request	1,904	774	14	54	-	-	-	-	-	2,746
ARMB presentations and meeting attendance	27,015	10,999	200	773	-	-	-	-	-	38,987
FY20 AlaskaCare rates review	-	-	-	-	-	-	5,744	-	-	5,744
GASB valuation reports 67/68/74/75 (PERS/TRS/JRS/NGNMRS)	9,761	7,717	4,484	2,882	-	-	-	-	-	24,844
EGWP cost savings analysis	618	226	2	-	-	-	3	-	-	849
TOTAL	\$ 274,942	137,641	17,165	7,722	-	-	5,747	-	-	\$ 443,217
For the Three Months Ended December 31, 2018	\$ 228,137	112,943	3,183	24,064	-	-	-	-	-	\$ 368,327

For the Three Months Ended March 31, 2020

	<u>PERS</u>	<u>TRS</u>	<u>JRS</u>	<u>NGNMRS</u>	<u>EPORS</u>	<u>AHF</u>	<u>RHF</u>	<u>SBS</u>	<u>DCP</u>	<u>TOTAL</u>
GASB valuation reports 67/68/74/75 (PERS/TRS/JRS/NGNMRS)	34,883	27,886	1,252	1,947	-	-	-	-	-	65,968
GASB 75 - EGWP as a plan change	1,853	679	5	-	-	-	10	-	-	2,547
GASB 68 allocation	719	314	-	-	-	-	-	-	-	1,033
Aetna litigation support	1,029	377	3	6	-	-	-	-	-	1,415
Repeal of Cadillac tax 6/30/19 valuations	5,111	1,871	-	-	-	-	-	-	-	6,982
JRS - effect of 0% salary assumptions for 2 years	-	-	10,017	-	-	-	-	-	-	10,017
NGNMRS asset allocation	-	-	-	708	-	-	-	-	-	708
Senate Finance Committee attendance and preparation	3,430	1,393	-	-	-	-	-	-	-	4,823
Misc emails and phone calls	4,536	1,977	-	4,460	-	-	-	-	-	10,973
TOTAL	\$ 51,561	34,497	11,277	7,121	-	-	10	-	-	\$ 104,466
For the Three Months Ended March 31, 2019	\$ 155,081	71,479	8,091	28,346	-	-	24	-	-	\$ 263,021

Summary through the Nine Months Ended March 31, 2020

	PERS	TRS	JRS	NGNMRS	EPORS	AHF	RHF	SBS	DCP	TOTAL
Actuarial valuations	\$ 348,523	211,305	29,413	18,889	-	-	-	-	-	\$ 608,130
KPMG audit information request	8,096	3,292	59	231	-	-	-	-	-	11,678
ARMB presentations and meeting attendance	36,285	14,767	269	1,038	-	-	-	-	-	52,359
FY20 final PERS/TRS contribution rates	8,780	3,563	-	-	-	-	-	-	-	12,343
Unfunded liability article	2,918	1,187	21	87	-	-	-	-	-	4,213
FY20 AlaskaCare rates review	-	-	-	-	-	-	12,530	-	-	12,530
GASB valuation reports 67/68/74/75 (PERS/TRS/JRS/NGNMRS)	44,644	35,603	5,736	4,829	-	-	-	-	-	90,812
GASB 68 allocation	719	314	-	-	-	-	-	-	-	1,033
EGWP cost savings analysis	5,569	2,039	15	-	-	-	32	-	-	7,655
GASB 75 - EGWP as a plan change	1,853	679	5	-	-	-	10	-	-	2,547
Aetna litigation support	1,029	377	3	6	-	-	-	-	-	1,415
Repeal of Cadillac tax 6/30/19 valuations	5,111	1,871	-	-	-	-	-	-	-	6,982
JRS - effect of 0% salary assumptions for 2 years	-	-	10,017	-	-	-	-	-	-	10,017
NGNMRS asset allocation	-	-	-	708	-	-	-	-	-	708
Senate Finance Committee attendance and preparation	3,430	1,393	-	-	-	-	-	-	-	4,823
Actuarial dashboard	1,576	639	12	45	-	-	1,984	-	-	4,256
Misc emails and phone calls	5,665	2,775	1	4,513	-	-	-	-	-	12,954
TOTAL	\$ 474,198	279,804	45,551	30,346	-	-	14,556	-	-	844,455
Summary through the Nine Months March 31, 2019	\$ 625,567	283,389	16,867	68,987	-	-	24	-	-	994,834

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Division of Retirement & Benefits Report June 18, 2020

Retirement System Membership Activity as of March 31, 2020

Attached for your information are the membership statistics for the quarter ending

- March 31, 2020

We see a net increase in active members from last quarter, primarily in PERS DCR members:

- PERS Tier 1-3 active members decreased from 11,850 to 11,654 or a decrease of 196.
- PERS DCR active members increased from 23,225 to 23,559 or an increase of 334.
- PERS active members had a net increase of 138.

- TRS Tier 1-2 active members decreased from 4,144 to 4,130 or a decrease of 14.
- TRS DCR active members increased from 6,143 to 6,149 or an increase of 6.
- TRS active members had a net decrease of 8.

Retiree counts have changed in the following manner:

- PERS retirees increased from 35,923 to 35,998 or an increase of 75 (all tiers).
- TRS retirees decreased from 13,126 to 13,110 or a decrease of 16 (all tiers).

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Retirement System Membership Activity
as of March 31, 2020

ACTION: _____

DATE: June 18, 2020

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, 2020.

MEMBERSHIP STATISTICS AS OF SEPTEMBER 30, 2019

	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	942	2,923	8,078	11,943	22,663	34,606	267	3,883	4,150	6,113	10,263	71	n/a	20,209	6,181
Terminated Members															
Entitled to Future Benefits	308	1,891	3,172	5,371	1,566	6,937	30	646	676	626	1,302	2	n/a	26,885	5,393
Other Terminated Members	1,053	2,092	7,566	10,711	13,729	24,440	242	1,532	1,774	2,418	4,192	1	n/a	n/a	n/a
Total Terminated Members	1,361	3,983	10,738	16,082	15,295	31,377	272	2,178	2,450	3,044	5,494	3	n/a	26,885	5,393
Retirees & Beneficiaries	22,876	8,432	4,388	35,696	100	35,796	10,210	2,903	13,113	32	13,145	142	715	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,752	5,752	n/a	n/a	n/a	1,528	1,528	n/a	n/a	2,395	2,601
Retirements - 1st QTR FY20	84	181	145	410	13	423	63	185	248	9	257	1	15	n/a	n/a
Full Disbursements - 1st QTR FY20	21	72	109	202	524	726	5	11	16	111	127	-	n/a	667	189
Partial Disbursements - 1st QTR FY20	n/a	n/a	n/a	n/a	99	99	n/a	n/a	n/a	27	27	n/a	n/a	1,296	617

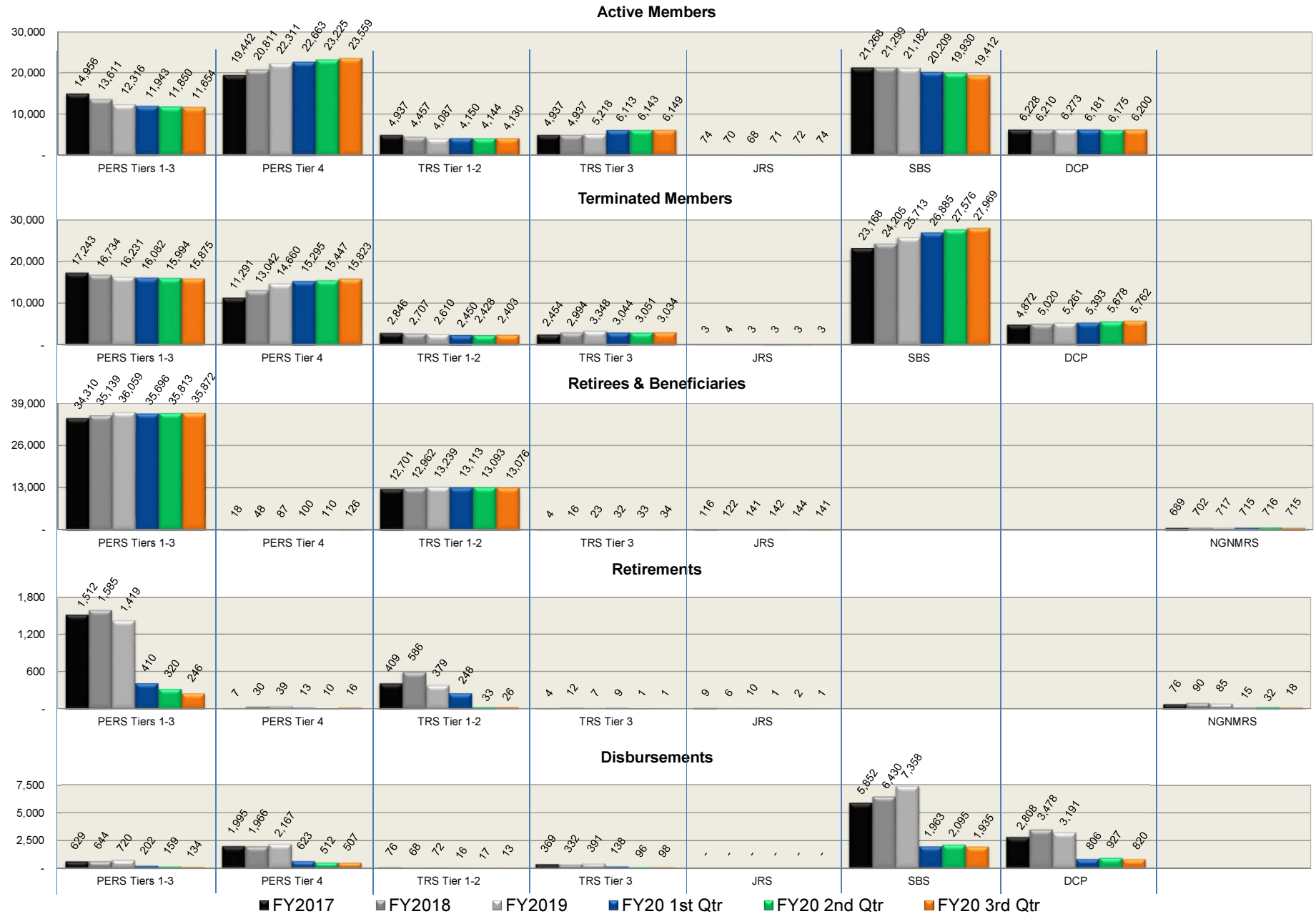
MEMBERSHIP STATISTICS AS OF DECEMBER 31, 2019

	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	932	2,896	8,022	11,850	23,225	35,075	264	3,880	4,144	6,143	10,287	72	n/a	19,930	6,175
Terminated Members															
Entitled to Future Benefits	291	1,860	3,170	5,321	1,571	6,892	29	633	662	614	1,276	2	n/a	27,576	5,678
Other Terminated Members	1,044	2,081	7,548	10,673	13,876	24,549	241	1,525	1,766	2,437	4,203	1	n/a	n/a	n/a
Total Terminated Members	1,335	3,941	10,718	15,994	15,447	31,441	270	2,158	2,428	3,051	5,479	3	n/a	27,576	5,678
Retirees & Beneficiaries	22,830	8,516	4,467	35,813	110	35,923	10,167	2,926	13,093	33	13,126	144	716	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,823	5,823	n/a	n/a	n/a	1,532	1,532	n/a	n/a	2,565	2,793
Retirements - 2nd QTR FY20	62	136	122	320	10	330	7	26	33	1	34	2	32	n/a	n/a
Full Disbursements - 2nd QTR FY20	17	50	92	159	411	570	3	14	17	67	84	-	n/a	536	206
Partial Disbursements - 2nd QTR FY20	n/a	n/a	n/a	n/a	101	101	n/a	n/a	n/a	29	29	n/a	n/a	1,559	721

MEMBERSHIP STATISTICS AS OF MARCH 31, 2020

	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	897	2,819	7,938	11,654	23,559	35,213	256	3,874	4,130	6,149	10,279	74	n/a	19,412	6,200
Terminated Members															
Entitled to Future Benefits	279	1,825	3,157	5,261	1,592	6,853	27	623	650	601	1,251	2	n/a	27,969	5,762
Other Terminated Members	1,038	2,068	7,508	10,614	14,231	24,845	240	1,513	1,753	2,433	4,186	1	n/a	n/a	n/a
Total Terminated Members	1,317	3,893	10,665	15,875	15,823	31,698	267	2,136	2,403	3,034	5,437	3	n/a	27,969	5,762
Retirees & Beneficiaries	22,730	8,590	4,552	35,872	126	35,998	10,136	2,940	13,076	34	13,110	141	715	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,811	5,811	n/a	n/a	n/a	1,519	1,519	n/a	n/a	2,635	2,453
Retirements - 3rd QTR FY20	48	100	98	246	16	262	8	18	26	1	27	1	18	n/a	n/a
Full Disbursements - 3rd QTR FY20	8	46	80	134	402	536	1	12	13	65	78	-	n/a	492	179
Partial Disbursements - 3rd QTR FY20	n/a	n/a	n/a	n/a	105	105	n/a	n/a	n/a	33	33	n/a	n/a	1,443	641

Alaska Division of Retirement and Benefits
FY 2020 QUARTERLY REPORT OF MEMBERSHIP STATISTICS
 Annual & Quarterly Trends as of March 31, 2020



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.

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Division of Retirement & Benefits Report June 18, 2020

FY 2021 Health Reimbursement Arrangement employer contribution amounts –

Attached for your information is the memorandum establishing the FY 2021 Health Reimbursement Arrangement (HRA) employer contribution amount as determined by Alaska Statute 39.30.370.

Also attached is a summary spreadsheet for Fiscal Years 2008 - 2021.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	<u>Fiscal Year 2021 Health Reimbursement</u>	ACTION:	<u> </u>
	<u>Arrangement amounts for employers</u>		
DATE:	<u>June 18, 2020</u>	INFORMATION:	<u> X </u>

BACKGROUND:

AS 39.30.350 “Employer Contribution Fund” states that Teachers’ and Public Employees’ Retiree health reimbursement arrangement plan trust fund is an employer contribution fund. Employee contributions are not permitted.

AS 39.30.360 “Management and Investment of the Fund” states that “The Alaska Retirement Management Board is the fiduciary of the fund and has the same powers and duties under this section in regard to the fund as are provided under AS 37.10.220.”

AS 39.30.370 “Contributions by Employers” states that “For each member of the plan, an employer shall contribute to the teachers’ and public employees’ retiree health reimbursement arrangement plan trust fund an amount equal to three percent of the average annual compensation of all employees of all employers in the TRS and PERS.” The Division of Retirement & Benefits calculates the HRA amount annually and reports this to all affected employers for proper payroll reporting each fiscal year.

STATUS:

Attached is the memorandum from the Division of Retirement & Benefits for Fiscal Year 2021’s Health Reimbursement Arrangement employer contribution per pay period. The amounts have been reported to employers.

Also attached is a summary spreadsheet for fiscal years 2008 - 2021.

MEMORANDUM

STATE OF ALASKA DEPARTMENT OF ADMINISTRATION Division of Retirement and Benefits

To: Ajay Desai
Director

Thru: Kevin Worley 
Chief Financial Officer

From: Christina Maiquis 
Accounting Unit Supervisor

Date: November 8, 2019

Subject: FY 2021 HRA Employer
Contribution Amounts

Alaska Statute 39.30.370 "Contributions by Employers" relates to the employer contributions required to fund the Health Reimbursement Arrangement (HRA) Plan for Public Employees' Retirement System (PERS) and Teachers' Retirement System (TRS) Defined Contribution Retirement (DCR) Plan members. The statute states in part:

For each member of the plan, an employer shall contribute to the teachers' (TRS) and public employees' (PERS) retiree health reimbursement arrangement plan trust fund an amount equal to three percent of the average annual compensation of all employees of all employers in the teachers' retirement system and public employees' retirement system. The administrator shall maintain a record for each member to account for employer contributions on behalf of that member.

In order to compute the dollar amount required to fund the PERS and TRS HRA Plan, a rate of 3.00% is applied to the average annual compensation of all employees of all employers in PERS and TRS. Contributions to a DCR members HRA account are required each pay period in which the employee is enrolled in the Defined Contribution Retirement (DCR) Plan, regardless of the compensation paid during the calendar year. By definition, the HRA employer contribution is a dollar amount.

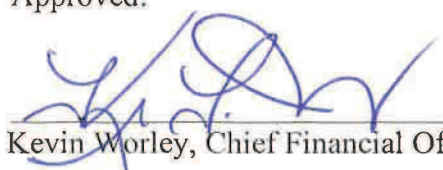
The Fiscal Year 2021 HRA employer contribution amounts are shown below:

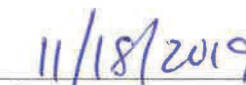
FY 2021 HRA Amounts

Annual	Quarterly	Monthly	Semi-monthly	Bi-weekly	Weekly	Hourly
\$2,159.04	\$539.76	\$179.92	\$89.96	\$83.04	\$41.52	\$1.38

The attached document shows a comparative of HRA rates since Fiscal Year 2008.

Approved:


Kevin Worley, Chief Financial Officer


Date

Attachment

Division of Retirement & Benefits
Health Reimbursement Arrangement (HRA)
Employer contribution amounts by fiscal year

<u>Fiscal Year</u>	<u>Annual</u>	<u>Annual Percentage of Change</u>	<u>Quarterly</u>	<u>Monthly</u>	<u>Semi-monthly</u>	<u>Bi-weekly</u>	<u>Weekly</u>	<u>Hourly</u>
2008	1,531.27	-	382.82	127.61	63.80	58.89	-	0.98
2009	1,616.81	5.59%	404.20	134.73	67.37	62.18	-	1.04
2010	1,699.71	5.13%	424.93	141.64	70.82	65.37	-	1.09
2011	1,720.70	1.23%	430.17	143.39	71.70	66.18	-	1.10
2012	1,778.09	3.34%	444.52	148.17	74.09	68.39	-	1.14
2013	1,848.43	3.96%	462.11	154.04	77.02	71.09	-	1.18
2014	1,896.60	2.61%	474.15	158.05	79.03	72.95	-	1.22
2015	1,960.53	3.37%	490.13	163.38	81.69	75.41	37.70	1.26
2016	2,004.52	2.24%	501.13	167.04	83.52	77.10	38.55	1.28
2017	2,049.36	2.24%	512.34	170.78	85.39	78.82	39.41	1.31
2018	2,084.16	1.70%	521.04	173.68	86.84	80.16	40.08	1.34
2019	2,102.88	0.90%	525.72	175.24	87.62	80.88	40.44	1.35
2020	2,121.60	0.89%	530.40	176.80	88.40	81.60	40.80	1.36
2021	2,159.04	1.76%	539.76	179.92	89.96	83.04	41.52	1.38

NOTE: For fiscal year 2007, HRA amounts were computed by employer rather than the HRA as a plan. Beginning fiscal year 2008, HRA amounts were computed and applied uniformly to all members and are reflected above.

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Disclosure - Calendar Update

June 18, 2020

The Disclosure Memorandum is included in the packet; no transactions requiring additional review or discussion.

The 2020 calendar is attached and a copy of 2021 drafted calendar for Trustee review and potential adoption. The ARMB website will be updated to reflect the most current calendars.

Nothing further to report.

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

To: ARMB Trustees
From: Stephanie Alexander
Date: June 4, 2020
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, 2020 to March 31, 2020

Name	Position Title	Disclosure Type	Disclosure Date
Victor Djajalie	State Investment Officer	Equities	02/05/2020
Bob Mitchell	Chief Investment Officer	Equities	03/06/2020
Bob Mitchell	Chief Investment Officer	Equities	03/24/2020
Hunter Romberg	Treasury Accounting Staff	Equities	04/03/2020
Tina Martin	Treasury Accounting Staff	Equities	04/03/2020
Michelle Prebula	State Investment Officer	Equities	04/20/2020
Greg Samorajski	Deputy Commissioner	Equities, Fixed Income	04/22/2020
Tom Brice	ARMB Trustee	Equities	04/28/2020

ALASKA RETIREMENT MANAGEMENT BOARD

2020 Meeting Calendar

DATE	LOCATION	DESCRIPTION
June 17 Wednesday	Teleconferenced	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
June 18-19 Thursday - Friday	Teleconferenced	Board of Trustees Meeting: <i>*Final Actuary Reports/Adopt Valuation</i> <i>*Adopt Asset Allocation</i> <i>*Performance Measurement - 1st Quarter</i> <i>*Manager Presentations</i>
September 16 Wednesday	Juneau, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
September 17-18 Thursday - Friday	Juneau, AK	Board of Trustees Meeting: <i>*Set Contribution Rates</i> <i>*Audit Results/Assets – Auditor</i> <i>*Approve Budget</i> <i>*Performance Measurement – 2nd Quarter</i> <i>*Real Estate Annual Plan</i> <i>*Real Assets Evaluation – Callan LLC</i> <i>*Manager Presentations</i>
October 16 Friday (placeholder)	Telephonic	Audit Committee
December 2 Wednesday	Juneau, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
December 3-4 Thursday-Friday	Juneau, AK	Board of Trustees Meeting: <i>*Audit Report - DRB Auditor</i> <i>*Performance Measurement – 3rd Quarter</i> <i>*Manager Review (Questionnaire)</i> <i>*Private Equity Evaluation - Callan LLC</i> <i>*Review Private Equity Annual Plan</i> <i>*Manager Presentations</i>

ALASKA RETIREMENT MANAGEMENT BOARD

2021 Meeting Calendar

DATE	LOCATION	DESCRIPTION
March 17 Wednesday	Juneau, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
March 18-19 Thursday-Friday	Juneau, AK	Board of Trustees Meeting: <i>*Performance Measurement – 4th Quarter</i> <i>*Buck Draft Actuarial Report/GRS Draft Actuary Certification</i> <i>*Capital Markets – Asset Allocation</i> <i>*Manager Presentations</i>
April 29 Thursday	TBD	Actuarial Committee <i>*As necessary: follow-up/additional discussion/questions on valuations</i>
April 30 Friday	TBD	Board of Trustees Meeting <i>*As necessary</i>
June 16 Wednesday	Juneau, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
June 17-18 Thursday - Friday	Juneau, AK	Board of Trustees Meeting: <i>*Final Actuary Reports/Adopt Valuation</i> <i>*Adopt Asset Allocation</i> <i>*Performance Measurement - 1st Quarter</i> <i>*Manager Presentations</i>
September 22 Wednesday	Juneau, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
September 23-24 Thursday - Friday	Juneau, AK	Board of Trustees Meeting: <i>*Set Contribution Rates</i> <i>*Audit Results/Assets – Auditor</i> <i>*Approve Budget</i> <i>*Performance Measurement – 2nd Quarter</i> <i>*Real Estate Annual Plan</i> <i>*Real Assets Evaluation – Callan LLC</i> <i>*Manager Presentations</i>
October 13 Tuesday (placeholder)	Telephonic	Audit Committee
December 1 Wednesday	Juneau, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
December 2-3 Thursday-Friday	Juneau, AK	Board of Trustees Meeting: <i>*Audit Report - DRB Auditor</i> <i>*Performance Measurement – 3rd Quarter</i> <i>*Manager Review (Questionnaire)</i> <i>*Private Equity Evaluation - Callan LLC</i> <i>*Review Private Equity Annual Plan</i> <i>*Manager Presentations</i>
NOTE: Meeting locations and topics are subject to change.		

CIO Report - Individual Manager Transactions
March 2020 - May 2020

Asset Class	Total	Internal	External
Broad Domestic Equity (DE)	501,098,796	-	501,098,796
Global Equity Ex-US (IE)	493,904,354	-	493,904,354
Fixed Income (FI)	(824,517,195)	-	(824,517,195)
Real Assets (Real)	(846)	-	(846)
Private Equity (PE)	-	-	-
Opportunistic (Opp)	(170,485,109)	-	(170,485,109)
Total	-	-	-

Manager	Total	Internal	External	Fund	Asset Class	Description of Large Transactions
JPM Systematic Alpha	(132,484,999)	-	(132,484,999)	AYL3	Opp	Full Redemption
Schroders Insurance Linked Securities	(38,000,000)	-	(38,000,000)	AY1H	Opp	Redemption
Fidelity Tactical Bond	300,000,000	-	300,000,000	AY1F	FI	Investment Increase
ARMB S&P 600	89,000,000	-	89,000,000	AYGA	DE	Quarter End Rebalancing
ARMB S&P 900	282,000,000	-	282,000,000	AY4L	DE	Quarter End Rebalancing
ARMB Scientific Beta	131,000,000	-	131,000,000	AYLM	DE	Quarter End Rebalancing
Arrowstreet Capital	43,000,000	-	43,000,000	AYLQ	IE	Quarter End Rebalancing
Ballie Gifford	20,000,000	-	20,000,000	AYLR	IE	Quarter End Rebalancing
Brandes Investment Partners	35,000,000	-	35,000,000	AY65	IE	Quarter End Rebalancing
Capital Gaurdian	36,000,000	-	36,000,000	AY67	IE	Quarter End Rebalancing
Legal & General Sci Beta Emerging Markets	20,000,000	-	20,000,000	AYLH	IE	Quarter End Rebalancing
Legal & General Sci Beta International	17,000,000	-	17,000,000	AYLS	IE	Quarter End Rebalancing
SSGA MSCI Emerging Markets Index Fund	81,000,000	-	81,000,000	AYLB	IE	Quarter End Rebalancing
SSGA MSCI World Ex-US IMI	242,740,000	-	242,740,000	AYL7	IE	Quarter End Rebalancing
ARMB Aggregate Bond Fund	(1,243,740,000)	-	(1,243,740,000)	AY77	FI	Quarter End Rebalancing + Benefit Payments
Short-Term Investment Pool	119,222,805	-	119,222,805	AY70	FI	Quarter End Rebalancing + Benefit Payments
Allianz Global Investors	(2,370)	-	(2,370)	AY38	DE	Account Wind Down
ARMB Domestic Residual Assets	(117,743)	-	(117,743)	AY5E	DE	Account Wind Down
ARMB Russell 1000 Value	(25,514)	-	(25,514)	AY4M	DE	Account Wind Down
ARMB Russell 200	(219)	-	(219)	AY4R	DE	Account Wind Down
DePrince Race & Zollo Micro Cap	(427,084)	-	(427,084)	AYLG	DE	Account Wind Down
Large Cap Transition Account	(86,625)	-	(86,625)	AY30	DE	Account Wind Down
Lazard Asset Management	(16,538)	-	(16,538)	AY47	DE	Account Wind Down
Lord Abbett Micro Cap	(95,194)	-	(95,194)	AY4Z	DE	Account Wind Down
Small Cap Transition Account	(125,154)	-	(125,154)	AY43	DE	Account Wind Down
SSGA Futures Large Cap	(10)	-	(10)	AY6B	DE	Account Wind Down
SSGA Futures Small Cap	(10)	-	(10)	AY6A	DE	Account Wind Down
SSGA Russell 2000 Growth	(2,290)	-	(2,290)	AY4N	DE	Account Wind Down
SSGA Russell 2000 Growth	(2,452)	-	(2,452)	AY4P	DE	Account Wind Down
Allianz - NFJ	(15,974)	-	(15,974)	AYLP	IE	Account Wind Down
Internal Transition	(819,539)	-	(819,539)	AY69	IE	Account Wind Down
Lazard Asset Management	(79)	-	(79)	AY58	IE	Account Wind Down
Mondrian Investment Partners	30	-	30	AY5B	IE	Account Wind Down
Schroder Investment Management	(85)	-	(85)	AY5D	IE	Account Wind Down
Wells Capital Management Buy Write	(111)	-	(111)	AY4X	Opp	Account Wind Down
Brookfield Infrastructure	(4)	-	(4)	AYRE	Real	Account Wind Down
Lazard Infrastructure	(842)	-	(842)	AYRF	Real	Account Wind Down

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Fund Financials – Cash Flow Report June 18, 2020

Kayla Wisner, State Comptroller, Department of Revenue

As of April month-end, total plan assets were as follows: PERS - \$18.6 billion, TRS - \$8.9 billion, JRS - \$215.1 million, NGNMRS - \$40.4 million, SBS - \$4.0 billion, DCP - \$955.0 million. Total non-participant direct plans totaled \$25.9 billion, and participant-directed plans totaled \$6.8 billion. Total assets were \$32.7 billion.

Year-to-date loss was \$66.1 million, and the plans experienced a net withdrawal of \$769.5 million. Total assets were down 2.49% year-to-date.

Internally managed assets totaled \$13.2 billion

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

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, 2020.

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 contributions, as well as benefit payments, refunds / distributions, and combined administrative / investment expenditures. DRB's report presents cash inflows / outflows for the 10-months ended April 30, 2020 (page 1) and the month of April 2020 (page 2). The amounts presented here do not reflect investment income / loss for the schedules shown as they are reported on the DOR schedules.

Also presented are participant-directed distributions by plan and by type for the 10-month period on page 3. This page has been updated for 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, 2020

ALASKA RETIREMENT MANAGEMENT BOARD
Schedule of Investment Income and Changes in Invested Assets by Fund
Fiscal Year-to-Date through April 30, 2020

	Beginning Invested Assets	Investment Income ⁽¹⁾	Net Contributions (Withdrawals)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income ⁽²⁾
<u>Public Employees' Retirement System (PERS)</u>						
Defined Benefit Plans:						
Retirement Trust	\$ 9,465,719,458	\$ (11,662,422)	\$ (303,261,829)	\$ 9,150,795,207	-3.33%	-0.13%
Retirement Health Care Trust	7,807,287,545	(7,843,726)	(245,647,397)	7,553,796,422	-3.25%	-0.10%
Total Defined Benefit Plans	17,273,007,003	(19,506,148)	(548,909,226)	16,704,591,629	-3.29%	-0.11%
Defined Contribution Plans:						
Participant Directed Retirement	1,218,753,974	(26,792,386)	95,541,429	1,287,503,017	5.64%	-2.12%
Health Reimbursement Arrangement	419,023,779	(709,897)	36,606,053	454,919,935	8.57%	-0.16%
Retiree Medical Plan	117,399,406	(221,375)	14,398,745	131,576,776	12.08%	-0.18%
Defined Benefit Occupational Death and Disability:						
Public Employees	24,859,446	(43,173)	2,420,173	27,236,446	9.56%	-0.17%
Police and Firefighters	11,367,334	(20,193)	829,673	12,176,814	7.12%	-0.17%
Total Defined Contribution Plans	1,791,403,939	(27,787,024)	149,796,073	1,913,412,988	6.81%	-1.49%
Total PERS	19,064,410,942	(47,293,172)	(399,113,153)	18,618,004,617	-2.34%	-0.25%
<u>Teachers' Retirement System (TRS)</u>						
Defined Benefit Plans:						
Retirement Trust	5,505,314,103	(6,206,865)	(220,226,479)	5,278,880,759	-4.11%	-0.12%
Retirement Health Care Trust	2,940,744,859	(2,959,369)	(88,354,982)	2,849,430,508	-3.11%	-0.10%
Total Defined Benefit Plans	8,446,058,962	(9,166,234)	(308,581,461)	8,128,311,267	-3.76%	-0.11%
Defined Contribution Plans:						
Participant Directed Retirement	516,072,656	(12,451,091)	30,218,963	533,840,528	3.44%	-2.34%
Health Reimbursement Arrangement	124,841,136	(195,658)	9,260,754	133,906,232	7.26%	-0.15%
Retiree Medical Plan	41,730,124	(66,867)	3,218,670	44,881,927	7.55%	-0.15%
Defined Benefit Occupational Death and Disability	4,293,954	(6,398)	227,196	4,514,752	5.14%	-0.15%
Total Defined Contribution Plans	686,937,870	(12,720,014)	42,925,583	717,143,439	4.40%	-1.80%
Total TRS	9,132,996,832	(21,886,248)	(265,655,878)	8,845,454,706	-3.15%	-0.24%
<u>Judicial Retirement System (JRS)</u>						
Defined Benefit Plan Retirement Trust	183,941,036	(252,644)	(1,313,151)	182,375,241	-0.85%	-0.14%
Defined Benefit Retirement Health Care Trust	33,156,612	(34,264)	(445,775)	32,676,573	-1.45%	-0.10%
Total JRS	217,097,648	(286,908)	(1,758,926)	215,051,814	-0.94%	-0.13%
<u>National Guard/Naval Militia Retirement System (MRS)</u>						
Defined Benefit Plan Retirement Trust	40,994,203	230,156	(822,374)	40,401,985	-1.44%	0.57%
<u>Other Participant Directed Plans</u>						
Supplemental Annuity Plan	4,111,631,106	8,566,279	(78,961,039)	4,041,236,346	-1.71%	0.21%
Deferred Compensation Plan	983,593,517	(5,409,802)	(23,156,566)	955,027,149	-2.90%	-0.56%
Total All Funds	33,550,724,248	(66,079,695)	(769,467,936)	32,715,176,617		
Total Non-Participant Directed	26,720,672,995	(29,992,695)	(793,110,723)	25,897,569,577	-3.08%	-0.11%
Total Participant Directed	6,830,051,253	(36,087,000)	23,642,787	6,817,607,040	-0.18%	-0.53%
Total All Funds	\$ 33,550,724,248	\$ (66,079,695)	\$ (769,467,936)	\$ 32,715,176,617	-2.49%	-0.20%

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://www.revenue.state.ak.us/treasury/programs/programs/other/armb/investmentresults.aspx>

ALASKA RETIREMENT MANAGEMENT BOARD
Schedule of Investment Income and Changes in Invested Assets by Fund
For the Month Ended April 30, 2020

	Beginning Invested Assets	Investment Income (1)	Net Contributions (Withdrawals)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (2)
<u>Public Employees' Retirement System (PERS)</u>						
<u>Defined Benefit Plans:</u>						
Retirement Trust	\$ 8,746,149,194	\$ 448,601,348	\$ (43,955,335)	\$ 9,150,795,207	4.63%	5.14%
Retirement Health Care Trust	7,211,490,884	369,614,723	(27,309,185)	7,553,796,422	4.75%	5.14%
Total Defined Benefit Plans	15,957,640,078	818,216,071	(71,264,520)	16,704,591,629	4.68%	5.14%
<u>Defined Contribution Plans:</u>						
Participant Directed Retirement	1,170,033,775	104,477,427	12,991,815	1,287,503,017	10.04%	8.88%
Health Reimbursement Arrangement	428,494,092	22,098,832	4,327,011	454,919,935	6.17%	5.13%
Retiree Medical Plan	123,505,339	6,380,846	1,690,591	131,576,776	6.54%	5.13%
<u>Defined Benefit Occupational Death and Disability:</u>						
Public Employees	25,639,178	1,323,035	274,233	27,236,446	6.23%	5.13%
Police and Firefighters	11,477,028	591,191	108,595	12,176,814	6.10%	5.13%
Total Defined Contribution Plans	1,759,149,412	134,871,331	19,392,245	1,913,412,988	8.77%	7.62%
Total PERS	17,716,789,490	953,087,402	(51,872,275)	18,618,004,617	5.09%	5.39%
<u>Teachers' Retirement System (TRS)</u>						
<u>Defined Benefit Plans:</u>						
Retirement Trust	5,054,769,582	258,997,725	(34,886,548)	5,278,880,759	4.43%	5.14%
Retirement Health Care Trust	2,718,893,183	139,374,386	(8,837,061)	2,849,430,508	4.80%	5.13%
Total Defined Benefit Plans	7,773,662,765	398,372,111	(43,723,609)	8,128,311,267	4.56%	5.14%
<u>Defined Contribution Plans:</u>						
Participant Directed Retirement	485,139,621	43,980,202	4,720,705	533,840,528	10.04%	9.02%
Health Reimbursement Arrangement	126,280,224	6,505,878	1,120,130	133,906,232	6.04%	5.13%
Retiree Medical Plan	42,292,135	2,179,703	410,089	44,881,927	6.12%	5.13%
Defined Benefit Occupational Death and Disability	4,267,113	219,633	28,006	4,514,752	5.80%	5.13%
Total Defined Contribution Plans	657,979,093	52,885,416	6,278,930	717,143,439	8.99%	8.00%
Total TRS	8,431,641,858	451,257,527	(37,444,679)	8,845,454,706	4.91%	5.36%
<u>Judicial Retirement System (JRS)</u>						
Defined Benefit Plan Retirement Trust	174,191,496	8,934,673	(750,928)	182,375,241	4.70%	5.14%
Defined Benefit Retirement Health Care Trust	31,127,080	1,596,031	(46,538)	32,676,573	4.98%	5.13%
Total JRS	205,318,576	10,530,704	(797,466)	215,051,814	4.74%	5.14%
<u>National Guard/Naval Militia Retirement System (MRS)</u>						
Defined Benefit Plan Retirement Trust	38,195,345	2,300,149	(93,509)	40,401,985	5.78%	6.03%
<u>Other Participant Directed Plans</u>						
Supplemental Annuity Plan	3,789,798,418	253,936,213	(2,498,285)	4,041,236,346	6.63%	6.70%
Deferred Compensation Plan	891,149,123	64,524,889	(646,863)	955,027,149	7.17%	7.24%
Total All Funds	31,072,892,810	1,735,636,884	(93,353,077)	32,715,176,617		
Total Non-Participant Directed	24,736,771,873	1,268,718,153	(107,920,449)	25,897,569,577	4.69%	5.14%
Total Participant Directed	6,336,120,937	466,918,731	14,567,372	6,817,607,040	7.60%	7.36%
Total All Funds	\$ 31,072,892,810	\$ 1,735,636,884	\$ (93,353,077)	\$ 32,715,176,617	5.29%	5.59%

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://www.revenue.state.ak.us/treasury/programs/programs/other/armb/investmentresults.aspx>

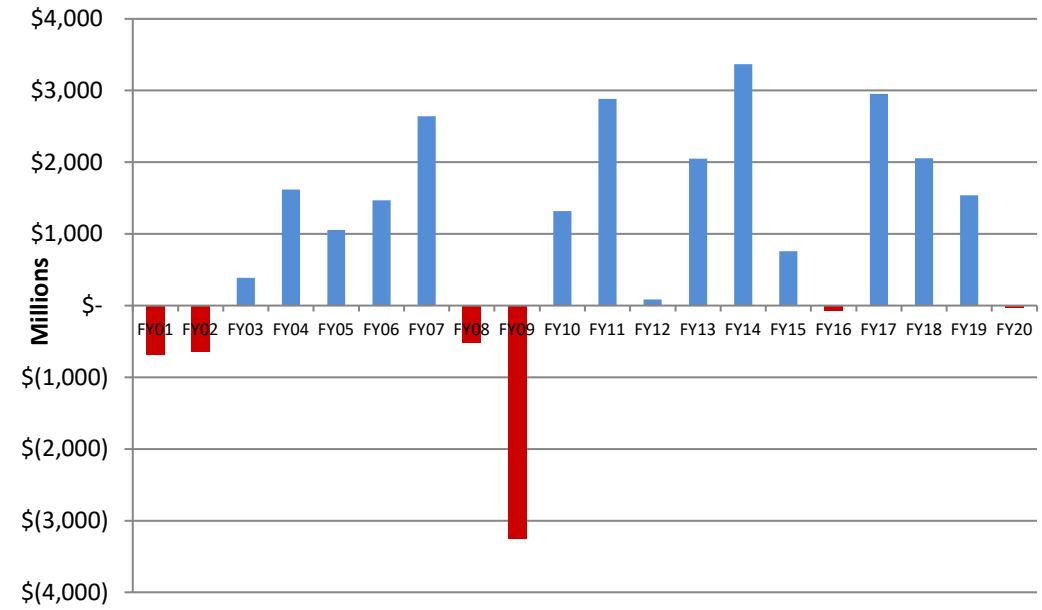
Total Non Participant Directed Assets

As of April 30, 2020

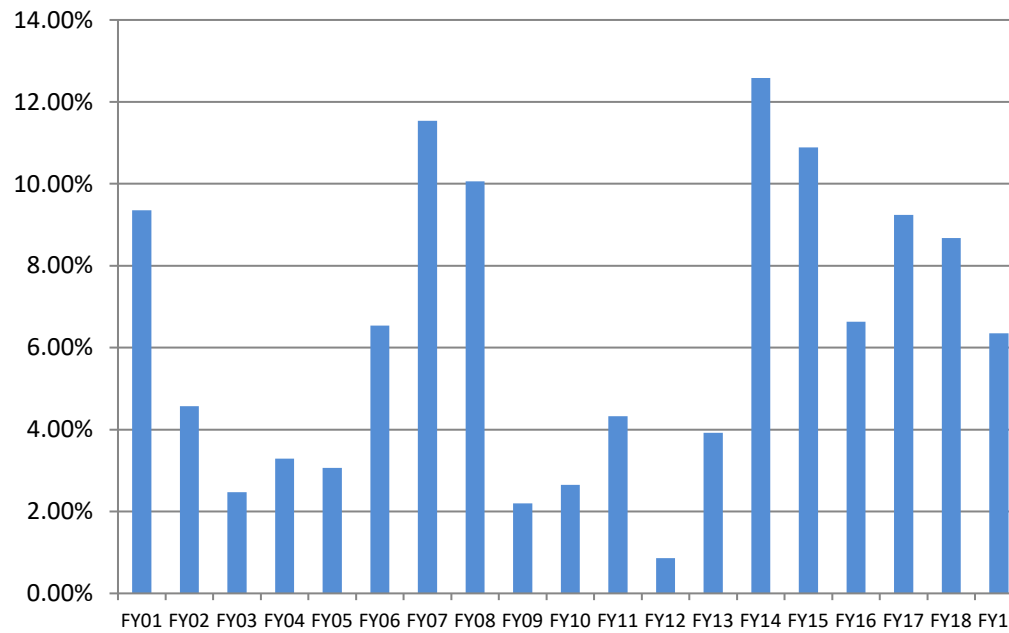
Total Assets History



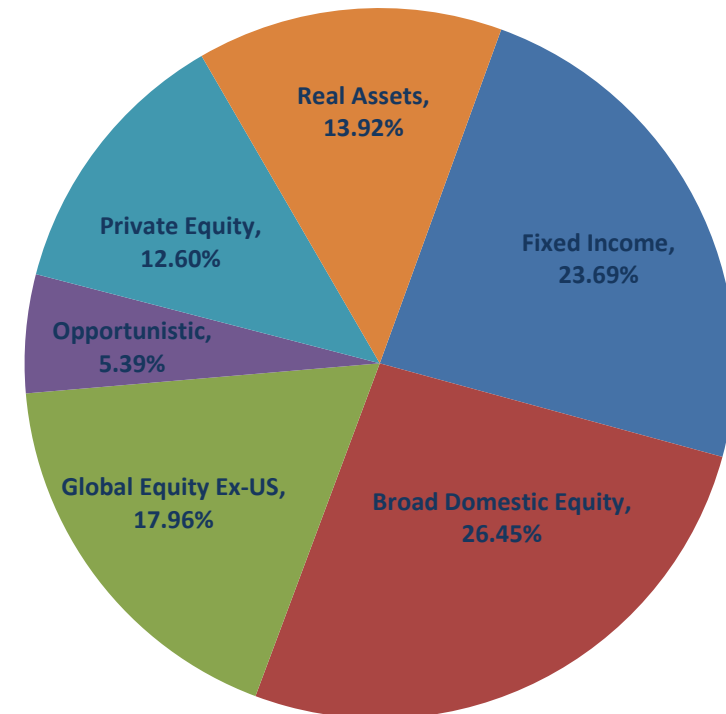
Income by Fiscal Year



5-year Annualized Returns as of Fiscal Year End



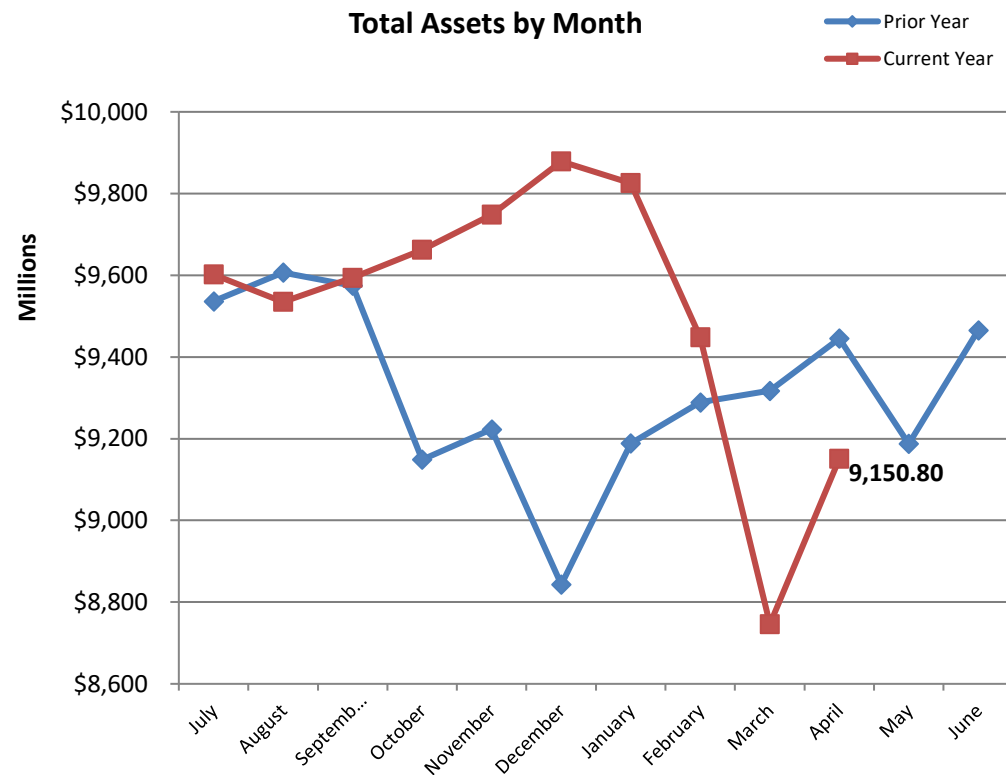
Actual Asset Allocation



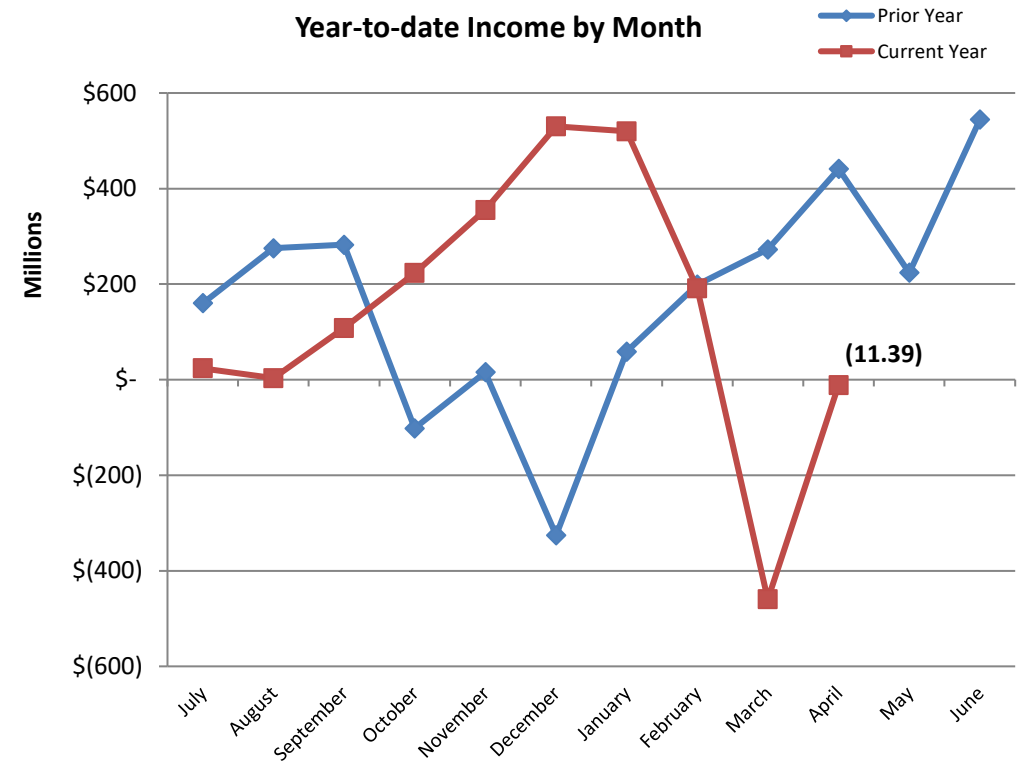
Public Employees' Retirement Pension Trust Fund

Fiscal Year-to-Date through April 30, 2020

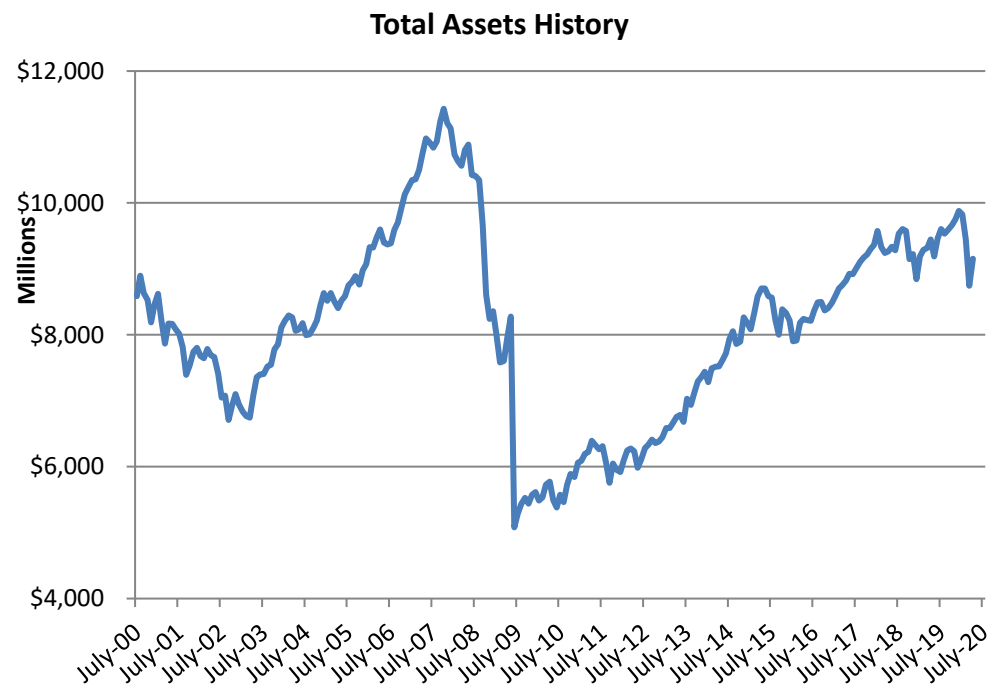
Total Assets by Month



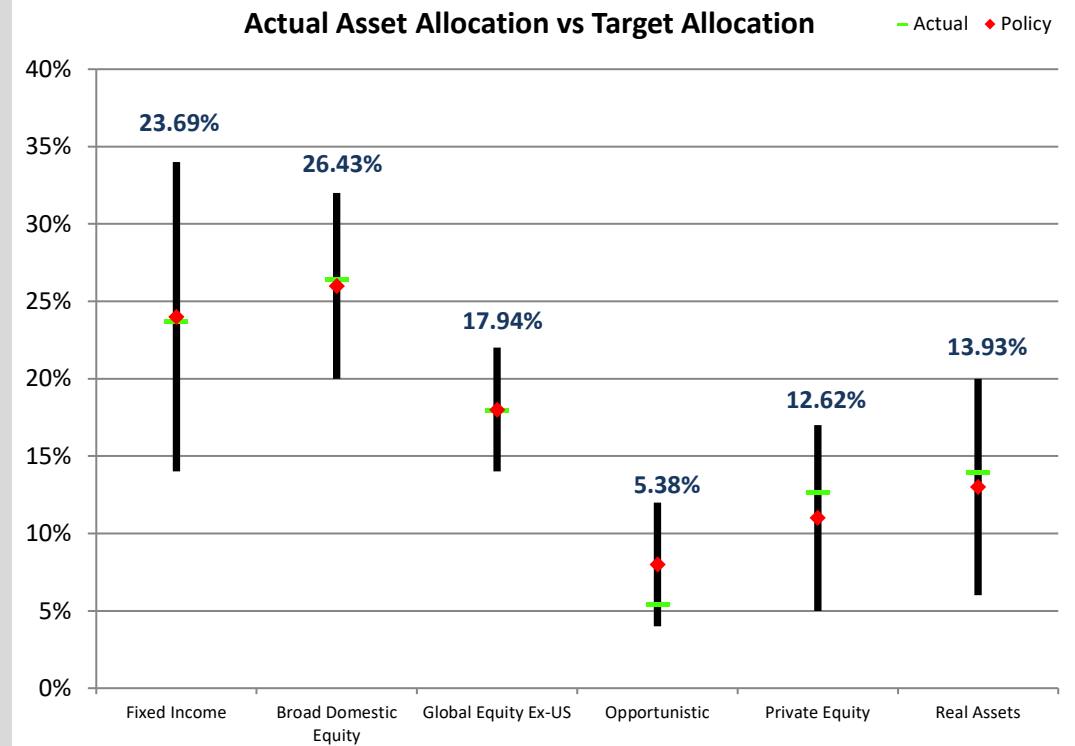
Year-to-date Income by Month



Total Assets History



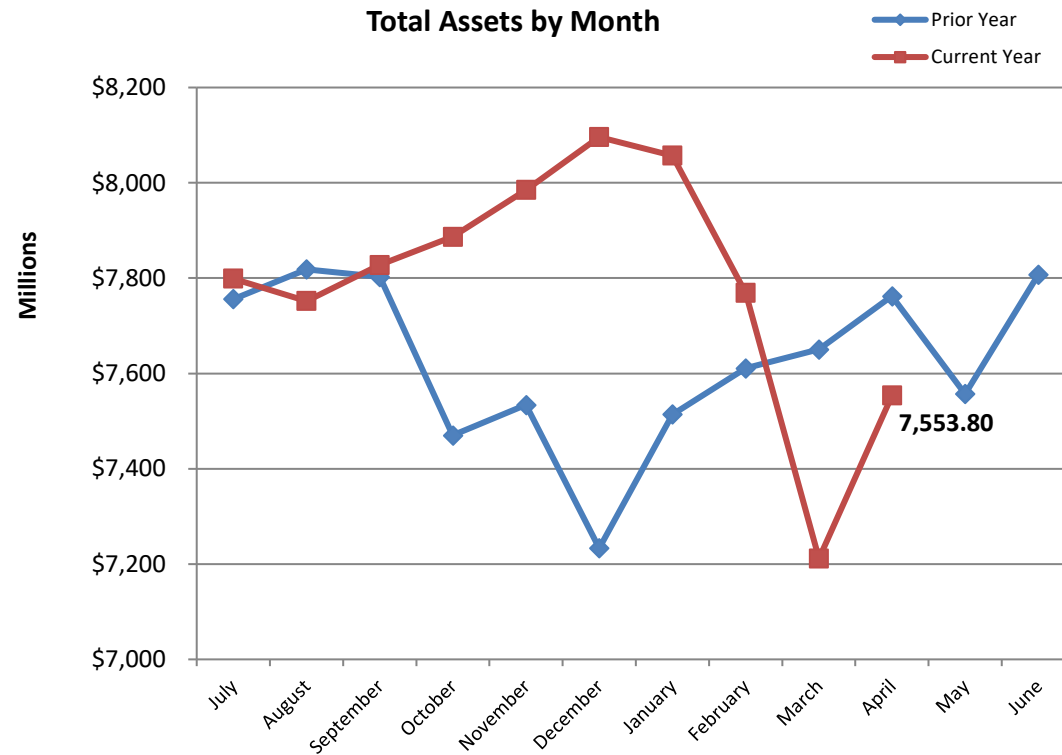
Actual Asset Allocation vs Target Allocation



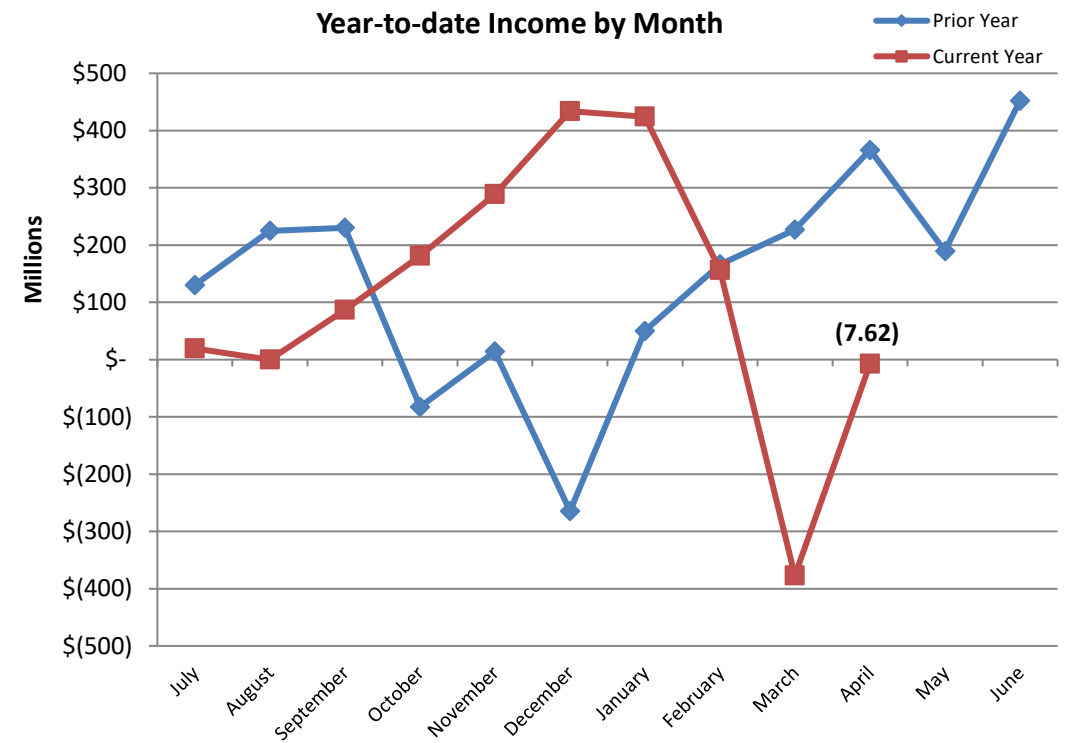
Public Employees' Retirement Health Care Trust Fund

Fiscal Year-to-Date through April 30, 2020

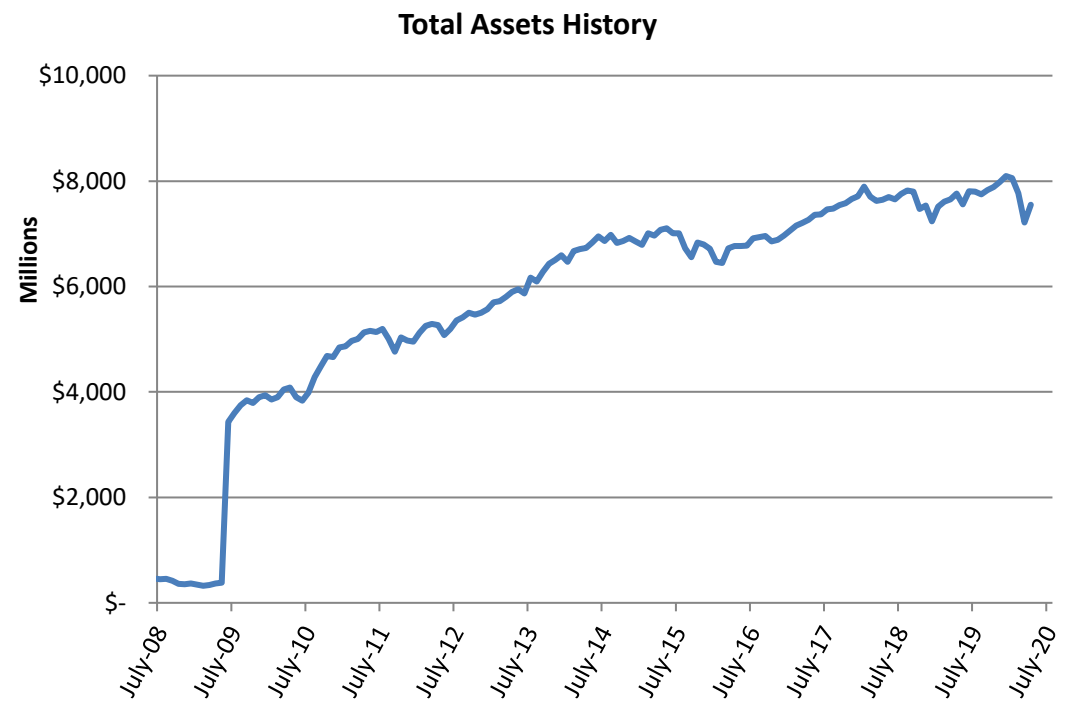
Total Assets by Month



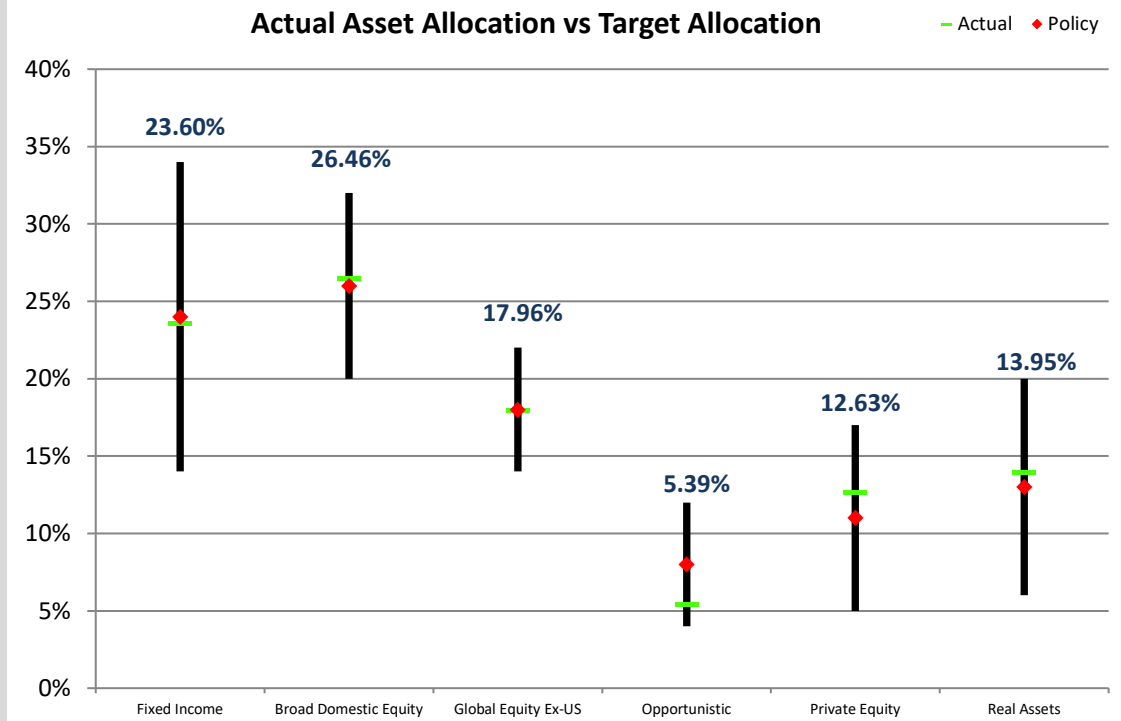
Year-to-date Income by Month



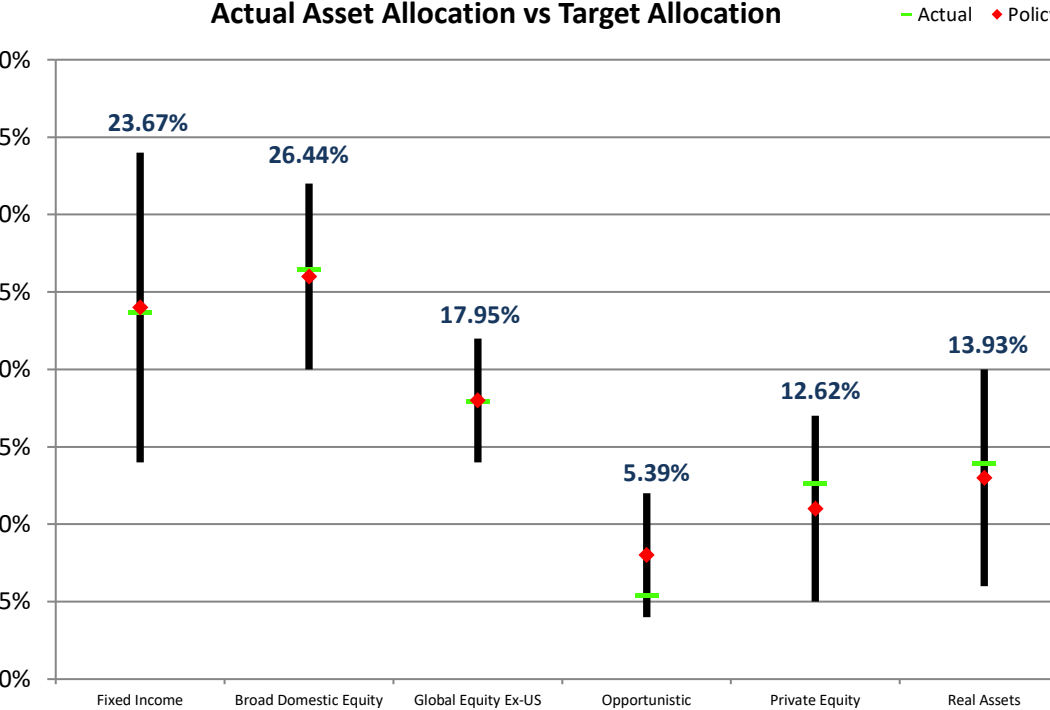
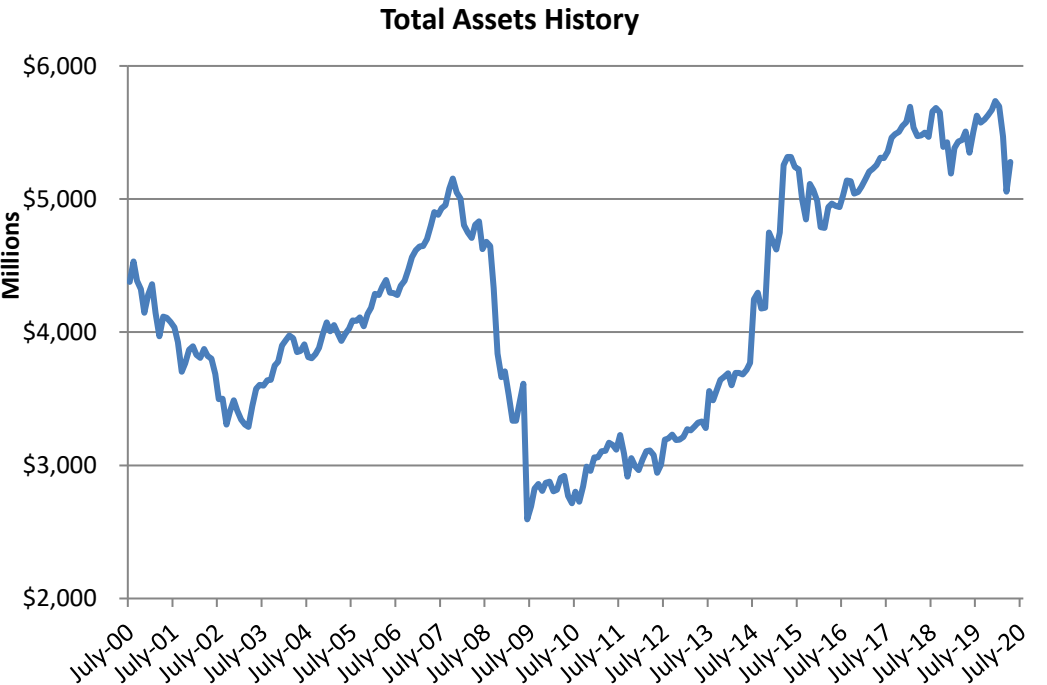
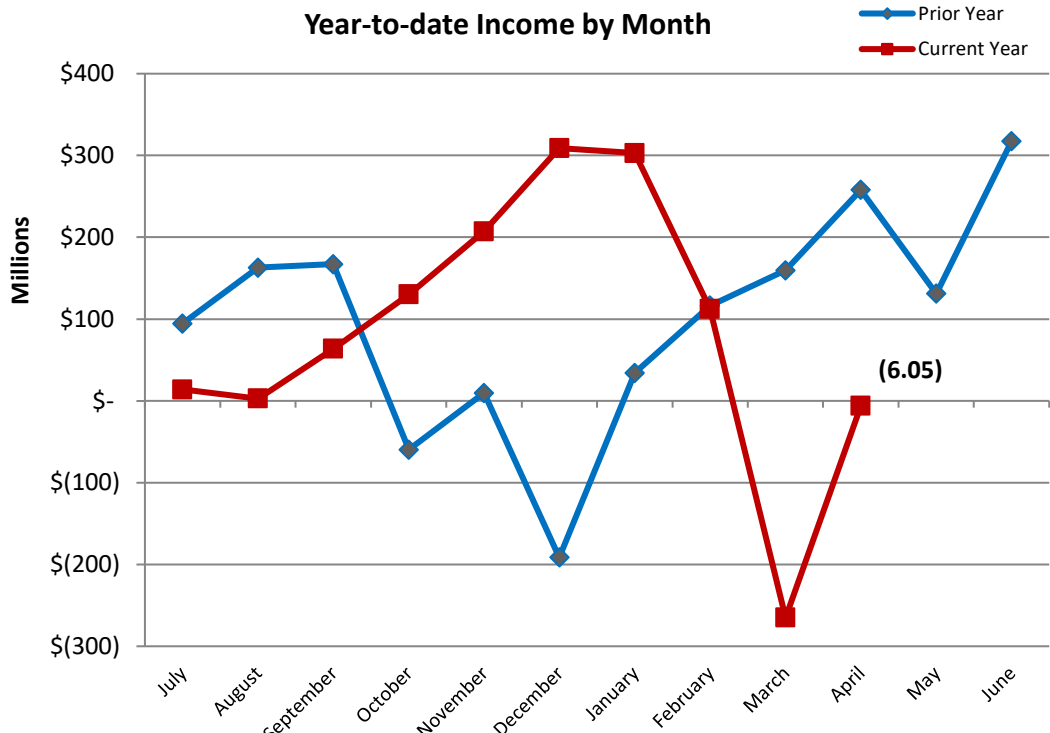
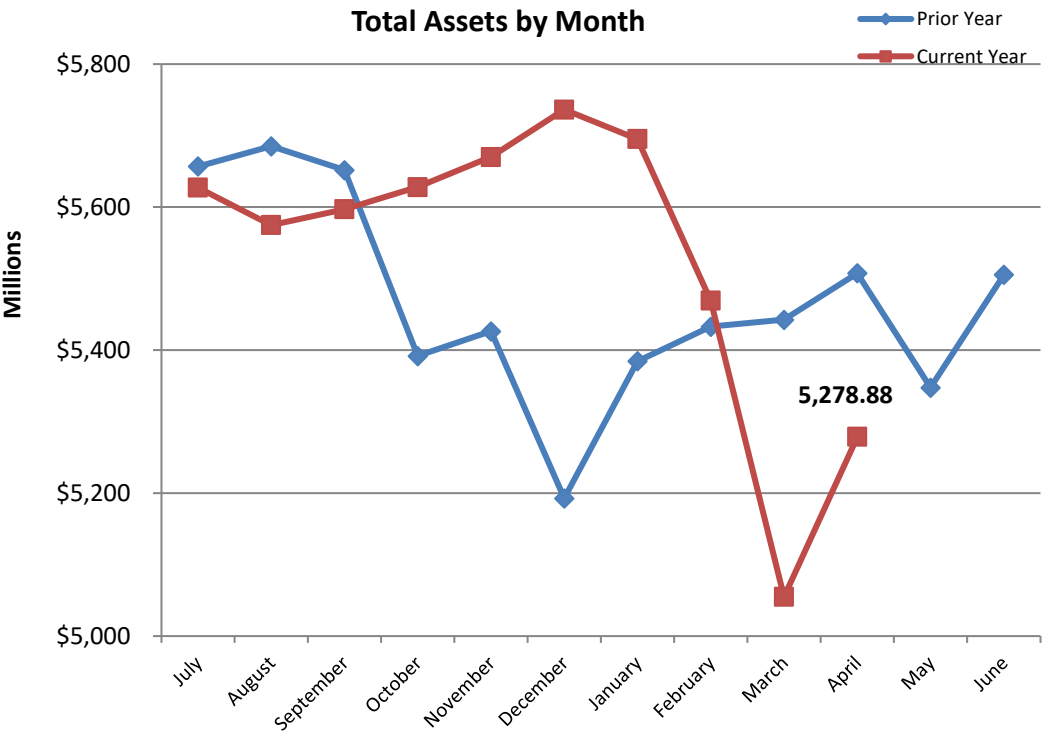
Total Assets History



Actual Asset Allocation vs Target Allocation

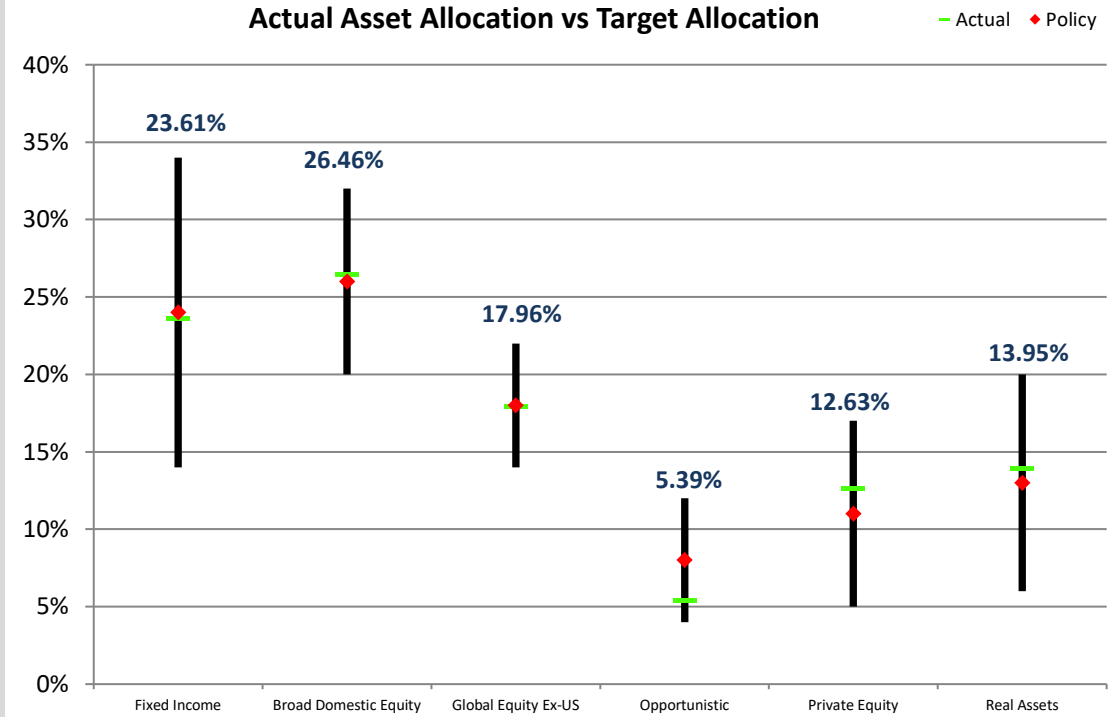
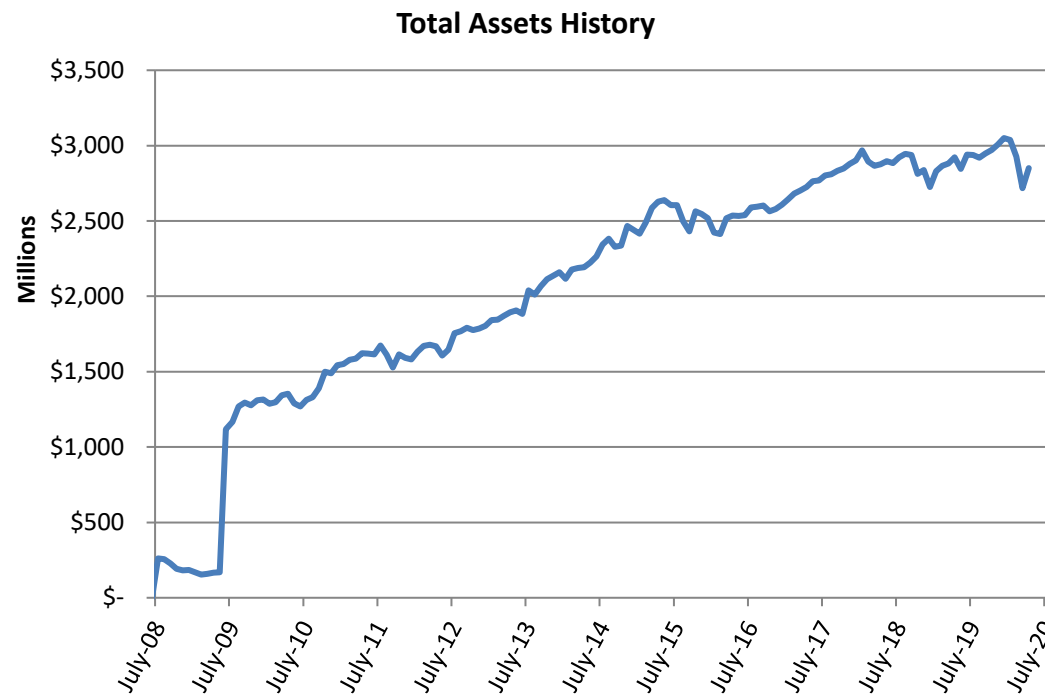
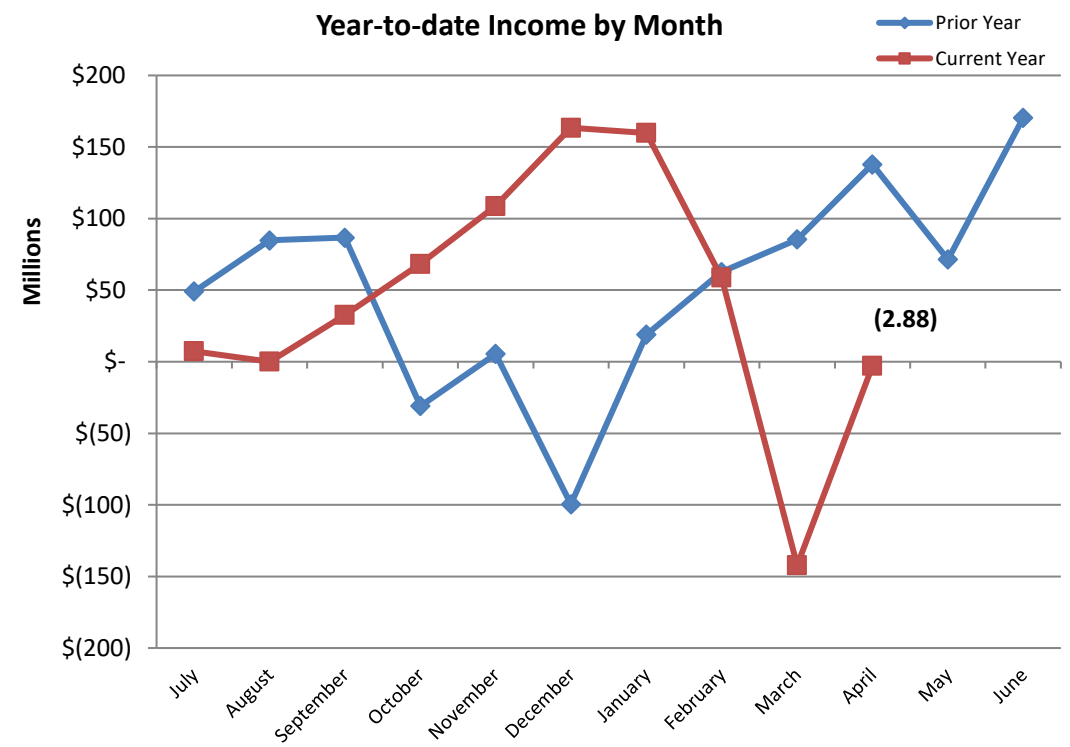
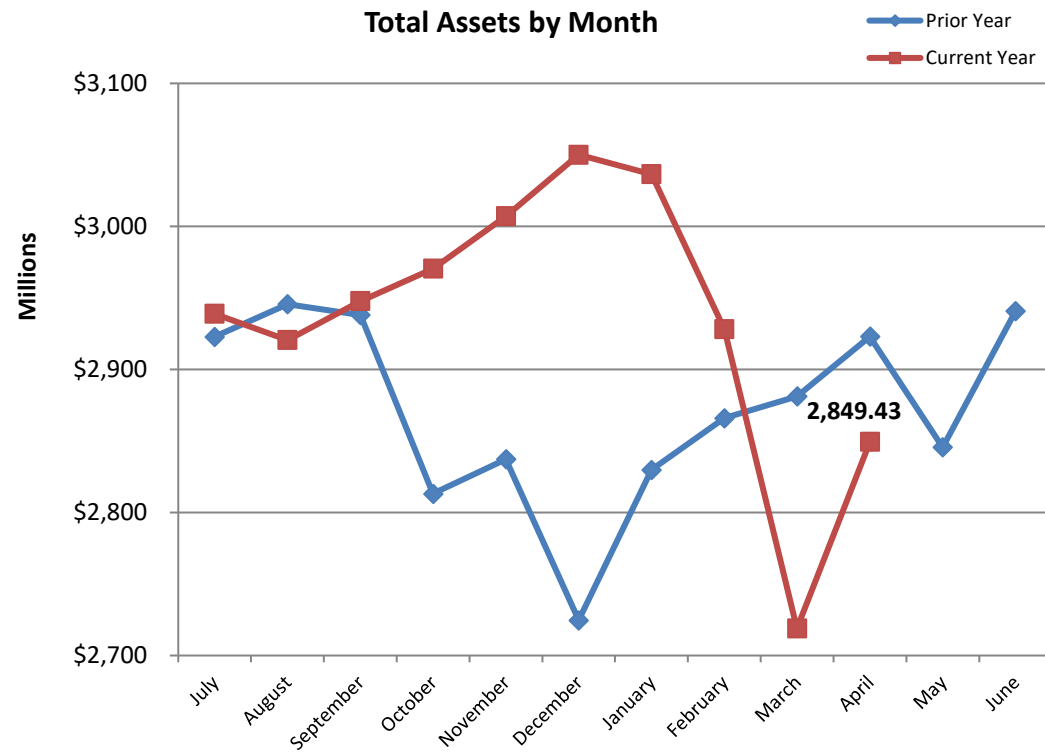


Teachers' Retirement Pension Trust Fund Fiscal Year-to-Date through April 30, 2020



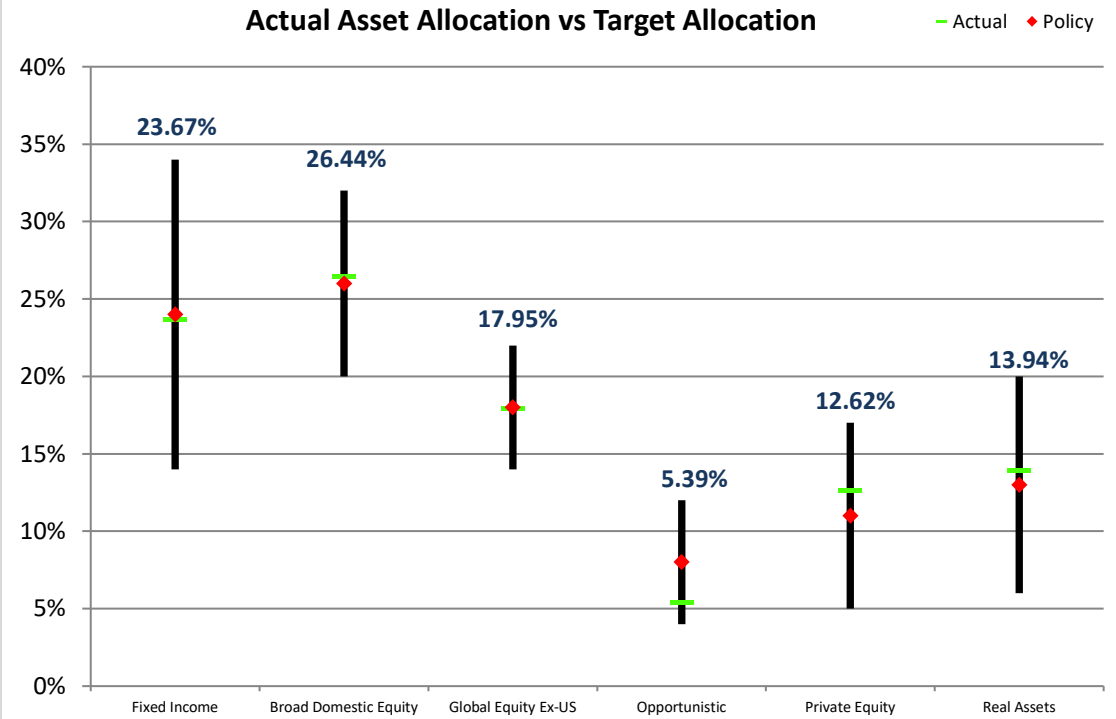
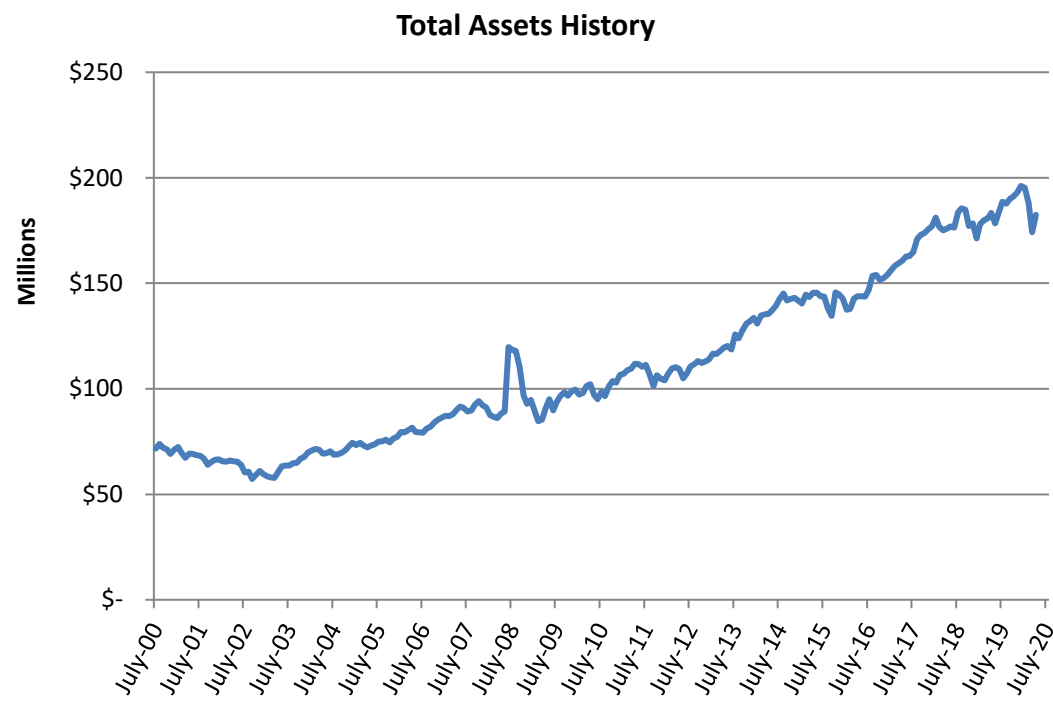
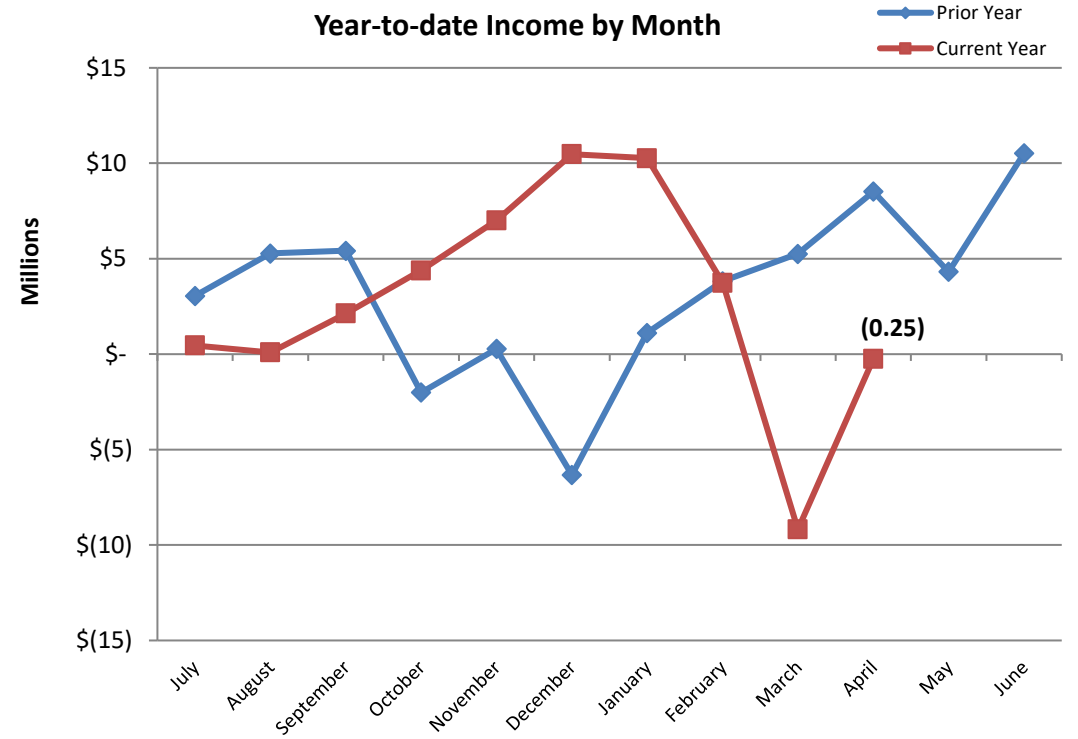
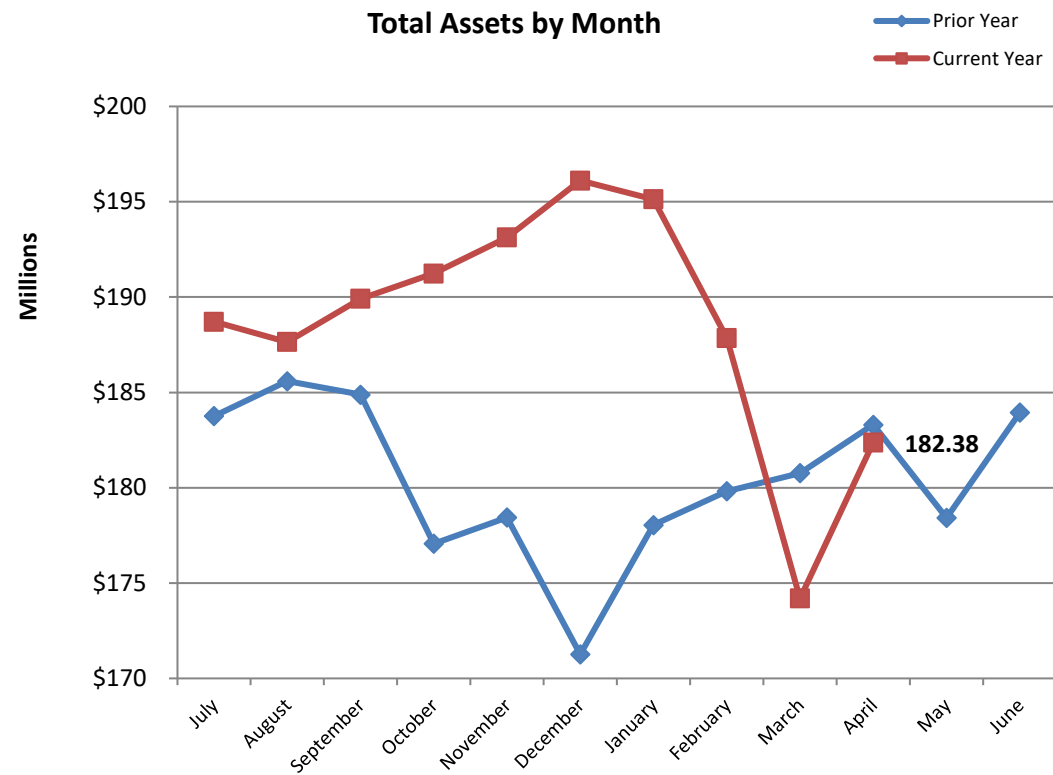
Teachers' Retirement Health Care Trust Fund

Fiscal Year-to-Date through April 30, 2020



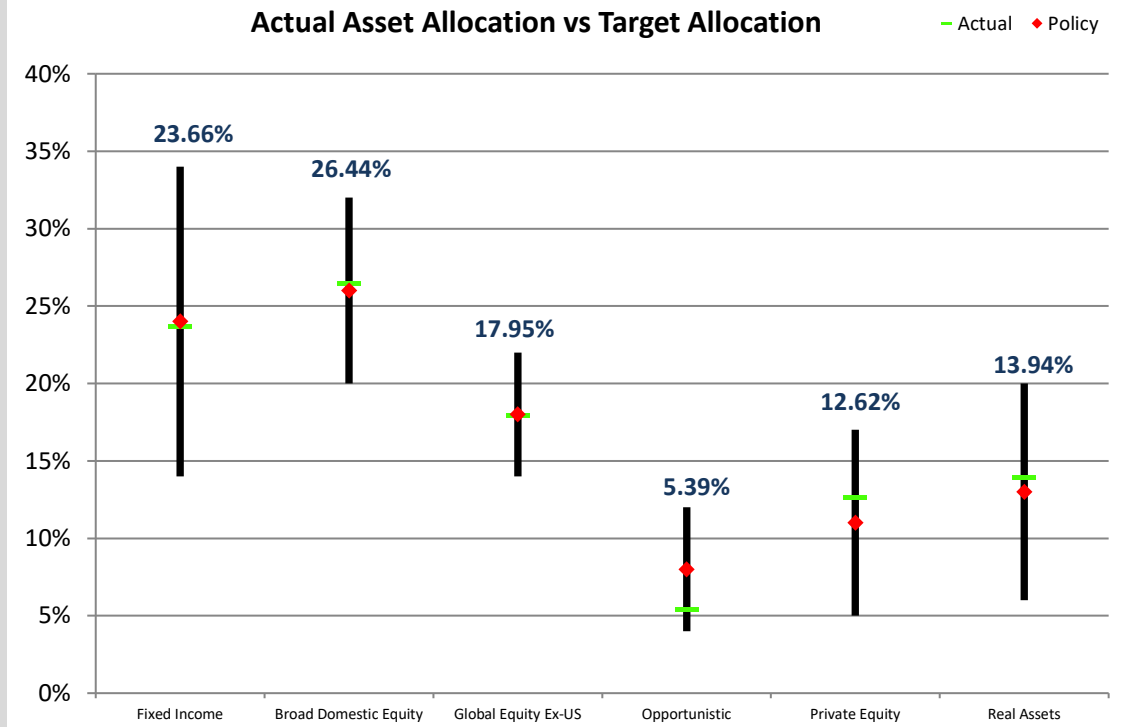
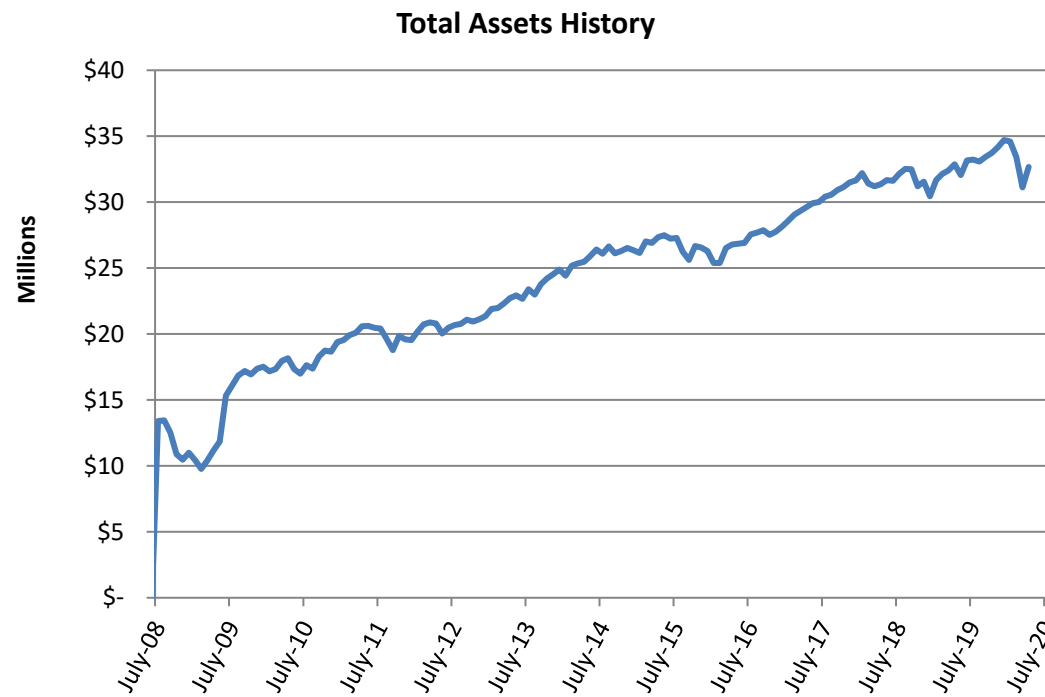
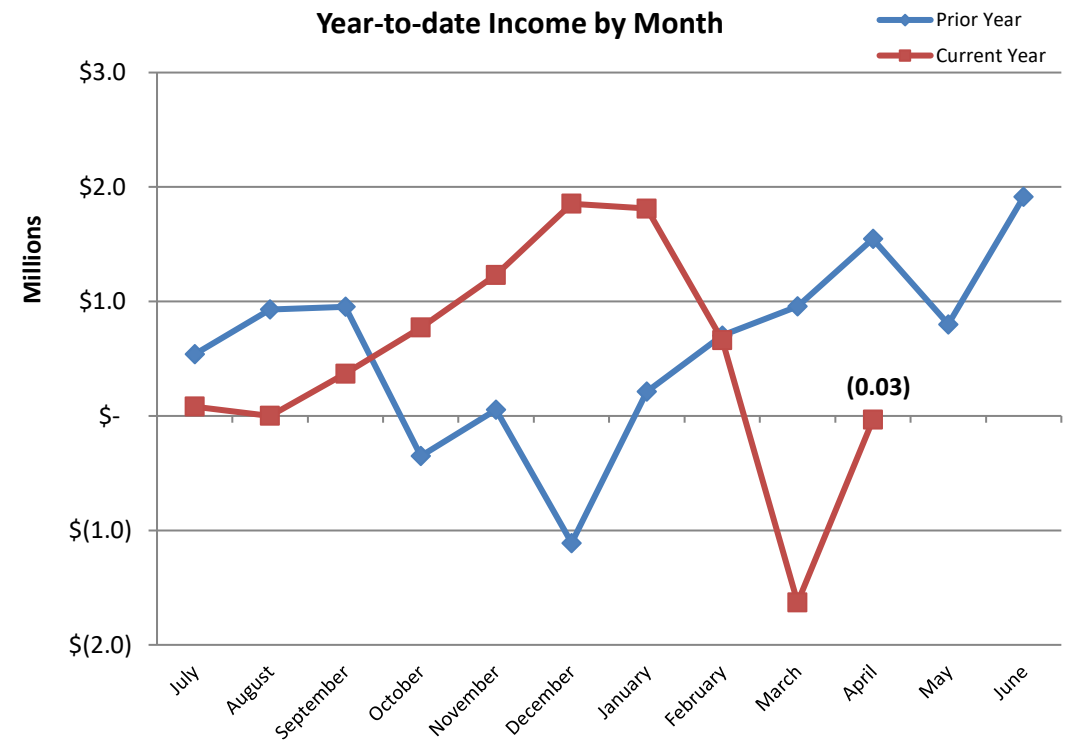
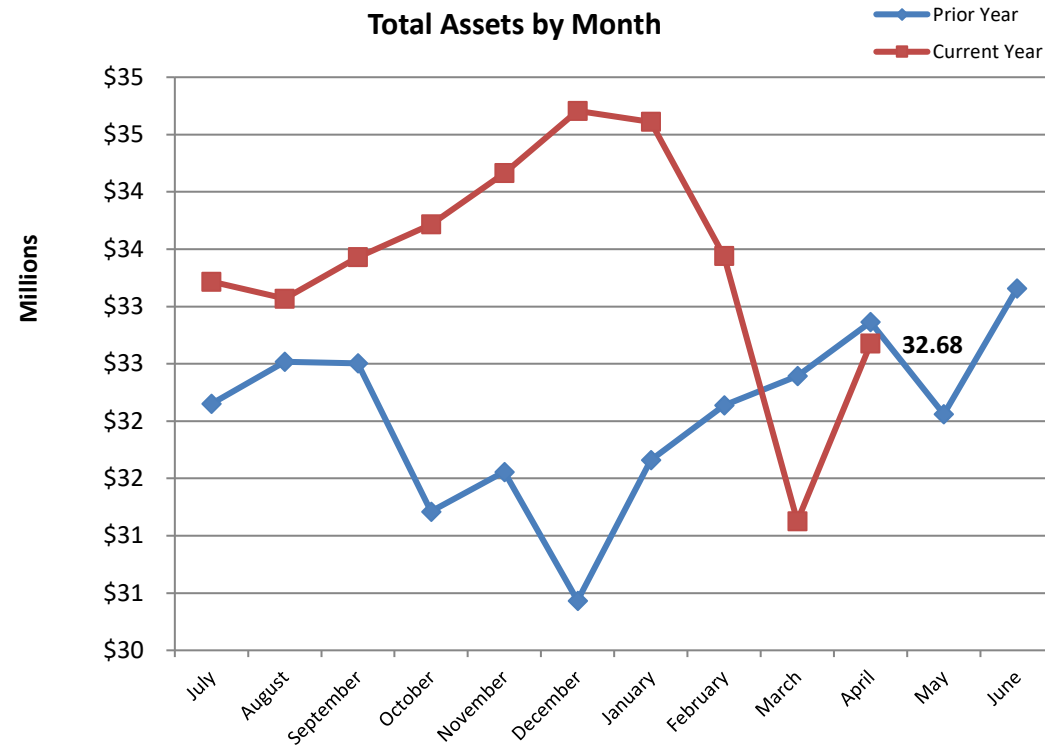
Judicial Retirement Pension Trust Fund

Fiscal Year-to-Date through April 30, 2020



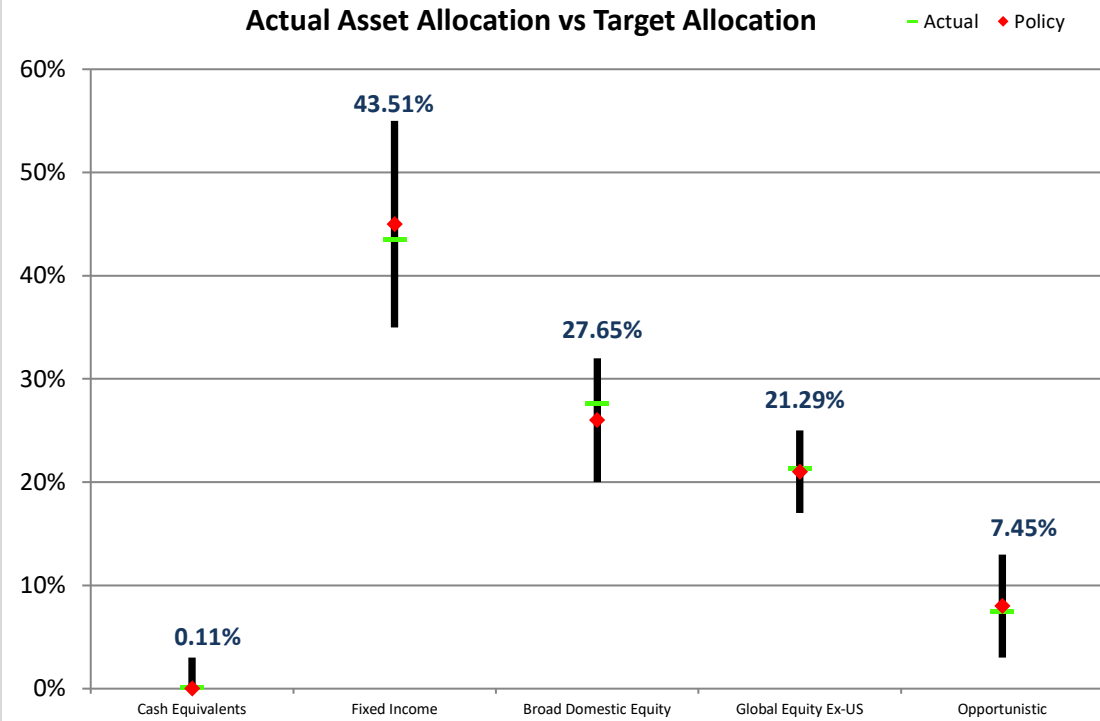
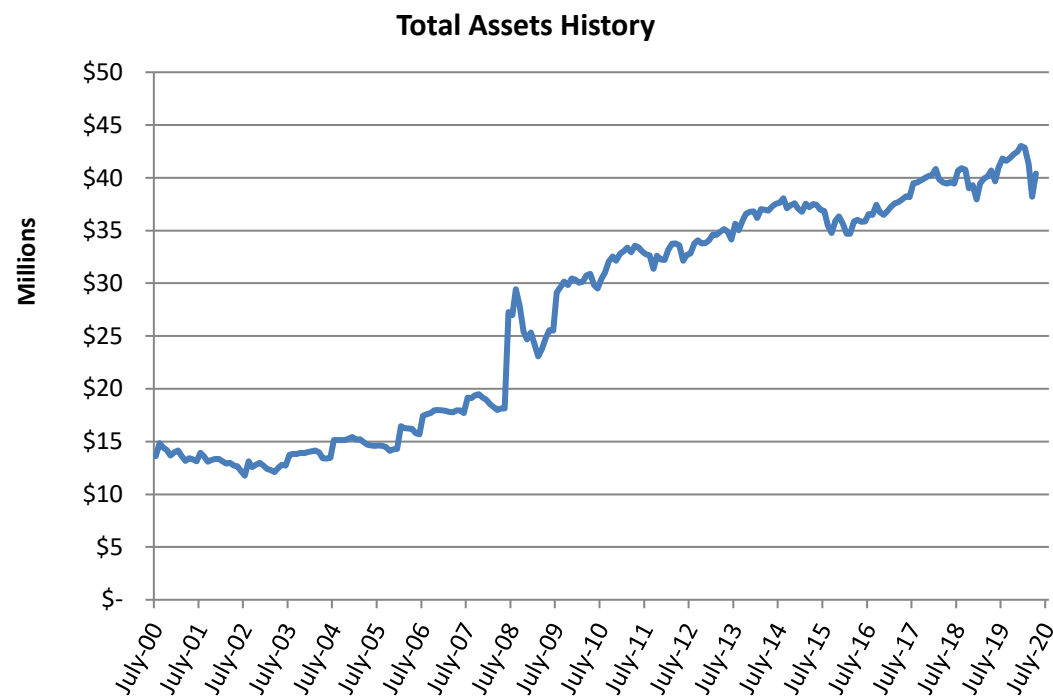
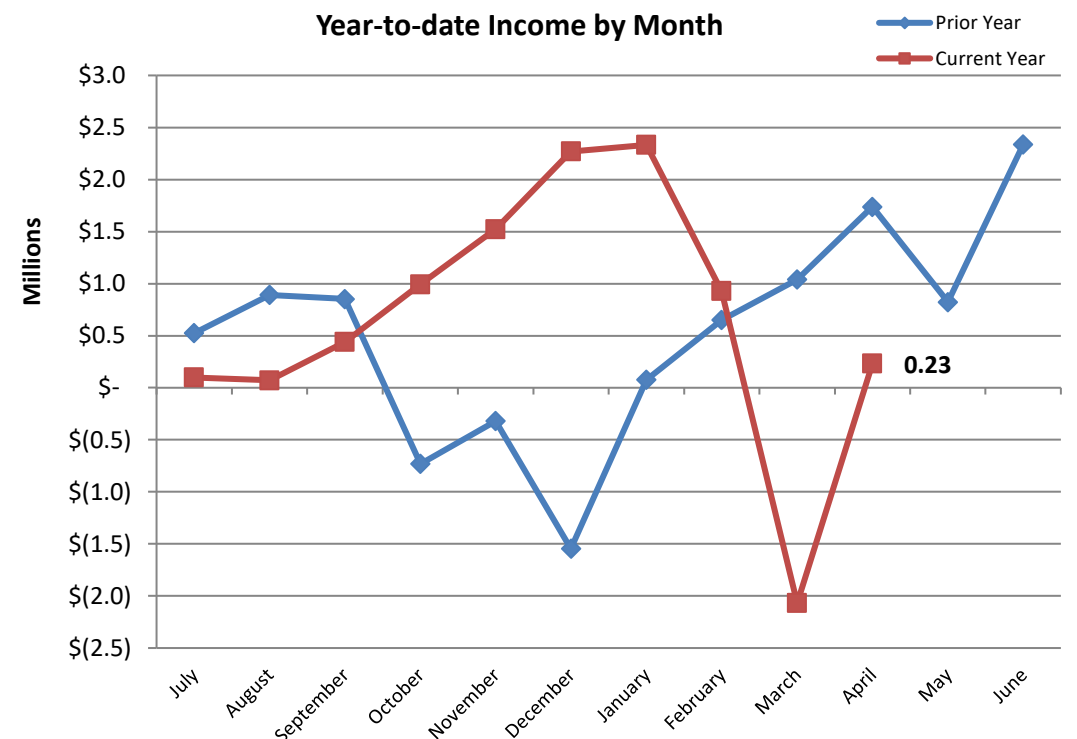
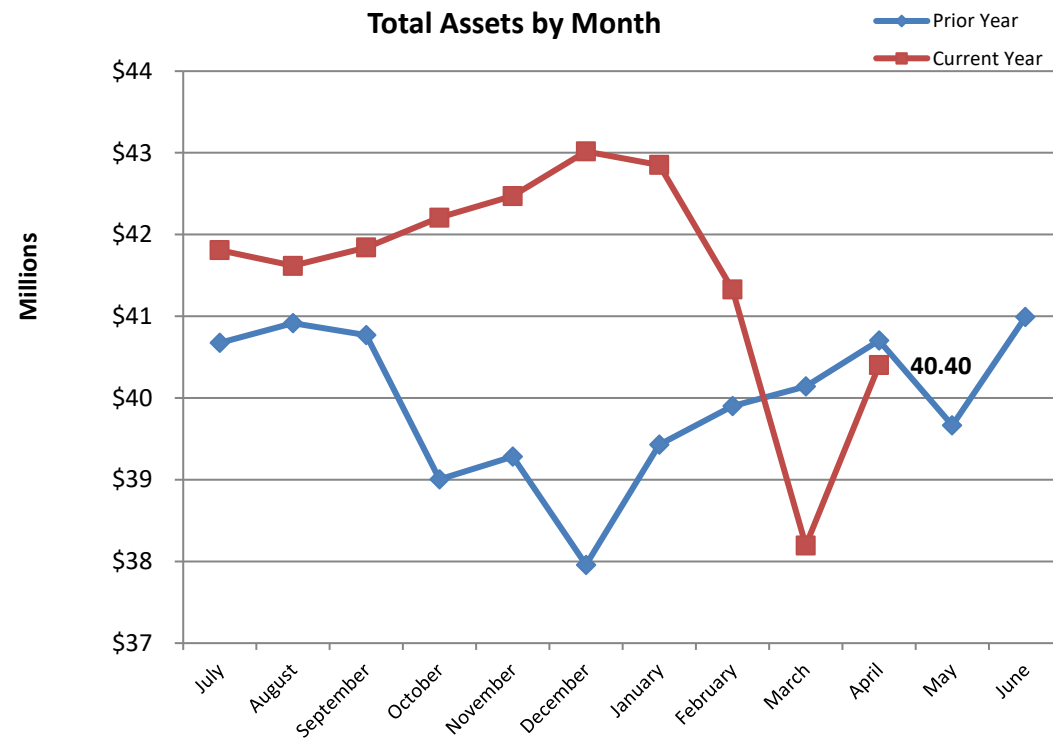
Judicial Retirement Health Care Trust Fund

Fiscal Year-to-Date through April 30, 2020



Military Retirement Trust Fund

Fiscal Year-to-Date through April 30, 2020



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, 2020

	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	\$ 322,559,032	\$ 427,326	\$ 16,139,436	\$ 339,125,794	5.14%	0.13%
Securities Lending Income Pool	60,953	39,865	(61,041)	39,777	-34.74%	130.99%
Total Cash	<u>322,619,985</u>	<u>467,191</u>	<u>16,078,395</u>	<u>339,165,571</u>	5.13%	0.14%
Fixed Income						
Alternative Fixed Income						
Crestline Investors, Inc.	599,587,958	-	(4,695,300)	594,892,658	-0.78%	-
Prisma Capital Partners	163,416,582	824,458	(20,000,000)	144,241,040	-11.73%	0.54%
Crestline Specialty Fund	29,447,791	-	-	29,447,791	-	-
Crestline Specialty Lending Fund II	33,020,320	-	-	33,020,320	-	-
Total Alternative Fixed Income	<u>825,472,651</u>	<u>824,458</u>	<u>(24,695,300)</u>	<u>801,601,809</u>	-2.89%	0.10%
Opportunistic Fixed Income						
Fidelity Inst. Asset Mgmt. High Yield CMBS	175,633,762	(1,846,990)	-	173,786,772	-1.05%	-1.05%
Fidelity Institutional Asset Management	341,883,010	11,224,660	300,000,000	653,107,670	91.03%	2.28%
MacKay Shields, LLC	5,334,518	(263,737)	-	5,070,781	-4.94%	-4.94%
Mondrian Investment Partners	18,308	705	-	19,013	3.85%	3.85%
Total Opportunistic Fixed Income	<u>522,869,598</u>	<u>9,114,638</u>	<u>300,000,000</u>	<u>831,984,236</u>	59.12%	1.35%
ARMB Barclays Agg Bond Fund						
ARMB Barclays Agg Bond Fund	4,865,303,105	89,921,228	(793,740,000)	4,161,484,333	-14.47%	2.01%
Total Fixed Income	<u>6,213,645,354</u>	<u>99,860,324</u>	<u>(518,435,300)</u>	<u>5,795,070,378</u>	-6.74%	1.68%
Domestic Equities						
Small Cap						
Passively Managed						
ARMB Futures Small Cap	11	(1)	(10)	-	-100.00%	-16.67%
ARMB S&P 600	456,540,120	61,939,423	31,000,000	549,479,543	20.36%	13.12%
SSgA Russell 2000 Growth	7,786	-	(7,786)	-	-100.00%	-
SSgA Russell 2000 Value	9,573	(10)	(9,563)	-	-100.00%	-0.21%
Total Passive	<u>456,557,490</u>	<u>61,939,412</u>	<u>30,982,641</u>	<u>549,479,543</u>	20.35%	13.12%
Actively Managed						
Lord Abbett & Co.- Micro Cap	95,455	(261)	(95,194)	-	-100.00%	-0.55%
Transition Account	176,171	(1,465)	(174,636)	70	-99.96%	-1.65%
Zebra Capital Management	-	4,219	-	4,219	100.00%	100.00%
Total Active	<u>271,626</u>	<u>2,493</u>	<u>(269,830)</u>	<u>4,289</u>	-98.42%	1.82%
Total Small Cap	<u>456,829,116</u>	<u>61,941,905</u>	<u>30,712,811</u>	<u>549,483,832</u>	20.28%	13.12%

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, 2020

Large Cap

Passively Managed						
ARMB Futures Large Cap	10	-	(10)	-	-100.00%	-
ARMB S&P 900	3,748,140,624	504,456,779	167,000,000	4,419,597,403	17.91%	13.17%
ARMB Russell 1000 Value	25,518	(4)	(25,514)	-	-100.00%	-0.03%
ARMB Russell Top 200	330	(111)	(219)	-	-100.00%	-50.34%
Total Passive	<u>3,748,166,482</u>	<u>504,456,664</u>	<u>166,974,257</u>	<u>4,419,597,403</u>	17.91%	13.17%
Actively Managed						
Allianz Global Investors	2,370	-	(2,370)	-	-100.00%	-
ARMB Domestic Residual Assets	5,058	63,342	62,160	130,560	2481.26%	175.28%
ARMB Large Cap Multi-Factor	89,567,224	11,520,112	-	101,087,336	12.86%	12.86%
ARMB Scientific Beta	1,533,181,240	192,380,198	53,157,203	1,778,718,641	16.01%	12.33%
Barrow, Hanley, Mewhinney & Strauss	100	-	-	100	-	-
Lazard Freres	10,675	5,863	(16,538)	-	-100.00%	243.68%
Transition Account	103,611	(16,940)	(86,625)	46	-99.96%	-28.09%
Total Active	<u>1,622,870,278</u>	<u>203,952,575</u>	<u>53,113,830</u>	<u>1,879,936,683</u>	15.84%	12.37%
Total Large Cap	<u>5,371,036,760</u>	<u>708,409,239</u>	<u>220,088,087</u>	<u>6,299,534,086</u>	17.29%	12.92%
Total Domestic Equity	<u>5,827,865,876</u>	<u>770,351,144</u>	<u>250,800,898</u>	<u>6,849,017,918</u>	17.52%	12.94%

Global Equities Ex US

Small Cap

Mondrian Investment Partners	6,881	(12)	-	6,869	-0.17%	-0.17%
Schroder Investment Management	46,461	7,813	-	54,274	16.82%	16.82%
Total Small Cap	<u>53,342</u>	<u>7,801</u>	<u>-</u>	<u>61,143</u>	14.62%	14.62%

Large Cap

Allianz Global Investors	129,580	(113,606)	(15,972)	2	-100.00%	-93.43%
Arrow Street Capital	452,344,566	38,658,123	-	491,002,689	8.55%	8.55%
Baillie Gifford Overseas Limited	228,963,558	21,759,152	-	250,722,710	9.50%	9.50%
Brandes Investment Partners	225,529,693	12,616,669	-	238,146,362	5.59%	5.59%
Cap Guardian Trust Co	447,107,377	41,162,659	-	488,270,036	9.21%	9.21%
Lazard Freres	28,769	(52)	-	28,717	-0.18%	-0.18%
Legal & General	615,417,076	44,013,117	63,832	659,494,025	7.16%	7.15%
McKinley Capital Management	1,679,987	113,233	(73,389)	1,719,831	2.37%	6.89%
SSgA MSCI World Ex-US IMI Index Fund	1,380,293,595	119,967,283	204,740,000	1,705,000,878	23.52%	8.09%
State Street Global Advisors	1,870,573	(1,259,106)	-	611,467	-67.31%	-67.31%
Total Large Cap	<u>3,353,364,774</u>	<u>276,917,472</u>	<u>204,714,471</u>	<u>3,834,996,717</u>	14.36%	8.01%

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, 2020

Emerging Markets Equity						
MSCI Emerging Markets Index Fund	491,264,188	48,955,494	33,000,000	573,219,682	16.68%	9.64%
DePrince, Race, and Zollo Emerging Markets	500,000	-	(427,084)	72,916	-85.42%	-
Legal & General Sci-Beta Emerging Markets	219,844,504	22,262,527	21,622	242,128,653	10.14%	10.13%
Total Emerging Markets	<u>711,608,692</u>	<u>71,218,021</u>	<u>32,594,538</u>	<u>815,421,251</u>	14.59%	9.78%
Total Global Equities	<u>4,065,026,808</u>	<u>348,143,294</u>	<u>237,309,009</u>	<u>4,650,479,111</u>	14.40%	8.32%
Opportunistic						
Alternative Equity Strategy						
Alternative Equity Strategies Transition Account	-	-	-	-	-	-
Analytic Buy Write Account	-	233	(111)	122	100.00%	419.82%
McKinley Global Health Care	225,666,654	33,828,827	307,700	259,803,181	15.13%	14.98%
Total Alternative Equity Strategy	<u>225,666,654</u>	<u>33,829,060</u>	<u>307,589</u>	<u>259,803,303</u>	15.13%	14.98%
Alternative Beta						
JPM Systemic Alpha	159,711,273	(27,226,274)	(132,484,999)	-	-100.00%	-29.13%
Man Group Alternative Risk Premia	313,958,507	(2,215,223)	-	311,743,284	-0.71%	-0.71%
Zebra Global Equity Fund	3,903,353	-	(3,903,353)	-	-100.00%	-
Total Alternative Beta	<u>477,573,133</u>	<u>(29,441,497)</u>	<u>(136,388,352)</u>	<u>311,743,284</u>	-34.72%	-7.19%
Other Opportunities						
Project Pearl	9,914,405	(70,018)	150,000	9,994,387	0.81%	-0.70%
Schroders Insurance Linked Securities	48,303,455	(966,225)	(12,000,000)	35,337,230	-26.84%	-2.28%
Total Other Opportunities	<u>58,217,860</u>	<u>(1,036,243)</u>	<u>(11,850,000)</u>	<u>45,331,617</u>	-22.13%	-1.98%
Tactical Allocation Strategies						
Fidelity Signals	377,537,737	26,716,979	-	404,254,716	7.08%	7.08%
PineBridge	358,191,274	16,669,118	-	374,860,392	4.65%	4.65%
Total Tactical Allocation Strategies	<u>735,729,011</u>	<u>43,386,097</u>	<u>-</u>	<u>779,115,108</u>	5.90%	5.90%
Total Opportunistic	<u>1,497,186,658</u>	<u>46,737,417</u>	<u>(147,930,763)</u>	<u>1,395,993,312</u>	-6.76%	3.28%

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, 2020

Private Equity

Abbott Capital	1,227,479,340	(4,249,508)	14,163,028	1,237,392,860	0.81%	-0.34%
Advent International GPE Fund VIII-B	28,581,217	1,097,434	-	29,678,651	3.84%	3.84%
Advent International GPE Fund IX	6,415,796	(141,098)	-	6,274,698	-2.20%	-2.20%
Angelo, Gordon & Co.	5,783	-	-	5,783	-	-
Dyal Capital Partners III	33,587,416	(38,126)	2,106,475	35,655,765	6.16%	-0.11%
Dyal Capital Partners IV	2,282,282	394,997	838,821	3,516,100	54.06%	14.62%
Glendon Opportunities	33,617,753	-	4,000,000	37,617,753	11.90%	-
Glendon Opportunities II	22,865,937	-	9,375,000	32,240,937	41.00%	-
KKR Lending Partners II	28,315,346	-	-	28,315,346	-	-
Lexington Capital Partners VIII	34,872,069	80,862	(814,144)	34,138,787	-2.10%	0.23%
Lexington Partners VII	16,239,508	(182,697)	-	16,056,811	-1.13%	-1.13%
Merit Capital Partners	11,000,277	197,605	-	11,197,882	1.80%	1.80%
NB SOF III	20,408,787	-	-	20,408,787	-	-
NB SOF IV	23,028,490	-	-	23,028,490	-	-
New Mountain Partners IV	19,186,380	-	-	19,186,380	-	-
New Mountain Partners V	35,011,536	-	2,979,344	37,990,880	8.51%	-
NGP XI	43,072,912	-	-	43,072,912	-	-
NGP XII	19,366,793	-	-	19,366,793	-	-
Onex Partnership III	9,204,375	-	-	9,204,375	-	-
Pathway Capital Management LLC	1,398,406,005	(4,594,982)	24,267,402	1,418,078,425	1.41%	-0.33%
Resolute Fund III	15,330,469	941,449	-	16,271,918	6.14%	6.14%
Resolute Fund IV	26,354,936	3,911,233	2,368,376	32,634,545	23.83%	14.20%
Summit Partners GE IX	40,764,361	3,045,390	1,608,000	45,417,751	11.42%	7.33%
Summit Partners GE X	1,137,500	(199,442)	1,050,000	1,988,058	74.77%	-12.00%
Warburg Pincus Global Growth Fund	6,993,220	-	-	6,993,220	-	-
Warburg Pincus X	7,282,097	-	(923,550)	6,358,547	-12.68%	-
Warburg Pincus XI	18,862,466	(61,629)	-	18,800,837	-0.33%	-0.33%
Warburg Pincus XII	73,039,849	-	-	73,039,849	-	-
Total Private Equity	3,202,712,900	201,488	61,018,752	3,263,933,140	1.91%	0.01%

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, 2020

Real Assets

Farmland

Hancock Agricultural Investment Group	288,338,178	-	-	288,338,178	-	-
UBS Agrivest, LLC	587,552,314	-	-	587,552,314	-	-
Total Farmland	<u>875,890,492</u>	<u>-</u>	<u>-</u>	<u>875,890,492</u>	<u>-</u>	<u>-</u>

Timber

Hancock Natural Resource Group	99,556,280	-	-	99,556,280	-	-
Timberland Inv't Resource LLC	267,395,726	-	-	267,395,726	-	-
Total Timber	<u>366,952,006</u>	<u>-</u>	<u>-</u>	<u>366,952,006</u>	<u>-</u>	<u>-</u>

Energy

EIG Energy Fund XIV-A	7,036,696	(2,227,415)	-	4,809,281	-31.65%	-31.65%
EIG Energy Fund XV	16,286,566	(2,389,173)	(185,921)	13,711,472	-15.81%	-14.75%
EIG Energy Fund XVI	53,140,269	(2,427,953)	-	50,712,316	-4.57%	-4.57%
Total Energy	<u>76,463,531</u>	<u>(7,044,541)</u>	<u>(185,921)</u>	<u>69,233,069</u>	<u>-9.46%</u>	<u>-9.22%</u>

REIT

REIT Transition Account	-	-	-	-	-	-
ARMB REIT	265,911,360	23,388,272	-	289,299,632	8.80%	8.80%
Total REIT	<u>265,911,360</u>	<u>23,388,272</u>	<u>-</u>	<u>289,299,632</u>	<u>8.80%</u>	<u>8.80%</u>

Infrastructure Private

IFM Global Infrastructure Fund-Private	555,056,842	(18,163,282)	(6,453,351)	530,440,209	-4.43%	-3.29%
JP Morgan Infrastructure Fund-Private	123,526,887	-	-	123,526,887	-	-
Total Infrastructure Private	<u>678,583,729</u>	<u>(18,163,282)</u>	<u>(6,453,351)</u>	<u>653,967,096</u>	<u>-3.63%</u>	<u>-2.69%</u>

Infrastructure Public

Brookfield Investment Mgmt.-Public	25,634	(37)	-	25,597	-0.14%	-0.14%
Lazard Asset Mgmt.-Public	73,942	(75)	-	73,867	-0.10%	-0.10%
Total Infrastructure Public	<u>99,576</u>	<u>(112)</u>	<u>-</u>	<u>99,464</u>	<u>-0.11%</u>	<u>-0.11%</u>

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, 2020

Real Estate

Core Commingled Accounts						
BlackRock US Core Property Fund	222,616,787	3,277,811	-	225,894,598	1.47%	1.47%
JP Morgan	183,635,766	1,310,088	(3,723,956)	181,221,898	-1.31%	0.72%
UBS Trumbull Property Fund	50,216,812	116,979	(424,193)	49,909,598	-0.61%	0.23%
Total Core Commingled	456,469,365	4,704,878	(4,148,149)	457,026,094	0.12%	1.04%
Core Separate Accounts						
UBS Realty	67,212,926	-	-	67,212,926	-	-
Sentinel Separate Account	175,188,362	-	(572,559)	174,615,803	-0.33%	-
UBS Realty	551,724,001	1	1,900,000	553,624,002	0.34%	0.00%
Total Core Separate	794,125,289	1	1,327,441	795,452,731	0.17%	0.00%
Non-Core Commingled Accounts						
Almanac Realty Securities V	80,738	-	-	80,738	-	-
Almanac Realty Securities VII	21,455,101	-	280,989	21,736,090	1.31%	-
Almanac Realty Securities VIII	5,296,337	-	1,971,839	7,268,176	37.23%	-
Clarion Ventures 4	30,858,700	-	-	30,858,700	-	-
Colony Investors VIII, L.P.	1,360,177	-	-	1,360,177	-	-
Coventry	226,833	(58,235)	-	168,598	-25.67%	-25.67%
ING Clarion Development Ventures III	2,583,971	-	-	2,583,971	-	-
KKR Real Estate Partners Americas II	14,073,917	-	445,712	14,519,629	3.17%	-
KKR Real Estate Partners Americas L.P.	9,313,616	-	-	9,313,616	-	-
Silverpeak Legacy Pension Partners II, L.P.	1,938,527	130,314	-	2,068,841	6.72%	6.72%
Silverpeak Legacy Pension Partners III, L.P.	3,492,942	-	-	3,492,942	-	-
Tishman Speyer Real Estate Venture VI	1,977,531	-	-	1,977,531	-	-
Tishman Speyer Real Estate Venture VII	560,554	-	-	560,554	-	-
Total Non-Core Commingled	93,218,944	72,079	2,698,540	95,989,563	2.97%	0.08%
Total Real Estate	1,343,813,598	4,776,958	(122,168)	1,348,468,388	0.35%	0.36%
Total Real Assets	3,607,714,292	2,957,295	(6,761,440)	3,603,910,147	-0.11%	0.08%
Total Assets	\$ 24,736,771,873	\$ 1,268,718,153	\$ (107,920,449)	\$ 25,897,569,577	4.69%	5.14%

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, 2020

	<u>Beginning Invested Assets</u>	<u>Investment Income</u>	<u>Net Contributions (Withdrawals)</u>	<u>Transfers In (Out)</u>	<u>Ending Invested Assets</u>	<u>% Change in Invested Assets</u>	<u>% Change due to Investment Income (1)</u>
Participant Options							
T. Rowe Price							
Stable Value Fund	\$ 455,078,312	\$ 869,870	\$ (3,196,125)	\$ (904,644)	\$ 451,847,413	-0.71%	0.19%
Small Cap Stock Fund	155,559,828	22,909,958	47,623	2,672,782	181,190,191	16.48%	14.60%
Alaska Balanced Trust	1,029,967,518	49,806,932	(2,279,231)	(2,542,129)	1,074,953,090	4.37%	4.85%
Long Term Balanced Fund	598,960,261	43,974,350	502,049	(5,768,766)	637,667,894	6.46%	7.37%
AK Target Date 2010 Trust	9,435,345	486,345	(96,092)	313,434	10,139,032	7.46%	5.10%
AK Target Date 2015 Trust	70,590,732	4,081,097	19,323	64,506	74,755,658	5.90%	5.78%
AK Target Date 2020 Trust	81,361,537	5,496,004	152,708	(917,755)	86,092,494	5.81%	6.79%
AK Target Date 2025 Trust	81,596,539	6,305,313	131,167	(250,505)	87,782,514	7.58%	7.73%
AK Target Date 2030 Trust	60,535,891	5,203,467	372,288	(688,877)	65,422,769	8.07%	8.62%
AK Target Date 2035 Trust	56,206,305	5,292,007	553,706	(457,378)	61,594,640	9.59%	9.41%
AK Target Date 2040 Trust	57,623,337	5,766,629	562,849	(371,364)	63,581,451	10.34%	9.99%
AK Target Date 2045 Trust	64,074,285	6,730,351	710,211	(200,515)	71,314,332	11.30%	10.46%
AK Target Date 2050 Trust	71,420,827	7,520,655	811,519	(65,088)	79,687,913	11.58%	10.48%
AK Target Date 2055 Trust	68,623,511	7,232,959	1,194,379	(479,263)	76,571,586	11.58%	10.49%
AK Target Date 2060 Trust	2,360,705	249,522	61,353	32,062	2,703,642	14.53%	10.36%
AK Target Date 2065 Trust	1,080,414	19,437	13,407	(545,208)	568,050	-47.42%	2.39%
Total Investments with T. Rowe Price	<u>2,864,475,347</u>	<u>171,944,896</u>	<u>(438,866)</u>	<u>(10,108,708)</u>	<u>3,025,872,669</u>		
State Street Global Advisors							
Money Market	69,247,802	21,218	(1,173,906)	785,728	68,880,842	-0.53%	0.03%
S&P 500 Stock Index Fund Series A	345,228,264	44,325,502	(105,294)	4,058,447	393,506,919	13.98%	12.77%
Russell 3000 Index	108,850,235	14,317,457	3,878	(1,640,382)	121,531,188	11.65%	13.25%
World Equity Ex-US Index	57,506,799	4,527,758	76,104	(1,827,140)	60,283,521	4.83%	8.00%
Total Investments with SSgA	<u>580,833,100</u>	<u>63,191,935</u>	<u>(1,199,218)</u>	<u>1,376,653</u>	<u>644,202,470</u>		
BlackRock							
Passive U.S. Bond Index Fund	177,954,888	3,211,829	(692,112)	1,555,753	182,030,358	2.29%	1.80%
Strategic Completion Fund	33,209,266	1,267,964	(122,105)	(493,626)	33,861,499	1.96%	3.85%
Total Investments with BlackRock	<u>211,164,154</u>	<u>4,479,793</u>	<u>(814,217)</u>	<u>1,062,127</u>	<u>215,891,857</u>		
Brandes/Baillie Gifford (2)							
AK International Equity Fund	53,130,046	4,326,953	27,407	5,268,285	62,752,691	18.11%	7.76%
Northern Trust							
Environmental, Social, and Governance Fund	80,195,771	9,992,636	(73,391)	2,401,643	92,516,659	15.36%	12.28%
Total All Funds	<u>\$ 3,789,798,418</u>	<u>\$ 253,936,213</u>	<u>\$ (2,498,285)</u>	<u>\$ -</u>	<u>\$ 4,041,236,346</u>	6.63%	6.70%

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.

(2) This investment is comprised of two funds, Brandes International Equity Fund and Baillie Gifford International Equity Fund.

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, 2020
\$ (Thousands)

<u>Invested Assets (at fair value)</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>
Investments with T. Rowe Price										
Stable Value Fund	\$ 390,930	\$ 399,454	\$ 412,664	\$ 420,316	\$ 420,772	\$ 419,937	\$ 421,796	\$ 434,235	\$ 455,078	\$ 451,847
Small Cap Stock Fund	200,646	196,187	200,339	206,502	214,069	217,571	212,363	193,885	155,560	181,190
Alaska Balanced Trust	1,136,113	1,129,963	1,121,844	1,121,617	1,124,727	1,133,371	1,132,090	1,101,104	1,029,968	1,074,953
Long Term Balanced Fund	684,783	675,729	679,423	687,126	697,002	708,140	702,737	666,274	598,960	637,668
AK Target Date 2010 Trust	10,189	9,988	10,032	9,996	9,957	10,132	10,083	10,026	9,435	10,139
AK Target Date 2015 Trust	83,190	81,950	81,406	81,818	81,720	81,094	79,609	76,384	70,591	74,756
AK Target Date 2020 Trust	97,905	95,383	95,622	95,881	97,734	98,212	96,918	91,534	81,362	86,092
AK Target Date 2025 Trust	84,647	84,454	86,846	88,608	89,932	92,410	94,087	89,405	81,597	87,783
AK Target Date 2030 Trust	66,366	66,147	67,775	68,959	70,507	72,530	72,381	68,474	60,536	65,423
AK Target Date 2035 Trust	61,813	60,851	62,152	64,106	65,772	67,718	68,534	64,547	56,206	61,595
AK Target Date 2040 Trust	62,429	62,054	63,078	65,003	67,631	69,619	69,714	64,366	57,623	63,581
AK Target Date 2045 Trust	70,965	70,008	71,559	73,397	75,716	78,914	79,297	73,755	64,074	71,314
AK Target Date 2050 Trust	80,073	79,250	80,851	83,135	85,379	88,531	88,612	81,947	71,421	79,688
AK Target Date 2055 Trust	72,253	72,118	74,105	76,947	80,147	83,305	83,885	77,967	68,624	76,572
AK Target Date 2060 Trust	4,171	4,189	4,182	3,977	4,076	4,306	4,213	3,553	2,361	2,704
AK Target Date 2065 Trust	-	-	-	-	-	-	387	357	1,080	568
State Street Global Advisors										
Money Market	48,583	51,584	51,228	52,402	54,697	54,476	55,959	60,778	69,248	68,881
S&P 500 Stock Index Fund Series A	485,856	458,600	437,251	423,128	431,566	442,830	439,964	394,613	345,228	393,507
Russell 3000 Index	77,118	90,072	112,374	134,994	145,500	146,477	142,301	126,035	108,850	121,531
US Real Estate Investment Trust Index	39,340	-	-	-	-	-	-	-	-	-
World Equity Ex-US Index	70,168	70,243	74,123	79,423	80,674	82,343	77,157	69,845	57,507	60,284
US Treasury Inflation Protected Securities Index	48,876	-	-	-	-	-	-	-	-	-
Investments with BlackRock										
Passive U.S. Bond Index Fund	126,578	141,390	150,818	162,717	166,390	165,368	169,571	178,541	177,955	182,030
Strategic Completion Fund	-	78,755	63,183	49,098	44,585	44,271	43,454	40,557	33,209	33,861
Investments with Brandes/Baillie Gifford										
AK International Equity Fund	62,924	58,085	55,885	54,044	55,381	62,659	62,303	59,441	53,130	62,753
Investments with Northern Trust										
Environmental, Social, and Governance Fund	60,303	63,627	71,495	78,355	84,080	89,699	93,785	89,372	80,196	92,517
Total Invested Assets	\$ 4,126,219	\$ 4,100,080	\$ 4,128,232	\$ 4,181,547	\$ 4,248,015	\$ 4,313,916	\$ 4,301,200	\$ 4,116,995	\$ 3,789,798	\$ 4,041,236
<u>Change in Invested Assets</u>										
Beginning Assets	\$ 4,111,631	\$ 4,126,219	\$ 4,100,080	\$ 4,128,232	\$ 4,181,547	\$ 4,248,015	\$ 4,313,916	\$ 4,301,200	\$ 4,116,995	\$ 3,789,798
Investment Earnings	20,000	(21,625)	40,452	59,168	71,303	76,294	(3,962)	(168,675)	(318,325)	253,936
Net Contributions (Withdrawals)	(5,413)	(4,514)	(12,300)	(5,853)	(4,835)	(10,393)	(8,754)	(15,530)	(8,871)	(2,498)
Ending Invested Assets	\$ 4,126,219	\$ 4,100,080	\$ 4,128,232	\$ 4,181,547	\$ 4,248,015	\$ 4,313,916	\$ 4,301,200	\$ 4,116,995	\$ 3,789,798	\$ 4,041,236

Deferred Compensation Plan
Schedule of Invested Assets and Changes in Invested Assets
for the Month Ended
April 30, 2020

	<u>Beginning Invested</u> <u>Assets</u>	<u>Investment Income</u>	<u>Net Contributions</u> <u>(Withdrawals)</u>	<u>Transfers In (Out)</u>	<u>Ending Invested</u> <u>Assets</u>	<u>% Change in</u> <u>Invested</u> <u>Assets</u>	<u>% Change due</u> <u>to Investment</u> <u>Income (1)</u>
Participant Options							
T. Rowe Price							
Stable Value Fund	\$ 203,391,863	\$ 388,163	\$ (1,296,806)	\$ (426,893)	\$ 202,056,327	-0.66%	0.19%
Small Cap Stock Fund	89,929,238	13,171,398	(31,547)	(23,817)	103,045,272	14.58%	14.65%
Alaska Balanced Trust	26,648,294	1,296,121	43,620	(206,773)	27,781,262	4.25%	4.88%
Long Term Balanced Fund	71,248,386	5,201,410	(539,965)	(475,140)	75,434,691	5.88%	7.35%
AK Target Date 2010 Trust	2,935,500	151,502	(141)	67,819	3,154,680	7.47%	5.10%
AK Target Date 2015 Trust	8,526,377	492,829	(5,357)	-	9,013,849	5.72%	5.78%
AK Target Date 2020 Trust	21,358,744	1,457,472	83,767	(499,150)	22,400,833	4.88%	6.89%
AK Target Date 2025 Trust	19,321,833	1,507,315	150,775	53,708	21,033,631	8.86%	7.76%
AK Target Date 2030 Trust	11,266,808	979,316	151,302	(22,762)	12,374,664	9.83%	8.64%
AK Target Date 2035 Trust	7,259,529	684,920	97,800	17,724	8,059,973	11.03%	9.36%
AK Target Date 2040 Trust	8,100,582	798,039	92,442	(373,343)	8,617,720	6.38%	10.03%
AK Target Date 2045 Trust	5,843,645	624,406	86,652	28,697	6,583,400	12.66%	10.58%
AK Target Date 2050 Trust	3,800,333	405,043	102,080	6,891	4,314,347	13.53%	10.51%
AK Target Date 2055 Trust	3,970,905	413,286	77,967	(182,562)	4,279,596	7.77%	10.55%
AK Target Date 2060 Trust	705,685	73,102	72	(1,637)	777,222	10.14%	10.37%
AK Target Date 2065 Trust	260,496	8,853	6,328	(132,205)	143,472	-44.92%	4.48%
Total Investments with T. Rowe Price	<u>484,568,218</u>	<u>27,653,175</u>	<u>(981,011)</u>	<u>(2,169,443)</u>	<u>509,070,939</u>		
State Street Global Advisors							
Money Market	22,300,189	7,158	(52,062)	1,449,119	23,704,404	6.30%	0.03%
S&P 500 Stock Index	184,422,920	23,538,069	187,381	(2,742,931)	205,405,439	11.38%	12.85%
Russell 3000 Index	26,878,193	3,630,838	74,118	1,706,686	32,289,835	20.13%	13.08%
World Equity Ex-US Index	16,456,447	1,318,256	71,254	(135,272)	17,710,685	7.62%	8.03%
Total Investments with SSgA	<u>250,057,749</u>	<u>28,494,321</u>	<u>280,691</u>	<u>277,602</u>	<u>279,110,363</u>		
BlackRock							
Passive U.S. Bond Index Fund	80,434,694	1,449,690	(131,241)	1,447,865	83,201,008	3.44%	1.79%
Strategic Completion Fund	14,686,688	565,212	32,213	(199,545)	15,084,568	2.71%	3.87%
Total Investments with BlackRock	<u>95,121,382</u>	<u>2,014,902</u>	<u>(99,028)</u>	<u>1,248,320</u>	<u>98,285,576</u>		
Brandes/Baillie Gifford (2)							
AK International Equity Fund	27,921,463	2,231,987	63,291	971,815	31,188,556	11.70%	7.85%
Northern Trust							
Environmental, Social, and Governance Fund	33,480,311	4,130,504	89,194	(328,294)	37,371,715	11.62%	12.38%
Total All Funds	<u>\$ 891,149,123</u>	<u>\$ 64,524,889</u>	<u>\$ (646,863)</u>	<u>\$ -</u>	<u>\$ 955,027,149</u>	7.17%	7.24%

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.

(2) This investment is comprised of two funds, Brandes International Equity Fund and Baillie Gifford International Equity Fund.

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, 2020
\$ (Thousands)

<u>Invested Assets (at fair value)</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>
Investments with T. Rowe Price										
Stable Value Fund	\$ 183,474	\$ 185,942	\$ 188,292	\$ 191,328	\$ 190,821	\$ 190,455	\$ 188,767	\$ 195,876	\$ 203,392	\$ 202,056
Small Cap Stock Fund	120,406	116,510	117,756	119,686	123,718	125,876	123,698	113,329	89,929	103,045
Alaska Balanced Trust	31,506	31,031	30,849	29,518	29,479	29,786	29,730	29,499	26,648	27,781
Long Term Balanced Fund	86,198	84,760	85,056	86,056	86,842	87,060	85,361	79,889	71,248	75,435
AK Target Date 2010 Trust	3,977	3,838	3,870	3,663	3,370	3,414	3,391	3,185	2,935	3,155
AK Target Date 2015 Trust	9,411	9,349	9,416	9,404	9,418	9,308	9,290	9,021	8,526	9,014
AK Target Date 2020 Trust	24,801	24,501	24,738	24,941	25,090	25,772	25,913	23,553	21,359	22,401
AK Target Date 2025 Trust	20,841	20,599	21,087	21,492	23,246	23,527	23,707	22,701	19,322	21,034
AK Target Date 2030 Trust	13,580	12,866	13,206	13,511	13,638	14,249	14,303	13,072	11,267	12,375
AK Target Date 2035 Trust	7,893	8,032	8,187	8,444	8,618	9,015	9,299	8,599	7,260	8,060
AK Target Date 2040 Trust	8,985	9,000	9,223	9,150	9,509	9,766	9,554	8,804	8,101	8,618
AK Target Date 2045 Trust	6,557	6,496	6,652	6,829	6,965	7,269	7,337	6,884	5,844	6,583
AK Target Date 2050 Trust	4,762	4,726	4,880	5,000	5,190	5,438	5,319	4,651	3,800	4,314
AK Target Date 2055 Trust	4,539	4,487	4,412	4,524	4,739	4,669	4,761	4,377	3,971	4,280
AK Target Date 2060 Trust	892	845	893	856	874	1,020	867	813	706	777
AK Target Date 2065 Trust	-	-	-	-	-	-	20	60	260	143
State Street Global Advisors										
Money Market	15,439	16,190	16,283	16,818	17,461	17,621	17,990	20,072	22,300	23,704
S&P 500 Stock Index	-	-	-	-	226,205	235,235	237,120	213,774	184,423	205,405
Russell 3000 Index	49,810	48,284	48,709	49,603	48,966	44,069	37,691	31,597	26,878	32,290
US Real Estate Investment Trust Index	14,386	-	-	-	-	-	-	-	-	-
World Equity Ex-US Index	21,943	22,073	23,281	24,520	24,267	24,480	22,473	19,910	16,456	17,711
US Treasury Inflation Protected Securities Index	19,161	-	-	-	-	-	-	-	-	-
Investments with BlackRock										
S&P 500 Index Fund	221,137	215,581	215,993	219,007	-	-	-	-	-	-
Passive U.S. Bond Index Fund	62,456	67,832	70,658	74,139	76,154	76,938	79,408	81,419	80,435	83,201
Strategic Completion Fund	-	30,241	26,005	21,726	19,648	19,363	19,110	17,915	14,687	15,085
Investments with Brandes/Baillie Gifford										
AK International Equity Fund	33,579	31,725	31,753	31,630	32,551	35,047	34,412	32,234	27,921	31,189
Investments with Northern Trust										
Environmental, Social, and Governance Fund	24,052	24,595	27,001	28,939	32,295	36,297	39,599	38,544	33,480	37,372
Total Invested Assets	\$ 989,787	\$ 979,503	\$ 988,201	\$ 1,000,783	\$ 1,019,063	\$ 1,035,674	\$ 1,029,121	\$ 979,777	\$ 891,149	\$ 955,027
<u>Change in Invested Assets</u>										
Beginning Assets	\$ 983,594	\$ 989,787	\$ 979,503	\$ 988,201	\$ 1,000,783	\$ 1,019,063	\$ 1,035,674	\$ 1,029,121	\$ 979,777	\$ 891,149
Investment Earnings	7,422	(7,979)	10,636	14,636	20,354	19,287	(2,402)	(46,742)	(85,147)	64,525
Net Contributions (Withdrawals)	(1,228)	(2,305)	(1,937)	(2,054)	(2,074)	(2,677)	(4,152)	(2,601)	(3,482)	(647)
Ending Invested Assets	\$ 989,787	\$ 979,503	\$ 988,201	\$ 1,000,783	\$ 1,019,063	\$ 1,035,674	\$ 1,029,121	\$ 979,777	\$ 891,149	\$ 955,027

Defined Contribution Retirement - Participant Directed PERS
Schedule of Investment Income and Changes in Invested Assets
for the Month Ended
April 30, 2020

	<u>Beginning Invested</u> <u>Assets</u>	<u>Investment Income</u>	<u>Net Contributions</u> <u>(Withdrawals)</u>	<u>Transfers In (Out)</u>	<u>Ending Invested</u> <u>Assets</u>	<u>% Change in</u> <u>Invested</u> <u>Assets</u>	<u>% Change due</u> <u>to Investment</u> <u>Income (1)</u>
Participant Options							
T. Rowe Price							
Stable Value Fund	\$ 76,671,236	\$ 145,634	\$ (182,703)	\$ (3,024,762)	\$ 73,609,405	-3.99%	0.19%
Small Cap Stock Fund	70,532,568	10,655,438	459,366	3,457,835	85,105,207	20.66%	14.70%
Alaska Balanced Trust	12,208,729	556,859	64,047	(2,297,080)	10,532,555	-13.73%	5.02%
Long Term Balanced Fund	10,554,628	724,071	54,865	(2,519,378)	8,814,186	-16.49%	7.77%
AK Target Date 2010 Trust	2,378,859	121,677	18,535	(826)	2,518,245	5.86%	5.10%
AK Target Date 2015 Trust	10,874,321	627,196	(88,855)	1,130	11,413,792	4.96%	5.79%
AK Target Date 2020 Trust	33,796,013	2,298,905	365,416	(227,577)	36,232,757	7.21%	6.79%
AK Target Date 2025 Trust	56,830,284	4,430,707	638,646	35,011	61,934,648	8.98%	7.75%
AK Target Date 2030 Trust	59,461,006	5,155,512	861,704	(103,521)	65,374,701	9.95%	8.62%
AK Target Date 2035 Trust	71,198,484	6,720,504	1,155,464	(256,559)	78,817,893	10.70%	9.38%
AK Target Date 2040 Trust	82,616,362	8,287,723	1,264,921	(377,042)	91,791,964	11.11%	9.98%
AK Target Date 2045 Trust	105,044,594	11,040,994	1,545,297	(390,681)	117,240,204	11.61%	10.45%
AK Target Date 2050 Trust	124,408,952	13,094,184	1,801,329	(184,570)	139,119,895	11.82%	10.46%
AK Target Date 2055 Trust	122,242,518	12,918,312	3,260,985	(426,900)	137,994,915	12.89%	10.45%
AK Target Date 2060 Trust	1,462,066	156,697	131,103	(27,076)	1,722,790	17.83%	10.35%
AK Target Date 2065 Trust	290,976	32,366	37,272	(130)	360,484	23.89%	10.46%
Total Investments with T. Rowe Price	<u>840,571,596</u>	<u>76,966,779</u>	<u>11,387,392</u>	<u>(6,342,126)</u>	<u>922,583,641</u>		
State Street Global Advisors							
Money Market	14,964,415	4,351	(148,430)	(987,149)	13,833,187	-7.56%	0.03%
S&P 500 Stock Index Fund Series A	38,385,403	5,072,606	414,051	3,579,713	47,451,773	23.62%	12.56%
Russell 3000 Index	67,166,548	8,873,978	464,683	(1,526,139)	74,979,070	11.63%	13.32%
World Equity Ex-US Index	53,655,635	4,282,016	352,042	(829,732)	57,459,961	7.09%	8.02%
Total Investments with SSgA	<u>174,172,001</u>	<u>18,232,951</u>	<u>1,082,346</u>	<u>236,693</u>	<u>193,723,991</u>		
BlackRock							
Passive U.S. Bond Index Fund	79,523,546	1,422,443	88,437	(2,678,745)	78,355,681	-1.47%	1.82%
Strategic Completion Fund	3,822,525	162,665	49,183	134,379	4,168,752	9.06%	4.16%
Total Investments with BlackRock	<u>83,346,071</u>	<u>1,585,108</u>	<u>137,620</u>	<u>(2,544,366)</u>	<u>82,524,433</u>		
Brandes/Baillie Gifford (2)							
AK International Equity Fund	33,737,293	2,842,649	241,490	5,661,704	42,483,136	25.92%	7.75%
Northern Trust							
Environmental, Social, and Governance Fund	38,206,814	4,849,940	142,967	2,988,095	46,187,816	20.89%	12.19%
Total All Funds	<u>\$ 1,170,033,775</u>	<u>\$ 104,477,427</u>	<u>\$ 12,991,815</u>	<u>\$ -</u>	<u>\$ 1,287,503,017</u>	10.04%	8.88%

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.

(2) This investment is comprised of two funds, Brandes International Equity Fund and Baillie Gifford International Equity Fund.

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, 2020
\$ (Thousands)

<u>Invested Assets (at fair value)</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>
Investments with T. Rowe Price										
Stable Value Fund	\$ 49,550	\$ 53,405	\$ 60,034	\$ 65,234	\$ 68,077	\$ 69,792	\$ 72,712	\$ 75,851	\$ 76,671	\$ 73,609
Small Cap Stock Fund	85,588	84,037	85,540	88,225	91,601	92,961	90,854	83,638	70,533	85,105
Alaska Balanced Trust	25,259	22,057	17,849	13,477	12,684	13,330	13,973	14,253	12,209	10,533
Long Term Balanced Fund	15,570	15,571	16,022	16,568	16,369	15,728	14,695	13,739	10,555	8,814
AK Target Date 2010 Trust	2,364	2,407	2,422	2,462	2,511	2,523	2,551	2,505	2,379	2,518
AK Target Date 2015 Trust	12,447	12,475	12,347	12,392	12,573	12,323	12,466	11,668	10,874	11,414
AK Target Date 2020 Trust	36,313	35,922	36,333	36,927	37,451	38,376	38,382	36,909	33,796	36,233
AK Target Date 2025 Trust	58,997	58,278	59,088	60,616	62,489	64,183	64,776	62,389	56,830	61,935
AK Target Date 2030 Trust	61,669	61,231	62,610	64,347	66,514	69,033	69,277	65,735	59,461	65,375
AK Target Date 2035 Trust	74,455	74,147	75,694	77,734	80,500	83,816	83,969	79,323	71,198	78,818
AK Target Date 2040 Trust	88,249	87,469	89,345	91,921	95,173	98,902	98,717	92,867	82,616	91,792
AK Target Date 2045 Trust	113,710	112,618	116,000	118,849	123,072	127,543	127,338	119,618	105,045	117,240
AK Target Date 2050 Trust	135,192	133,855	137,374	141,506	145,984	151,365	150,898	141,609	124,409	139,120
AK Target Date 2055 Trust	123,545	123,185	127,227	132,393	138,301	144,745	145,870	137,732	122,243	137,995
AK Target Date 2060 Trust	1,437	1,436	1,502	1,550	1,627	1,741	1,623	1,587	1,462	1,723
AK Target Date 2065 Trust	-	-	-	-	-	-	163	182	291	360
State Street Global Advisors										
Money Market	11,355	12,169	12,199	12,295	12,378	12,681	12,833	13,330	14,964	13,833
S&P 500 Stock Index Fund Series A	112,815	93,825	69,994	47,161	42,738	44,366	45,268	41,623	38,385	47,452
Russell 3000 Index	13,165	29,669	54,395	80,956	89,558	90,355	87,450	78,858	67,167	74,979
US Real Estate Investment Trust Index	17,236	-	-	-	-	-	-	-	-	-
World Equity Ex-US Index	60,410	61,642	66,646	72,519	73,184	74,977	70,221	64,731	53,656	57,460
US Treasury Inflation Protected Securities Index	20,051	-	-	-	-	-	-	-	-	-
Investments with BlackRock										
Passive U.S. Bond Index Fund	52,746	58,392	65,047	71,583	74,010	74,890	78,615	81,667	79,524	78,356
Strategic Completion Fund	-	30,060	19,184	8,300	5,193	5,194	5,016	4,727	3,823	4,169
Investments with Brandes/Baillie Gifford										
AK International Equity Fund	39,804	35,904	32,831	29,808	30,829	35,000	36,200	34,627	33,737	42,483
Investments with Northern Trust										
Environmental, Social, and Governance Fund	19,449	23,374	29,983	36,577	40,207	42,642	43,992	41,077	38,207	46,188
Total Invested Assets	\$ 1,231,376	\$ 1,223,126	\$ 1,249,666	\$ 1,283,402	\$ 1,323,024	\$ 1,366,468	\$ 1,367,857	\$ 1,300,244	\$ 1,170,034	\$ 1,287,503
<u>Change in Invested Assets</u>										
Beginning Assets	\$ 1,218,754	\$ 1,231,376	\$ 1,223,126	\$ 1,249,666	\$ 1,283,402	\$ 1,323,024	\$ 1,366,468	\$ 1,367,857	\$ 1,300,244	\$ 1,170,034
Investment Earnings	5,513	(15,573)	17,922	24,420	28,841	32,981	(8,937)	(77,591)	(138,845)	104,477
Net Contributions (Withdrawals)	7,110	7,323	8,618	9,316	10,781	10,463	10,325	9,978	8,635	12,992
Ending Invested Assets	\$ 1,231,376	\$ 1,223,126	\$ 1,249,666	\$ 1,283,402	\$ 1,323,024	\$ 1,366,468	\$ 1,367,857	\$ 1,300,244	\$ 1,170,034	\$ 1,287,503

Defined Contribution Retirement - Participant Directed TRS
Schedule of Investment Income and Changes in Invested Assets
for the Month Ended
April 30, 2020

	<u>Beginning Invested Assets</u>	<u>Investment Income</u>	<u>Net Contributions (Withdrawals)</u>	<u>Transfers In (Out)</u>	<u>Ending Invested Assets</u>	<u>% Change in Invested Assets</u>	<u>% Change due to Investment Income (1)</u>
Participant Options							
T. Rowe Price							
Stable Value Fund	\$ 29,510,760	\$ 55,921	\$ 104,200	\$ (1,391,656)	\$ 28,279,225	-4.17%	0.19%
Small Cap Stock Fund	29,812,024	4,462,174	158,845	1,278,337	35,711,380	19.79%	14.62%
Alaska Balanced Trust	4,315,156	199,641	20,592	(1,017,802)	3,517,587	-18.48%	5.23%
Long Term Balanced Fund	4,497,249	312,849	26,344	(1,168,006)	3,668,436	-18.43%	7.97%
AK Target Date 2010 Trust	898,170	45,917	7,724	-	951,811	5.97%	5.09%
AK Target Date 2015 Trust	3,371,021	195,971	40,542	-	3,607,534	7.02%	5.78%
AK Target Date 2020 Trust	10,268,019	697,456	89,436	(23,203)	11,031,708	7.44%	6.77%
AK Target Date 2025 Trust	18,069,474	1,407,749	236,311	(476)	19,713,058	9.10%	7.74%
AK Target Date 2030 Trust	22,338,371	1,937,498	287,731	48,265	24,611,865	10.18%	8.61%
AK Target Date 2035 Trust	31,223,982	2,932,965	189,329	(143,451)	34,202,825	9.54%	9.39%
AK Target Date 2040 Trust	34,838,353	3,485,569	520,810	(185,892)	38,658,840	10.97%	9.96%
AK Target Date 2045 Trust	50,190,392	5,210,905	491,570	(325,400)	55,567,467	10.71%	10.37%
AK Target Date 2050 Trust	70,826,605	7,427,416	828,062	(69,395)	79,012,688	11.56%	10.43%
AK Target Date 2055 Trust	41,297,269	4,357,880	986,590	(87,935)	46,553,804	12.73%	10.44%
AK Target Date 2060 Trust	467,547	49,395	12,765	-	529,707	13.29%	10.42%
AK Target Date 2065 Trust	966	113	545	-	1,624	68.12%	9.12%
Total Investments with T. Rowe Price	<u>351,925,358</u>	<u>32,779,419</u>	<u>4,001,396</u>	<u>(3,086,614)</u>	<u>385,619,559</u>		
State Street Global Advisors							
Money Market	4,248,624	1,295	28,996	32,151	4,311,066	1.47%	0.03%
S&P 500 Stock Index Fund Series A	11,609,445	1,516,526	119,891	1,089,769	14,335,631	23.48%	12.42%
Russell 3000 Index	29,257,379	3,861,745	153,504	(974,851)	32,297,777	10.39%	13.39%
World Equity Ex-US Index	24,295,550	1,928,570	121,442	(666,636)	25,678,926	5.69%	8.03%
Total Investments with SSgA	<u>69,410,998</u>	<u>7,308,136</u>	<u>423,833</u>	<u>(519,567)</u>	<u>76,623,400</u>		
BlackRock							
Passive U.S. Bond Index Fund	31,718,988	570,862	126,093	(143,031)	32,272,912	1.75%	1.80%
Strategic Completion Fund	1,238,766	48,036	14,007	(16,292)	1,284,517	3.69%	3.88%
Total Investments with BlackRock	<u>32,957,754</u>	<u>618,898</u>	<u>140,100</u>	<u>(159,323)</u>	<u>33,557,429</u>		
Brandes/Baillie Gifford (2)							
AK International Equity Fund	14,494,935	1,206,466	78,156.00	2,441,206	18,220,763	25.70%	7.66%
Northern Trust							
Environmental, Social, and Governance Fund	16,350,576	2,067,283	77,220.00	1,324,298	19,819,377	21.22%	12.12%
Total All Funds	<u>\$ 485,139,621</u>	<u>\$ 43,980,202</u>	<u>\$ 4,720,705</u>	<u>\$ -</u>	<u>\$ 533,840,528</u>	10.04%	9.02%

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.

(2) This investment is comprised of two funds, Brandes International Equity Fund and Baillie Gifford International Equity Fund.

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, 2020
\$ (Thousands)

<u>Invested Assets (at fair value)</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>
Investments with T. Rowe Price										
Stable Value Fund	\$ 20,540	\$ 22,070	\$ 24,472	\$ 26,796	\$ 27,760	\$ 28,050	\$ 29,285	\$ 30,426	\$ 29,511	\$ 28,279
Small Cap Stock Fund	36,368	35,589	36,076	37,049	38,422	39,239	38,321	35,183	29,812	35,711
Alaska Balanced Trust	10,692	9,202	7,147	5,102	4,626	4,888	5,056	5,250	4,315	3,518
Long Term Balanced Fund	6,574	6,478	6,648	6,892	7,060	6,801	6,346	5,766	4,497	3,668
AK Target Date 2010 Trust	860	859	868	883	899	916	875	831	898	952
AK Target Date 2015 Trust	3,718	3,702	3,671	3,734	3,815	3,797	3,723	3,657	3,371	3,608
AK Target Date 2020 Trust	10,625	10,368	10,430	10,709	11,003	11,315	11,414	11,089	10,268	11,032
AK Target Date 2025 Trust	19,684	19,121	19,430	19,628	20,042	20,527	20,542	19,741	18,069	19,713
AK Target Date 2030 Trust	23,081	22,832	23,319	23,954	24,639	25,615	25,652	24,530	22,338	24,612
AK Target Date 2035 Trust	34,192	33,605	34,264	35,031	36,033	37,128	37,084	34,901	31,224	34,203
AK Target Date 2040 Trust	37,136	36,244	37,067	38,358	39,809	41,478	41,489	39,195	34,838	38,659
AK Target Date 2045 Trust	55,300	54,086	55,171	56,773	58,681	60,762	60,714	56,998	50,190	55,567
AK Target Date 2050 Trust	77,799	76,297	77,822	80,176	83,056	86,123	86,006	80,639	70,827	79,013
AK Target Date 2055 Trust	42,579	41,668	42,529	44,266	46,341	48,703	48,898	46,269	41,297	46,554
AK Target Date 2060 Trust	524	521	532	547	550	558	558	527	468	530
AK Target Date 2065 Trust	-	-	-	-	-	-	-	0	1	2
State Street Global Advisors										
Money Market	3,144	3,340	3,352	3,468	3,393	3,442	3,495	3,654	4,249	4,311
S&P 500 Stock Index Fund Series A	45,559	37,389	26,061	15,289	12,354	13,182	13,416	12,077	11,609	14,336
Russell 3000 Index	4,569	11,581	23,298	34,819	39,532	40,084	38,984	34,534	29,257	32,298
US Real Estate Investment Trust Index	7,072	-	-	-	-	-	-	-	-	-
World Equity Ex-US Index	27,203	27,650	29,946	32,630	33,279	34,176	32,218	29,398	24,296	25,679
US Treasury Inflation Protected Securities Index	7,449	-	-	-	-	-	-	-	-	-
Investments with BlackRock										
Passive U.S. Bond Index Fund	21,451	23,517	25,886	28,341	29,320	29,686	31,160	32,652	31,719	32,273
Strategic Completion Fund	-	11,844	7,262	2,993	1,677	1,730	1,757	1,547	1,239	1,285
Investments with Brandes/Baillie Gifford										
AK International Equity Fund	17,368	15,544	13,997	12,577	12,414	14,337	14,907	14,736	14,495	18,221
Investments with Northern Trust										
Environmental, Social, and Governance Fund	8,276	9,906	12,717	15,600	17,042	17,942	18,521	17,413	16,351	19,819
Total Invested Assets	\$ 521,761	\$ 513,410	\$ 521,965	\$ 535,614	\$ 551,745	\$ 570,481	\$ 570,420	\$ 541,011	\$ 485,140	\$ 533,841
<u>Change in Invested Assets</u>										
Beginning Assets	\$ 516,073	\$ 521,761	\$ 513,410	\$ 521,965	\$ 535,614	\$ 551,745	\$ 570,481	\$ 570,420	\$ 541,011	\$ 485,140
Investment Earnings	2,269	(6,905)	7,675	10,364	12,181	14,017	(4,011)	(33,008)	(59,012)	43,980
Net Contributions (Withdrawals)	3,420	(1,446)	880	3,285	3,951	4,718	3,950	3,599	3,141	4,721
Ending Invested Assets	\$ 521,761	\$ 513,410	\$ 521,965	\$ 535,614	\$ 551,745	\$ 570,481	\$ 570,420	\$ 541,011	\$ 485,140	\$ 533,841

ALASKA RETIREMENT MANAGEMENT BOARD

FINANCIAL REPORT

(Supplement to the Treasury Division Report)

As of April 30, 2020

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, 2020

	Contributions				Expenditures				Net
	Contributions EE and ER	State of Alaska	Other	Total Contributions	Benefits	Refunds & Disbursements	Administrative & Investment	Total Expenditures	Contributions/ (Withdrawals)
Public Employees' Retirement System (PERS)									
<u>Defined Benefit Plans:</u>									
Retirement Trust	\$ 293,157,115	\$ 159,055,000	\$ 120,752	\$ 452,332,867	\$ (741,901,374)	\$ (8,826,206)	\$ (4,867,116)	\$ (755,594,696)	\$ (303,261,829)
Retirement Health Care Trust	91,012,160	-	64,401,417	155,413,577	(386,500,381)	-	(14,560,593)	(401,060,974)	(245,647,397)
Total Defined Benefit Plans	384,169,275	159,055,000	64,522,169	607,746,444	(1,128,401,755)	(8,826,206)	(19,427,709)	(1,156,655,670)	(548,909,226)
<u>Defined Contribution Plans:</u>									
Participant Directed Retirement	146,731,430	-	-	146,731,430	-	(47,086,184)	(4,103,817)	(51,190,001)	95,541,429
Health Reimbursement Arrangement ^(a)	36,861,742	-	-	36,861,742	(133,313)	-	(122,376)	(255,689)	36,606,053
Retiree Medical Plan ^(a)	14,681,793	-	45,374	14,727,167	(278,643)	-	(49,779)	(328,422)	14,398,745
Occupational Death and Disability: ^(a)									
All Others	2,517,048	-	-	2,517,048	(89,871)	-	(7,004)	(96,875)	2,420,173
Peace Officers and Firefighters	1,155,466	-	-	1,155,466	(322,674)	-	(3,119)	(325,793)	829,673
Total Defined Contribution Plans	201,947,479	-	45,374	201,992,853	(824,501)	(47,086,184)	(4,286,095)	(52,196,780)	149,796,073
Total PERS	586,116,754	159,055,000	64,567,543	809,739,297	(1,129,226,256)	(55,912,390)	(23,713,804)	(1,208,852,450)	(399,113,153)
Teachers' Retirement System (TRS)									
<u>Defined Benefit Plans:</u>									
Retirement Trust	51,610,905	141,129,000	25,930	192,765,835	(408,907,613)	(1,509,830)	(2,574,871)	(412,992,314)	(220,226,479)
Retirement Health Care Trust	14,590,984	-	21,701,189	36,292,173	(119,252,073)	-	(5,395,082)	(124,647,155)	(88,354,982)
Total Defined Benefit Plans	66,201,889	141,129,000	21,727,119	229,058,008	(528,159,686)	(1,509,830)	(7,969,953)	(537,639,469)	(308,581,461)
<u>Defined Contribution Plans:</u>									
Participant Directed Retirement	46,600,821	-	-	46,600,821	-	(14,857,368)	(1,524,490)	(16,381,858)	30,218,963
Health Reimbursement Arrangement ^(a)	9,348,408	-	-	9,348,408	(50,693)	-	(36,961)	(87,654)	9,260,754
Retiree Medical Plan ^(a)	3,320,709	-	2,917	3,323,626	(87,211)	-	(17,745)	(104,956)	3,218,670
Occupational Death and Disability ^(a)	248,481	-	-	248,481	(20,242)	-	(1,043)	(21,285)	227,196
Total Defined Contribution Plans	59,518,419	-	2,917	59,521,336	(158,146)	(14,857,368)	(1,580,239)	(16,595,753)	42,925,583
Total TRS	125,720,308	141,129,000	21,730,036	288,579,344	(528,317,832)	(16,367,198)	(9,550,192)	(554,235,222)	(265,655,878)
Judicial Retirement System (JRS)									
Defined Benefit Plan Retirement Trust	5,554,363	5,010,000	-	10,564,363	(11,750,261)	-	(127,253)	(11,877,514)	(1,313,151)
Defined Benefit Retirement Health Care Trust	542,420	-	290,785	833,205	(1,216,453)	-	(62,527)	(1,278,980)	(445,775)
Total JRS	6,096,783	5,010,000	290,785	11,397,568	(12,966,714)	-	(189,780)	(13,156,494)	(1,758,926)
National Guard/Naval Militia Retirement System (NGNMRS)									
Defined Benefit Plan Retirement Trust ^(a)	860,686	-	-	860,686	(1,581,758)	-	(101,302)	(1,683,060)	(822,374)
Other Participant Directed Plans									
Supplemental Annuity Plan	140,863,068	-	-	140,863,068	-	(213,327,770)	(6,496,337)	(219,824,107)	(78,961,039)
Deferred Compensation Plan	38,642,421	-	-	38,642,421	-	(60,091,848)	(1,707,139)	(61,798,987)	(23,156,566)
Total All Funds	898,300,020	305,194,000	86,588,364	1,290,082,384	(1,672,092,560)	(345,699,206)	(41,758,554)	(2,059,550,320)	(769,467,936)
Total Non-Participant Directed	525,462,280	305,194,000	86,588,364	917,244,644	(1,672,092,560)	(10,336,036)	(27,926,771)	(1,710,355,367)	(793,110,723)
Total Participant Directed	372,837,740	-	-	372,837,740	-	(335,363,170)	(13,831,783)	(349,194,953)	23,642,787
Total All Funds	\$ 898,300,020	\$ 305,194,000	\$ 86,588,364	\$ 1,290,082,384	\$ (1,672,092,560)	\$ (345,699,206)	\$ (41,758,554)	\$ (2,059,550,320)	\$ (769,467,936)

(a) Employer 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, 2020

	Contributions				Expenditures				Net
	Contributions EE and ER	State of Alaska	Other	Total Contributions	Benefits	Refunds & Disbursements	Administrative & Investment	Total Expenditures	Contributions/ (Withdrawals)
Public Employees' Retirement System (PERS)									
<u>Defined Benefit Plans:</u>									
Retirement Trust	\$ 31,429,813	\$ -	\$ 6,667	\$ 31,436,480	\$ (74,144,990)	\$ (702,699)	\$ (544,126)	\$ (75,391,815)	\$ (43,955,335)
Retirement Health Care Trust	9,988,064	-	3,721,179	13,709,243	(39,617,706)	-	(1,400,722)	(41,018,428)	(27,309,185)
Total Defined Benefit Plans	41,417,877	-	3,727,846	45,145,723	(113,762,696)	(702,699)	(1,944,848)	(116,410,243)	(71,264,520)
<u>Defined Contribution Plans:</u>									
Participant Directed Retirement	16,956,042	-	-	16,956,042	-	(3,422,015)	(542,212)	(3,964,227)	12,991,815
Health Reimbursement Arrangement ^(a)	4,369,730	-	-	4,369,730	(23,327)	-	(19,392)	(42,719)	4,327,011
Retiree Medical Plan ^(a)	1,732,177	-	2,520	1,734,697	(37,699)	-	(6,407)	(44,106)	1,690,591
Occupational Death and Disability: ^(a)									
All Others	284,341	-	-	284,341	(8,987)	-	(1,121)	(10,108)	274,233
Peace Officers and Firefighters	140,222	-	-	140,222	(31,146)	-	(481)	(31,627)	108,595
Total Defined Contribution Plans	23,482,512	-	2,520	23,485,032	(101,159)	(3,422,015)	(569,613)	(4,092,787)	19,392,245
Total PERS	64,900,389	-	3,730,366	68,630,755	(113,863,855)	(4,124,714)	(2,514,461)	(120,503,030)	(51,872,275)
Teachers' Retirement System (TRS)									
<u>Defined Benefit Plans:</u>									
Retirement Trust	6,172,697	-	2,378	6,175,075	(40,662,883)	(86,455)	(312,285)	(41,061,623)	(34,886,548)
Retirement Health Care Trust	1,770,639	-	1,293,871	3,064,510	(11,390,192)	-	(511,379)	(11,901,571)	(8,837,061)
Total Defined Benefit Plans	7,943,336	-	1,296,249	9,239,585	(52,053,075)	(86,455)	(823,664)	(52,963,194)	(43,723,609)
<u>Defined Contribution Plans:</u>									
Participant Directed Retirement	5,743,625	-	-	5,743,625	-	(790,285)	(232,635)	(1,022,920)	4,720,705
Health Reimbursement Arrangement ^(a)	1,134,007	-	-	1,134,007	(8,059)	-	(5,818)	(13,877)	1,120,130
Retiree Medical Plan ^(a)	420,061	-	378	420,439	(7,908)	-	(2,442)	(10,350)	410,089
Occupational Death and Disability ^(a)	30,192	-	-	30,192	(2,024)	-	(162)	(2,186)	28,006
Total Defined Contribution Plans	7,327,885	-	378	7,328,263	(17,991)	(790,285)	(241,057)	(1,049,333)	6,278,930
Total TRS	15,271,221	-	1,296,627	16,567,848	(52,071,066)	(876,740)	(1,064,721)	(54,012,527)	(37,444,679)
Judicial Retirement System (JRS)									
Defined Benefit Plan Retirement Trust	439,419	-	-	439,419	(1,173,107)	-	(17,240)	(1,190,347)	(750,928)
Defined Benefit Retirement Health Care Trust	45,561	-	31,248	76,809	(116,655)	-	(6,692)	(123,347)	(46,538)
Total JRS	484,980	-	31,248	516,228	(1,289,762)	-	(23,932)	(1,313,694)	(797,466)
National Guard/Naval Militia Retirement System (NGNMRS)									
Defined Benefit Plan Retirement Trust ^(a)	-	-	-	-	(89,211)	-	(4,298)	(93,509)	(93,509)
Other Participant Directed Plans									
Supplemental Annuity Plan	13,598,728	-	-	13,598,728	-	(15,396,262)	(700,751)	(16,097,013)	(2,498,285)
Deferred Compensation Plan	3,813,331	-	-	3,813,331	-	(4,250,019)	(210,175)	(4,460,194)	(646,863)
Total All Funds	98,068,649	-	5,058,241	103,126,890	(167,313,894)	(24,647,735)	-	(196,479,967)	(93,353,077)
Total Non-Participant Directed	57,956,923	-	5,058,241	63,015,164	(167,313,894)	(789,154)	(2,832,565)	(170,935,613)	(107,920,449)
Total Participant Directed	40,111,726	-	-	40,111,726	-	(23,858,581)	(1,685,773)	(25,544,354)	14,567,372
Total All Funds	\$ 98,068,649	\$ -	\$ 5,058,241	\$ 103,126,890	\$ (167,313,894)	\$ (24,647,735)	\$ (4,518,338)	\$ (196,479,967)	\$ (93,353,077)

(a) Employer 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, 2020

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	\$ 17,339	\$ -	\$ 377,240	\$ 114,116	\$ 508,695	0.2%
Death Benefit	598,042	16,942	15,232,007	2,946,105	18,793,096	5.6%
Disability / Hardship	64,368	-	110,655	107,847	282,870	0.1%
Minimum Required Distribution	135,503	37,681	8,885,903	3,139,717	12,198,804	3.6%
Qualified Domestic Relations Order	276,460	174,903	4,801,114	625,108	5,877,585	1.8%
Separation from Service / Retirement	45,994,472	14,627,842	183,021,386	52,899,336	296,543,036	88.4%
Purchase of Service Credit	-	-	899,465	259,619	1,159,084	0.3%
Transfer to a Qualifying Plan	-	-	-	-	-	0.0%
TOTAL	\$ 47,086,184	\$ 14,857,368	\$ 213,327,770	\$ 60,091,848	\$ 335,363,170	100.0%

PERS & TRS PARTICIPANT DIRECTED DISBURSEMENTS BY PLAN AND VESTED PERCENTAGE

Vesting	PERS DCR Plan	TRS DCR Plan	TOTAL	% of Total
100% Vested	\$ 40,638,734	\$ 13,044,742	\$ 53,683,476	86.7%
75% Vested	1,411,342	306,335	1,717,677	2.8%
50% Vested	1,674,433	511,572	2,186,005	3.5%
25% Vested	1,303,713	503,080	1,806,793	2.9%
0% Vested	2,057,962	491,639	2,549,601	4.1%
TOTAL	\$ 47,086,184	\$ 14,857,368	\$ 61,943,552	100.0%

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

Contribution Type	PERS DB Pension Plan				TRS DB Pension Plan			JRS
	Tier 1	Tier 2	Tier 3	Total	Tier 1	Tier 2	Total	DB Pension Plan
Mandatory Vested	\$ 363,164	\$ 799,210	\$ 3,219,435	\$ 4,381,809	\$ 62,299	\$ 399,981	\$ 462,280	\$ -
Mandatory Non-Vested	117,869	240,709	806,625	1,165,203	158,473	849,333	1,007,806	-
Geographic Differential	-	279,450	122,370	401,820	-	-	-	-
Voluntary Full	402,093	1,136,111	1,164,872	2,703,076	-	-	-	-
Indebtedness, Lagging & Partial	30,419	72,385	71,494	174,298	28	39,716	39,744	-
TOTAL	\$ 913,545	\$ 2,527,865	\$ 5,384,796	\$ 8,826,206	\$ 220,800	\$ 1,289,030	\$ 1,509,830	\$ -

Notes for the DRB Supplement to the Treasury Report

April 2020

This report is the DRB supplement to the Treasury Division's Financial Report. It expands their "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. It 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 2020, while page two shows only the month of April 2020.

Highlights – On page one, for the ten months ending April 30, 2020:

- PERS DB Pension – Average employer and employee contributions of \$29.3 million per month; benefit payments of approximately \$74.2 million per month; refunds average \$883 thousand; and Administrative and Investment expenditures of \$487 thousand per month (DOR and DRB).
- PERS DB Healthcare – Average employer contributions of \$9.1 million per month; other income of \$30 million from pharmacy rebates (most recently received in April for 4th Quarter CY2018), \$1 million from Medicare drug subsidies (most recently received in April for CY2018), \$22.5 million from monthly EGWP subsidies and \$978 thousand from performance fees; benefit payments of approximately \$38.7 million per month; and average Administrative and Investment expenditures of \$1.5 million per month (DOR and DRB).
- PERS DC Pension – Average employer and employee contributions of \$14.7 million per month; participant disbursements average \$4.7 million per month; and average Administrative and Investment expenditures of \$410 thousand per month (DOR and DRB).
- PERS DCR Health – For HRA, RMP, and OD&D, only employer contributions average \$5.5 million per month on behalf of participating employees; benefit payments of approximately \$82 thousand per month. Currently, 65 benefits are being paid from the Occupational Death & Disability plans, 42 retirees are participating in RMP, and 70 retirees are participating in HRA. Administrative and investment expenditures were approximately \$18 thousand per month (DOR and DRB).
- TRS DB Pension - Average employer and employee contributions of \$5.2 million per month; benefit payments of approximately \$40.9 million per month; refunds average \$151 thousand; and average Administrative and Investment expenditures of \$257 thousand per month (DOR and DRB).
- TRS DB Healthcare – Average employer contributions of \$1.5 million per month; other income of \$9.8 million from pharmacy rebates (most recently received in April for 4th Quarter CY2018), \$344 thousand from Medicare drug subsidies (most recently received in April for CY2018), \$7.8 million from monthly EGWP subsidies and \$431 thousand from performance fees; benefit payments of approximately \$11.9 million per month; and average Administrative and Investment expenditures of \$540 thousand per month (DOR and DRB).

- TRS DC Pension – Average employer and employee contributions of \$4.7 million per month; participant disbursements average \$1.5 million per month; and average Administrative and investment expenditures of \$152 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 \$16 thousand per month. Currently, 16 benefits are being paid from the Occupational Death & Disability plans, 18 retirees are participating in RMP, and 21 retirees are participating in HRA. Administrative and investment expenditures were approximately \$6 thousand per month (DOR and DRB).
- JRS Pension – Average employer and employee contributions of \$555 thousand per month; benefit payments of approximately \$1.2 million per month; and average Administrative and Investment expenditures of \$13 thousand per month (DOR and DRB).
- JRS Healthcare – Average employer contributions of \$54 thousand per month; other income of \$131 thousand from pharmacy rebates (most recently received in April for 4th Quarter CY2018), \$4 thousand from Medicare drug subsidies (most recently received in April for CY2018), \$84 thousand from monthly EGWP subsidies and \$26 thousand from performance fees; benefit payments of approximately \$122 thousand per month; and average Administrative and Investment expenditures of \$6 thousand per month (DOR and DRB).
- NGNMRS – Annual contribution from DMVA in the amount of \$861 thousand was received in July; combination of lump-sum and monthly benefit payments of \$158 thousand per month; and average Administrative and Investment expenditures of \$10 thousand per month (DOR and DRB).
- SBS – Average employer and employee contributions and transfers in of \$14.1 million per month. Participant disbursements average of \$21.3 million per month; and average Administrative and Investment expenditures of \$650 thousand per month (DOR and DRB).
- Deferred Compensation – Average member-only contributions and transfers in of \$3.9 million per month; participant disbursements average of \$6 million per month; and average Administrative and Investment expenditures of \$171 thousand per month (DOR and DRB).

Highlights – On page two, activity for the one month of April 2020 only:

- PERS DB Healthcare – Other income of \$1.4 million from pharmacy rebates, \$9 thousand from Medicare drug subsidies, \$1.3 million from EGWP subsidies and \$978 thousand from performance fees.
- TRS DB Healthcare – Other income of \$404 thousand from pharmacy rebates, \$3 thousand from Medicare drug subsidies, \$456 thousand from EGWP subsidies and \$431 thousand from performance fees.
- JRS Healthcare – Other income of \$1 thousand from pharmacy rebates, \$4 thousand from EGWP subsidies and \$26 thousand from performance fees.
- All other funds – Nothing significant to report

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

RETIREE HEALTH PLAN ADVISORY BOARD MEETING
MAY 27, 2020 – GAYLE HARBO

Chair Judy Salo and board members met via teleconference. The health care team for the division gave an update on the recent focus which has mainly been a response to the COVID-19 impact and the changes the division has implemented to aid retirees who are in the age group most impacted. The response was quick and effective, and the focus has been on safety and security of the 75k lives that are served by the division. Since over 70% of retirees are over 65 and Medicare eligible, some provisions from the active plan, like tele-medicine, were made available so members would minimize the need to leave home.

The health care team has also been working to help the nearly 300 retirees turning 65 each month to ease into EGWP and additionally if they earn over 87k per year individually, to apply for IRMAA - the surcharge applied to these members based on income two years prior.

An RFP has been issued for the DVA enrollment and other programs, like COBRA and HRA, and the interviews for the respondents were held June 10th and 12th.

Richard Ward, the actuary from Segal, gave an hour-long presentation on a federal program available for retirees 65 and older called Medicare Advantage. It is a supplemental program, like EGWP, that provides subsidies and offers many of the things we were seeking in the modernization program. It is very promising because it could provide the same level of care and more benefits at lower cost. It would have been good to have this presentation before we started on the modernization work. The health care team is going to send out an RFI so we have more details at our next meeting in August. In the lower 48 plans are filed county by county so we need to see how this would work in Alaska.

On the modernization work done thus far - there will be an analysis summary presented at the August meeting and a discussion on how we could integrate the Medicare Advantage offerings with the items we have worked on to date.

Thanks to the great health care team - they put in countless hours helping retirees. The next meeting will be August 6th.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Certification of Actuarial Review

ACTION: X

DATE: June 18-19, 2020

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.”

STATUS:

Buck Global, LLC (Buck), the board’s actuary, has completed: (1) a valuation of the Public Employees’ Retirement System (PERS) as of June 30, 2019, (2) a valuation of the Teachers’ Retirement System (TRS) as of June 30, 2019, (3) a valuation of the Defined Contribution Retirement Plan as of June 30, 2019, (4) a roll-forward valuation of the Judicial Retirement System (JRS) as of June 30, 2019, and (5) a roll-forward valuation of the National Guard Naval Militia System (NGNMRS) as of June 30, 2019.

Gabriel Roeder Smith & Company (GRS), the board’s review actuary, has reviewed the valuation reports prepared by Buck and provided:

A draft letter and report describing a review of the June 30, 2019 PERS and TRS and;

PERS Tier IV and TRS Tier III Defined Contribution Retirement Plan for Occupational Death & Disability and Retiree Medical Benefits valuations presented to the Actuarial Committee;

A draft letter describing a review of the June 30, 2019 roll-forward valuation of NGNMRS and JRS plans presented to the Actuarial Committee.

With the assistance of GRS and staff, the Committee compiled and reviewed an Audit Findings (incorporated in the report referenced above) list 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 FY 2019 actuarial reports by Gabriel Roeder Smith & Company.

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

June 4, 2020





June 4, 2020

Mr. Bob Mitchell
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, 2019 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, 2019 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 Bob:

We have performed an actuarial review of the June 30, 2019 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

A handwritten signature in black ink, appearing to read "Paul Wood".

Paul Wood, ASA, FCA, MAAA
Consultant

A handwritten signature in black ink, appearing to read "Bill Detweiler".

Bill Detweiler, ASA, FCA, MAAA
Senior Analyst

cc: Ms. Stephanie Alexander

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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, 2019 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, 2019 VALUATIONS

- We recommend Buck carefully monitor the newly adopted assumptions going forward to determine if they are working as intended.
- We recommend Buck continues to track the medical claims experience closely, particularly any further impact of the drug costs associated with the new vendor.
- 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 detail the risk associated with assuming the EGWP subsidies will continue in perpetuity, especially if EGWP subsidies wear away over time.
- We recommend the retiree health care plan assumption of a member cost-sharing offset of 0.2% be removed.
- 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 make them more consistent.



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 testlives 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 four findings related to the valuation of certain ancillary benefits. One of them was cleared up by Alaska DRB staff and the other three, while may be viewed as immaterial, should, at the very least, be updated in future valuations, subject to Actuarial Committee discretion.
 - Pre and Post Commencement Mortality Rates
 - Timing of PRPA for Disability
 - Disability Benefit Conversion
 - Retiree Medical Participation

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 2019, 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.
2. We expressed concerns over the large gains from medical claims experience that were presented at the December Board meeting. Buck subsequently provided us with additional material about the medical claims experience.
3. We received draft reports in January and February of 2020.
4. 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:

5. Reviewed actuarial assumptions – We checked to see if they were consistent, comprehensive, and appeared reasonable.
6. Reviewed the actuarial valuation reports, as of June 30, 2019, for completeness and reviewed the financial determinations.
7. 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.
8. 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 of 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	2019 Valuation	2018 Valuation	2017 Valuation	2016 Valuation	2015 Valuation
Retirement	\$ (3,126)	\$ (10,403)	\$ 1,448	\$ (1,035)	\$ (3,813)
Termination	6,714	(5,131)	(9,254)	(8,713)	(2,435)
Mortality	12,459	39,631	3,856	23,872	34,564
Disability	(1,435)	(3,631)	(1,612)	(687)	(2,073)
Rehires	(13,297)	7,141	(6,403)	(31,814)	(21,255)
Other	(8,534)	(7,923)	25,341	520	(44,211)
Salary	(59,955)	97,200	121,046	69,532	91,053
COLA and PRPA	(8,371)	108,227	146,017	132,576	67,117
Total G/L	\$ (75,545)	\$ 225,111	\$ 280,439	\$ 184,251	\$ 118,947
Total AL at BOY	\$ 14,606,033	\$ 13,832,130	\$ 13,633,033	\$ 13,337,929	\$ 12,947,759
G/L as a % of AL	-0.52%	1.63%	2.06%	1.38%	0.92%

Note: 2015-2018 gains and losses are prior to the implementation of new assumptions.

The \$75 million loss in the most recent valuation is predominantly made up of negative experience on both individual salary increases and rehires. The salary increases that occurred in 2019 were more than those assumed in the actuarial valuation. That implies that the ultimate retirement benefits will be more than assumed, thereby created a loss on the accrued liability. The increase in liabilities due to rehires was also more than assumed.

After a number of years with salary gains, the salary increase assumptions were lowered in the most recent experience study. This is the first year of experience under the newly adopted assumptions and now we are seeing a salary loss. This assumption should be carefully monitored going forward to make sure the new salary increase assumptions were not lowered too much.

The rehired category generated a loss. The liabilities for rehires were more than what was assumed with the normal cost rehire load. This was also an assumption that was updated with the most recent experience study and it should be monitored going forward to see if it should have been set higher.

All of the other gains and losses will also need to be monitored over the next few valuations to determine if the assumption changes worked as intended.

TABLE 2-PERS DB HEALTHCARE GAINS AND (LOSSES) BY SOURCE (000's)

<u>Source</u>	<u>2019 Valuation</u>	<u>2018 Valuation</u>	<u>2017 Valuation</u>	<u>2016 Valuation</u>	<u>2015 Valuation</u>
Retirement	\$ 1,098	\$ 22,262	\$ 23,360	\$ (7,873)	\$ 2,568
Termination	(946)	(6,746)	(12,648)	(13,620)	(12,263)
Mortality	2,976	4,794	22,472	20,654	34,903
Disability	(981)	288	(1,155)	(1,966)	(2,927)
Rehires	10,708	5,948	1,089	(8,617)	(9,547)
Other	95,602	(19,667)	80,508	21,567	47,916
Medical Claims	642,081	412,243	830,620	(198,836)	884,823
Modified Part B Assumption	6,164	235,258	N/A	N/A	N/A
Dependent Coverage Election	18,580	69,614	N/A	N/A	N/A
Methodology	-	-	(976,619)	-	-
Total	\$ 775,282	\$ 723,994	\$ (32,373)	\$ (188,691)	\$ 945,473
Total AI at BOY	\$ 7,658,104	\$ 8,049,265	\$ 7,736,457	\$ 7,310,734	\$ 7,949,613
G/L as a % of AL	10.12%	8.99%	-0.42%	-2.58%	11.89%

Note: 2015-2018 gains and losses are prior to the implementation of new assumptions.

Overall, there was a \$775 million gain on the PERS DB Healthcare results. This is mostly due to positive experience on the medical claims, as well as the repeal of the Cadillac Tax.

Results in three of the last five years had significant medical claims gains. The large gain this year is mostly comprised of increased rebates experienced after changing vendors on January 1, 2019. This will be discussed further in the next section.

The "Other" category includes the repeal of the Cadillac Tax. Previously, liabilities included an assumption for this excise tax that was scheduled to take effect in 2022. The H.R. 1865, *Further Consolidated Appropriations Act, 2020*, included a repeal of the tax, so the assumption has been removed, leading to a decrease in liabilities and a gain to the plan.

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. The gains this year indicate fewer members are eligible for Part B than assumed and fewer dependents are electing coverage than assumed. These assumptions will be monitored annually.

TABLE 3 - TRS DB PENSION GAINS AND (LOSSES) BY SOURCE (000's)

Source	2019 Valuation	2018 Valuation	2017 Valuation	2016 Valuation	2015 Valuation
Retirement	\$ 4,611	\$ 6,125	\$ 9,201	\$ 7,046	\$ (101)
Termination	(4,692)	(11,283)	(11,770)	(9,687)	(10,284)
Mortality	(6,628)	1,634	(282)	(5,612)	8,784
Disability	(1,732)	(543)	(1,010)	(369)	(407)
Rehires	2,148	3,114	5,142	(8,470)	(11,622)
Other	(3,295)	3,790	(10,367)	(34,154)	(2,799)
Salary	7,272	41,455	37,590	32,576	25,558
COLA and PRPA	(5,231)	80,819	92,877	84,426	46,292
Total	\$ (7,547)	\$ 125,111	\$ 121,381	\$ 65,756	\$ 55,421
Total AI at BOY	\$ 7,276,290	\$ 7,217,525	\$ 7,159,788	\$ 7,051,724	\$ 6,921,362
G/L as a % of AL	-0.10%	1.73%	1.70%	0.93%	0.80%

Note: 2015-2018 gains and losses are prior to the implementation of new assumptions.

The results of the gain loss analysis for the TRS DB was in some ways the opposite of the PERS DB, as there were gains due to salary experience and rehires, rather than losses. These gains were more than offset by negative experience on terminations, mortality, and COLA/PRPA. Overall, the aggregate gain/loss was quite small.

Again, as this is the first year of experience under the newly adopted assumptions, these gains and losses will be monitored over the next few valuations to determine if the assumption changes worked as intended.

TABLE 4 - TRS DB HEALTHCARE GAINS AND (LOSSES) BY SOURCE (000's)

Source	2019 Valuation	2018 Valuation	2017 Valuation	2016 Valuation	2015 Valuation
Retirement	\$ 3,344	\$ 13,627	\$ 17,174	\$ 1,691	\$ (90)
Termination	(2,555)	(2,501)	(7,543)	(3,040)	(2,923)
Mortality	(3,198)	(812)	7,778	5,240	22,470
Disability	(19)	259	(666)	466	(660)
Rehires	1,710	(146)	(1,755)	(584)	(202)
Other	20,341	(6,683)	42,231	5,597	52,883
Medical Claims	225,987	146,354	257,626	24,266	311,407
Modified Part B Assumption	1,594	23,321	N/A	N/A	N/A
Dependent Coverage Election	15,195	18,765	N/A	N/A	N/A
Methodology	-	-	(378,830)	-	-
Total	\$ 262,399	\$ 192,184	\$ (63,985)	\$ 33,636	\$ 382,885
Total AI at BOY	\$ 2,684,150	\$ 2,927,093	\$ 2,747,836	\$ 2,677,393	\$ 2,919,670
G/L as a % of AL	9.78%	6.57%	-2.33%	1.26%	13.11%

Note: 2015-2018 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 the repeal of the Cadillac Tax. The discussion on PERS DB applies to TRS DB as well.

TABLE 5-PERS DCR TOTAL GAINS AND (LOSSES) BY SOURCE (000's)

Source	2019 Valuation	2018 Valuation	2017 Valuation	2016 Valuation	2015 Valuation
Mortality	\$ 1,197	\$ 1,566	\$ 883	\$ 955	\$ 968
Termination	1,579	3,519	1,417	1,154	1,155
Disability	1,696	1,955	2,228	1,715	1,067
New Entrants	(1,593)	(1,748)	(1,825)	(1,695)	(1,899)
Rehires	(2,671)	(2,795)	(1,393)	(1,054)	(822)
Other Demographic Experience	2,481	1,249	1,465	(3,935)	(317)
Salary Increases	(80)	40	131	24	55
Trend Rates/Cadillac Tax*	1,233	(1,605)	(24,441)	-	-
Medical Claims Costs	15,366	759	908	8,044	5,699
Total	\$ 19,208	\$ 2,940	\$ (20,627)	\$ 5,208	\$ 5,906
Total AI at BOY	\$ 126,311	\$ 117,243	\$ 77,052	\$ 63,732	\$ 53,844
G/L as a % of AL	15.21%	2.51%	-26.77%	8.17%	10.97%

*Trend rate gain/loss applicable to 2017 and the Cadillac tax is applicable to 2018 and 2019.

Note: 2015-2018 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, the majority of the 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.

TABLE 6-PERS DCR HEALTHCARE ONLY GAINS AND (LOSSES) BY SOURCE (000's)

Source	2019 Valuation	2018 Valuation	2017 Valuation	2016 Valuation	2015 Valuation
Mortality	\$ (387)	\$ 57	\$ 30	\$ (40)	\$ (17)
Termination	1,567	3,467	1,418	1,181	1,146
Disability	317	264	228	158	(60)
New Entrants	(1,476)	(1,587)	(1,666)	(1,593)	(1,786)
Rehires	(2,630)	(2,763)	(1,354)	(1,029)	(795)
Other Demographic Experience	2,401	1,380	1,116	(4,127)	701
Salary Increases	-	-	-	-	-
Trend Rates/Cadillac Tax*	1,233	(1,605)	(24,441)	-	-
Medical Claims Costs	15,366	759	908	8,044	5,699
Total	\$ 16,391	\$ (28)	\$ (23,761)	\$ 2,594	\$ 4,888
Total AI at BOY	\$ 118,598	\$ 109,703	\$ 70,289	\$ 58,683	\$ 50,217
G/L as a % of AL	13.82%	-0.03%	-33.80%	4.42%	9.73%

*Trend rate gain/loss applicable to 2017 and the Cadillac tax is applicable to 2018 and 2019.

Note: 2015-2018 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. There is a gain due to the repeal of the Cadillac Tax. An assumption was just added to this plan last year for the excise tax.

TABLE 7-TRS DCR TOTAL GAINS AND (LOSSES) BY SOURCE (000's)

Source	2019 Valuation	2018 Valuation	2017 Valuation	2016 Valuation	2015 Valuation
Mortality	\$ 123	\$ 36	\$ 41	\$ 36	\$ 33
Termination	1,921	865	1,433	1,309	204
Disability	171	99	170	137	117
New Entrants	(808)	(724)	(600)	(1,176)	(787)
Rehires	(874)	(2,975)	(617)	-	(1,314)
Other Demographic Experience	(31)	(49)	94	(968)	19
Salary Increases	1	-	-	-	-
Trend Rates/Cadillac Tax*	389	(375)	(7,948)	-	-
Medical Claims Costs	4,135	290	303	2,768	1,955
Total	\$ 5,027	\$ (2,833)	\$ (7,124)	\$ 2,106	\$ 227
Total AI at BOY	\$ 32,459	\$ 33,707	\$ 22,007	\$ 19,797	\$ 16,296
G/L as a % of AL	15.49%	-8.40%	-32.37%	10.64%	1.39%

*Trend rate gain/loss applicable to 2017 and the Cadillac tax is applicable to 2018 and 2019.

Note: 2015-2018 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, the majority of the 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.

TABLE 8-TRS DCR HEALTHCARE ONLY GAINS AND (LOSSES) BY SOURCE

Source	2019 Valuation	2018 Valuation	2017 Valuation	2016 Valuation	2015 Valuation
Mortality	\$ 15	\$ (37)	\$ (22)	\$ (22)	\$ (17)
Termination	1,926	871	1,435	1,313	206
Disability	(20)	(108)	(21)	(22)	(16)
New Entrants	(600)	(724)	(600)	(1,176)	(786)
Rehires	(873)	(2,974)	(617)	-	(1,313)
Other Demographic Experience	(4)	(29)	94	(987)	20
Salary Increases	-	-	-	-	-
Trend Rates/Cadillac Tax*	389	(375)	(7,948)	-	-
Medical Claims Costs	4,135	290	303	2,768	1,955
Total	\$ 4,968	\$ (3,086)	\$ (7,376)	\$ 1,874	\$ 49
Total AI at BOY	\$ 32,429	\$ 33,681	\$ 21,988	\$ 19,768	\$ 16,273
G/L as a % of AL	15.32%	-9.16%	-33.55%	9.48%	0.30%

*Trend rate gain/loss applicable to 2017 and the Cadillac tax is applicable to 2018 and 2019.

Note: 2015-2018 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. There is a gain due to the repeal of the Cadillac Tax. An assumption was just added to this plan last year for the excise tax.

SUMMARY OF RECOMMENDATIONS RESULTING FROM A REVIEW OF GAINS AND LOSSES

Based on our review above, we recommend the following be considered by Buck:

- Carefully monitor the newly adopted assumptions going forward to determine if they are working as intended.
- Continue to track the medical claims experience closely, particularly any further impact of the drug costs associated with the new vendor.
- 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.

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 inflation assumption. In recent years, long-term inflation forecasts have been declining and this new assumptions reflects this. We find this assumption to be reasonable.

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. We find this assumption to be reasonable.

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 the changes made as part of the experience study end the pattern of large pay increase gains.

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.

Disabled mortality

The RP 2014 disabled table with MP 2017 generational improvement (and with the various credibility adjustments) is reasonable.

Withdrawal from service before retirement (termination)

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

Retirement

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

Disability

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

Withdrawal of contributions at termination

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



Other Assumptions

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 2019, the total payroll, based on the annualized earnings for the fiscal year ending on the valuation date, grew by about 2%. 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
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%
2010	0%	34%	6%

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 seven years, there will be upward pressure on the contribution rate because contributions that are less than anticipated are flowing in the plan.

SUMMARY

With this being the first year of experience under the new assumptions, it is too soon to ascertain their effectiveness. Based on the experience study data presented, the assumptions and methods are reasonable. We will continue to monitor the results to track the effectiveness of the assumptions 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 2019 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.

<u>Table 10-Summary of Retiree Medical Data Received</u>						
	<u>PERS</u>		<u>TRS</u>		<u>Total</u>	
	<u>Total for</u>	<u>Total for</u>	<u>Total for</u>	<u>Total for</u>	<u>Total for</u>	<u>Total for</u>
	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2017</u>	<u>2018</u>
Retiree coverage only	20,526	21,145	7,563	7,885	28,089	29,030
Retiree and spouse	27,711	28,004	8,441	8,330	36,152	36,334
Retiree and children and other dependents	845	864	347	378	1,192	1,242
Family	2,909	2,754	1,386	1,241	4,295	3,995
Total by Coverage	51,991	52,767	17,737	17,834	69,728	70,601
Pre-Medicare	21,815	20,914	6,018	5,682	27,833	26,596
Medicare A & B	29,989	31,634	11,491	11,917	41,480	43,551
Medicare part B only	187	219	228	235	415	454
Total by Medicare Status	51,991	52,767	17,737	17,834	69,728	70,601

On page 86 of the PERS DB valuation report the total incurred claims are spread over the eligible population. For Fiscal Year 2019, the average enrollment for the pre-Medicare group is 20,625 and for the Medicare group is 42,843. The total average enrollment for fiscal 2019 is the sum of these two groups, or 63,468. 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 12 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
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
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
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
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

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	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%	5.9%
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%	1.5%
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%	3.4%
Rx - Medicare	1.7%	7.5%	7.7%	-2.3%	-4.2%	0.1%	4.9%	20.6%	11.6%	1.6%	-7.0%	3.6%

Table 11(c)-PERS and TRS Health Care Cost Trend Actual to Assumed			
Medicare Status:	19-20 Actual	19-20 Assumed	Gain/Loss
Medical: Pre-Medicare	6.9%	7.5%	Gain
Medical: Medicare A&B only	4.5%	5.5%	Gain
Medical: Medicare B only	4.6%	5.5%	Gain
Rx - Medicare	-7.0%	8.5%	Gain

While the per capita medical costs increased less than assumed, leading to small gains, the large decrease in per capita prescription drug (Rx) costs clearly sticks out and explains the majority of the very large gains seen in the previous section. Buck believed this decrease in the prescription drug costs was from a change in vendors that took place on January 1, 2020, and more specifically, a significant increase in prescription drug rebates. In order to verify this, we asked Buck if they could isolate the amount that was specifically due to this change in vendors. While Buck did not provide the details in the valuation report, they provided supplemental information to GRS showing the claims before and after the vendor change. In order to estimate what the total cost would have been without the change in vendors, Buck assumed the claims in prescriptions drug costs experienced during the first half of fiscal year 2019 (July 1, 2018 – December 31, 2018) with the old vendor also occurred during the second half of fiscal year 2019 (January 1, 2019 – June 30, 2019), rather than the actual claims experienced with the new vendor during the second half of 2019. We find this assumption to be an acceptable method of estimating the impact of changing vendors. The chart below shows the change broken out between experience and the change to a new vendor.

Table 11(d)-PERS and TRS Health Care Cost Changes Due to New Vendor					
Medicare Status:	18-19 Actual	19-20 Before Change in Vendor*	19-20 After Change in Vendor	Change Due to Experience	Change Due to New Vendor
Medical: Pre-Medicare	13,535	14,464	14,464	6.9%	0.0%
Medical: Medicare A&B only	1,468	1,534	1,534	4.5%	0.0%
Medical: Medicare B only	4,667	4,880	4,880	4.6%	0.0%
Rx - Medicare	3,764	3,969	3,501	5.4%	-11.8%

*Estimated, assuming prescription drug changes for the second half of fiscal 2019 were set equal to the experience during the first half of fiscal 2019

As shown, while the change due to experience of 5.4% is still lower than the assumed 8.5%, clearly the change due to the new vendor accounts for most of the decrease and subsequent gains seen this year.

Finally, it should be noted that Buck averages the claims experience over the prior two years to calculate the per capita costs, and the change to a new vendor is only being reflected in one of those years. The higher drug prices seen during fiscal year ending 2018 are still being accounted for in this year's assumption for per capita costs. If the lower prescription drug costs continue during fiscal year ending 2020, the per capita cost will decrease again in next year's valuation, and there will once again be very

large gains. We recommend Buck continues to track the medical claims experience closely, particularly any further impact of the drug costs associated with the new vendor.

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

Last year, 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 last year 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 starting this year. We recommend this assumption be carefully monitored going forward to make sure the new methodology is tracking closely to actual experience.

Cadillac Tax

Under the provisions of the Patient Protection and Affordable Care Act (PPACA), an additional tax was to be levied on plans with premiums that exceed a certain threshold. This tax, commonly referred to as the "Cadillac tax," is equal to 40% of the excess of the plan's premium over the statutorily set limits. Buck had previously valued a liability for the Cadillac tax by augmenting the trend rates. Early in 2020, however, the H.R. 1865, *Further Consolidated Appropriations Act, 2020*, included a repeal of this tax. Buck has removed the assumption applied to the trend rates for the June 30, 2019 valuation, which we agree with.

Other Assumptions

The following assumptions were used in the June 30, 2020, valuations for the DCR plans. Relative value refers to the value of the DCR benefits compared to those provided by the Defined Benefit retiree plan. These assumptions were unchanged since the June 30, 2019 actuarial valuation.

Table 12-Relative Value between DB and DCR Health Plan		
DCR Health Plan as a percent of the DB Health Plan		
Benefits	June 30, 2019 Valuation	June 30, 2018 Valuation
Pre-Medicare Medical	0.979	0.979
Medicare Medical	0.686	0.686
Prescription Drug	0.896	0.896

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 be tested to ensure this assumption is supporting the liabilities of the plan.

In the June 30, 2012, valuation, the assumption change on cost-sharing results was the single most important factor in the increase in the contribution requirements. This assumption is the 0.2% offset that is assumed to occur in each year. As noted in the Executive Summary, we have not been provided enough documentation on this, the relative value adjustment, or the Medicare Coordination adjustment to conclude that the revised June 30, 2018, assumptions on these three items currently in use are appropriate for developing the costs of the retiree medical plan. We have made this comment in prior audits.

Member cost-sharing offset is 0.2% in each future year, reflecting and intention to create cost equality in sharing future trend increases between retirees and the plan. We are concerned about this assumption since we are not aware of any plan changes that share the increase in trend that have occurred. In the absence of a stated policy or a practice, we recommend that this assumption be removed. Any sharing of future trend can be recognized as it occurs. Further, since the EGWP is a savings to the plan its implementation may further reduce the likelihood of the implementation of “cost sharing” features as represented by the 0.2% per year assumption.

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, 2019. 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 couple 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, published in January 2015, surveyed 126 retirement systems (mostly statewide). Over 75% 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, 2019 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, and we also fine-tuned some of the methodology for verifying the annuity factors used by Buck. As a result, we identified the following four minor findings related to the valuation of certain ancillary benefits:

1. **Pre and Post Commencement Mortality Rates** – Buck's valuation reports currently state that different mortality rates are being applied pre and post 'termination', but we found that they are actually being applied pre and post 'commencement' or 'retirement'. This also creates some inconsistency with how mortality rates are being applied for members who have benefit, but not their Alaska COLA (which are any tier 2 and tier 3 members under age 65 who have commenced their retirement benefit). We recommend Buck apply the mortality rates consistently between these different benefit pieces and that it is disclosed appropriately in the assumptions section of the reports.
2. **Timing of PRPA for Disability** – The 75% PRPA assumption should be applied immediately to all members on disability, but Buck is currently not applying them immediately to occupational



disability benefits in PERS or deferred disability benefits in TRS. We recommend Buck update their calculations so that the 75% PRPA assumptions is applied immediately to all members on disability.

- 3. Disability Benefit Conversion** – Buck is currently assuming that disability benefits are converted to a normal retirement benefit at each members' earliest unreduced retirement age. After reviewing the statutes, regulations, and handbooks, it's not clear to us if members can convert at that time, or if they have to wait until they reach different eligibility requirements. We recommend Buck verify with Alaska staff when members are eligible to convert their disability benefit to a normal retirement benefit.
- 4. Retiree Medical Participation Rates** – It appears that Buck is basing retiree medical participation rates on credited service, rather than eligibility service. For a select number of employees, these service amounts are different. We recommend Buck always base the retiree medical participation rates on the appropriate eligibility service.

We provided these findings to Buck. The Alaska staff was able to confirm that for item 3 the current administrative practice is to convert disability benefits to normal retirement benefits at the members' earliest unreduced retirement age, so Buck is currently valuing this correctly.

For the other three findings (items 1, 2, and 4) Buck agreed they should be updated and provided the following summary of the impact of correcting these items in the June 30, 2019 valuations.

	PERS			TRS		
	Pension	Healthcare	Total	Pension	Healthcare	Total
AAL at 6/30/19						
- before	\$15,039,180	\$7,151,694	\$22,190,874	\$7,388,020	\$2,518,644	\$9,906,664
- after	\$15,037,623	\$7,144,299	\$22,181,922	\$7,387,534	\$2,518,644	\$9,906,178
- \$ impact	\$(1,557)	\$(7,395)	\$(8,952)	\$(486)	n/a	\$(486)
- % impact	(0.01)%	(0.10)%	(0.04)%	(0.01)%	n/a	(0.01)%
Total NC at 6/30/19						
- before	\$148,395	\$91,715	\$240,110	\$53,688	\$25,897	\$79,585
- after	\$148,434	\$91,537	\$239,971	\$53,700	\$25,897	\$79,597
- \$ impact	\$39	\$(178)	\$(139)	\$12	n/a	\$12
- % impact	0.03%	(0.19)%	(0.06)%	0.02%	n/a	0.02%

As shown, the impact may be viewed as immaterial and, at the very least, be updated in future valuations, subject to Actuarial Committee discretion.

QUANTITATIVE RESULTS

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, 2019 Comparison of Present Value of Benefits

Active Pension		GRS	Buck	% Diff
TRS	Active Test Case 1 - Tier 1	1,102,463	1,102,461	0.0%
TRS	Active Test Case 2 - Tier 2	320,728	320,725	0.0%
TRS	Active Test Case 3 - Tier 2	515,310	515,313	0.0%
PERS	Active Test Case 1 - Other Tier 3	156,706	156,736	0.0%
PERS	Active Test Case 2 - Other Tier 3	144,841	144,957	-0.1%
PERS	Active Test Case 3 - P/F Tier 3	765,596	765,612	0.0%
Inactive Pension		GRS	Buck	% Diff
TRS	TRS - Retiree - Female, Tier 1	1,153,834	1,149,377	0.4%
TRS	TRS - DV - Female, Tier 2	33,968	34,019	-0.2%
TRS	TRS - Beneficiary - Female, Tier 1	282,572	281,789	0.3%
PERS	PERS Peace Officer/Firefighter - Retiree	894,486	893,816	0.1%
PERS	PERS Peace Officer/Firefighter - Disable	760,267	791,514	-3.9%
PERS	PERS Peace Officer/Firefighter - DV	35,894	35,574	0.9%
PERS	PERS Peace Officer/Firefighter - Retiree 2	396,905	396,904	0.0%
PERS	PERS Others - Retiree	269,092	269,092	0.0%
PERS	PERS Others - DV	221,735	220,050	0.8%
Active Healthcare		GRS	Buck	% Diff
TRS	Active Test Case 1 - Tier 1	150,123	149,998	0.1%
TRS	Active Test Case 2 - Tier 2	230,182	229,789	0.2%
TRS	Active Test Case 3 - Tier 2	208,828	208,217	0.3%
PERS	Active Test Case 1 - Other Tier 3	75,469	75,862	-0.5%
PERS	Active Test Case 2 - Other Tier 3	68,381	68,066	0.5%
PERS	Active Test Case 3 - P/F Tier 3	365,803	361,952	1.1%
Inactive Healthcare		GRS	Buck	% Diff
TRS	Vested Termination - Female	163,265	162,794	0.3%
TRS	Retiree - Female	405,887	405,591	0.1%
TRS	Beneficiary - Female	173,659	173,182	0.3%
PERS	Vested Termination - Other Tier 2 - Female	200,741	201,926	-0.6%
PERS	Vested Termination - P/F Tier 3 - Male	13,295	13,455	-1.2%
PERS	Disabled - PF Tier 2 - Male	201,666	201,618	0.0%
PERS	Retiree - Other Tier 2 - Female	160,828	160,813	0.0%
PERS	Retiree - Other Tier 1 - Female	72,734	72,729	0.0%
PERS	Retiree - PF Tier 2 - Male	182,939	191,858	-4.6%

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, 2019

Comparison of Present Value of Benefits - **TRS Pension**
Active Test Case 1 - Tier 1

<u>Basic Data:</u>	Current Age 64.67	Credited Service 32.00	Gender Male
Present Value of Benefits (PVB)	GRS Replicate	Buck	% Diff
<u>Retirement:</u>			
Main Retirement Benefit	1,031,228.46	1,031,228.76	0.0%
AK COLA	53,218.69	53,218.71	0.0%
Total Retirement PVB	1,084,447.15	1,084,447.47	0.0%
<u>Withdrawal:</u>			
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%
<u>Death:</u>			
Non Vested NonOcc 1<svc<5 LS Dth	-	-	0.0%
NonOcc Dth Marr	10,965.37	10,965.08	0.0%
NonOcc Dth Marr AK COLA	556.05	556.05	0.0%
NonOcc Married LS Dth	-	-	0.0%
NonOcc Single LS Dth	1,481.71	1,481.35	0.0%
Occ Dth Marr (Pre-NR Conversion Benefit)	-	-	0.0%
Occ Dth Marr (Post-NR Conversion Benefit)	4,770.86	4,769.87	0.0%
Occ Dth Marr AK COLA (Pre-NR)	-	-	0.0%
Occ Dth Marr AK COLA (Post-NR)	241.66	241.61	0.0%
Occ Single LS Dth	-	-	0.0%
Total Death PVB	18,015.65	18,013.96	0.0%
<u>Disability:</u>			
Non-vested LS Ben	-	-	0.0%
Dis (Pre-NR Conversion Benefit)	-	-	0.0%
Dis (Post-NR Conversion Benefit)	-	-	0.0%
Dis AK COLA (Pre-NR)	-	-	0.0%
Dis AK COLA (Post-NR)	-	-	0.0%
Dis Death Ben	-	-	0.0%
Dis Death Ben AK COLA	-	-	0.0%
Dis Child Ben	-	-	0.0%
Dis Child Ben AK COLA	-	-	0.0%
Total Disability PVB	-	-	0.0%
GRAND TOTAL PVB	1,102,462.80	1,102,461.43	0.0%

ALASKA RETIREMENT MANAGEMENT BOARD
Actuarial Review of Pension and Health Plans - June 30, 2019

Comparison of Present Value of Benefits - **TRS Pension**
Active Test Case 2 - Tier 2

<u>Basic Data:</u>	Current Age 37.11	Credited Service 15.00	Gender Female
Present Value of Benefits (PVB)	GRS Replicate	Conduent	% Diff
<u>Retirement:</u>			
Main Retirement Benefit	299,064.62	299,064.64	0.0%
AK COLA	5,983.90	5,983.92	0.0%
Total Retirement PVB	305,048.52	305,048.56	0.0%
<u>Withdrawal:</u>			
Non Vested Term	-	-	0.0%
Vested Term	12,025.02	12,025.01	0.0%
Vested Term AK COLA	397.89	397.89	0.0%
Vested Term (take LS)	-	-	0.0%
Vested Term (death during deferral)	75.09	72.26	3.9%
Vested Term (death during deferral AK COLA)	2.84	2.34	21.3%
Vested Term (death, single)	47.37	47.48	-0.2%
Total Withdrawal PVB	12,548.21	12,544.98	0.0%
<u>Death:</u>			
Non Vested NonOcc 1<svc<5 LS Dth	-	-	0.0%
NonOcc Dth Marr	943.41	943.30	0.0%
NonOcc Dth Marr AK COLA	15.88	15.90	-0.1%
NonOcc Married LS Dth	-	-	0.0%
NonOcc Single LS Dth	236.27	236.23	0.0%
Occ Dth Marr (Pre-NR Conversion Benefit)	15.84	15.83	0.1%
Occ Dth Marr (Post-NR Conversion Benefit)	459.77	459.80	0.0%
Occ Dth Marr AK COLA (Pre-NR)	-	-	0.0%
Occ Dth Marr AK COLA (Post-NR)	7.87	7.87	0.0%
Occ Single LS Dth	-	-	0.0%
Total Death PVB	1,679.04	1,678.93	0.0%
<u>Disability:</u>			
Non-vested LS Ben	-	-	0.0%
Dis (Pre-NR Conversion Benefit)	266.16	266.17	0.0%
Dis (Post-NR Conversion Benefit)	909.24	909.25	0.0%
Dis AK COLA (Pre-NR)	15.63	15.63	0.0%
Dis AK COLA (Post-NR)	50.30	50.30	0.0%
Dis Death Ben	16.70	16.76	-0.4%
Dis Death Ben AK COLA	0.91	0.91	0.0%
Dis Child Ben	182.80	182.80	0.0%
Dis Child Ben AK COLA	10.44	10.44	0.0%
Total Disability PVB	1,452.18	1,452.26	0.0%
GRAND TOTAL PVB	320,727.94	320,724.73	0.0%

ALASKA RETIREMENT MANAGEMENT BOARD
Actuarial Review of Pension and Health Plans - June 30, 2019

Comparison of Present Value of Benefits - **TRS Pension**
Active Test Case 3 - Tier 2

<u>Basic Data:</u>	Current Age 51.43	Credited Service 21.00	Gender Female
Present Value of Benefits (PVB)	GRS Replicate*	Conduent	% Diff
<u>Retirement:</u>			
Main Retirement Benefit	499,814.73	499,814.73	0.0%
AK COLA	13,049.56	13,049.54	0.0%
Total Retirement PVB	512,864.29	512,864.27	0.0%
<u>Withdrawal:</u>			
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%
<u>Death:</u>			
Non Vested NonOcc 1<svc<5 LS Dth	-	-	0.0%
NonOcc Dth Marr	1,352.79	1,352.75	0.0%
NonOcc Dth Marr AK COLA	36.97	36.95	0.1%
NonOcc Married LS Dth	-	-	0.0%
NonOcc Single LS Dth	384.77	388.78	-1.0%
Occ Dth (Pre-NR Conversion Benefit)	-	-	0.0%
Occ Dth (Post-NR Conversion Benefit)	653.34	653.19	0.0%
Occ Dth Marr AK COLA (Pre-NR)	-	-	0.0%
Occ Dth Marr AK COLA (Post-NR)	17.48	17.46	0.1%
Occ Single LS Dth	-	-	0.0%
Total Death PVB	2,445.35	2,449.13	-0.2%
<u>Disability:</u>			
Non-vested LS Ben	-	-	0.0%
Dis (Pre-NR Conversion Benefit)	-	-	0.0%
Dis (Post-NR Conversion Benefit)	-	-	0.0%
Dis AK COLA (Pre-NR)	-	-	0.0%
Dis AK COLA (Post-NR)	-	-	0.0%
Dis Death Ben	-	-	0.0%
Dis Death Ben AK COLA	-	-	0.0%
Dis Child Ben	-	-	0.0%
Dis Child Ben AK COLA	-	-	0.0%
Total Disability PVB	-	-	0.0%
GRAND TOTAL PVB	515,309.64	515,313.40	0.0%

ALASKA RETIREMENT MANAGEMENT BOARD

Actuarial Review of Pension and Health Plans - June 30, 2019

Comparison of Present Value of Benefits - **PERS Active Pension**
Active Test Case 1 - Other Tier 3

<u>Basic Data:</u>	<u>Current Age</u>	<u>Credited Service</u>	<u>Gender</u>
	41.6	13.6	Female
Present Value of Benefits (PVB)	GRS	Buck	% Diff
<u>Retirement:</u>			
Main Retirement Benefit	102,767	102,767	0.0%
AK COLA	4,329	4,329	0.0%
Total Retirement PVB	107,095	107,095	0.0%
<u>Withdrawal:</u>			
Non Vested Term	-	-	0.0%
Vested Term	41,179	41,179	0.0%
Vested Term AK COLA	1,594	1,594	0.0%
Vested Term (take LS)	1,416	1,421	-0.4%
Vested Term (death during deferral)	192	200	-4.1%
Vested Term (death during deferral AK COLA)	7	8	-0.4%
Total Withdrawal PVB	44,389	44,402	0.0%
<u>Death:</u>			
Non Vested NonOcc <1 svc LS Dth	-	-	0.0%
Non Vested NonOcc 1<svc<5 LS Dth	-	-	0.0%
NonOcc Dth Marr	639	639	0.0%
NonOcc Dth Marr AK COLA	17	17	0.0%
NonOcc Married LS Dth	22	22	-0.5%
NonOcc Single LS Dth	186	187	-0.5%
Occ Dth Marr (Pre-NR Conversion Benefit)	278	265	4.9%
Occ Dth Marr (Post-NR Conversion Benefit)	766	792	-3.4%
Occ Dth Marr AK COLA (Post-NR)	29	29	0.8%
Occ Single LS Dth	124	125	-0.5%
Total Death PVB	2,061	2,076	-0.7%
<u>Disability:</u>			
Non-vested LS Ben	-	-	0.0%
NonOcc Dis	1,585	1,585	0.0%
NonOcc Dis AK COLA	100	100	0.0%
Occ Dis (Pre-NR Conversion Benefit)	590	590	0.0%
Occ Dis (Post-NR Conversion Benefit)	783	783	0.0%
Occ Dis AK COLA (Pre-NR)	38	38	0.0%
Occ Dis AK COLA (Post-NR)	46	46	-0.1%
Dis Death Ben	18	18	-2.3%
Dis Death Ben AK COLA	1	1	-5.2%
Total Disability PVB	3,162	3,162	0.0%
GRAND TOTAL PVB	156,706	156,736	0.0%

ALASKA RETIREMENT MANAGEMENT BOARD
Actuarial Review of Pension and Health Plans - June 30, 2019

Comparison of Present Value of Benefits - **PERS Active Pension**
Active Test Case 2 - Other Tier 3

<u>Basic Data:</u>	Current Age 31.4	Credited Service 8.6	Gender Male
Present Value of Benefits (PVB)	GRS	Buck	% Diff
<u>Retirement:</u>			
Main Retirement Benefit	90,645	90,645	0.0%
AK COLA	2,337	2,337	0.0%
Total Retirement PVB	92,982	92,982	0.0%
<u>Withdrawal:</u>			
Non Vested Term	-	-	0.0%
Vested Term	41,370	41,370	0.0%
Vested Term AK COLA	1,580	1,580	0.0%
Vested Term (take LS)	2,855	2,883	-1.0%
Vested Term (death during deferral)	457	437	4.6%
Vested Term (death during deferral AK COLA)	31	16	92.3%
Total Withdrawal PVB	46,293	46,286	0.0%
<u>Death:</u>			
Non Vested NonOcc <1 svc LS Dth	-	-	0.0%
Non Vested NonOcc 1<svc<5 LS Dth	-	-	0.0%
NonOcc Dth Marr	668	730	-8.6%
NonOcc Dth Marr AK COLA	12	11	16.9%
NonOcc Married LS Dth	23	24	-1.6%
NonOcc Single LS Dth	154	157	-1.5%
Occ Dth Marr (Pre-NR Conversion Benefit)	535	560	-4.4%
Occ Dth Marr (Post-NR Conversion Benefit)	877	855	2.6%
Occ Dth Marr AK COLA (Post-NR)	21	21	-0.1%
Occ Single LS Dth	103	105	-1.6%
Total Death PVB	2,395	2,463	-2.8%
<u>Disability:</u>			
Non-vested LS Ben	-	-	0.0%
NonOcc Dis	1,508	1,508	0.0%
NonOcc Dis AK COLA	96	96	0.0%
Occ Dis (Pre-NR Conversion Benefit)	770	770	0.0%
Occ Dis (Post-NR Conversion Benefit)	688	688	0.0%
Occ Dis AK COLA (Pre-NR)	48	49	-0.3%
Occ Dis AK COLA (Post-NR)	40	40	0.0%
Dis Death Ben	13	71	-81.1%
Dis Death Ben AK COLA	7	4	60.5%
Total Disability PVB	3,171	3,226	-1.7%
GRAND TOTAL PVB	144,841	144,957	-0.1%

ALASKA RETIREMENT MANAGEMENT BOARD
Actuarial Review of Pension and Health Plans - June 30, 2019

Comparison of Present Value of Benefits - **PERS Active Pension**
Active Test Case 3 - P/F Tier 3

<u>Basic Data:</u>	Current Age 45.5	Credited Service 21.1	Gender Male
Present Value of Benefits (PVB)	GRS	Buck	% Diff
<u>Retirement:</u>			
Main Retirement Benefit	744,417	744,417	0.0%
AK COLA	14,430	14,430	0.0%
Total Retirement PVB	758,847	758,847	0.0%
<u>Withdrawal:</u>			
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%
<u>Death:</u>			
Non Vested NonOcc <1 svc LS Dth	-	-	0.0%
Non Vested NonOcc 1<svc<5 LS Dth	-	-	0.0%
NonOcc Dth Marr	794	782	1.6%
NonOcc Dth Marr AK COLA	16	16	-2.4%
NonOcc Married LS Dth	42	42	-0.3%
NonOcc Single LS Dth	73	73	-0.2%
Occ Dth Marr (Pre-NR Conversion Benefit)	-	-	0.0%
Occ Dth Marr (Post-NR Conversion Benefit)	5,493	5,516	-0.4%
Occ Dth Marr AK COLA (Post-NR)	112	115	-2.5%
Occ Single LS Dth	220	220	-0.2%
Total Death PVB	6,749	6,766	-0.2%
<u>Disability:</u>			
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	765,596	765,612	0.0%



Actuarial Review of Pension and Health Plans Active Pension Test Case Legend	
Benefit	Extended Description
Retirement: Main Retirement Benefit AK COLA	Early/Normal Retirement (base) Benefit Alaska Cost of Living Allowance (10% of Ret base benefit)
Withdrawal: Non Vested Term Vested Term Vested Term AK COLA Vested Term (take LS) Vested Term (death during deferral) Vested Term (death during deferral AK COLA) Vested Term (death, single)	Refund of employee contributions upon termination of non-vested member Deferred retirement (base) Benefit (deferred to early retirement eligibility) Alaska Cost of Living Allowance (10% of Term base benefit) Refund of employee contributions upon termination of (vested) member Death (base) Benefit payable upon death after withdrawal but before benefit commencement Alaska Cost of Living Allowance (10% of DV Dth base benefit) Return of employee contributions upon death during deferral period for single members
Death: Non Vested NonOcc 1<svc<5 LS Dth NonOcc Dth Marr NonOcc Dth Marr AK COLA NonOcc Married LS Dth NonOcc Single LS Dth Occ Dth Marr (Pre-NR Conversion Benefit) Occ Dth Marr (Post-NR Conversion Benefit) Occ Dth Marr AK COLA (Pre-NR) Occ Dth Marr AK COLA (Post-NR) Occ Single LS Dth	Refund of employee contributions upon death of non-vested member Non-Occupational Death (base) benefit Alaska Cost of Living Allowance (10% of Non-Occupational Dth base benefit) Refund of employee contributions upon non-occupational death of married (vested) member Refund of employee contributions upon non-occupational death of single (vested) member Occupational Death (base) benefit until normal retirement conversion Occupational Death (base) benefit after normal retirement conversion Alaska Cost of Living Allowance (10% of Occupational Dth base benefit pre-conversion) Alaska Cost of Living Allowance (10% of Occupational Dth base benefit post-conversion) Refund of employee contributions upon occupational death of single (vested) member
Disability: Non-vested LS Ben Dis (Pre-NR Conversion Benefit) Dis (Post-NR Conversion Benefit) Dis AK COLA (Pre-NR) Dis AK COLA (Post-NR) Dis Death Ben Dis Death Ben AK COLA Dis Child Ben Dis Child Ben AK COLA	Refund of employee contributions payable upon disability before vested Disability benefit prior to normal retirement conversion Disability benefit after normal retirement conversion Alaska Cost of Living Allowance (10% of pre-conversion disability benefit) Alaska Cost of Living Allowance (10% of post-conversion disability benefit) Death (base) Benefit payable upon death after disability Alaska Cost of Living Allowance (10% of Dis Dth base benefit) Disability (base) Child Benefit payable until eligible for normal retirement Alaska Cost of Living Allowance (10% of Temp Dis Child base benefit)

Actuarial Review of Pension and Health Plans - June 30, 2019
Comparison of Present Value of Benefits - TRS Retiree Health

Actives	Test Case 1 - Tier 2			Test Case 2 - Tier 2			Test Case 3 - Tier 2		
<u>Basic Data:</u>									
Sex	Male			Female			Female		
Current Age	64.67			51.43			37.11		
Current Credited Service	32.00			21.00			15.00		
Present Value of Benefits (PVB)	GRS	Buck	% Diff	GRS	Buck	% Diff	GRS	Buck	% Diff
<u>Retirement:</u>									
Tier x <Member>	99,953.71	99,975.62	0.0%	175,923.43	175,889.13	0.0%	148,433.60	148,570.90	-0.1%
Tier x <Spouse>	82,703.24	82,563.07	0.2%	88,094.77	87,729.91	0.4%	80,579.17	79,857.33	0.9%
Post 65 Part D Tier x <Member>	(19,000.17)	(19,003.60)	0.0%	(17,440.43)	(17,437.44)	0.0%	(10,598.12)	(10,608.67)	-0.1%
Post 65 Part D Tier x <Spouse>	(13,533.92)	(13,536.85)	0.0%	(10,245.58)	(10,243.85)	0.0%	(6,311.58)	(6,315.41)	-0.1%
Contrib <Member>	-	-	0.0%	(3,851.58)	(3,850.69)	0.0%	(2,051.69)	(2,059.43)	-0.4%
Contrib <Spouse>	-	-	0.0%	(2,298.86)	(2,298.31)	0.0%	(1,223.45)	(1,227.71)	-0.3%
Total Retirement PVB	150,122.86	149,998.24	0.1%	230,181.75	229,788.75	0.2%	208,827.94	208,217.01	0.3%

Inactives - PVB	GRS	Buck	% Diff
Vested Termination - Female	163,265	162,794	0.3%
Retiree - Female	405,887	405,591	0.1%
Beneficiary - Female	173,659	173,182	0.3%

Benefits - Buck Valuation Terminology	Description
<u>Retirement:</u>	
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

Actuarial Review of Pension and Health Plans - June 30, 2019
Comparison of Present Value of Benefits - **PERS Retiree Health**

Actives	Test Case 1 - Other Tier 3			Test Case 2 - Other Tier 3			Test Case 3 - PF Tier 3		
<u>Basic Data:</u>									
Sex	Female			Active			Active		
Current Age	41.57			31.41			45.54		
Current Credited Service	52353.11			8.6			24.10		
Present Value of Benefits (PVB)	GRS	Buck	% Diff	GRS	Buck	% Diff	GRS*	Buck	% Diff
<u>Retirement:</u>									
Tier x <Member>	57,974.88	58,675.31	-1.2%	42,213.84	42,204.39	0.0%	230,633.66	229,343.65	0.6%
Tier x <Spouse>	28,986.51	28,713.64	1.0%	31,181.48	30,874.68	1.0%	164,025.31	161,172.77	1.8%
Contrib Tier x <Member>	256.43	256.37	0.0%	3,067.14	3,066.52	0.0%	742.89	745.86	-0.4%
Contrib Tier x <Spouse>	153.21	189.62	-19.2%	1,946.95	1,947.00	0.0%	3,704.14	3,720.42	-0.4%
Post 65 Part D Tier x <Member>	6,963.39	6,962.29	0.0%	-	-	0.0%	14,001.44	13,800.90	1.5%
Post 65 Part D Tier x <Spouse>	4,118.95	4,118.26	0.0%	-	-	0.0%	10,407.14	10,297.58	1.1%
Total Retirement PVB	75,469.40	75,862.41	-0.5%	68,381.23	68,065.55	0.5%	365,803.36	361,951.66	1.1%

Inactives - PVB	GRS	Buck	% Diff
Vested Termination - Other Tier 2 - Female	200,741	201,926	-0.6%
Vested Termination - P/F Tier 3 - Male	13,295	13,455	-1.2%
Disabled - PF Tier 2 - Male	201,666	201,618	0.0%
Retiree - Other Tier 2 - Female	160,828	160,813	0.0%
Retiree - Other Tier 1 - Female	72,734	72,729	0.0%
Retiree - PF Tier 2 - Male	182,939	191,858	-4.6%

Benefits - Buck Valuation Terminology	Description
<u>Retirement:</u>	
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, 2019, 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 two disabled test lives.

We conclude that the test lives are calculated correctly using the underlying assumptions.

ALASKA RETIREMENT MANAGEMENT BOARD
Actuarial Review of DCR Pension and Health Plans - June 30, 2019

Comparison of Present Value of Benefits - DCR PERS and TRS Pension

Actives	Test Case 1 - PERS Other		
<u>Basic Data:</u>		<u>Basic Data:</u>	
Sex	Female	Tier	4
Current Age	28.929	Full time %	100%
Current Credited Service	5.21		
Present Value of Benefits (PVB)	GRS*	Buck	% Diff
<u>Disability:</u>			
DCR	167.11	167.12	0.0%
DCR Death during Disability	6.07	5.42	12.0%
Total Disability PVB	173.18	172.54	0.4%
<u>Death:</u>			
DCR - married only	61.19	61.60	-0.7%
Total Death PVB	61.19	61.60	-0.7%
GRAND TOTAL PVB	234.37	234.14	0.1%

Actives	Test Case 3 - TRS		
<u>Basic Data:</u>		<u>Basic Data:</u>	
Sex	Female	Tier	3
Current Age	54.61	Full time %	100%
Current Credited Service	8.00		
Present Value of Benefits (PVB)	GRS*	Buck	% Diff
<u>Disability:</u>			
DCR	452.34	452.34	0.0%
DCR Death during Disability	17.73	17.44	1.7%
Total Disability PVB	470.07	469.78	0.1%
<u>Death:</u>			
DCR - married only	286.44	286.42	0.0%
Total Death PVB	286.44	286.42	0.0%
GRAND TOTAL PVB	756.50	756.20	0.0%

Actives	Test Case 2 - PERS PF		
<u>Basic Data:</u>		<u>Basic Data:</u>	
Sex	Female	Tier	4
Current Age	51.33	Full time %	100%
Current Credited Service	6.00		
Present Value of Benefits (PVB)	GRS*	Buck	% Diff
<u>Disability:</u>			
DCR Deferred - single	3,753.76	3,664.35	2.4%
DCR Deferred - married	487.09	477.33	2.0%
DCR Immediate	4,130.76	4,130.77	0.0%
DCR Imm. Death during Disable	445.47	414.73	7.4%
Total Disability PVB	8,817.08	8,687.18	1.5%
<u>Death:</u>			
DCR - married only	4,299.35	4,299.09	0.0%
Total Death PVB	4,299.35	4,299.09	0.0%
GRAND TOTAL PVB	13,116.44	12,986.27	1.0%

Benefits - Buck Valuation Terminology	
<u>Disability:</u>	
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
<u>Death:</u>	
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.

ALASKA RETIREMENT MANAGEMENT BOARD
Actuarial Review of DCR Pension and Health Plans - June 30, 2019

Comparison of Present Value of Benefits - DCR PERS and TRS Retiree Health

Actives	Test Case 1 - PERS Other		
<u>Basic Data:</u>		<u>Basic Data:</u>	
Sex	Female	Tier	4
Current Age	28.93	Full time %	100%
Current Credited Service	5.21		
Present Value of Benefits (PVB)	GRS*	Buck	% Diff
<u>Retirement:</u>			
Post 65 DCR <Member>	2,273.30	2,286.38	-0.6%
Post 65 DCR <Spouse>	1,246.18	1,253.16	-0.6%
Contrib DCR <Member>	(227.33)	(228.64)	-0.6%
Contrib DCR <Spouse>	(124.62)	(125.32)	-0.6%
Post 65 Part D DCR <Member>	418.70	421.10	-0.6%
Post 65 Part D DCR <Spouse>	229.05	230.33	-0.6%
Total Retirement PVB	3,815.28	3,837.01	-0.6%

Actives	Test Case 2 - PERS PF		
<u>Basic Data:</u>		<u>Basic Data:</u>	
Sex	Male	Tier	4
Current Age	51.33	Full time %	100%
Current Credited Service	6.00		
Present Value of Benefits (PVB)	GRS*	Buck	% Diff
<u>Retirement:</u>			
Post 65 DCR <Member>	11,360.70	11,378.73	-0.2%
Post 65 DCR <Spouse>	10,777.43	10,792.34	-0.1%
Contrib DCR <Member>	(2,116.61)	(2,119.23)	-0.1%
Contrib DCR <Spouse>	(2,023.37)	(2,025.52)	-0.1%
Post 65 Part D DCR <Member>	2,038.09	1,902.57	7.1%
Post 65 Part D DCR <Spouse>	1,648.72	1,527.19	8.0%
Total Retirement PVB	21,684.95	21,456.08	1.1%

Actives	Test Case 3 - TRS		
<u>Basic Data:</u>		<u>Basic Data:</u>	
Sex	Female	Tier	3
Current Age	54.6093	Full time %	100%
Part-Time Credited Service	8.00		
Present Value of Benefits (PVB)	GRS*	Buck	% Diff
<u>Retirement:</u>			
Post 65 DCR <Member>	25,337.55	25,487.33	-0.6%
Post 65 DCR <Spouse>	13,559.57	13,640.36	-0.6%
Contrib DCR <Member>	(5,742.76)	(5,557.68)	3.3%
Contrib DCR <Spouse>	(3,076.27)	(2,976.93)	3.3%
Post 65 Part D DCR <Member>	4,003.08	4,071.49	-1.7%
Post 65 Part D DCR <Spouse>	2,139.18	2,175.93	-1.7%
Total Retirement PVB	36,220.34	36,840.50	-1.7%

Benefits - Buck Valuation Terminology	
<u>Retirement:</u>	
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.

ALASKA RETIREMENT MANAGEMENT BOARD
Actuarial Review of DCR Pension and Health Plans - June 30, 2019

Comparison of Present Value of Benefits - **DCR PERS Disability**

Retirees	Test Case 4 - PERS Other		
<u>Basic Data:</u>		<u>Basic Data:</u>	
Sex	Male	Tier	4
Current Age	53.186	Type	Disability
Annual Benefit	15,209.52	Stop date	4/30/2031
	GRS*	Buck	% Diff
PVB - Disability Benefit	119,415.56	119,200.00	0.2%
PVB - Post-retirement Medical Benefits	75,974.87	75,999.00	0.0%

Retirees	Test Case 5 - PERS PF		
<u>Basic Data:</u>		<u>Basic Data:</u>	
Sex	Male	Tier	4
Current Age	38.552	Type	Disability
Annual Benefit	33,252.12	Stop date	12/31/2045
	GRS*	Buck	% Diff
PVB - Disability Benefit	651,786.89	645,411.00	1.0%
PVB - Post-retirement Medical Benefits	56,356.16	57,245.00	-1.6%

* 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 FY2022 Contribution Rate Calculation and verified the contribution rate computation (as shown in pages 20 - 22 of the PERS valuation report and pages 12 - 14 of the TRS valuation report). We verified the calculation of the layered amortization amount for FY22.

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. Because layering was introduced in the calculation of the FY21 rate last year, we recommended that Buck include the details behind the amortization payment calculation and were pleased to see they are now doing that.

SECTION 9

REVIEW OF ACTUARIAL VALUATION REPORT

Review of Actuarial Valuation Report

VALUATION REPORT:

GRS reviewed the June 30, 2019 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.

GRS provided Buck with a list of recommendations that we believe will further improve communication and provide more consistency between the different reports. Some of these recommendations are listed below.

FOR ALL PLAN VALUATION REPORTS WE RECOMMEND THE FOLLOWING:

- Remove old historical accounting information that is out of date and no longer relevant
- In the gain/loss exhibits, provide further explanation for the large gains due to medical claims cost
- Provide more detail in the description of mortality tables
 - Indicate that they are 2006 rates
 - Indicate that they are benefit-weighted
 - Update pre and post 'termination' to either 'commencement' or 'retirement'
- Provide a breakdown of the males vs females in the participant counts
- Indicate that new amortization layers are based on the difference between actual and expected UAAL occurring during the year (rather than just the difference in UAAL)
- In the projection graphs, keep the colors consistent from graph to graph to improve readability

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
June 4, 2020





June 4, 2020

Mr. Bob Mitchell
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, 2019 valuations for the State of Alaska National Guard and Naval Militia Retirement System (NGNMRS) and Judicial Retirement System (JRS)

Dear Bob:

We have performed an actuarial review of the June 30, 2019 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 February 18, 2020 (re: Judicial Retirement System and National Guard and Naval Militia Retirement System Roll-Forward Actuarial Valuations as of June 30, 2019). 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, 2018 in the Roll-Forward letter match Buck's June 30, 2018 actuarial valuation reports. We confirmed that the results do match
2. Calculating the actuarial value of assets as of June 30, 2019 using the financial statements provided and the historical gains and losses shown in the June 30, 2018 report. We matched the results very closely.
3. Verifying Buck's June 30, 2019 Roll-Forward calculations using information from the most recent June 30, 2018 Buck actuarial valuations, the Roll Forward letter, and the financial statements for the fiscal year ending June 30, 2019. 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.

4. Auditing the contribution rate calculations using the past service base and payment information, and estimating the FY19 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 total salaries assumed for the upcoming year used in the calculations of the contribution rates.
 - Disclose the assumed average member contribution rate used in the calculations of the contribution rates.
 - 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 do feel it necessary to point out that roll forward approaches are more appropriate in situations where there have not been significant changes in assumptions, methods, or benefits. In the June 30, 2019, valuations for the other Alaska state plans, there were significant changes to the medical claims costs. We would recommend that Buck at the very least, comment on the materiality of these changes in assumptions and methods for the JRS health plan and determine whether a full valuation would be more appropriate.

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
Consultant



Bill Detweiler, ASA, FCA, MAAA
Senior Analyst



ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Acceptance of Actuarial Valuation Reports
PERS / TRS DB & DCR, JRS, NGNMRS

ACTION: X

DATE: June 18, 2020

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 March 19, April 30, and June 17, 2020:

- 1) an actuarial valuation of the Public Employees’ Retirement System as of June 30, 2019
- 2) an actuarial valuation of the Teachers’ Retirement System as of June 30, 2019
- 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, 2019
- 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, 2019
- 5) a roll-forward actuarial valuation of the Judicial Retirement System (JRS) as of June 30, 2019
- 6) a roll-forward actuarial valuation of the National Guard and Naval Militia Retirement System (NGNMRS) as of June 30, 2019

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

- 1) The medical trend assumption was updated as shown in Section 5.3 of the PERS and TRS actuarial valuation reports to reflect anticipated increases in costs based on recent survey data. The Cadillac Tax is no longer included in the plans’ liabilities since it was repealed as part of The Further Consolidated Appropriations Act, 2020 that was passed in December 2019.
- 2) 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.
- 3) The Normal Cost load for administrative expenses was updated based on the most recent two years of actual amounts paid from plan assets.

Gabriel Roeder Smith & Company (GRS), the Board’s actuary, has reviewed the above 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 reports for the Judicial and National Guard and Naval Militia retirement systems as of June 30, 2019.

State of Alaska

Public Employees' Retirement System



Actuarial Valuation
Report
As of June 30, 2019

April 2020

BUCK



April 2, 2020

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, 2019 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, 2019. 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, 2019.

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 is expected to increase to 100% after 25 years.

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 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. 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, 2019 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.

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, 2019 have been prepared. We have also prepared the member data tables shown in Section 4 of this report for the Statistical Section of the CAFR, and the summary of actuarial assumptions, solvency test, and analysis of financial experience for the Actuarial Section of the CAFR. Please see our separate GASB 67 and GASB 74 reports for other information needed for the CAFR.

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. See Section 6 of this report for further details regarding ASOP 51.

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.

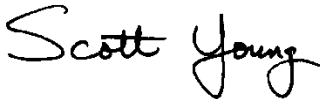
I am available to discuss this report with you at your convenience. I can be reached at 602-803-6174.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "D. J. Kershner".

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.

A handwritten signature in black ink, appearing to read "Scott Young".

Scott Young, FSA, EA, MAAA
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, 2019.

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.

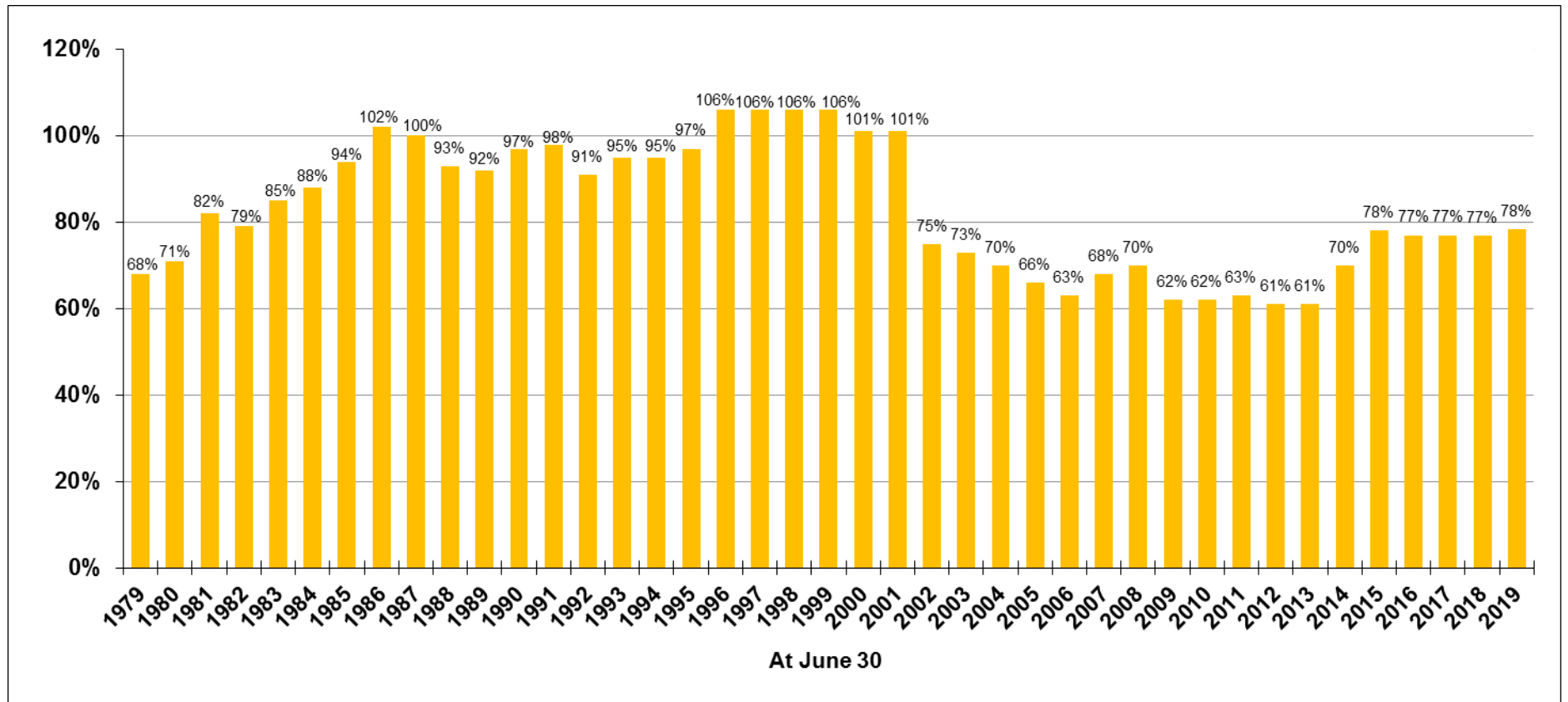
Retiree group benefits models necessarily rely on the use of approximations and estimates, and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements.

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)		2018	2019
Pension			
a. Actuarial Accrued Liability		\$ 14,606,033	\$ 15,039,180
b. Valuation Assets		<u>9,430,192</u>	<u>9,576,693</u>
c. Unfunded Actuarial Accrued Liability, (a) – (b)		\$ 5,175,841	\$ 5,462,487
d. Funded Ratio based on Valuation Assets, (b) ÷ (a)		64.6%	63.7%
e. Fair Value of Assets		\$ 9,306,675	\$ 9,489,405
f. Funded Ratio based on Fair Value of Assets, (e) ÷ (a)		63.7%	63.1%
Healthcare			
a. Actuarial Accrued Liability		\$ 7,658,104	\$ 7,151,694
b. Valuation Assets		<u>7,686,509</u>	<u>7,810,491</u>
c. Unfunded Actuarial Accrued Liability, (a) – (b)		\$ (28,405)	\$ (658,797)
d. Funded Ratio based on Valuation Assets, (b) ÷ (a)		100.4%	109.2%
e. Fair Value of Assets		\$ 7,612,001	\$ 7,767,692
f. Funded Ratio based on Fair Value of Assets, (e) ÷ (a)		99.4%	108.6%
Total			
a. Actuarial Accrued Liability		\$ 22,264,137	\$ 22,190,874
b. Valuation Assets		<u>17,116,701</u>	<u>17,387,184</u>
c. Unfunded Actuarial Accrued Liability, (a) – (b)		\$ 5,147,436	\$ 4,803,690
d. Funded Ratio based on Valuation Assets, (b) ÷ (a)		76.9%	78.4%
e. Fair Value of Assets		\$ 16,918,676	\$ 17,257,097
f. Funded Ratio based on Fair Value of Assets, (e) ÷ (a)		76.0%	77.8%

PERS Funded Ratio History (Based on Valuation Assets)



The key reasons for the change in 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 because there are no available financial instruments for purchase. Future experience is likely to vary from assumptions so there is a potential for future healthcare actuarial gains and 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 FY19 investment return based on fair value of assets was approximately 6.0% compared to the expected investment return of 7.38% (net of investment expenses of approximately 0.04%). This resulted in a market asset loss of approximately \$237 million. Due to the recognition of investment gains and losses over a 5-year period, the FY19 investment return based on actuarial value of assets was approximately 5.5%, which resulted in an actuarial asset loss of approximately \$320 million.

2. Salary Increases

Salary increases for continuing active members during FY19 were higher than expected based on the valuation assumptions, resulting in a liability loss of approximately \$60 million.

3. Demographic Experience

Section 4 provides statistics on active and inactive participants. The number of active participants decreased 9.5%, from 13,434 at June 30, 2018 to 12,152 at June 30, 2019 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 52.52 to 52.84, and average credited service increased from 17.21 to 17.80 years.

The number of benefit recipients increased 2.4%, from 35,454 to 36,310 and their average age increased from 69.85 to 70.29. The number of vested terminated participants decreased 2.8%, from 5,660 to 5,499. Their average age increased from 52.56 to 53.06.

The overall effect of the demographic experience during FY19 was an actuarial gain of approximately \$14.6 million (pension) and \$26.9¹ million (healthcare).

4. COLA/PRPA Experience

The cost-of-living increases and postretirement pension adjustments for benefit recipients during FY19 were more than expected based on the valuation assumptions, resulting in a liability loss of approximately \$8.4 million.

5. Medical Claims Experience and Assumptions

As described in Section 5.2, recent medical claims experience and changes in healthcare enrollment data provided to us for the June 30, 2019 valuation generated an actuarial gain of approximately \$696 million (this amount includes a \$54 million gain due to the Cadillac Tax). Beginning January 1, 2019, Rx benefits were provided through a new contract with Optum. This change in vendors resulted in lower actual (and future expected) claims and higher rebates. Approximately \$666 million of the \$696 million gain in FY19 was attributable to Rx experience, the majority of which was due to the change in Rx vendors.

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. Retired member contribution trend rates were updated to reflect the ongoing shift in population from pre-Medicare to Medicare-eligible and a projection of expected future retiree contributions reflecting the 10% decrease

¹ Includes the effect of changes in dependent coverage elections and part B only experience.

from 2019 to 2020. The Further Consolidated Appropriations Act, 2020 that was signed in December 2019 made several changes, including the repeal of the Cadillac Tax. The repeal of the Cadillac Tax reduced the plan's liabilities as of June 30, 2019 by approximately \$36.3M. The amounts included in the Normal Cost for administrative expenses were updated based on the most recent two years of actual administrative expenses paid from plan assets.

8. Changes in Benefit Provisions Since the Prior Valuation

There have been no changes in the PERS benefit provisions since the prior valuation.

Comparative Summary of Key Actuarial Valuation Results

Pension Employer/State Contribution Rates for Fiscal Year:		2021	2022
a.	Normal Cost Rate Net of Member Contributions	2.88%	2.58%
b.	Past Service Rate	<u>17.78%</u>	<u>17.69%</u>
c.	Total Employer/State Contribution Rate, (a) + (b), not less than (a) ¹	20.66%	20.27%

Healthcare Employer/State Contribution Rates for Fiscal Year:		2021	2022
a.	Normal Cost Rate	3.82%	3.12%
b.	Past Service Rate	<u>0.45%</u>	<u>(2.15%)</u>
c.	Total Employer/State Contribution Rate, (a) + (b), not less than (a) ¹	4.27%	3.12%

Total Employer/State Contribution Rates for Fiscal Year:		2021	2022
a.	Normal Cost Rate Net of Member Contributions	6.70%	5.70%
b.	Past Service Rate	<u>18.23%</u>	<u>17.69%</u>
c.	Total Employer/State Contribution Rate (a) + (b) ¹	24.93%	23.39%
d.	Board Adopted Total Employer/State Contribution Rate	24.93%	TBD
e.	Defined Contribution Retirement (DCR) Rate Paid by Employers	<u>5.92%</u>	<u>6.10%</u>
f.	Board Adopted Total Rate, Including DCR Rate Paid by Employers, (d) + (e)	30.85%	TBD

Contribution rates are based on total (DB and DCR) payroll. The contribution rates shown above for FY22 are estimated assuming no actuarial gains/losses during FY20 and FY21. Actual FY22 contribution rates will be adopted reflecting FY20 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.

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, 2018 and June 30, 2019 based on DB and DCR payroll combined:

	Pension	Healthcare	Total
1. Total Employer/State contribution rate as of June 30, 2018	19.85%	4.74%	24.59%
2. Change due to:			
a. Health claims experience	N/A	(2.39%)	(2.39%)
b. Salary increases	0.16%	N/A	0.16%
c. Investment experience	0.50%	0.38%	0.88%
d. Demographic experience and miscellaneous ¹	(0.45%)	1.16%	0.71%
e. FY19 Contribution shortfall/(excess)	0.11%	0.02%	0.13%
f. Assumption changes	0.00%	0.00%	0.00%
g. Total change, (a) + (b) + (c) + (d) + (e) + (f)	0.33%	(0.83%)	(0.50%)
3. Total Employer/State contribution rate as of June 30, 2019, (1) + (2g)	20.17%	3.91%	24.08%

The following table shows the gain/(loss) on actuarial accrued liability as of June 30, 2019 (\$'s in 000's):

	Pension	Healthcare	Total
Retirement Experience	\$ (3,126)	\$ 1,098	\$ (2,028)
Termination Experience	6,714	(946)	5,768
Active Mortality Experience	8,209	1,977	10,186
Inactive Mortality Experience	4,250	999	5,249
Disability Experience	(1,435)	(981)	(2,416)
Rehires	(13,297)	10,708	(2,589)
Salary Increases	(59,955)	N/A	(59,955)
Alaska COLA	8,345	N/A	8,345
PRPA	(16,716)	N/A	(16,716)
Medical Claims Experience ²	N/A	642,081	642,081
Cadillac Tax – Medical Claims Experience	N/A	54,237	54,237
Cadillac Tax – Repeal	N/A	36,301	36,301
Modified Part B Only Experience	N/A	6,164	6,164
Dependent Coverage Elections	N/A	18,580	18,580
FY20 contributions reduced by 10% and revised trend ³	N/A	(14,270)	(14,270)
Programming Changes ⁴	N/A	11,585	11,585
Miscellaneous ⁵	(8,534)	7,749	(785)
Total	\$ (75,545)	\$ 775,282	\$ 699,737

¹ Includes the effects of census data changes between the two valuations.

² Beginning January 1, 2019, Rx benefits were provided through a new contract with Optum. This change in vendors resulted in lower actual (and future expected) claims and higher rebates. Approximately 95% of the gain shown in this table was due to Rx experience, the majority of which was due to the change in Rx vendors.

³ Based on a projection of future expected retiree contributions, trend was revised to be 0% for the next 3 years and 4% per year thereafter.

⁴ Added Part D benefits for deferred retirees.

⁵ Includes the effects of various data changes that are typical when new census data is received for the annual valuation, the effects of the differences between expected and actual benefit payments, and 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, 2019 due to rehires during the most recent plan year, and (ii) the load that was added to the June 30, 2018 Normal Cost based on the rehire load assumption used in the June 30, 2018 valuation. The development of the FY19 rehire gain/(loss) amount is shown in the table below (\$'s in 000's):

	Pension	Healthcare	Total
1. Increase in Actuarial Accrued Liability at June 30, 2019 due to Rehires	\$ 38,747	\$ 5,468	\$ 44,215
2. June 30, 2018 Normal Cost Rehire Load, with interest to June 30, 2019	\$ 25,450	\$ 16,176	\$ 41,626
3. Rehire Gain/(Loss), (2) – (1)	\$ (13,297)	\$ 10,708	\$ (2,589)

Section 1: Actuarial Funding Results

Section 1.1: Actuarial Liabilities and Normal Cost

Peace Officer/Firefighter (\$'s in 000's)

As of June 30, 2019	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Retirement Benefits	\$ 939,467	\$ 821,094
Termination Benefits	14,833	4,854
Disability Benefits	1,989	(996)
Death Benefits	10,468	6,592
Return of Contributions	1,735	(4,931)
Medical and Prescription Drug Benefits	403,117	336,045
Medicare Part D Subsidy	(34,438)	(28,768)
Indebtedness	(4,913)	(4,913)
Subtotal	\$ 1,332,258	\$ 1,128,977
Inactive Members		
Not Vested	\$ 2,294	\$ 2,294
Vested Terminations		
- Retirement Benefits	33,268	33,268
- Medical and Prescription Drug Benefits	98,506	98,506
- Medicare Part D Subsidy	(9,681)	(9,681)
- Indebtedness	(524)	(524)
Retirees & Beneficiaries		
- Retirement Benefits	1,565,096	1,565,096
- Medical and Prescription Drug Benefits	554,635	554,635
- Medicare Part D Subsidy	(73,627)	(73,627)
Subtotal	\$ 2,169,967	\$ 2,169,967
Total	\$ 3,502,225	\$ 3,298,944
Total Pension	\$ 2,563,713	\$ 2,421,834
Total Medical, Net of Part D Subsidy	\$ 938,512	\$ 877,110
Total Medical, Gross of Part D Subsidy	\$ 1,056,258	\$ 989,186

Peace Officer/Firefighter (\$'s in 000's)

As of June 30, 2019	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
By Tier		
Tier 1		
- Pension	\$ 1,045,675	\$ 1,044,284
- Medical, Net of Part D Subsidy	310,089	309,304
Tier 2		
- Pension	664,294	644,752
- Medical, Net of Part D Subsidy	263,996	256,450
Tier 3		
- Pension	853,744	732,798
- Medical, Net of Part D Subsidy	364,427	311,356
Total	\$ 3,502,225	\$ 3,298,944

As of June 30, 2019	Normal Cost
Active Members	
Retirement Benefits	\$ 20,338
Termination Benefits	1,774
Disability Benefits	529
Death Benefits	710
Return of Contributions	1,170
Medical and Prescription Drug Benefits	11,222
Medicare Part D Subsidy	(973)
Rehire Assumption (Pension)	4,603
Rehire Assumption (Medical)	1,752
Administrative Expenses (Pension)	1,407
Administrative Expenses (Medical)	511
Total	\$ 43,043
Total Pension	\$ 30,531
Total Medical, Net of Part D Subsidy	\$ 12,512
Total Medical, Gross of Part D Subsidy	\$ 13,485
By Tier	
Tier 1	
- Pension	\$ 584
- Medical, Net of Part D Subsidy	319
Tier 2	
- Pension	5,809
- Medical, Net of Part D Subsidy	2,131
Tier 3	
- Pension	24,138
- Medical, Net of Part D Subsidy	10,062
Total	\$ 43,043

Section 1.1: Actuarial Liabilities and Normal Cost

Others (\$'s in 000's)

As of June 30, 2019	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Retirement Benefits	\$ 3,674,545	\$ 3,310,952
Termination Benefits	247,320	137,846
Disability Benefits	18,908	5,067
Death Benefits	51,825	39,961
Return of Contributions	16,214	(34,225)
Medical and Prescription Drug Benefits	2,196,562	1,766,876
Medicare Part D Subsidy	(274,706)	(227,249)
Indebtedness	<u>(43,850)</u>	<u>(43,850)</u>
Subtotal	\$ 5,886,818	\$ 4,955,378
Inactive Members		
Not Vested	\$ 73,314	\$ 73,314
Vested Terminations		
- Retirement Benefits	629,468	629,468
- Medical and Prescription Drug Benefits	959,991	959,991
- Medicare Part D Subsidy	(103,660)	(103,660)
- Indebtedness	(12,619)	(12,619)
Retirees & Beneficiaries		
- Retirement Benefits	8,511,432	8,511,432
- Medical and Prescription Drug Benefits	4,575,948	4,575,948
- Medicare Part D Subsidy	<u>(697,322)</u>	<u>(697,322)</u>
Subtotal	\$ 13,936,552	\$ 13,936,552
Total	\$ 19,823,370	\$ 18,891,930
Total Pension	\$ 13,166,557	\$ 12,617,346
Total Medical, Net of Part D Subsidy	\$ 6,656,813	\$ 6,274,584
Total Medical, Gross of Part D Subsidy	\$ 7,732,501	\$ 7,302,815

Others (\$'s in 000's)

As of June 30, 2019	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
By Tier		
Tier 1		
- Pension	\$ 6,346,268	\$ 6,309,542
- Medical, Net of Part D Subsidy	2,671,152	2,636,032
Tier 2		
- Pension	3,661,983	3,537,823
- Medical, Net of Part D Subsidy	1,958,353	1,870,865
Tier 3		
- Pension	3,158,306	2,769,981
- Medical, Net of Part D Subsidy	2,027,308	1,767,687
Total	\$ 19,823,370	\$ 18,891,930

As of June 30, 2019	Normal Cost
Active Members	
Retirement Benefits	\$ 65,622
Termination Benefits	16,611
Disability Benefits	2,234
Death Benefits	2,092
Return of Contributions	8,105
Medical and Prescription Drug Benefits	73,052
Medicare Part D Subsidy	(8,170)
Rehire Assumption (Pension)	17,768
Rehire Assumption (Medical)	11,088
Administrative Expenses (Pension)	5,432
Administrative Expenses (Medical)	3,233
Total	\$ 197,067
Total Pension	\$ 117,864
Total Medical, Net of Part D Subsidy	\$ 79,203
Total Medical, Gross of Part D Subsidy	\$ 87,373
By Tier	
Tier 1	
- Pension	\$ 12,920
- Medical, Net of Part D Subsidy	11,864
Tier 2	
- Pension	30,524
- Medical, Net of Part D Subsidy	20,305
Tier 3	
- Pension	74,420
- Medical, Net of Part D Subsidy	47,034
Total	\$ 197,067

Section 1.1: Actuarial Liabilities and Normal Cost

All Members (\$'s in 000's)

As of June 30, 2019	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Retirement Benefits	\$ 4,614,012	\$ 4,132,046
Termination Benefits	262,153	142,700
Disability Benefits	20,897	4,071
Death Benefits	62,293	46,553
Return of Contributions	17,949	(39,156)
Medical and Prescription Drug Benefits	2,599,679	2,102,921
Medicare Part D Subsidy	(309,144)	(256,017)
Indebtedness	<u>(48,763)</u>	<u>(48,763)</u>
Subtotal	\$ 7,219,076	\$ 6,084,355
Inactive Members		
Not Vested	\$ 75,608	\$ 75,608
Vested Terminations		
- Retirement Benefits	662,736	662,736
- Medical and Prescription Drug Benefits	1,058,497	1,058,497
- Medicare Part D Subsidy	(113,341)	(113,341)
- Indebtedness	(13,143)	(13,143)
Retirees & Beneficiaries		
- Retirement Benefits	10,076,528	10,076,528
- Medical and Prescription Drug Benefits	5,130,583	5,130,583
- Medicare Part D Subsidy	<u>(770,949)</u>	<u>(770,949)</u>
Subtotal	\$ 16,106,519	\$ 16,106,519
Total	\$ 23,325,595	\$ 22,190,874
Total Pension	\$ 15,730,270	\$ 15,039,180
Total Medical, Net of Part D Subsidy	\$ 7,595,325	\$ 7,151,694
Total Medical, Gross of Part D Subsidy	\$ 8,788,759	\$ 8,292,001

All Members (\$'s in 000's)

As of June 30, 2019	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
By Tier		
Tier 1		
- Pension	\$ 7,391,943	\$ 7,353,826
- Medical, Net of Part D Subsidy	2,981,241	2,945,336
Tier 2		
- Pension	4,326,277	4,182,575
- Medical, Net of Part D Subsidy	2,222,349	2,127,315
Tier 3		
- Pension	4,012,050	3,502,779
- Medical, Net of Part D Subsidy	2,391,735	2,079,043
Total	\$ 23,325,595	\$ 22,190,874

As of June 30, 2019	Normal Cost
Active Members	
Retirement Benefits	\$ 85,960
Termination Benefits	18,385
Disability Benefits	2,763
Death Benefits	2,802
Return of Contributions	9,275
Medical and Prescription Drug Benefits	84,274
Medicare Part D Subsidy	(9,143)
Rehire Assumption (Pension)	22,371
Rehire Assumption (Medical)	12,840
Administrative Expenses (Pension)	6,839
Administrative Expenses (Medical)	3,744
Total	\$ 240,110
Total Pension	\$ 148,395
Total Medical, Net of Part D Subsidy	\$ 91,715
Total Medical, Gross of Part D Subsidy	\$ 100,858
By Tier	
Tier 1	
- Pension	\$ 13,504
- Medical, Net of Part D Subsidy	12,183
Tier 2	
- Pension	36,333
- Medical, Net of Part D Subsidy	22,436
Tier 3	
- Pension	98,558
- Medical, Net of Part D Subsidy	57,096
Total	\$ 240,110

Section 1.2: Actuarial Contributions as of June 30, 2019

Actuarial Contributions as of June 30, 2019 - Peace Officer/Firefighter (\$'s in 000's)

Normal Cost Rate	Pension	Healthcare	Total
1. Total Normal Cost	\$ 30,531	\$ 12,512	\$ 43,043
2. DB Rate Payroll Projected for FY20	169,949	169,949	169,949
3. DCR Rate Payroll Projected for FY20	180,262	180,262	180,262
4. Total Rate Payroll Projected for FY20	350,211	350,211	350,211
5. Normal Cost Rate			
a. Based on DB Rate Payroll, (1) / (2)	17.97%	7.36%	25.33%
b. Based on Total Rate Payroll, (1) / (4)	8.72%	3.57%	12.29%
6. Average Member Contribution Rate	3.64%	0.00%	3.64%
7. Employer Normal Cost, (5)(b) - (6)	5.08%	3.57%	8.65%

Past Service Rate			
1. Actuarial Accrued Liability	\$ 2,421,834	\$ 877,110	\$ 3,298,944
2. Valuation Assets ¹	1,542,183	957,907	2,500,090
3. Unfunded Actuarial Accrued Liability, (1) - (2)	\$ 879,651	\$ (80,797)	\$ 798,854
4. Funded Ratio, (2) / (1)	63.7%	109.2%	75.8%
5. Past Service Cost Amortization Payment	63,514	(5,455)	58,059
6. Total Rate Payroll Projected for FY20	350,211	350,211	350,211
7. Past Service Rate, (5) / (6)	18.14%	(1.56%)	18.14%
Total Employer / State Contribution Rate, not less than Normal Cost Rate	23.22%	3.57%	26.79%

Normal Cost Rate by Tier (Total Employer and Member)²

Tier 1	19.91%	10.88%	30.79%
Tier 2	17.67%	6.48%	24.15%
Tier 3	18.00%	7.50%	25.50%

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.

Schedule of Past Service Cost Amortizations - Peace Officer/Firefighter Pension (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Amount	06/30/2018	20	\$ 731,232	\$ 729,116	\$ 53,663
Experience Study and EGWP	06/30/2018	24	88,162	88,555	\$ 5,849
FY19 (Gain)/Loss	06/30/2019	25	61,980	61,980	\$ 4,002
Total				\$ 879,651	\$ 63,514

Schedule of Past Service Cost Amortizations - Peace Officer/Firefighter Healthcare (\$'s in 000's)

Layer	Amortization		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Amount	06/30/2018	20	\$ (30,991)	\$ (30,901)	\$ (2,274)
Experience Study and EGWP	06/30/2018	24	27,556	27,679	1,828
FY19 (Gain)/Loss	06/30/2019	25	(77,575)	(77,575)	(5,009)
Total				\$ (80,797)	\$ (5,455)

Schedule of Past Service Cost Amortizations - Peace Officer/Firefighter Total (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Amount	06/30/2018	20	\$ 700,241	\$ 698,215	\$ 51,389
Experience Study and EGWP	06/30/2018	24	115,718	116,234	7,677
FY19 (Gain)/Loss	06/30/2019	25	(15,595)	(15,595)	(1,007)
Total				\$ 798,854	\$ 58,059

Section 1.2: Actuarial Contributions as of June 30, 2019

Actuarial Contributions as of June 30, 2019 - Others (\$'s in 000's)

Normal Cost Rate	Pension	Healthcare	Total
1. Total Normal Cost	\$ 117,864	\$ 79,203	\$ 197,067
2. DB Rate Payroll Projected for FY20	834,518	834,518	834,518
3. DCR Rate Payroll Projected for FY20	1,162,577	1,162,577	1,162,577
4. Total Rate Payroll Projected for FY20	1,997,095	1,997,095	1,997,095
5. Normal Cost Rate			
a. Based on DB Rate Payroll, (1) / (2)	14.12%	9.49%	23.61%
b. Based on Total Rate Payroll, (1) / (4)	5.90%	3.97%	9.87%
6. Average Member Contribution Rate	2.86%	0.00%	2.86%
7. Employer Normal Cost, (5)(b) - (6)	3.04%	3.97%	7.01%

Past Service Rate			
1. Actuarial Accrued Liability	\$ 12,617,346	\$ 6,274,584	\$ 18,891,930
2. Valuation Assets ¹	8,034,510	6,852,584	14,887,094
3. Unfunded Actuarial Accrued Liability, (1) - (2)	\$ 4,582,836	\$ (578,000)	\$ 4,004,836
4. Funded Ratio, (2) / (1)	63.7%	109.2%	78.8%
5. Past Service Cost Amortization Payment	331,629	(37,715)	293,914
6. Total Rate Payroll Projected for FY20	1,997,095	1,997,095	1,997,095
7. Past Service Rate, (5) / (6)	16.61%	(1.89%)	16.61%
Total Employer / State Contribution Rate, not less than Normal Cost Rate	19.65%	3.97%	23.62%

Normal Cost Rate by Tier (Total Employer and Member)²

Tier 1	17.42%	16.00%	33.42%
Tier 2	13.16%	8.75%	21.91%
Tier 3	14.08%	8.90%	22.98%

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.

Schedule of Past Service Cost Amortizations - Others Pension (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Amount	06/30/2018	20	\$ 3,889,167	\$ 3,877,911	\$ 285,415
Experience Study and EGWP	06/30/2018	24	467,280	469,366	31,003
FY19 (Gain)/Loss	06/30/2019	25	235,559	235,559	15,211
Total				\$ 4,582,836	\$ 331,629

Schedule of Past Service Cost Amortizations - Others Healthcare (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Amount	06/30/2018	20	\$ (47,263)	\$ (47,127)	\$ (3,469)
Experience Study and EGWP	06/30/2018	24	22,293	22,392	1,479
FY19 (Gain)/Loss	06/30/2019	25	(553,265)	(553,265)	(35,725)
Total				\$ (578,000)	\$ (37,715)

Schedule of Past Service Cost Amortizations - Others Total (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Amount	06/30/2018	20	\$ 3,841,904	\$ 3,830,784	\$ 281,946
Experience Study and EGWP	06/30/2018	24	489,573	491,758	32,482
FY19 (Gain)/Loss	06/30/2019	25	(317,706)	(317,706)	(20,514)
Total				\$ 4,004,836	\$ 293,914

Section 1.2: Actuarial Contributions as of June 30, 2019

Actuarial Contributions as of June 30, 2019 - All Members (\$'s in 000's)

Normal Cost Rate	Pension	Healthcare	Total
1. Total Normal Cost	\$ 148,395	\$ 91,715	\$ 240,110
2. DB Rate Payroll Projected for FY20	1,004,467	1,004,467	1,004,467
3. DCR Rate Payroll Projected for FY20	1,342,839	1,342,839	1,342,839
4. Total Rate Payroll Projected for FY20	2,347,306	2,347,306	2,347,306
5. Normal Cost Rate			
a. Based on DB Rate Payroll, (1) / (2)	14.77%	9.13%	23.90%
b. Based on Total Rate Payroll, (1) / (4)	6.32%	3.91%	10.23%
6. Average Member Contribution Rate ¹	2.98%	0.00%	2.98%
7. Employer Normal Cost, (5)(b) - (6)	3.34%	3.91%	7.25%

Past Service Rate			
1. Actuarial Accrued Liability	\$ 15,039,180	\$ 7,151,694	\$ 22,190,874
2. Valuation Assets	9,576,693	7,810,491	17,387,184
3. Unfunded Actuarial Accrued Liability, (1) - (2)	\$ 5,462,487	\$ (658,797)	\$ 4,803,690
4. Funded Ratio, (2) / (1)	63.7%	109.2%	78.4%
5. Past Service Cost Amortization Payment	395,143	(43,170)	351,973
6. Total Rate Payroll Projected for FY20	2,347,306	2,347,306	2,347,306
7. Past Service Rate, (5) / (6)	16.83%	(1.84%)	16.83%
Total Employer / State Contribution Rate, not less than Normal Cost Rate	20.17%	3.91%	24.08%

Normal Cost Rate by Tier (Total Employer and Member)²

Tier 1	17.51%	15.80%	33.31%
Tier 2	13.72%	8.47%	22.19%
Tier 3	14.88%	8.62%	23.50%

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.

Schedule of Past Service Cost Amortizations - All Members Pension (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Amount	06/30/2018	20	\$ 4,620,399	\$ 4,607,027	\$ 339,078
Experience Study and EGWP	06/30/2018	24	555,442	557,921	36,852
FY19 (Gain)/Loss	06/30/2019	25	297,539	297,539	19,213
Total				\$ 5,462,487	\$ 395,143

Schedule of Past Service Cost Amortizations - All Members Healthcare (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Amount	06/30/2018	20	\$ (78,254)	\$ (78,028)	\$ (5,743)
Experience Study and EGWP	06/30/2018	24	49,849	50,071	3,307
FY19 (Gain)/Loss	06/30/2019	25	(630,840)	(630,840)	(40,734)
Total				\$ (658,797)	\$ (43,170)

Schedule of Past Service Cost Amortizations - All Members Total (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Amount	06/30/2018	20	\$ 4,542,145	\$ 4,528,999	\$ 333,335
Experience Study and EGWP	06/30/2018	24	605,291	607,992	40,159
FY19 (Gain)/Loss	06/30/2019	25	(333,301)	(333,301)	(21,521)
Total				\$ 4,803,690	\$ 351,973

Section 1.3: Roll Forward Contribution Rate Calculation for FY20 (\$'s in 000's)

	Pension	Healthcare	Total
1. Liability Roll Forward			
a. Actuarial Accrued Liability as of June 30, 2019	\$ 15,039,180	\$ 7,151,694	\$ 22,190,874
b. Normal Cost	141,556	87,971	229,527
c. Interest on (a) and (b) at 7.38%	1,120,338	534,287	1,654,625
d. Estimated Benefit Payments	(904,085)	(398,844)	(1,302,929)
e. Interest on (d) at 7.38%, adjusted for timing	(35,551)	(14,455)	(50,006)
f. Expected Actuarial Accrued Liability as of June 30, 2020	\$ 15,361,438	\$ 7,360,653	\$ 22,722,091
g. Projected Normal Cost	127,518	79,403	206,921
h. Interest on (f) and (g) at 7.38%	1,143,085	549,076	1,692,161
i. Estimated Benefit Payments	(953,247)	(421,016)	(1,374,263)
j. Interest on (i) at 7.38%, adjusted for timing	(37,484)	(15,259)	(52,743)
k. Expected Actuarial Accrued Liability as of June 30, 2021	\$ 15,641,310	\$ 7,552,857	\$ 23,194,167
2. Asset Roll Forward			
a. Actuarial Value of Assets as of June 30, 2019	\$ 9,576,693	\$ 7,810,491	\$ 17,387,184
b. Interest on (a) at 7.38%	706,760	576,414	1,283,174
c. Employee Contributions	76,365	0	76,365
d. Employer Contributions	295,761	92,953	388,714
e. State Assistance Contributions	159,055	0	159,055
f. Interest on (c), (d) and (e) at 7.38%, adjusted for timing*	25,225	3,369	28,594
g. Estimated Benefit Payments	(904,085)	(398,844)	(1,302,929)
h. Administrative Expenses	(6,839)	(3,744)	(10,583)
i. AVA Adjustments	(97,840)	(65,909)	(163,749)
j. Interest on (g) and (h) at 7.38%, adjusted for timing	(35,798)	(14,591)	(50,389)
k. Expected Actuarial Value of Assets as of June 30, 2020	\$ 9,795,297	\$ 8,000,139	\$ 17,795,436
l. Interest on (k) at 7.38%	722,893	590,410	1,313,303
m. Employee Contributions	70,772	0	70,772
n. Employer Contributions	284,407	95,748	380,155
o. State Assistance Contributions**	203,585	0	203,585
p. Interest on (m), (n) and (o) at 7.38%, adjusted for timing*	27,897	3,470	31,367
q. Estimated Benefit Payments	(953,247)	(421,016)	(1,374,263)
r. Administrative Expenses	(6,210)	(3,404)	(9,614)
s. AVA Adjustments	55,343	55,677	111,020
t. Interest on (q) and (r) at 7.38%, adjusted for timing	(37,709)	(15,382)	(53,091)
u. Expected Actuarial Value of Assets as of June 30, 2021	\$ 10,163,028	\$ 8,305,642	\$ 18,468,670
3. Expected Unfunded Actuarial Accrued Liability as of June 30, 2021, 1(k) - 2(s)	\$ 5,478,282	\$ (752,785)	\$ 4,725,497

* Employee and Employer Contributions are paid throughout the year. State Assistance Contributions are assumed to be paid on July 1, 2019 for FY20, and July 1, 2020 for FY21.

** The FY20 State Assistance Contribution is expected to be contributed 100% to pension.

	Pension	Healthcare	Total
4. Expected Annual Rate Payroll for FY22			
a. Defined Benefit Members			\$ 842,859
a. Defined Contribution Retirement Members			1,543,010
c. Total Rate Payroll			\$ 2,385,869
5. Expected FY22 Contribution Rate Calculation			
a. Projected Normal Cost for FY22	\$ 120,047	\$ 74,512	\$ 194,559
b. Projected Normal Cost Rate for FY22	5.03%	3.12%	8.15%
c. Expected Member Contribution Rate for FY22	(2.45%)	0.00%	(2.45%)
d. Expected Employer Normal Cost Rate for FY22	2.58%	3.12%	5.70%
e. Expected Unfunded Liability as of June 30, 2021	\$ 5,478,282	\$ (752,785)	\$ 4,725,497
f. FY22 Layered Amortization of Expected Unfunded Liability	421,969	(51,393)	370,576
g. Expected Past Service Cost Contribution Rate for FY22	17.69%	(2.15%)	17.69%
h. Expected Total Contribution Rate for FY22	20.27%	3.12%	23.39%

The components of the expected FY22 amortization amounts are shown below (totals may not add due to rounding):

Expected FY22 Schedule of Past Service Cost Amortizations - Pension (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment for 2022
	Date Created	Years Remaining as of June 30, 2021	Initial	Outstanding as of June 30, 2021	
Initial Amount	06/30/2018	18	\$ 4,620,399	\$ 4,547,029	\$ 357,984
Experience Study	06/30/2018	22	555,442	560,157	38,907
(Gain)/Loss FY19	06/30/2019	23	297,539	299,724	20,284
Expected (Gain)/Loss FY20	06/30/2020	24	124,827	125,384	8,282
Expected (Gain)/Loss FY21	06/30/2021	25	(54,012)	(54,012)	(3,488)
Total				\$ 5,478,282	\$ 421,969

Expected FY22 Schedule of Past Service Cost Amortizations - Healthcare (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment for 2022
	Date Created	Years Remaining as of June 30, 2021	Initial	Outstanding as of June 30, 2021	
Initial Amount	06/30/2018	18	\$ (78,254)	\$ (77,012)	\$ (6,063)
Experience Study and EGWP	06/30/2018	22	49,849	50,272	3,492
(Gain)/Loss FY19	06/30/2019	23	(630,840)	(635,476)	(43,006)
Expected (Gain)/Loss FY20	06/30/2020	24	21,574	21,671	1,431
Expected (Gain)/Loss FY21	06/30/2021	25	(112,240)	(112,240)	(7,247)
Total				\$ (752,785)	\$ (51,393)

Expected FY22 Schedule of Past Service Cost Amortizations - Total (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment for 2022
	Date Created	Years Remaining as of June 30, 2021	Initial	Outstanding as of June 30, 2021	
Initial Amount	06/30/2018	18	\$ 4,542,145	\$ 4,470,017	\$ 351,921
Experience Study and EGWP	06/30/2018	22	605,291	610,429	42,399
(Gain)/Loss FY19	06/30/2019	23	(333,301)	(335,752)	(22,722)
Expected (Gain)/Loss FY20	06/30/2020	24	146,401	147,055	9,713
Expected (Gain)/Loss FY21	06/30/2021	25	(166,252)	(166,252)	(10,735)
Total				\$ 4,725,497	\$ 370,576

Section 1.4: Actuarial Gain/(Loss) for FY19 (\$'s in 000's)

	Pension	Healthcare	Total
1. Expected Actuarial Accrued Liability			
a. Actuarial Accrued Liability as of June 30, 2018	\$ 14,606,033	\$ 7,658,104	\$ 22,264,137
b. Normal Cost	149,974	103,208	253,182
c. Interest on (a) and (b) at 7.38%	1,088,993	572,785	1,661,778
d. Medicare Part D Subsidy and EGWP	0	27,547	27,547
e. Benefit Payments	(837,381)	(420,429)	(1,257,810)
f. Refund of Contributions	(10,638)	0	(10,638)
g. Interest on (d), (e) and (f) at 7.38%, adjusted for timing	(33,346)	(14,239)	(47,585)
h. Assumptions/Methods Changes	-	-	-
i. Expected Actuarial Accrued Liability as of June 30, 2019 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	\$ 14,963,635	\$ 7,926,976	\$ 22,890,611
2. Actual Actuarial Accrued Liability as of June 30, 2019	15,039,180	7,151,694	22,190,874
3. Liability Gain/(Loss), (1)(i) - (2)	\$ (75,545)	\$ 775,282	\$ 699,737
4. Expected Actuarial Asset Value			
a. Actuarial Value of Assets as of June 30, 2018	\$ 9,430,192	\$ 7,686,509	\$ 17,116,701
b. Interest on (a) at 7.38%	695,948	567,264	1,263,212
c. Employee Contributions	79,609	0	79,609
d. Employer Contributions	283,098	102,266	385,364
e. State Assistance Contributions	135,360	0	135,360
f. Medicare Part D Subsidy and EGWP	0	27,547	27,547
g. Interest on (c), (d), (e) and (f) at 7.38%, adjusted for timing	23,135	4,705	27,840
h. Benefit Payments	(837,381)	(420,429)	(1,257,810)
i. Refund of Contributions	(10,638)	0	(10,638)
j. Administrative Expenses	(7,429)	(3,665)	(11,094)
k. Interest on (h), (i) and (j) at 7.38%, adjusted for timing	(33,615)	(15,371)	(48,986)
l. Expected Actuarial Asset Value as of June 30, 2019 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h) + (i) + (j) + (k)	\$ 9,758,279	\$ 7,948,826	\$ 17,707,105
5. Actual Actuarial Asset Value as of June 30, 2019	9,576,693	7,810,491	17,387,184
6. Actuarial Asset Value Gain/(Loss), (5) - (4)(l)	\$ (181,586)	\$ (138,335)	\$ (319,921)
7. Total Actuarial Gain/(Loss), (3) + (6)	\$ (257,131)	\$ 636,947	\$ 379,816
8. Contribution Gain/(Loss)	\$ (40,106)	\$ (6,996)	\$ (47,102)
9. Administrative Expense Gain/(Loss)	\$ (302)	\$ 889	\$ 587
10. FY19 Gain/(Loss), (7) + (8) + (9)	\$ (297,539)	\$ 630,840	\$ 333,301

Section 1.5: Development of Change in Unfunded Liability During FY19 (\$'s in 000's)

	Pension	Healthcare	Total
1. 2018 Unfunded Liability	\$ 5,175,841	\$ (28,405)	\$ 5,147,436
a. Interest on Unfunded Liability at 7.38%	381,977	(2,096)	379,881
b. Normal Cost	149,974	103,208	253,182
c. Employee Contributions	(79,609)	0	(79,609)
d. Employer Contributions	(283,098)	(102,266)	(385,364)
e. State Assistance Contributions	(135,360)	0	(135,360)
f. Administrative Expenses	7,429	3,665	11,094
g. Interest on (b), (c), (d), (e) and (f) at 7.38%, adjusted for timing	(11,798)	4,044	(7,754)
h. Assumptions/Methods Changes	<u>0</u>	<u>0</u>	<u>0</u>
i. Expected Change in Unfunded Liability During FY19 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	\$ 29,515	\$ 6,555	\$ 36,070
2. Expected 2019 Unfunded Liability, (1) + (1)(i)	\$ 5,205,356	\$ (21,850)	\$ 5,183,506
a. Liability (Gain)/Loss During FY19	\$ 75,545	\$ (775,282)	\$ (699,737)
b. Actuarial Assets (Gain)/Loss During FY19	<u>181,586</u>	<u>138,335</u>	<u>319,921</u>
c. Total Actuarial (Gain)/Loss During FY19	\$ 257,131	\$ (636,947)	\$ (379,816)
3. Actual 2019 Unfunded Liability, (2) + (2)(c)	\$ 5,462,487	\$ (658,797)	\$ 4,803,690

Section 1.6: Analysis of Financial Experience

Pension

Change in Employer / State Contribution Rate

Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

Type of (Gain) or Loss	Change in Employer / State Contribution Rate During Fiscal Year				
	Pension				
	2015	2016	2017	2018	2019
1. Health Claims	N/A	N/A	N/A	N/A	N/A
2. Salary Experience	(0.32%)	(0.35%)	(0.42%)	(0.37%)	0.17%
3. Investment Experience	0.24%	0.77%	0.75%	0.63%	0.52%
4. Demographic Experience and Miscellaneous	0.34%	0.13%	(1.01%)	(0.24%)	(0.91%)
5. Contribution Shortfall	<u>0.00%</u>	<u>0.00%</u>	<u>0.18%</u>	<u>0.17%</u>	<u>0.11%</u>
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	0.26%	0.55%	(0.50%)	0.19%	(0.11%)
7. Assumptions / Method Changes	0.00%	1.92%	0.00%	1.98%	0.00%
8. System Benefit Changes	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>
9. Composite (Gain) or Loss During Year, (6) + (7) + (8)	0.26%	2.47%	(0.50%)	2.17%	(0.11%)
10. Beginning Total Employer / State Contribution Rate	<u>15.98%</u>	<u>16.24%</u>	<u>18.71%</u>	<u>18.21%</u>	<u>20.38%</u>
11. Ending Valuation Year Employer / State Contribution Rate, (9) + (10)	16.24%	18.71%	18.21%	20.38%	20.27%
12. Fiscal Year Rates					
a. Fiscal Year Employer / State Contribution Rate	17.27%	18.27%	18.29%	20.66%	20.27% *
b. Fiscal Year for which Rate Applies	FY18	FY19	FY20	FY21	FY22

* Expected rate. Actual rate to be determined

Healthcare
Change in Employer / State Contribution Rate
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

Type of (Gain) or Loss	Change in Employer / State Contribution Rate During Fiscal Year				
	Healthcare				
	2015	2016	2017	2018	2019
1. Health Claims ¹	(3.65%)	1.02%	(2.90%)	(1.75%)	(2.39%)
2. Salary Experience	N/A	N/A	N/A	N/A	N/A
3. Investment Experience	0.21%	0.63%	0.61%	0.49%	0.40%
4. Demographic Experience and Miscellaneous	N/A	N/A	(0.96%)	(1.64%)	0.83%
5. Contribution Shortfall	<u>0.00%</u>	<u>0.00%</u>	<u>(0.14%)</u>	<u>0.08%</u>	<u>0.02%</u>
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	(3.44%)	1.65%	(3.39%)	(2.82%)	(1.14%)
7. Assumptions / Method Changes	0.00%	0.93%	3.41%	2.12%	0.00%
8. System Benefit Changes	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>
9. Composite (Gain) or Loss During Year, (6) + (7) + (8)	(3.44%)	2.58%	0.02%	(0.70%)	(1.14%)
10. Beginning Total Employer / State Contribution Rate	<u>5.80%</u>	<u>2.36%</u>	<u>4.94%</u>	<u>4.96%</u>	<u>4.26%</u>
11. Ending Valuation Year Employer / State Contribution Rate, (9) + (10)	2.36%	4.94%	4.96%	4.26%	3.12%
12. Fiscal Year Rates					
a. Fiscal Year Employer / State Contribution Rate	3.11%	4.37%	4.89%	4.27%	3.12% *
b. Fiscal Year for which Rate Applies	FY18	FY19	FY20	FY21	FY22

* Expected rate. Actual rate to be determined

¹ Prior to 2017, the health claims percentages include the effects of healthcare demographic experience gains/losses

Total
Change in Employer / State Contribution Rate
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

Type of (Gain) or Loss	Change in Employer / State Contribution Rate During Fiscal Year				
	Total				
	2015	2016	2017	2018	2019
1. Health Claims ¹	(3.65%)	1.02%	(2.90%)	(1.75%)	(2.39%)
2. Salary Experience	(0.32%)	(0.35%)	(0.42%)	(0.37%)	0.17%
3. Investment Experience	0.45%	1.40%	1.36%	1.12%	0.92%
4. Demographic Experience and Miscellaneous	0.34%	0.13%	(1.97%)	(1.88%)	(0.08%)
5. Contribution Shortfall	<u>0.00%</u>	<u>0.00%</u>	<u>0.04%</u>	<u>0.25%</u>	<u>0.13%</u>
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	(3.18%)	2.20%	(3.89%)	(2.63%)	(1.25%)
7. Assumptions / Method Changes	0.00%	2.85%	3.41%	4.10%	0.00%
8. System Benefit Changes	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>
9. Composite (Gain) or Loss During Year, (6) + (7) + (8)	(3.18%)	5.05%	(0.48%)	1.47%	(1.25%)
10. Beginning Total Employer / State Contribution Rate	<u>21.78%</u>	<u>18.60%</u>	<u>23.65%</u>	<u>23.17%</u>	<u>24.64%</u>
11. Ending Valuation Year Employer / State Contribution Rate, (9) + (10)	18.60%	23.65%	23.17%	24.64%	23.39%
12. Fiscal Year Rates					
a. Fiscal Year Employer / State Contribution Rate	20.38%	22.64%	23.18%	24.93%	23.39% *
b. Fiscal Year for which Rate Applies	FY18	FY19	FY20	FY21	FY22

* Expected rate. Actual rate to be determined

¹ Prior to 2017, the health claims percentages include the effects of healthcare demographic experience gains/losses

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

Section 2: Plan Assets

Section 2.1: Summary of Fair Value of Assets (\$'s in 000's)

As of June 30, 2019	Pension	Healthcare	Total Fair Value	Allocation Percent
Cash and Short-Term Investments				
- Cash and Cash Equivalents	\$ 193,372	\$ 159,554	\$ 352,926	2.0%
- Subtotal	\$ 193,372	\$ 159,554	\$ 352,926	2.0%
Fixed Income Investments				
- Domestic Fixed Income Pool	\$ 993,678	\$ 819,561	\$ 1,813,239	10.5%
- 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	\$ 993,678	\$ 819,561	\$ 1,813,239	10.5%
Equity Investments				
- Domestic Equity Pool	\$ 2,188,657	\$ 1,805,150	\$ 3,993,807	23.1%
- International Equity Pool	1,736,262	1,432,026	3,168,288	18.3%
- Private Equity Pool	997,227	822,488	1,819,715	10.5%
- Emerging Markets Equity Pool	341,699	281,826	623,525	3.6%
- Alternative Equity Strategies	921,017	759,632	1,680,649	9.7%
- Subtotal	\$ 6,184,862	\$ 5,101,122	\$ 11,285,984	65.2%
Other Investments				
- Real Estate Pool	\$ 641,672	\$ 529,323	\$ 1,170,995	6.8%
- Other Investments Pool	922,588	760,927	1,683,515	9.7%
- Absolute Return Pool	545,747	450,119	995,866	5.8%
- Other Assets	15	967	982	0.0%
- Subtotal	\$ 2,110,022	\$ 1,741,336	\$ 3,851,358	22.3%
Total Cash and Investments	\$ 9,481,934	\$ 7,821,573	\$ 17,303,507	100.0%
Net Accrued Receivables	7,471	(53,881)	(46,410)	
Net Assets	\$ 9,489,405	\$ 7,767,692	\$ 17,257,097	

Section 2.2: Changes in Fair Value of Assets During FY 2019 (\$'s in 000's)

As of June 30, 2019	Pension	Healthcare	Total Fair Value
1. Fair Value of Assets as of June 30, 2018	\$ 9,306,675	\$ 7,612,001	\$ 16,918,676
2. Additions:			
a. Employee Contributions	\$ 79,609	\$ 0	\$ 79,609
b. Employer Contributions	283,098	102,266	385,364
c. State Assistance Contributions	135,360	0	135,360
d. Interest and Dividend Income	171,359	140,836	312,195
e. Net Appreciation / Depreciation in Fair Value of Investments	372,865	311,499	684,364
f. Medicare Part D Subsidy	0	27,547	27,547
g. Other	23	874	897
h. Total Additions	\$ 1,042,314	\$ 583,022	\$ 1,625,336
3. Deductions:			
a. Medical Benefits	\$ 0	\$ 420,429	\$ 420,429
b. Retirement Benefits	837,381	0	837,381
c. Refund of Contributions	10,638	0	10,638
d. Investment Expenses	4,136	3,237	7,373
e. Administrative Expenses	7,429	3,665	11,094
f. Total Deductions	\$ 859,584	\$ 427,331	\$ 1,286,915
4. Fair Value of Assets as of June 30, 2019	\$ 9,489,405	\$ 7,767,692	\$ 17,257,097
Approximate Fair Value Investment Return Rate During FY 2019 Net of Investment Expenses	5.9%	6.0%	6.0%

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. Investment Gain / (Loss) for FY 2019			
a. Fair Value of Assets as of June 30, 2018	\$ 9,306,675	\$ 7,612,001	\$ 16,918,676
b. Contributions	498,067	102,266	600,333
c. Medicare Part D Subsidy	0	27,547	27,547
d. Benefit Payments	848,019	420,429	1,268,448
e. Administrative Expenses	7,429	3,665	11,094
f. Actual Investment Return (net of expenses)	540,111	449,972	990,083
g. Expected Return Rate (net of expenses)	7.38%	7.38%	7.38%
h. Expected Return - Weighted for Timing	676,353	551,100	1,227,453
i. Investment Gain / (Loss) for the Year, (f) - (h)	(136,242)	(101,128)	(237,370)
2. Actuarial Value as of June 30, 2019			
a. Fair Value as of June 30, 2019	\$ 9,489,405	\$ 7,767,692	\$ 17,257,097
b. Deferred Investment Gain / (Loss)	(87,288)	(42,799)	(130,087)
c. Actuarial Value as of June 30, 2019, (a) - (b)	9,576,693	7,810,491	17,387,184
3. Ratio of Actuarial Value of Assets to Fair Value of Assets	100.9%	100.6%	100.8%
4. Approximate Actuarial Value Investment Return Rate			
During FY 2019 Net of Investment Expenses	5.4%	5.5%	5.5%

The tables below show the development of the gains/(losses) to be recognized in the current year (\$'s in 000's):

Pension				
Plan Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2015	\$ (405,373)	\$ (324,300)	\$ (81,073)	\$ 0
June 30, 2016	(732,190)	(439,314)	(146,438)	(146,438)
June 30, 2017	393,607	157,442	78,721	157,444
June 30, 2018	17,834	3,567	3,567	10,700
June 30, 2019	<u>(136,242)</u>	<u>0</u>	<u>(27,248)</u>	<u>(108,994)</u>
Total	\$ (862,364)	\$ (602,605)	\$ (172,471)	\$ (87,288)

Healthcare				
Plan Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2015	\$ (350,420)	\$ (280,336)	\$ (70,084)	\$ 0
June 30, 2016	(584,781)	(350,868)	(116,956)	(116,957)
June 30, 2017	341,151	136,460	68,230	136,461
June 30, 2018	30,997	6,199	6,199	18,599
June 30, 2019	<u>(101,128)</u>	<u>0</u>	<u>(20,226)</u>	<u>(80,902)</u>
Total	\$ (664,181)	\$ (488,545)	\$ (132,837)	\$ (42,799)

Total				
Plan Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2015	\$ (755,793)	\$ (604,636)	\$ (151,157)	\$ 0
June 30, 2016	(1,316,971)	(790,182)	(263,394)	(263,395)
June 30, 2017	734,758	293,902	146,951	293,905
June 30, 2018	48,831	9,766	9,766	29,299
June 30, 2019	<u>(237,370)</u>	<u>0</u>	<u>(47,474)</u>	<u>(189,896)</u>
Total	\$ (1,526,545)	\$ (1,091,150)	\$ (305,308)	\$ (130,087)

Section 2.4: Historical Asset Rates of Return

Year Ending	Actuarial Value		Fair Value	
	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%

* Cumulative since fiscal year ending June 30, 2005

Section 3: Projections

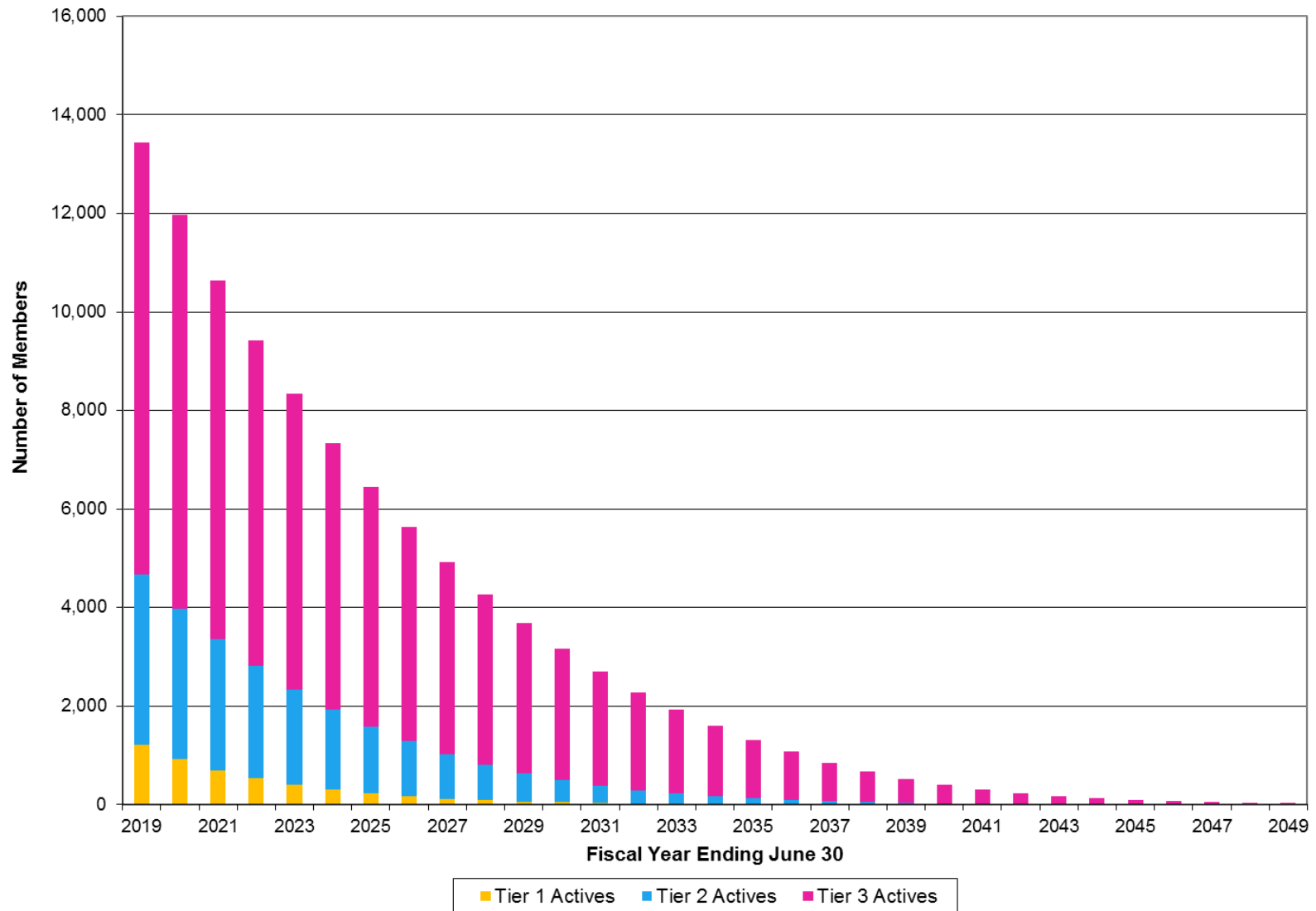
Section 3.1: Projection Assumptions and Methods

Key Assumptions

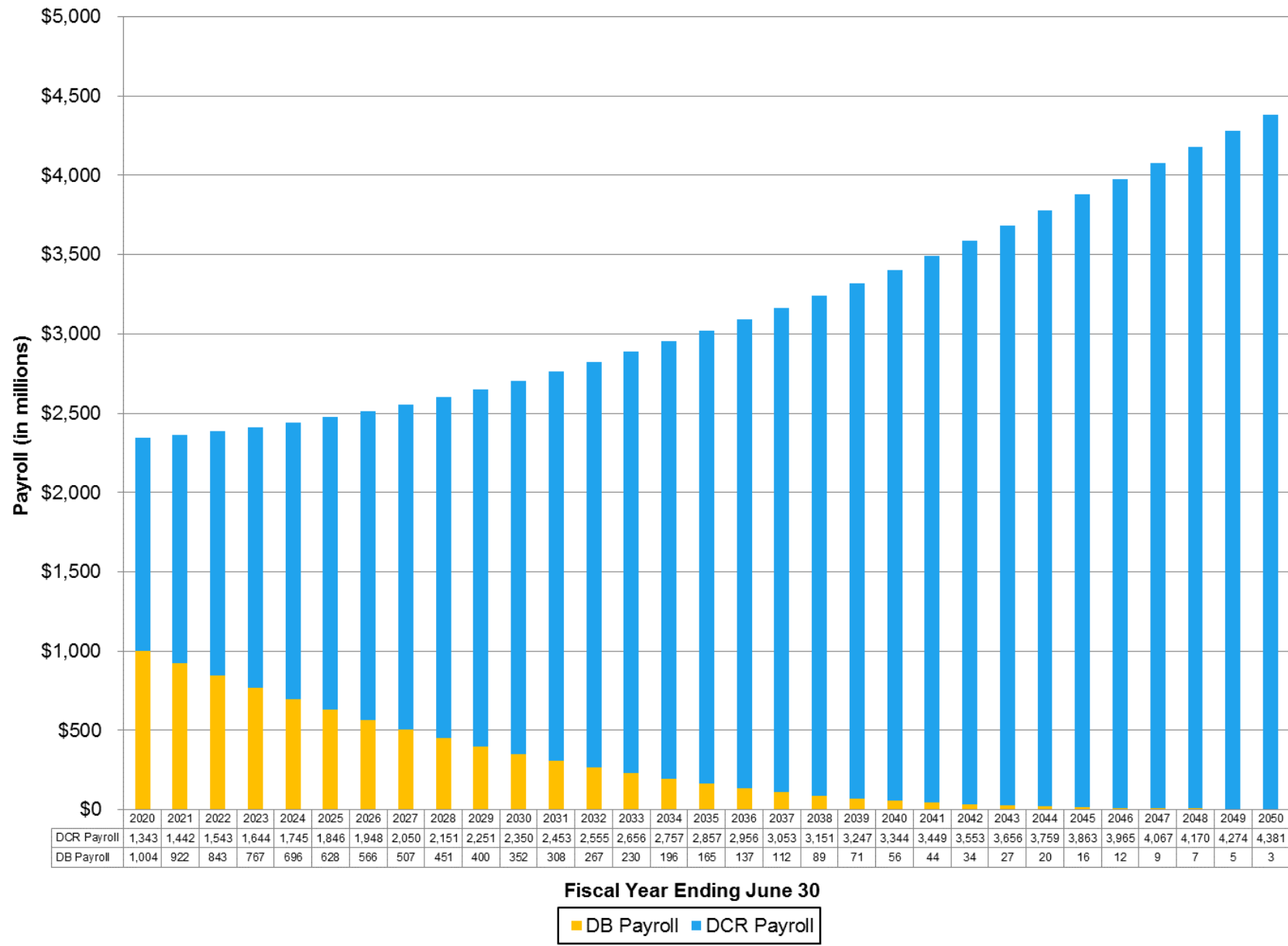
- 7.38% investment return (net of investment expenses) on the Fair Value of Assets in all future years.
- The Actuarial Value of Assets was re-initialized to Fair Value as of June 30, 2014. The Actuarial Value of Assets after June 30, 2014 reflects the deferred gains and losses generated by the smoothing 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, 2019.
- 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, combined.
- The DCR contribution rate determined as of June 30, 2019 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.

Section 3.2: Membership Projection

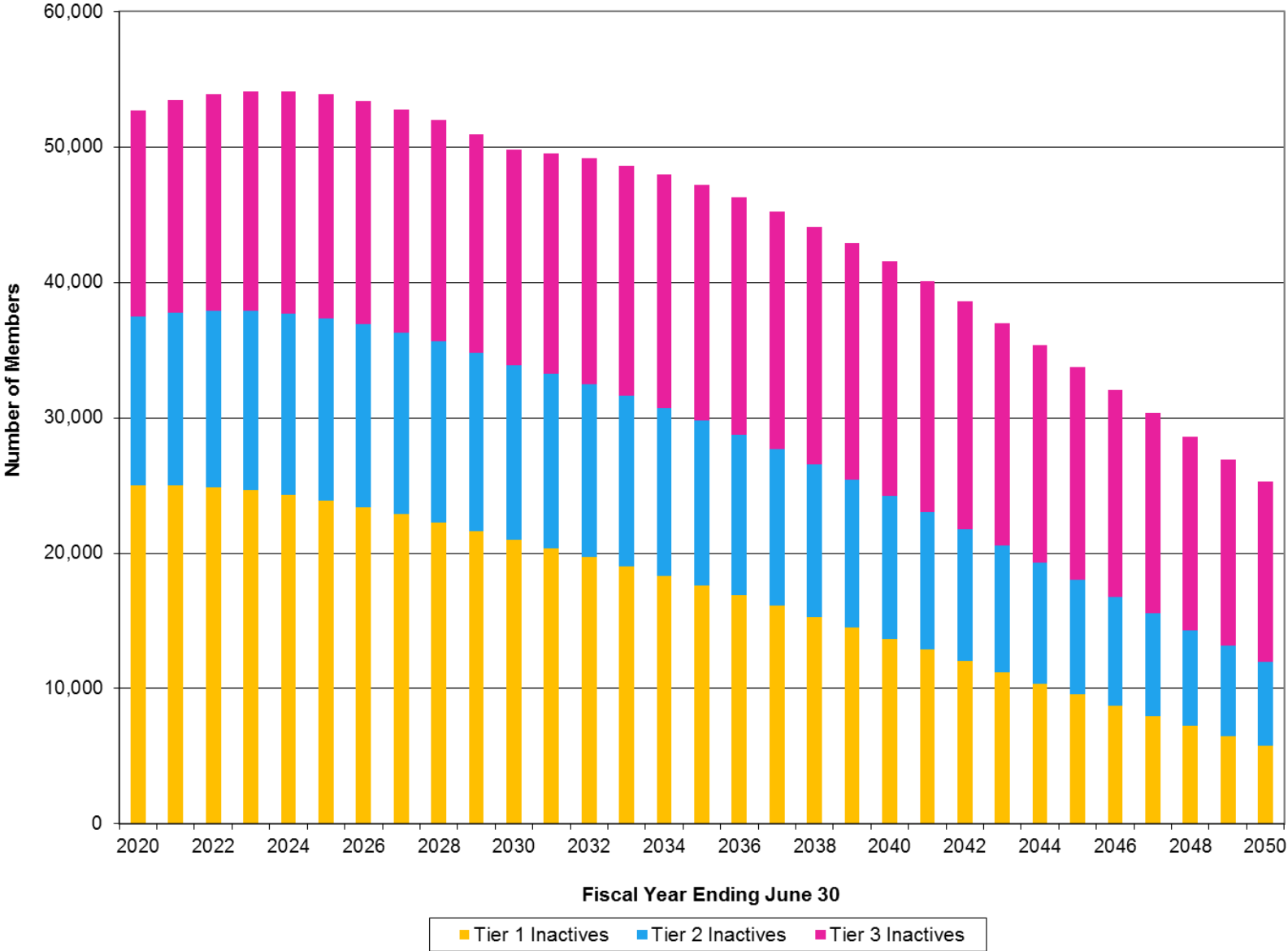
Projected Active Member Count



Projected DB and DCR Payroll

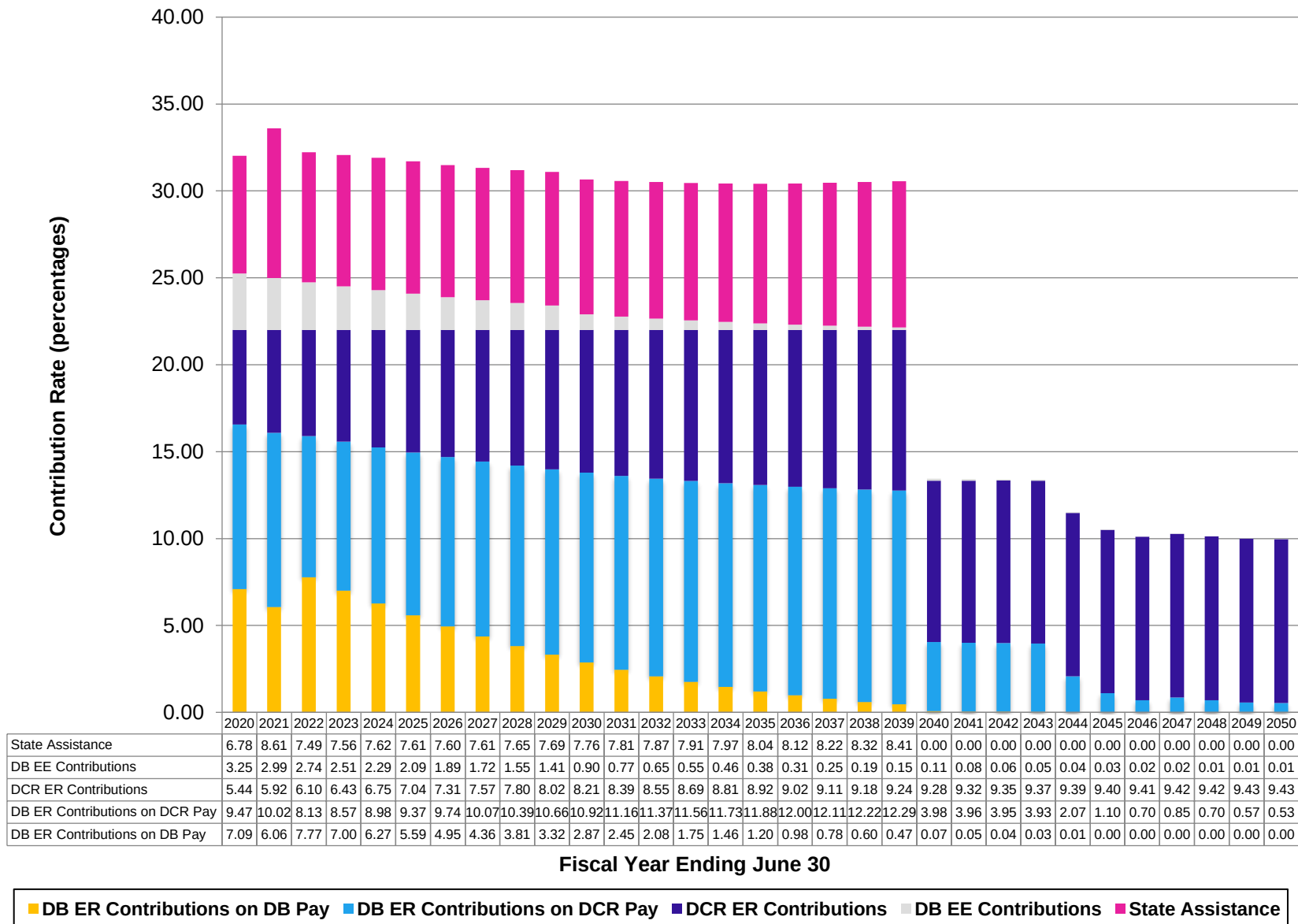


Projected Inactive Member Count

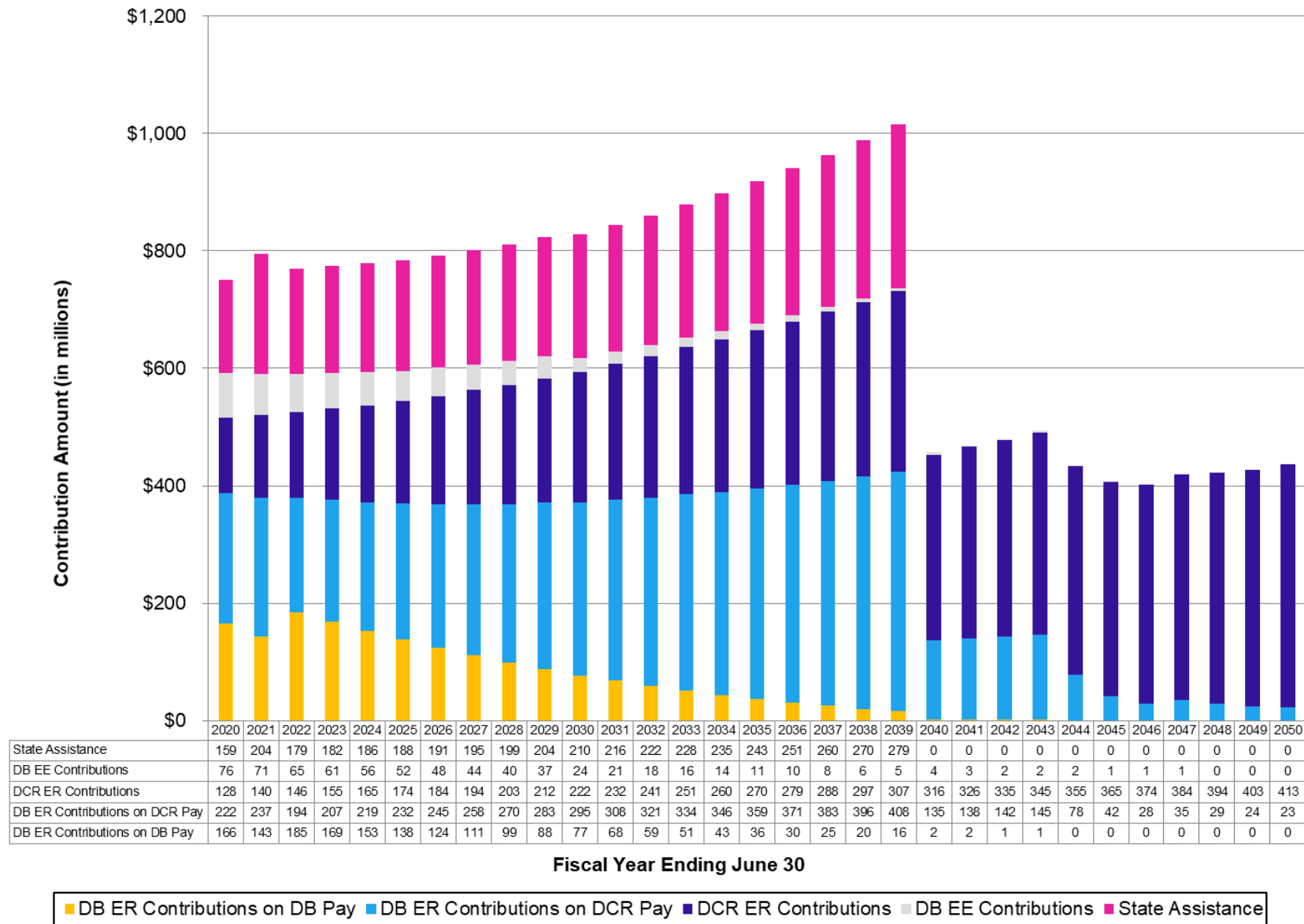


Section 3.3: Projected Employer/State Contribution Rates

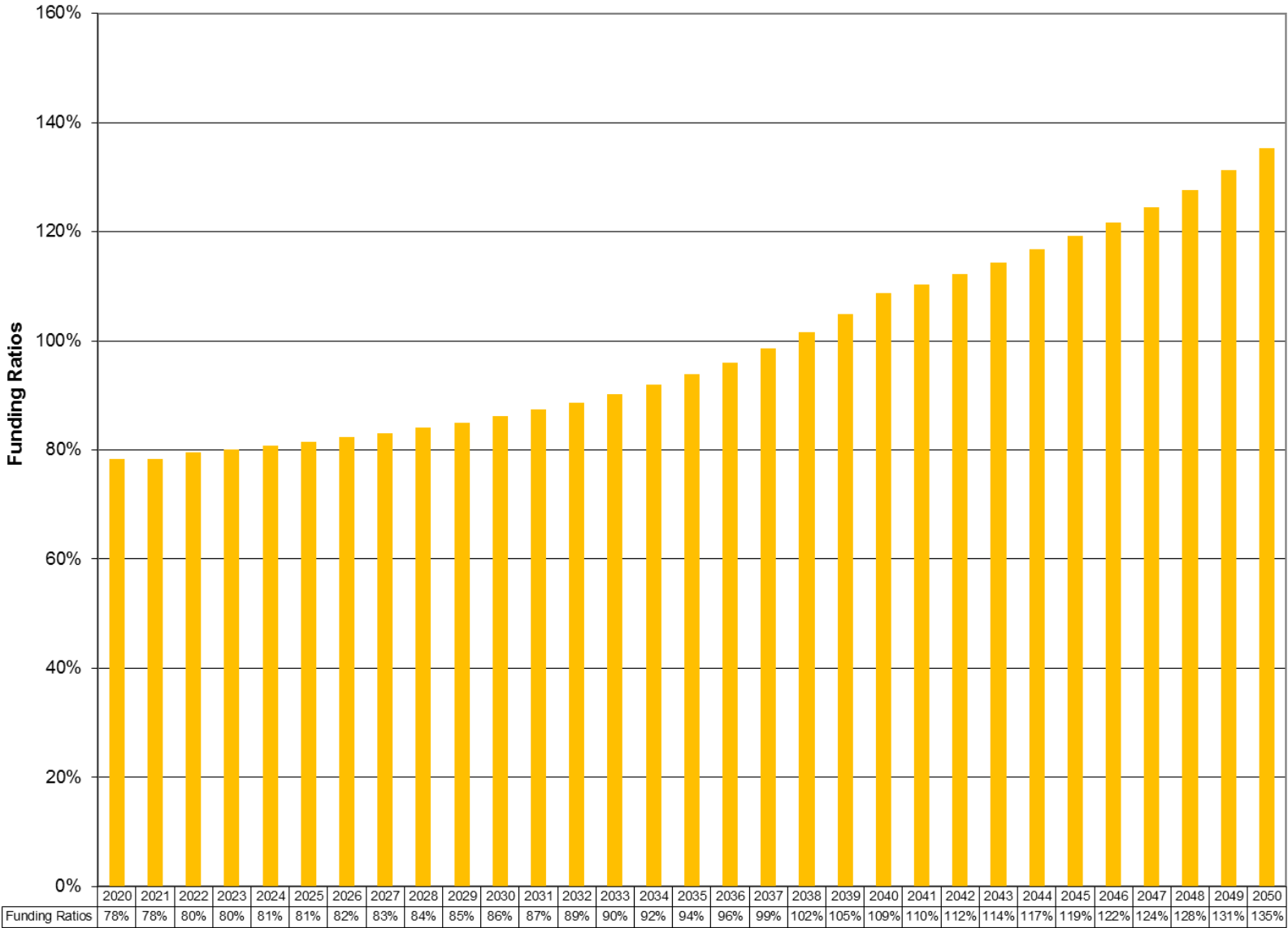
Based on Total DB and DCR Payroll



Section 3.4: Projected Employer/State Contribution Amounts



Section 3.5: Projection of Funded Ratios



Fiscal Year Ending June 30

Section 3.6: Table of Projected Actuarial Results

State of Alaska PERS
Financial Projections (\$ in Thousands)
Based on 2019 Actuarial Valuation Results, 0% Population Growth for Payroll
Baseline

Fiscal Year End	Valuation Amounts on July 1 (Beginning of Fiscal Year)				Flow Amounts During Following 12 Months										Deferred Asset Gain/(Loss)	Ending Actuarial Assets	
	Actuarial Assets	Accrued Liability	Funding Ratio	Surplus (Deficit)	Total Salaries	Er/State Ctb Rate	DCR Ctb Rate	Total Ctb Rate	DB Contributions				Benefit Payments	Net Contribs			Investment Earnings
									Employer	State Assistance	Employee	Total					
2020	\$17,387,184	\$22,190,874	78.4%	(\$4,803,690)	\$2,347,306	23.34%	5.44%	28.78%	\$388,714	\$159,055	\$76,365	\$624,134	\$1,302,929	(\$678,795)	\$1,251,778	\$24,062	\$17,795,436
2021	17,795,436	22,722,091	78.3%	(4,926,655)	2,364,145	24.69%	5.92%	30.61%	380,155	203,585	70,772	654,512	1,374,263	(719,751)	1,293,355	(85,182)	18,468,670
2022	18,468,670	23,194,167	79.6%	(4,725,497)	2,385,869	23.39%	6.10%	29.49%	379,353	178,702	65,459	623,514	1,445,206	(821,692)	1,330,232	(47,474)	18,930,801
2023	18,930,801	23,616,968	80.2%	(4,686,167)	2,411,254	23.13%	6.43%	29.56%	375,432	182,291	60,610	618,333	1,513,140	(894,807)	1,364,492	0	19,345,169
2024	19,345,169	23,972,154	80.7%	(4,626,985)	2,440,856	22.87%	6.75%	29.62%	372,231	185,993	55,979	614,203	1,578,474	(964,271)	1,396,089	0	19,769,951
2025	19,769,951	24,266,654	81.5%	(4,496,703)	2,474,306	22.57%	7.04%	29.61%	370,156	188,295	51,789	610,240	1,640,811	(1,030,571)	1,425,016	0	20,158,108
2026	20,158,108	24,500,630	82.3%	(4,342,522)	2,514,124	22.29%	7.31%	29.60%	369,325	191,073	47,574	607,972	1,700,059	(1,092,087)	1,451,438	0	20,511,859
2027	20,511,859	24,674,678	83.1%	(4,162,819)	2,556,989	22.04%	7.57%	29.61%	368,974	194,586	44,016	607,576	1,754,730	(1,147,154)	1,475,584	0	20,835,335
2028	20,835,335	24,789,941	84.0%	(3,954,606)	2,602,138	21.85%	7.80%	29.65%	369,504	199,063	40,349	608,916	1,807,066	(1,198,150)	1,497,685	0	21,130,511
2029	21,130,511	24,846,537	85.0%	(3,716,026)	2,650,707	21.67%	8.02%	29.69%	370,568	203,840	37,365	611,773	1,855,944	(1,244,171)	1,517,896	0	21,400,418
2030	21,400,418	24,844,459	86.1%	(3,444,041)	2,702,088	21.55%	8.21%	29.76%	372,618	209,682	24,319	606,619	1,892,273	(1,285,654)	1,536,490	0	21,647,931
2031	21,647,931	24,783,528	87.3%	(3,135,597)	2,761,000	21.42%	8.39%	29.81%	375,772	215,634	21,260	612,666	1,938,424	(1,325,758)	1,553,458	0	21,872,754
2032	21,872,754	24,659,644	88.7%	(2,786,890)	2,822,228	21.32%	8.55%	29.87%	379,589	222,110	18,344	620,043	1,982,322	(1,362,279)	1,568,910	0	22,076,913
2033	22,076,913	24,472,463	90.2%	(2,395,550)	2,886,168	21.22%	8.69%	29.91%	384,149	228,296	15,874	628,319	2,022,615	(1,394,296)	1,582,999	0	22,263,507
2034	22,263,507	24,221,418	91.9%	(1,957,911)	2,952,756	21.16%	8.81%	29.97%	389,469	235,334	13,583	638,386	2,057,108	(1,418,722)	1,596,110	0	22,439,112
2035	22,439,112	23,908,844	93.9%	(1,469,732)	3,022,165	21.12%	8.92%	30.04%	395,300	242,982	11,484	649,766	2,086,336	(1,436,570)	1,608,682	0	22,609,731
2036	22,609,731	23,536,279	96.1%	(926,548)	3,093,285	21.10%	9.02%	30.12%	401,509	251,174	9,589	662,272	2,110,746	(1,448,474)	1,621,133	0	22,781,153
2037	22,781,153	23,104,649	98.6%	(323,496)	3,165,022	21.11%	9.11%	30.22%	407,971	260,165	7,913	676,049	2,130,815	(1,454,766)	1,633,888	0	22,959,273
2038	22,959,273	22,616,499	101.5%	342,774	3,239,767	21.14%	9.18%	30.32%	415,339	269,548	6,156	691,043	2,141,569	(1,450,526)	1,647,550	0	23,155,495
2039	23,155,495	22,077,080	104.9%	1,078,415	3,318,029	21.17%	9.24%	30.41%	423,381	279,046	4,977	707,404	2,146,094	(1,438,690)	1,662,841	0	23,379,012
2040	23,379,012	21,489,747	108.8%	1,889,265	3,399,457	4.05%	9.28%	13.33%	137,678	0	3,739	141,417	2,139,577	(1,998,160)	1,648,622	0	23,028,974
2041	23,028,974	20,863,037	110.4%	2,165,937	3,492,862	4.01%	9.32%	13.33%	140,064	0	2,794	142,858	2,126,001	(1,983,143)	1,623,388	0	22,668,825
2042	22,668,825	20,201,914	112.2%	2,466,911	3,587,159	3.99%	9.35%	13.34%	143,128	0	2,152	145,280	2,103,236	(1,957,956)	1,597,791	0	22,308,353
2043	22,308,353	19,513,845	114.3%	2,794,508	3,682,686	3.96%	9.37%	13.33%	145,834	0	1,841	147,675	2,073,691	(1,926,016)	1,572,429	0	21,954,529
2044	21,954,529	18,804,237	116.8%	3,150,292	3,779,717	2.08%	9.39%	11.47%	78,618	0	1,512	80,130	2,032,104	(1,951,974)	1,545,472	0	21,547,845
2045	21,547,845	18,084,245	119.2%	3,463,600	3,878,119	1.10%	9.40%	10.50%	42,659	0	1,163	43,822	1,984,318	(1,940,496)	1,515,984	0	21,123,194
2046	21,123,194	17,359,782	121.7%	3,763,412	3,976,969	0.70%	9.41%	10.11%	27,838	0	795	28,633	1,929,799	(1,901,166)	1,486,189	0	20,708,114
2047	20,708,114	16,637,727	124.5%	4,070,387	4,076,145	0.85%	9.42%	10.27%	34,647	0	815	35,462	1,868,254	(1,832,792)	1,458,162	0	20,333,407
2048	20,333,407	15,925,715	127.7%	4,407,692	4,176,674	0.70%	9.42%	10.12%	29,237	0	418	29,655	1,804,074	(1,774,419)	1,432,760	0	19,991,691
2049	19,991,691	15,227,357	131.3%	4,764,334	4,279,243	0.57%	9.43%	10.00%	24,392	0	428	24,820	1,736,056	(1,711,236)	1,409,973	0	19,690,387
Totals:									\$8,493,604	\$4,300,454	\$699,434	\$13,493,492					

Note: The FY20 and FY21 Employer/State contribution rates shown above differ from those shown in Section 1.6 because they are adjusted for total salaries.

Section 3.6: Table of Projected Actuarial Results (continued)

State of Alaska PERS
Financial Projections (\$ in Thousands)
Based on 2019 Actuarial Valuation Results, 0% Population Growth for Payroll
Baseline

Fiscal Year End	Valuation Amounts on July 1 (Beginning of Fiscal Year)					
	Funding Ratio Pension	Funding Ratio Healthcare	Funding Ratio Total	Surplus (Deficit) Pension	Surplus (Deficit) Healthcare	Surplus (Deficit) Total
-----	-----	-----	-----	-----	-----	-----
2020	63.7%	109.2%	78.4%	(\$5,462,487)	658,797	(\$4,803,690)
2021	63.8%	108.7%	78.3%	(\$5,566,141)	639,486	(\$4,926,655)
2022	65.0%	110.0%	79.6%	(\$5,478,282)	752,785	(\$4,725,497)
2023	65.5%	110.3%	80.2%	(\$5,479,436)	793,269	(\$4,686,167)
2024	66.1%	110.5%	80.7%	(\$5,455,981)	828,996	(\$4,626,985)
2025	66.9%	111.1%	81.5%	(\$5,385,982)	889,279	(\$4,496,703)
2026	67.6%	111.7%	82.3%	(\$5,296,848)	954,326	(\$4,342,522)
2027	68.4%	112.4%	83.1%	(\$5,187,205)	1,024,386	(\$4,162,819)
2028	69.3%	113.2%	84.0%	(\$5,055,028)	1,100,422	(\$3,954,606)
2029	70.2%	114.0%	85.0%	(\$4,897,773)	1,181,747	(\$3,716,026)
2030	71.2%	115.0%	86.1%	(\$4,713,669)	1,269,628	(\$3,444,041)
2031	72.3%	116.0%	87.3%	(\$4,499,683)	1,364,086	(\$3,135,597)
2032	73.6%	117.2%	88.7%	(\$4,253,064)	1,466,174	(\$2,786,890)
2033	75.1%	118.4%	90.2%	(\$3,970,765)	1,575,215	(\$2,395,550)
2034	76.7%	119.9%	91.9%	(\$3,650,356)	1,692,445	(\$1,957,911)
2035	78.7%	121.4%	93.9%	(\$3,287,906)	1,818,174	(\$1,469,732)
2036	81.0%	123.2%	96.1%	(\$2,879,664)	1,953,116	(\$926,548)
2037	83.6%	125.2%	98.6%	(\$2,422,427)	2,098,931	(\$323,496)
2038	86.7%	127.5%	101.5%	(\$1,911,477)	2,254,251	\$342,774
2039	90.4%	130.0%	104.9%	(\$1,342,241)	2,420,656	\$1,078,415
2040	94.8%	132.9%	108.8%	(\$710,128)	2,599,393	\$1,889,265
2041	95.2%	136.1%	110.4%	(\$625,187)	2,791,124	\$2,165,937
2042	95.8%	139.8%	112.2%	(\$530,050)	2,996,961	\$2,466,911
2043	96.5%	144.0%	114.3%	(\$423,539)	3,218,047	\$2,794,508
2044	97.4%	148.7%	116.8%	(\$305,035)	3,455,327	\$3,150,292
2045	97.8%	154.0%	119.2%	(\$246,659)	3,710,259	\$3,463,600
2046	97.9%	160.0%	121.7%	(\$220,628)	3,984,040	\$3,763,412
2047	98.0%	166.7%	124.5%	(\$207,558)	4,277,945	\$4,070,387
2048	98.1%	174.3%	127.7%	(\$186,102)	4,593,794	\$4,407,692
2049	98.2%	182.8%	131.3%	(\$168,394)	4,932,728	\$4,764,334

Section 4: Member Data

Section 4.1: Summary of Members Included

As of June 30	2015	2016	2017	2018 ¹	2019
Active Members					
1. Number	17,660	16,105	14,719	13,434	12,152 ²
2. Average Age	51.34	51.74	52.10	52.52	52.84
3. Average Credited Service	15.29	15.95	16.57	17.21	17.80
4. Average Entry Age	36.05	35.79	35.53	35.30	35.04
5. Average Annual Earnings	\$ 73,248	\$ 75,717	\$ 76,902	\$ 77,813	\$ 82,192
6. Number Vested	16,996	15,607	14,314	13,103	11,868
7. Percent Who Are Vested	96.2%	96.9%	97.2%	97.5%	97.7%
Retirees, Disabilitants and Beneficiaries					
1. Number	32,145	33,353	34,347	35,454	36,310
2. Average Age	68.60	69.02	69.42	69.85	70.29
3. Average Years Since Retirement	11.27	11.48	11.71	11.87	12.14
4. Average Monthly Pension Benefit					
Base	\$ 1,490	\$ 1,529	\$ 1,574	\$ 1,616	\$ 1,660
COLA ³	92	93	93	94	92
P.R.P.A. ³	258	245	230	222	241
Adjustment	1	1	1	1	1
Total	\$ 1,841	\$ 1,868	\$ 1,898	\$ 1,933	\$ 1,994
Vested Terminations (vested at time of termination, not refunded contributions or commenced benefits)					
1. Number	6,304	6,160	5,962	5,660	5,499
2. Average Age	51.80	52.08	52.45	52.56	53.06
3. Average Monthly Pension Benefit	\$ 991	\$ 1,042	\$ 1,080	\$ 1,087	\$ 1,123
Non-Vested Terminations With Account Balances (not vested at termination, not refunded contributions)					
1. Number	12,339	11,880	11,506	11,192	10,921
2. Average Account Balance	\$ 5,981	\$ 6,212	\$ 6,462	\$ 6,558	\$ 6,923
Total Number of Members	68,448	67,498	66,534	65,740	64,882

¹ 4 members who were terminated before the valuation date were subsequently rehired, per census data as of October 1, 2018. These members were valued as active as of the valuation date.

² Includes 5,650 male active members and 6,502 female active members.

³ 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

Active Members

As of June 30, 2019	Tier 1	DB		Total	DCR Tier 4	Grand Total
		Tier 2	Tier 3			
1. Number	982	3,030	8,140	12,152	21,902	34,054
2. Average Age	61.82	55.80	50.66	52.84	40.96	45.20
3. Average Credited Service	22.75	22.37	15.50	17.80	4.33	9.14
4. Average Entry Age	39.07	33.43	35.16	35.04	36.63	36.06
5. Annual Earnings						
(a) Amount (000's)	\$ 77,264	\$ 263,316	\$ 658,216	\$ 998,796	\$ 1,328,934	\$ 2,327,730
(b) Average	\$ 78,680	\$ 86,903	\$ 80,862	\$ 82,192	\$ 60,676	\$ 68,354

Retirees, Disabilitants and Beneficiaries

As of June 30, 2019	Tier 1	Tier 2	Tier 3	Total
1. Number	23,614	8,378	4,318	36,310
2. Average Age	71.57	68.46	66.78	70.29
3. Average Years Since Retirement	14.92	8.04	4.91	12.14
4. Average Monthly Pension Benefit				
Base	\$ 1,719	\$ 1,709	\$ 1,237	\$ 1,660
COLA	116	52	39	92
P.R.P.A.	327	102	44	241
Adjustment	1	2	3	1
Total	2,163	1,865	1,323	1,994

Summary of Members Included

As of June 30, 2019	Active	Retiree	Covered Spouse	Covered Children / Dependent	Deferred	Total
Retiree Medical Participants						
1. Retiree Coverage Only	12,019	18,732	0	0	2,413	21,145
2. Retiree + Spouse	0	12,318	12,318	0	3,368	28,004
3. Retiree + Children / Other Dependent	0	427	0	437	0	864
4. Family	<u>0</u>	<u>813</u>	<u>813</u>	<u>1,128</u>	<u>0</u>	<u>2,754</u>
5. Total	12,019	32,290	13,131	1,565	5,781	52,767

Retiree Medical Participants as of June 30, 2019

	Retiree	Covered Spouse	Covered Children / Dependent	Deferred	All Members
Pre-Medicare	8,466	5,246	1,565	5,637	20,914
Medicare Part A & B	23,643	7,847	0	144	31,634
Medicare Part B Only	<u>181</u>	<u>38</u>	<u>0</u>	<u>0</u>	<u>219</u>
Total	32,290	13,131	1,565	5,781	52,767

As of June 30, 2019

Retiree

Summary of Retiree Medical Data Received

1. Retiree records on pension data	36,326
2. Multiple records on pension data	(916)
3. Records valued in a different retiree healthcare plan ¹	(1,101)
4. Records without medical coverage	<u>(2,019)</u>
5. Total	32,290

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	2015	2016	2017	2018 ¹	2019
Peace Officer/Firefighter					
1. Number	1,827	1,704	1,606	1,507	1,382 ²
2. Average Age	46.26	46.80	47.22	47.75	48.25
3. Average Credited Service	16.23	16.87	17.41	18.15	18.90
4. Average Entry Age	30.03	29.93	29.81	29.60	29.35
5. Average Annual Earnings	\$ 101,450	\$ 105,317	\$ 106,987	\$ 108,580	\$ 120,089
6. Number Vested	1,817	1,695	1,599	1,500	1,374
7. Percent Who Are Vested	99.5%	99.5%	99.6%	99.5%	99.4%
Others					
1. Number	15,833	14,401	13,113	11,927	10,770 ³
2. Average Age	51.93	52.32	52.70	53.12	53.43
3. Average Credited Service	15.18	15.84	16.47	17.09	17.66
4. Average Entry Age	36.75	36.48	36.23	36.03	35.77
5. Average Annual Earnings	\$ 69,994	\$ 72,214	\$ 73,218	\$ 73,926	\$ 77,329
6. Number Vested	15,179	13,912	12,715	11,603	10,494
7. Percent Who Are Vested	95.9%	96.6%	97.0%	97.3%	97.4%
Total					
1. Number	17,660	16,105	14,719	13,434	12,152
2. Average Age	51.34	51.74	52.10	52.52	52.84
3. Average Credited Service	15.29	15.95	16.57	17.21	17.80
4. Average Entry Age	36.05	35.79	35.53	35.30	35.04
5. Average Annual Earnings	\$ 73,248	\$ 75,717	\$ 76,902	\$ 77,813	\$ 82,192
6. Number Vested	16,996	15,607	14,314	13,103	11,868
7. Percent Who Are Vested	96.2%	96.9%	97.3%	97.5%	97.7%

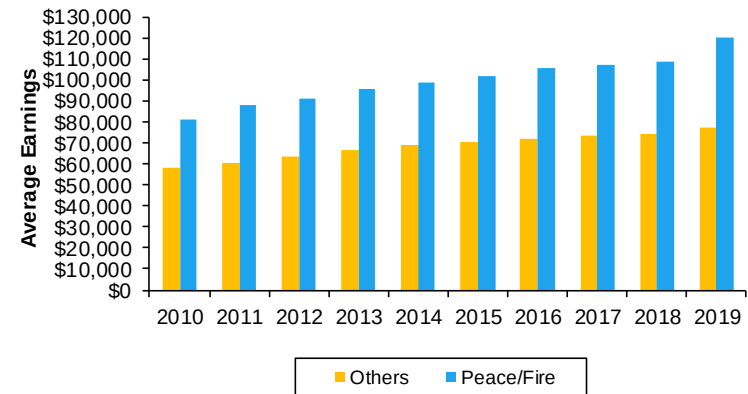
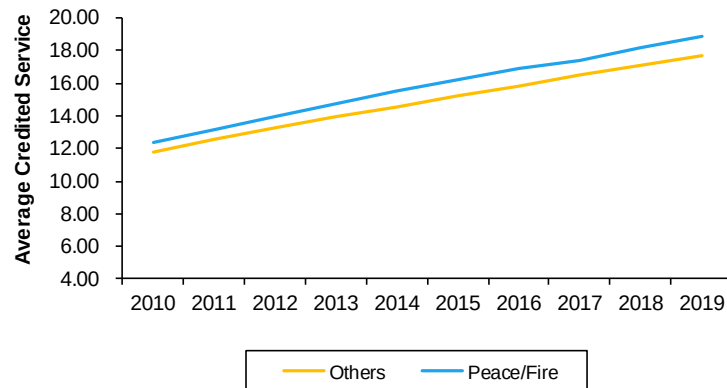
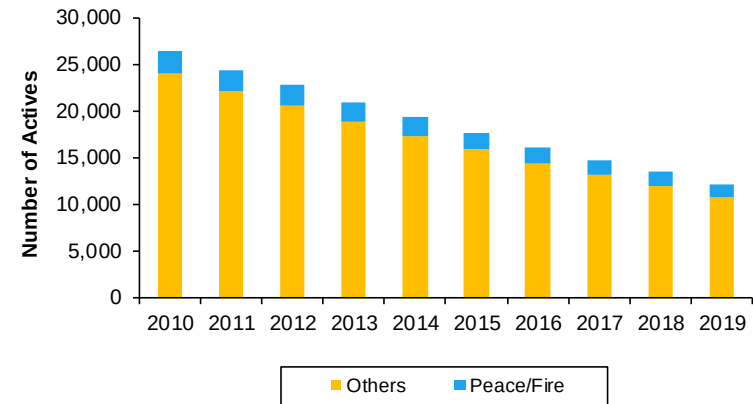
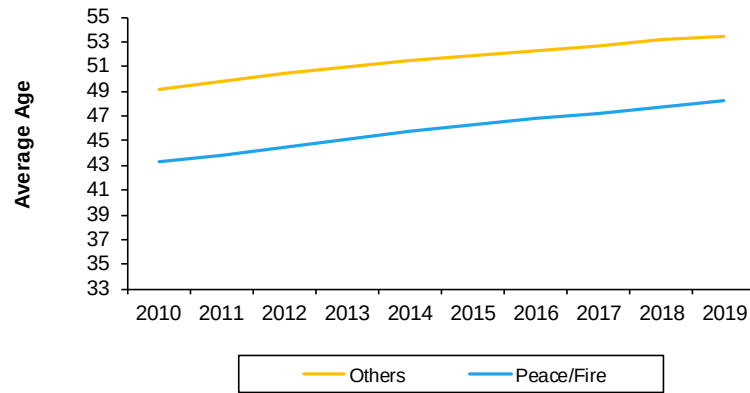
Total and average annual earnings (“valuation pay”) are the annualized earnings for the fiscal year ending on the valuation date.

¹ 4 members who were terminated before the valuation date were subsequently rehired, per census data as of October 1, 2018. These members were valued as active as of the valuation date.

² Includes 1,173 male active members and 209 female active members.

³ Includes 4,477 male active members and 6,293 female active members.

Summary of Members Included – Active Members as of June 30



Total and 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	12	1,207,294	100,608
35 – 39	142	17,038,253	119,988
40 – 44	307	37,690,010	122,769
45 – 49	403	49,487,557	122,798
50 – 54	294	35,292,738	120,043
55 – 59	159	18,275,385	114,940
60 – 64	52	5,507,215	105,908
65 – 69	11	1,292,101	117,464
70 – 74	2	172,186	86,093
75+	0	0	0
Total	1,382	\$ 165,962,739	\$ 120,089

Annual Earnings by Credited Service

Years of Service	Number	Total Annual Earnings	Average Annual Earnings
0	1	\$ 33,369	\$ 33,369
1	1	69,125	69,125
2	1	57,954	57,954
3	2	171,473	85,737
4	2	152,967	76,484
0 – 4	7	484,888	69,270
5 – 9	15	1,217,948	81,197
10 – 14	318	35,403,668	111,332
15 – 19	540	63,121,664	116,892
20 – 24	357	47,124,548	132,002
25 – 29	115	14,804,244	128,733
30 – 34	25	3,180,082	127,203
35 – 39	3	337,333	112,444
40+	2	288,364	144,182
Total	1,382	\$ 165,962,739	\$ 120,089

Years of Credited Service by Age

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
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	0	11	0	0	0	0	0	0	12
35 – 39	2	2	88	49	1	0	0	0	0	142
40 – 44	2	4	79	166	56	0	0	0	0	307
45 – 49	1	1	59	144	158	40	0	0	0	403
50 – 54	1	5	37	96	100	48	7	0	0	294
55 – 59	0	1	31	66	31	20	9	1	0	159
60 – 64	0	1	11	15	11	6	7	1	0	52
65 – 69	0	1	1	4	0	1	2	1	1	11
70 – 74	0	0	1	0	0	0	0	0	1	2
75+	0	0	0	0	0	0	0	0	0	0
Total	7	15	318	540	357	115	25	3	2	1,382

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	91	6,351,422	69,796
35 – 39	663	50,873,398	76,732
40 – 44	1,189	92,458,881	77,762
45 – 49	1,611	132,715,934	82,381
50 – 54	2,175	169,842,911	78,089
55 – 59	2,763	212,370,958	76,862
60 – 64	1,524	112,714,258	73,959
65 – 69	571	42,570,616	74,554
70 – 74	145	10,590,906	73,041
75+	38	2,342,687	61,650

Total 10,770 \$ 832,831,971 \$ 77,329

Annual Earnings by Credited Service

Years of Service	Number	Total Annual Earnings	Average Annual Earnings
0	15	\$ 784,565	\$ 52,304
1	45	2,257,784	50,173
2	45	2,651,443	58,921
3	55	2,953,579	53,701
4	93	5,372,917	57,773
0 – 4	253	14,020,288	55,416
5 – 9	766	45,621,819	59,559
10 – 14	2,940	207,099,506	70,442
15 – 19	3,461	271,278,784	78,382
20 – 24	1,867	158,511,035	84,901
25 – 29	1,098	99,990,319	91,066
30 – 34	291	27,326,226	93,905
35 – 39	74	7,137,003	96,446
40+	20	1,846,991	92,350

Total 10,770 \$ 832,831,971 \$ 77,329

Years of Credited Service by Age

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
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	12	28	48	3	0	0	0	0	0	91
35 – 39	44	91	368	157	3	0	0	0	0	663
40 – 44	44	119	448	479	97	2	0	0	0	1,189
45 – 49	38	116	469	619	310	57	2	0	0	1,611
50 – 54	46	139	556	680	429	280	44	1	0	2,175
55 – 59	37	130	573	836	586	474	114	13	0	2,763
60 – 64	19	98	330	459	313	190	84	27	4	1,524
65 – 69	9	32	116	173	105	74	32	23	7	571
70 – 74	3	10	25	38	22	21	12	9	5	145
75+	1	3	7	17	2	0	3	1	4	38
Total	253	766	2,940	3,461	1,867	1,098	291	74	20	10,770

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	With Deferred Benefits	Retired Members	Disabled Members	Beneficiaries	Total
As of June 30, 2018	13,434	11,192	5,660	31,218*	189	4,062	65,755
Vested Terminations	(485)	(4)	499	0	(10)	0	0
Non-vested Terminations	(54)	54	0	0	0	0	0
Cash-outs	(37)	(217)	(59)	0	(1)	(51)	(365)
Converted to DCR Plan	0	0	0	0	0	0	0
Disability Retirements	(18)	0	(3)	0	21	0	0
Age Retirements	(989)	(10)	(390)	1,412	(23)	N/A	0
Deaths With Beneficiary	(20)	(5)	(21)	(271)	0	329	12
Deaths Without Beneficiary	(6)	(14)	(2)	(412)	(2)	(133)	(569)
Expired Benefits	0	0	0	0	0	(7)	(7)
Data Corrections	(1)	2	(3)	4	0	(18)	(16)
Transfers Out	5	0	(3)	(2)	0	0	0
Rehires	322	(111)	(179)	(29)	(1)	0	2
Pick Ups***	1	0	0	2	0	49	52
Net Change	(1,282)	(305)	(161)	704	(16)	169	(891)
As of June 30, 2019	12,152	10,887	5,499	31,922**	173	4,231	64,864

* Includes 15 medical only retirees

** Includes 16 medical only retirees

*** Pickup beneficiaries are primarily new QDROs

Healthcare

	Active	Inactive Members				Total Inactive Members
		Inactive Individuals	Covered Spouses	Covered Children	Deferred	
As of June 30, 2018	13,380	31,396	12,880	1,645	6,070	51,991
Vested Terminations	(442)	0	0	0	442	442
Non-vested Terminations	(66)	0	0	0	0	0
Cash-outs	(37)	0	0	0	(97)	(97)
Disability	(22)	22	12	16	0	50
Rehires	308	(19)	0	(6)	(179)	(204)
Retirement	(1,021)	1,021	546	167	0	1,734
Retired from deferred status	0	409	218	49	(422)	254
Retired without medical coverage	(56)	0	0	0	(17)	(17)
Deceased	(25)	(696)	(178)	(4)	(14)	(892)
New Beneficiaries	0	149	(149)	0	0	0
Added Dependent Coverage	N/A	0	153	82	0	235
Dropped Dependent Coverage	N/A	0	(334)	(377)	0	(711)
Added Retiree Medical Coverage	0	153	0	0	0	153
Dropped Retiree Medical Coverage	0	(144)	(11)	0	0	(155)
Transfer to/from another plan	0	(1)	(6)	(7)	(2)	(16)
Net Change	(1,361)	894	251	(80)	(289)	776
As of June 30, 2019	12,019	32,290	13,131	1,565	5,781	52,767

Section 4.4: Schedule of Active Member Data

Peace Officer/Firefighter

Valuation Date	Number	Annual Earnings (000's)	Annual Average Earnings	Percent Increase/ (Decrease) in Average Earnings	Number of Participating Employers
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	91,286	4.1%	160
June 30, 2011	2,275	199,537	87,709	8.6%	160
June 30, 2010	2,388	192,895	80,777	2.8%	160

Total and average earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

Others

Valuation Date	Number	Annual Earnings (000's)	Annual Average Earnings	Percent Increase/ (Decrease) in Average Earnings	Number of Participating Employers
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
June 30, 2011	22,118	1,342,122	60,680	4.7%	160
June 30, 2010	24,054	1,393,803	57,945	4.5%	160

Total and average 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 (000s)
a) DRB actual reported salaries FY19 – employer list	\$ 2,166,250
b) DRB actual reported salaries FY19 – valuation data	2,123,367
c) Annualized valuation data	2,327,729
d) Valuation payroll as of June 30, 2019	2,425,842
e) Rate payroll for FY20	2,347,306
f) Rate payroll for FY22	2,385,869

- a) Actual reported salaries from DRB employer listing showing all payroll paid during FY19, including those who were not active as of June 30, 2019
- b) Payroll from valuation data for people who are in active status as of June 30, 2019
- 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		2015	2016	2017	2018	2019
Service						
1.	Number	97	108	119	105	109
2.	Average Age at Commencement	55.29	55.91	56.65	55.70	55.61
3.	Average Monthly Pension Benefit	\$ 4,146	\$ 4,614	\$ 4,166	\$ 4,519	\$ 4,412
Survivor (including surviving spouse and DROs)						
1.	Number	36	27	42	44	36
2.	Average Age at Commencement	63.51	61.48	62.88	63.76	68.19
3.	Average Monthly Pension Benefit	\$ 1,546	\$ 1,745	\$ 1,797	\$ 2,187	\$ 1,842
Disability Retirements						
1.	Number	3	2	4	4	4
2.	Average Age at Commencement	40.50	42.07	49.33	46.56	50.44
3.	Average Monthly Pension Benefit	\$ 3,433	\$ 3,096	\$ 2,427	\$ 3,230	\$ 3,071
Total						
1.	Number	136	137	165	153	149
2.	Average Age at Commencement	57.14	56.81	58.06	57.78	58.51
3.	Average Monthly Pension Benefit	\$ 3,442	\$ 4,026	\$ 3,521	\$ 3,814	\$ 3,755

Summary of New Pension Benefit Recipients

Average Pension Benefit Payments – Peace Officer/Firefighter

	Years of Credited Service						
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+
Period 7/1/18 - 6/30/19:							
Average Monthly Pension Benefit	\$ 0	\$ 651	\$ 1,933	\$ 3,362	\$ 4,786	\$ 6,196	\$ 5,688
Number of Recipients	0	5	11	25	38	26	6
Period 7/1/17 - 6/30/18:							
Average Monthly Pension Benefit	\$ 0	\$ 1,063	\$ 2,133	\$ 3,747	\$ 4,847	\$ 6,024	\$ 7,717
Number of Recipients	0	4	18	19	35	30	3
Period 7/1/16 - 6/30/17:							
Average Monthly Pension Benefit	\$ 0	\$ 686	\$ 2,075	\$ 3,234	\$ 4,462	\$ 5,151	\$ 6,376
Number of Recipients	0	8	9	28	41	23	14
Period 7/1/15 - 6/30/16:							
Average Monthly Pension Benefit	\$ 0	\$ 958	\$ 1,742	\$ 3,347	\$ 4,622	\$ 5,778	\$ 7,221
Number of Recipients	0	6	11	19	30	28	16
Period 7/1/14 - 6/30/15:							
Average Monthly Pension Benefit	\$ 0	\$ 1,173	\$ 1,621	\$ 3,632	\$ 4,436	\$ 5,457	\$ 6,863
Number of Recipients	0	8	9	26	24	25	7
Period 7/1/13 - 6/30/14:							
Average Monthly Pension Benefit	\$ 290	\$ 1,423	\$ 2,002	\$ 2,902	\$ 4,014	\$ 5,464	\$ 6,299
Number of Recipients	1	9	10	14	22	16	7
Period 7/1/12 - 6/30/13:							
Average Monthly Pension Benefit	\$ 0	\$ 865	\$ 1,779	\$ 2,762	\$ 3,793	\$ 4,983	\$ 4,911
Number of Recipients	0	9	8	19	31	18	4
Period 7/1/11 - 6/30/12:							
Average Monthly Pension Benefit	\$ 0	\$ 1,159	\$ 1,161	\$ 3,142	\$ 3,504	\$ 4,673	\$ 5,079
Number of Recipients	0	13	13	12	20	17	7
Period 7/1/10 - 6/30/11:							
Average Monthly Pension Benefit	\$ 525	\$ 880	\$ 1,469	\$ 2,666	\$ 3,743	\$ 4,806	\$ 5,661
Number of Recipients	1	8	18	10	24	16	8
Period 7/1/09 - 6/30/10:							
Average Monthly Pension Benefit	\$ 1,902	\$ 1,242	\$ 1,459	\$ 2,284	\$ 3,179	\$ 4,527	\$ 4,695
Number of Recipients	4	7	16	14	28	14	7

Average Monthly Pension Benefit" includes post-retirement pension adjustments and cost-of-living increases.

Summary of New Pension Benefit Recipients

Others

During the Year Ending June 30	2015	2016	2017	2018	2019
Service					
1. Number	1,281	1,472	1,393	1,419	1,288
2. Average Age at Commencement	60.70	61.28	61.40	62.19	61.38
3. Average Monthly Pension Benefit	\$ 2,310	\$ 2,269	\$ 2,404	\$ 2,477	\$ 2,540
Survivor (including surviving spouse and DROs)					
1. Number	275	286	292	261	238
2. Average Age at Commencement	69.00	66.30	67.12	70.38	69.25
3. Average Monthly Pension Benefit	\$ 1,159	\$ 1,093	\$ 1,150	\$ 1,120	\$ 1,249
Disability Retirements					
1. Number	27	22	14	28	17
2. Average Age at Commencement	51.39	53.04	52.43	53.80	52.95
3. Average Monthly Pension Benefit	\$ 1,858	\$ 2,209	\$ 2,405	\$ 1,896	\$ 2,313
Total					
1. Number	1,583	1,780	1,699	1,708	1,543
2. Average Age at Commencement	61.98	61.98	62.31	63.31	62.50
3. Average Monthly Pension Benefit	\$ 2,103	\$ 2,079	\$ 2,189	\$ 2,260	\$ 2,339

Summary of New Pension Benefit Recipients

Average Pension Benefit Payments – Others

	Years of Credited Service						
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+
Period 7/1/18 - 6/30/19:							
Average Monthly Pension Benefit	\$ 652	\$ 646	\$ 1,301	\$ 2,071	\$ 3,058	\$ 4,596	\$ 5,685
Number of Recipients	21	190	266	289	222	205	105
Period 7/1/17 - 6/30/18:							
Average Monthly Pension Benefit	\$ 414	\$ 607	\$ 1,299	\$ 1,982	\$ 3,034	\$ 4,475	\$ 6,085
Number of Recipients	26	221	351	280	223	214	127
Period 7/1/16 - 6/30/17:							
Average Monthly Pension Benefit	\$ 381	\$ 640	\$ 1,271	\$ 2,067	\$ 3,119	\$ 4,579	\$ 6,224
Number of Recipients	27	254	375	233	212	191	115
Period 7/1/15 - 6/30/16:							
Average Monthly Pension Benefit	\$ 434	\$ 660	\$ 1,240	\$ 2,017	\$ 3,059	\$ 4,158	\$ 6,583
Number of Recipients	30	323	387	266	192	161	135
Period 7/1/14 - 6/30/15:							
Average Monthly Pension Benefit	\$ 430	\$ 685	\$ 1,260	\$ 2,008	\$ 3,086	\$ 4,544	\$ 6,195
Number of Recipients	42	284	304	213	198	169	98
Period 7/1/13 - 6/30/14:							
Average Monthly Pension Benefit	\$ 503	\$ 700	\$ 1,189	\$ 2,065	\$ 3,021	\$ 4,439	\$ 5,490
Number of Recipients	48	347	319	241	214	224	121
Period 7/1/12 - 6/30/13:							
Average Monthly Pension Benefit	\$ 414	\$ 650	\$ 1,179	\$ 1,925	\$ 2,879	\$ 4,356	\$ 5,208
Number of Recipients	59	349	365	257	206	209	132
Period 7/1/11 - 6/30/12:							
Average Monthly Pension Benefit	\$ 407	\$ 610	\$ 1,147	\$ 1,931	\$ 2,805	\$ 4,214	\$ 5,076
Number of Recipients	67	351	314	204	208	188	106
Period 7/1/10 - 6/30/11:							
Average Monthly Pension Benefit	\$ 409	\$ 633	\$ 1,150	\$ 1,876	\$ 2,690	\$ 4,294	\$ 5,226
Number of Recipients	73	352	270	227	172	205	105
Period 7/1/09 - 6/30/10:							
Average Monthly Pension Benefit	\$ 485	\$ 579	\$ 1,116	\$ 1,763	\$ 2,674	\$ 4,008	\$ 5,039
Number of Recipients	93	367	273	217	218	200	74

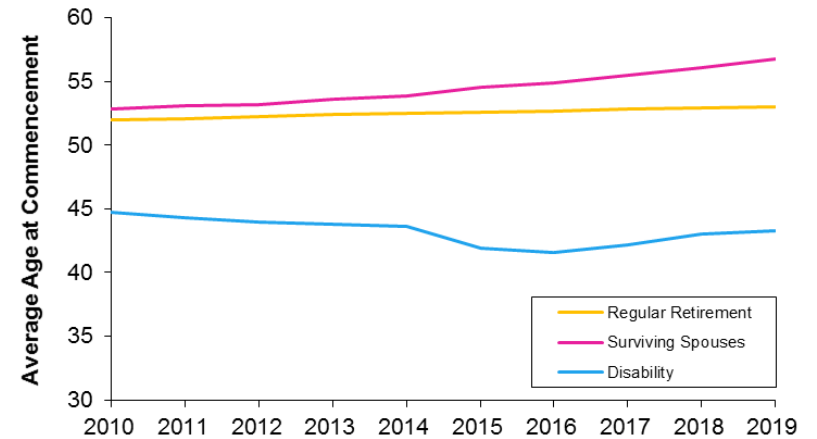
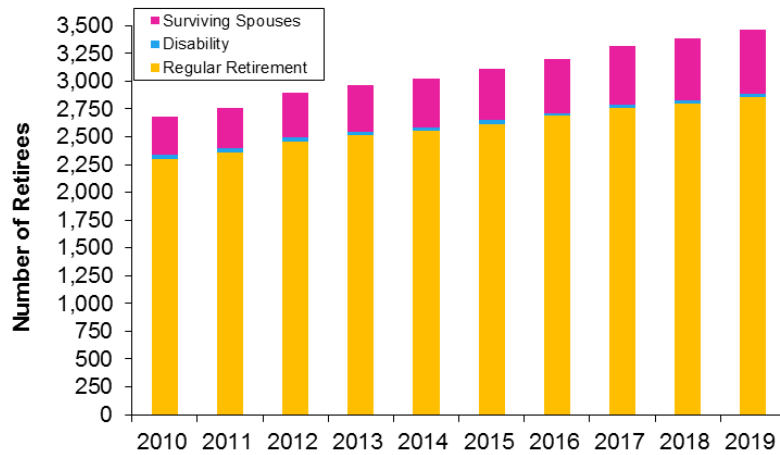
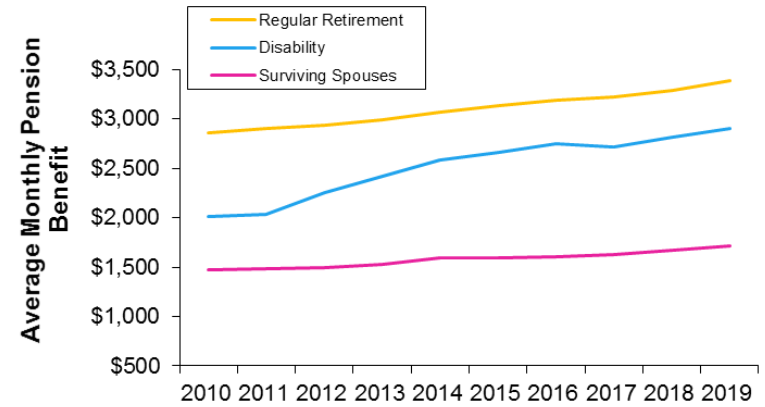
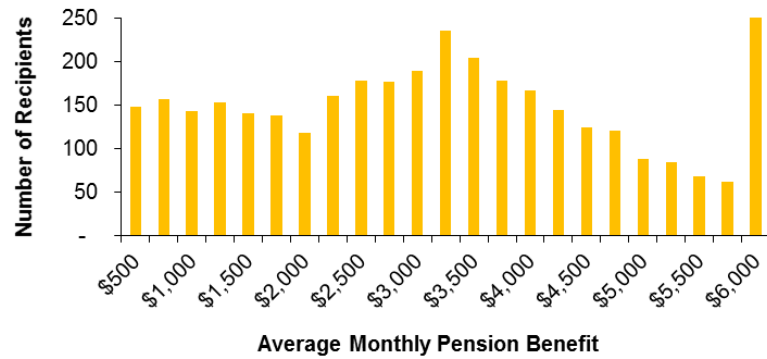
"Average Monthly Benefit" includes post-retirement pension adjustments and cost-of-living increases.

Section 4.7: Summary of All Pension Benefit Recipients

	Peace Officer/ Firefighter	Others
Service Retirements		
1. Number, June 30, 2018	2,803	28,400
2. Net Change During FY19	54	649
3. Number, June 30, 2019	2,857	29,049
4. Average Age At Commencement	53.02	58.20
5. Average Current Age	67.96	70.36
6. Average Monthly Pension Benefit	\$ 3,388	\$ 1,978
Survivors (including surviving spouses and DROs)		
1. Number, June 30, 2018	559	3,503
2. Net Change During FY19	23	146
3. Number, June 30, 2019	582	3,649
4. Average Age At Commencement	56.73	62.60
5. Average Current Age	68.05	72.62
6. Average Monthly Pension Benefit	\$ 1,713	\$ 1,082
Disability Retirements		
1. Number, June 30, 2018	25	164
2. Net Change During FY19	1	(17)
3. Number, June 30, 2019	26	147
4. Average Age At Commencement	43.29	46.71
5. Average Current Age	48.73	54.90
6. Average Monthly Pension Benefit	\$ 2,900	\$ 1,838
Total		
1. Number, June 30, 2018	3,387	32,067
2. Net Change During FY19	78	778
3. Number, June 30, 2019	3,465	32,845
4. Average Age At Commencement	53.57	58.63
5. Average Current Age	67.83	70.55
6. Average Monthly Pension Benefit	\$ 3,103	\$ 1,877

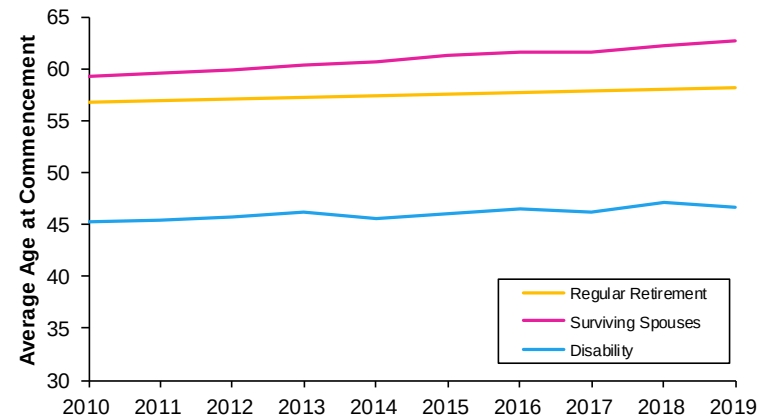
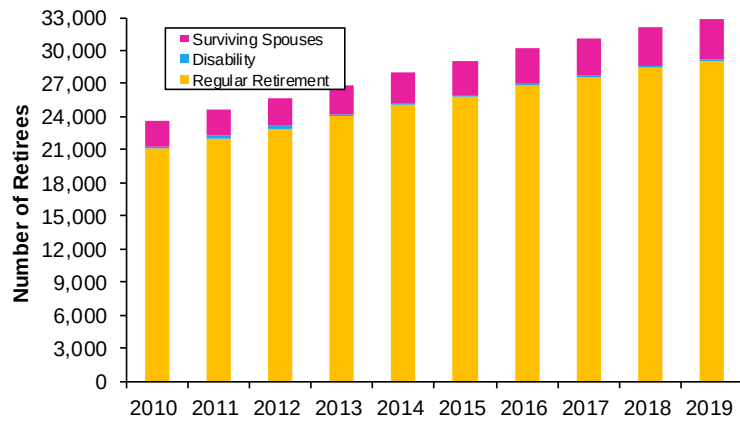
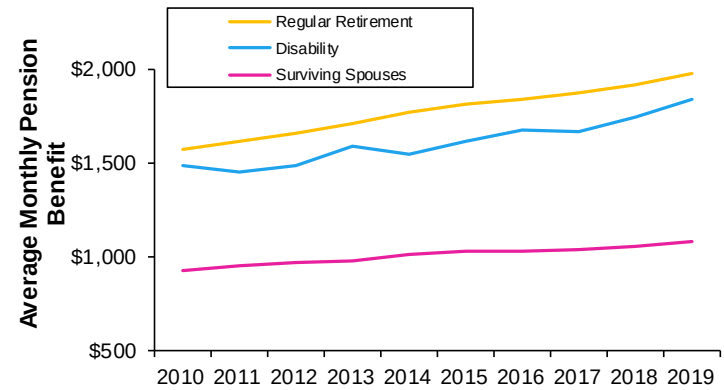
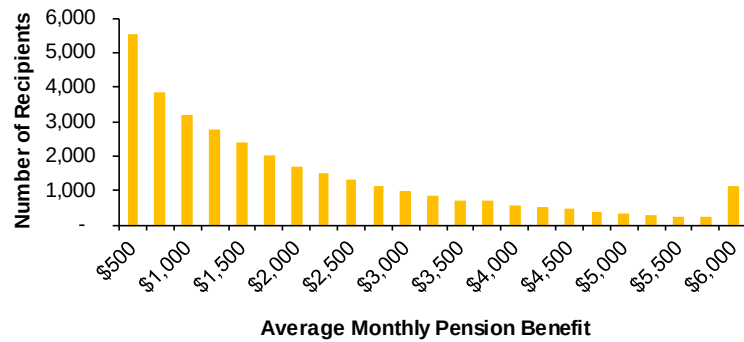
Summary of All Pension Benefit Recipients

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 Benefit	Average Annual Benefit
0 – 19	0	\$ 0	\$ 0
20 – 24	0	0	0
25 – 29	0	0	0
30 – 34	0	0	0
35 – 39	4	173,169	43,292
40 – 44	8	310,438	38,805
45 – 49	74	3,532,323	47,734
50 – 54	188	9,809,800	52,180
55 – 59	352	14,735,404	41,862
60 – 64	634	23,536,821	37,124
65 – 69	806	28,407,111	35,245
70 – 74	681	23,926,286	35,134
75+	718	24,589,136	34,247

Total 3,465 \$129,020,488 \$ 37,235

Annual Pension Benefit by Years Since Commencement

Years Since Commencement	Number	Total Annual Benefit	Average Annual Benefit
0	137	\$ 6,129,853	\$ 44,743
1	157	7,175,326	45,703
2	150	6,299,539	41,997
3	137	6,278,885	45,831
4	152	6,615,694	43,524
0 – 4	733	32,499,297	44,337
5 – 9	525	18,871,668	35,946
10 – 14	589	17,791,088	30,206
15 – 19	644	21,905,509	34,015
20 – 24	535	19,830,615	37,067
25 – 29	227	8,463,805	37,285
30 – 34	154	7,521,824	48,843
35 – 39	38	1,607,036	42,290
40+	20	529,646	26,482

Total 3,465 \$129,020,488 \$ 37,235

Years Since Benefit Commencement by Age

Age	Years Since Commencement									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
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	3	1	0	0	0	0	0	0	0	4
40 – 44	5	1	2	0	0	0	0	0	0	8
45 – 49	58	12	2	1	1	0	0	0	0	74
50 – 54	134	42	8	3	1	0	0	0	0	188
55 – 59	185	73	63	27	2	2	0	0	0	352
60 – 64	182	132	143	149	24	2	1	1	0	634
65 – 69	87	163	192	227	117	16	2	1	1	806
70 – 74	34	67	133	157	191	62	29	3	5	681
75+	45	34	46	80	199	145	122	33	14	718
Total	733	525	589	644	535	227	154	38	20	3,465

Summary of All 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	1	62,938	62,938
30 – 34	1	6,894	6,894
35 – 39	4	63,045	15,761
40 – 44	12	130,978	10,915
45 – 49	42	703,685	16,754
50 – 54	213	6,076,425	28,528
55 – 59	1,653	49,181,216	29,753
60 – 64	6,592	170,029,546	25,793
65 – 69	8,677	203,424,005	23,444
70 – 74	7,018	148,851,344	21,210
75+	8,632	161,436,620	18,702

Total 32,845 \$739,966,696 \$ 22,529

Annual Pension Benefit by Years Since Commencement

Years Since Commencement	Number	Total Annual Pension Benefit	Average Annual Pension Benefit
0	1,485	\$ 41,029,368	\$ 27,629
1	1,689	46,470,707	27,514
2	1,482	38,994,335	26,312
3	1,636	41,504,829	25,370
4	1,626	42,730,378	26,279
0 – 4	7,918	210,729,617	26,614
5 – 9	7,752	187,787,212	24,224
10 – 14	6,358	133,882,757	21,057
15 – 19	4,795	93,818,164	19,566
20 – 24	3,286	66,314,955	20,181
25 – 29	1,595	26,887,909	16,858
30 – 34	861	16,208,288	18,825
35 – 39	229	3,511,241	15,333
40+	51	826,553	16,207

Total 32,845 \$739,966,696 \$ 22,529

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	1	0	0	0	0	0	0	0	0	1
30 – 34	1	0	0	0	0	0	0	0	0	1
35 – 39	1	3	0	0	0	0	0	0	0	4
40 – 44	6	4	2	0	0	0	0	0	0	12
45 – 49	19	12	8	3	0	0	0	0	0	42
50 – 54	148	30	18	12	4	1	0	0	0	213
55 – 59	1,149	398	64	27	10	4	1	0	0	1,653
60 – 64	3,521	2,274	710	54	19	10	3	1	0	6,592
65 – 69	1,828	3,055	2,740	948	86	10	8	2	0	8,677
70 – 74	669	1,315	1,855	2,257	883	23	11	4	1	7,018
75+	575	661	961	1,494	2,284	1,547	838	222	50	8,632
Total	7,918	7,752	6,358	4,795	3,286	1,595	861	229	51	32,845

Section 4.8: Schedule of Pension Benefit Recipients by Type of Pension 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	53	20	33	0	37	7	0	2	7
301 – 600	172	106	66	0	92	38	23	7	12
601 – 900	172	96	75	1	102	39	9	11	11
901 – 1,200	179	103	76	0	109	36	19	8	7
1,201 – 1,500	171	115	55	1	98	37	20	6	10
1,501 – 1,800	163	121	41	1	86	43	23	8	3
1,801 – 2,100	156	109	45	2	70	43	30	7	6
2,101 – 2,400	216	164	51	1	96	68	29	13	10
2,401 – 2,700	201	170	26	5	78	70	34	13	6
2,701 – 3,000	228	204	22	2	68	97	40	14	9
3,001 – 3,300	285	250	32	3	93	117	51	13	11
3,301 – 3,600	242	213	24	5	87	100	32	13	10
3,601 – 3,900	184	169	12	3	60	80	28	12	4
3,901 – 4,200	186	181	4	1	46	87	34	15	4
Over \$4,200	857	836	20	1	215	434	133	63	12
Totals	3,465	2,857	582	26	1,337	1,296	505	205	122

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

Schedule of Pension Benefit Recipients by Type of Pension 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	1	2	3	4	5
\$ 1 – \$ 300	2,100	1,560	538	2	997	391	281	68	363		
301 – 600	5,088	4,288	790	10	2,655	1,197	824	258	154		
601 – 900	4,239	3,561	663	15	2,215	1,024	684	190	126		
901 – 1,200	3,401	2,938	456	7	1,663	843	642	159	94		
1,201 – 1,500	2,940	2,572	347	21	1,425	775	541	117	82		
1,501 – 1,800	2,351	2,085	244	22	1,074	681	443	89	64		
1,801 – 2,100	1,973	1,782	175	16	896	547	374	97	59		
2,101 – 2,400	1,684	1,542	123	19	726	480	348	81	49		
2,401 – 2,700	1,414	1,319	82	13	588	436	272	67	51		
2,701 – 3,000	1,176	1,100	70	6	475	389	240	35	37		
3,001 – 3,300	984	933	43	8	398	324	195	40	27		
3,301 – 3,600	857	826	31	0	312	280	195	51	19		
3,601 – 3,900	753	725	24	4	288	261	150	35	19		
3,901 – 4,200	647	622	25	0	241	213	146	32	15		
Over \$4,200	3,238	3,196	38	4	1,077	1,193	738	180	50		
Totals	32,845	29,049	3,649	147	15,030	9,034	6,073	1,499	1,209		

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 – 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, 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	166	6,971,580	54	2,132,027	3,315	118,111,073	4.3%	35,629
June 30, 2016	137	6,618,744	49	1,594,392	3,204	113,271,520	4.6%	35,353
June 30, 2015	136	5,617,344	46	633,048	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
June 30, 2011	114	3,772,720	33	116,090	2,758	89,500,495	4.3%	32,451
June 30, 2010	118	3,593,724	46	1,413,071	2,677	85,843,865	2.6%	32,067

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 – 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, 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%	21,822
June 30, 2017	1,699	44,619,382	816	14,610,212	31,032	663,978,286	4.7%	21,398
June 30, 2016	1,780	44,409,702	660	12,099,362	30,149	633,969,116	5.4%	21,028
June 30, 2014	1,583	39,939,292	627	7,232,812	29,029	601,658,776	5.7%	20,726
June 30, 2013	1,778	44,823,611	603	3,011,383	28,073	568,952,296	7.9%	20,267
June 30, 2012	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
June 30, 2011	1,595	37,100,217	554	6,897,899	24,601	456,243,016	7.1%	18,546
June 30, 2010	1,667	35,089,579	517	8,712,630	23,560	426,040,698	6.6%	18,083

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, 2019. 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 155 employers participating in PERS, including the State of Alaska and 154 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 10 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, each PERS employer will pay a simple uniform contribution rate of 22% of 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 employer contribution (22%) will be sufficient to pay the total contribution rate adopted by The Alaska Retirement Management 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 60 or early retirement at age 55 if they were hired 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, actuarially reduced benefits when they reach early retirement age and complete the service required.

Members may elect an early retirement or a joint and survivor option. Members who entered PERS prior to July 1, 1996 may also select a 66-2/3 last survivor option and 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 10 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%.

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, if a member is otherwise eligible to retire, 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 under PERS, TRS, or the University of Alaska's Optional Retirement Plan 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.

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, excl. 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 will be 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.

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, excluding the Alaska COLA, times:

- a. 75% of the CPI increase in the preceding calendar year or 9%, whichever is less, if the recipient is at least age 65 or on PERS disability; or

- b. 50% of the CPI increase in the preceding calendar year or 6%, whichever is less, if the recipient is at least age 60, or 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 first entered PERS 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

Eligible benefit recipients who reside in Alaska receive an Alaska cost of living allowance (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

There were no 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 Method

Entry Age Normal Cost.

Liabilities and contributions shown in the report are computed using the Entry Age Normal Actuarial Cost Method.

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 2014¹. 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.

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 value method recognizes 20% of the gain or loss each year, for a period of 5 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 have been 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 to develop 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, 2018 to June 30, 2019.

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.

Benefits

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.

Administration and Data Sources

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 2017 through June 2019 (FY18 through FY19) 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, 2019 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 that 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 FY20 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 FY18 through FY19
 - 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 FY20).
 - Because the reports provided this year 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 4/1/1986 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, 2018, and July 1, 2019, 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 Aetna for years through 2018 and Optum for January-June 2019, rebates were assumed to be 12% of prescription drug claims for FY18 and 17% of prescription drug claims for FY19.
2. Develop estimated EGWP reimbursements – Segal provided estimated 2019 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. Due to group size and demographics, we did not make any 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 FY20 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 6/30/17 valuation as outlined below. Note also that 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:

Alaska-Specific and National Average Weighted Trend from Experience Period to Valuation Year			
Experience Period	Medical	Prescription	Weighting Factors
FY18 to FY19	6.2% Pre-Medicare / 4.0% Medicare	8.0%	50%
FY19 to FY20	7.3% Pre-Medicare / 4.6% Medicare	1.2%	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. Develop separate administration costs – no adjustments were made for internal administrative costs. Third party retiree plan administration fees for FY20 are based upon total fees projected to 2020 by Segal based on actual FY19 fees. The annual per participant per year administrative cost rate for medical and prescription benefits is \$348.

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 of the following 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 valuation results included in the report reflect the repeal of this tax. The removal of the Cadillac Tax created an actuarial gain of approximately \$36.3M.

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 provision of health care 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:

- Some records provided on the Aetna data were associated with a participant social security number not listed on the RIN-to-SSN translation file. We reconciled those participants with the pension valuation data as either a surviving spouse or a retiree in the appropriate plan based on account structure information in the Aetna data.
- 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 2018				
1. Incurred Claims	\$ 228,572,782	\$ 72,875,570	\$ 65,406,973	\$ 178,763,430
2. Adjustments for Rx Rebates	0	0	(7,848,837)	(21,451,612)
3. Net incurred claims	\$ 228,572,782	\$ 72,875,570	\$ 57,558,136	\$ 157,311,819
4. Average Enrollment	21,920	40,560	21,920	40,560
5. Claim Cost Rate (3) / (4)	10,428	1,797	2,626	3,878
6. Trend to Fiscal 2020	1.140	1.088	1.093	1.093
7. Fiscal 2020 Incurred Cost Rate (5) x (6)	\$ 11,883	\$ 1,955	\$ 2,870	\$ 4,239

B. Fiscal 2019				
1. Incurred Claims	\$ 230,731,518	\$ 80,855,220	\$ 63,846,605	\$ 183,281,273
2. Adjustments for Rx Rebates	0	0	(10,853,923)	(31,157,816)
3. Net incurred claims	\$ 230,731,518	\$ 80,855,220	\$ 52,992,682	\$ 152,123,456
4. Average Enrollment	20,625	42,843	20,625	42,843
5. Claim Cost Rate (3) / (4)	11,187	1,887	2,569	3,551
6. Trend to Fiscal 2020	1.073	1.046	1.012	1.012
7. Fiscal 2020 Incurred Cost Rate (5) x (6)	\$ 12,003	\$ 1,974	\$ 2,600	\$ 3,593

	Medical		Prescription Drugs (Rx)	
	Pre-Medicare	Medicare	Pre-Medicare	Medicare
C. Incurred Cost Rate by Fiscal Year				
1. Fiscal 2018 A.(7)	11,883	1,955	2,870	4,239
2. Fiscal 2019 B.(7)	12,003	1,974	2,600	3,593

D. Weighting by Fiscal Year				
1. Fiscal 2018	50%	50%	50%	50%
2. Fiscal 2019	50%	50%	50%	50%

E. Fiscal 2020 Incurred Cost Rate				
1. Rate at Average Age C x D	\$ 11,943	\$ 1,964	\$ 2,735	\$ 3,916
2. Average Aging Factor	0.826	1.256	0.838	1.119
3. Rate at Age 65 (1) / (2)	\$ 14,464	\$ 1,564	\$ 3,263	\$ 3,501

**F. Development of Part A&B and Part B
Only Cost from Pooled Rate Above**

1. Part A&B Average Enrollment	42,469
2. Part B Only Average Enrollment	374
3. Total Medicare Average Enrollment B(4)	42,843
4. Cost ratio for those with Part B only to those with Parts A&B	3.180
5. Factor to determine cost for those with Parts A&B (2) / (3) x (4) + (1) / (3) x 1.00	1.019
6. Medicare per capita cost for all participants: E(3)	\$ 1,564
7. Cost for those eligible for Parts A&B: (6) / (5)	\$ 1,534
8. Cost for those eligible for Part B only: (7) x (4)	\$ 4,880

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, 2019 through June 30, 2020**

Age	Medical and Medicare Parts A & B	Medical and Medicare Part B Only	Prescription Drug	Medicare EGWP Subsidy
45	\$ 8,827	\$ 8,827	\$ 1,993	\$ 0
50	9,987	9,987	2,368	0
55	11,299	11,299	2,812	0
60	12,784	12,784	3,029	0
65	1,534	4,880	3,501	1,044
70	1,779	5,657	3,865	1,152
75	2,062	6,558	4,267	1,272
80	2,277	7,240	4,162	1,241

Section 5.3: Summary of Actuarial Assumptions

The demographic and economic assumptions used in the June 30, 2019 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.

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

Based upon the 2013-2017 actual experience (See Tables 2 and 3).

Disability

Incidence rates based on 2013-2017 actual experience (See Table 4).

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, 40% of the time for Others.

Retirement

Retirement rates based upon the 2013-2017 actual experience (See Tables 5 and 6).

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% 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% 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

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 5 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%

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, 2019 was increased by the following amounts for administrative expenses (for projections, the % increase was assumed to remain constant in future years):

- Pension: \$6,839,000
- Healthcare: \$3,744,000

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.

Re-Employment Option

All re-employed retirees are assumed to return to work under the Standard Option.

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 FY20 medical and prescription drugs are shown below:

	Medical	Prescription Drugs
Pre-Medicare	\$ 14,464	\$ 3,263
Medicare Parts A & B	\$ 1,534	\$ 3,501
Medicare Part B Only	\$ 4,880	\$ 3,501
Medicare Part D – EGWP	N/A	\$ 1,044

Members are assumed to attain Medicare eligibility at age 65. All costs are for the 2020 fiscal year (July 1, 2019 – June 30, 2020).

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

\$348 per person per year; assumed to increase at 4.5% per year.

Medicare Part B Only

We assume that 5% of actives hired before 4/1/1986 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, 7.0% is applied to the FY20 pre-Medicare medical claims costs to get the FY21 medical claims costs.

	Medical Pre-65	Medical Post-65	Prescription Drugs / EGWP
FY20	7.0%	5.4%	8.0%
FY21	6.5%	5.4%	7.5%
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 FY20 contributions based on monthly rates shown below for calendar 2020 are assumed based on the coverage category for current retirees. The composite rate shown is used for current active and inactive members 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 2020 Annual Contribution	Calendar 2020 Monthly Contribution	Calendar 2019 Monthly Contribution
Retiree Only	\$ 8,892	\$ 741	\$ 823
Retiree and Spouse	\$ 17,784	\$ 1,482	\$ 1,647
Retiree and Child(ren)	\$ 12,564	\$ 1,047	\$ 1,163
Retiree and Family	\$ 21,456	\$ 1,788	\$ 1,987
Composite	\$ 13,212	\$ 1,101	\$ 1,223

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 FY20 retired member medical contributions to get the FY21 retired member medical contributions.

Trend Assumptions	
FY20	0.0%
FY21	0.0%
FY22	0.0%
FY23+	4.0%

Graded trend rates for retired member medical contributions were updated to the rates shown above for the June 30, 2019 valuation to reflect the ongoing shift in population from pre-Medicare to Medicare-eligible and a projection of expected future retiree contributions reflecting the 10% decrease from 2019 to 2020. Actual FY20 retired member medical contributions are reflected in the valuation.

Healthcare Participation

100% of system paid members and their spouses are assumed to elect the 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. Retired member contribution trend rates were updated to reflect the ongoing shift in population from pre-Medicare to Medicare-eligible and a projection of expected future retiree contributions reflecting the 10% decrease from 2019 to 2020. The Further Consolidated Appropriations Act, 2020 that was signed in December 2019 made several changes, including the repeal of the Cadillac Tax. The repeal of the Cadillac Tax reduced the plan's liabilities as of June 30, 2019 by approximately \$36.3M. The amounts included in the Normal Cost for administrative expenses were changed to \$6,839,000 for pension and \$3,744,000 for healthcare (based on the most recent two years of actual administrative expenses paid from plan assets). No adjustment was made to reflect participants who terminate employment before the valuation date and are subsequently rehired after the valuation date.

Table 1: Alaska PERS Salary Scale

Peace Officer / Firefighter		Others	
Service	% Increase	Service	% 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%
19	2.75%	19	2.75%
20+	2.75%	20+	2.75%

Table 2: Alaska PERS Peace Officer / Firefighter Turnover Table

Service	Male (rounded)	Female (rounded)
0	0.15	0.15
1	0.12	0.08
2	0.07	0.06
3	0.06	0.06
4	0.06	0.07

Members with 5 or more years of service

Age	Male	Female
20	0.047000	0.068000
21	0.047000	0.068000
22	0.047000	0.068000
23	0.044600	0.068000
24	0.042200	0.068000
25	0.039800	0.068000
26	0.037400	0.068000
27	0.035000	0.068000
28	0.033200	0.066300
29	0.031400	0.064600
30	0.029600	0.062900
31	0.027900	0.061200
32	0.026100	0.059500
33	0.025000	0.053600
34	0.023900	0.047700
35	0.022800	0.041800
36	0.021700	0.036000
37	0.020600	0.030100
38	0.020500	0.029900
39	0.020400	0.029800
40	0.016800	0.033900
41	0.016700	0.033700
42	0.016700	0.033600
43	0.017100	0.033300
44	0.017600	0.033100
45	0.018100	0.032800
46	0.018500	0.032500
47	0.019000	0.032300
48	0.022200	0.031900
49	0.025300	0.031500
50	0.031800	0.064200
51	0.042400	0.063200
52	0.042400	0.061900
53	0.042400	0.060400
54	0.042400	0.030000
55+	0.030000	0.020000

Table 3: Alaska PERS Others Turnover Table

Service	Hire Age < 35		Hire Age >35	
	Male (rounded)	Female (rounded)	Male (rounded)	Female (rounded)
0	0.29	0.29	0.20	0.20
1	0.16	0.20	0.12	0.15
2	0.13	0.16	0.10	0.13
3	0.10	0.13	0.09	0.10
4	0.08	0.10	0.09	0.09

Members with 5 or more years of service

Age	Male	Female
20	0.114000	0.129900
21	0.114000	0.129900
22	0.114000	0.129900
23	0.108300	0.122100
24	0.102600	0.114300
25	0.096900	0.106500
26	0.091200	0.098700
27	0.085500	0.090900
28	0.083000	0.087200
29	0.080500	0.083400
30	0.078000	0.079700
31	0.075400	0.076000
32	0.072900	0.072300
33	0.069900	0.068800
34	0.066900	0.065300
35	0.063900	0.061700
36	0.061000	0.058200
37	0.058000	0.054700
38	0.056300	0.053500
39	0.054700	0.052300
40	0.048600	0.056500
41	0.047100	0.055100
42	0.045600	0.053800
43	0.045000	0.051900
44	0.044400	0.049900
45	0.043900	0.048000
46	0.043300	0.046000
47	0.042700	0.044100
48	0.042600	0.044000
49	0.042400	0.043900
50	0.036300	0.044500
51	0.036000	0.044300
52	0.035600	0.044000
53	0.035200	0.043700
54	0.041700	0.062000
55+	0.030000	0.050000

Table 4: Alaska PERS Disability Table

Age	Peace Officer / Firefighter		Others	
	Male	Female	Male	Female
20	0.000179	0.000112	0.000327	0.000376
21	0.000179	0.000112	0.000327	0.000376
22	0.000179	0.000112	0.000327	0.000376
23	0.000244	0.000153	0.000360	0.000400
24	0.000310	0.000194	0.000392	0.000424
25	0.000374	0.000234	0.000425	0.000448
26	0.000440	0.000275	0.000456	0.000472
27	0.000505	0.000316	0.000489	0.000496
28	0.000526	0.000329	0.000501	0.000510
29	0.000548	0.000343	0.000513	0.000524
30	0.000570	0.000356	0.000524	0.000538
31	0.000591	0.000370	0.000536	0.000554
32	0.000612	0.000383	0.000548	0.000568
33	0.000634	0.000397	0.000566	0.000586
34	0.000657	0.000411	0.000584	0.000606
35	0.000679	0.000425	0.000602	0.000624
36	0.000702	0.000439	0.000620	0.000644
37	0.000724	0.000453	0.000638	0.000662
38	0.000757	0.000473	0.000669	0.000696
39	0.000789	0.000493	0.000701	0.000728
40	0.000822	0.000514	0.000734	0.000762
41	0.000854	0.000534	0.000765	0.000794
42	0.000887	0.000554	0.000797	0.000826
43	0.000977	0.000611	0.000879	0.000908
44	0.001066	0.000667	0.000962	0.000990
45	0.001157	0.000723	0.001043	0.001072
46	0.001247	0.000780	0.001125	0.001154
47	0.001337	0.000836	0.001208	0.001236
48	0.001462	0.000914	0.001329	0.001360
49	0.001588	0.000993	0.001451	0.001484
50	0.001714	0.001071	0.001572	0.001608
51	0.001839	0.001150	0.001694	0.001734
52	0.001965	0.001228	0.001815	0.001858
53	0.002294	0.001434	0.002132	0.002168
54	0.002624	0.001640	0.002450	0.002478

Table 5: Alaska PERS Peace Officer / Firefighter Retirement Table

Age at Retirement	Reduced		Unreduced	
	Male	Female	Male	Female
< 47	N/A	N/A	0.8800	0.0600
47	N/A	N/A	0.8800	0.1500
48	N/A	N/A	0.1430	0.1500
49	N/A	N/A	0.1430	0.1500
50	0.0500	0.0500	0.1650	0.1500
51	0.0500	0.0700	0.1650	0.1500
52	0.0700	0.0700	0.2035	0.1500
53	0.0700	0.0700	0.2035	0.1500
54	0.0700	0.3500	0.2035	0.2500
55	0.0700	0.0800	0.2750	0.2000
56	0.0700	0.0800	0.2750	0.1500
57	0.0700	0.0800	0.2750	0.1500
58	0.0700	0.0800	0.2750	0.1500
59	0.2000	0.2000	0.2750	0.1500
60	N/A	N/A	0.3300	0.2500
61	N/A	N/A	0.2750	0.2000
62	N/A	N/A	0.2750	0.3000
63	N/A	N/A	0.2750	0.5000
64	N/A	N/A	0.2200	0.5000
65	N/A	N/A	0.2200	0.5000
66	N/A	N/A	0.2750	0.5000
67	N/A	N/A	0.5500	0.5000
68	N/A	N/A	0.5500	0.5000
69	N/A	N/A	0.5500	0.5000
70	N/A	N/A	1.0000	1.0000
71	N/A	N/A	1.0000	1.0000
72	N/A	N/A	1.0000	1.0000
73	N/A	N/A	1.0000	1.0000
74	N/A	N/A	1.0000	1.0000
75	N/A	N/A	1.0000	1.0000

Table 6: Alaska PERS Others Retirement Table

Age at Retirement	Reduced		Unreduced	
	Male	Female	Male	Female
< 50	N/A	N/A	0.1100	0.1100
50	0.0600	0.0800	0.3300	0.3850
51	0.0600	0.0800	0.3575	0.3850
52	0.0900	0.0800	0.3575	0.3850
53	0.0600	0.0800	0.3575	0.3850
54	0.2000	0.1500	0.3850	0.3850
55	0.0600	0.0600	0.3300	0.3300
56	0.0600	0.0600	0.2200	0.2200
57	0.0600	0.0600	0.2200	0.1980
58	0.0600	0.0600	0.2200	0.1980
59	0.1500	0.2000	0.2200	0.1980
60	N/A	N/A	0.2200	0.2310
61	N/A	N/A	0.2200	0.2200
62	N/A	N/A	0.2200	0.2200
63	N/A	N/A	0.2200	0.2200
64	N/A	N/A	0.2200	0.2200
65	N/A	N/A	0.2475	0.2860
66	N/A	N/A	0.2750	0.2860
67	N/A	N/A	0.2200	0.2420
68	N/A	N/A	0.2475	0.2420
69	N/A	N/A	0.2750	0.2420
70	N/A	N/A	0.2750	0.2420
71	N/A	N/A	0.2750	0.2420
72	N/A	N/A	0.2750	0.2750
73	N/A	N/A	0.2750	0.2750
74	N/A	N/A	0.2750	0.3850
75 - 79	N/A	N/A	0.5500	0.5500
80+	N/A	N/A	1.0000	1.0000

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.

A new Actuarial Standard of Practice (ASOP) has been adopted for measurements on or after November 1, 2018 - Actuarial Standard of Practice No. 51 ("ASOP 51")¹. ASOP 51 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 recommended contribution in the actuarial valuation
- 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.

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 recommended amount differ.

- If the actual contribution is lower than the recommended 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 12%.
- 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 will 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/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 stand alone assumption and therefore is considered as part of the associated assumption risk instead of 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 4-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 on page 3 shows the plan's funded status (comparison of actuarial accrued liabilities to actuarial value of assets) 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, 2018	June 30, 2019
1. Retiree and Beneficiary Accrued Liability	\$ 9,591,758	\$ 10,076,528
2. Total Accrued Liability	\$ 14,606,033	\$ 15,039,180
3. Ratio, (1) ÷ (2)	65.7%	67.0%

A high percentage of liability concentrated on participants in pay status indicates a mature plan (often a ratio above 60 - 65 percent). Because the plan was closed to new entrants in 2006, we expect the percentage in #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, 2018	FYE June 30, 2019
1. Contributions	\$ 457,339	\$ 498,067
2. Benefit Payments	<u>\$ 812,877</u>	<u>\$ 848,019</u>
3. Cash Flow, (1) – (2)	\$ (355,538)	\$ (349,952)
4. Fair Value of Assets	\$ 9,306,675	\$ 9,489,405
5. Ratio, (3) ÷ (4)	(3.8%)	(3.7%)

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 garner 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, 2018	June 30 2019
1. Fair Value of Assets	\$ 9,306,675	\$ 9,489,405
2. DB/DCR Payroll	\$ 2,267,338	\$ 2,347,306
3. Asset to Payroll Ratio, (1) ÷ (2)	410.5%	404.3%
4. Accrued Liability	\$ 14,606,033	\$ 15,039,180
5. Liability to Payroll Ratio, (4) ÷ (2)	644.2%	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.

State of Alaska

Public Employees' Retirement System Defined Contribution Retirement Plan

For Occupational Death and
Disability and Retiree Medical
Benefits

Actuarial Valuation
Report
As of June 30, 2019

April 2020

BUCK



April 2, 2020

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, 2019 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, 2019. 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, 2019.

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 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. 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, 2019 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.

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 and 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 and disability benefits provided by this 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.

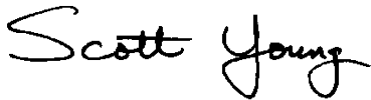
I am available to discuss this report with you at your convenience. I can be reached at 602-803-6174.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "D. J. Kershner".

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.

A handwritten signature in black ink, appearing to read "Scott Young".

Scott Young, FSA, EA, MAAA
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, 2019.

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)	2018	2019
a. Actuarial Accrued Liability	\$ 126,311	\$ 134,720
b. Valuation Assets	<u>131,058</u>	<u>155,484</u>
c. Unfunded Actuarial Accrued Liability, (a) – (b)	\$ (4,747)	\$ (20,764)
d. Funded Ratio based on Valuation Assets, (b) ÷ (a)	103.8%	115.4%
e. Fair Value of Assets	\$ 130,820	\$ 154,763
f. Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	103.6%	114.9%

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 FY19 investment return based on fair value of assets was 6.2% compared to the expected investment return of 7.38% (net of investment expenses of approximately 0.04%). This resulted in a loss of approximately \$1,582,000 to the plan from investment experience. The asset valuation method recognizes 20 percent of this loss (\$316,000) this year and an additional 20 percent in each of the next 4 years. In addition, 20 percent of the FY15 investment loss, 20 percent of the FY16 investment loss, 20 percent of the FY17 investment gain and 20 percent of the FY18 investment loss were recognized this year. The approximate FY19 asset return based on actuarial value of assets was 6.6% compared to the expected asset return of 7.38% (net of investment expenses).

2. Salary Increases

Salary increases for continuing active members during FY19 were higher than anticipated based on the valuation assumptions, resulting in a liability loss of approx. \$80,000.

3. Demographic Experience

The number of active members increased 7.5% from 20,378 at June 30, 2018 to 21,902 at June 30, 2019. The average age of active members increased from 40.80 to 40.96 and average credited service increased from 4.15 to 4.33 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, 2019 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.

Beginning January 1, 2019, Rx benefits were provided through a new contract with Optum. This change in vendors resulted in lower actual (and future expected) claims and higher rebates. 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 \$15,366,000. Approximately 95% of the gain in FY19 was attributable to Rx experience, the majority of which was due to the change in Rx vendors.

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 Further Consolidated Appropriations Act, 2020 that was signed in December 2019 made several changes, including the repeal of the Cadillac Tax. The repeal of the Cadillac Tax reduced the plan's liabilities as of June 30, 2019 by approximately \$925,000. 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

There have been no changes in benefit provisions valued since the prior valuation.

Comparative Summary of Key Actuarial Valuation Results

Total Employer Contribution Rates for Occupational Death & Disability for Fiscal Year:		2021	2022
<u>Peace Officer/Firefighter</u>			
a.	Employer Normal Cost Rate	0.70%	0.68%
b.	Past Service Cost Rate	<u>(0.22)%</u>	<u>(0.18)%</u>
c.	Total Employer Contribution Rate, (a) + (b), not less than (a)	0.70%	0.68%
<u>Others</u>			
a.	Employer Normal Cost Rate	0.31%	0.31%
b.	Past Service Cost Rate	<u>(0.13)%</u>	<u>(0.14)%</u>
c.	Total Employer Contribution Rate, (a) + (b), not less than (a)	0.31%	0.31%
Total Employer Contribution Rates for Retiree Medical for Fiscal Year:		2021	2022
a.	Employer Normal Cost Rate	1.15%	1.02%
b.	Past Service Cost Rate	<u>0.12%</u>	<u>0.05%</u>
c.	Total Employer Contribution Rate, (a) + (b), not less than (a)	1.27%	1.07%

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
N/A	FY07	0.40% / 0.30%	1.75%
N/A	FY08	1.33% / 0.58%	0.99%
N/A	FY09	1.33% / 0.58%	0.99%
June 30, 2007	FY10	1.33% / 0.30%	0.83%
June 30, 2008	FY11	1.18% / 0.31%	0.55%
June 30, 2009	FY12	0.97% / 0.11%	0.51%
June 30, 2010	FY13	0.99% / 0.14%	0.48%
June 30, 2011	FY14	1.14% / 0.20%	0.48%
June 30, 2012	FY15	1.06% / 0.22%	1.66%
June 30, 2013	FY16	1.05% / 0.22%	1.68%
June 30, 2014	FY17	0.49% / 0.17%	1.18%
June 30, 2015	FY18	0.43% / 0.16%	1.03%
June 30, 2016	FY19	0.76% / 0.26%	0.94%
June 30, 2017	FY20	0.72% / 0.26%	1.32%
June 30, 2018	FY21	0.70% / 0.31%	1.27%
June 30, 2019	FY22	TBD	TBD

Summary of Actuarial Accrued Liability Gain/(Loss)

The following table shows the FY19 gain/(loss) on actuarial accrued liability as of June 30, 2019 (\$'s in 000's):

	Occupational Death & Disability	Retiree Medical	Total
Retirement Experience	\$ 0	\$ 1,220	\$ 1,220
Termination Experience	12	1,567	1,579
Active Mortality Experience	1,639	12	1,651
Inactive Mortality Experience	(55)	(399)	(454)
Disability Experience	1,379	317	1,696
New Entrants	(117)	(1,476)	(1,593)
Rehires	(41)	(2,630)	(2,671)
Salary Increases	(80)	N/A	(80)
Medical Claims Costs ¹	N/A	15,366	15,366
Cadillac Tax – Medical Claims Costs	N/A	1,233	1,233
Cadillac Tax – Repeal	N/A	925	925
Miscellaneous	<u>80</u>	<u>1,181</u>	<u>1,261</u>
Total	\$ 2,817	\$ 17,316	\$ 20,133

¹ Beginning January 1, 2019, Rx benefits were provided through a new contract with Optum. This change in vendors resulted in lower actual (and future expected) claims and higher rebates. Approximately 95% of the gain shown in this table was due to Rx experience, the majority of which was due to the change in Rx vendors.

Section 1: Actuarial Funding Results

Section 1.1: Actuarial Liabilities and Normal Cost

Peace Officer/Firefighter (\$'s in 000's)

As of June 30, 2019	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Occupational Death Benefits	\$ 3,147	\$ 26
Occupational Disability Benefits	9,620	2,632
Medical and Prescription Drug Benefits	32,014	15,448
Medicare Part D Subsidy	(5,797)	(2,823)
Subtotal	\$ 38,984	\$ 15,283
Benefit Recipients		
Survivor Benefits	\$ 651	\$ 651
Disability Benefits	3,753	3,753
Medical and Prescription Drug Benefits	484	484
Medicare Part D Subsidy	(78)	(78)
Subtotal	\$ 4,810	\$ 4,810
Total	\$ 43,794	\$ 20,093
Total Occupational Death & Disability	\$ 17,171	\$ 7,062
Total Medical, Net of Part D Subsidy	\$ 26,623	\$ 13,031
Total Medical, Gross of Part D Subsidy	\$ 32,498	\$ 15,932

As of June 30, 2019	Normal Cost
Active Members	
Occupational Death Benefits	\$ 400
Occupational Disability Benefits	828
Medical and Prescription Drug Benefits	1,851
Medicare Part D Subsidy	(334)
Subtotal	\$ 2,745
Administrative Expense Load	
Occupational Death & Disability	\$ 0
Retiree Medical	2
Subtotal	\$ 2
Total	\$ 2,747
Total Occupational Death & Disability	\$ 1,228
Total Medical, Net of Part D Subsidy	\$ 1,519
Total Medical, Gross of Part D Subsidy	\$ 1,853

Section 1.1: Actuarial Liabilities and Normal Cost

Others (\$'s in 000's)

As of June 30, 2019	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Occupational Death Benefits	\$ 8,235	\$ 525
Occupational Disability Benefits	14,495	1,241
Medical and Prescription Drug Benefits	228,344	136,686
Medicare Part D Subsidy	(44,892)	(27,012)
Subtotal	\$ 206,182	\$ 111,440
Benefit Recipients		
Survivor Benefits	\$ 276	\$ 276
Disability Benefits	670	670
Medical and Prescription Drug Benefits	2,796	2,796
Medicare Part D Subsidy	(555)	(555)
Subtotal	\$ 3,187	\$ 3,187
Total	\$ 209,369	\$ 114,627
Total Occupational Death & Disability	\$ 23,676	\$ 2,712
Total Medical, Net of Part D Subsidy	\$ 185,693	\$ 111,915
Total Medical, Gross of Part D Subsidy	\$ 231,140	\$ 139,482

As of June 30, 2019	Normal Cost
Active Members	
Occupational Death Benefits	\$ 1,317
Occupational Disability Benefits	2,263
Medical and Prescription Drug Benefits	15,203
Medicare Part D Subsidy	(2,973)
Subtotal	\$ 15,810
Administrative Expense Load	
Occupational Death & Disability	\$ 1
Retiree Medical	6
Subtotal	\$ 7
Total	\$ 15,817
Total Occupational Death & Disability	\$ 3,581
Total Medical, Net of Part D Subsidy	\$ 12,236
Total Medical, Gross of Part D Subsidy	\$ 15,209

Section 1.1: Actuarial Liabilities and Normal Cost

All Members (\$'s in 000's)

As of June 30, 2019	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Occupational Death Benefits	\$ 11,382	\$ 551
Occupational Disability Benefits	24,115	3,873
Medical and Prescription Drug Benefits	260,358	152,134
Medicare Part D Subsidy	(50,689)	(29,835)
Subtotal	\$ 245,166	\$ 126,723
Benefit Recipients		
Survivor Benefits	\$ 927	\$ 927
Disability Benefits	4,423	4,423
Medical and Prescription Drug Benefits	3,280	3,280
Medicare Part D Subsidy	(633)	(633)
Subtotal	\$ 7,997	\$ 7,997
Total	\$ 253,163	\$ 134,720
Total Occupational Death & Disability	\$ 40,847	\$ 9,774
Total Medical, Net of Part D Subsidy	\$ 212,316	\$ 124,946
Total Medical, Gross of Part D Subsidy	\$ 263,638	\$ 155,414

As of June 30, 2019	Normal Cost
Active Members	
Occupational Death Benefits	\$ 1,717
Occupational Disability Benefits	3,091
Medical and Prescription Drug Benefits	17,054
Medicare Part D Subsidy	(3,307)
Subtotal	\$ 18,555
Administrative Expense Load	
Occupational Death & Disability	\$ 1
Retiree Medical	8
Subtotal	\$ 9
Total	\$ 18,564
Total Occupational Death & Disability	\$ 4,809
Total Medical, Net of Part D Subsidy	\$ 13,755
Total Medical, Gross of Part D Subsidy	\$ 17,062

Section 1.2: Actuarial Contributions as of June 30, 2019

Actuarial Contributions as of June 30, 2019 - Peace Officer/Firefighter (\$'s in 000's)

Normal Cost Rate	Occupational Death & Disability	Retiree Medical	Total
1. Total Normal Cost	\$ 1,228	\$ 1,519	\$ 2,747
2. DCR Plan Rate Payroll Projected for FY2020	180,262	180,262	180,262
3. Employer Normal Cost Rate, (1) / (2)	0.68%	0.84%	1.52%

Past Service Rate			
1. Actuarial Accrued Liability	\$ 7,062	\$ 13,031	\$ 20,093
2. Valuation Assets	11,520	12,388	23,908
3. Unfunded Actuarial Accrued Liability, (1) - (2)	\$ (4,458)	\$ 643	\$ (3,815)
4. Funded Ratio, (2) / (1)	163.1%	95.1%	119.0%
5. Past Service Cost Amortization Payment	(330)	71	(259)
6. DCR Plan Rate Payroll Projected for FY2020	180,262	180,262	180,262
7. Past Service Cost Rate, (5) / (6)	(0.18%)	0.04%	(0.14%)
Total Employer Contribution Rate, not less than Normal Cost Rate	0.68%	0.88%	1.56%

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	\$ 1,228	\$ 1,519	\$ 2,747
2. Total DB and DCR Plan Rate Payroll Projected for FY2020	350,211	350,211	350,211
3. Employer Normal Cost Rate, (1) / (2)	0.35%	0.43%	0.78%
4. Past Service Cost Amortization Payment	(330)	71	(259)
5. Past Service Cost Rate, (4) / (2)	(0.09%)	0.02%	(0.07%)
Total Employer Contribution Rate, not less than Normal Cost Rate	0.35%	0.45%	0.80%

Schedule of Past Service Cost Amortizations - Peace Officer/Firefighter 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	13	\$ (100)	\$ (100)	\$ (10)
FY08 Gain	06/30/2008	14	(586)	(590)	(55)
Change in Assumptions	06/30/2009	15	(104)	(106)	(9)
FY09 Loss	06/30/2009	15	446	455	41
Change in Assumptions	06/30/2010	16	79	81	7
FY10 Gain	06/30/2010	16	(282)	(291)	(25)
FY11 Loss	06/30/2011	17	73	72	6
FY12 Gain	06/30/2012	18	(349)	(362)	(28)
FY13 Gain	06/30/2013	19	(204)	(212)	(16)
Change in Assumptions	06/30/2014	20	(1,274)	(1,320)	(97)
PRPA Modification	06/30/2014	20	(91)	(94)	(7)
FY14 Gain	06/30/2014	20	(95)	(98)	(7)
FY15 Gain	06/30/2015	21	(664)	(684)	(49)
FY16 Loss	06/30/2016	22	4	4	0
FY17 Gain	06/30/2017	23	(525)	(533)	(36)
FY18 Gain	06/30/2018	24	(262)	(263)	(17)
Change in Assumptions	06/30/2018	24	(633)	(636)	(42)
FY19 Loss	06/30/2019	25	219	219	14
Total				\$ (4,458)	\$ (330)

Schedule of Past Service Cost Amortizations - Peace Officer/Firefighter Retiree Medical (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Unfunded Liability	06/30/2007	13	\$ (21)	\$ (23)	\$ (2)
Change In Assumptions	06/30/2008	14	17	16	1
FY08 Gain	06/30/2008	14	(62)	(63)	(6)
Change In Assumptions	06/30/2009	15	(8)	(8)	(1)
FY09 Gain	06/30/2009	15	(38)	(39)	(3)
Change In Assumptions	06/30/2010	16	41	41	3
FY10 Gain	06/30/2010	16	(46)	(44)	(4)
FY11 Loss	06/30/2011	17	70	70	6
Change In Assumptions	06/30/2012	18	3,085	3,200	252
FY12 Gain	06/30/2012	18	(273)	(282)	(22)
FY13 Loss	06/30/2013	19	880	913	69
Change In Assumptions	06/30/2014	20	(3,034)	(3,141)	(231)
FY14 Loss	06/30/2014	20	1,213	1,256	92
FY15 Gain	06/30/2015	21	(712)	(733)	(52)
EGWP Gain	06/30/2016	22	(1,675)	(1,716)	(119)
FY16 Loss	06/30/2016	22	1,116	1,144	79
Change In Assumptions	06/30/2017	23	2,244	2,278	154
FY17 Gain	06/30/2017	23	(50)	(52)	(4)
FY18 Gain	06/30/2018	24	(231)	(232)	(15)
Change In Assumptions	06/30/2018	24	(649)	(651)	(43)
FY19 Gain	06/30/2019	25	(1,291)	(1,291)	(83)
Total			\$	643	\$ 71

Schedule of Past Service Cost Amortizations - Peace Officer/Firefighter Total (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Unfunded Liability	06/30/2007	13	\$ (121)	\$ (123)	\$ (12)
Change In Assumptions	06/30/2008	14	17	16	1
FY08 Gain	06/30/2008	14	(648)	(653)	(61)
Change In Assumptions	06/30/2009	15	(112)	(114)	(10)
FY09 Gain	06/30/2009	15	408	416	38
Change In Assumptions	06/30/2010	16	120	122	10
FY10 Gain	06/30/2010	16	(328)	(335)	(29)
FY11 Loss	06/30/2011	17	143	142	12
Change In Assumptions	06/30/2012	18	3,085	3,200	252
FY12 Gain	06/30/2012	18	(622)	(644)	(50)
FY13 Loss	06/30/2013	19	676	701	53
Change In Assumptions	06/30/2014	20	(4,308)	(4,461)	(328)
PRPA Modification	06/30/2014	20	(91)	(94)	(7)
FY14 Loss	06/30/2014	20	1,118	1,158	85
FY15 Gain	06/30/2015	21	(1,376)	(1,417)	(101)
EGWP Gain	06/30/2016	22	(1,675)	(1,716)	(119)
FY16 Loss	06/30/2016	22	1,120	1,148	79
Change In Assumptions	06/30/2017	23	2,244	2,278	154
FY17 Gain	06/30/2017	23	(575)	(585)	(40)
FY18 Gain	06/30/2018	24	(493)	(495)	(32)
Change In Assumptions	06/30/2018	24	(1,282)	(1,287)	(85)
FY19 Gain	06/30/2019	25	(1,072)	(1,072)	(69)
Total			\$	(3,815)	\$ (259)

Actuarial Contributions as of June 30, 2019 - Others (\$'s in 000's)

Normal Cost Rate	Occupational Death & Disability	Retiree Medical	Total
1. Total Normal Cost	\$ 3,581	\$ 12,236	\$ 15,817
2. DCR Plan Rate Payroll Projected for FY2020	1,162,577	1,162,577	1,162,577
3. Employer Normal Cost Rate, (1) / (2)	0.31%	1.05%	1.36%

Past Service Rate			
1. Actuarial Accrued Liability	\$ 2,712	\$ 111,915	\$ 114,627
2. Valuation Assets	25,181	106,395	131,576
3. Unfunded Actuarial Accrued Liability, (1) - (2)	\$ (22,469)	\$ 5,520	\$ (16,949)
4. Funded Ratio, (2) / (1)	928.5%	95.1%	114.8%
5. Past Service Cost Amortization Payment	(1,639)	651	(988)
6. DCR Plan Rate Payroll Projected for FY2020	1,162,577	1,162,577	1,162,577
7. Past Service Cost Rate, (5) / (6)	(0.14%)	0.06%	(0.08%)
Total Employer Contribution Rate, not less than Normal Cost Rate	0.31%	1.11%	1.42%

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	\$ 3,581	\$ 12,236	\$ 15,817
2. Total DB and DCR Plan Rate Payroll Projected for FY2020	1,997,095	1,997,095	1,997,095
3. Employer Normal Cost Rate, (1) / (2)	0.18%	0.61%	0.79%
4. Past Service Cost Amortization Payment	(1,639)	651	(988)
5. Past Service Cost Rate, (4) / (2)	(0.08%)	0.03%	(0.05%)
Total Employer Contribution Rate, not less than Normal Cost Rate	0.18%	0.64%	0.82%

Schedule of Past Service Cost Amortizations - Others 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	13	\$ (40)	\$ (41)	\$ (4)
FY08 Gain	06/30/2008	14	(318)	(321)	(30)
Change in Assumptions	06/30/2009	15	(92)	(94)	(9)
FY09 Loss	06/30/2009	15	(1,924)	(1,960)	(175)
Change in Assumptions	06/30/2010	16	24	25	2
FY10 Gain	06/30/2010	16	(994)	(1,022)	(87)
FY11 Loss	06/30/2011	17	(1,184)	(1,221)	(100)
FY12 Gain	06/30/2012	18	(1,233)	(1,278)	(101)
FY13 Gain	06/30/2013	19	(779)	(808)	(62)
Change in Assumptions	06/30/2014	20	(51)	(52)	(4)
PRPA Modification	06/30/2014	20	(27)	(28)	(2)
FY14 Gain	06/30/2014	20	(2,003)	(2,073)	(153)
FY15 Gain	06/30/2015	21	(1,850)	(1,906)	(136)
FY16 Loss	06/30/2016	22	(2,361)	(2,418)	(168)
FY17 Gain	06/30/2017	23	(2,377)	(2,412)	(163)
FY18 Gain	06/30/2018	24	(2,590)	(2,602)	(172)
Change in Assumptions	06/30/2018	24	(272)	(274)	(18)
FY19 Loss	06/30/2019	25	(3,984)	(3,984)	(257)
Total				\$ (22,469)	\$ (1,639)

Schedule of Past Service Cost Amortizations - Others Retiree Medical (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Unfunded Liability	06/30/2007	13	\$ (335)	\$ (332)	\$ (33)
Change In Assumptions	06/30/2008	14	165	167	16
FY08 Gain	06/30/2008	14	(702)	(705)	(66)
Change In Assumptions	06/30/2009	15	(122)	(124)	(11)
FY09 Gain	06/30/2009	15	(438)	(446)	(40)
Change In Assumptions	06/30/2010	16	(572)	(586)	(49)
FY10 Gain	06/30/2010	16	579	591	51
FY11 Loss	06/30/2011	17	820	850	69
Change In Assumptions	06/30/2012	18	25,180	26,119	2,056
FY12 Gain	06/30/2012	18	1,451	1,503	118
FY13 Loss	06/30/2013	19	9,974	10,351	787
Change In Assumptions	06/30/2014	20	(21,822)	(22,596)	(1,663)
FY14 Loss	06/30/2014	20	7,002	7,251	534
FY15 Gain	06/30/2015	21	(8,726)	(8,996)	(643)
EGWP Gain	06/30/2016	22	(17,884)	(18,308)	(1,272)
FY16 Loss	06/30/2016	22	10,367	10,613	738
Change In Assumptions	06/30/2017	23	21,288	21,607	1,462
FY17 Gain	06/30/2017	23	(1,658)	(1,682)	(113)
FY18 Gain	06/30/2018	24	118	118	7
Change In Assumptions	06/30/2018	24	(8,993)	(9,034)	(597)
FY19 Gain	06/30/2019	25	(10,841)	(10,841)	(700)
Total				\$ 5,520	\$ 651

Schedule of Past Service Cost Amortizations - Others Total (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Unfunded Liability	06/30/2007	13	\$ (375)	\$ (373)	\$ (37)
Change In Assumptions	06/30/2008	14	165	167	16
FY08 Gain	06/30/2008	14	(1,020)	(1,026)	(96)
Change In Assumptions	06/30/2009	15	(214)	(218)	(20)
FY09 Gain	06/30/2009	15	(2,362)	(2,406)	(215)
Change In Assumptions	06/30/2010	16	(548)	(561)	(47)
FY10 Gain	06/30/2010	16	(415)	(431)	(36)
FY11 Loss	06/30/2011	17	(364)	(371)	(31)
Change In Assumptions	06/30/2012	18	25,180	26,119	2,056
FY12 Gain	06/30/2012	18	218	225	17
FY13 Loss	06/30/2013	19	9,195	9,543	725
Change In Assumptions	06/30/2014	20	(21,873)	(22,648)	(1,667)
PRPA Modification	06/30/2014	20	(27)	(28)	(2)
FY14 Loss	06/30/2014	20	4,999	5,178	381
FY15 Gain	06/30/2015	21	(10,576)	(10,902)	(779)
EGWP Gain	06/30/2016	22	(17,884)	(18,308)	(1,272)
FY16 Loss	06/30/2016	22	8,006	8,195	570
Change In Assumptions	06/30/2017	23	21,288	21,607	1,462
FY17 Gain	06/30/2017	23	(4,035)	(4,094)	(276)
FY18 Gain	06/30/2018	24	(2,472)	(2,484)	(165)
Change In Assumptions	06/30/2018	24	(9,265)	(9,308)	(615)
FY19 Gain	06/30/2019	25	(14,825)	(14,825)	(957)
Total			\$	(16,949)	\$ (988)

Actuarial Contributions as of June 30, 2019 - All Members (\$'s in 000's)

Normal Cost Rate	Occupational Death & Disability	Retiree Medical	Total
1. Total Normal Cost	\$ 4,809	\$ 13,755	\$ 18,564
2. DCR Plan Rate Payroll Projected for FY2020	1,342,839	1,342,839	1,342,839
3. Employer Normal Cost Rate, (1) / (2)	0.36%	1.02%	1.38%

Past Service Rate			
1. Actuarial Accrued Liability	\$ 9,774	\$ 124,946	\$ 134,720
2. Valuation Assets	36,701	118,783	155,484
3. Unfunded Actuarial Accrued Liability, (1) - (2)	\$ (26,927)	\$ 6,163	\$ (20,764)
4. Funded Ratio, (2) / (1)	375.5%	95.1%	115.4%
5. Past Service Cost Amortization Payment	(1,969)	722	(1,247)
6. DCR Plan Rate Payroll Projected for FY2020	1,342,839	1,342,839	1,342,839
7. Past Service Cost Rate, (5) / (6)	(0.15%)	0.05%	(0.09%)
Total Employer Contribution Rate, not less than Normal Cost Rate	0.36%	1.07%	1.43%

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	\$ 4,809	\$ 13,755	\$ 18,564
2. Total DB and DCR Plan Rate Payroll Projected for FY2020	2,347,306	2,347,306	2,347,306
3. Employer Normal Cost Rate, (1) / (2)	0.20%	0.59%	0.79%
4. Past Service Cost Amortization Payment	(1,969)	722	(1,247)
5. Past Service Cost Rate, (4) / (2)	(0.08%)	0.03%	(0.05%)
Total Employer Contribution Rate, not less than Normal Cost Rate	0.20%	0.62%	0.82%

Schedule of Past Service Cost Amortizations - All Members 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	13	\$ (140)	\$ (141)	\$ (14)
FY08 Gain	06/30/2008	14	(904)	(911)	(85)
Change in Assumptions	06/30/2009	15	(196)	(200)	(18)
FY09 Loss	06/30/2009	15	(1,478)	(1,505)	(134)
Change in Assumptions	06/30/2010	16	103	106	9
FY10 Gain	06/30/2010	16	(1,276)	(1,313)	(112)
FY11 Loss	06/30/2011	17	(1,111)	(1,149)	(94)
FY12 Gain	06/30/2012	18	(1,582)	(1,640)	(129)
FY13 Gain	06/30/2013	19	(983)	(1,020)	(78)
Change in Assumptions	06/30/2014	20	(1,325)	(1,372)	(101)
PRPA Modification	06/30/2014	20	(118)	(122)	(9)
FY14 Gain	06/30/2014	20	(2,098)	(2,171)	(160)
FY15 Gain	06/30/2015	21	(2,514)	(2,590)	(185)
FY16 Loss	06/30/2016	22	(2,357)	(2,414)	(168)
FY17 Gain	06/30/2017	23	(2,902)	(2,945)	(199)
FY18 Gain	06/30/2018	24	(2,852)	(2,865)	(189)
Change in Assumptions	06/30/2018	24	(905)	(910)	(60)
FY19 Loss	06/30/2019	25	(3,765)	(3,765)	(243)
Total				\$ (26,927)	\$ (1,969)

Schedule of Past Service Cost Amortizations - All Members Retiree Medical (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Unfunded Liability	06/30/2007	13	\$ (356)	\$ (355)	\$ (35)
Change In Assumptions	06/30/2008	14	182	183	17
FY08 Gain	06/30/2008	14	(764)	(768)	(72)
Change In Assumptions	06/30/2009	15	(130)	(132)	(12)
FY09 Gain	06/30/2009	15	(476)	(485)	(43)
Change In Assumptions	06/30/2010	16	(531)	(545)	(46)
FY10 Gain	06/30/2010	16	533	547	47
FY11 Loss	06/30/2011	17	890	920	75
Change In Assumptions	06/30/2012	18	28,265	29,319	2,308
FY12 Gain	06/30/2012	18	1,178	1,221	96
FY13 Loss	06/30/2013	19	10,854	11,264	856
Change In Assumptions	06/30/2014	20	(24,856)	(25,737)	(1,894)
FY14 Loss	06/30/2014	20	8,215	8,507	626
FY15 Gain	06/30/2015	21	(9,438)	(9,729)	(695)
EGWP Gain	06/30/2016	22	(19,559)	(20,024)	(1,391)
FY16 Loss	06/30/2016	22	11,483	11,757	817
Change In Assumptions	06/30/2017	23	23,532	23,885	1,616
FY17 Gain	06/30/2017	23	(1,708)	(1,734)	(117)
FY18 Gain	06/30/2018	24	(113)	(114)	(8)
Change In Assumptions	06/30/2018	24	(9,642)	(9,685)	(640)
FY19 Gain	06/30/2019	25	(12,132)	(12,132)	(783)
Total				\$ 6,163	\$ 722

Schedule of Past Service Cost Amortizations - All Members Total (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Unfunded Liability	06/30/2007	13	\$ (496)	\$ (496)	\$ (49)
Change In Assumptions	06/30/2008	14	182	183	17
FY08 Gain	06/30/2008	14	(1,668)	(1,679)	(157)
Change In Assumptions	06/30/2009	15	(326)	(332)	(30)
FY09 Gain	06/30/2009	15	(1,954)	(1,990)	(177)
Change In Assumptions	06/30/2010	16	(428)	(439)	(37)
FY10 Gain	06/30/2010	16	(743)	(766)	(65)
FY11 Loss	06/30/2011	17	(221)	(229)	(19)
Change In Assumptions	06/30/2012	18	28,265	29,319	2,308
FY12 Gain	06/30/2012	18	(404)	(419)	(33)
FY13 Loss	06/30/2013	19	9,871	10,244	778
Change In Assumptions	06/30/2014	20	(26,181)	(27,109)	(1,995)
PRPA Modification	06/30/2014	20	(118)	(122)	(9)
FY14 Loss	06/30/2014	20	6,117	6,336	466
FY15 Gain	06/30/2015	21	(11,952)	(12,319)	(880)
EGWP Gain	06/30/2016	22	(19,559)	(20,024)	(1,391)
FY16 Loss	06/30/2016	22	9,126	9,343	649
Change In Assumptions	06/30/2017	23	23,532	23,885	1,616
FY17 Gain	06/30/2017	23	(4,610)	(4,679)	(316)
FY18 Gain	06/30/2018	24	(2,965)	(2,979)	(197)
Change In Assumptions	06/30/2018	24	(10,547)	(10,595)	(700)
FY19 Gain	06/30/2019	25	(15,897)	(15,897)	(1,026)
Total			\$	(20,764)	\$ (1,247)

Section 1.3: Actuarial Gain/(Loss) for FY 2019 (\$'s in 000's)

	Occupational Death & Disability	Retiree Medical	Total
1. Expected Actuarial Accrued Liability			
a. Actuarial Accrued Liability as of June 30, 2018	\$ 7,713	\$ 118,598	\$ 126,311
b. Normal Cost	4,396	13,973	18,369
c. Interest on (a) and (b) at 7.38%	894	9,784	10,678
d. Medicare Part D Subsidy and EGWP	0	19	19
e. Benefit Payments	(398)	(109)	(507)
f. Interest on (d) at 7.38%, adjusted for timing	(14)	(3)	(17)
g. Assumptions/Method Changes	0	0	0
h. Expected Actuarial Accrued Liability as of June 30, 2019 (a) + (b) + (c) + (d) + (e) + (f)	\$ 12,591	\$ 142,262	\$ 154,853
2. Actual Actuarial Accrued Liability as of June 30, 2019	9,774	124,946	134,720
3. Liability Gain/(Loss), (1)(h) - (2)	\$ 2,817	\$ 17,316	\$ 20,133
4. Expected Actuarial Asset Value			
a. Actuarial Value of Assets as of June 30, 2018	\$ 30,961	\$ 100,097	\$ 131,058
b. Interest on (a) at 7.38%	2,285	7,387	9,672
c. Employer Contributions	4,083	11,736	15,819
d. Interest on (c) at 7.38%, adjusted for timing	148	425	573
e. Medicare Part D Subsidy and EGWP	0	19	19
f. Benefit Payments	(398)	(109)	(507)
g. Admin Expenses	(1)	(14)	(15)
h. Interest on (e), (f) and (g) at 7.38%, adjusted for timing	(14)	(4)	(18)
i. Expected Actuarial Asset Value as of June 30, 2019 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	\$ 37,064	\$ 119,537	\$ 156,601
5. Actual Actuarial Asset Value as of June 30, 2019	36,701	118,783	155,484
6. Actuarial Asset Value Gain/(Loss), (5) - (4)(k)	\$ (363)	\$ (754)	\$ (1,117)
7. Total Actuarial Gain/(Loss), (3) + (6)	\$ 2,454	\$ 16,562	\$ 19,016
8. Contribution Gain/(Loss)	\$ 1,302	\$ (4,424)	\$ (3,122)
9. Administrative Expense Gain/(Loss)	\$ 9	\$ (6)	\$ 3
10. FY 2019 Gain/(Loss), (7) + (8) + (9)	\$ 3,765	\$ 12,132	\$ 15,897

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)

Section 2: Plan Assets

Section 2.1: Summary of Fair Value of Assets (\$'s in 000's)

As of June 30, 2019	Occupational Death & Disability	Retiree Medical	Total Fair Value	Allocation Percent
Cash and Short-Term Investments				
- Cash and Cash Equivalents	\$ 740	\$ 2,399	\$ 3,139	2.0%
- Subtotal	\$ 740	\$ 2,399	\$ 3,139	2.0%
Fixed Income Investments				
- Domestic Fixed Income Pool	\$ 3,803	\$ 12,324	\$ 16,127	10.5%
- 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	\$ 3,803	\$ 12,324	\$ 16,127	10.5%
Equity Investments				
- Domestic Equity Pool	\$ 8,376	\$ 27,144	\$ 35,520	23.1%
- International Equity Pool	6,645	21,533	28,178	18.3%
- Private Equity Pool	3,816	12,368	16,184	10.5%
- Emerging Markets Equity Pool	1,308	4,238	5,546	3.6%
- Alternative Equity Strategies	3,524	11,422	14,946	9.7%
- Subtotal	\$ 23,669	\$ 76,705	\$ 100,374	65.2%
Other Investments				
- Real Estate Pool	\$ 2,456	\$ 7,959	\$ 10,415	6.8%
- Other Investments Pool	3,531	11,443	14,974	9.7%
- Absolute Return Pool	2,089	6,768	8,857	5.8%
- Other Assets	0	0	0	0.0%
- Subtotal	\$ 8,076	\$ 26,170	\$ 34,246	22.3%
Total Cash and Investments	\$ 36,288	\$ 117,598	\$ 153,886	100.0%
Net Accrued Receivables	237	640	877	
Net Assets	\$ 36,525	\$ 118,238	\$ 154,763	
Peace Officer / Firefighter	\$ 11,465	N/A	N/A	
Others	25,060	N/A	N/A	
All Members	\$ 36,525	\$ 118,238	\$ 154,763	

Section 2.2: Changes in Fair Value of Assets During FY 2019 (\$'s in 000's)

As of June 30, 2019	Occupational Death & Disability	Retiree Medical	Total Fair Value
1. Fair Value of Assets as of June 30, 2018	\$ 30,805	\$ 100,015	\$ 130,820
2. Additions:			
a. Employee Contributions	\$ 0	\$ 0	\$ 0
b. Employer Contributions	4,083	11,736	15,819
c. Interest and Dividend Income	601	1,948	2,549
d. Net Appreciation / Depreciation			0
in Fair Value of Investments	1,448	4,686	6,134
e. Medicare Part D Subsidy	0	19	19
f. Other	<u>0</u>	<u>0</u>	<u>0</u>
g. Total Additions	\$ 6,132	\$ 18,389	\$ 24,521
3. Deductions:			
a. Medical Benefits	\$ 0	\$ 109	\$ 109
b. Death & Disability Benefits	398	0	398
c. Investment Expenses	12	41	53
d. Administrative Expenses	1	14	15
e. Securities Expenses	<u>1</u>	<u>2</u>	<u>3</u>
f. Total Deductions	\$ 412	\$ 166	\$ 578
4. Fair Value of Assets as of June 30, 2019	\$ 36,525	\$ 118,238	\$ 154,763
Approximate Fair Value Investment Return Rate			
During FY 2019 Net of All Expenses	6.2%	6.2%	6.2%

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. Deferral of Investment Gain / (Loss) for FY 2019			
a. Fair Value of Assets as of June 30, 2018	\$ 30,805	\$ 100,015	\$ 130,820
b. Contributions	4,083	11,736	15,819
c. Medicare Part D Subsidy	0	19	19
d. Benefit Payments	398	109	507
e. Administrative Expenses	1	14	15
f. Actual Investment Return (net of expenses)	2,036	6,591	8,627
g. Expected Return Rate (net of expenses)	7.38%	7.38%	7.38%
h. Expected Return - Weighted for Timing	2,406	7,803	10,209
i. Investment Gain / (Loss) for the Year, (f) - (h)	(370)	(1,212)	(1,582)
2. Actuarial Value as of June 30, 2019			
a. Fair Value as of June 30, 2019	\$ 36,525	\$ 118,238	\$ 154,763
b. Deferred Investment Gain / (Loss)	(176)	(545)	(721)
c. Preliminary Actuarial Value as of June 30, 2019, (a) - (b)	36,701	118,783	155,484
d. Upper Limit: 120% of Fair Value, June 30, 2019	43,830	141,886	185,716
e. Lower Limit: 120% of Fair Value, June 30, 2019	29,220	94,590	123,810
f. Actuarial Value, June 30, 2019(c), limited by (d) and (e)	36,701	118,783	155,484
3. Ratio of Actuarial Value of Assets to Fair Value of Assets	100.5%	100.5%	100.5%
4. Approximate Actuarial Value Investment Return Rate			
During FY 2019 Net of All Expenses	6.3%	6.6%	6.6%
5. Actuarial Value Allocation ¹			
a. Peace Officer/Firefighter	\$ 11,520	\$ 12,388	\$ 23,908
b. Others	25,181	106,395	131,576
c. All Members	\$ 36,701	\$ 118,783	\$ 155,484

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, 2015	\$ (841)	\$ (672)	\$ (169)	\$ 0
June 30, 2016	(1,649)	(990)	(330)	(329)
June 30, 2017	1,090	436	218	436
June 30, 2018	23	5	5	13
June 30, 2019	<u>(370)</u>	<u>0</u>	<u>(74)</u>	<u>(296)</u>
Total	\$ (1,747)	\$ (1,221)	\$ (350)	\$ (176)

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, 2015	\$ (1,608)	\$ (1,288)	\$ (320)	\$ 0
June 30, 2016	(4,028)	(2,418)	(806)	(804)
June 30, 2017	3,156	1,262	631	1,263
June 30, 2018	(58)	(12)	(12)	(34)
June 30, 2019	<u>(1,212)</u>	<u>0</u>	<u>(242)</u>	<u>(970)</u>
Total	\$ (3,750)	\$ (2,456)	\$ (749)	\$ (545)

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, 2015	\$ (2,449)	\$ (1,960)	\$ (489)	\$ 0
June 30, 2016	(5,677)	(3,408)	(1,136)	(1,133)
June 30, 2017	4,246	1,698	849	1,699
June 30, 2018	(35)	(7)	(7)	(21)
June 30, 2019	<u>(1,582)</u>	<u>0</u>	<u>(316)</u>	<u>(1,266)</u>
Total	\$ (5,497)	\$ (3,677)	\$ (1,099)	\$ (721)

Section 2.4: Historical Asset Rates of Return

Year Ending	Actuarial Value		Fair Value	
	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%

Section 3: Member Data

Section 3.1: Summary of Members Included

As of June 30	2015	2016	2017	2018 ¹	2019
Peace Officer/Firefighter – Active Members					
1. Number	1,438	1,605	1,701	1,905	2,038 ²
2. Average Age	34.93	35.17	35.59	35.63	35.76
3. Average Credited Service	3.71	4.12	4.65	4.83	5.09
4. Average Entry Age	31.22	31.05	30.94	30.80	30.67
5. Average Annual Earnings	\$ 71,839	\$ 76,213	\$ 77,800	\$ 78,603	\$ 84,593
Others – Active Members					
1. Number	15,660	16,610	17,470	18,473	19,864 ³
2. Average Age	40.54	40.90	41.22	41.34	41.49
3. Average Credited Service	3.24	3.51	3.83	4.08	4.25
4. Average Entry Age	37.30	37.39	37.39	37.26	37.24
5. Average Annual Earnings	\$ 53,780	\$ 55,335	\$ 56,100	\$ 57,349	\$ 58,223
Total – Active Members					
1. Number	17,098	18,215	19,171	20,378	21,902 ⁴
2. Average Age	40.07	40.39	40.72	40.80	40.96
3. Average Credited Service	3.28	3.56	3.90	4.15	4.33
4. Average Entry Age	36.79	36.83	36.82	36.65	36.63
5. Average Annual Earnings	\$ 55,299	\$ 57,175	\$ 58,025	\$ 59,336	\$ 60,676
Disabilitants and Beneficiaries (Occupational Death & Disability)					
1. Number	12	12	14	15	16
2. Average Age	43.19	44.19	42.37	43.66	42.28
3. Average Monthly Death & Disability Benefit	\$ 2,399	\$ 2,442	\$ 2,199	\$ 2,285	\$ 2,404
Retirees, Surviving Spouses, and Dependent Spouses (Retiree Medical)					
1. Number	0	0	9	23	43
2. Average Age	N/A	N/A	70.76	69.97	69.72
Total Number of Members	17,100	18,227	19,194	20,416	21,961

Total and average annual earnings (“valuation pay”) are the annualized earnings for the fiscal year ending on the valuation date.

¹ 4 members who were terminated before the valuation date were subsequently rehired, per client data as of October 1, 2018. These members were valued as active as of the valuation date.

² Includes 1,695 male active members and 343 female active members.

³ Includes 8,512 male active members and 11,352 female active members.

⁴ Includes 10,207 male active members and 11,695 female active members.

Section 3.2: Age and Service Distribution of Active Members

Annual Earnings by Age				Annual Earnings by Credited Service			
Age	Number	Total Annual Earnings	Average Annual Earnings	Years of Service	Number	Total Annual Earnings	Average Annual Earnings
0 – 19	99	4,317,310	43,609	0	4,443	215,796,164	48,570
20 – 24	1,273	59,896,179	47,051	1	3,144	165,298,056	52,576
25 – 29	3,038	167,256,749	55,055	2	2,298	130,194,774	56,656
30 – 34	3,808	238,434,861	62,614	3	2,031	121,264,760	59,707
35 – 39	3,341	217,132,738	64,990	4	1,818	114,118,868	62,772
40 – 44	2,652	168,439,475	63,514	0 – 4	13,734	746,672,622	54,367
45 – 49	2,315	142,276,247	61,458	5 – 9	6,224	427,017,115	68,608
50 – 54	1,964	121,337,963	61,781	10 – 14	1,940	154,914,035	79,853
55 – 59	1,763	106,888,595	60,629	15 – 19	4	330,675	82,669
60 – 64	1,142	70,975,462	62,150	20 – 24	0	0	0
65 – 69	383	25,161,499	65,696	25 – 29	0	0	0
70 – 74	99	5,660,947	57,181	30 – 34	0	0	0
75+	25	1,156,422	46,257	35 – 39	0	0	0
				40+	0	0	0
Total	21,902	1,328,934,447	60,676	Total	21,902	1,328,934,447	60,676

Years of Credited Service by Age										
Age	Years of Service									
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total
0 – 19	99	0	0	0	0	0	0	0	0	99
20 – 24	1,263	10	0	0	0	0	0	0	0	1,273
25 – 29	2,632	402	4	0	0	0	0	0	0	3,038
30 – 34	2,442	1,165	201	0	0	0	0	0	0	3,808
35 – 39	1,876	1,085	380	0	0	0	0	0	0	3,341
40 – 44	1,496	814	341	1	0	0	0	0	0	2,652
45 – 49	1,281	765	268	1	0	0	0	0	0	2,315
50 – 54	1,035	678	251	0	0	0	0	0	0	1,964
55 – 59	879	642	242	0	0	0	0	0	0	1,763
60 – 64	522	438	180	2	0	0	0	0	0	1,142
65 – 69	153	174	56	0	0	0	0	0	0	383
70 – 74	41	43	15	0	0	0	0	0	0	99
75+	15	8	2	0	0	0	0	0	0	25
Total	13,734	6,224	1,940	4	0	0	0	0	0	21,902

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, 2018 ¹	20,378	19	4	12	3	20,416
Vested Termination	(521)	0	0	(1)	0	(522)
Non-vested Termination	(2,019)	0	0	0	0	(2,019)
Refund of Contributions	(663)	0	0	0	0	(663)
Converted To/From DB Plan	0	0	0	0	0	0
Transfer In	74	1	0	0	0	75
Transfer Out	(69)	0	0	0	0	(69)
Disabled	(2)	0	0	2	0	0
Retired	(15)	15	5	0	0	5
Deceased, No Beneficiary	(16)	(1)	0	0	0	(17)
Deceased, With Beneficiary	0	0	0	(1)	1	0
Return to Active	614	0	0	0	0	614
Data Adjustment	0	0	0	0	0	0
New Entrant	4,141	N/A	N/A	N/A	N/A	4,141
As of June 30, 2019 ²	21,902	34	9	12	4	21,961

¹ 112 participants are expected to receive retiree medical benefits in a different plan and are included for OD&D benefits only.

² 101 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 Valuation Data

Valuation Date	Number	Annual Earnings (000's)	Annual Average Earnings	Percent Increase/ (Decrease) in Average Earnings	Number of Participating Employers
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
June 30, 2011	10,965	524,088	47,796	4.8%	160
June 30, 2010	9,232	421,187	45,622	5.4%	160
June 30, 2009	7,256	314,118	43,291	7.2%	160
June 30, 2008	5,052	203,955	40,371	8.1%	159
June 30, 2007	2,827	105,611	37,358	0.0%	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 (000s)
a) DRB actual reported salaries FY19 – employer list	\$ 1,217,156
b) DRB actual reported salaries FY19 – valuation data	1,158,637
c) Annualized valuation data	1,328,934
d) Valuation payroll as of June 30, 2019	1,397,451
e) Rate payroll for FY20	1,342,839

a) Actual reported salaries from DRB employer listing showing all payroll paid during FY19, including those who were not active as of June 30, 2019
b) Payroll from valuation data for people who are in active status as of June 30, 2019
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, 2019.

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 155 employers participating in PERS DCR, including the State of Alaska, and 154 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 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	\$300 / \$600
Medical services (participant share)	20%	40%
Emergency Room Copay (non-emergent use)	\$100	\$100
Medical Out-of-Pocket Maximum (single / family, after deductible)	\$1,200 / \$2,400	\$2,400 / \$4,800
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	\$1,000 / \$2,000
Medicare Pharmacy Arrangement	Retiree Drug Subsidy / Employer Group Waiver Plan effective 1/1/2019	
Wellness / Preventative	100%, Not subject to deductible	

¹ Assumed to increase annually to mitigate impact of healthcare cost trend

² OON applies only to non-Medicare eligible participants.

- Buck used its manual rate models to determine relative plan values for the defined benefit (DB) retiree medical plan and the adopted 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 adopted 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 2020 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.
- The retiree medical plan's coverage is supplemental to Medicare. Medicare coordination is described in the 2019 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
Less than 15 years	30%
15 – 19	25%
20 – 24	20%
25 – 29	15%
30 years or more	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 dual coverage members.
- 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

- There have been no 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 Method

Entry Age Normal Cost.

Liabilities and contributions shown in the report are computed using the Entry Age Normal Actuarial Cost Method. Each year's difference between actual and expected unfunded actuarial accrued liability is amortized over 25 years as a level percentage of expected payroll. However, in keeping with GASB requirements in effect when the plan was adopted, the net amortization period will not exceed 30 years. Under the new accounting standards (GASB 74 and 75), the GASB requirements will not directly control amortization periods used for funding of the plan.

Cost factors designed to produce annual costs as a constant percentage of each member's expected compensation in each year for death and 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, 2019.

Due to the lack of experience for the DCR retiree medical plan only, base claims costs are based on those described in the actuarial valuation as of June 30, 2019 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 FY20 claims costs were reduced 2.1% for medical claims, and 10.4% for prescription drugs. In addition, to account for the difference in Medicare coordination, projected FY20 medical claims costs for Medicare eligible retirees were further reduced 29.3%. The medical and prescription drug percentages mentioned above were reduced 0.2% in each future year for the DCR medical benefits to reflect the fact that the medical benefit to be offered to DCR members will have annual indexing of member cost sharing features such as deductibles and out-of-pocket amounts.

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 2020 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 valuation results included in the report reflect the repeal of this tax. The removal of the Cadillac Tax created an actuarial gain of approximately \$925,000.

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, 2019 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.

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 Table 2).

Disability

Incidence rates based upon the 2013-2017 actual experience. (See Table 3).

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, 40% of the time for Others.

For Peace Officer/Firefighters, members are assumed to take the monthly annuity 100% of the time.

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% 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 dual medical coverage. For Others, 65% of male members and 60% 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 and 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 FY20 medical and prescription drugs are shown below:

	Medical	Prescription Drugs
Pre-Medicare	\$ 14,464	\$ 3,263
Medicare Parts A & B	\$ 1,564	\$ 3,501
Medicare Part D – EGWP	N/A	\$ 1,044

Members are assumed to attain Medicare eligibility at age 65. All costs are for the 2020 fiscal year (July 1, 2019 – June 30, 2020).

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

\$348 per person per year; assumed trend rate of 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:

- 0.979 for the pre-Medicare plan.
- 0.686 for both the Medicare medical plan and Medicare coordination method (2.1% reduction for the medical plan and 29.3% reduction for the coordination method).
- 0.896 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, 2019 Normal Cost, which are based on the average of actual administrative expenses during the last two fiscal years, are \$600 for occupational death & disability and \$8,750 for retiree medical.

Health Cost Trend

The table below shows the rates used to project the cost from the shown fiscal year to the next fiscal year. For example, 7.0% is applied to the FY20 pre-Medicare medical claims cost to get the FY21 medical claims cost.

Fiscal Year	Medical Pre-65	Medical Post-65	Prescription Drugs / EGWP
FY20	7.0%	5.4%	8.0%
FY21	6.5%	5.4%	7.5%
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 valuations 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 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

Decrement Due to Disability		Decrement Due to Retirement	
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 to \$600 for occupational death & disability and \$8,750 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. Trend rates are no longer loaded to reflect the Cadillac Tax, which was repealed in December 2019.

Table 1: Alaska PERS DCR Plan Salary Scale

Peace Officer / Firefighter		Others	
Service	% Increase	Service	% 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%
19	2.75%	19	2.75%
20+	2.75%	20+	2.75%

Table 2: Alaska PERS DCR Plan Peace Officer / Firefighter Turnover Table

Select Rates of Turnover During the First 5 Years of Employment

Service	Male	Female
0	18.9%	20.6%
1	14.2%	16.5%
2	10.5%	13.8%
3	9.5%	12.4%
4	8.4%	11.3%

Ultimate Rates of Turnover After the First 5 Years of Employment

Age	Male	Female	Age	Male	Female
20	5.52%	11.97%	45	5.71%	11.03%
21	5.52%	11.97%	46	5.64%	10.98%
22	5.52%	11.97%	47	5.57%	10.92%
23	5.65%	11.97%	48	6.01%	10.84%
24	5.78%	11.97%	49	6.45%	10.75%
25	5.91%	11.97%	50	6.89%	10.67%
26	6.04%	11.97%	51	7.32%	10.58%
27	6.16%	11.97%	52	7.76%	10.50%
28	6.16%	11.94%	53	7.97%	10.66%
29	6.15%	11.91%	54	8.18%	10.82%
30	6.14%	11.88%	55	8.38%	10.98%
31	6.14%	11.84%	56	8.59%	11.15%
32	6.12%	11.81%	57	8.80%	11.31%
33	6.11%	11.79%	58	9.03%	11.47%
34	6.09%	11.77%	59	9.25%	11.63%
35	6.08%	11.75%	60	9.48%	11.79%
36	6.07%	11.72%	61	9.71%	11.95%
37	6.05%	11.70%	62	9.94%	12.12%
38	6.03%	11.60%	63	12.37%	12.28%
39	6.00%	11.50%	64	14.81%	12.44%
40	5.98%	11.40%	65+	17.25%	12.60%
41	5.95%	11.30%			
42	5.90%	11.20%			
43	5.85%	11.14%			
44	5.78%	11.09%			

Table 2: Alaska PERS DCR Plan Others Turnover Table

Select Rates of Turnover During the First 5 Years of Employment

Service	Male	Female
0	24.4%	28.0%
1	21.0%	22.3%
2	16.8%	17.9%
3	13.4%	14.3%
4	9.5%	12.3%

Ultimate Rates of Turnover After the First 5 Years of Employment

Age	Male	Female	Age	Male	Female
20	13.71%	16.50%	45	7.72%	7.90%
21	13.71%	16.50%	46	7.60%	7.58%
22	13.71%	16.50%	47	7.48%	7.26%
23	13.71%	16.51%	48	7.68%	7.23%
24	13.71%	16.51%	49	7.87%	7.20%
25	13.71%	16.52%	50	8.07%	7.17%
26	13.71%	16.53%	51	8.26%	7.14%
27	13.71%	16.54%	52	8.46%	7.11%
28	13.41%	15.94%	53	8.46%	7.26%
29	13.21%	15.34%	54	8.47%	7.42%
30	12.82%	17.75%	55	8.48%	7.57%
31	12.52%	14.15%	56	8.48%	7.72%
32	12.22%	13.55%	57	8.49%	7.88%
33	11.65%	12.90%	58	8.77%	8.15%
34	11.09%	12.24%	59	9.08%	8.42%
35	10.52%	11.58%	60	9.32%	8.69%
36	9.95%	10.92%	61	9.60%	8.96%
37	9.39%	10.26%	62	9.88%	9.24%
38	9.12%	9.98%	63	10.28%	10.51%
39	8.86%	9.70%	64	10.68%	11.78%
40	8.60%	9.42%	65+	11.08%	13.05%
41	8.32%	9.14%			
42	8.07%	8.86%			
43	7.95%	8.54%			
44	7.83%	8.22%			

Table 3: Alaska PERS DCR Plan Disability Table

Age	Peace Officer / Firefighter		Others	
	Male	Female	Male	Female
20	0.0179%	0.0112%	0.0327%	0.0376%
21	0.0179%	0.0112%	0.0327%	0.0376%
22	0.0179%	0.0112%	0.0327%	0.0376%
23	0.0244%	0.0153%	0.0360%	0.0400%
24	0.0310%	0.0194%	0.0392%	0.0424%
25	0.0374%	0.0234%	0.0425%	0.0448%
26	0.0440%	0.0275%	0.0456%	0.0472%
27	0.0505%	0.0316%	0.0489%	0.0496%
28	0.0526%	0.0329%	0.0501%	0.0510%
29	0.0548%	0.0343%	0.0513%	0.0524%
30	0.0570%	0.0356%	0.0524%	0.0538%
31	0.0591%	0.0370%	0.0536%	0.0554%
32	0.0612%	0.0383%	0.0548%	0.0568%
33	0.0634%	0.0397%	0.0566%	0.0586%
34	0.0657%	0.0411%	0.0584%	0.0606%
35	0.0679%	0.0425%	0.0602%	0.0624%
36	0.0702%	0.0439%	0.0620%	0.0644%
37	0.0724%	0.0453%	0.0638%	0.0662%
38	0.0757%	0.0473%	0.0669%	0.0696%
39	0.0789%	0.0493%	0.0701%	0.0728%
40	0.0822%	0.0514%	0.0734%	0.0762%
41	0.0854%	0.0534%	0.0765%	0.0794%
42	0.0887%	0.0554%	0.0797%	0.0826%
43	0.0977%	0.0611%	0.0879%	0.0908%
44	0.1066%	0.0667%	0.0962%	0.0990%
45	0.1157%	0.0723%	0.1043%	0.1072%
46	0.1247%	0.0780%	0.1125%	0.1154%
47	0.1337%	0.0836%	0.1208%	0.1236%
48	0.1462%	0.0914%	0.1329%	0.1360%
49	0.1588%	0.0993%	0.1451%	0.1484%
50	0.1714%	0.1071%	0.1572%	0.1608%
51	0.1839%	0.1150%	0.1694%	0.1734%
52	0.1965%	0.1228%	0.1815%	0.1858%
53	0.2294%	0.1434%	0.2132%	0.2168%
54	0.2624%	0.1640%	0.2450%	0.2478%

Table 4: Alaska PERS DCR Plan Retirement Table

Age at Retirement	Unisex Rate
<=50	2.0%
51	2.0%
52	2.0%
53	2.0%
54	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 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.

State of Alaska

Teachers' Retirement System

Actuarial Valuation
Report
As of June 30, 2019

April 2020

BUCK



April 2, 2020

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, 2019 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, 2019. 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, 2019.

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 is expected to increase to 100% after 25 years.

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 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. 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, 2019 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.

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, 2019 have been prepared. We have also prepared the member data tables shown in Section 4 of this report for the Statistical Section of the CAFR, and the summary of actuarial assumptions, solvency test, and analysis of financial experience for the Actuarial Section of the CAFR. Please see our separate GASB 67 and GASB 74 reports for other information needed for the CAFR.

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. See Section 6 of this report for further details regarding ASOP 51.

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.

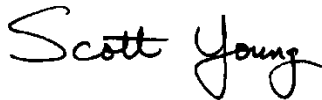
I am available to discuss this report with you at your convenience. I can be reached at 602-803-6174.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "D. J. Kershner".

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.

A handwritten signature in black ink, appearing to read "Scott Young".

Scott Young, FSA, EA, MAAA
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, 2019.

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.

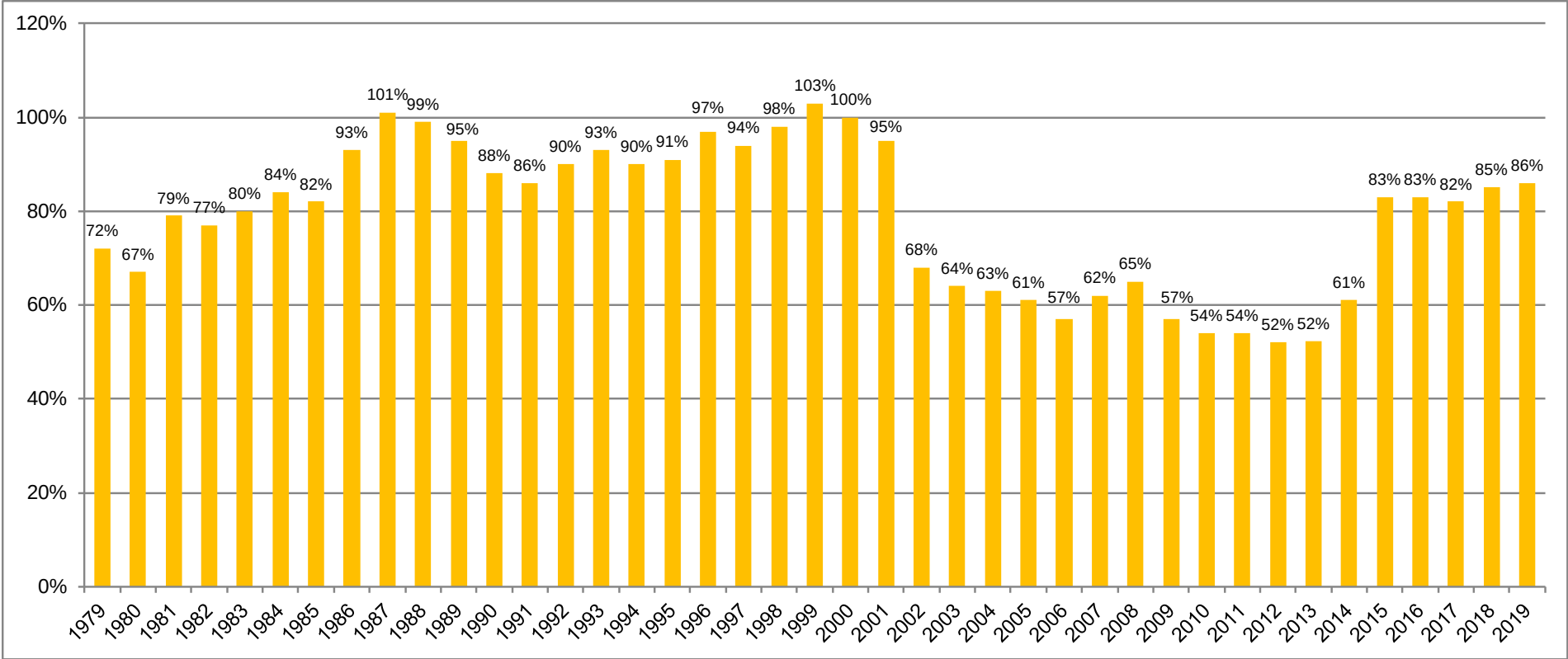
Retiree group benefits models necessarily rely on the use of approximations and estimates, and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements.

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)		2018	2019
Pension			
a. Actuarial Accrued Liability	\$	7,276,290	\$ 7,388,020
b. Valuation Assets		<u>5,541,600</u>	<u>5,563,931</u>
c. Unfunded Actuarial Accrued Liability, (a) - (b)	\$	1,734,690	\$ 1,824,089
d. Funded Ratio based on Valuation Assets, (b) ÷ (a)		76.2%	75.3%
e. Fair Value of Assets	\$	5,472,727	\$ 5,511,929
f. Funded Ratio based on Fair Value of Assets, (e) ÷ (a)		75.2%	74.6%
Healthcare			
a. Actuarial Accrued Liability	\$	2,684,150	\$ 2,518,644
b. Valuation Assets		<u>2,898,709</u>	<u>2,947,562</u>
c. Unfunded Actuarial Accrued Liability, (a) - (b)	\$	(214,559)	\$ (428,918)
d. Funded Ratio based on Valuation Assets, (b) ÷ (a)		108.0%	117.0%
e. Fair Value of Assets	\$	2,870,134	\$ 2,929,319
f. Funded Ratio based on Fair Value of Assets, (e) ÷ (a)		106.9%	116.3%
Total			
a. Actuarial Accrued Liability	\$	9,960,440	\$ 9,906,664
b. Valuation Assets		<u>8,440,309</u>	<u>8,511,493</u>
c. Unfunded Actuarial Accrued Liability, (a) - (b)	\$	1,520,131	\$ 1,395,171
d. Funded Ratio based on Valuation Assets, (b) ÷ (a)		84.7%	85.9%
e. Fair Value of Assets	\$	8,342,861	\$ 8,441,248
f. Funded Ratio based on Fair Value of Assets, (e) ÷ (a)		83.8%	85.2%

TRS Funded Ratio History (Based on Valuation Assets)



The key reasons for the change in 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 because there are no available financial instruments for purchase. Future experience is likely to vary from assumptions so there is a potential for future healthcare actuarial gains and 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 FY19 investment return based on fair value of assets was approximately 5.9% compared to the expected investment return of 7.38% (net of investment expenses of approximately 0.04%). This resulted in a market asset loss of approximately \$121 million. Due to the recognition of investment gains and losses over a 5-year period, the FY19 investment return based on actuarial value of assets was approximately 5.5%, which resulted in an actuarial asset loss of approximately \$155 million.

2. Salary Increases

Salary increases for continuing active members during FY19 were less than expected based on the valuation assumptions, resulting in a liability gain of approximately \$7 million.

3. Demographic Experience

Section 4 provides statistics on active and inactive participants. The number of active participants decreased 8.5% from 4,418 at June 30, 2018 to 4,044 at June 30, 2019 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 51.13 to 51.48 and average credited service increased from 18.62 to 19.21 years.

The number of benefit recipients increased 1.6% from 13,277 to 13,491, and their average age increased from 70.78 to 71.30. The number of vested terminated participants increased from 797 to 812. Their average age increased from 51.01 to 51.71.

The overall effect of the demographic experience during FY19 was an actuarial loss of approximately \$8 million (pension) and an actuarial gain of approximately \$14¹ million (healthcare).

4. COLA / PRPA Experience

The cost-of-living increases (COLA) for benefit recipients during FY19 were less than expected based on the valuation assumptions, resulting in a liability gain of approximately \$5 million. The postretirement pension adjustments (PRPA) were more than expected, resulting in a liability loss of approximately \$10 million.

5. Medical Claims Experience and Assumptions

As described in Section 5.2, recent medical claims experience and changes in healthcare enrollment data provided to us for the June 30, 2019 valuation generated a liability gain of approximately \$246 million (this amount includes a \$20 million gain due to the Cadillac Tax). Beginning January 1, 2019, Rx benefits were provided through a new contract with Optum. This change in vendors resulted in lower actual (and future expected) claims and higher rebates. Approximately \$234 million of the \$246 million gain in FY19 was attributable to Rx experience, the majority of which was due to the change in Rx vendors.

6. Changes in Methods Since the Prior Valuation

There were no changes in actuarial methods since the prior valuation.

¹ Includes the effect of changes in dependent coverage elections and Part B only experience.

7. Changes in Assumptions Since the Prior Valuation

Healthcare claim costs are updated annually as described in Section 5.2. Retired member contribution trend rates were updated to reflect the ongoing shift in population from pre-Medicare to Medicare-eligible and a projection of expected future retiree contributions reflecting the 10% decrease from 2019 to 2020. The Further Consolidated Appropriations Act, 2020 that was signed in December 2019 made several changes, including the repeal of the Cadillac Tax. The repeal of the Cadillac Tax reduced the plan's liabilities as of June 30, 2019 by approximately \$14 million. The amounts included in the Normal Cost for administrative expenses were updated based on the most recent two years of actual administrative expenses paid from plan assets.

8. Changes in Benefit Provisions Since the Prior Valuation

There have been no changes in the TRS benefit provisions since the prior valuation.

Comparative Summary of Key Actuarial Valuation Results

Pension Employer/State Contribution Rates for Fiscal Year	2021	2022
a. Normal Cost Rate Net of Member Contributions	2.53%	2.40%
b. Past Service Rate	<u>18.41%</u>	<u>19.08%</u>
c. Total Employer/State Contribution Rate, (a) + (b), not less than (a) ¹	20.94%	21.48%
Healthcare Employer/State Contribution Rates for Fiscal Year	2021	2022
a. Normal Cost Rate	3.40%	2.98%
b. Past Service Rate	<u>(1.43)%</u>	<u>(4.44)%</u>
c. Total Employer/State Contribution Rate, (a) + (b), not less than (a) ¹	3.40%	2.98%
Total Employer/State Contribution Rates for Fiscal Year	2021	2022
a. Normal Cost Rate Net of Member Contributions	5.93%	5.38%
b. Past Service Rate	<u>18.41%</u>	<u>19.08%</u>
c. Total Employer/State Contribution Rate, (a) + (b) ¹	24.34%	24.46%
d. Board Adopted Total Employer/State Contribution Rate	24.34%	TBD
e. Defined Contribution Retirement (DCR) Rate Paid by Employers	<u>6.13%</u>	<u>6.36%</u>
f. Board Adopted Total Rate, Including DCR Rate Paid by Employers, (d) + (e)	30.47%	TBD

Contribution rates are based on total (DB and DCR) payroll. The contribution rates shown above for FY22 are estimated assuming no actuarial gains/losses during FY20 and FY21. Actual FY22 contribution rates will be adopted reflecting FY20 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.

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, 2018 and June 30, 2019 based on DB and DCR payroll combined:

	Pension	Healthcare	Total
1. Total Employer/State contribution rate as of June 30, 2018	19.94%	4.05%	23.99%
2. Change due to:			
a. Health claims experience	N/A	(2.51)%	(2.51)%
b. Salary increases	(0.06)%	N/A	(0.06)%
c. Investment experience	0.93%	0.45%	1.38%
d. Demographic experience and miscellaneous ¹	0.75%	1.60%	2.35%
e. FY19 Contribution shortfall/(excess)	(0.15)%	(0.02)%	(0.17)%
f. Assumption changes	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>
g. Total change, (a) + (b) + (c) + (d) + (e) + (f)	1.47%	(0.48)%	0.99%
3. Total Employer/State contribution rate as of June 30, 2019, (1) + (2)(g)	21.41%	3.57%	24.98%

The following table shows the gain/(loss) on actuarial accrued liability as of June 30, 2019 (\$'s in 000's):

	Pension	Healthcare	Total
Retirement Experience	\$ 4,611	\$ 3,344	\$ 7,955
Termination Experience	(4,692)	(2,555)	(7,247)
Active Mortality Experience	(326)	(747)	(1,073)
Inactive Mortality Experience	(6,302)	(2,451)	(8,753)
Disability Experience	(1,732)	(19)	(1,751)
Rehires	2,148	1,710	3,858
Salary Increases	7,272	N/A	7,272
COLA	4,503	N/A	4,503
PRPA	(9,734)	N/A	(9,734)
Medical Claims Experience ²	N/A	225,987	225,987
Cadillac Tax – Medical Claims Experience	N/A	20,145	20,145
Cadillac Tax – Repeal	N/A	14,283	14,283
Modified Part B Only Experience	N/A	1,594	1,594
Dependent Coverage Elections	N/A	15,195	15,195
FY20 contributions reduced by 10% and revised trend ³	N/A	(6,711)	(6,711)
Programming Changes ⁴	N/A	(17,140)	(17,140)
Miscellaneous ⁵	<u>(3,295)</u>	<u>9,764</u>	<u>6,469</u>
Total	\$ (7,547)	\$ 262,399	\$ 254,852

¹ Includes the effects of census data changes between the two valuations.

² Beginning January 1, 2019, Rx benefits were provided through a new contract with Optum. This change in vendors resulted in lower actual (and future expected) claims and higher rebates. Approximately 95% of the gain shown in this table was due to Rx experience, the majority of which was due to the change in Rx vendors.

³ Based on a projection of future expected retiree contributions, trend was revised to be 0% for the next 3 years and 4% per year thereafter.

⁴ Added Part D benefits for deferred retirees.

⁵ Includes the effects of various data changes that are typical when new census data is received for the annual valuation, the effects of the differences between expected and actual benefit payments, and 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, 2019 due to rehires during the most recent plan year, and (ii) the load that was added to the June 30, 2018 Normal Cost based on the rehire load assumption used in the June 30, 2018 valuation. The development of the FY19 rehire gain/(loss) amount is shown in the table below (\$'s in 000's):

	Pension	Healthcare	Total
1. Increase in Actuarial Accrued Liability at June 30, 2019 due to Rehires	\$ 5,733	\$ 1,547	\$ 7,280
2. June 30, 2018 Normal Cost Rehire Load, with interest to June 30, 2019	\$ 7,881	\$ 3,257	\$ 11,138
3. Rehire Gain/(Loss), (2) - (1)	\$ 2,148	\$ 1,710	\$ 3,858

Section 1: Actuarial Funding Results

Section 1.1: Actuarial Liabilities and Normal Cost (\$'s in 000's)

As of June 30, 2019	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Retirement Benefits	\$ 1,950,007	\$ 1,760,572
Termination Benefits	35,603	12,407
Disability Benefits	2,468	(1,558)
Death Benefits	13,566	11,353
Return of Contributions	2,301	(38,368)
Medical and Prescription Drug Benefits	974,223	822,393
Medicare Part D Subsidy	(107,892)	(91,873)
Indebtedness	(28,389)	(28,389)
Subtotal	\$ 2,841,887	\$ 2,446,537
Inactive Members		
Not Vested	\$ 39,118	\$ 39,118
Vested Terminations		
- Retirement Benefits	141,283	141,283
- Medical and Prescription Drug Benefits	251,911	251,911
- Medicare Part D Subsidy	(28,050)	(28,050)
- Indebtedness	(4,305)	(4,305)
Retirees & Beneficiaries		
- Retirement Benefits	5,495,907	5,495,907
- Medical and Prescription Drug Benefits	1,843,354	1,843,354
- Medicare Part D Subsidy	(279,091)	(279,091)
Subtotal	\$ 7,460,127	\$ 7,460,127
Total	\$ 10,302,014	\$ 9,906,664
Total Pension	\$ 7,647,559	\$ 7,388,020
Total Medical, Net of Part D Subsidy	\$ 2,654,455	\$ 2,518,644
Total Medical, Gross of Part D Subsidy	\$ 3,069,488	\$ 2,917,658

As of June 30, 2019	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
By Tier		
Tier 1		
- Pension	\$ 4,631,408	\$ 4,619,626
- Medical, Net of Part D Subsidy	1,210,006	1,204,708
Tier 2		
- Pension	3,016,151	2,768,394
- Medical, Net of Part D Subsidy	1,444,449	1,313,936
Total	\$ 10,302,014	\$ 9,906,664

As of June 30, 2019	Normal Cost
Active Members	
Retirement Benefits	\$ 32,005
Termination Benefits	3,859
Disability Benefits	669
Death Benefits	396
Return of Contributions	6,901
Medical and Prescription Drug Benefits	24,474
Medicare Part D Subsidy	(2,642)
Rehire Assumption (Pension)	6,824
Rehire Assumption (Medical)	2,626
Administrative Expenses (Pension)	3,034
Administrative Expenses (Medical)	1,439
Total	\$ 79,585
Total Pension	\$ 53,688
Total Medical, Net of Part D Subsidy	\$ 25,897
Total Medical, Gross of Part D Subsidy	\$ 28,539

By Tier	
Tier 1	
- Pension	\$ 3,933
- Medical, Net of Part D Subsidy	1,637
Tier 2	
- Pension	49,755
- Medical, Net of Part D Subsidy	24,260
Total	\$ 79,585

Section 1.2: Actuarial Contributions as of June 30, 2019 (\$'s in 000's)

Normal Cost Rate	Pension	Healthcare	Total
1. Total Normal Cost	\$ 53,688	\$ 25,897	\$ 79,585
2. DB Rate Payroll Projected for FY20	366,037	366,037	366,037
3. DCR Rate Payroll Projected for FY20	359,622	359,622	359,622
4. Total Rate Payroll Projected for FY20	725,659	725,659	725,659
5. Normal Cost Rate			
a. Based on DB Rate Payroll, (1) ÷ (2)	14.67%	7.07%	21.74%
b. Based on Total Rate Payroll, (1) ÷ (4)	7.40%	3.57%	10.97%
6. Average Member Contribution Rate ¹	4.36%	0.00%	4.36%
7. Employer Normal Cost, (5)(b) - (6)	3.04%	3.57%	6.61%

Past Service Rate	Pension	Healthcare	Total
1. Actuarial Accrued Liability	\$ 7,388,020	\$ 2,518,644	\$ 9,906,664
2. Valuation Assets	<u>5,563,931</u>	<u>2,947,562</u>	<u>8,511,493</u>
3. Unfunded Actuarial Accrued Liability, (1) - (2)	\$ 1,824,089	\$ (428,918)	\$ 1,395,171
4. Funded Ratio, (2) ÷ (1)	75.3%	117.0%	85.9%
5. Past Service Cost Amortization Payment	133,293	(28,378)	104,915
6. Total Rate Payroll Projected for FY20	725,659	725,659	725,659
7. Past Service Rate, (5) ÷ (6)	18.37%	(3.91%)	14.46%
Total Employer / State Contribution Rate, not less than Normal Cost Rate	21.41%	3.57%	24.98%

Normal Cost Rate by Tier (Total Employer and Member)²

Tier 1	15.17%	6.31%	21.48%
Tier 2	14.63%	7.13%	21.76%

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		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Amount	6/30/2018	20	\$ 1,720,344	\$ 1,715,365	\$ 126,251
Experience Study	6/30/2018	24	14,346	14,410	952
FY19 Loss	6/30/2019	25	94,314	94,314	6,090
Total				\$ 1,824,089	\$ 133,293

Schedule of Past Service Cost Amortizations - Healthcare (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Amount	6/30/2018	20	\$ (48,285)	\$ (48,145)	\$ (3,543)
Experience Study and EGWP	6/30/2018	24	(166,274)	(167,016)	(11,032)
FY19 Gain	6/30/2019	25	(213,757)	(213,757)	(13,803)
Total				\$ (428,918)	\$ (28,378)

Schedule of Past Service Cost Amortizations - Total (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Amount	6/30/2018	20	\$ 1,672,059	\$ 1,667,220	\$ 122,708
Experience Study and EGWP	6/30/2018	24	(151,928)	(152,606)	(10,080)
FY19 Gain	6/30/2019	25	(119,443)	(119,443)	(7,713)
Total				\$ 1,395,171	\$ 104,915

Section 1.3: Roll Forward Contribution Rate Calculation for FY20 (\$'s in 000's)

	Pension	Healthcare	Total
1. Liability Roll Forward			
a. Actuarial Accrued Liability as of June 30, 2019	\$ 7,388,020	\$ 2,518,644	\$ 9,906,664
b. Normal Cost	50,654	24,458	75,112
c. Interest on (a) and (b) at 7.38%	548,974	187,681	736,655
d. Estimated Benefit Payments	(500,100)	(130,343)	(630,443)
e. Interest on (d) at 7.38%, adjusted for timing	(19,665)	(4,724)	(24,389)
f. Expected Actuarial Accrued Liability as of June 30, 2020	\$ 7,467,883	\$ 2,595,716	\$ 10,063,599
g. Projected Normal Cost	46,170	22,591	68,761
h. Interest on (f) and (g) at 7.38%	554,537	193,231	747,768
i. Estimated Benefit Payments	(518,726)	(137,282)	(656,008)
j. Interest on (i) at 7.38%, adjusted for timing	(20,397)	(4,976)	(25,373)
k. Expected Actuarial Accrued Liability as of June 30, 2021	\$ 7,529,467	\$ 2,669,280	\$ 10,198,747
2. Asset Roll Forward			
a. Actuarial Value of Assets as of June 30, 2019	\$ 5,563,931	\$ 2,947,562	\$ 8,511,493
b. Interest on (a) at 7.38%	410,618	217,530	628,148
c. Employee Contributions	35,027	0	35,027
d. Employer Contributions	32,727	15,965	48,692
e. State Assistance Contributions	141,129	0	141,129
f. Interest on (c) thru (e) at 7.38%, adjusted for timing*	12,871	579	13,450
g. Estimated Benefit Payments	(500,100)	(130,343)	(630,443)
h. Administrative Expenses	(3,034)	(1,439)	(4,473)
i. Interest on (g) and (h) at 7.38%, adjusted for timing	(19,775)	(4,776)	(24,551)
j. AVA Adjustments	(59,029)	(25,662)	(84,691)
k. Expected Actuarial Value of Assets as of June 30, 2020	\$ 5,614,365	\$ 3,019,416	\$ 8,633,781
l. Interest on (k) at 7.38%	414,340	222,833	637,173
m. Employee Contributions	32,666	0	32,666
n. Employer Contributions	22,174	24,882	47,056
o. State Assistance Contributions**	134,976	0	134,976
p. Interest on (m) thru (o) at 7.38%, adjusted for timing*	11,949	902	12,851
q. Estimated Benefit Payments	(518,726)	(137,282)	(656,008)
r. Administrative Expenses	(2,784)	(1,336)	(4,120)
s. Interest on (q) and (r) at 7.38%, adjusted for timing	(20,498)	(5,024)	(25,522)
t. AVA Adjustments	33,722	19,921	53,643
u. Expected Actuarial Value of Assets as of June 30, 2021	\$ 5,722,184	\$ 3,144,312	\$ 8,866,496
3. Expected Unfunded Actuarial Accrued Liability as of June 30, 2021, 1(k) - 2(u)	\$ 1,807,283	\$ (475,032)	\$ 1,332,251

* Employee and Employer Contributions are paid throughout the year. State Assistance Contributions are assumed to be paid on July 1, 2019 for FY20, and July 1, 2020 for FY21.

** The FY21 State Assistance Contribution is expected to be contributed 100% to pension.

	Pension	Healthcare	Total
4. Expected Annual Rate Payroll for FY22			
a. Defined Benefit Members			\$ 308,732
b. Defined Contribution Retirement Members			430,849
c. Total Rate Payroll			\$ 739,581
5. Expected FY22 Contribution Rate Calculation			
a. Projected Normal Cost for FY22	\$ 44,433	\$ 22,003	\$ 66,436
b. Projected Normal Cost Rate for FY22	6.01%	2.98%	8.99%
c. Expected Member Contribution Rate for FY22	(3.61%)	0.00%	(3.61%)
d. Expected Employer Normal Cost Rate for FY22	2.40%	2.98%	5.38%
e. Expected Unfunded Liability as of June 30, 2021	\$ 1,807,283	\$ (475,032)	\$ 1,332,251
f. FY22 Layered Amortization of Expected Unfunded Liability	141,091	(32,824)	108,267
g. Expected Past Service Cost Contribution Rate for FY22	19.08%	(4.44%)	19.08%
h. Expected Total Contribution Rate for FY22, not less than Normal Cost Rate	21.48%	2.98%	24.46%

The components of the expected FY22 amortization amounts are shown below (totals may not add due to rounding):

Expected FY22 Schedule of Past Service Cost Amortizations - Pension (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment for FY22
	Date Created	Years Remaining as of June 30, 2021	Initial	Outstanding as of June 30, 2021	
Initial Amount	6/30/2018	18	\$ 1,720,344	\$ 1,693,026	\$ 133,291
Experience Study	6/30/2018	22	14,346	14,467	1,005
FY19 Loss	6/30/2019	23	94,314	95,008	6,430
Expected (Gain)/Loss FY20	6/30/2020	24	37,941	38,110	2,517
Expected (Gain)/Loss FY21	6/30/2021	25	(33,328)	(33,328)	(2,152)
Total				\$ 1,807,283	\$ 141,091

Expected FY22 Schedule of Past Service Cost Amortizations - Healthcare (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment for FY22
	Date Created	Years Remaining as of June 30, 2021	Initial	Outstanding as of June 30, 2021	
Initial Amount	6/30/2018	18	\$ (48,285)	\$ (47,519)	\$ (3,741)
Experience Study and EGWP	6/30/2018	22	(166,274)	(167,686)	(11,647)
FY19 Gain	6/30/2019	23	(213,757)	(215,328)	(14,572)
Expected (Gain)/Loss FY20	6/30/2020	24	6,400	6,429	425
Expected (Gain)/Loss FY21	6/30/2021	25	(50,928)	(50,928)	(3,289)
Total				\$ (475,032)	\$ (32,824)

Expected FY22 Schedule of Past Service Cost Amortizations - Total (\$'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment for FY22
	Date Created	Years Remaining as of June 30, 2021	Initial	Outstanding as of June 30, 2021	
Initial Amount	6/30/2018	18	\$ 1,672,059	\$ 1,645,507	\$ 129,550
Experience Study and EGWP	6/30/2018	22	(151,928)	(153,219)	(10,642)
FY19 Gain	6/30/2019	23	(119,443)	(120,320)	(8,142)
Expected (Gain)/Loss FY20	6/30/2020	24	44,341	44,539	2,942
Expected (Gain)/Loss FY21	6/30/2021	25	(84,256)	(84,256)	(5,441)
Total				\$ 1,332,251	\$ 108,267

Section 1.4: Actuarial Gain/(Loss) for FY19 (\$'s in 000's)

	Pension	Healthcare	Total
1. Expected Actuarial Accrued Liability			
a. Actuarial Accrued Liability as of June 30, 2018	\$ 7,276,290	\$ 2,684,150	\$ 9,960,440
b. Normal Cost	54,477	28,247	82,724
c. Interest on (a) and (b) at 7.38%	541,011	200,175	741,186
d. Medicare Part D Subsidy and EGWP	0	9,229	9,229
e. Benefit Payments	(470,414)	(136,158)	(606,572)
f. Refund of Contributions	(2,303)	0	(2,303)
g. Interest on (d) thru (f) at 7.38%, adjusted for timing	(18,588)	(4,600)	(23,188)
h. Assumptions/Methods Changes	0	0	0
i. Expected Actuarial Accrued Liability as of June 30, 2019 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	\$ 7,380,473	\$ 2,781,043	\$ 10,161,516
2. Actual Actuarial Accrued Liability as of June 30, 2019	7,388,020	2,518,644	9,906,664
3. Liability Gain/(Loss), (1)(i) - (2)	\$ (7,547)	\$ 262,399	\$ 254,852
4. Expected Actuarial Asset Value			
a. Actuarial Value of Assets as of June 30, 2018	\$ 5,541,600	\$ 2,898,709	\$ 8,440,309
b. Interest on (a) at 7.38%	408,970	213,925	622,895
c. Employee Contributions	35,763	0	35,763
d. Employer Contributions	35,996	17,957	53,953
e. State Assistance Contributions	128,174	0	128,174
f. Medicare Part D Subsidy and EGWP	0	9,229	9,229
g. Interest on (c) thru (f) at 7.38%, adjusted for timing	12,060	985	13,045
h. Benefit Payments	(470,414)	(136,158)	(606,572)
i. Refund of Contributions	(2,303)	0	(2,303)
j. Administrative Expenses	(3,018)	(1,351)	(4,369)
k. Interest on (h) thru (j) at 7.38%, adjusted for timing	(18,698)	(4,984)	(23,682)
l. Expected Actuarial Asset Value as of June 30, 2019 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h) + (i) + (j) + (k)	\$ 5,668,130	\$ 2,998,312	\$ 8,666,442
5. Actual Actuarial Asset Value as of June 30, 2019	5,563,931	2,947,562	8,511,493
6. Actuarial Asset Value Gain/(Loss), (5) - (4)(l)	\$ (104,199)	\$ (50,750)	\$ (154,949)
7. Total Actuarial Gain/(Loss), (3) + (6)	\$ (111,746)	\$ 211,649	\$ 99,903
8. Contribution Gain/(Loss)	\$ 17,370	\$ 1,734	\$ 19,104
9. Administrative Expense Gain/(Loss)	\$ 62	\$ 374	\$ 436
10. FY19 Gain/(Loss), (7) + (8) + (9)	\$ (94,314)	\$ 213,757	\$ 119,443

Section 1.5: Development of Change in Unfunded Liability During FY19 (\$'s in 000's)

	Pension	Healthcare	Total
1. 2018 Unfunded Liability	\$ 1,734,690	\$ (214,559)	\$ 1,520,131
a. Interest on Unfunded Liability at 7.38%	\$ 128,020	\$ (15,834)	\$ 112,186
b. Normal Cost	54,477	28,247	82,724
c. Employee Contributions	(35,763)	0	(35,763)
d. Employer Contributions	(35,996)	(17,957)	(53,953)
e. State Assistance Contributions	(128,174)	0	(128,174)
f. Administrative Expenses	3,018	1,351	4,369
g. Interest on (b) thru (f) at 7.38%, adjusted for timing	(7,929)	1,483	(6,446)
h. Assumptions/Methods Changes	<u>0</u>	<u>0</u>	<u>0</u>
i. Expected Change in Unfunded Liability During FY19 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	\$ (22,347)	\$ (2,710)	\$ (25,057)
2. Expected 2019 Unfunded Liability, (1) + (1)(i)	\$ 1,712,343	\$ (217,269)	\$ 1,495,074
a. Liability (Gain)/Loss During FY19	\$ 7,547	\$ (262,399)	\$ (254,852)
b. Actuarial Assets (Gain)/Loss During FY19	<u>104,199</u>	<u>50,750</u>	<u>154,949</u>
c. Total Actuarial (Gain)/Loss During FY19	\$ 111,746	\$ (211,649)	\$ (99,903)
3. Actual 2019 Unfunded Liability, (2) + (2)(c)	\$ 1,824,089	\$ (428,918)	\$ 1,395,171

Section 1.6: Analysis of Financial Experience

Pension

Change in Employer / State Contribution Rate

Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

Type of (Gain) or Loss	Change in Employer / State Contribution Rate During Fiscal Year				
	Pension				
	2015	2016	2017	2018	2019
1. Health Claims	N/A	N/A	N/A	N/A	N/A
2. Salary Experience	(0.34%)	(0.42%)	(0.39%)	(0.48%)	(0.07%)
3. Investment Experience	0.40%	1.36%	1.32%	1.10%	0.96%
4. Demographic Experience and Miscellaneous	(0.52%)	(0.98%)	(0.98%)	(0.94%)	(0.19%)
5. Contribution Shortfall	<u>0.00%</u>	<u>0.00%</u>	<u>(0.09%)</u>	<u>(0.03%)</u>	<u>(0.16%)</u>
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	(0.46%)	(0.04%)	(0.14%)	(0.35%)	0.54%
7. Assumptions / Method Changes	0.00%	2.73%	0.00%	0.16%	0.00%
8. System Benefit Changes	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>
9. Composite (Gain) or Loss During Year, (6) + (7) + (8)	(0.46%)	2.69%	(0.14%)	(0.19%)	0.54%
10. Beginning Total Employer / State Contribution Rate	<u>17.78%</u>	<u>19.16%</u>	<u>20.86%</u>	<u>20.71%</u>	<u>20.94%</u>
11. Ending Valuation Year Employer / State Contribution Rate, (9) + (10)	17.32%	21.85%	20.72%	20.52%	21.48%
12. Fiscal Year Rates					
a. Fiscal Year Employer / State Contribution Rate	19.16%	20.86%	20.71%	20.94%	21.48% *
b. Fiscal Year for which Rate Applies	FY18	FY19	FY20	FY21	FY22

* Expected rate. Actual rate to be determined

Healthcare

Change in Employer / State Contribution Rate

Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years

Resulting from Differences Between Assumed Experience and Actual Experience

Type of (Gain) or Loss	Change in Employer / State Contribution Rate During Fiscal Year				
	Healthcare				
	2015	2016	2017	2018	2019
1. Health Claims ¹	(4.07%)	(0.43%)	(2.75%)	(1.69%)	(2.58)%
2. Salary Experience	N/A	N/A	N/A	N/A	N/A
3. Investment Experience	0.22%	0.71%	0.67%	0.55%	0.47%
4. Demographic Experience and Miscellaneous	N/A	N/A	(0.53%)	2.29%	1.71%
5. Contribution Shortfall	<u>0.00%</u>	<u>0.00%</u>	<u>(0.13%)</u>	<u>0.07%</u>	<u>(0.02%)</u>
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	(3.85%)	0.28%	(2.74%)	1.22%	(0.42%)
7. Assumptions / Method Changes	0.00%	0.46%	4.04%	(1.73%)	0.00%
8. System Benefit Changes	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>
9. Composite (Gain) or Loss During Year, (6) + (7) + (8)	(3.85%)	0.74%	1.30%	(0.51%)	(0.42%)
10. Beginning Total Employer / State Contribution Rate	<u>5.62%</u>	<u>2.59%</u>	<u>2.70%</u>	<u>3.91%</u>	<u>3.40%</u>
11. Ending Valuation Year Employer / State Contribution Rate, (9) + (10)	1.77%	3.33%	4.00%	3.40%	2.98%
12. Fiscal Year Rates					
a. Fiscal Year Employer / State Contribution Rate	2.59%	2.70%	3.91%	3.40%	2.98% *
b. Fiscal Year for which Rate Applies	FY18	FY19	FY20	FY21	FY22

* Expected rate. Actual rate to be determined

¹ Prior to 2017, the health claims percentages include the effects of healthcare demographic experience gains/losses

Total
Change in Employer / State Contribution Rate
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

Type of (Gain) or Loss	Change in Employer / State Contribution Rate During Fiscal Year				
	Total				
	2015	2016	2017	2018	2019
1. Health Claims ¹	(4.07%)	(0.43%)	(2.75%)	(1.69%)	(2.58)%
2. Salary Experience	(0.34%)	(0.42%)	(0.39%)	(0.48%)	(0.07)%
3. Investment Experience	0.62%	2.07%	1.99%	1.65%	1.43%
4. Demographic Experience and Miscellaneous	(0.52%)	(0.98%)	(1.51%)	1.35%	1.52%
5. Contribution Shortfall	<u>0.00%</u>	<u>0.00%</u>	<u>(0.22%)</u>	<u>0.04%</u>	<u>(0.18%)</u>
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	(4.31%)	0.24%	(2.88%)	0.87%	0.12%
7. Assumptions / Method Changes	0.00%	3.19%	4.04%	(1.57%)	0.00%
8. System Benefit Changes	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>
9. Composite (Gain) or Loss During Year, (6) + (7) + (8)	(4.31%)	3.43%	1.16%	(0.70%)	0.12%
10. Beginning Total Employer / State Contribution Rate	<u>23.40%</u>	<u>21.75%</u>	<u>23.56%</u>	<u>24.62%</u>	<u>24.34%</u>
11. Ending Valuation Year Employer / State Contribution Rate, (9) + (10)	19.09%	25.18%	24.72%	23.92%	24.46%
12. Fiscal Year Rates					
a. Fiscal Year Employer / State Contribution Rate	21.75%	23.56%	24.62%	24.34%	24.46% *
b. Fiscal Year for which Rate Applies	FY18	FY19	FY20	FY21	FY22

* Expected rate. Actual rate to be determined

¹ Prior to 2017, the health claims percentages include the effects of healthcare demographic experience gains/losses

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

Section 2: Plan Assets

Section 2.1: Summary of Fair Value of Assets (\$'s in 000's)

As of June 30, 2019	Pension	Healthcare	Total	Allocation Percent
Cash and Short-Term Investments				
- Cash and Cash Equivalents	\$ 112,603	\$ 60,096	\$ 172,699	2.0%
- Subtotal	\$ 112,603	\$ 60,096	\$ 172,699	2.0%
Fixed Income Investments				
- Domestic Fixed Income Pool	\$ 577,915	\$ 308,702	\$ 886,617	10.5%
- International Fixed Income Pool	0	0	0	0.0%
- Tactical Fixed Income Pool	149,443	79,827	229,270	2.7%
- 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	\$ 727,358	\$ 388,529	\$ 1,115,887	13.2%
Equity Investments				
- Domestic Equity Pool	\$ 1,272,904	\$ 679,940	\$ 1,952,844	23.1%
- International Equity Pool	1,009,795	539,396	1,549,191	18.3%
- Private Equity Pool	579,978	309,804	889,782	10.5%
- Emerging Markets Equity Pool	198,729	106,154	304,883	3.6%
- Alternative Equity Strategies	386,212	206,301	592,513	7.0%
- Subtotal	\$ 3,447,618	\$ 1,841,595	\$ 5,289,213	62.5%
Other Investments				
- Real Estate Pool	\$ 373,191	\$ 199,379	\$ 572,570	6.8%
- Other Investments Pool	536,569	286,616	823,185	9.7%
- Absolute Return Pool	317,401	169,545	486,946	5.8%
- Other Assets	0	318	318	0.0%
- Subtotal	\$ 1,227,161	\$ 655,858	\$ 1,883,019	22.3%
Total Cash and Investments	\$ 5,514,740	\$ 2,946,078	\$ 8,460,818	100.0%
Net Accrued Receivables	(2,811)	(16,759)	(19,570)	
Net Assets	\$ 5,511,929	\$ 2,929,319	\$ 8,441,248	

Section 2.2: Changes in Fair Value of Assets During FY19 (\$'s in 000's)

Fiscal Year 2019	Pension	Healthcare	Total
1. Fair Value of Assets as of June 30, 2018	\$ 5,472,727	\$ 2,870,134	\$ 8,342,861
2. Additions:			
a. Employee Contributions	\$ 35,763	\$ 0	\$ 35,763
b. Employer Contributions	35,996	17,957	53,953
c. State Assistance Contributions	128,174	0	128,174
d. Interest and Dividend Income	100,638	52,997	153,635
e. Net Appreciation / Depreciation in Fair Value of Investments	216,649	117,363	334,012
f. Medicare Part D Subsidy	0	9,229	9,229
g. Other	<u>32</u>	<u>324</u>	<u>356</u>
h. Total Additions	\$ 517,252	\$ 197,870	\$ 715,122
3. Deductions:			
a. Medical Benefits	\$ 0	\$ 136,158	\$ 136,158
b. Retirement Benefits	470,414	0	470,414
c. Refund of Contributions	2,303	0	2,303
d. Investment Expenses	2,315	1,176	3,491
e. Administrative Expenses	<u>3,018</u>	<u>1,351</u>	<u>4,369</u>
f. Total Deductions	\$ 478,050	\$ 138,685	\$ 616,735
4. Fair Value of Assets as of June 30, 2019	\$ 5,511,929	\$ 2,929,319	\$ 8,441,248
Approximate Fair Value Investment Return Rate During FY19 Net of Investment Expenses	5.9%	6.0%	5.9%

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 FY19			
a. Fair Value of Assets as of June 30, 2018	\$ 5,472,727	\$ 2,870,134	\$ 8,342,861
b. Contributions	199,933	17,957	217,890
c. Medicare Part D Subsidy	0	9,229	9,229
d. Benefit Payments	472,717	136,158	608,875
e. Administrative Expenses	3,018	1,351	4,369
f. Actual Investment Return (net of investment expenses)	315,004	169,508	484,512
g. Expected Return Rate (net of investment expenses)	7.38%	7.38%	7.38%
h. Expected Return, Weighted for Timing	397,250	207,817	605,067
i. Investment Gain / (Loss) for the Year, (f) - (h)	(82,246)	(38,309)	(120,555)
2. Actuarial Value as of June 30, 2019			
a. Fair Value as of June 30, 2019	\$ 5,511,929	\$ 2,929,319	\$ 8,441,248
b. Deferred Investment Gain / (Loss)	(52,002)	(18,243)	(70,245)
c. Actuarial Value as of June 30, 2019, (a) - (b)	5,563,931	2,947,562	8,511,493
3. Ratio of Actuarial Value of Assets to Fair Value of Assets	100.9%	100.6%	100.8%
4. Approximate Actuarial Value Investment Return Rate During FY19 Net of Investment Expenses	5.5%	5.6%	5.5%

The tables below show the development of the gains/(losses) to be recognized in the current year (\$'s in 000's):

Pension				
Plan Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2015	\$ (219,620)	\$ (175,696)	\$ (43,924)	\$ 0
June 30, 2016	(443,393)	(266,037)	(88,679)	(88,677)
June 30, 2017	236,679	94,672	47,336	94,671
June 30, 2018	13,001	2,600	2,600	7,801
June 30, 2019	<u>(82,246)</u>	<u>0</u>	<u>(16,449)</u>	<u>(65,797)</u>
Total	\$ (495,579)	\$ (344,461)	\$ (99,116)	\$ (52,002)

Healthcare				
Plan Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2015	\$ (121,632)	\$ (97,308)	\$ (24,324)	\$ 0
June 30, 2016	(218,931)	(131,358)	(43,786)	(43,787)
June 30, 2017	126,053	50,422	25,211	50,420
June 30, 2018	9,619	1,924	1,924	5,771
June 30, 2019	<u>(38,309)</u>	<u>0</u>	<u>(7,662)</u>	<u>(30,647)</u>
Total	\$ (243,200)	\$ (176,320)	\$ (48,637)	\$ (18,243)

Total				
Plan Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2015	\$ (341,252)	\$ (273,004)	\$ (68,248)	\$ 0
June 30, 2016	(662,324)	(397,395)	(132,465)	(132,464)
June 30, 2017	362,732	145,094	72,547	145,091
June 30, 2018	22,620	4,524	4,524	13,572
June 30, 2019	<u>(120,555)</u>	<u>0</u>	<u>(24,111)</u>	<u>(96,444)</u>
Total	\$ (738,779)	\$ (520,781)	\$ (147,753)	\$ (70,245)

Section 2.4: Historical Asset Rates of Return

Year Ending	Actuarial Value		Fair Value	
	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%

* Cumulative since fiscal year ending June 30, 2005

Section 3: Projections

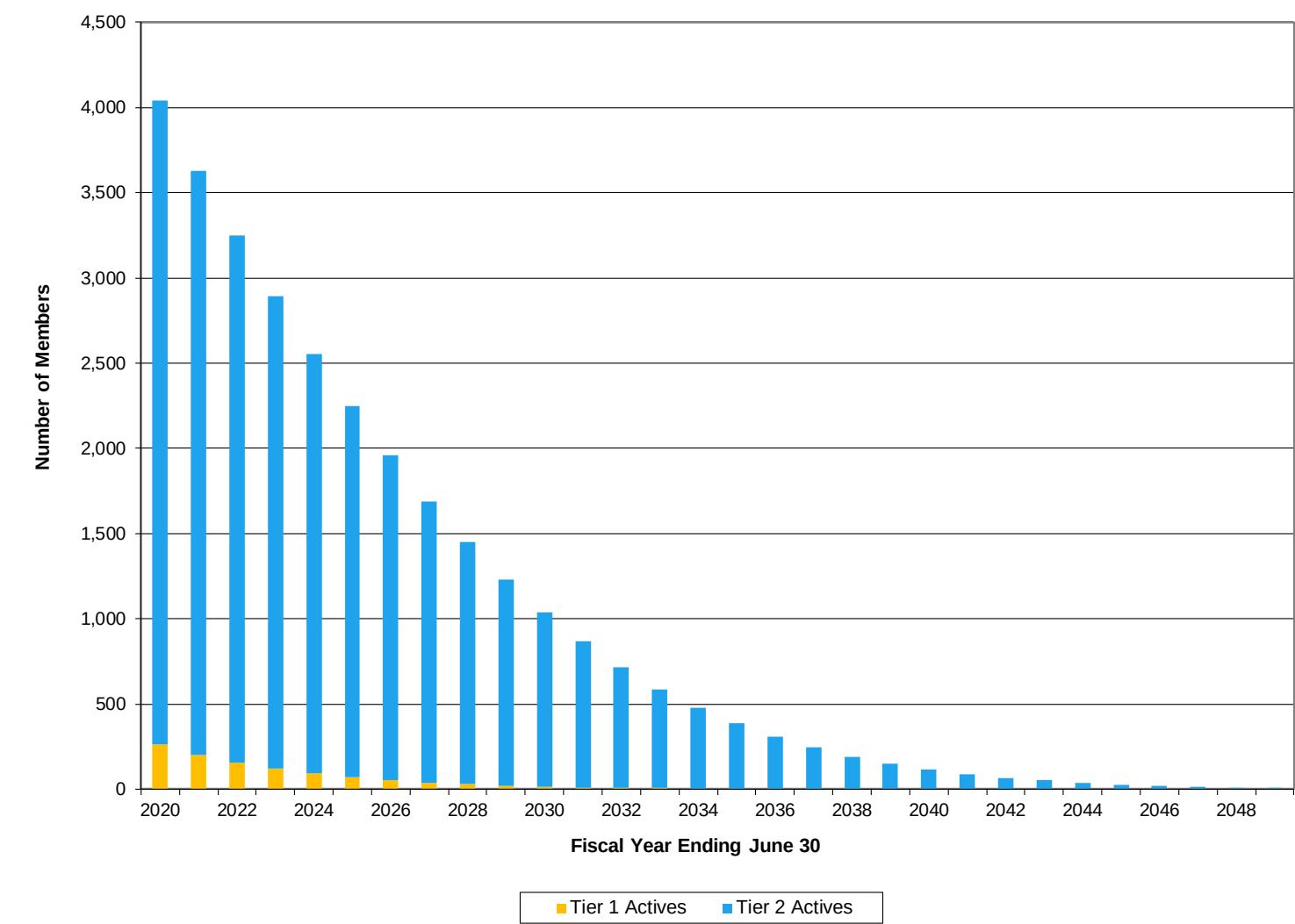
Section 3.1: Projection Assumptions and Methods

Key Assumptions

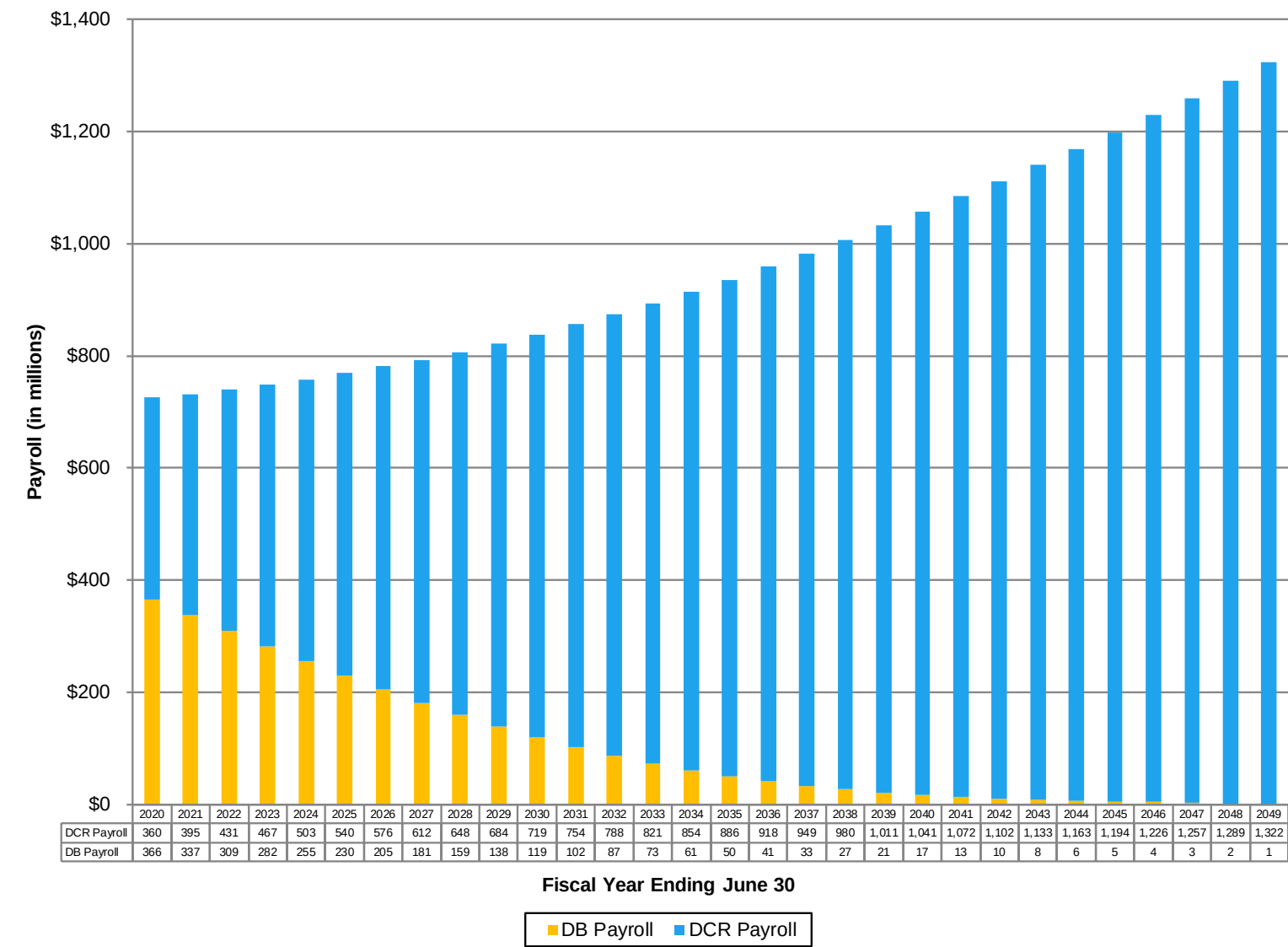
- 7.38% investment return (net of investment expenses) on the Fair Value of Assets in all future years.
- The Actuarial Value of Assets was re-initialized to Fair Value as of June 30, 2014. The Actuarial Value of Assets after June 30, 2014 reflects the deferred gains and losses generated by the smoothing 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, 2019.
- 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, combined.
- The DCR contribution rate determined as of June 30, 2019 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.

Section 3.2: Membership Projection

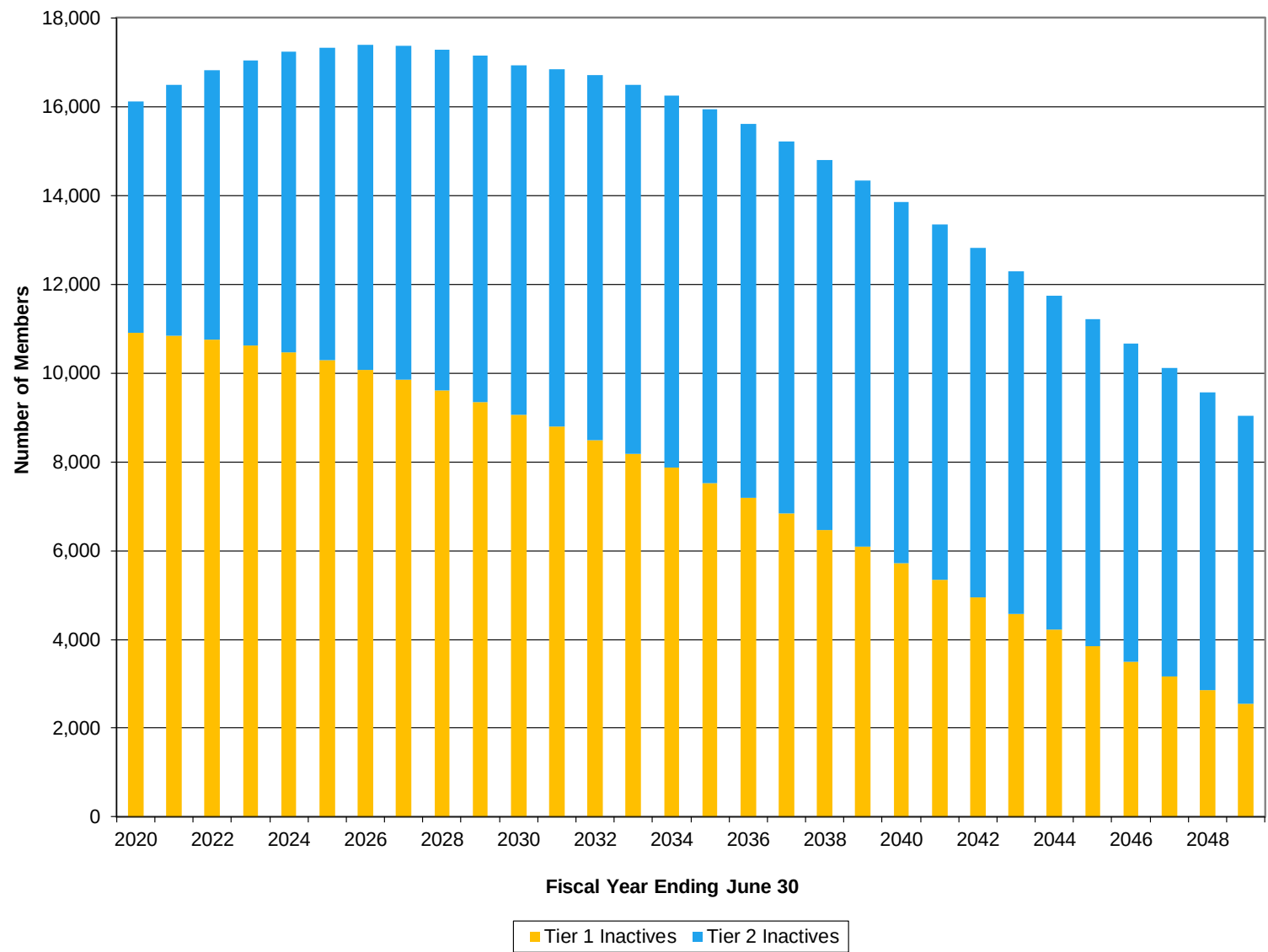
Projected Active Member Count



Projected DB and DCR Payroll

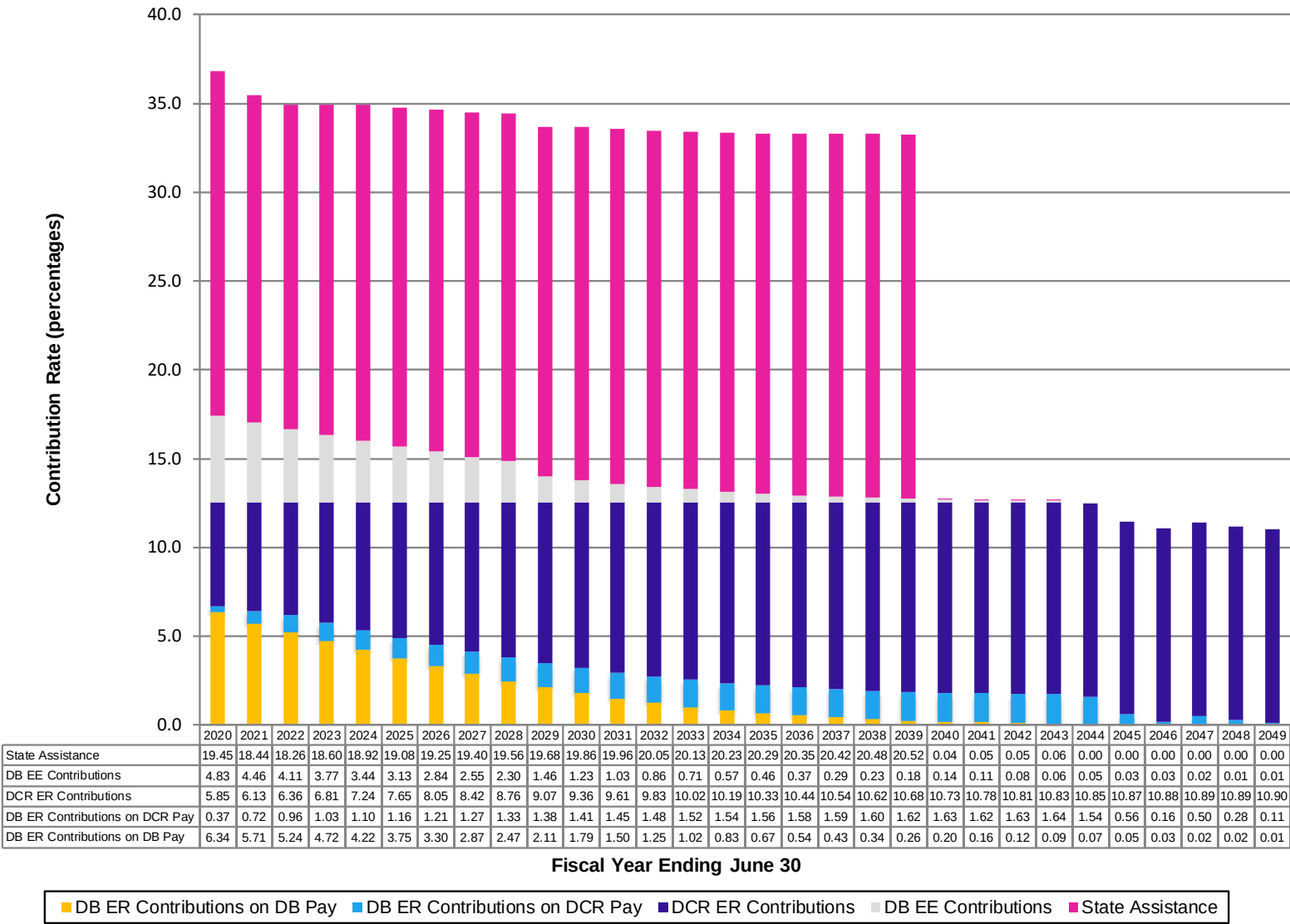


Projected Inactive Member Count

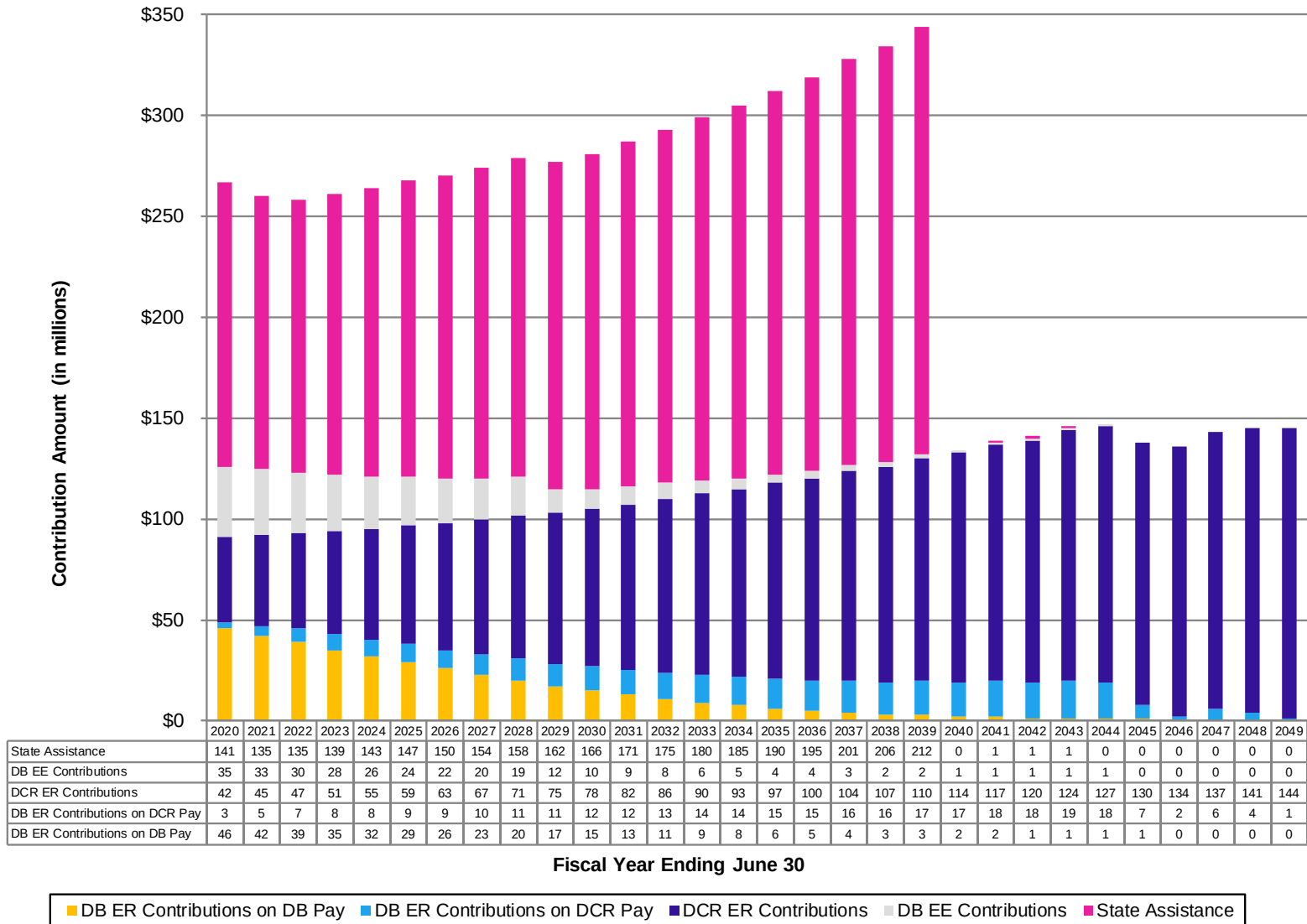


Section 3.3: Projected Employer/State Contribution Rates

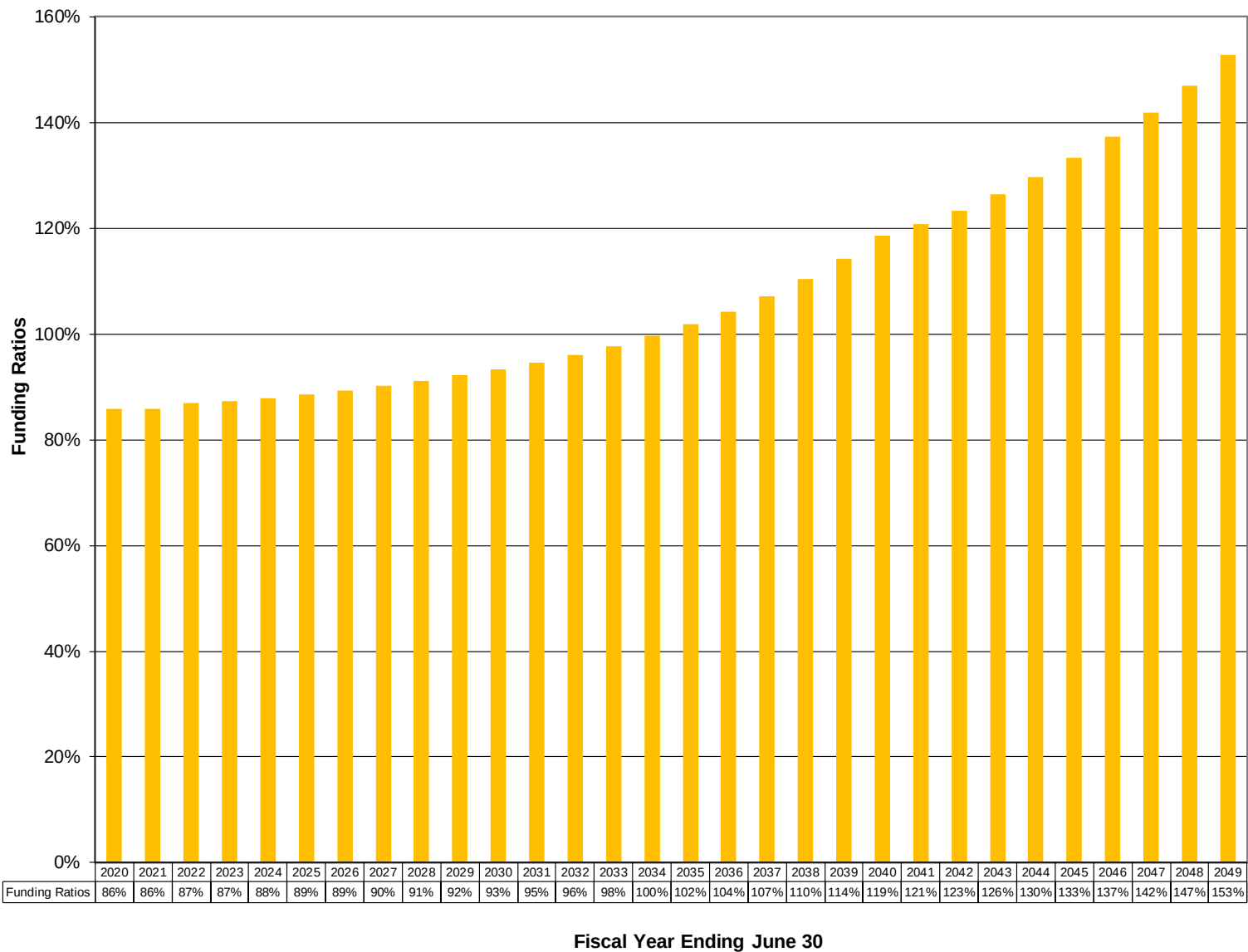
Based on Total DB and DCR Payroll



Section 3.4: Projected Employer/State Contribution Amounts



Section 3.5: Projection of Funded Ratios



Section 3.6: Table of Projected Actuarial Results

Financial Projections (\$'s in 000's) Based on 2019 Actuarial Valuation Results, 0% Population Growth for Payroll

Fiscal Year End	Valuation Amounts on July 1 (Beginning of Fiscal Year)				Flow Amounts During Following 12 Months										Deferred Asset Gain/(Loss)	Ending Actuarial Assets		
	Actuarial Assets	Accrued Liability	Funding Ratio	Surplus (Deficit)	Total Salaries	Er/State Ctb Rate	DCR Ctb Rate	Total Ctb Rate	DB Contributions				Benefit Payments	Net Contribs			Investment Earnings	
									Employer	State	Assistance	Employee						Total
2020	\$8,511,493	\$9,906,664	85.9%	(\$1,395,171)	\$725,659	26.16%	5.85%	32.01%	\$48,692	\$141,129		\$35,027	\$224,848	\$630,443	(\$405,595)	\$611,863	\$9,261	\$8,633,782
2021	8,633,782	10,063,599	85.8%	(1,429,818)	731,818	24.87%	6.13%	31.00%	47,056	134,976		32,666	214,698	656,008	(441,310)	625,185	(43,698)	8,866,496
2022	8,866,496	10,198,747	86.9%	(1,332,251)	739,581	24.46%	6.36%	30.82%	45,855	135,047		30,399	211,301	680,786	(469,485)	637,390	(24,111)	9,011,035
2023	9,011,035	10,315,497	87.4%	(1,304,462)	748,443	24.35%	6.81%	31.16%	43,035	139,211		28,190	210,436	705,158	(494,722)	648,704	0	9,137,459
2024	9,137,459	10,406,627	87.8%	(1,269,168)	758,261	24.24%	7.24%	31.48%	40,340	143,462		26,105	209,907	728,679	(518,772)	659,065	0	9,274,629
2025	9,274,629	10,474,524	88.5%	(1,199,895)	769,237	23.99%	7.65%	31.64%	37,770	146,770		24,068	208,608	751,756	(543,148)	668,393	0	9,397,058
2026	9,397,058	10,518,159	89.3%	(1,121,101)	780,909	23.76%	8.05%	31.81%	35,219	150,325		22,139	207,683	774,351	(566,668)	676,676	0	9,504,548
2027	9,504,548	10,536,422	90.2%	(1,031,874)	793,625	23.54%	8.42%	31.96%	32,856	153,963		20,244	207,063	795,150	(588,087)	683,939	0	9,598,175
2028	9,598,175	10,529,137	91.2%	(930,962)	807,278	23.36%	8.76%	32.12%	30,676	157,904		18,541	207,121	816,138	(609,017)	690,211	0	9,677,414
2029	9,677,414	10,495,378	92.2%	(817,964)	822,201	23.17%	9.07%	32.24%	28,695	161,809		12,004	202,508	836,323	(633,815)	695,284	0	9,737,180
2030	9,737,180	10,433,975	93.3%	(696,795)	838,346	23.06%	9.36%	32.42%	26,827	166,496		10,312	203,635	847,827	(644,192)	699,495	0	9,791,013
2031	9,791,013	10,346,916	94.6%	(555,903)	855,982	22.91%	9.61%	32.52%	25,251	170,855		8,817	204,923	863,135	(658,212)	703,112	0	9,834,653
2032	9,834,653	10,234,479	96.1%	(399,826)	874,558	22.78%	9.83%	32.61%	23,876	175,349		7,521	206,746	876,722	(669,976)	706,068	0	9,869,673
2033	9,869,673	10,096,664	97.8%	(226,991)	894,207	22.67%	10.02%	32.69%	22,713	180,003		6,349	209,065	888,114	(679,049)	708,496	0	9,898,219
2034	9,898,219	9,933,994	99.6%	(35,775)	914,881	22.60%	10.19%	32.79%	21,683	185,080		5,215	211,978	895,679	(683,701)	710,629	0	9,924,397
2035	9,924,397	9,748,955	101.8%	175,442	936,534	22.52%	10.33%	32.85%	20,884	190,023		4,308	215,215	899,170	(683,955)	712,746	0	9,952,568
2036	9,952,568	9,544,391	104.3%	408,177	959,162	22.47%	10.44%	32.91%	20,334	195,189		3,549	219,072	899,694	(680,622)	715,155	0	9,986,592
2037	9,986,592	9,322,282	107.1%	664,310	982,498	22.44%	10.54%	32.98%	19,846	200,626		2,849	223,321	898,009	(674,688)	718,106	0	10,029,597
2038	10,029,597	9,083,944	110.4%	945,653	1,006,868	22.42%	10.62%	33.04%	19,533	206,207		2,316	228,056	892,467	(664,411)	721,886	0	10,086,739
2039	10,086,739	8,832,425	114.2%	1,254,314	1,032,136	22.40%	10.68%	33.08%	19,404	211,794		1,858	233,056	885,035	(651,979)	726,794	0	10,161,287
2040	10,161,287	8,568,925	118.6%	1,592,362	1,058,222	1.87%	10.73%	12.60%	19,366	423		1,482	21,271	876,262	(854,991)	717,034	0	10,023,119
2041	10,023,119	8,294,158	120.8%	1,728,961	1,085,097	1.83%	10.78%	12.61%	19,315	543		1,194	21,052	862,915	(841,863)	707,357	0	9,888,445
2042	9,888,445	8,012,237	123.4%	1,876,208	1,112,575	1.80%	10.81%	12.61%	19,471	556		890	20,917	846,679	(825,762)	698,046	0	9,760,601
2043	9,760,601	7,725,761	126.3%	2,034,840	1,140,672	1.79%	10.83%	12.62%	19,733	685		684	21,102	826,020	(804,918)	689,420	0	9,645,003
2044	9,645,003	7,439,093	129.7%	2,205,910	1,169,487	1.61%	10.85%	12.46%	18,829	0		585	19,414	803,586	(784,172)	681,666	0	9,542,420
2045	9,542,420	7,154,171	133.4%	2,388,249	1,198,933	0.61%	10.87%	11.48%	7,314	0		360	7,674	778,857	(771,183)	674,621	0	9,445,798
2046	9,445,798	6,873,582	137.4%	2,572,216	1,229,078	0.19%	10.88%	11.07%	2,335	0		369	2,704	754,559	(751,855)	668,247	0	9,362,147
2047	9,362,147	6,597,282	141.9%	2,764,865	1,259,775	0.52%	10.89%	11.41%	6,551	0		252	6,803	730,249	(723,446)	663,162	0	9,301,830
2048	9,301,830	6,325,648	147.0%	2,976,182	1,291,205	0.30%	10.89%	11.19%	3,873	0		129	4,002	706,987	(702,985)	659,512	0	9,258,333
2049	9,258,333	6,057,988	152.8%	3,200,345	1,323,452	0.12%	10.90%	11.02%	1,588	0		132	1,720	683,659	(681,939)	657,126	0	9,233,503
Totals									\$728,919	\$3,348,425		\$308,554	\$4,385,899					

The FY20 and FY21 Employer/State contribution rates shown above differ from those shown in Section 1.6 because they are adjusted for total salaries.

Section 3.6: Table of Projected Actuarial Results (continued)

Financial Projections (\$'s in 000's) Based on 2019 Actuarial Valuation Results, 0% Population Growth for Payroll

Fiscal Year End	Valuation Amounts on July 1 (Beginning of Fiscal Year)					
	Funding Ratio Pension	Funding Ratio Healthcare	Funding Ratio Total	Surplus (Deficit) Pension	Surplus (Deficit) Healthcare	Surplus (Deficit) Total
2020	75.3%	117.0%	85.9%	(\$1,824,089)	\$428,918	(\$1,395,171)
2021	75.2%	116.3%	85.8%	(1,853,518)	423,700	(1,429,818)
2022	76.0%	117.8%	86.9%	(1,807,283)	475,032	(1,332,251)
2023	76.1%	118.5%	87.4%	(1,810,579)	506,117	(1,304,462)
2024	76.3%	119.2%	87.8%	(1,805,293)	536,125	(1,269,168)
2025	76.7%	120.2%	88.5%	(1,776,348)	576,453	(1,199,895)
2026	77.1%	121.3%	89.3%	(1,740,759)	619,658	(1,121,101)
2027	77.6%	122.5%	90.2%	(1,698,000)	666,126	(1,031,874)
2028	78.1%	123.9%	91.2%	(1,647,428)	716,466	(930,962)
2029	78.7%	125.4%	92.2%	(1,588,141)	770,177	(817,964)
2030	79.3%	127.1%	93.3%	(1,524,804)	828,009	(696,795)
2031	80.1%	129.0%	94.6%	(1,446,113)	890,210	(555,903)
2032	81.1%	131.1%	96.1%	(1,356,145)	956,319	(399,826)
2033	82.2%	133.5%	97.8%	(1,253,927)	1,026,936	(226,991)
2034	83.5%	136.1%	99.6%	(1,138,515)	1,102,740	(35,775)
2035	85.0%	139.1%	101.8%	(1,008,618)	1,184,060	175,442
2036	86.8%	142.4%	104.3%	(863,158)	1,271,335	408,177
2037	89.0%	146.2%	107.1%	(700,838)	1,365,148	664,310
2038	91.6%	150.3%	110.4%	(520,172)	1,465,825	945,653
2039	94.6%	155.0%	114.2%	(319,552)	1,573,866	1,254,314
2040	98.3%	160.3%	118.6%	(97,569)	1,689,931	1,592,362
2041	98.5%	166.3%	120.8%	(85,665)	1,814,626	1,728,961
2042	98.6%	173.0%	123.4%	(72,284)	1,948,492	1,876,208
2043	98.9%	180.5%	126.3%	(57,313)	2,092,153	2,034,840
2044	99.2%	188.8%	129.7%	(40,590)	2,246,500	2,205,910
2045	99.5%	198.1%	133.4%	(24,029)	2,412,278	2,388,249
2046	99.6%	208.3%	137.4%	(18,081)	2,590,297	2,572,216
2047	99.6%	219.6%	141.9%	(16,565)	2,781,430	2,764,865
2048	99.7%	232.1%	147.0%	(10,434)	2,986,616	2,976,182
2049	99.8%	246.1%	152.8%	(6,660)	3,207,005	3,200,345

Section 4: Member Data

Section 4.1: Summary of Members Included

As of June 30	2015	2016	2017	2018 ¹	2019
Active Members					
1. Number	5,502	5,123	4,772	4,418	4,044 ²
2. Average Age	50.09	50.50	50.86	51.13	51.48
3. Average Credited Service	16.94	17.53	18.12	18.62	19.21
4. Average Entry Age	33.15	32.97	32.74	32.51	32.27
5. Average Annual Earnings	\$ 82,995	\$ 84,954	\$ 86,327	\$ 87,734	\$ 88,879
6. Number Vested	5,297	4,966	4,772	4,418	4,044
7. Percent Who Are Vested	96.3%	96.9%	100.0%	100.0%	100.0%
Retirees, Disabilitants, and Beneficiaries					
1. Number	12,418	12,726	12,983	13,277	13,491
2. Average Age	69.35	69.85	70.36	70.78	71.30
3. Average Years Since Retirement	13.50	13.78	14.13	14.40	14.74
4. Average Monthly Pension Benefit					
Base	\$ 2,175	\$ 2,204	\$ 2,228	\$ 2,273	\$ 2,303
COLA ³	129	128	128	128	126
PRPA ³	550	529	506	489	518
Adjustment	0	0	0	0	0
Sick	58	60	62	64	67
Total	\$ 2,912	\$ 2,921	\$ 2,924	\$ 2,954	\$ 3,014
Vested Terminations (vested at termination, not refunded contributions, or commenced benefit)					
1. Number	890	875	876	797	812
2. Average Age	50.09	50.25	50.82	51.01	51.71
3. Average Monthly Pension Benefit	\$ 1,273	\$ 1,352	\$ 1,441	\$ 1,350	\$ 1,534
Non-Vested Terminations (not vested at termination, not refunded contributions)					
1. Number	2,218	2,103	1,994	1,900	1,810
2. Average Account Balance	\$ 18,962	\$ 19,728	\$ 20,290	\$ 20,872	\$ 21,612
Total Number of Members	21,028	20,827	20,625	20,392	20,157

¹ 33 members who were terminated before the valuation date were subsequently rehired, per census data as of October 1, 2018. These members were valued as active as of the valuation date.

² Includes 1,280 male active members and 2,764 female active members.

³ 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, 2019	DB			DCR Tier 3	Grand Total
	Tier 1	Tier 2	Total		
Active Members					
1. Number	262	3,782	4,044	4,998	9,042
2. Average Age	61.66	50.78	51.48	41.06	45.72
3. Average Credited Service	28.66	18.56	19.21	5.67	11.73
4. Average Entry Age	33.00	32.22	32.27	35.39	33.99
5. Annual Earnings					
a. Amount	\$ 25,265,973	\$ 334,159,655	\$ 359,425,628	\$ 347,956,827	\$ 707,382,455
b. Average	\$ 96,435	\$ 88,355	\$ 88,879	\$ 69,619	\$ 78,233

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

As of June 30, 2019	Tier 1	Tier 2	Total
Retirees, Disabilitants, and Beneficiaries			
1. Number	10,612	2,879	13,491
2. Average Age	72.84	65.62	71.30
3. Average Years Since Retirement	17.24	5.52	14.74
4. Average Monthly Pension Benefit			
Base	\$ 2,344	\$ 2,152	\$ 2,303
COLA	146	51	126
PRPA	636	82	518
Adjustment	0	0	0
Sick	67	65	67
Total	\$ 3,193	\$ 2,350	\$ 3,014

Summary of Members Included

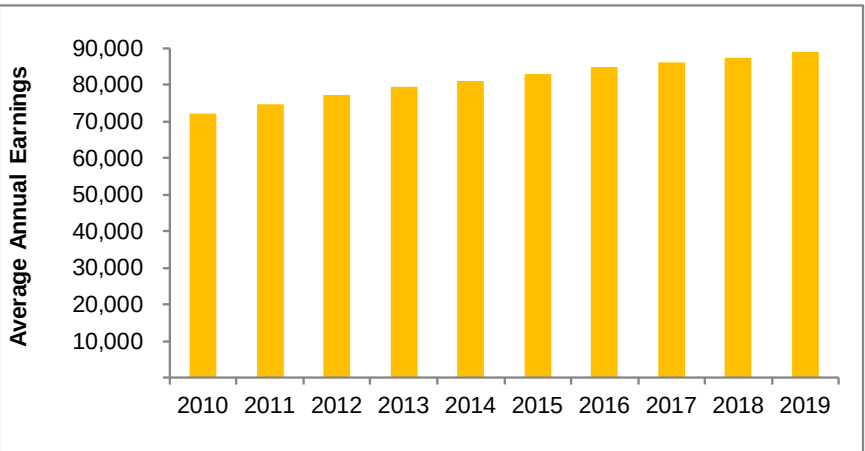
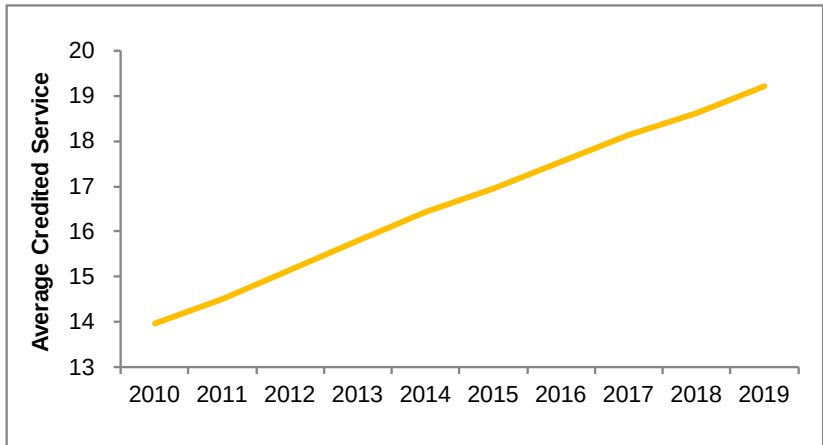
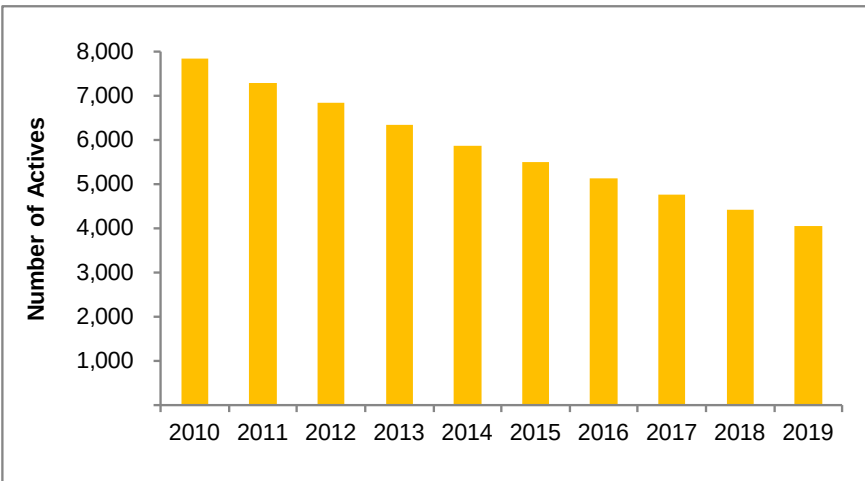
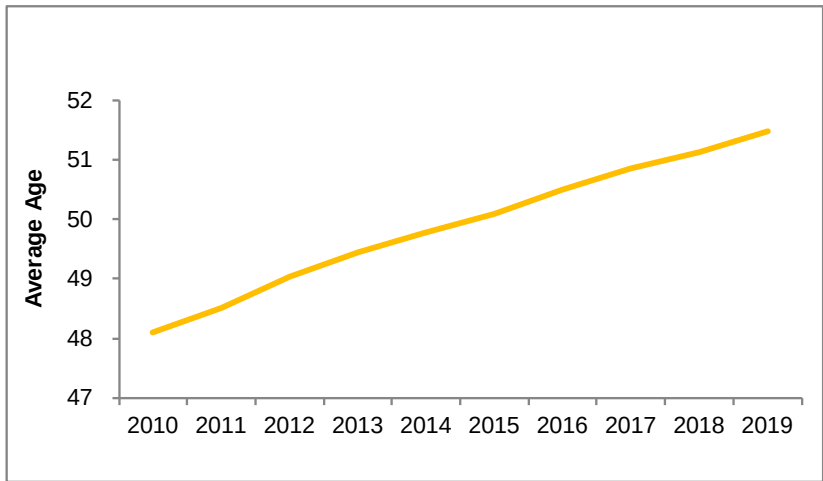
As of June 30, 2019	Active Members	Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members
Retiree Medical Participants						
1. Retiree Coverage Only	3,994	7,508	0	0	377	7,885
2. Retiree + Spouse	0	3,858	3,858	0	614	8,330
3. Retiree + Children / Other Dependent	0	194	0	184	0	378
4. Family	<u>0</u>	<u>354</u>	<u>354</u>	<u>533</u>	<u>0</u>	<u>1,241</u>
5. Total	3,994	11,914	4,212	717	991	17,834

Retiree Medical Participants as of June 30, 2019					
	Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members
Pre-Medicare	2,554	1,435	717	976	5,682
Medicare Part A & B	9,151	2,751	0	15	11,917
Medicare Part B Only	<u>209</u>	<u>26</u>	<u>0</u>	<u>0</u>	<u>235</u>
Total	11,914	4,212	717	991	17,834

As of June 30, 2019	Retirees
Summary of Retiree Medical Data Received	
1. Retiree records on pension data	13,491
2. Remove duplicates on pension data	(394)
3. Records valued in a different retiree healthcare plan ¹	(784)
4. Records without medical coverage	<u>(399)</u>
5. Total	11,914

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



Total annual earnings 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				Annual Earnings by Credited Service			
Age	Number	Total Annual Earnings	Average Annual Earnings	Years of Service	Number	Total Annual Earnings	Average Annual Earnings
0 – 19	0	\$ 0	\$ 0	0	0	\$ 0	\$ 0
20 – 24	0	0	0	1	1	63,331	63,331
25 – 29	0	0	0	2	4	236,834	59,209
30 – 34	0	0	0	3	7	443,788	63,398
35 – 39	198	15,743,124	79,511	4	18	1,161,334	64,519
40 – 44	666	56,627,944	85,027	0 – 4	30	\$ 1,905,287	\$ 63,510
45 – 49	1,019	89,981,229	88,303	5 – 9	126	9,418,094	74,747
50 – 54	892	80,646,548	90,411	10 – 14	658	53,848,725	81,837
55 – 59	700	63,277,633	90,397	15 – 19	1,459	127,538,047	87,415
60 – 64	357	32,750,323	91,738	20 – 24	1,183	109,067,092	92,195
65 – 69	141	13,365,556	94,791	25 – 29	439	42,422,416	96,634
70 – 74	55	5,372,289	97,678	30 – 34	109	10,839,794	99,448
75+	16	1,660,983	103,811	35 – 39	24	2,514,127	104,755
				40+	16	1,872,047	117,003
Total	4,044	\$ 359,425,629	\$ 88,879	Total	4,044	\$ 359,425,629	\$ 88,879

Years of Credited Service by Age										
Age	Years of Service									Total
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	
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	3	14	116	65	0	0	0	0	0	198
40 – 44	8	44	177	376	61	0	0	0	0	666
45 – 49	8	31	154	398	400	28	0	0	0	1,019
50 – 54	8	18	97	264	340	155	10	0	0	892
55 – 59	2	11	54	208	225	153	45	2	0	700
60 – 64	1	5	34	95	113	71	28	10	0	357
65 – 69	0	2	18	40	29	28	15	6	3	141
70 – 74	0	1	8	9	12	2	9	6	8	55
75+	0	0	0	4	3	2	2	0	5	16
Total	30	126	658	1,459	1,183	439	109	24	16	4,044

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

	Active Members	Inactive Members					Total
		Due a Refund	Deferred Benefits	Retired Members	Disabled Members	Bene-ficiaries	
As of June 30, 2018	4,418	1,900	797	11,988	25	1,264	20,392
Vested Terminations	(137)	(2)	139	0	0	0	0
Non-vested Terminations	(11)	11	0	0	0	0	0
Cash-outs	(1)	(65)	(8)	0	0	0	(74)
Disability Retirements	(3)	0	(2)	0	5	0	0
Age Retirements	(284)	(8)	(71)	367	(4)	0	0
Deaths With Beneficiary	0	(1)	(3)	(85)	0	89	0
Deaths Without Beneficiary	(3)	(2)	0	(121)	0	(40)	(166)
Data Corrections	0	(1)	(1)	2	0	(2)	(2)
Transfers Out	0	0	0	0	0	0	0
Rehires	65	(22)	(39)	(4)	0	0	0
Pick Ups*	0	0	0	0	0	7	7
Net Change	(374)	(90)	15	159	1	54	(235)
As of June 30, 2019	4,044	1,810	812	12,147	26	1,318	20,157

* Pickup beneficiaries are primarily new DROs.

Healthcare

	Active Members	Inactive Members				Total Inactive Members
		Retirees	Covered Spouses	Covered Children / Dependents	Deferred	
As of June 30, 2018	4,371	11,714	4,240	798	985	17,737
Vested Terminations	(109)	0	0	0	109	109
Non-vested Terminations	(9)	0	0	0	0	0
Cash-outs	0	0	0	0	0	0
Disability	(3)	3	2	0	0	5
Rehires	58	(1)	0	0	(39)	(40)
Retirement	(257)	257	130	54	0	441
Retired from deferred status	0	70	36	20	(70)	56
Retired without Medical Coverage	(46)	0	0	0	46	46
Deceased	(11)	(211)	(16)	0	(8)	(235)
New Beneficiaries	0	31	(31)	0	0	0
Added Dependent Coverage	N/A	0	31	24	0	55
Dropped Dependent Coverage	N/A	0	(194)	(106)	0	(300)
Added Retiree Medical Coverage	0	52	14	7	(33)	40
Dropped Retiree Medical Coverage	0	(8)	(1)	(80)	3	(86)
Transfer to/from another plan	0	7	1	0	(2)	6
Net Change	(377)	200	(28)	(81)	6	97
As of June 30, 2019	3,994	11,914	4,212	717	991	17,834

Section 4.4: Schedule of Active Member Data

Valuation Date	Number	Annual Earnings (000's)	Annual Average Earnings	Percent Increase/ (Decrease) in Average Earnings	Number of Participating Employers
June 30, 2019	4,044	\$ 359,426	\$ 88,879	1.7%	56
June 30, 2018	4,418	386,016	87,374	1.2%	56
June 30, 2017	4,772	411,951	86,327	1.6%	57
June 30, 2016	5,123	435,222	84,954	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
June 30, 2011	7,303	545,155	74,648	3.5%	58
June 30, 2010	7,832	564,887	72,125	6.5%	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 FY19 – employer list	\$ 783,276
b) DRB actual reported salaries FY19 – valuation data	695,990
c) Annualized valuation data	707,382
d) Valuation payroll as of June 30, 2019	734,030
e) Rate payroll for FY20	725,659
f) Rate payroll for FY22	739,581

- Actual reported salaries from DRB employer listing showing all payroll paid during FY19, including those who were not active as of June 30, 2019
- Payroll from valuation data for people who are in active status as of June 30, 2019
- Payroll from (b) annualized for both new entrants and part-timers
- Payroll from (c) with one year of salary scale applied to estimate salaries payable for the upcoming year
- Payroll from (d) with the part-timer annualization removed
- 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	2015	2016	2017	2018	2019
Service					
1. Number	791	422	376	465	367
2. Average Age at Commencement	59.87	60.32	59.77	59.98	59.87
3. Average Monthly Pension Benefit	\$ 3,363	\$ 3,190	\$ 3,300	\$ 3,527	\$ 3,562
Survivor (including surviving spouse and DROs)					
1. Number	89	104	108	87	96
2. Average Age at Commencement	70.22	72.15	70.57	71.61	74.36
3. Average Monthly Pension Benefit	\$ 1,715	\$ 1,633	\$ 1,643	\$ 2,022	\$ 1,795
Disability					
1. Number	8	4	3	3	5
2. Average Age at Commencement	53.62	50.48	43.30	49.92	51.51
3. Average Monthly Pension Benefit	\$ 3,808	\$ 3,616	\$ 3,678	\$ 3,625	\$ 4,182
Total					
1. Number	888	530	487	555	468
2. Average Age at Commencement	60.85	62.56	62.06	61.75	62.75
3. Average Monthly Pension Benefit	\$ 3,202	\$ 2,888	\$ 2,935	\$ 3,292	\$ 3,206

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 7/1/18 – 6/30/19:							
Average Monthly Pension Benefit	\$ 334	\$ 891	\$ 1,540	\$ 2,760	\$ 3,567	\$ 4,666	\$ 6,777
Number of Recipients	4	23	39	87	93	85	41
Period 7/1/17 – 6/30/18:							
Average Monthly Pension Benefit	\$ 204	\$ 899	\$ 1,583	\$ 2,583	\$ 3,422	\$ 4,580	\$ 6,083
Number of Recipients	5	21	61	85	109	130	57
Period 7/1/16 – 6/30/17:							
Average Monthly Pension Benefit	\$ 426	\$ 795	\$ 1,626	\$ 2,433	\$ 3,549	\$ 4,536	\$ 6,351
Number of Recipients	10	22	60	75	100	64	48
Period 7/1/15 – 6/30/16:							
Average Monthly Pension Benefit	\$ 245	\$ 1,002	\$ 1,535	\$ 2,540	\$ 3,445	\$ 4,472	\$ 6,168
Number of Recipients	11	31	82	69	105	74	54
Period 7/1/14 – 6/30/15:							
Average Monthly Pension Benefit	\$ 349	\$ 1,041	\$ 1,342	\$ 2,205	\$ 3,267	\$ 4,220	\$ 5,900
Number of Recipients	11	33	70	67	137	125	94
Period 7/1/13 – 6/30/14:							
Average Monthly Pension Benefit	\$ 235	\$ 904	\$ 1,435	\$ 2,398	\$ 3,016	\$ 4,073	\$ 7,485
Number of Recipients	8	31	31	28	22	18	12
Period 7/1/12 – 6/30/13:							
Average Monthly Pension Benefit	\$ 253	\$ 1,030	\$ 1,496	\$ 2,450	\$ 3,281	\$ 4,384	\$ 6,052
Number of Recipients	10	57	67	90	101	79	64
Period 7/1/11 – 6/30/12:							
Average Monthly Pension Benefit	\$ 353	\$ 1,064	\$ 1,512	\$ 2,241	\$ 3,276	\$ 4,320	\$ 5,739
Number of Recipients	11	43	62	61	118	81	58
Period 7/1/10 – 6/30/11:							
Average Monthly Pension Benefit	\$ 146	\$ 902	\$ 1,432	\$ 2,328	\$ 3,131	\$ 4,283	\$ 5,496
Number of Recipients	5	68	63	77	118	104	67
Period 7/1/09 – 6/30/10:							
Average Monthly Pension Benefit	\$ 482	\$ 1,020	\$ 1,343	\$ 2,263	\$ 2,992	\$ 4,120	\$ 6,263
Number of Recipients	14	50	63	85	109	79	49

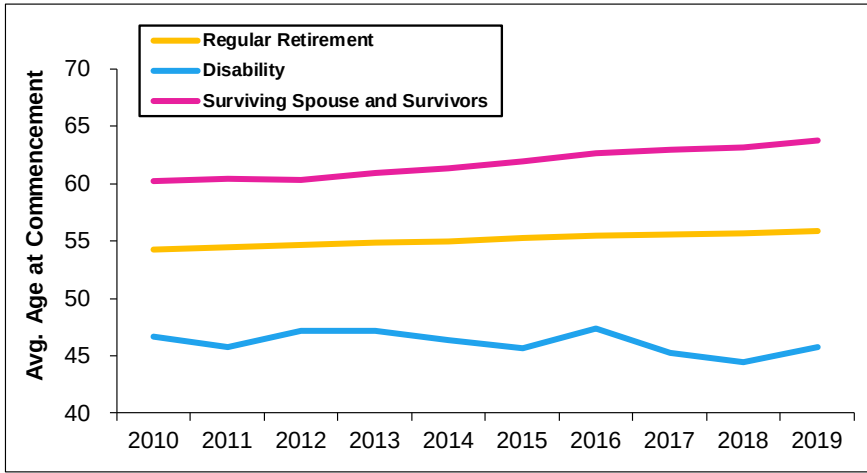
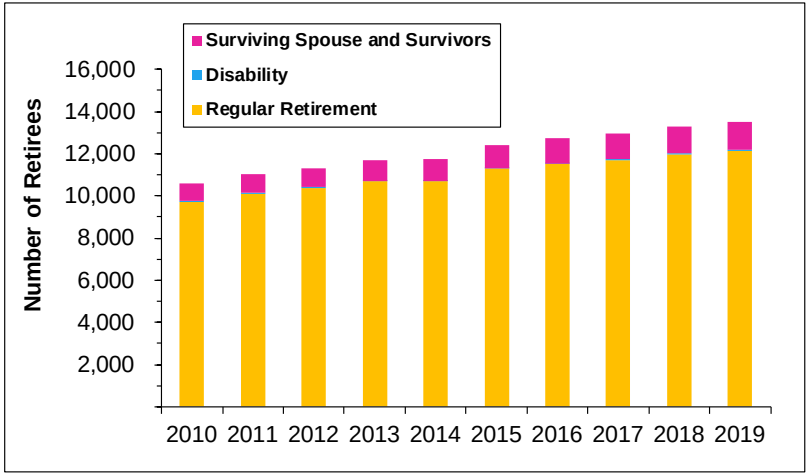
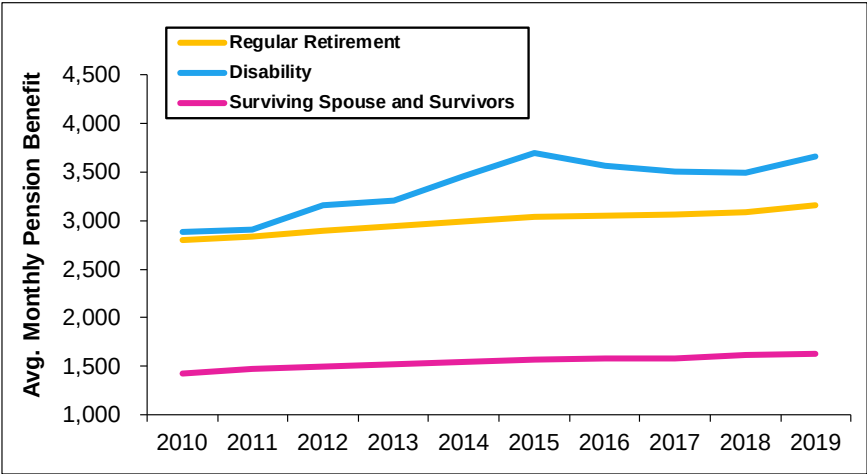
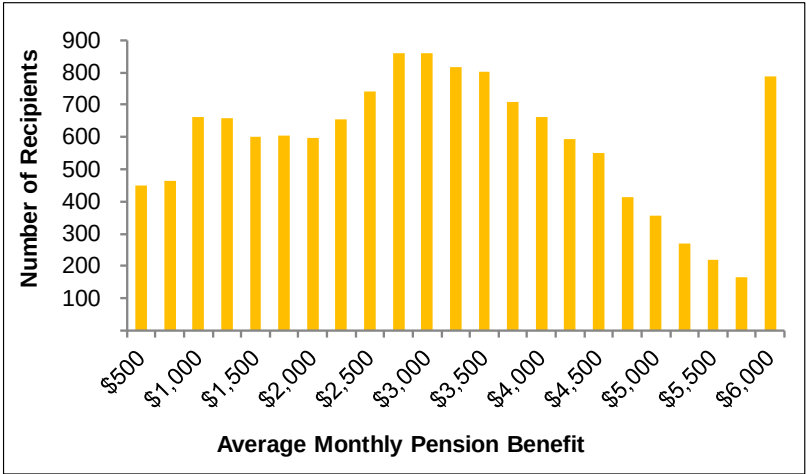
“Average Monthly Pension Benefit” includes postretirement pension adjustments and cost-of-living increases.

Beneficiaries are not included in the table above.

Section 4.7: Summary of All Pension Benefit Recipients

As of June 30	2015	2016	2017	2018	2019
Service					
1. Number, Fiscal Year Start	10,681	11,287	11,527	11,716	11,988
2. Net Change	606	240	189	272	159
3. Number, Fiscal Year End	11,287	11,527	11,716	11,988	12,147
4. Average Age at Commencement	55.28	55.43	55.55	55.70	55.82
5. Average Current Age	69.09	69.58	70.09	70.50	70.99
6. Average Monthly Pension Benefit	\$ 3,040	\$ 3,056	\$ 3,064	\$ 3,093	\$ 3,161
Surviving Spouse (includes DROs)					
1. Number, Fiscal Year Start	1,034	1,096	1,168	1,237	1,261
2. Net Change	62	72	69	24	54
3. Number, Fiscal Year End	1,096	1,168	1,237	1,261	1,315
4. Average Age at Commencement	62.04	62.66	62.98	63.16	63.73
5. Average Current Age	72.54	73.07	73.42	73.90	74.65
6. Average Monthly Pension Benefit	\$ 1,576	\$ 1,580	\$ 1,584	\$ 1,618	\$ 1,629
Survivor (other than spouse)					
1. Number, Fiscal Year Start	5	6	3	3	3
2. Net Change	1	(3)	0	0	0
3. Number, Fiscal Year End	6	3	3	3	3
4. Average Age at Commencement	49.91	52.81	52.81	53.85	53.85
5. Average Current Age	54.06	57.22	58.22	60.65	61.65
6. Average Monthly Pension Benefit	\$ 1,128	\$ 746	\$ 746	\$ 749	\$ 765
Disability					
1. Number, Fiscal Year Start	30	29	28	27	25
2. Net Change	(1)	(1)	(1)	(2)	1
3. Number, Fiscal Year End	29	28	27	25	26
4. Average Age at Commencement	45.67	47.34	45.25	44.40	45.75
5. Average Current Age	49.16	51.56	50.34	50.02	51.08
6. Average Monthly Pension Benefit	\$ 3,699	\$ 3,568	\$ 3,500	\$ 3,494	\$ 3,666
Total					
1. Number, Fiscal Year Start	11,750	12,418	12,726	12,983	13,277
2. Net Change	668	308	257	294	214
3. Number, Fiscal Year End	12,418	12,726	12,983	13,277	13,491
4. Average Age at Commencement	55.85	56.07	56.24	56.38	56.56
5. Average Current Age	69.35	69.86	70.36	70.78	71.30
6. Average Monthly Pension Benefit	\$ 2,912	\$ 2,921	\$ 2,924	\$ 2,954	\$ 3,014

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				Annual Pension Benefit by Years Since Commencement			
Age	Number	Total Annual Pension Benefit	Average Annual Pension Benefit	Years Since Commencement	Number	Total Annual Pension Benefit	Average Annual Pension Benefit
0 – 19	0	\$ 0	\$ 0	0	438	\$ 16,585,110	\$ 37,866
20 – 24	0	0	0	1	493	19,964,703	40,496
25 – 29	0	0	0	2	494	18,315,592	37,076
30 – 34	0	0	0	3	490	17,953,204	36,639
35 – 39	0	0	0	4	557	21,259,308	38,168
40 – 44	15	543,005	36,200	0 – 4	2,472	\$ 94,077,917	\$ 38,057
45 – 49	46	1,441,585	31,339	5 – 9	2,466	89,382,717	36,246
50 – 54	284	12,009,895	42,288	10 – 14	2,049	64,965,247	31,706
55 – 59	740	29,984,537	40,520	15 – 19	2,062	64,730,198	31,392
60 – 64	1,919	66,806,946	34,813	20 – 24	2,318	87,240,981	37,636
65 – 69	3,098	105,932,078	34,194	25 – 29	1,076	42,910,444	39,880
70 – 74	3,130	109,484,756	34,979	30 – 34	733	32,520,593	44,366
75+	4,259	161,428,701	37,903	35 – 39	232	9,177,619	39,559
				40+	83	2,625,787	31,636
Total	13,491	\$ 487,631,503	\$ 36,145	Total	13,491	\$ 487,631,503	\$ 36,145

Years Since Commencement by Age

Age	Years Since Commencement									Total
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	
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	12	3	0	0	0	0	0	0	0	15
45 – 49	39	5	2	0	0	0	0	0	0	46
50 – 54	219	52	10	2	1	0	0	0	0	284
55 – 59	397	208	104	27	3	1	0	0	0	740
60 – 64	829	566	317	148	57	1	0	0	1	1,919
65 – 69	505	957	755	515	339	25	2	0	0	3,098
70 – 74	242	411	578	892	753	203	44	5	2	3,130
75+	229	264	283	478	1,165	846	687	227	80	4,259
Total	2,472	2,466	2,049	2,062	2,318	1,076	733	232	83	13,491

Section 4.8: Schedule of Pension Benefit Recipients by Type of Pension 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	225	156	69	0	137	44	37	7
301 – 600	390	278	112	0	206	76	85	23
601 – 900	658	505	153	0	358	134	130	36
901 – 1,200	837	667	170	0	480	166	156	35
1,201 – 1,500	726	566	160	0	391	167	145	23
1,501 – 1,800	715	559	156	0	396	154	142	23
1,801 – 2,100	748	614	134	0	375	165	179	29
2,101 – 2,400	819	712	107	0	363	199	227	30
2,401 – 2,700	985	901	83	1	433	238	284	30
2,701 – 3,000	1,050	989	59	2	424	261	333	32
3,001 – 3,300	964	921	37	6	381	217	339	27
3,301 – 3,600	933	900	29	4	379	189	337	28
3,601 – 3,900	832	814	14	4	305	181	319	27
3,901 – 4,200	733	718	11	4	277	163	271	22
4,200+	2,876	2,847	24	5	1,040	476	1,266	94
Total	13,491	12,147	1,318	26	5,945	2,830	4,250	466

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 – 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, 2019	468	\$ 18,004,896	254	\$ 871,684	13,491	\$ 487,631,503	3.64%	\$ 36,145
June 30, 2018	555	21,924,986	261	6,926,129	13,277	470,498,291	3.29%	35,437
June 30, 2017	487	17,151,684	230	7,736,025	12,983	455,499,434	2.11%	35,084
June 30, 2016	530	18,364,581	222	6,144,109	12,726	446,083,775	2.82%	35,053
June 30, 2015	888	34,120,658	220	3,531,501	12,418	433,863,303	7.59%	34,938
June 30, 2014	226	5,964,256	181	(1,150,187)	11,750	403,274,146	1.80%	34,321
June 30, 2013	576	19,387,542	172	1,652,575	11,705	396,159,703	4.69%	33,845
June 30, 2012	473	17,104,564	188	(617,561)	11,301	378,424,736	4.91%	33,486
June 30, 2011	564	19,546,369	146	1,464,766	11,016	360,702,611	5.28%	32,744
June 30, 2010	533	16,980,817	190	5,495,399	10,598	342,621,008	3.47%	32,329

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, 2019. 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.

Additional State Contributions

Pursuant to AS14.25.070 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 (12.56%) will be sufficient to pay the total contribution rate adopted by The State of Alaska Retirement Management 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 those 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%.

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 RIP who return to employment under TRS, PERS, Judicial Retirement System (JRS) or the University of Alaska's Optional Retirement Plan 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 twenty-five years of membership service, are disabled or age sixty 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 sixty 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.

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, excl. 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 will be 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 (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 (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 (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.
- c. **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, excluding the Alaska COLA, times:

- a. 75% of the CPI increase in the preceding calendar year or 9%, whichever is less, if the recipient is at least age 65 or on TRS disability; or
- b. 50% of the CPI increase in the preceding calendar year or 6%, whichever is less, 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

There were no 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 Method

Entry Age Normal Cost.

Liabilities and contributions shown in the report are computed using the Entry Age Normal Actuarial Cost Method.

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 2014¹. 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.

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 value method recognizes 20% of the gain or loss each year, for a period of 5 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 have been 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 to develop 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, 2018 to June 30, 2019.

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.

Benefits

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.

Administration and Data Sources

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 2017 through June 2019 (FY18 through FY19) 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, 2019 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 that 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 FY20 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 FY18 through FY19.
 - 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 FY20).
 - Because the reports provided this year 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, 2018, and July 1, 2019, 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 Aetna for years through 2018 and Optum for January-June 2019, rebates were assumed to be 12% of prescription drug claims for FY18 and 17% of prescription drug claims for FY19.
2. Develop estimated EGWP reimbursements – Segal provided estimated 2019 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. Due to group size and demographics, we did not make any 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 FY20 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 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:

Alaska-Specific and National Average Weighted Trend from Experience Period to Valuation Year			
Experience Period	Medical	Prescription	Weighting Factors
FY18 to FY19	6.2% Pre-Medicare / 4.0% Medicare	8.0%	50%
FY19 to FY20	7.3% Pre-Medicare / 4.6% Medicare	1.2%	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. Develop separate administration costs – no adjustments were made for internal administrative costs. Third party retiree plan administration fees for FY20 are based upon total fees projected to 2020 by Segal based on actual FY19 fees. The annual per participant per year administrative cost rate for medical and prescription benefits is \$348.

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 of the following 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 valuation results included in the report reflect the repeal of this tax. The removal of the Cadillac Tax reduced the plan's liabilities as of June 30, 2019 by approximately \$14 million.

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 provision of health care 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:

- Some records provided on the Aetna data were associated with a participant social security number not listed on the RIN-to-SSN translation file. We reconciled those participants with the pension valuation data as either a surviving spouse or a retiree in the appropriate plan based on account structure information in the Aetna data.
- 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 2018				
1. Incurred Claims	\$ 228,572,782	\$ 72,875,570	\$ 65,406,973	\$ 178,763,430
2. Adjustments for Rx Rebates	0	0	(7,848,837)	(21,451,612)
3. Net incurred claims	\$ 228,572,782	\$ 72,875,570	\$ 57,558,136	\$ 157,311,819
4. Average Enrollment	21,920	40,560	21,920	40,560
5. Claim Cost Rate (3) / (4)	10,428	1,797	2,626	3,878
6. Trend to Fiscal 2020	1.140	1.088	1.093	1.093
7. Fiscal 2020 Incurred Cost Rate (5) x (6)	\$ 11,883	\$ 1,955	\$ 2,870	\$ 4,239

B. Fiscal 2019				
1. Incurred Claims	\$ 230,731,518	\$ 80,855,220	\$ 63,846,605	\$ 183,281,273
2. Adjustments for Rx Rebates	0	0	(10,853,923)	(31,157,816)
3. Net incurred claims	\$ 230,731,518	\$ 80,855,220	\$ 52,992,682	\$ 152,123,456
4. Average Enrollment	20,625	42,843	20,625	42,843
5. Claim Cost Rate (3) / (4)	11,187	1,887	2,569	3,551
6. Trend to Fiscal 2020	1.073	1.046	1.012	1.012
7. Fiscal 2020 Incurred Cost Rate (5) x (6)	\$ 12,003	\$ 1,974	\$ 2,600	\$ 3,593

	Medical		Prescription Drugs (Rx)	
	Pre-Medicare	Medicare	Pre-Medicare	Medicare
C. Incurred Cost Rate by Fiscal Year				
1. Fiscal 2018 A.(7)	11,883	1,955	2,870	4,239
2. Fiscal 2019 B.(7)	12,003	1,974	2,600	3,593

D. Weighting by Fiscal Year				
1. Fiscal 2018	50%	50%	50%	50%
2. Fiscal 2019	50%	50%	50%	50%

E. Fiscal 2020 Incurred Cost Rate				
1. Rate at Average Age C x D	\$ 11,943	\$ 1,964	\$ 2,735	\$ 3,916
2. Average Aging Factor	0.826	1.256	0.838	1.119
3. Rate at Age 65 (1) / (2)	\$ 14,464	\$ 1,564	\$ 3,263	\$ 3,501

F. Development of Part A&B and Part B Only Cost from Pooled Rate Above

1. Part A&B Average Enrollment	42,469
2. Part B Only Average Enrollment	374
3. Total Medicare Average Enrollment B(4)	42,843
4. Cost ratio for those with Part B only to those with Parts A&B	3.180
5. Factor to determine cost for those with Parts A&B (2) / (3) x (4) + (1) / (3) x 1.00	1.019
6. Medicare per capita cost for all participants: E(3)	\$ 1,564
7. Cost for those eligible for Parts A&B: (6) / (5)	\$ 1,534
8. Cost for those eligible for Part B only: (7) x (4)	\$ 4,880

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, 2019 through June 30, 2020**

Age	Medical and Medicare Parts A & B	Medical and Medicare Part B Only	Prescription Drug	Medicare EGWP Subsidy
45	\$ 8,827	\$ 8,827	\$ 1,993	\$ 0
50	9,987	9,987	2,368	0
55	11,299	11,299	2,812	0
60	12,784	12,784	3,029	0
65	1,534	4,880	3,501	1,044
70	1,779	5,657	3,865	1,152
75	2,062	6,558	4,267	1,272
80	2,277	7,240	4,162	1,241

Section 5.3: Summary of Actuarial Assumptions

The demographic and economic assumptions used in the June 30, 2019 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% of RP-2014 white-collar employee table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

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.

Deaths are assumed to result from occupational causes 15% of the time.

Turnover

Based upon the 2013-2017 actual experience (see Table 2).

Disability

Incidence rates based upon the 2013-2017 actual experience (see Table 3).

Post-disability mortality in accordance with the RP-2014 disabled table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement. Deaths are assumed to be from non-occupational causes 85% of the time.

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% 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 5 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%

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.

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.

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, 2019 was increased by the following amounts for administrative expenses (for projections, the percent increase was assumed to remain constant in future years):

- Pension: \$3,034,000
- Healthcare: \$1,439,000

Part-Time Status

Part-time employees are assumed to earn 0.75 years of credited service per year.

Re-Employment Option

All re-employed retirees are assumed to return to work under the Standard Option.

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 FY20 medical and prescription drugs are shown below:

	Medical	Prescription Drugs
Pre-Medicare	\$ 14,464	\$ 3,263
Medicare Parts A & B	\$ 1,534	\$ 3,501
Medicare Part B Only	\$ 4,880	\$ 3,501
Medicare Part D – EGWP	N/A	\$ 1,044

Members are assumed to attain Medicare eligibility at age 65. All costs are for the 2020 fiscal year (July 1, 2019 – June 30, 2020).

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

\$348 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, 7.0% is applied to the FY20 pre-Medicare medical claims costs to get the FY21 medical claims costs.

	Medical Pre-65	Medical Post-65	Prescription Drugs / EGWP
FY20	7.0%	5.4%	8.0%
FY21	6.5%	5.4%	7.5%
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 FY20 contributions based on monthly rates shown below for calendar 2020 are assumed based on the coverage category for current retirees. The composite rate shown is used for current active and inactive members 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 2020 Annual Contribution	Calendar 2020 Monthly Contribution	Calendar 2019 Monthly Contribution
Retiree Only	\$ 8,892	\$ 741	\$ 823
Retiree and Spouse	\$ 17,784	\$ 1,482	\$ 1,647
Retiree and Child(ren)	\$ 12,564	\$ 1,047	\$ 1,163
Retiree and Family	\$ 21,456	\$ 1,788	\$ 1,987
Composite	\$ 13,212	\$ 1,101	\$ 1,223

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 FY20 retired member medical contributions to get the FY21 retired member medical contributions.

Trend Assumptions	
FY20	0.0%
FY21	0.0%
FY22	0.0%
FY23+	4.0%

Graded trend rates for retired member medical contributions were updated to the rates shown above for the June 30, 2019 valuation to reflect the ongoing shift in population from pre-Medicare to Medicare-eligible and a projection of expected future retiree contributions reflecting the 10% decrease from 2019 to 2020. Actual FY20 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. Retired member contribution trend rates were updated to reflect the ongoing shift in population from pre-Medicare to Medicare-eligible and a projection of expected future retiree contributions reflecting the 10% decrease from 2019 to 2020. The Further Consolidated Appropriations Act, 2020 that was signed in December 2019 made several changes, including the repeal of the Cadillac Tax. The repeal of the Cadillac Tax reduced the plan's liabilities as of June 30, 2019 by approximately \$14 million. The amounts included in the Normal Cost for administrative expenses were changed to \$3,034,000 for pension and \$1,439,000 for healthcare (based on the most recent two years of actual administrative expenses paid from plan assets). No adjustment was made to reflect participants who terminate employment before the valuation date and are subsequently rehired after the valuation date.

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
< 31	0.0337%	0.0612%
31	0.0337%	0.0613%
32	0.0337%	0.0613%
33	0.0342%	0.0622%
34	0.0347%	0.0631%
35	0.0353%	0.0641%
36	0.0357%	0.0650%
37	0.0362%	0.0659%
38	0.0371%	0.0674%
39	0.0379%	0.0689%
40	0.0387%	0.0703%
41	0.0395%	0.0718%
42	0.0403%	0.0733%
43	0.0423%	0.0770%
44	0.0443%	0.0806%
45	0.0464%	0.0843%
46	0.0483%	0.0879%
47	0.0504%	0.0916%
48	0.0536%	0.0975%
49	0.0569%	0.1034%
50	0.0601%	0.1093%
51	0.0634%	0.1152%
52	0.0666%	0.1211%
53	0.0746%	0.1356%
54	0.0826%	0.1501%

Table 4: Retirement Rates

Age	Reduced		Unreduced	
	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.

A new Actuarial Standard of Practice (ASOP) has been adopted for measurements on or after November 1, 2018 - Actuarial Standard of Practice No. 51 ("ASOP 51")¹. ASOP 51 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 recommended contribution in the actuarial valuation
- 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.

¹ ASOP 51 does not apply to the healthcare portion of the plan. Accordingly, all figures in this section relate to the pension portion.

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.

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 recommended amount differ.

- If the actual contribution is lower than the recommended 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 will 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 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 4-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 on page 3 shows the plan's funded status (comparison of actuarial accrued liabilities to actuarial value of assets) 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, 2018	June 30, 2019
1. Retiree and Beneficiary Accrued Liability	\$ 5,353,494	\$ 5,495,907
2. Total Accrued Liability	\$ 7,276,290	\$ 7,388,020
3. Ratio, (1) ÷ (2)	73.6%	74.4%

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 #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, 2018	FYE June 30, 2019
1. Contributions	\$ 189,267	\$ 199,933
2. Benefit Payments	<u>458,512</u>	<u>472,717</u>
3. Cash Flow, (1) - (2)	\$ (269,245)	\$ (272,784)
4. Fair Value of Assets	\$ 5,472,727	\$ 5,511,929
5. Ratio, (3) ÷ (4)	(4.9%)	(4.9%)

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 garner 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, 2018	June 30, 2019
1. Fair Value of Assets	\$ 5,472,727	\$ 5,511,929
2. DB/DCR Payroll	\$ 738,653	\$ 725,659
3. Asset to Payroll Ratio, (1) ÷ (2)	740.9%	759.6%
4. Accrued Liability	\$ 7,276,290	\$ 7,388,020
5. Liability to Payroll Ratio, (4) ÷ (2)	985.1%	1,018.1%

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.

State of Alaska

Teachers' Retirement System Defined Contribution Retirement Plan

For Occupational Death and
Disability and Retiree Medical
Benefits

Actuarial Valuation
Report
As of June 30, 2019

April 2020

BUCK



April 2, 2020

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, 2019 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, 2019. 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, 2019.

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 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. 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, 2019 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.

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 and 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 and disability benefits provided by this 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.

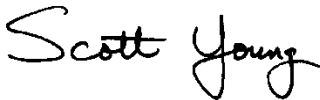
I am available to discuss this report with you at your convenience. I can be reached at 602-803-6174.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "D. J. Kershner".

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.

A handwritten signature in black ink, appearing to read "Scott Young".

Scott Young, FSA, EA, MAAA
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, 2019.

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)	2018	2019
a. Actuarial Accrued Liability	\$ 32,459	\$ 33,221
b. Valuation Assets	<u>40,621</u>	<u>46,666</u>
c. Unfunded Actuarial Accrued Liability, (a) - (b)	\$ (8,162)	\$ (13,445)
d. Funded Ratio based on Valuation Assets, (b) ÷ (a)	125.1%	140.5%
e. Fair Value of Assets	\$ 40,461	\$ 46,395
f. Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	124.7%	139.7%

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 FY19 investment return based on fair value of assets was 6.2% compared to the expected investment return of 7.38% (net of investment expenses of approximately 0.04%). This resulted in a loss of approximately \$508,000 to the plan from investment experience. The asset valuation method recognizes 20 percent of this loss (\$102,000) this year and an additional 20 percent in each of the next 4 years. In addition, 20 percent of the FY15 investment loss, 20 percent of the FY16 investment loss, 20 percent of the FY17 investment gain and 20 percent of the FY18 investment loss were recognized this year. The approximate FY19 asset return based on actuarial value of assets was 6.4% compared to the expected asset return of 7.38% (net of investment expenses).

2. Salary Increases

Salary increases for continuing active members during FY19 were less than anticipated based on the valuation assumptions, resulting in a very small liability gain of approximately \$1,000.

3. Demographic Experience

The number of active members increased 1.7% from 4,915 at June 30, 2018 to 4,998 at June 30, 2019. The average age of active members increased from 40.64 to 41.06 and average credited service increased from 5.30 to 5.67 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, 2019 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.

Beginning January 1, 2019, Rx benefits were provided through a new contract with Optum. This change in vendors resulted in lower actual (and future expected) claims and higher rebates. 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 \$4,135,000. Approximately 95% of the gain in FY19 was attributable to Rx experience, the majority of which was due to the change in Rx vendors.

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 Further Consolidated Appropriations Act, 2020 that was signed in December 2019 made several changes, including the repeal of the Cadillac Tax. The repeal of the Cadillac Tax reduced the plan's liabilities as of June 30, 2019 by approximately \$286,000. 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

There have been no changes in benefit provisions valued since the prior valuation.

Comparative Summary of Key Actuarial Valuation Results

Total Employer Contribution Rates for Occupational Death & Disability for Fiscal Year:			2021	2022
a.	Employer Normal Cost Rate		0.08%	0.08%
b.	Past Service Cost Rate		<u>(0.09)%</u>	<u>(0.09)%</u>
c.	Total Employer Contribution Rate, (a) + (b), not less than (a)		0.08%	0.08%

Total Employer Contribution Rates for Retiree Medical for Fiscal Year:			2021	2022
a.	Employer Normal Cost Rate		0.93%	0.83%
b.	Past Service Cost Rate		<u>(0.07)%</u>	<u>(0.15)%</u>
c.	Total Employer Contribution Rate, (a) + (b), not less than (a)		0.93%	0.83%

The exhibit below shows the historical Board-adopted employer contribution rates for TRS DCR.

Valuation Date	Fiscal Year	Total Employer Contribution Rate		
		Occupational Death & Disability	Retiree Medical	Total
N/A	FY07	N/A	1.75%	1.75%
N/A	FY08	0.56%	0.99%	1.55%
N/A	FY09	0.62%	0.99%	1.61%
June 30, 2007	FY10	0.32%	1.03%	1.35%
June 30, 2008	FY11	0.28%	0.68%	0.96%
June 30, 2009	FY12	0.00%	0.58%	0.58%
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	TBD	TBD	TBD

Summary of Actuarial Accrued Liability Gain/(Loss)

The following table shows the FY19 gain/(loss) on actuarial accrued liability as of June 30, 2019 (\$'s in 000's):

	Occupational Death & Disability	Retiree Medical	Total
Retirement Experience	\$ 0	\$ 218	\$ 218
Termination Experience	(5)	1,926	1,921
Active Mortality Experience	108	(43)	65
Inactive Mortality Experience	0	58	58
Disability Experience	191	(20)	171
New Entrants	(208)	(600)	(808)
Rehires	(1)	(873)	(874)
Salary Increases	1	N/A	1
Medical Claims Costs ¹	N/A	4,135	4,135
Cadillac Tax – Medical Claims Costs	N/A	389	389
Cadillac Tax – Repeal	N/A	286	286
Miscellaneous	<u>(27)</u>	<u>(222)</u>	<u>(249)</u>
Total	\$ 59	\$ 5,254	\$ 5,313

¹ Beginning January 1, 2019, Rx benefits were provided through a new contract with Optum. This change in vendors resulted in lower actual (and future expected) claims and higher rebates. Approximately 95% of the gain shown in this table was due to Rx experience, the majority of which was due to the change in Rx vendors.

Section 1: Actuarial Funding Results

Section 1.1: Actuarial Liabilities and Normal Cost (\$'s in 000's)

As of June 30, 2019	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Occupational Death Benefits	\$ 731	\$ 78
Occupational Disability Benefits	1,211	(47)
Medical and Prescription Drug Benefits	65,464	40,417
Medicare Part D Subsidy	<u>(13,089)</u>	<u>(8,083)</u>
Subtotal	\$ 54,317	\$ 32,365
Benefit Recipients		
Survivor Benefits	\$ 0	\$ 0
Disability Benefits	209	209
Medical and Prescription Drug Benefits	807	807
Medicare Part D Subsidy	<u>(160)</u>	<u>(160)</u>
Subtotal	\$ 856	\$ 856
Total	\$ 55,173	\$ 33,221
Total Occupational Death & Disability	\$ 2,151	\$ 240
Total Retiree Medical, Net of Part D Subsidy	\$ 53,022	\$ 32,981
Total Retiree Medical, Gross of Part D Subsidy	\$ 66,271	\$ 41,224

As of June 30, 2019	Normal Cost
Active Members	
Occupational Death Benefits	\$ 101
Occupational Disability Benefits	183
Medical and Prescription Drug Benefits	3,708
Medicare Part D Subsidy	<u>(741)</u>
Subtotal	\$ 3,251
Administrative Expense Load	
Occupational Death & Disability	\$ 0
Retiree Medical	<u>5</u>
Subtotal	\$ 5
Total	\$ 3,256
Total Occupational Death & Disability	\$ 284
Total Retiree Medical, Net of Part D Subsidy	\$ 2,972
Total Retiree Medical, Gross of Part D Subsidy	\$ 3,713

Section 1.2: Actuarial Contributions as of June 30, 2019 for FY22 (\$'s in 000's)

Normal Cost Rate	Occupational Death & Disability	Retiree Medical	Total
1. Total Normal Cost	\$ 284	\$ 2,972	\$ 3,256
2. DCR Plan Rate Payroll Projected for FY20	359,622	359,622	359,622
3. Employer Normal Cost Rate, (1) ÷ (2)	0.08%	0.83%	0.91%
Past Service Cost Rate			
1. Actuarial Accrued Liability	\$ 240	\$ 32,981	\$ 33,221
2. Valuation Assets	4,359	42,307	46,666
3. Unfunded Actuarial Accrued Liability, (1) - (2)	\$ (4,119)	\$ (9,326)	\$ (13,445)
4. Funded Ratio based on Valuation Assets	1,816.3%	128.3%	140.5%
5. Past Service Cost Amortization Payment	(326)	(555)	(881)
6. DCR Plan Rate Payroll Projected for FY20	359,622	359,622	359,622
7. Past Service Cost Rate, (5) ÷ (6)	(0.09%)	(0.15%)	(0.24%)
Total Employer Contribution Rate, not less than Normal Cost Rate	0.08%	0.83%	0.91%

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	\$ 284	\$ 2,972	\$ 3,256
2. Total DB and DCR Plan Rate Payroll Projected for FY20	725,659	725,659	725,659
3. Employer Normal Cost Rate, (1) ÷ (2)	0.04%	0.41%	0.45%
4. Past Service Cost Amortization Payment	(326)	(555)	(881)
5. Past Service Cost Rate, (4) ÷ (2)	(0.04%)	(0.08%)	(0.12%)
Total Employer Contribution Rate, not less than Normal Cost Rate	0.04%	0.41%	0.45%

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	13	\$ 16	\$ 15	\$ 1
FY08 Gain	06/30/2008	14	(392)	(391)	(37)
Change in Assumptions	06/30/2009	15	(82)	(82)	(7)
FY09 Gain	06/30/2009	15	(594)	(605)	(54)
Change in Assumptions	06/30/2010	16	(7)	(8)	(1)
FY10 Gain	06/30/2010	16	(479)	(492)	(42)
FY11 Gain	06/30/2011	17	(560)	(578)	(47)
FY12 Gain	06/30/2012	18	(129)	(135)	(11)
FY13 Gain	06/30/2013	19	(149)	(154)	(12)
Change in Assumptions	06/30/2014	20	(50)	(53)	(4)
PRPA Modification	06/30/2014	20	(25)	(25)	(2)
FY14 Gain	06/30/2014	20	(255)	(263)	(19)
FY15 Gain	06/30/2015	21	(275)	(283)	(20)
FY16 Gain	06/30/2016	22	(209)	(215)	(15)
FY17 Gain	06/30/2017	23	(251)	(254)	(17)
Change in Assumptions ¹	06/30/2018	24	0	0	0
FY18 Gain	06/30/2018	24	(257)	(258)	(17)
FY19 Gain	06/30/2019	25	(338)	(338)	(22)
Total				\$ (4,119)	\$ (326)

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		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Unfunded Liability	06/30/2007	13	\$ (239)	\$ (238)	\$ (24)
Change in Assumptions	06/30/2008	14	84	88	8
FY08 Gain	06/30/2008	14	(393)	(391)	(37)
Change in Assumptions	06/30/2009	15	(69)	(68)	(6)
FY09 Gain	06/30/2009	15	(281)	(288)	(26)
Change in Assumptions ¹	06/30/2010	16	0	0	0
FY10 Gain	06/30/2010	16	(545)	(559)	(48)
FY11 Gain	06/30/2011	17	(94)	(96)	(8)
Change in Assumptions	06/30/2012	18	11,518	11,948	941
FY12 Gain	06/30/2012	18	(60)	(59)	(5)
FY13 Loss	06/30/2013	19	3,439	3,571	271
Change in Assumptions	06/30/2014	20	(9,736)	(10,082)	(742)
FY14 Loss	06/30/2014	20	1,616	1,672	123
FY15 Gain	06/30/2015	21	(3,485)	(3,592)	(257)
EGWP Impact	06/30/2016	22	(6,400)	(6,552)	(455)
FY16 Loss	06/30/2016	22	958	983	68
Change in Assumptions	06/30/2017	23	7,645	7,759	525
FY17 Gain	06/30/2017	23	(1,451)	(1,473)	(100)
Change in Assumptions/Methods	06/30/2018	24	(9,505)	(9,547)	(631)
FY18 Loss	06/30/2018	24	2,491	2,502	165
FY19 Gain	06/30/2019	25	(4,904)	(4,904)	(317)
Total				\$ (9,326)	\$ (555)

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		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Unfunded Liability	06/30/2007	13	\$ (223)	\$ (223)	\$ (23)
Change in Assumptions	06/30/2008	14	84	88	8
FY08 Gain	06/30/2008	14	(785)	(782)	(74)
Change in Assumptions	06/30/2009	15	(151)	(150)	(13)
FY09 Gain	06/30/2009	15	(875)	(893)	(80)
Change in Assumptions	06/30/2010	16	(7)	(8)	(1)
FY10 Gain	06/30/2010	16	(1,024)	(1,051)	(90)
FY11 Gain	06/30/2011	17	(654)	(674)	(55)
Change in Assumptions	06/30/2012	18	11,518	11,948	941
FY12 Gain	06/30/2012	18	(189)	(194)	(16)
FY13 Loss	06/30/2013	19	3,290	3,417	259
Change in Assumptions	06/30/2014	20	(9,786)	(10,135)	(746)
PRPA Modification	06/30/2014	20	(25)	(25)	(2)
FY14 Loss	06/30/2014	20	1,361	1,409	104
FY15 Gain	06/30/2015	21	(3,760)	(3,875)	(277)
EGWP Impact	06/30/2016	22	(6,400)	(6,552)	(455)
FY16 Loss	06/30/2016	22	749	768	53
Change in Assumptions	06/30/2017	23	7,645	7,759	525
FY17 Gain	06/30/2017	23	(1,702)	(1,727)	(117)
Change in Assumptions/Methods	06/30/2018	24	(9,505)	(9,547)	(631)
FY18 Loss	06/30/2018	24	2,234	2,244	148
FY19 Gain	06/30/2019	25	(5,242)	(5,242)	(339)
Total				\$ (13,445)	\$ (881)

Section 1.3: Actuarial Gain/(Loss) for FY19 (\$'s in 000's)

	Occupational Death & Disability	Retiree Medical	Total
1. Expected Actuarial Accrued Liability			
a. Actuarial Accrued Liability as of June 30, 2018	\$ 30	\$ 32,429	\$ 32,459
b. Normal Cost	272	3,209	3,481
c. Interest on (a) and (b) at 7.38%	22	2,630	2,652
d. Medicare Part D Subsidy and EGWP	0	3	3
e. Benefit Payments	(24)	(35)	(59)
f. Interest on (d) and (e) at 7.38%, adjusted for timing	(1)	(1)	(2)
g. Assumption/Method Changes	0	0	0
h. Expected Actuarial Accrued Liability as of June 30, 2019 (a) + (b) + (c) + (d) + (e) + (f) + (g)	\$ 299	\$ 38,235	\$ 38,534
2. Actual Actuarial Accrued Liability as of June 30, 2019	240	32,981	33,221
3. Liability Gain/(Loss), (1)(h) - (2)	\$ 59	\$ 5,254	\$ 5,313
4. Expected Actuarial Asset Value			
a. Actuarial Asset Value as of June 30, 2018	\$ 3,845	\$ 36,776	\$ 40,621
b. Interest on (a) at 7.38%	284	2,714	2,998
c. Employer Contributions	312	3,085	3,397
d. Medicare Part D Subsidy and EGWP	0	3	3
e. Interest on (c) and (d) at 7.38%, adjusted for timing	11	112	123
f. Benefit Payments	(24)	(35)	(59)
g. Administrative Expenses	0	(6)	(6)
h. Interest on (f) and (g) at 7.38%, adjusted for timing	(1)	(1)	(2)
i. Expected Actuarial Asset Value as of June 30, 2019, (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	\$ 4,427	\$ 42,648	\$ 47,075
5. Actuarial Asset Value as of June 30, 2019	4,359	42,307	46,666
6. Actuarial Asset Gain/(Loss), (5) - (4)(i)	\$ (68)	\$ (341)	\$ (409)
7. Total Actuarial Gain/(Loss), (3) + (6)	\$ (9)	\$ 4,913	\$ 4,904
8. Contribution Gain/(Loss)	\$ 341	\$ (11)	\$ 330
9. Administrative Expense Gain/(Loss)	\$ 6	\$ 2	\$ 8
10. FY19 Gain/(Loss), (7) + (8) + (9)	\$ 338	\$ 4,904	\$ 5,242

Section 1.4: History of Unfunded Liability and Funded Ratio (\$'s in 000's)

Valuation Date	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)

Section 2: Plan Assets

Section 2.1: Summary of Fair Value of Assets (\$'s in 000's)

As of June 30, 2019	Occupational Death & Disability	Retiree Medical	Total	Allocation Percent
Cash and Short-Term Investments				
- Cash and Cash Equivalents	\$ 88	\$ 853	\$ 941	2.0%
- Subtotal	\$ 88	\$ 853	\$ 941	2.0%
Fixed Income Investments				
- Domestic Fixed Income Pool	\$ 451	\$ 4,381	\$ 4,832	10.5%
- International Fixed Income Pool	0	0	0	0.0%
- Tactical Fixed Income Pool	117	1,133	1,250	2.7%
- 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	\$ 568	\$ 5,514	\$ 6,082	13.2%
Equity Investments				
- Domestic Equity Pool	\$ 992	\$ 9,648	\$ 10,640	23.1%
- International Equity Pool	788	7,654	8,442	18.3%
- Private Equity Pool	452	4,396	4,848	10.5%
- Emerging Markets Equity Pool	155	1,506	1,661	3.6%
- Alternative Equity	301	2,927	3,228	7.0%
- Subtotal	\$ 2,688	\$ 26,131	\$ 28,819	62.5%
Other Investments				
- Real Estate Pool	\$ 291	\$ 2,829	\$ 3,120	6.8%
- Other Investments Pool	418	4,068	4,486	9.7%
- Absolute Return Pool	248	2,406	2,654	5.8%
- Other Assets	0	0	0	0.0%
- Subtotal	\$ 957	\$ 9,303	\$ 10,260	22.3%
Total Cash and Investments	\$ 4,301	\$ 41,801	\$ 46,102	100.0%
Net Accrued Receivables	27	266	293	
Net Assets	\$ 4,328	\$ 42,067	\$ 46,395	

Section 2.2: Changes in Fair Value of Assets During FY19 (\$'s in 000's)

Fiscal Year 2019	Occupational Death & Disability	Retiree Medical	Total
1. Fair Value of Assets as of June 30, 2018	\$ 3,797	\$ 36,664	\$ 40,461
2. Additions:			
a. Member Contributions	\$ 0	\$ 0	\$ 0
b. Employer Contributions	312	3,085	3,397
c. Interest and Dividend Income	72	700	772
d. Net Appreciation/(Depreciation) in Fair Value of Investments	172	1,671	1,843
e. Medicare Part D Subsidy	0	3	3
f. Other	0	0	0
g. Total Additions	\$ 556	\$ 5,459	\$ 6,015
3. Deductions:			
a. Medical Benefits	\$ 0	\$ 35	\$ 35
b. Death & Disability Benefits	24	0	24
c. Investment Expenses	1	15	16
d. Administrative Expenses	0	6	6
e. Total Deductions	\$ 25	\$ 56	\$ 81
4. Fair Value of Assets as of June 30, 2019	\$ 4,328	\$ 42,067	\$ 46,395
Approximate Fair Value Investment Return Rate during FY19 Net of Investment Expenses	6.17%	6.17%	6.17%

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 FY19			
a. Fair Value as of June 30, 2018	\$ 3,797	\$ 36,664	\$ 40,461
b. Contributions	312	3,085	3,397
c. Medicare Part D Subsidy	0	3	3
d. Benefit Payments	24	35	59
e. Administrative Expenses	0	6	6
f. Actual Investment Return (net of investment expenses)	243	2,356	2,599
g. Expected Return Rate (net of investment expenses)	7.38%	7.38%	7.38%
h. Expected Return	291	2,816	3,107
i. Investment Gain/(Loss) for the Year (f) - (h)	(48)	(460)	(508)
2. Actuarial Value as of June 30, 2019			
a. Fair Value as of June 30, 2019	\$ 4,328	\$ 42,067	\$ 46,395
b. Deferred Investment Gain/(Loss)	(31)	(240)	(271)
c. Preliminary Actuarial Value as of June 30, 2019, (a) - (b)	4,359	42,307	46,666
d. Upper Limit: 120% of Fair Value as of June 30, 2019	5,193	50,480	55,673
e. Lower Limit: 80% of Fair Value as of June 30, 2019	3,463	33,654	37,117
f. Actuarial Value as of June 30, 2019, (c) limited by (d) and (e)	4,359	42,307	46,666
3. Ratio of Actuarial Value of Assets to Fair Value of Assets	100.7%	100.6%	100.6%
4. Approximate Actuarial Value Investment Return Rate during FY19 Net of Investment Expenses	5.67%	6.49%	6.40%

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, 2015	\$ (168)	\$ (136)	\$ (32)	\$ 0
June 30, 2016	(269)	(162)	(54)	(53)
June 30, 2017	143	58	29	56
June 30, 2018	8	2	2	4
June 30, 2019	<u>(48)</u>	<u>0</u>	<u>(10)</u>	<u>(38)</u>
Total	\$ (334)	\$ (238)	\$ (65)	\$ (31)

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, 2015	\$ (694)	\$ (556)	\$ (138)	\$ 0
June 30, 2016	(1,674)	(1,005)	(335)	(334)
June 30, 2017	1,184	474	237	473
June 30, 2018	(19)	(4)	(4)	(11)
June 30, 2019	<u>(460)</u>	<u>0</u>	<u>(92)</u>	<u>(368)</u>
Total	\$ (1,663)	\$ (1,091)	\$ (332)	\$ (240)

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, 2015	\$ (862)	\$ (692)	\$ (170)	\$ 0
June 30, 2016	(1,943)	(1,167)	(389)	(387)
June 30, 2017	1,327	532	266	529
June 30, 2018	(11)	(2)	(2)	(7)
June 30, 2019	<u>(508)</u>	<u>0</u>	<u>(102)</u>	<u>(406)</u>
Total	\$ (1,997)	\$ (1,329)	\$ (397)	\$ (271)

Section 2.4: Historical Asset Rates of Return

Year Ending	Actuarial Value		Fair Value	
	Annual	Cumulative ¹	Annual	Cumulative ¹
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%

¹ Cumulative since FYE June 30, 2008

Section 3: Member Data

Section 3.1: Summary of Members Included

As of June 30	2015	2016	2017 ¹	2018 ²	2019
Active Members					
1. Number	4,095	4,383	4,694	4,915	4,998 ³
2. Average Age	39.15	39.57	40.21	40.64	41.06
3. Average Credited Service	4.19	4.50	4.88	5.30	5.67
4. Average Entry Age	34.96	35.07	35.33	35.34	35.39
5. Average Annual Earnings	\$ 63,635	\$ 65,219	\$ 66,542	\$ 68,119	\$ 69,619
Disabilitants and Beneficiaries (Occupational Death & Disability)					
1. Number	0	0	0	0	1
2. Average Age	N/A	N/A	N/A	N/A	53.45
3. Average Monthly Death & Disability Benefit	N/A	N/A	N/A	N/A	\$ 2,024
Retirees, Surviving Spouses, and Dependent Spouses (Retiree Medical)					
1. Number	0	0	4	9	12
2. Average Age	N/A	N/A	69.72	68.59	68.54
Total Number of Members	4,095	4,383	4,698	4,924	5,011

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

¹ 142 members who were terminated before the valuation date were subsequently rehired, per client data as of October 1, 2017. These members were valued as active as of the valuation date.

² 153 members who were terminated before the valuation date were subsequently rehired, per client data as of October 1, 2018. These members were valued as active as of the valuation date.

³ Includes 1,317 male active members and 3,681 female active members.

Section 3.2: Age and Service Distribution of Active Members

Annual Earnings by Age				Annual Earnings by Credited Service			
Age	Number	Total Annual Earnings	Average Annual Earnings	Years of Service	Number	Total Annual Earnings	Average Annual Earnings
0 – 19	0	\$ 0	\$ 0	0	119	\$ 6,379,869	\$ 53,612
20 – 24	110	5,714,336	51,949	1	678	41,455,358	61,144
25 – 29	615	36,103,284	58,705	2	520	32,546,568	62,590
30 – 34	967	63,160,186	65,316	3	514	33,615,328	65,399
35 – 39	990	69,936,641	70,643	4	453	30,343,848	66,984
40 – 44	696	50,135,546	72,034	0 – 4	2,284	\$ 144,340,971	\$ 63,197
45 – 49	549	40,465,559	73,708	5 – 9	1,804	130,675,916	72,437
50 – 54	421	31,650,984	75,180	10 – 14	908	72,754,196	80,126
55 – 59	371	28,697,381	77,351	15 – 19	2	185,744	92,872
60 – 64	199	15,715,932	78,975	20 – 24	0	0	0
65 – 69	67	5,346,876	79,804	25 – 29	0	0	0
70 – 74	12	921,140	76,762	30 – 34	0	0	0
75+	1	108,962	108,962	35 – 39	0	0	0
				40+	0	0	0
Total	4,998	\$ 347,956,827	\$ 69,619	Total	4,998	\$ 347,956,827	\$ 69,619

Years of Credited Service by Age										
Age	Years of Service									Total
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	
0 – 19	0	0	0	0	0	0	0	0	0	0
20 – 24	110	0	0	0	0	0	0	0	0	110
25 – 29	514	101	0	0	0	0	0	0	0	615
30 – 34	454	437	76	0	0	0	0	0	0	967
35 – 39	324	421	245	0	0	0	0	0	0	990
40 – 44	265	242	188	1	0	0	0	0	0	696
45 – 49	219	196	134	0	0	0	0	0	0	549
50 – 54	158	162	101	0	0	0	0	0	0	421
55 – 59	129	140	102	0	0	0	0	0	0	371
60 – 64	73	83	42	1	0	0	0	0	0	199
65 – 69	30	20	17	0	0	0	0	0	0	67
70 – 74	7	2	3	0	0	0	0	0	0	12
75+	1	0	0	0	0	0	0	0	0	1
Total	2,284	1,804	908	2	0	0	0	0	0	4,998

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, 2018 ¹	4,915	7	2	0	0	4,924
Vested Termination	(257)	0	0	0	0	(257)
Non-vested Termination	(456)	0	0	0	0	(456)
Refund of Contributions	(31)	0	0	0	0	(31)
Disabled	0	0	0	0	0	0
Retired	(3)	3	1	0	0	1
Deceased, No Beneficiary	0	0	(1)	0	0	(1)
Deceased, With Beneficiary	0	0	0	0	0	0
Return to Active	109	0	0	0	0	109
Data Adjustment	3	0	0	1	0	4
New Entrant	718	0	0	0	0	718
As of June 30, 2019 ²	4,998	10	2	1	0	5,011

¹ 133 participants are expected to receive retiree medical benefits in a different plan and are included for OD&D benefits only.

² 117 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 Valuation Data

Valuation Date	Number	Annual Earnings (000's)	Annual Average Earnings	Percent Increase/ (Decrease) in Average Earnings	Number of Participating Employers
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
June 30, 2011	2,708	151,269	55,860	5.6%	58
June 30, 2010	2,246	118,813	52,900	5.7%	58
June 30, 2009	1,792	89,708	50,061	6.4%	58
June 30, 2008	1,198	56,369	47,053	6.2%	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 FY19 – employer list	\$ 392,494
b) DRB actual reported salaries FY19 – valuation data	340,363
c) Annualized valuation data	347,957
d) Valuation payroll as of June 30, 2019	364,235
e) Rate payroll for FY20	359,622

- a) Actual reported salaries from DRB employer listing showing all payroll paid during FY19, including those who were not active as of June 30, 2019
- b) Payroll from valuation data for people who are in active status as of June 30, 2019
- 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, 2019.

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 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	\$300 / \$600
Medical services (participant share)	20%	40%
Emergency Room Copay (non-emergent use)	\$100	\$100
Medical Out-of-Pocket Maximum (single / family, after deductible)	\$1,200 / \$2,400	\$2,400 / \$4,800
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	\$1,000 / \$2,000
Medicare Pharmacy Arrangement	Retiree Drug Subsidy / Employer Group Waiver Plan effective 1/1/2019	
Wellness / Preventative		
	100%, Not subject to deductible	

¹ Assumed to increase annually to mitigate impact of healthcare cost trend.

² OON applies only to non-Medicare eligible participants.

- Buck used its manual rate models to determine relative plan values for the defined benefit (DB) retiree medical plan and the adopted 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 adopted 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 2020 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.
- The retiree medical plan's coverage is supplemental to Medicare. Medicare coordination is described in the 2019 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 dual coverage members.
- 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

There have been no 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 Method

Entry Age Normal Cost.

Liabilities and contributions shown in the report are computed using the Entry Age Normal Actuarial Cost Method. Each year's difference between actual and expected unfunded actuarial accrued liability is amortized over 25 years as a level percentage of expected payroll. However, in keeping with GASB requirements in effect when the plan was adopted, the net amortization period will not exceed 30 years. Under the new accounting standards (GASB 74 and 75), the GASB requirements will not directly control amortization periods used for funding of the plan.

Cost factors designed to produce annual costs as a constant percentage of each member's expected compensation in each year for death and 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, 2019.

Due to the lack of experience for the DCR retiree medical plan only, base claims costs are based on those described in the actuarial valuation as of June 30, 2019 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 FY20 claims costs were reduced 2.1% for medical claims, and 10.4% for prescription drugs. In addition, to account for the difference in Medicare coordination, projected FY20 medical claims costs for Medicare eligible retirees were further reduced 29.3%. The medical and prescription drug percentages mentioned above were reduced 0.2% in each future year for the DCR medical benefits to reflect the fact that the medical benefit to be offered to DCR members will have annual indexing of member cost sharing features such as deductibles and out-of-pocket amounts.

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 2020 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 valuation results included in the report reflect the repeal of this tax. The removal of the Cadillac Tax created an actuarial gain of approximately \$286,000.

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, 2019 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.

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).

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% female members are assumed to be married at termination from active service.

Dependent Spouse Medical Coverage Election

Applies to members who do not have dual medical coverage. 65% of male members and 60% 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 FY20 medical and prescription drugs are shown below:

	Medical	Prescription Drugs
Pre-Medicare	\$ 14,464	\$ 3,263
Medicare Parts A & B	\$ 1,564	\$ 3,501
Medicare Part D – EGWP	N/A	\$ 1,044

Members are assumed to attain Medicare eligibility at age 65. All costs are for the 2020 fiscal year (July 1, 2019 – June 30, 2020).

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

\$348 per person per year; assumed trend rate of 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:

- 0.979 for the pre-Medicare plan.
- 0.686 for both the Medicare medical plan and Medicare coordination method (2.1% reduction for the medical plan and 29.3% reduction for the coordination method).
- 0.896 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, 2019 Normal Cost, which are based on the average of actual administrative expenses during the last two fiscal years, are \$0 for occupational death & disability and \$4,700 for retiree medical.

Health Cost Trend

The table below shows the rates used to project the cost from the shown fiscal year to the next fiscal year. For example, 7.0% is applied to the FY20 pre-Medicare medical claims cost to get the FY21 medical claims cost.

Fiscal Year	Medical Pre-65	Medical Post-65	Prescription Drugs / EGWP
FY20	7.0%	5.4%	8.0%
FY21	6.5%	5.4%	7.5%
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 valuations 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 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
< 45	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

Decrement Due to Disability		Decrement Due to Retirement	
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 to \$0 for occupational death & disability and \$4,700 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. Trend rates are no longer loaded to reflect the Cadillac Tax, which was repealed in December 2019.

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
< 31	0.0337%	0.0612%
31	0.0337%	0.0613%
32	0.0337%	0.0613%
33	0.0342%	0.0622%
34	0.0347%	0.0631%
35	0.0353%	0.0641%
36	0.0357%	0.0650%
37	0.0362%	0.0659%
38	0.0371%	0.0674%
39	0.0379%	0.0689%
40	0.0387%	0.0703%
41	0.0395%	0.0718%
42	0.0403%	0.0733%
43	0.0423%	0.0770%
44	0.0443%	0.0806%
45	0.0464%	0.0843%
46	0.0483%	0.0879%
47	0.0504%	0.0916%
48	0.0536%	0.0975%
49	0.0569%	0.1034%
50	0.0601%	0.1093%
51	0.0634%	0.1152%
52	0.0666%	0.1211%
53	0.0746%	0.1356%
54	0.0826%	0.1501%

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 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.



February 18, 2020

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, 2019**

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, 2019. The valuations have been performed by a projection or "roll forward" of results from the last valuation date of June 30, 2018 to June 30, 2019. Actual asset values as of June 30, 2019 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 review by Buck.

Summary of Results

The results of the June 30, 2019 roll-forward valuations are shown below (results from the June 30, 2018 valuations are shown for comparison purposes):

	June 30, 2018	June 30, 2019
Judicial Retirement System		
• Funded Status ¹		
○ Pension	78.8%	84.2%
○ Healthcare	189.2%	184.2%
○ Total	86.4%	91.7%
• Employer/State Contribution Rates ²		
○ Pension	77.8%	71.0%
○ Healthcare	6.1%	6.3%
○ Total	83.9%	77.3%
National Guard and Naval Militia Retirement System		
• Funded Status ¹	187.1%	185.6%
• Recommended Contribution, not less than zero ³	\$ 0	\$ 0

Actuarial Assumptions and Methods

In lieu of collecting new participant data as of June 30, 2019 and performing a full actuarial valuation, the actuarial liabilities are projected or “rolled forward” from the June 30, 2018 valuation date to June 30, 2019 by assuming the actuarial assumptions during the year are exactly realized. All data, actuarial assumptions, methods, and plan provisions are the same as those shown in the June 30, 2018 valuation reports dated August 9, 2019, with the following exceptions:

- For JRS, the salary increase assumption and the pensioner benefit increase assumption were modified to be 0% per year for two years, and 3.62% per year thereafter.
- For JRS, the administrative expense assumption is the average of the actual administrative expenses paid in the prior two years. For the June 30, 2018 valuation, the administrative expense assumptions were \$71,050 (pension) and \$19,250 (healthcare). For the June 30, 2019 valuation, these amounts were updated to \$61,000 (pension) and \$21,600 (healthcare).
- For NGNMRS, the administrative expense assumption is the average of the actual administrative expenses paid in the prior two years. For the June 30, 2018 valuation, the administrative expense assumption was \$242,000. For the June 30, 2019 valuation, this amount was updated to \$254,000.

¹ The funded status shown is based on the Actuarial Value of Assets. The funded status is different based on the Market Value of Assets.

² The June 30, 2018 valuation determined the contribution rates for FY21. The June 30, 2019 valuation determines the contribution rates for FY22. Total contribution rates are not less than the Normal Cost rate.

³ The June 30, 2018 valuation determined the recommended contribution for FY21. The June 30, 2019 valuation determines the recommended contribution for FY22.

The actuarial value of assets was calculated as of June 30, 2019 using actual assets and cash flows during FY19. Investment gains and losses are recognized at a rate of 20% per year. The actuarial value of assets must be within 20% plus/minus of the market value.

The FY19 actuarial gains/(losses) are shown below:

	JRS	NGNMRS
Asset gain/(loss)	\$ (3,555,000)	\$ (1,159,000)
Salary scale assumption change gain/(loss)	14,649,000	N/A
Healthcare benefit payment gain/(loss)	(27,000)	N/A
Contribution gain/(loss)	375,000	881,000
Administrative expense gain/(loss)	<u>17,000</u>	<u>(33,000)</u>
Total gain/(loss)	\$ 11,459,000	\$ (311,000)

Net actuarial gains/losses have the effect of decreasing/increasing the unfunded actuarial accrued liability versus what was expected based on the previous valuation. These gains/losses decrease/increase the employer contributions.

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, these measures presented are appropriate for evaluating the need and level of future contributions but make 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.

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. 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.

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 long-term anticipated experience under each System.

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 JRS. Additional details regarding ASOP 51 are provided beginning on page 15 of this report.

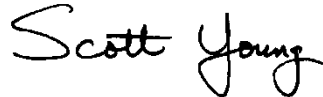
This report was prepared under our supervision and in accordance with all applicable Actuarial Standards of Practice. David Kershner and Scott Young are Fellows of the Society of Actuaries, Enrolled Actuaries, and Members of the American Academy of Actuaries. We meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in this report.

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
Director
Buck

Attachments

cc: Mr. Kevin Worley, State of Alaska

Judicial Retirement System

	June 30, 2018	June 30, 2019
Pension		
Actuarial Accrued Liability	\$ 226,559,580	\$ 221,159,289
Actuarial Value of Assets (AVA)	<u>178,489,284</u>	<u>186,117,830</u>
Unfunded Actuarial Accrued Liability	\$ 48,070,296	\$ 35,041,459
Funded Ratio based on AVA	78.8%	84.2%
Market Value of Assets (MVA)	\$ 176,794,969	\$ 184,625,818
Funded Ratio based on MVA	78.0%	83.5%
Normal Cost with Administrative Expense Load	\$ 6,421,700	\$ 6,138,783
Healthcare		
Actuarial Accrued Liability	\$ 16,846,959	\$ 18,089,100
Actuarial Value of Assets (AVA)	<u>31,868,079</u>	<u>33,319,896</u>
Unfunded Actuarial Accrued Liability	\$ (15,021,120)	\$ (15,230,796)
Funded Ratio based on AVA	189.2%	184.2%
Market Value of Assets (MVA)	\$ 31,497,603	\$ 33,092,326
Funded Ratio based on MVA	187.0%	182.9%
Normal Cost with Administrative Expense Load	\$ 819,763	\$ 840,972
Total		
Actuarial Accrued Liability	\$ 243,406,539	\$ 239,248,389
Actuarial Value of Assets	<u>210,357,363</u>	<u>219,437,726</u>
Unfunded Actuarial Accrued Liability	\$ 33,049,176	\$ 19,810,663
Funded Ratio based on Actuarial Value of Assets	86.4%	91.7%
Market Value of Assets	\$ 208,292,572	\$ 217,718,144
Funded Ratio based on Market Value of Assets	85.6%	91.0%
Normal Cost with Administrative Expense Load	\$ 7,241,463	\$ 6,979,755
	FY21	FY22
Pension Contribution Rate		
Employer Normal Cost Rate	42.04%	39.72%
Past Service Cost Rate	<u>35.78%</u>	<u>31.25%</u>
Total Employer Contribution Rate, not less than Normal Cost Rate	77.82%	70.97%
Healthcare Contribution Rate		
Employer Normal Cost Rate	6.12%	6.28%
Past Service Cost Rate	<u>(6.45)%</u>	<u>(6.64)%</u>
Total Employer Contribution Rate, not less than Normal Cost Rate	6.12%	6.28%
Total Contribution Rate		
Employer Normal Cost Rate	48.16%	46.00%
Past Service Cost Rate	<u>35.78%</u>	<u>31.25%</u>
Total Employer Contribution Rate, not less than Normal Cost Rate	83.94%	77.25%

Judicial Retirement System (continued)

Pension						
Charge	Amortization Period		Balances		Beginning-of-Year Payment	
	Date Created	Years Left	Initial	Outstanding		
Initial Unfunded Liability ¹	06/30/2002	8	\$ 5,864,449	\$ 4,775,895	\$	693,024
FY03/FY04 Loss ¹	06/30/2004	10	855,068	774,005		93,628
Loss due to revaluation of plan liabilities ¹	06/30/2005	11	9,115,451	8,560,541		960,741
FY05/FY06 Loss ¹	06/30/2006	12	18,186,558	17,575,368		1,844,959
FY07 Loss	06/30/2007	13	1,364,721	1,348,642		133,326
FY08 Gain	06/30/2008	14	(29,014,739)	(29,181,416)		(2,732,533)
FY09 Loss	06/30/2009	15	21,273,454	21,667,076		1,931,321
Change in Assumptions	06/30/2010	16	13,976,981	14,354,146		1,223,185
FY10 Loss	06/30/2010	16	6,474,780	6,649,499		566,635
FY11 Loss	06/30/2011	17	7,397,917	7,648,503		625,436
FY12 Loss	06/30/2012	18	11,916,371	12,361,447		973,206
FY13 Loss	06/30/2013	19	7,033,497	7,053,234		536,200
Change in Assumptions	06/30/2014	20	4,219,851	4,369,484		321,595
FY14 Gain	06/30/2014	20	(14,458,986)	(14,971,699)		(1,101,920)
FY15 Gain	06/30/2015	21	(3,325,706)	(3,427,850)		(244,827)
FY16 Gain	06/30/2016	22	(9,932,623)	(10,169,050)		(706,312)
FY17 Gain	06/30/2017	23	(1,137,538)	(1,154,576)		(78,135)
Change in Assumptions	06/30/2018	24	10,343,783	10,389,947		686,282
FY18 Gain	06/30/2018	24	(12,096,419)	(12,150,406)		(802,565)
Change in Assumptions	06/30/2019	25	(14,775,890)	(14,775,890)		(954,103)
FY19 Loss	06/30/2019	25	3,344,559	<u>3,344,559</u>		<u>215,964</u>
Total				\$ 35,041,459	\$	4,185,107

¹ Pension and healthcare split was done using a ratio of unfunded actuarial accrued liability as of June 30, 2006.

Judicial Retirement System (continued)

Healthcare						
Charge	Amortization Period		Balances		Beginning-of-Year Payment	
	Date Created	Years Left	Initial	Outstanding		
Initial Unfunded Liability	06/30/2002	8	\$ 2,295,257	\$ 1,869,214	\$ 271,239	
FY03/FY04 Loss	06/30/2004	10	334,660	302,933	36,645	
Loss due to revaluation of plan liabilities	06/30/2005	11	3,567,649	3,350,464	376,019	
FY05/FY06 Loss	06/30/2006	12	7,117,943	6,878,733	722,089	
FY07 Gain	06/30/2007	13	(810,073)	(800,529)	(79,140)	
Change in Assumptions	06/30/2008	14	789,072	793,606	74,313	
FY08 Gain	06/30/2008	14	(14,011,596)	(14,092,089)	(1,319,576)	
FY09 Loss	06/30/2009	15	901,355	918,035	81,830	
Change in Assumptions	06/30/2010	16	2,006,196	2,060,333	175,571	
FY10 Gain	06/30/2010	16	(1,930,656)	(1,982,752)	(168,960)	
FY11 Loss	06/30/2011	17	550,376	569,018	46,530	
Change in Assumptions	06/30/2012	18	353,605	366,811	28,879	
FY12 Gain	06/30/2012	18	(5,516,210)	(5,722,242)	(450,507)	
FY13 Loss	06/30/2013	19	226,259	234,807	17,850	
Change in Assumptions	06/30/2014	20	772,305	799,690	58,857	
FY14 Gain	06/30/2014	20	(3,342,464)	(3,460,987)	(254,729)	
FY15 Gain	06/30/2015	21	(1,416,996)	(1,460,517)	(104,315)	
Change in Method	06/30/2016	22	(3,567,789)	(3,652,714)	(253,707)	
FY16 Gain	06/30/2016	22	(425,711)	(435,845)	(30,273)	
FY17 Gain	06/30/2017	23	(586,113)	(594,892)	(40,259)	
Change in Assumptions/EGWP	06/30/2018	24	1,009,960	1,014,467	67,008	
FY18 Gain	06/30/2018	24	(2,148,478)	(2,158,066)	(142,546)	
Change in Assumptions	06/30/2019	25	126,754	126,754	8,185	
FY19 Gain	06/30/2019	25	(155,028)	<u>(155,028)</u>	<u>(10,011)</u>	
Total				\$ (15,230,796)	\$ (889,008)	

Judicial Retirement System (continued)

Total						
Charge	Amortization Period		Balances		Beginning-of-Year Payment	
	Date Created	Years Left	Initial	Outstanding		
Initial Unfunded Liability	06/30/2002	8	\$ 8,159,706	\$ 6,645,109	\$	964,263
FY03/FY04 Loss	06/30/2004	10	1,189,728	1,076,938		130,273
Loss due to revaluation of plan liabilities	06/30/2005	11	12,683,100	11,911,005		1,336,760
FY05/FY06 Loss	06/30/2006	12	25,304,501	24,454,101		2,567,048
FY07 Loss	06/30/2007	13	554,648	548,113		54,186
Change in Assumptions	06/30/2008	14	789,072	793,606		74,313
FY08 Gain	06/30/2008	14	(43,026,335)	(43,273,505)		(4,052,109)
FY09 Loss	06/30/2009	15	22,174,809	22,585,111		2,013,151
Change in Assumptions	06/30/2010	16	15,983,177	16,414,479		1,398,756
FY10 Loss	06/30/2010	16	4,544,124	4,666,747		397,675
FY11 Loss	06/30/2011	17	7,948,293	8,217,521		671,966
Change in Assumptions	06/30/2012	18	353,605	366,811		28,879
FY12 Loss	06/30/2012	18	6,400,161	6,639,205		522,699
FY13 Loss	06/30/2013	19	7,259,756	7,288,041		554,050
Change in Assumptions	06/30/2014	20	4,992,156	5,169,174		380,452
FY14 Gain	06/30/2014	20	(17,801,450)	(18,432,686)		(1,356,649)
FY15 Gain	06/30/2015	21	(4,742,702)	(4,888,367)		(349,142)
Change in Method	06/30/2016	22	(3,567,789)	(3,652,714)		(253,707)
FY16 Gain	06/30/2016	22	(10,358,334)	(10,604,895)		(736,585)
FY17 Gain	06/30/2017	23	(1,723,651)	(1,749,468)		(118,394)
Change in Assumptions/EGWP	06/30/2018	24	11,353,743	11,404,414		753,290
FY18 Gain	06/30/2018	24	(14,244,897)	(14,308,472)		(945,111)
Change in Assumptions	06/30/2019	25	(14,649,136)	(14,649,136)		(945,918)
FY18 Loss	06/30/2019	25	3,189,531	<u>3,189,531</u>		<u>205,953</u>
Total				\$ 19,810,663	\$	3,296,099

Judicial Retirement System (continued)

Changes in Fair Value of Assets	Pension	Healthcare	Total
1. Fair Value of Assets as of June 30, 2018	\$ 176,794,969	\$ 31,497,603	\$ 208,292,572
2. Additions:			
a. Employee Contributions	\$ 813,374	\$ 0	\$ 813,374
b. Employer Contributions	5,347,675	591,397	5,939,072
c. State Appropriation	4,909,000	0	4,909,000
d. Interest and Dividend Income	3,292,478	587,184	3,879,662
e. Net Appreciation/(Depreciation) in Fair Value of Investments	7,229,170	1,327,208	8,556,378
f. Medicare Part D Subsidy	0	96,542	96,542
g. Other	<u>0</u>	<u>2,291</u>	<u>2,291</u>
h. Total Additions	\$ 21,591,697	\$ 2,604,622	\$ 24,196,319
3. Deductions:			
a. Medical Benefits	\$ 0	\$ 978,813	\$ 978,813
b. Retirement Benefits	13,627,946	0	13,627,946
c. Investment Expenses	73,808	13,136	86,944
d. Administrative Expenses	59,094	17,950	77,044
e. Refunds of Contributions	<u>0</u>	<u>0</u>	<u>0</u>
f. Total Deductions	\$ 13,760,848	\$ 1,009,899	\$ 14,770,747
4. Fair Value of Assets as of June 30, 2019	\$ 184,625,818	\$ 33,092,326	\$ 217,718,144
Approximate Fair Value Investment Return Rate During FY19 Net of Investment Expenses	6.0%	6.1%	6.0%

Judicial Retirement System (continued)

Development of Actuarial Value of Assets	Pension	Healthcare	Total
1. Deferral of Investment Gain/(Loss) for FY19			
a. Fair Value of Assets as of June 30, 2018	\$ 176,794,969	\$ 31,497,603	\$ 208,292,572
b. Contributions	11,070,049	591,397	11,661,446
c. Medicare Part D Subsidy	0	96,542	96,542
d. Benefit Payments	13,627,946	978,813	14,606,759
e. Administrative Expenses	59,094	17,950	77,044
f. Actual Investment Return (net of investment expenses)	10,447,840	1,903,547	12,351,387
g. Expected Return Rate (net of investment expenses)	7.38%	7.38%	7.38%
h. Expected Return, Weighted for Timing	13,095,028	2,313,330	15,408,358
i. Investment Gain/(Loss) for the Year, (f) - (h)	(2,647,188)	(409,783)	(3,056,971)
2. Actuarial Value as of June 30, 2019			
a. Fair Value as of June 30, 2019	\$ 184,625,818	\$ 33,092,326	\$ 217,718,144
b. Deferred Investment Gain/(Loss)	(1,492,012)	(227,570)	(1,719,582)
c. Preliminary Actuarial Value at June 30, 2019, (a) - (b)	186,117,830	33,319,896	219,437,726
d. Upper Limit: 120% of Fair Value as of June 30, 2019	221,550,982	39,710,791	261,261,773
e. Lower Limit: 80% of Fair Value as of June 30, 2019	147,700,654	26,473,861	174,174,515
f. Actuarial Value as of June 30, 2019, [(c) limited by (d) and (e)]	\$ 186,117,830	\$ 33,319,896	\$ 219,437,726
g. Ratio of Actuarial Value of Assets to Fair Value of Assets	100.8%	100.7%	100.8%
h. Approximate Actuarial Value Investment Return Rate During FY19 Net of Investment Expenses	5.8%	5.6%	5.8%

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
6/30/2015	\$ (6,914,160)	\$ (5,531,328)	\$ (1,382,832)	\$ 0
6/30/2016	(12,208,288)	(7,324,974)	(2,441,658)	(2,441,656)
6/30/2017	7,229,597	2,891,838	1,445,919	2,891,840
6/30/2018	292,590	58,518	58,518	175,554
6/30/2019	<u>(2,647,188)</u>	<u>0</u>	<u>(529,438)</u>	<u>(2,117,750)</u>
Total	\$ (14,247,449)	\$ (9,905,946)	\$ (2,849,491)	\$ (1,492,012)

Healthcare				
Fiscal Year Ending	Asset Gain/(Loss)	Gain/(Loss) Recognized in Prior Years	Gain/(Loss) Recognized This Year	Gain/(Loss) Deferred to Future Years
6/30/2015	\$ (1,375,481)	\$ (1,100,384)	\$ (275,097)	\$ 0
6/30/2016	(2,359,113)	(1,415,469)	(471,823)	(471,821)
6/30/2017	1,282,441	512,976	256,488	512,977
6/30/2018	98,500	19,700	19,700	59,100
6/30/2019	<u>(409,783)</u>	<u>0</u>	<u>(81,957)</u>	<u>(327,826)</u>
Total	\$ (2,763,436)	\$ (1,983,177)	\$ (552,689)	\$ (227,570)

Total				
Fiscal Year Ending	Asset Gain/(Loss)	Gain/(Loss) Recognized in Prior Years	Gain/(Loss) Recognized This Year	Gain/(Loss) Deferred to Future Years
6/30/2015	\$ (8,289,641)	\$ (6,631,712)	\$ (1,657,929)	\$ 0
6/30/2016	(14,567,401)	(8,740,443)	(2,913,481)	(2,913,477)
6/30/2017	8,512,038	3,404,814	1,702,407	3,404,817
6/30/2018	391,090	78,218	78,218	234,654
6/30/2019	<u>(3,056,971)</u>	<u>0</u>	<u>(611,395)</u>	<u>(2,445,576)</u>
Total	\$ (17,010,885)	\$ (11,889,123)	\$ (3,402,180)	\$ (1,719,582)

National Guard and Naval Militia Retirement System

	June 30, 2018	June 30, 2019
Actuarial Accrued Liability	\$ 21,934,014	\$ 22,592,882
Actuarial Value of Assets	<u>41,031,353</u>	<u>41,939,204</u>
Unfunded Actuarial Accrued Liability	\$ (19,097,339)	\$ (19,346,322)
Funded Ratio based on Actuarial Value of Assets	187.1%	185.6%
Market Value of Assets	\$ 39,418,117	\$ 40,964,997
Funded Ratio based on Market Value of Assets	179.7%	181.3%
Normal Cost	\$ 483,551	\$ 483,551
Past Service Cost	(2,988,961)	(3,027,930)
Administrative Expense Load	<u>242,000</u>	<u>254,000</u>
Total Contribution, not less than zero	\$ 0	\$ 0
Fiscal Year Contribution Applies to	FY21	FY22

National Guard and Naval Militia Retirement System (continued)

Changes in Fair Value of Assets

1. Fair Value of Assets as of June 30, 2018	\$ 39,418,117
2. Additions:	
a. Employer Contributions	\$ 851,686
b. Investment Income	2,335,887
c. Other	<u>0</u>
d. Total Additions	\$ 3,187,573
3. Deductions:	
a. Retirement Benefits	\$ 1,343,753
b. Investment Expenses	14,602
c. Administrative Expenses	<u>282,338</u>
d. Total Deductions	\$ 1,640,693
4. Fair Value of Assets as of June 30, 2019	\$ 40,964,997

Approximate Fair Value Investment Return Rate
During FY19 Net of Investment Expenses

5.9%

National Guard and Naval Militia Retirement System (continued)

Development of Actuarial Value of Assets

1.	Deferral of Investment Gain/(Loss) for FY19		
a.	Fair Value of Assets as of June 30, 2018	\$	39,418,117
b.	Contributions		851,686
c.	Benefit Payments		1,343,753
d.	Administrative Expenses		282,338
e.	Actual Investment Return (net of investment expenses)		2,321,285
f.	Expected Return Rate (net of investment expenses)		7.00%
g.	Expected Return, Weighted for Timing		2,728,698
h.	Investment Gain/(Loss) for the Year, (e) - (g)		(407,413)
2.	Actuarial Value as of June 30, 2019		
a.	Fair Value as of June 30, 2019	\$	40,964,997
b.	Deferred Investment Gain/(Loss)		(974,207)
c.	Preliminary Actuarial Value at June 30, 2019, (a) - (b)		41,939,204
d.	Upper Limit: 120% of Fair Value as of June 30, 2019		49,157,996
e.	Lower Limit: 80% of Fair Value as of June 30, 2019		32,771,998
f.	Actuarial Value as of June 30, 2019, [(c) limited by (d) and (e)]	\$	41,939,204
g.	Ratio of Actuarial Value of Assets to Fair Value of Assets		102.4%
h.	Approximate Actuarial Value Investment Return Rate During FY19 Net of Investment Expenses		4.1%

Fiscal Year Ending	Asset Gain/(Loss)	Gain/(Loss) Recognized in Prior Years	Gain/(Loss) Recognized This Year	Gain/(Loss) Deferred to Future Years
6/30/2015	\$ (2,241,223)	\$ (1,792,980)	\$ (448,243)	\$ 0
6/30/2016	(2,606,836)	(1,564,101)	(521,367)	(521,368)
6/30/2017	704,309	281,724	140,862	281,723
6/30/2018	(681,054)	(136,211)	(136,211)	(408,632)
6/30/2019	<u>(407,413)</u>	<u>0</u>	<u>(81,483)</u>	<u>(325,930)</u>
Total	\$ (5,232,217)	\$ (3,211,568)	\$ (1,046,442)	\$ (974,207)

Actuarial Standard of Practice No. 51 (ASOP 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.

A new Actuarial Standard of Practice (ASOP) has been adopted for measurements on or after November 1, 2018 - Actuarial Standard of Practice No. 51 ("ASOP 51")¹. ASOP 51 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 (7.38% (JRS) and 7.00% (NGNMRS)) expected in the actuarial valuation
- Contribution Risk – potential that the contribution actually made will be different than the recommended contribution in the actuarial valuation
- 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 Risk² – potential that future salaries will be different than expected in the actuarial 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.

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 applies 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, 2018 reports dated August 9, 2019. This historical experience illustrates how returns can vary over time.

Contribution Risk

There is a risk to the plans when the actual contribution amount and the recommended amount differ.

- If the actual contributions are lower than the recommended 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).

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 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 will 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.

Salary Increase Risk¹

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.

Other Demographic Risk

The plans are subject to risks associated with other demographic assumptions (e.g., retirement and termination assumptions). 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 4-year experience studies to ensure the assumptions are consistent with long-term expectations.

¹ Salary increase risk applies to JRS only.

Callan

June 18, 2020

**Alaska Retirement
Management Board**

A Primer on Sustainable Investing

Thomas H. Shingler
Senior Vice President
ESG Committee Chair

Origin and Evolution

Faith-based beginnings to emerging political consciousness

Pre
1700s

Islamic faith subscribes to Sharia Law, prohibiting the collection or payment of interest.

1750s

John Wesley (founder of Methodism) gives sermon “The Use of Money” outlining social tenets of investing.

- Includes not to harm your neighbor through your business practices, and avoid industries like tanning and chemical production that harm health of workers.

1758 – Quakers prohibit members from participating in slave trade (buying or selling).

1861

Wake Forest University endowment divests all U.S. Treasury bonds, reinvests proceeds in Confederate Bonds.

- Confederate bonds lose 98% of value by end of Civil War in 1865.

1950s

Trade unions use multi-employer pension plan money for targeted investments.

- United Mine Workers fund invests in medical facilities; International Brotherhood of Electrical Workers finances union-built housing projects.

Emerging Political Consciousness

1960s

Civil Rights Movement and Vietnam War escalation drive boycotts of corporations involved.

- Dow Chemical (maker of napalm)

1970s

Milton Friedman argued that social responsibility adversely affects a firm's financial performance, and that regulation and interference from "big government" will always damage the macro economy.

1971

Leon Sullivan (board member of General Motors) drafts the Sullivan Principles, which becomes framework for divestment of companies in South Africa, an opposition to the apartheid government.

Emerging public consciousness regarding environment arises after multiple man-made disasters occur.

1980s

- 1984: Bhopal gas disaster (Union Carbide) | 1986: Chernobyl disaster | 1989: Exxon Valdez oil spill
- 1989: CERES founded by Joan Bavaria and Dennis Hayes (coordinator of the first Earth Day), as a network for investors, environmental organizations, and other public interest groups interested in working with companies to address environmental concerns.

2004

United Nations Secretary General Kofi Annan invited 50+ CEOs of major financial institutions to participate in a joint initiative with the UN Global Compact, the International Finance Corporation (IFC), and the Swiss Government.

- Result of UN initiative was published report, "Who Cares Wins," which was first introduction of the term "ESG" in mainstream discussion.

Tipping Point

Enhanced reporting capabilities lead to academic research and increased action

2005

UN Environmental Programme Finance Institute (UNEP FI) commissioned law firm Freshfields Bruckhaus Deringer to challenge economist Milton Friedman's assertion that social responsibility adversely affects a firm's financial performance and that regulation and interference from "big government" will always damage the macro economy.

- "Freshfields Report" concluded that not only was it permissible for investment companies to integrate ESG issues into investment analysis, but it was also arguably part of their fiduciary duty to do so.

2006

UN Principles of Responsible Investing (UN PRI) launched, using "Who Cares Wins" and "Freshfields Report" as basis for framework.

2013

Academic research published by George Serafeim, Bob Eccles, and Ioannis Ioannou demonstrates that good corporate sustainability performance is associated with good financial results.

2014

Law Commission (England and Wales) confirmed there was no restriction for asset owners and investors taking account of ESG factors when making investment decisions.

2015

UNEP FI releases report after three-year study, "Fiduciary Duty in the 21st Century," concluding that "Failing to consider all long-term investment value drivers, including ESG issues, is a failure of fiduciary duty."

2016

COP 21 (Paris Agreement) adopted by 197 nations (except U.S., Russia, Turkey, and Iran); agree to reduced emissions.

Technology Enables the Modern Era

Advancements in technology lead to better data, access, transparency, and reporting

1983: Bloomberg L.P. founded, installs first Bloomberg terminals across Wall Street

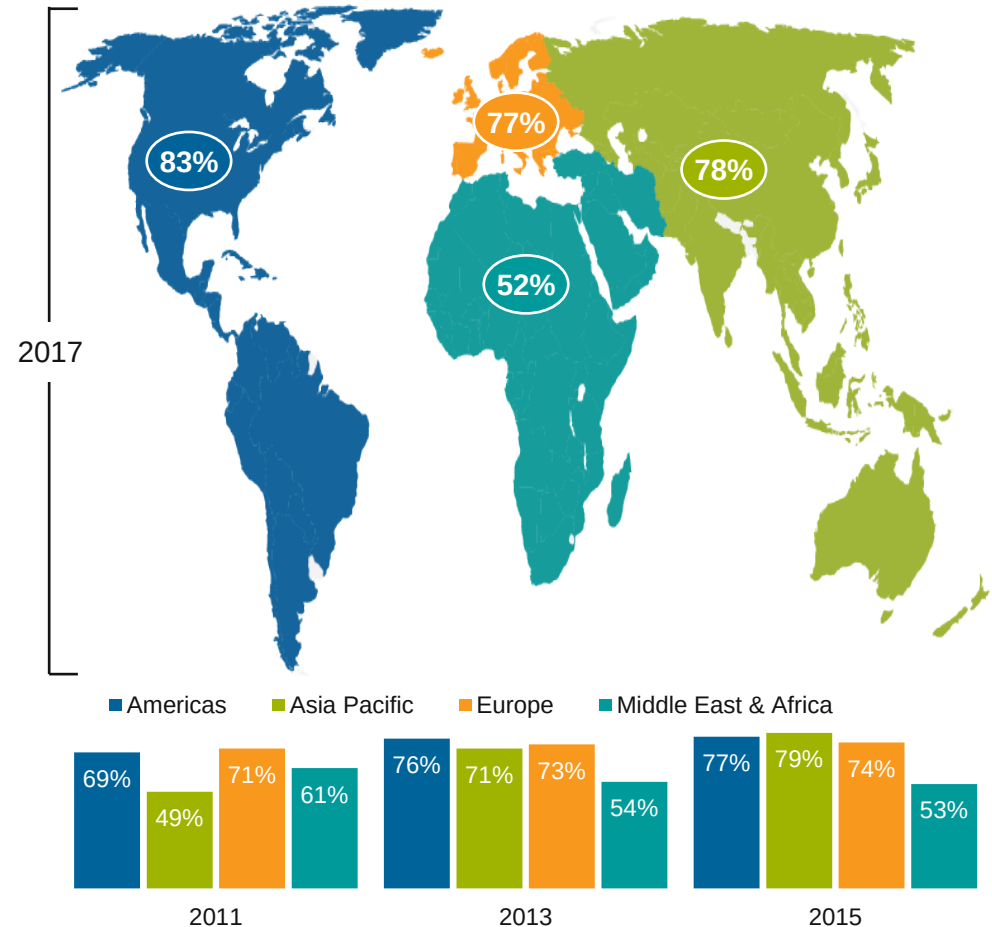
1994: SEC launches Electronic Data Gathering, Analysis, Retrieval (EDGAR) system for digital corporate document reporting of public companies

1997: Global Reporting Initiative (GRI) launched, which helped standardize corporate disclosures related to sustainability (93% of world's 250 largest corporations report using GRI standards)

2017: Number of publicly listed companies reporting ESG data has grown exponentially in the past two decades

- 1993: 12% of the largest 100 companies in each of 49 countries (4,900 companies) issued sustainability reports
- 2017: 75% were issuing reports

Corporate responsibility reporting rates by region



Base: 4,900 N100 companies

Source: KPMG Survey of Corporate Responsibility Reporting 2017

Defining Strategy Applications

Broad guidelines when thinking about ESG definitions and taxonomy

Environmental, Social, and Governance (ESG)

- Pricing negative liabilities not captured by financial reporting
- Are there any unfunded liabilities and risks in the business that would prevent investment?

Environmental (E) – factors related to a security's interaction with the physical world including:

- Resource use
- Hazardous waste spills
- Carbon emissions
- Climate change

Potential impact on securities:

Opportunities

- Renewable energy
- Efficiency improvement
- Environmental remediation

Risks

- Business disruption
- Reduced margins
- Litigation costs
- Reputation damage

Social (S) – factors that arise from relationship between company and stakeholders (employees, consumers, suppliers, communities of operation):

- Health and safety
- Diversity
- Community relations

Potential impact on securities:

Opportunities

- Better value chain
- Business continuity
- Increased employee engagement/retention

Risks

- Reduced productivity
- Loss of license to operate
- Loss of customers

Governance (G) – factors related to the structures or systems in place to ensure effective direction and control:

- Board composition & independence
- Incentive alignment
- Oversight of management
- Corporate culture

Potential impact on securities:

Opportunities

- Effective management
- Risk identification and mitigation
- Improved alignment of interests

Risks

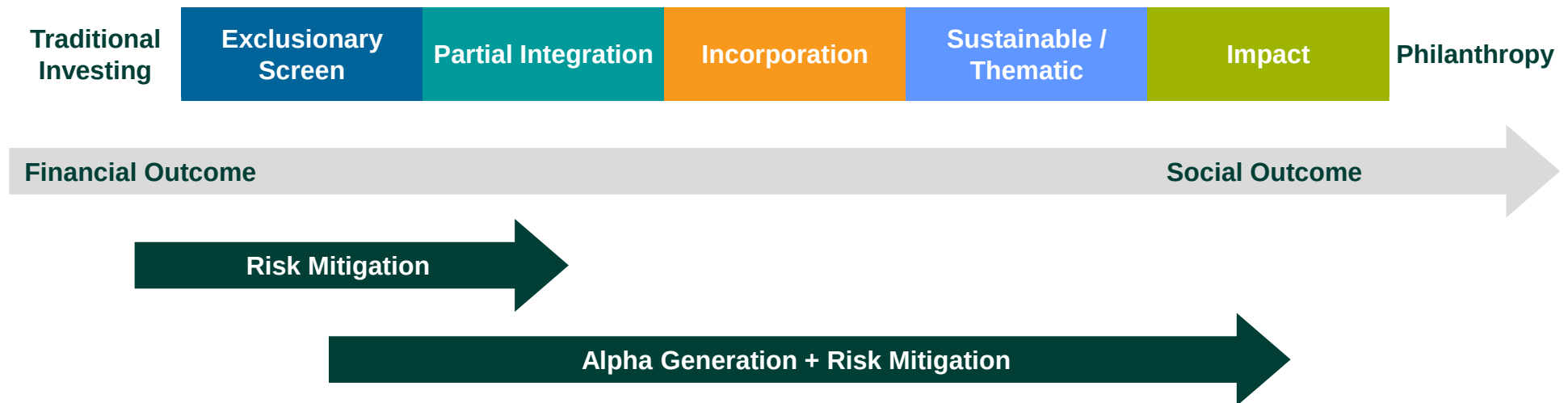
- Poor strategic plan
- Legal costs
- Reputational damage
- Principal/agent conflict

Defining Strategy Applications

Terminology, definitions becoming more specific and differentiated

Increasingly agreed upon terminology and framework helps define philosophy and implementation

Asset Owner Spectrum of Target Outcomes



Defining Strategy Implementations

Exclusionary Screen	Partial Integration	Incorporation	Sustainable / Thematic	Impact
Motivation	Avoid or limit exposure			
Strategy Goal	Remove specific companies and/or industries associated with objectionable activities based on shared values of organization			
Considerations	• How to define screens (e.g., what percentage of revenues warrant exclusion?) • Financial impact of screens (e.g., opportunity cost of not investing)			
Examples	Common applications • Environment: ex-fossil fuels, low carbon • Social: ex-firearms, controversial weapons, health care • Governance: exclude Saudi Arabia, Sudan, and/or Myanmar • Religious: Catholic or Sharia screens			
AUM Profile	Majority passive			

Defining Strategy Implementations

Exclusionary Screen	Partial Integration	Incorporation	Sustainable / Thematic	Impact
Motivation	Consider ESG risks of portfolio companies			
Strategy Goal	Invest in companies based off analysis of financial results with consideration of material ESG factors as part of process to mitigate risk			
Considerations	• ESG data sources (biases? completeness?) • Active risk taken relative to non-ESG benchmark			
Examples	ESG optimization/positive screening • Passive strategies maximizing exposure to a preferred ESG metric • Active strategies review ESG data as part of analysis but generally does not drive buy/sell decisions			
AUM Profile	Majority passive but growth in active as well			

Defining Strategy Implementations

Exclusionary Screen	Partial Integration	Incorporation	Sustainable / Thematic	Impact
Motivation	Incorporate ESG risks and opportunities to drive portfolio alpha			
Strategy Goal	Invest in companies with positive ESG opportunities while avoiding securities with potential negative ESG risks			
Considerations	• ESG data sources (biases? completeness?) • Active risk taken relative to non-ESG benchmark • Documenting and reporting on ESG incorporation			
Examples	ESG best-in-class • Passive strategies that track ESG-specific index/benchmark optimizing for highest ESG scores • Active strategies that tilt portfolio to best ESG opportunities within industry or sector; use as incremental input to buy/sell decision ESG managed • Active strategies using ESG factors/analysis to drive decision-making • Active strategies engage with companies and actively vote proxies			
AUM Profile	Majority active			

Defining Strategy Implementations

Exclusionary Screen	Partial Integration	Incorporation	Sustainable / Thematic	Impact
Motivation	Generate returns based on targeted exposure to specific criteria			
Strategy Goal	Invest in companies with specific focus on particular E, S, or G issue			
Considerations	• ESG data sources (biases? completeness?) • Active risk taken relative to non-ESG benchmark • Defining how broad (or narrow) to target exposure			
Examples	Sustainable • Passive strategies mitigate exposure to carbon, plastic production, etc. • Active strategies allocate capital to best opportunities that capitalize on long-term transformative industry trends • Active strategies engage with companies and actively vote proxies on specific E,S, or G initiative aligned with strategy goals Thematic • Active strategies focused on climate change, renewable energy, water efficiency, waste reduction, energy transition			
AUM Profile	Majority active but passive has substantial legacy assets (ex-fossil fuels)			

Defining Strategy Implementations

Exclusionary Screen	Partial Integration	Incorporation	Sustainable / Thematic	Impact
Motivation	Generate positive financial and social benefits			
Strategy Goal	Target specific non-financial outcome along with financial return with specific focus on particular E, S, or G pillars			
Considerations	• ESG data sources (biases? completeness?) • Active risk taken relative to non-ESG benchmark • Financial opportunity cost • Measuring and reporting on progress toward non-financial outcome			
Examples	Public markets • Active fixed income: Green bonds and municipal bonds issued to fund specific projects (e.g., more efficient waste management system) • Active equity: Alignment with UN Sustainable Development Goals Private assets • Targeting themes in more niche opportunities (e.g., wind power, de-salinization, or micro-finance)			
AUM Profile	Active			

Institutional Investor Views

Why different plan types may evaluate ESG strategies / investing going forward



AUM Reclassifies as Sustainable

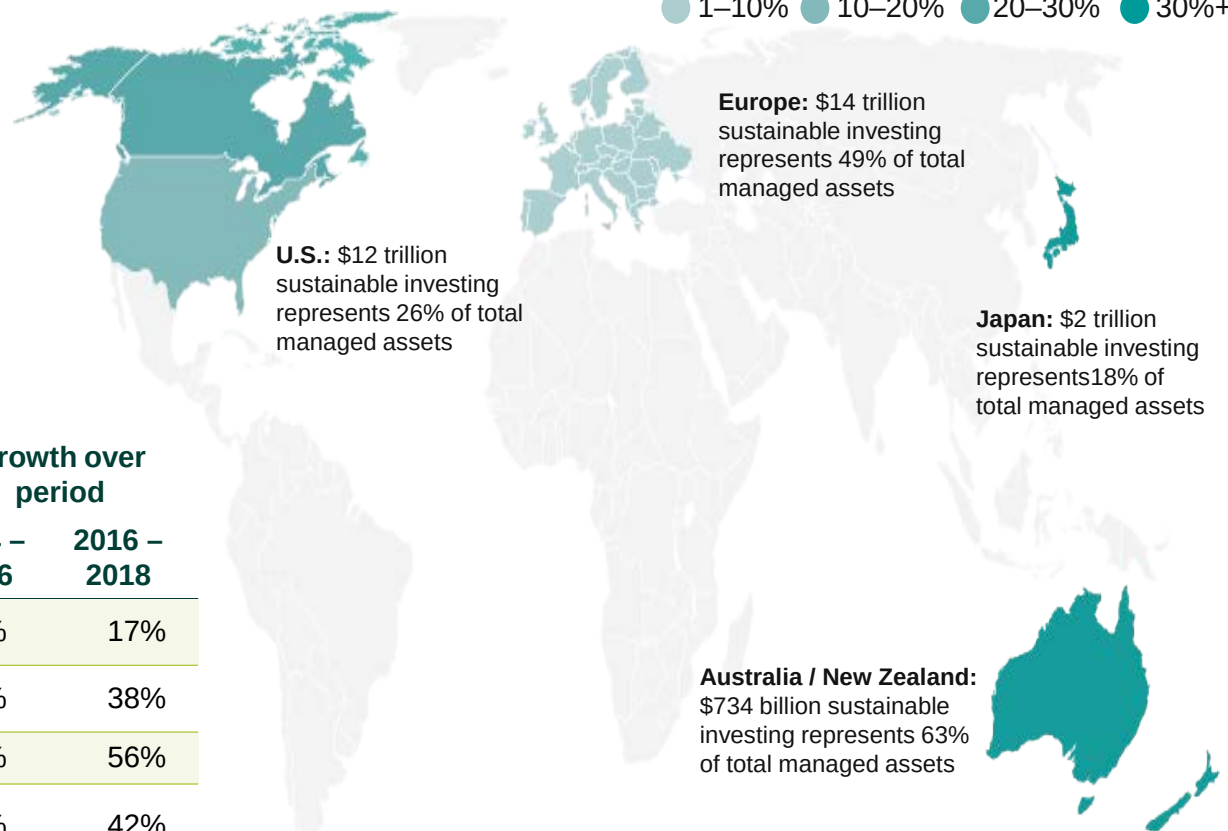
...are there really that many more sustainable assets in the world?

Might be in a period of massive re-classification, sometimes called “greenwashing”

Region	Sustainable assets (\$bn)			Growth over period	
	2014	2016	2018	2014 – 2016	2016 – 2018
Europe	\$10,770	\$12,040	\$14,075	12%	17%
United States	\$6,572	\$8,723	\$11,995	33%	38%
Canada	\$729	\$1,086	\$1,699	49%	56%
Australia / New Zealand	\$148	\$516	\$734	249%	42%
Japan	\$7	\$474	\$2,180	6671 %	360%
Total	\$18,226	\$22,838	\$30,683	25%	34%

Compound annual growth rate

1–10% 10–20% 20–30% 30%+

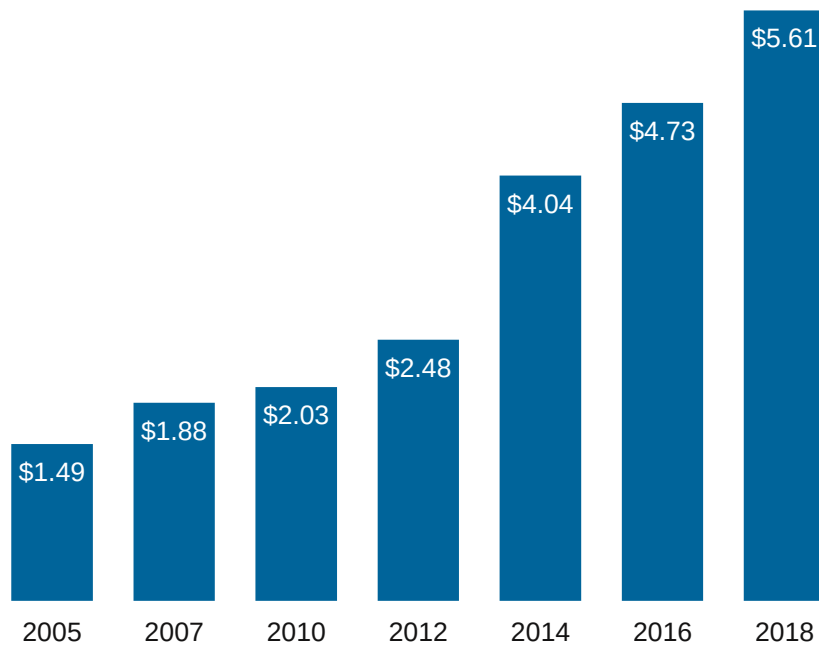


Note: Asset values are expressed in billions of US dollars. All 2016 assets are converted to US dollars at the exchange rates as of year-end 2015. All 2018 assets are converted to U.S. dollars at the exchange rates at the time of reporting. Source: Global Sustainable Investment Alliance

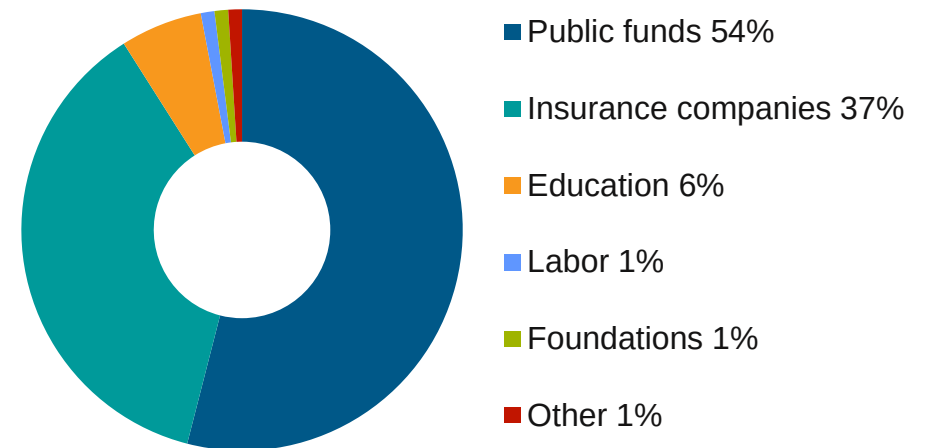
AUM Reclassifies as Sustainable

Institutions embrace ESG investing

Growth of ESG assets controlled by nearly 500 institutional investors surveyed (\$ trillions)



Institutional investment in ESG assets by investor type as of 2018



Source: US SIF Foundation

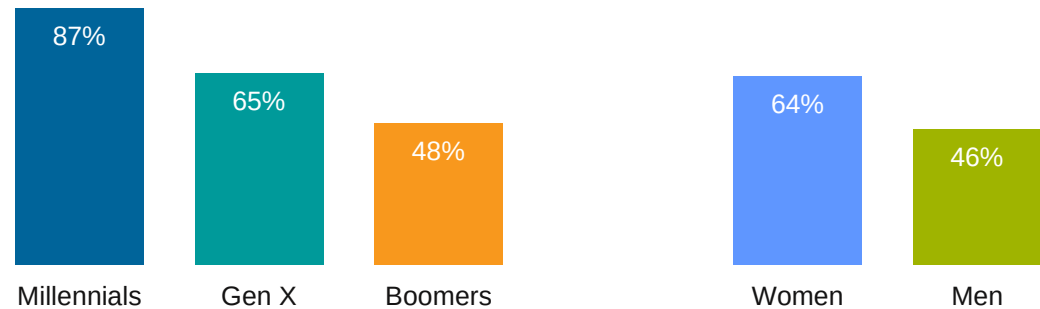
Long-term Trends Favorable for Growth in Interest in ESG

Demographic shift to younger investors favorable for continued interest and growth:

- Strong demand for investment decisions that consider thematic issues especially true among Gen X and Gen Y (Millennials), who are increasingly becoming the swing factors in terms of new asset formation.
- Currently 4.4 billion people in Generations Y and Z account for 59% of the world's population and \$21 trillion of income
- By 2020, Millennials will account for 16% of global private wealth (87% of Millennials believe ESG is important in their investment process)

\$20 trillion of AUM is estimated to invest in ESG strategies over the next 20 years, nearly total market cap of S&P 500.

Percentage who agree on the importance of ESG in their investment process



Top specific ESG criteria for money managers 2018



Percent increase in assets affected since 2016



Sources: BofA US Trust Survey 2018; US SIF Foundation

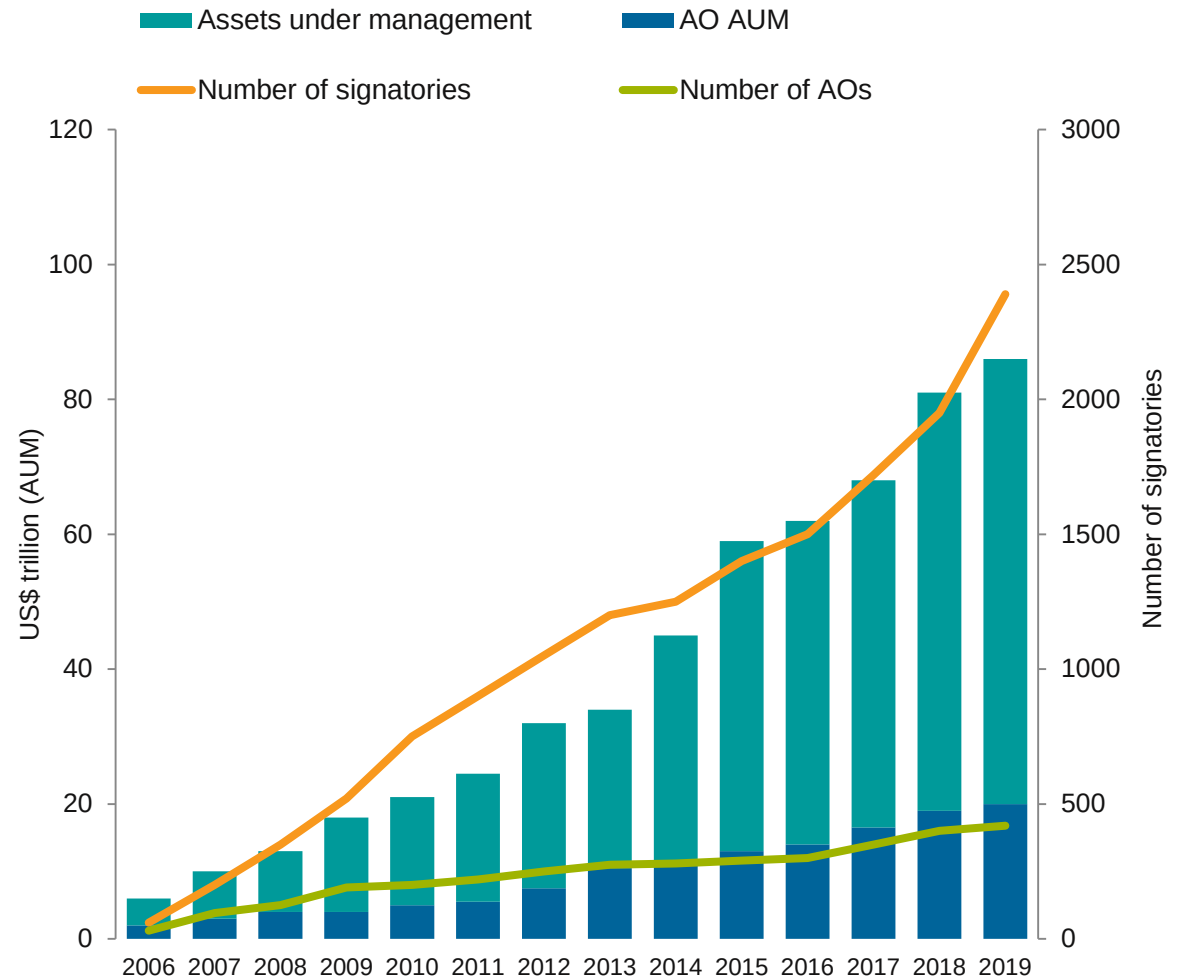
Additional Catalysts for Growth

Task Force on Climate-Related Financial Disclosures (TCFD)

Signatories to UN PRI are required to comply with TCFD from 2020 onward.

TCFD may be a catalyst for the following:

- Increased ESG disclosure on climate strategy, metrics, targets, and risk scenarios
- Debt and equity stakeholders working through potential exposures and mitigation (scope for de/re-rating)
- Growth in low carbon indices
- Abatement opportunities (AO) in green finance, renewables, storage, and EVs



Source: UN PRI 2019

Additional Catalysts for Growth

United Nations sustainable development goals

In 2015, the UN adopted 2030 Agenda for Sustainable Development.

Universal set of 17 goals, 169 targets, and 304 indicators on how 193 member states' governments, the private sector, and civil society can achieve the goals of ending poverty, protecting the planet, and ensuring prosperity for all as part of a new sustainable development agenda.

Global roadmap for reducing inequality, opening up \$12 trillion of market opportunities in four economic areas: food and agriculture, cities, energy and materials, and health and wellbeing, and creating 380 million new jobs by 2030.*

Sustainable Development Goals



Source: Business and Sustainable Development Commission

Callan's ESG Methodology

Our ESG philosophy and framework to support our clients' needs

- Callan believes that ESG criteria may have a material impact on investments, and that these factors provide an important lens by which to assess potential financial outcomes.

- Callan's approach:

Customized: understand that each client has a unique mission and values

Goal and objective-oriented: help clients develop custom plan to integrate ESG into investment process (if desired)

Ongoing Monitoring: review ESG practices and update as necessary on regular basis

- Callan leverages our internal experts and available research to identify impactful solutions that align with our clients' values and desired outcomes.



Callan 2019 ESG Survey Respondent Overview

Respondents by fund type and size

89 institutional investors responded to the survey

Public, corporate, and nonprofit investors, U.S.-based

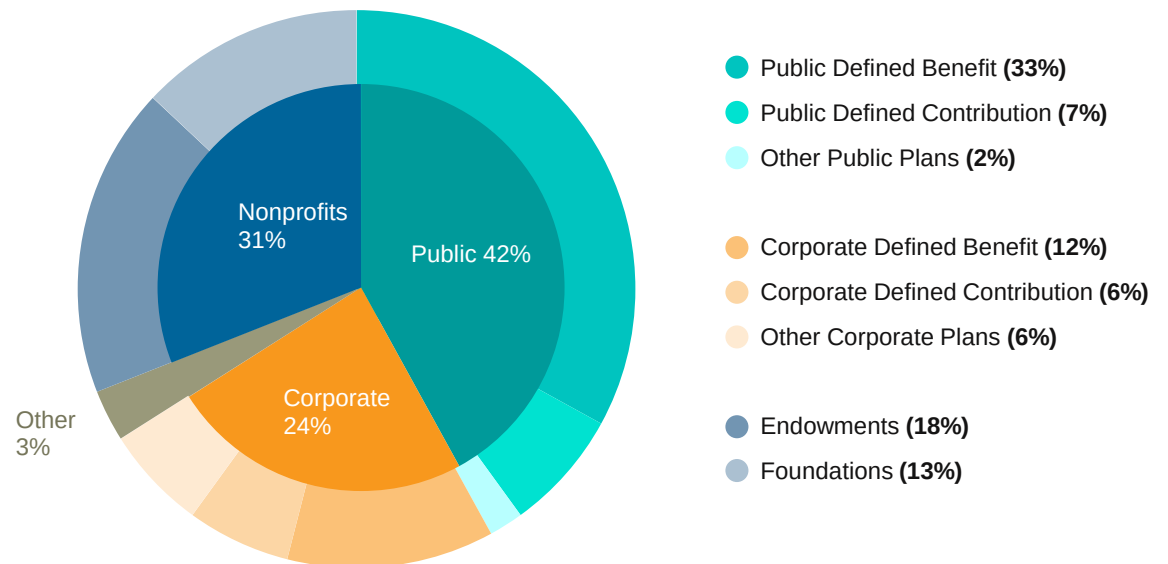
By size:

36% <\$500 million

27% \$500 million to \$3 billion

26% \$3 to \$20 billion

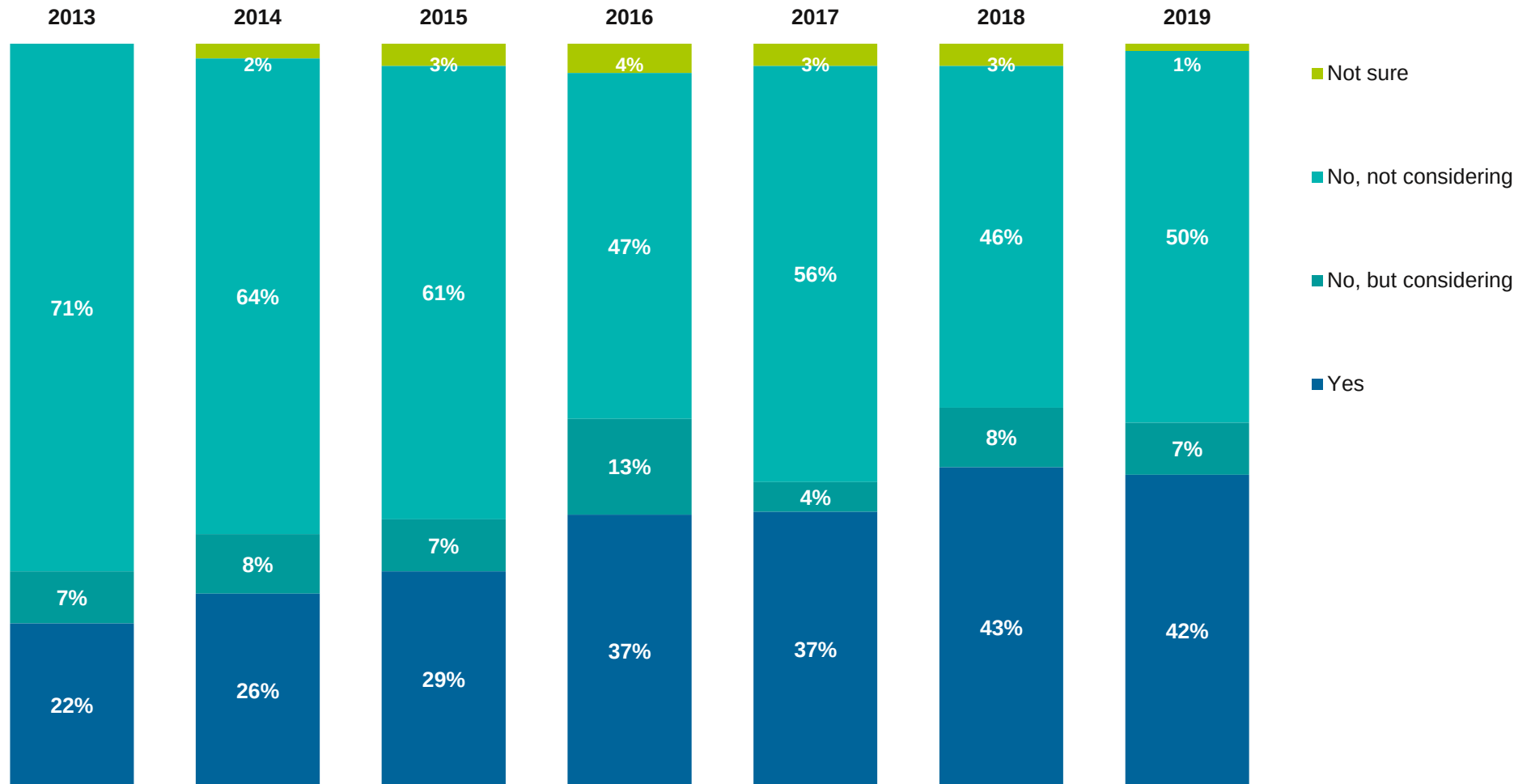
11% >\$20 billion



Source: Callan 2019 ESG Survey, September 2019

ESG Adoption in the U.S.

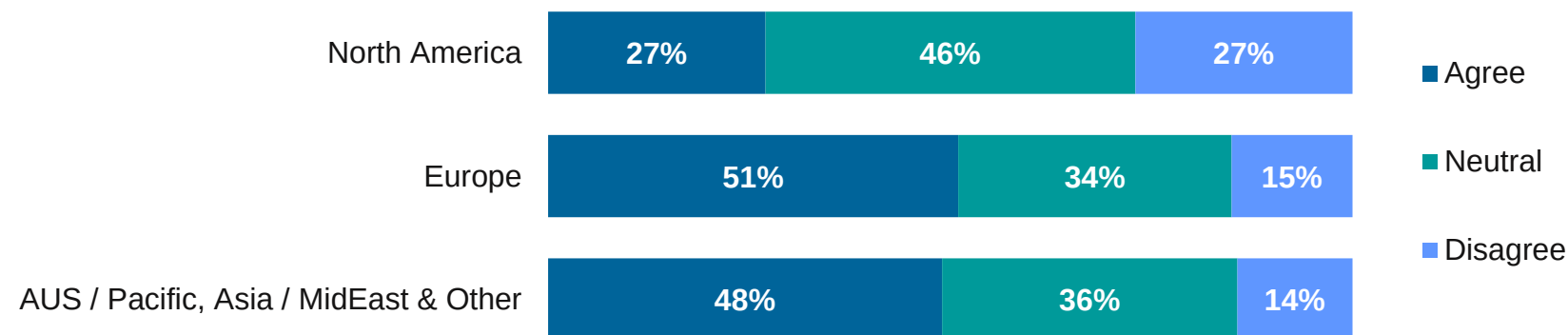
Funds that incorporate ESG into investment decisions



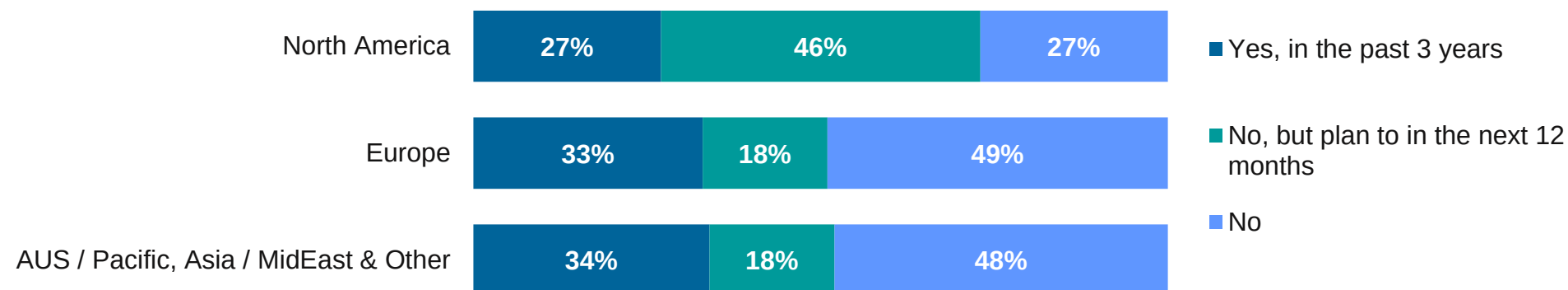
Source: Callan 2019 ESG Survey, September 2019

ESG Adoption: Global Perspective

“ESG is a high priority for our institution”



Have recently implemented a new / different ESG policy



Source: bfinance “Asset Owner Survey: Innovations in Implementation,” September 2018

U.S. ESG Adoption: Endowments Lead Other Investor Types

By fund type over last seven years

Foundation 35%	Endowment 34%	Foundation 39%	Endowment 53%	Foundation 56%	Foundation 64%	Endowment 58%
Endowment 22%	Foundation 31%	Endowment 37%	Foundation 48%	Endowment 39%	Endowment 56%	Public 49%
Public 15%	Public 22%	Public 27%	Corporate 30%	Public 35%	Public 39%	Foundation 44%
Corporate 14%	Corporate 16%	Corporate 15%	Public 25%	Corporate 25%	Corporate 20%	Corporate 19%
2013	2014	2015	2016	2017	2018	2019

Source: Callan 2019 ESG Survey, September 2019

U.S. ESG Adoption: Largest Investors Were Early Adopters

By fund size over last seven years

> \$20bn 33%	> \$20bn 31%	> \$20bn 35%	> \$20bn 71%	> \$20bn 78%	> \$20bn 72%	> \$20bn 50%
\$3bn to \$20bn 29%	\$500mm to \$3bn 24%	\$3bn to \$20bn 31%	<\$500mm 39%	\$500mm to \$3bn 42%	<\$500mm 47%	\$500mm to \$3bn 50%
\$500mm to \$3bn 23%	<\$500mm 22%	<\$500mm 26%	\$3bn to \$20bn 33%	<\$500mm 30%	\$3bn to \$20bn 33%	<\$500mm 38%
<\$500mm 20%	\$3bn to \$20bn 18%	\$500mm to \$3bn 26%	\$500mm to \$3bn 29%	\$3bn to \$20bn 22%	\$500mm to \$3bn 28%	\$3bn to \$20bn 35%
2013	2014	2015	2016	2017	2018	2019

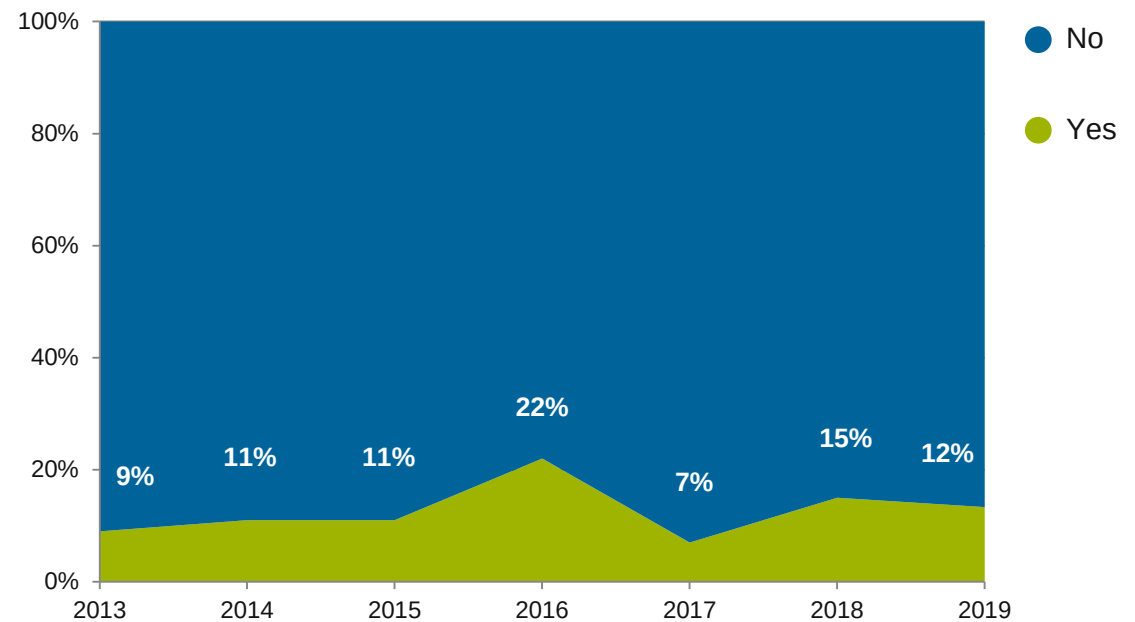
Source: Callan 2019 ESG Survey, September 2019

Looking Forward

Room to grow

12% of respondents that have not yet incorporated ESG into investment decisions are considering doing so in the future.

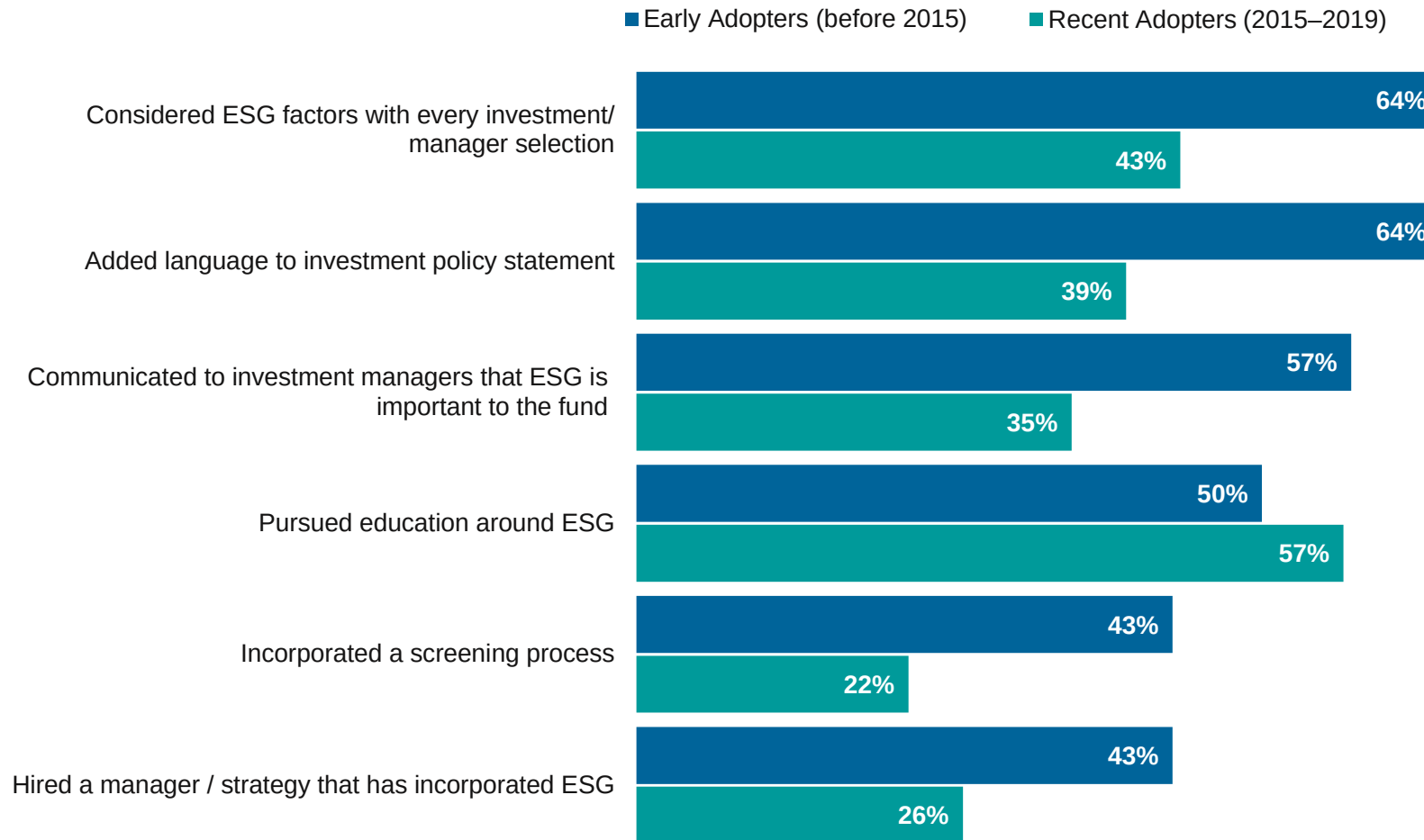
If ESG factors have not been incorporated into investment decisions, considering it in the future



Source: Callan 2019 ESG Survey, September 2019

U.S. ESG Implementation: Integration Is Central

How investors are incorporating ESG*

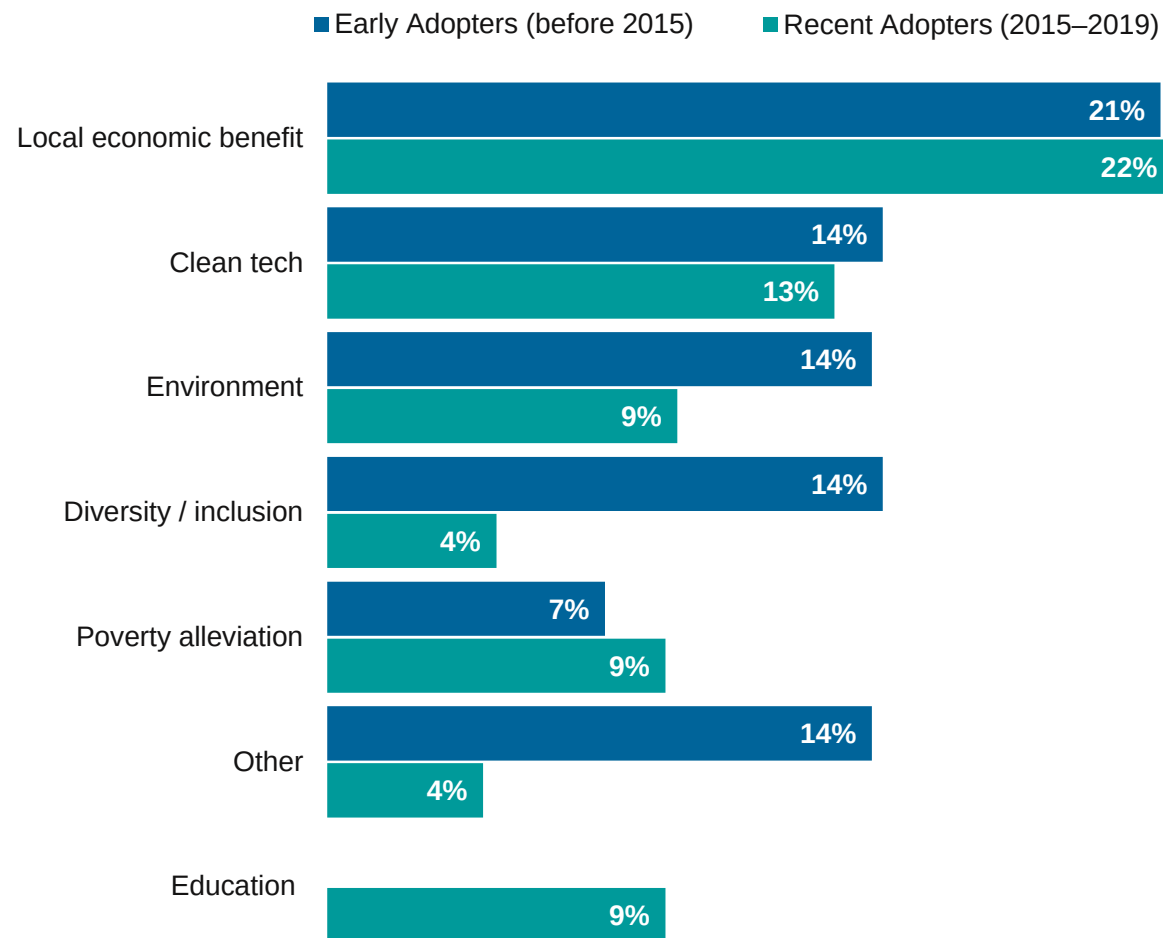


*Multiple responses allowed

Source: Callan 2019 ESG Survey, September 2019

U.S. ESG Implementation: To Embrace

Positive impact investments intentionally included per ESG policies*

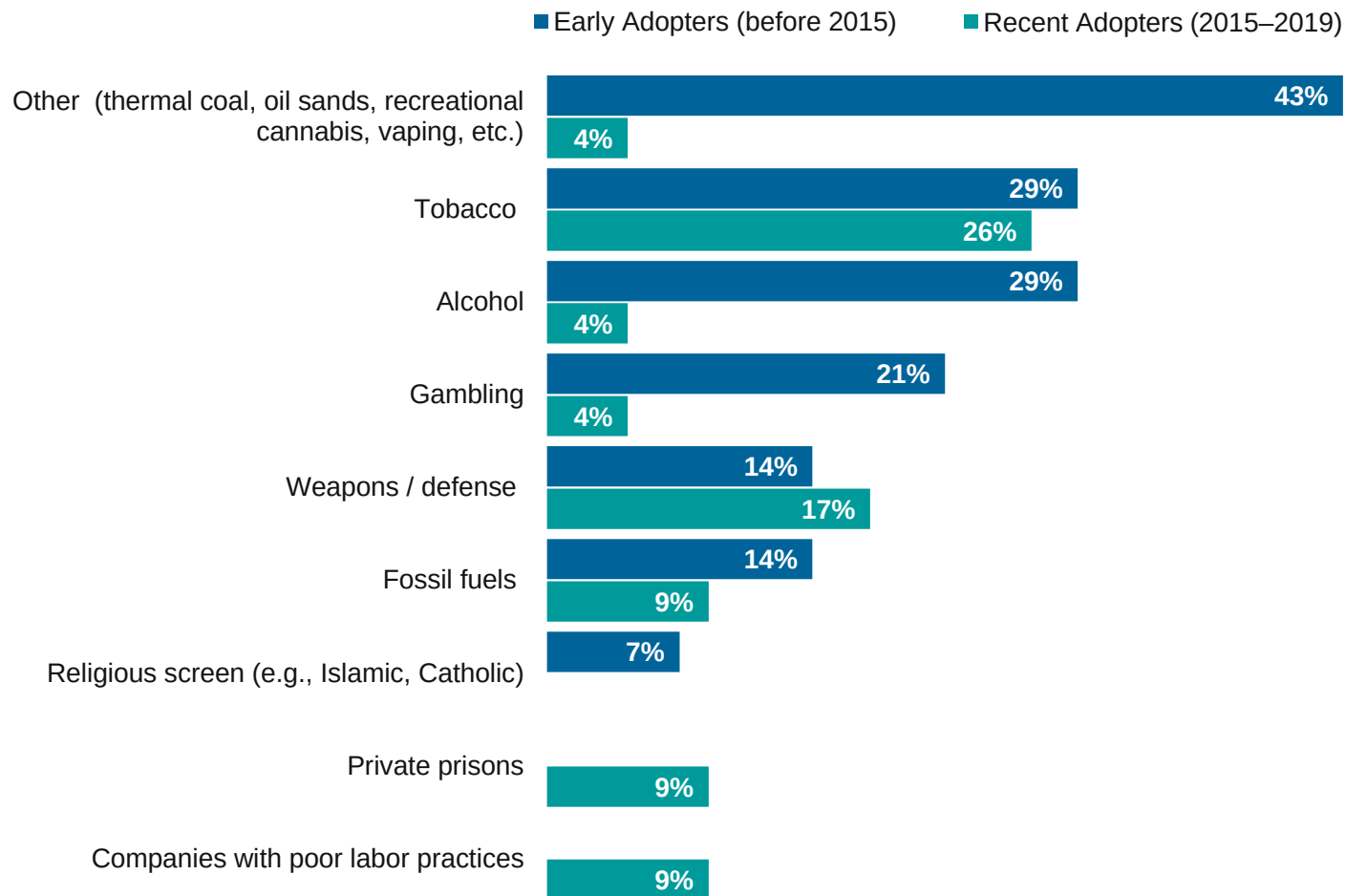


*Multiple responses allowed

Source: Callan 2019 ESG Survey, September 2019

U.S. ESG Implementation: To Avoid

Industries, sectors, and companies avoided / excluded per ESG policies*



*Multiple responses allowed

Source: Callan 2019 ESG Survey, September 2019

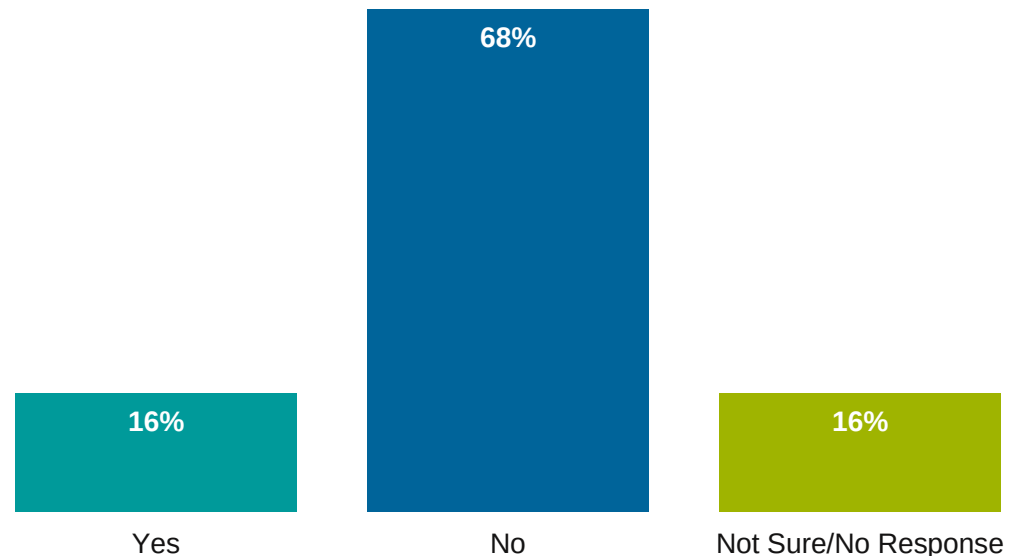
Separate ESG Allocation

As ESG integration is emerging as the most popular implementation method in the U.S., less than one-fifth of survey respondents that incorporate ESG separate their ESG investments.

16% of investors who have incorporated ESG factors into the investment decision-making process made a distinct allocation separate from the traditional portfolio.

For endowments/foundations that receive new donations, only 20% maintain a separate portfolio 100% dedicated to ESG for donors that desire this type of investment strategy.

Distinct allocation dedicated to ESG separate from the traditional portfolio

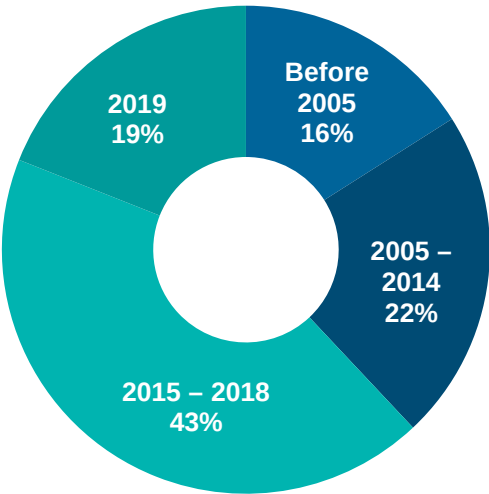


Source: *Callan 2019 ESG Survey*, September 2019

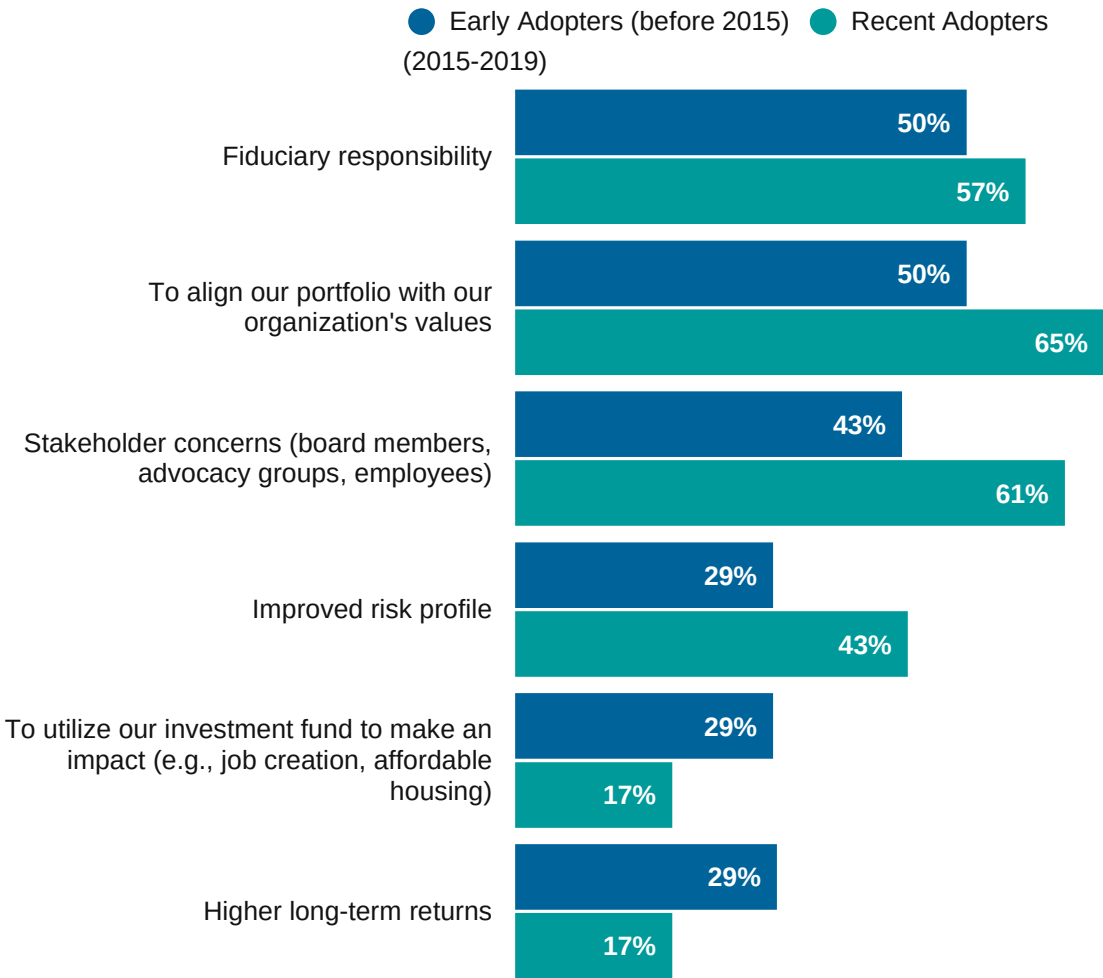
Reasons for Incorporating ESG: Early vs. Recent Adopters

When comparing the early adopters' motivations for incorporating ESG to the recent adopters, we note recent adopters are more likely to be addressing stakeholder concerns and to be focused on an improved risk profile.

Adoption Timeframes
Before 2015 (14) and after (23)



Reasons for incorporating ESG factors into the investment decision-making process*



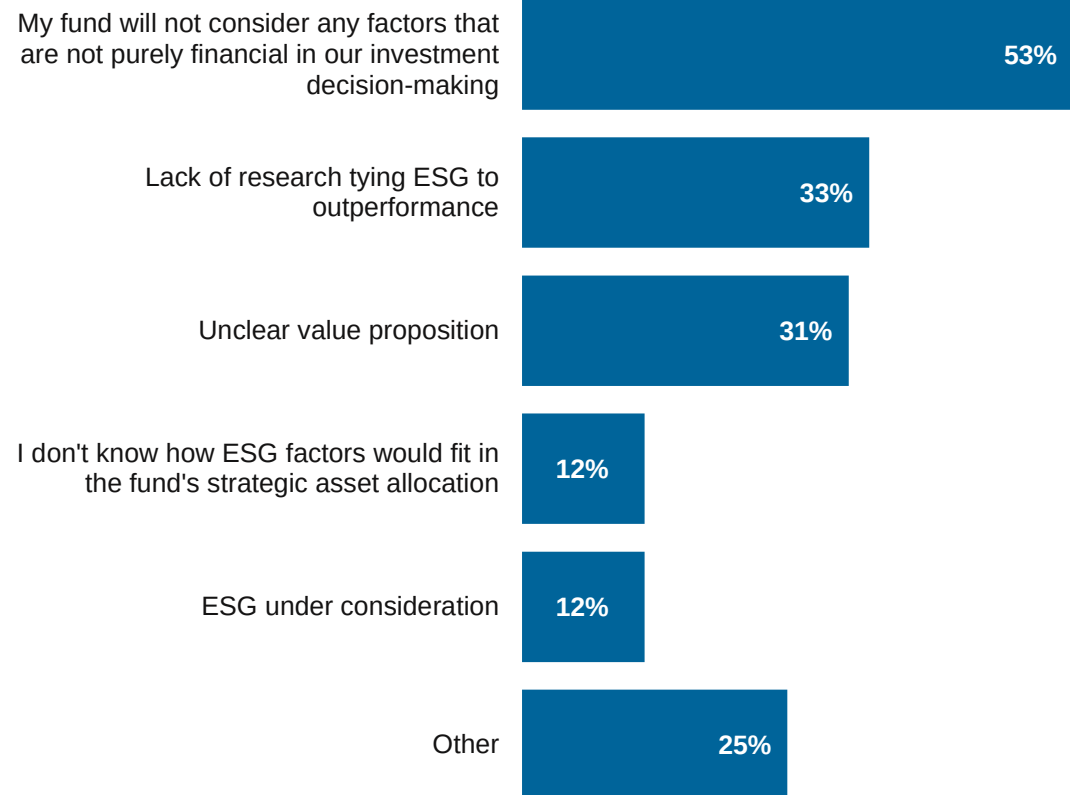
*Multiple responses allowed. Source: Callan 2019 ESG Survey, September 2019

Reasons Against ESG Incorporation

53% of investors that are not incorporating ESG indicated they will not consider any factors that are not purely financial.

12% of those that have not incorporated ESG into investment decision-making are considering doing so.

Reasons for NOT incorporating ESG factors into the investment decision-making process (all non-ESG respondents)*



*Multiple responses allowed

Source: Callan 2019 ESG Survey, September 2019

Environmental, Social, and Governance (ESG) Committee

The ESG Committee reviews all client projects that incorporate ESG into the investment framework. This group also creates solutions to issues facing our clients, and develops research to bring transparency and insight to the rapidly changing ESG landscape.



Amit Bansal
Kristin Bradbury, CFA
Citalli Cuevas

Alex Hoy
Jay Nayak
Aaron Quach

Tom Shingler*
Mark Wood, CFA

*Committee chair

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Alaska Retirement Management Board

Annual Fiduciary Training

Stuart W. Goering
Senior Assistant Attorney General
State of Alaska Department of Law

Objectives

- Satisfy statutory requirements
- Provide context for the work of the board
- Support discussion of staff presentations
- Identify topics for additional board and individual training

Fiduciary Duty

- Sources
 - Statutory
 - Common Law
 - ARMB not subject to ERISA or Uniform Prudent Investor Act, but would likely be used by analogy
- Definition: One who transacts business, and handles money and property, not for self-interest, but for the benefit of another, “implying and necessitating great confidence and trust, and a high degree of good faith”

Statutory Sources

- AS 37.10.071(c): “the fiduciary of a state fund shall apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the fund entrusted to the fiduciary. Among beneficiaries of a fund, the fiduciaries shall treat beneficiaries with impartiality.”

Statutory Sources

- AS 37.10.210(a): “Consistent with standards of prudence, the board has the fiduciary obligation to manage and invest these assets in a manner that is sufficient to meet the liabilities and pension obligations of the systems, plan, program, and trusts.”

Unpacking the Statutes

- No ideal prudent behavior for all situations and times
- Depends on purpose of invested funds
- Objective and subjective components
- Can rely on expert advisors or delegate

Unpacking the Statutes

- Applies to all funds managed by ARMB, even self-directed defined contribution plans
- Isn't fire-and-forget
- "Sole financial best interest" isn't defined in statute but historically has excluded decisional factors that implement public policy, but that do not directly improve financial outcomes for beneficiaries

How Can a Part-Time Board Meet This Standard?

- Only with substantial assistance
- The legislature provided ARMB with a comprehensive toolkit:
 - staff,
 - the IAC, and
 - authority to engage managers, consultants, and other professionals

How To Use the Toolkit?

- Process – have it, follow it, refine it
 - Structure/governance
 - Policies
 - Procedures
 - Compliance
 - Reporting
 - Obtain and use resources
- Think of process as organism, not artifact

Delegation

- Safe Harbor
 - Statutory delegations (e.g., staff)
 - Prudent delegations
- Exceptions
 - Participates in or conceals a breach
 - Enables a breach
 - Knows about a breach and does not attempt to remedy

Delegation Nuances

- Scope of delegation
- Direct private equity investment $\neq$ delegation
- Some seemingly non-discretionary functions (e.g., custody and depositary) are subject to the prudent investor rule
- Consultants, attorneys, and advisors have professional duties but may not be fiduciaries

Reconciling Individual and Collective Duty

- Do Trustees “represent” constituents?
- Courts recognize decision makers have diverse life experience
- Interests are often aligned, but statute controls in event of conflict

Conclusion

- Trustees have enormous responsibility
- Use the right tool for the right job
- When in doubt, ask
- Questions?

ALASKA RETIREMENT MANAGEMENT BOARD

Environmental, Social, Governance in ARMB Investments

Zachary Hanna, CFA
Deputy 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?

ARMB ESG Evaluation

Staff has been asked to provide guidance on how the ARMB should incorporate environmental, social, and governance (ESG) concepts into investment decision making and will cover the following topics:

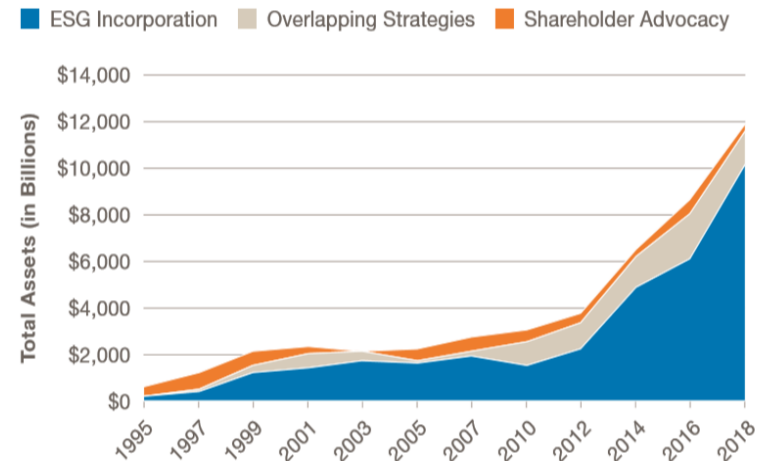
- Relevant evolution of ESG in investments
- Applicable legal framework – Alaska statutes and other legal guidance
- Investment framework and rationale – General, Passive, Factor, Active
- Synthesis of ESG, Legal, and ARMB investments
- Summary and Recommendations

ESG – Brief History

- The origins of ESG investing are largely with organizations combining social and environmental goals with financial goals.
- Early participants and current impact investors largely pursue divestment of specific industries or sectors.
- ESG has experienced significant recent growth as organizations have embraced the United Nations Principles for Responsible Investing (UN PRI).
- There is now a large ESG industry comprised of investment managers, data suppliers, and service providers who are actively working to support and grow the space.
- This industry interest has led to increased ESG investment sophistication focused on integrating ESG broadly into the market.



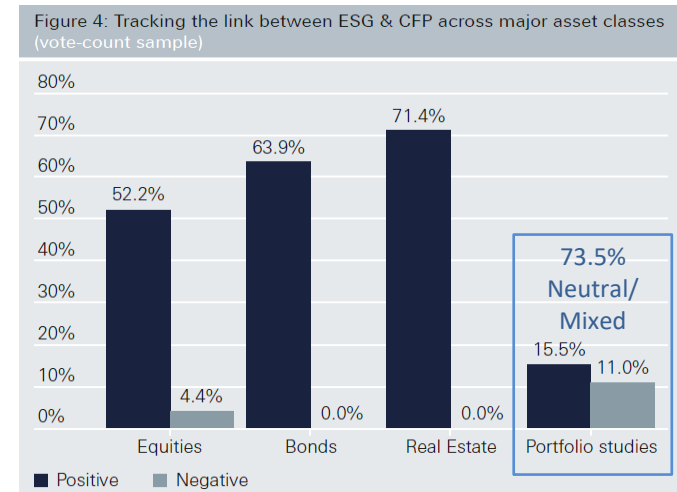
Sustainable and Responsible Investing in the United States
1995–2018



SOURCE: US SIF Foundation.

ESG – Empirical Evidence

- There are over 2,000 academic papers studying some combination of ESG, corporate performance, and investment performance.
- Many studies find a positive linkage between ESG and corporate financial performance (CFP). This isn't particularly surprising since there is overlap between ESG, especially governance factors, and best business management practices.



Source: Friede, Busch, Bassen (December 2015)

- This increased financial performance has not necessarily translated into stronger investment portfolio performance. 73.5% of the studies that specifically focus on portfolio performance did not find a linkage between strong ESG and investment outperformance.
- There are many reasons for this, but the result seems rational from an investment perspective. If companies with strong-ESG are empirically less risky and the market prices risk efficiently, then investments in strong-ESG companies should result in lower returns and risk and the opposite for potentially riskier weak-ESG companies.
- In addition, there is considerable research that shows that the pattern of ESG returns is not unique and can be explained by exposure to more traditional equity risk factors such as low beta, quality, value, size, and momentum.

ESG – Qualitative or Quantitative?

- ESG evaluation can be highly subjective. Investors often have widely divergent views about what comprises “good” ESG.
- Firms trying to measure similar ESG concepts, can come to very different conclusions:

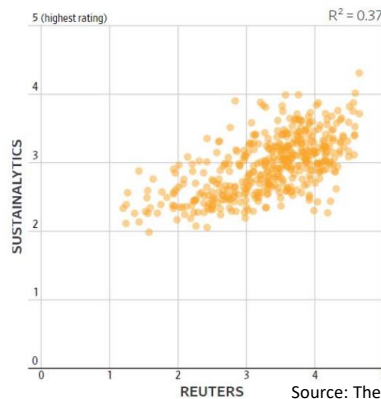
ESG providers

Compare one of these...

MSCI REUTERS FTSE SUSTAINALYTICS

...with one of these

MSCI REUTERS FTSE SUSTAINALYTICS



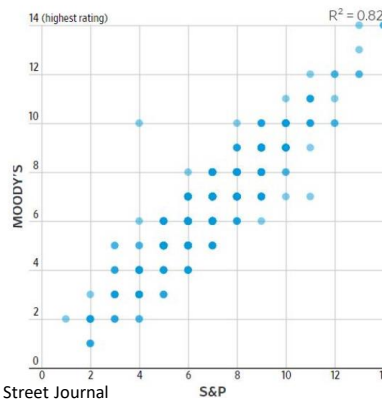
Credit-rating companies

Compare one of these...

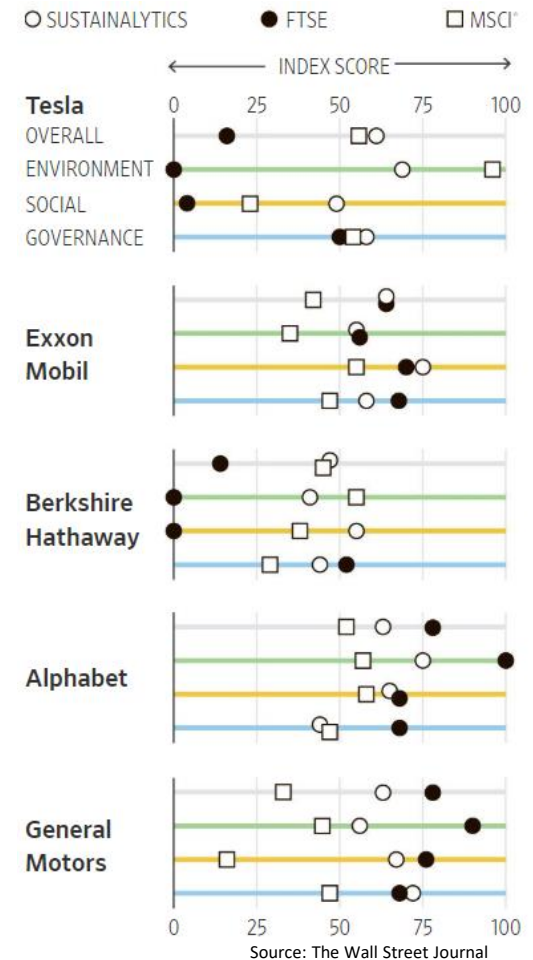
S&P FITCH MOODY'S

...with one of these

S&P FITCH MOODY'S



- Ultimately, ESG can be qualitative and the quantitative data is noisy as a result.
- This makes it harder for investors to sort through.



ESG – *Institutional Investor Adoption*

- Some institutional investors have incorporated ESG concepts into their plans, viewing it as part of their fiduciary duty and consistent with the prudent investor rule broadly defined.
- This may have been back-stopped by ESG-supportive ERISA guidance from 2015. The most recent 2018 DOL guidance is much more restrictive:

*The DOL's Field Assistance Bulletin 2018-01, says that fiduciaries under the Employee Retirement Income Security Act (ERISA) "**must not too readily treat ESG ... factors as economically relevant** to the particular investment choices at issue when making a decision." Rather, ERISA fiduciaries "**must always put first the economic interests of the plan** in providing retirement benefits."*

- Decision-makers also have varying approaches to social and environmental issues and expectations about how ESG impacts investments.
- Every institutional investor needs to evaluate ESG and other factors through the lens of their specific fiduciary responsibilities.
- The Alaska Statutes can help provide focus.

Legal Framework – *Invest to Meet Obligations*

- The ARMB has the responsibility to invest the assets of the trust to meet future benefit payments to participants.

*AS 37.10.210(a): “...Consistent with standards of prudence, the board has the fiduciary obligation to manage and **invest** these assets in a manner that is **sufficient to meet the liabilities and pension obligations** of the systems, plan, program, and trusts...”*

- The current actuarially adopted rate of return is 7.38% and meeting this return is challenging.
- The ARMB and staff are focused on producing the highest net-of-fee risk-adjusted returns necessary to meet the obligations of the systems.
- To maximize net-of-fee returns, the ARMB and staff run a relatively lean organization, are very selective with higher fee investments, and focus on expenditures where the benefits dependably outweigh the costs.
- Capital markets evolve, and staff is constantly evaluating new investments for approaches that are expected to be meaningfully additive.

Legal Framework – *Sole Financial Best Interest*

- The ARMB has a fiduciary duty to apply the prudent investor rule acting in the “sole financial best interest of the fund”:

AS 37.10.071(c) – “In exercising investment, custodial, or depository powers or duties under this section, the fiduciary of a state fund shall apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the fund entrusted to the fiduciary. Among beneficiaries of a fund, the fiduciaries shall treat beneficiaries with impartiality.”

- The ARMB’s fiduciary duty is narrower in scope and more restrictive than the typical prudent investor rule that most institutional investors are held to.
- The fiduciary duty to act only in the “sole financial best interest” is supported by a 1998 Alaska Attorney General’s Opinion on tobacco divestiture for the Alaska Children’s Trust that staff believes is applicable to the ARMB as a fiduciary charged with the same standard. This opinion concluded:
 - *“the statutes...clearly modify the common law prudent investor rule in a manner that restricts...considering anything other than the financial best interest of the fund.”*
 - *“Thus, you cannot consider the social implications of investment...”*
 - *“...the legislature sought to insulate state investment officers from pressure to consider matters other than the financial interests of the fund.”*

Legal Framework – *Synthesis*

- Alaska's more general Statutes on Trusts also provide some additional guidance:

AS 13.36.235 – “A trustee shall diversify the investments of the trust unless the trustee reasonably determines that, because of special circumstances, the purposes of the trust are better served without diversifying.”

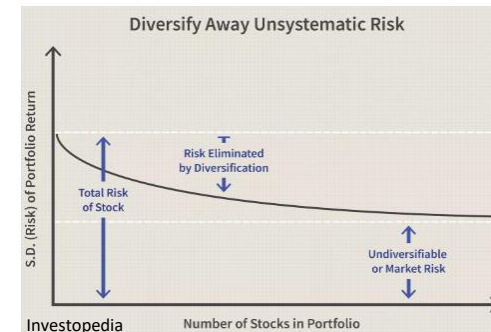
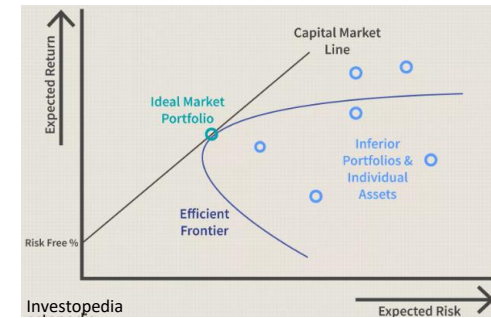
- The following is a synthesis of these Statutes that staff believes is a reasonable summary of the ARMB fiduciary obligations relevant to evaluating investments and portfolio structure:

To meet the obligations of the systems, the ARMB "shall apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the fund" and shall diversify investments consistent with this duty.

- When viewed through this narrower lens, all sources of investment returns and risks, including ESG sources, should be viewed directly in the context of improving net-of-fee-risk-adjusted-returns, which has been and is the primary focus of Staff and the ARMB.

Investment Framework – General

- The ARMB portfolio is structured around core investment concepts that are useful in the evaluation of ESG.
- Most of these concepts are well-accepted and Nobel-rich financial theories like the Efficient Markets Hypothesis, Modern Portfolio Theory, the Capital Asset Pricing Model, and Arbitrage Pricing Theory.
- None of these theories are perfect or always applicable to dynamic and evolving capital markets, but they contain key observations that drive decisions:
 - Markets are largely efficient, incorporate information well, and price risk efficiently.
 - Persistent returns are compensation for bearing some form of risk.
 - Risk and return are generally positively linked.
 - Diversified portfolios of asset classes and securities are usually the most risk-return efficient form of ownership.
- Staff will discuss the specific investment thinking that drives the passive, risk factor, and active portions of the portfolio and recommend how each should incorporate ESG in a manner consistent with the ARMB's fiduciary duty.



Investment Framework – *Passive*

- Passive investments are 63% of the ARMB's equity portfolio. The investment concepts that drive this core allocation include:
 - Equities are expected to provide compensation for systematic risk (beta) in the form of an equity risk premium.
 - Diversified market indices are highly efficient and largely contain only systematic risk.
 - Asset prices incorporate available information and largely reflect fair market value. As a result, and net-of-very-low passive investment management fees, it is difficult to beat market index investments.
- Staff recommends more active equity investments in market areas where investment managers are expected to increase net-of-fee returns and have a reasonable chance of beating passive indices.

Investment Recommendation – *Passive*

With respect to ESG and the ARMB's passive investments staff recommends:

- No divestment of specific sectors or industries:
 - Divestments are most likely to decrease diversification, which increases unsystematic risk with no expected compensation.
 - Industry expansion and contraction over time is inevitable, but the timing and specific catalysts are highly uncertain and market-cap indices best diversify this risk.
 - Broad markets generally price risk efficiently. The positive empirical linkage between ESG and corporate performance is most likely to lead to less-risky securities providing lower returns and more-risky securities providing higher returns.
- Annual evaluation of proxy voting to ensure that all issues, including ESG, are voted in the “sole financial best interest” of the fund.

Investment Framework – Risk Factors

Systematic risk factor investments are 24% of the ARMB's public equity portfolio:

- Factor investments focus on compensated risk factors beyond market beta.
- There is rigorous academic support for these factors and a reasonable expectation for continued long-term return compensation for bearing these risks.
- Factors can have cyclical performance and a common rationale for their compensation is related to the length of these cycles and the timing of potential drawdowns. Long-term investors like the ARMB are well-suited to bear this risk.
- The burden of proof for these factors is high – staff has recommended factors based on rigorous empirical analysis over long time periods with significant statistical support.

A Consensual Choice of Factors

- A choice based on long-term data documented by empirical academic evidence.

Factor	Factor Definition	Period	Annual Premium	t-stat	Source
Value	Stocks with high versus low book-to-market	1963-2013	4.53%	3.20	Fama-French (2015)
Momentum	Stocks with high vs. low returns over past 12 months (omitting last month)	1926-2008	9.34%	5.71	Ang et al. (2009)
Low Risk	Stocks with low versus high risk (beta, volatility or idiosyncratic volatility)	1926-2012	8.73%	7.12	Frazzini-Pedersen (2013)
Size	Stocks with low versus high market cap	1963-2013	3.54%	2.31	Fama-French (2015)
Profitability	Stocks with high vs. low profitability (e.g. return on equity or gross profitability)	1963-2013	3.04%	2.92	Fama-French (2015)
Investment	Stocks low vs. high investment (change in total assets)	1963-2013	4.03%	4.07	Fama-French (2015)

Justified by an Economic Rationale

A choice justified by economic research:

- Risk-based explanation: higher return means higher extreme marginal risk.
- Behavioural explanation: if there are persistent limits to arbitrage.

Factor	Risk-based explanation	Behavioural explanation
Value	Costly reversibility of assets in place: high sensitivity to economic shocks in bad times	Overreaction to bad news and extrapolation of the recent past leads to underpricing
Momentum	High expected growth firms are more sensitive to shocks to expected growth	Investor overconfidence and self-attribution bias leads to returns continuation in the short term
Low Risk	Liquidity-constrained investors have to sell leveraged positions in low risk assets in bad times when liquidity constraints become binding	Disagreement of investors about high risk stocks leads to overpricing due to short sales constraints
Size	Low liquidity, high distress and downside risk is compensated by higher returns	Limited investor attention to smaller cap stocks
Profitability	Firms facing high cost of capital will invest only in the most profitable projects	Investors do not discern high and low profitability in growth firms
Investment	Low investment reflects firms' limited scope for projects given high cost of capital	Investors under-price low investment firms due to expectation errors

Investment Recommendation – *Factors*

Staff does not recommend including ESG factors in the systematic factor portfolio:

- There needs to be strong empirical support for a risk factor to be included in the factor portfolio. Most of the studies that focus on portfolio investment performance do not find a linkage between strong ESG and investment performance.
- Additional risk factors would need to provide a unique risk and return contribution and ESG factors do not appear to do this since the return pattern can largely be explained by traditional risk factors.

The market is dynamic – if ESG or other factors prove likely to be a meaningfully compensated addition to the portfolio, staff will likely recommend them.

Investment Framework – *Active*

- When viewed through a lens of “sole financial best interest,” ESG concepts are best considered as potential risk and return drivers for the ARMB’s active investments
- The ARMB invests actively to varying degrees in 60% of it’s overall portfolio in the following areas that are either inefficient enough for active managers to add value or in attractive investment areas with no passive alternative:
 - International equities including emerging markets
 - Fixed income and debt investments
 - Opportunistic investments
 - Real assets including real estate, infrastructure, farmland, and timberland
 - Private equity and private debt
- The relative importance of ESG considerations to the expected risk and return of these investments varies widely:
 - For infrastructure, ESG is fundamental to the stewardship of critical public assets.
 - For other investments, adding value by improving ESG is a core part of the investment thesis.
 - For the majority, ESG is prioritized along with other relevant investment drivers.
 - And for some investments, ESG factors aren’t a significant driver of risk and return.

Investment Recommendation – *Active*

- Most ARMB active investment managers, both external and internal, are fiduciaries of the funds charged with acting in the “sole financial best interest.”
- The ARMB’s active managers are highly incentivized to perform using all sources of information about the risk and return of their investments – including ESG.
- For many ARMB active managers, ESG is already an integrated part of how they look to invest and add value. The evaluation, implementation, timeframe, and prioritization of ESG concepts is often specific to each investment.
- With respect to active investments, staff recommends:
 - Ongoing evaluation of investment managers to ensure that relevant factors, including ESG, are being considered in the “sole financial best interest” of the funds.
 - No broad ESG guidelines or ESG-specific policies for managers since the integration of ESG concepts and fiduciary obligations need to be specifically tailored to individual investment outcomes at the portfolio manager level.
 - Annual evaluation of proxy voting to ensure that all issues, including ESG, are voted in the “sole financial best interest” of the fund.

Summary Recommendations

Consistent with ARMB-specific fiduciary duties, staff has the following summary recommendations regarding ESG:

- No divestment of sectors or industries.
- No ESG-specific changes to systematic risk factor investments.
- Ongoing evaluation of investment managers to ensure that relevant factors, including ESG, are being considered in the “sole financial best interest” of the funds.
- No broad ESG guidelines or ESG-specific policies.
- Annual evaluation of proxy voting to ensure that all issues, including ESG, are voted in the “sole financial best interest” of the fund.

Presentation to Alaska Retirement Management Board

June 18, 2020

Pat McGurn
Managing Director, Research
Special Counsel

Chris Miller
Associate Vice President, Specialty Research



ISSGOVERNANCE.COM

AGENDA



- WHO IS ISS?
- VOTING POLICY DEVELOPMENT FOR BENCHMARK & SPECIALTY RESEARCH
- WHAT FACTORS DRIVE ISS' VOTING POLICIES?
- HOW DO BENCHMARK AND SPECIALTY POLICIES DIFFER?
- WHAT DOES "ESG" STAND FOR IN 2020?
- DRILLDOWN INTO ISS POLICY APPROACHES ON E&S PROPOSALS
- QUESTIONS

WHO IS ISS?

Expertise

- 30+ years of market leadership and experience in corporate governance
- Team of 400+ research & data professionals globally
- Specialists in compensation, M&A, ESG and industry-specific issues, as well as market and regional specialists around the world

Quality

- Thorough quality reviews throughout our process – meeting materials, company data, research analysis, and voting recommendations. Plus ongoing audits and specialized focus on complex matters.
- Publicly available information only – verifiable and available to all shareholders
- Continuous product innovation to enhance value to clients in research content and timeliness

Flexibility & Choice

- Market-leading research and policies covering the globe, focuses on best practices and long-term shareholder value
- Specialist thematic policies available for including Climate, Taft-Hartley, SRI, Sustainability, Catholic & Public Funds
- Fully customized corporate governance research service to help convert your unique philosophy into an actionable voting policy

Coverage

- Comprehensive global coverage of all of your common equity holdings
- 44,000 meetings and 200,000+ agenda items covered each year across 115+ markets

Engagement

- Engagement with many companies throughout the year
- Fact-checking and company dialogue (over 3K engagements in 2019) where needed, before research is published
- Robust process, including draft reports for fact-checking to largest companies in U.S and some other major markets



WHO IS ISS?

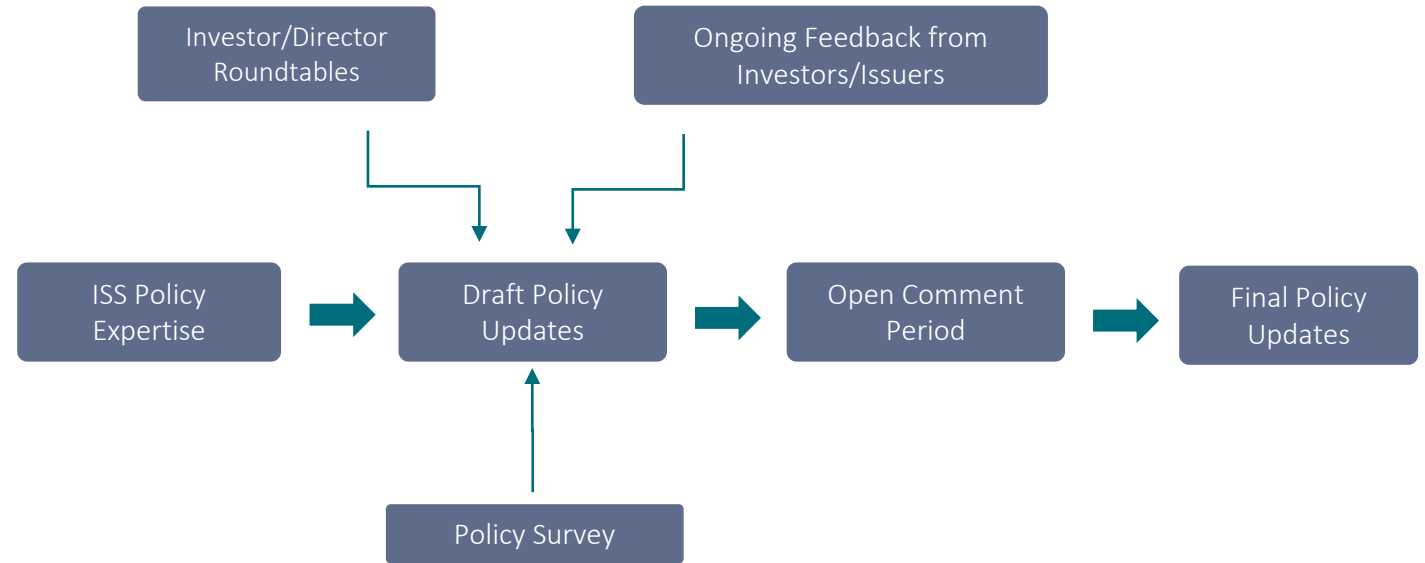
Nearly 2,000 employees across 30 U.S. and international locations

- ISS is...
 - A Fiduciary (a trusted advisor)
 - A For-Profit Service Provider
 - An Independent Research Provider
 - An ESG Data Aggregator
 - A Global Technology Company
 - An Industry Innovator
- ISS is not...
 - An Activist
 - A Watchdog
 - A Credit Rating Agency or a Sell-Side Research Provider
 - A Quasi-regulator or Standard-setter



POLICY DEVELOPMENT FOR BENCHMARK & SPECIALTY RESEARCH

Rigorous, transparent and inclusive policy formulation for informed decision-making.



Based on 30+ years experience working with institutional investors. Balancing global principles and local market specificity, ISS upholds a transparent and inclusive approach that includes ongoing market feedback, surveys, roundtables and an open industry comment period.

- Global in-person discussion forums and roundtables frame the policy process.
- Annual policy survey brings in perspectives from institutional investors, corporate issuers and governance experts. Offers all market constituents the ability to actively participate in ISS' policy development process.
- Numerous viewpoints are considered to develop guidelines that strike the right balance between long-term shareholder interests and economic practicality.



ISS BENCHMARK AND SPECIALTY VOTING POLICY COMPARISON

Voting recommendations for S&P 500 index universe of companies based on full-year for 2019

	ISS Benchmark Policy	SRI Policy	Sustainability Policy	Climate Policy
Policy Focus	All – including Investment managers and institutional investors of all sizes	SRI investment firms, religious groups, charitable foundations & university endowments	UN PRI Signatories or similarly aligned investment managers & asset owners	Climate-focused investors, inclusive of asset managers, asset owners and mutual funds
Orientation	“Best practice” governance standards that promote total, long-term shareholder value & risk mitigation	The "triple bottom line" value creation	United Nations Principles for Responsible Investment (UN PRI)	Widely recognized frameworks, including the Task Force on Climate-related Financial Disclosures (TCFD)
Key Policy Highlights:				
1. <u>Board</u>	Independence (50%), composition, accountability and responsiveness	Independence (50%), composition, accountability and responsiveness - including on ESG topics, diversity	Independence (50%), composition, accountability and responsiveness – including on ESG topics	Independence (50%), composition, accountability and responsiveness - including on ESG topics, with focus on climate-related risk oversight
1. <u>Compensation</u>	Alignment of pay and performance, presence of problematic compensation practices, shareholder value transfer (SVT)	Alignment of pay and performance including on ESG topics, presence of problematic compensation practices, shareholder value transfer (SVT)	Alignment of pay and performance, presence of problematic compensation practices, shareholder value transfer (SVT)	Alignment of pay and performance, presence of problematic compensation practices, shareholder value transfer (SVT)
1. <u>Environmental & Social</u>	Consider shareholder proposals on social, environmental and labor/human rights issues on a case-by-case basis	Generally support shareholder proposals on social, environmental and labor/human rights issues	Generally support shareholder proposals advocating ESG disclosure or universal norms/codes of conduct	Generally support shareholder proposals promoting greater disclosure of environmental policies and practices
Board Opposition	3%	14%	3%	New for 2020
Auditor Ratification Opposition	0%	8%	0%	New for 2020
Equity Pay Plans Opposition	12%	12%	12%	New for 2020
Say on Pay Opposition	12%	15%	12%	New for 2020
Gov. Share. Proposal Support	67%	90%	88%	New for 2020
E&S Share. Proposal Support	75%	93%	84%	New for 2020



ISS BENCHMARK AND SPECIALTY POLICY COMPARISON

Voting recommendations for Russell 3000 index universe of companies based on full-year for 2019

	ISS Benchmark Policy	SRI Policy	Sustainability Policy	Climate Policy
Policy Focus	All – including Investment managers and institutional investors of all sizes	SRI investment firms, religious groups, charitable foundations & university endowments	UN PRI Signatories or similarly aligned investment managers & asset owners	Climate-focused investors, inclusive of asset managers, asset owners and mutual funds
Orientation	“Best practice” governance standards that promote total, long-term shareholder value & risk mitigation	The "triple bottom line" value creation	United Nations Principles for Responsible Investment (UN PRI)	Widely recognized frameworks, including the Task Force on Climate-related Financial Disclosures (TCFD)
Key Policy Highlights:				
1. <u>Board</u>	Independence (50%), composition, accountability and responsiveness	Independence (50%), composition, accountability and responsiveness - including on ESG topics, diversity	Independence (50%), composition, accountability and responsiveness - including on ESG topics	Independence (50%), composition, accountability and responsiveness - including on ESG topics, with focus on climate-related risk oversight
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1. <u>Environmental & Social</u>	Consider shareholder proposals on social, environmental and labor/human rights issues on a case-by-case basis	Generally support shareholder proposals on social, environmental and labor/human rights issues	Generally support shareholder proposals advocating ESG disclosure or universal norms/codes of conduct	Generally support shareholder proposals promoting greater disclosure of corporate environmental policies and practices
Board Opposition	11%	31%	12%	New for 2020
Auditor Ratification Opposition	0%	6%	0%	New for 2020
Equity Pay Plans Opposition	25%	25%	25%	New for 2020
Say on Pay Opposition	13%	19%	13%	New for 2020
Gov. Share. Proposal Support	75%	91%	90%	New for 2020
E&S Share. Proposal Support	74%	94%	83%	New for 2020



ISS GLOBAL VOTING PRINCIPLES DRIVE BENCHMARK POLICY

Goals: Promote and protect long-term shareholder value and risk mitigation

- Accountability
 - Boards should be accountable to shareholders, the owners of the companies, by holding regular board elections, by providing sufficient information for shareholders to be able to assess directors and board composition, and by providing shareholders with the ability to remove directors. Directors should respond to investor input such as that expressed through vote results on management and shareholder proposals and other shareholder communications.
 - Shareholders should have meaningful rights on structural provisions, such as approval of or amendments to the corporate governing documents and a vote on takeover defenses. In addition, shareholders' voting rights should be proportional to their economic interest in the company; each share should have one vote. In general, a simple majority vote should be required to change a company's governance provisions or to approve transactions.
- Stewardship
 - A company's governance, social, and environmental practices should meet or exceed the standards of its market regulations and general practices and should take into account relevant factors that may impact significantly the company's long-term value creation. Companies and investors should recognize constructive engagement as both a right and a responsibility.



ISS GLOBAL VOTING PRINCIPLES DRIVE BENCHMARK POLICY

Goals: Promote and protect long-term shareholder value and risk mitigation

- Independence
 - Boards should be sufficiently independent so as to ensure that they are able and motivated to effectively supervise management's performance and remuneration, for the benefit of all shareholders. Boards should include an effective independent leadership position and sufficiently independent committees that focus on key governance concerns such as audit, compensation, and the selection and evaluation of directors.
- Transparency
 - Companies should provide sufficient and timely information that enables shareholders to understand key issues, make informed vote decisions, and effectively engage with companies on substantive matters that impact shareholders' long-term interests in the company.



DUAL OBJECTIVES DRIVE ISS' SRI VOTING POLICY

Goals: Socially responsible investors have dual objectives—financial and social

- Socially responsible investors invest for economic gain, as do all investors, but they also require that the companies in which they invest conduct their business in a socially and environmentally responsible manner. These dual objectives carry through to socially responsible investors' proxy voting activity once the security selection process is completed. In voting their shares, socially responsible institutional shareholders are concerned not only with sustainable economic returns to shareholders and good corporate governance but also with the ethical behavior of corporations and the social and environmental impact of their actions.
- ISS has, therefore, developed SRI proxy voting guidelines that are consistent with the dual objectives of socially responsible shareholders. On matters of social and environmental import, the guidelines seek to reflect a broad consensus of the socially responsible investing community. These generally take as a frame of reference the policies that have been developed by groups such as the Interfaith Center on Corporate Responsibility (ICCR), the General Board of Pension and Health Benefits of the United Methodist Church, Domini Social Investments, and other leading church shareholders and socially responsible mutual funds.
- They also incorporate the active ownership and investment philosophies of leading globally recognized initiatives such as the United Nations Environment Programme Finance Initiative (UNEP FI), the United Nations Principles for Responsible Investment (UNPRI), the United Nations Global Compact, and environmental and social European Union Directives.



ESG INTEGRATION DRIVES ISS' SUSTAINABILITY VOTING POLICY

Goals: Incorporating ESG performance into investment decision-making and proxy voting allows for a more comprehensive understanding of the overall risk profile of portfolio companies to ensure sustainable long-term profitability

- Sustainability-minded investors seek standardized reporting on ESG issues, request information regarding an issuer's adoption of, or adherence to, relevant norms, standards, codes of conduct or universally recognized international initiatives including affirmative support for related shareholder resolutions advocating enhanced disclosure and transparency.
- ISS' Sustainability Proxy Voting Guidelines ISS has developed proxy voting guidelines that are consistent with the objectives of sustainability-minded investors and fiduciaries. On matters of ESG import, ISS' Sustainability Policy seeks to promote support for recognized global governing bodies promoting sustainable business practices advocating for stewardship of environment, fair labor practices, non-discrimination, and the protection of human rights.
- Generally, ISS' Sustainability Policy takes as its frame of reference internationally recognized sustainability-related initiatives such as the United Nations Environment Programme Finance Initiative (UNEP FI), United Nations Principles for Responsible Investment (UNPRI), United Nations Global Compact, Global Reporting Initiative (GRI), Carbon Principles, International Labour Organization Conventions (ILO), CERES Roadmap for Sustainability, Global Sullivan Principles, MacBride Principles, and environmental and social European Union Directives. Each of these efforts promote a fair, unified and productive reporting and compliance environment which advances positive corporate ESG actions that promote practices that present new opportunities or that mitigate related financial and reputational risks.



LONG-TERM CLIMATE RISKS DRIVE ISS' CLIMATE VOTING POLICY

Using proxy voting to help actively manage and mitigate exposure to climate-related risks

- In response to investor demand to be able to address climate change-related concerns through voting, ISS has developed a climate-focused specialty proxy voting policy. ISS' extensive and unique climate data and proprietary research along with issue expertise is used to provide a model for assessment of a company's climate-related performance and disclosures that, in turn, is used to inform climate-based proxy voting recommendations for subscribing clients.
- The model draws on widely recognized frameworks including the Task Force on Climate-related Financial Disclosures (TCFD) and balances the need for good disclosure on climate-related-risks with a company's performance on key climate-related factors. It includes a view on a company's greenhouse gas (GHG) emissions, its climate strategy, and the impact of its activities on climate, putting these into context within its sector and incident-based climate risk exposure. Factors used to evaluate a company's climate-related performance fall under five primary categories: climate norms violations; disclosure indicators; current performance indicators including greenhouse gas emissions data; future performance indicators drawing from the ISS Carbon Risk Classification (CRR); and Carbon Risk Classification. The factors are used to assess a company's risks associated with the impacts of climate change, along with its preparedness to face and mitigate those risks in an increasingly carbon-restricted economy.
- The model's expectations used to assess performance practices are defined by industry groups, based on the specific climate risks identified in industry and multi-stakeholder initiatives and reflected in authoritative standards such as the Global Reporting Initiative, the Sustainability Accounting Standards Board standards, and TCFD recommendations. In cases of assessed underperformance, ISS' Climate Policy will provide relevant information, flags, and voting recommendations.



WHAT DOES “ESG” STAND FOR IN 2020?

Focus is on the risks raised by environmental, social and governance concerns

- Shareholder proposals generally not overly prescriptive or unduly burdensome
- Many proponents are institutional investors including asset owners
- R-Cubed Proposal Model—**R**ecommendations for **R**eports on **R**isks
 - **E**nvironmental = Climate Change, Water Use, Pollution and Renewables
 - **S**ocial = Sustainability, Supply Chain, Political Spending & Lobbying, Opioids, Human Capital and Data Privacy
 - **G**overnance = Board Refreshment/Diversity, Skill Sets and Risk Management Oversight
- Boards negotiated withdrawals of roughly half of E&S proposals
- Number of ballots cast as “abstain” on E&S issues approaching zero
- Support is up!—16 majority votes on US E&S resolutions so far in 2020



WHAT DOES “ESG” STAND FOR IN 2020?

16 proposals addressing a wide range of ESG concerns have received majority support so far in 2020

Company	Issue	Sponsor	Votes Cast FOR	Meeting Date
Johnson & Johnson	Report on Governance Measures Implemented Related to Opioids	Bright Start College Savings Trust	60.9	2020-04-23
J.B. Hunt Transport Services	Report on Climate Change Initiatives	The Trillium Small/Mid Cap Fund, Community Environmental Council, Threshold Foundation, Episcopal City Mission, Timken Matthews Family Foundation	54.5	2020-04-23
Ovintiv	Report on Climate Change	Pension Plan of The United Church of Canada	56.4	2020-04-29
Enphase Energy	Report on Sustainability	Undisclosed	52.3	2020-05-20
Phillips 66	Report on Risks of Gulf Coast Petrochemical Investments	As You Sow Foundation	54.7	2020-05-06
Chevron	Report on Climate Lobbying Aligned with Paris Agreement Goals	BNP Paribas Asset Management	53.5	2020-05-27
Centene	Report on Political Contributions	Friends Fiduciary Corporation	51.4	2020-04-28
J.B. Hunt Transport Services	Report on Political Contributions	The International Brotherhood of Teamsters General Fund	53.2	2020-04-23
Western Union	Report on Political Contributions Disclosure	Chevedden, John	53.3	2020-05-14
Fastenal	Prepare Employment Diversity Report	As You Sow Foundation	61.1	2020-04-25
Genuine Parts	Report on EEO	Lutra Living Trust, As You Sow Foundation	79.1	2020-04-27
Chipotle Mexican Grill	Report on Employment-Related Arbitration	Comptroller of the State of New York	51	2020-05-19
Alaska Air Group	Report on Lobbying Payments and Policy	Service Employees International Union	52.3	2020-05-07
Expeditors International of Washington	Adopt a Policy on Board Diversity	Comptroller of the City of New York	52.9	2020-05-05
National HealthCare Corporation	Report on Plans to Increase Board Diversity	Comptroller of the State of New York	59.2	2020-05-07
O'Reilly Automotive	Report on Material Human Capital Risks	Miller, Terry L Miller, Debra Shank	66	2020-05-14



ISS BENCHMARK VOTING POLICY APPROACH TO E&S PROPOSALS

Overall principle guiding all vote recommendations on E&S issues focuses on how the proposal may enhance or protect shareholder value in either the short- or long-term

- Generally vote CASE-BY-CASE, examining primarily whether implementation of the proposal is likely to enhance or protect shareholder value. The following factors will be considered:
 - Proper Forum: If the issues presented in the proposal are more appropriately or effectively dealt with through legislation or government regulation;
 - Substantially Implemented: If the company has already responded in an appropriate and sufficient manner to the issue(s) raised in the proposal;
 - Unduly Burdensome/Overly Prescriptive: Whether the proposal's request is unduly burdensome (scope or timeframe) or overly prescriptive;
 - Peer Comparison: The company's approach compared with any industry standard practices for addressing the issue(s) raised by the proposal;
 - Norms-based Evidence: Whether there are significant controversies, fines, penalties, or litigation associated with the company's environmental or social practices;
 - Other Public Sources Available: If the proposal requests increased disclosure or greater transparency, whether reasonable and sufficient information is currently available to shareholders from the company or from other publicly available sources; and
 - Proprietary/Confidential Information: If the proposal requests increased disclosure or greater transparency, whether implementation would reveal proprietary or confidential information that could place the company at a competitive disadvantage.



ISS' SRI VOTING POLICY APPROACH TO E&S PROPOSALS

Generally supports E&S shareholder proposals

- Generally vote FOR social and environmental shareholder proposals that promote good corporate citizens while enhancing long-term shareholder and stakeholder value. Vote for reports that seek additional information particularly when it appears companies have not adequately addressed shareholders' social, workforce, and environmental concerns. In determining vote recommendations on shareholder social, workforce, and environmental proposals, Social Advisory Services will analyze the following factors:
 - Whether the proposal itself is well framed and reasonable;
 - Whether adoption of the proposal would have either a positive or negative impact on the company's short- or long-term share value;
 - Whether the company's analysis and voting recommendation to shareholders is persuasive;
 - The degree to which the company's stated position on the issues could affect its reputation or sales, or leave it vulnerable to boycott or selective purchasing;
 - Whether the subject of the proposal is best left to the discretion of the board;
 - Whether the issues presented in the proposal are best dealt with through legislation, government regulation, or company-specific action;
 - The company's approach compared with its peers or any industry standard practices for addressing the issue(s) raised by the proposal;
 - Whether the company has already responded in an appropriate or sufficient manner to the issue(s) raised in the proposal;
 - Whether there are significant controversies, fines, penalties, or litigation associated with the company's environmental or social practices;
 - If the proposal requests increased disclosure or greater transparency, whether sufficient information is publicly available to shareholders and whether it would be unduly burdensome for the company to compile and avail the requested information to shareholders in a more comprehensive or amalgamated fashion;
 - Whether implementation of the proposal would achieve the objectives sought in the proposal.



ISS' SUSTAINABILITY VOTING POLICY APPROACH TO E&S PROPOSALS

Focus on proposals seeking transparency and adherence to recognized standards and principles

- Sustainability Policy generally supports standards-based ESG shareholder proposals that enhance long-term shareholder and stakeholder value while aligning the interests of the company with those of society at large. In particular, the policy will focus on resolutions seeking greater transparency and/or adherence to internationally recognized standards and principles. In determining our vote recommendation on standardized ESG reporting shareholder proposals, we also analyze the following factors:
 - Whether the proposal itself is well framed and reasonable;
 - Whether adoption of the proposal would have either a positive or negative impact on the company's short-term or long-term share value;
 - The percentage of sales, assets and earnings affected;
 - Whether the company has already responded in some appropriate manner to the request embodied in a proposal;
 - Whether the company's analysis and voting recommendation to shareholders is persuasive;
 - Whether there are significant controversies, fines, penalties, or litigation associated with the company's environmental or social practices;
 - What other companies have done in response to the issue addressed in the proposal;
 - Whether implementation of the proposal would achieve the objectives sought in the proposal; and
 - The degree to which the company's stated position on the issues raised in the proposal could affect its reputation or sales, or leave it vulnerable to a boycott or selective purchasing.



ISS' CLIMATE VOTING POLICY APPROACH TO E&S PROPOSALS

Similar approach to Sustainability Policy

- Climate Policy generally supports standards-based ESG shareholder proposals that enhance long-term shareholder and stakeholder value while aligning the interests of the company with those of society at large. In particular, the policy will focus on resolutions seeking greater transparency and/or adherence to internationally recognized standards and principles. In determining our vote recommendation on standardized ESG reporting shareholder proposals, we also analyze the following factors:
 - Whether the proposal itself is well framed and reasonable;
 - Whether adoption of the proposal would have either a positive or negative impact on the company's short-term or long-term share value;
 - The percentage of sales, assets and earnings affected;
 - Whether the company has already responded in some appropriate manner to the request embodied in a proposal;
 - Whether the company's analysis and voting recommendation to shareholders is persuasive;
 - Whether there are significant controversies, fines, penalties, or litigation associated with the company's environmental or social practices;
 - What other companies have done in response to the issue addressed in the proposal;
 - Whether implementation of the proposal would achieve the objectives sought in the proposal; and
 - The degree to which the company's stated position on the issues raised in the proposal could affect its reputation or sales, or leave it vulnerable to a boycott or selective purchasing.



Questions

- Thank you
- Pat McGurn
- patrick.mcgurn@issgovernance.com
- Chris Miller
- christopher.miller@issgovernance.com



Callan

June 18, 2020



ARMB Board Meeting

Preliminary Investment Performance
Periods Ended March 31, 2020

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

Global Economic Update 2020

The big picture

Markets faced unprecedented disruption in Q1 as the COVID-19 virus caused global economies to grind to a halt

- Governments urged their citizens to practice social distancing and many temporarily shut down businesses deemed "non-essential"
- The result was a precipitous drop in economic activity and an equally dramatic surge in unemployment
- The unemployment rate surged to 14.7% in April, reflecting the steepest monthly decline in jobs on record dating back to 1939. The unemployment rate was 4.4% in March and 3.5% in February.
- Over 36 million Americans have filed for unemployment insurance in the eight week period ending May 9.
- The Transport Security Administration (TSA) reported a 95% year-over-year decline in airline passengers as of April 7th.
- Oil prices fell 65% in the first quarter as a result of both demand and supply shocks.

Governments stepped in quickly with immediate monetary response and fiscal stimulus

- Fed Chairman Powell: "We'll do whatever it takes." The Fed has been able to leverage policy playbook following GFC
- The Federal Reserve cut policy rates to the lower bound of 0% to 0.25% and expanded asset purchasing programs to bolster liquidity and stabilize the financial markets
- The CARES Act provides over \$2 trillion in aid targeted at assisting small businesses and individuals

Broad economic impact

- Initial estimate of first quarter GDP down 4.8%, end of 11 year expansion
- Companies/Organizations: Stresses to revenue, earnings, economic viability, access to capital, recovery
- Individuals: Unemployment, income, wealth, retirement savings
- Governments: Increasing service burden, declining tax revenues

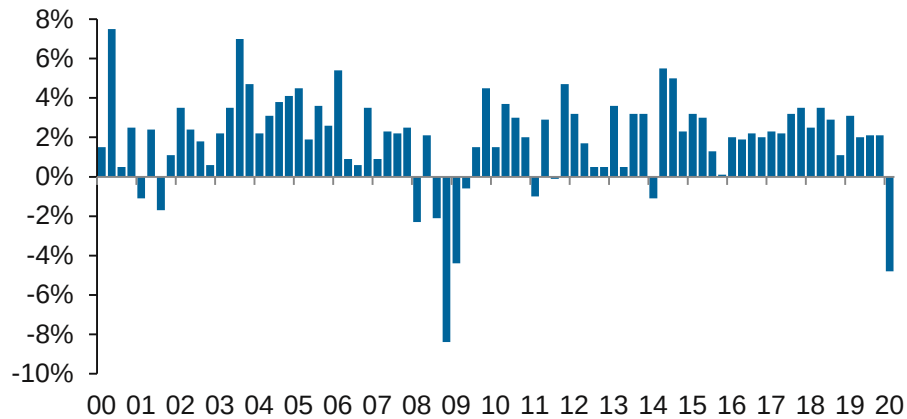
A true recovery is likely only to be realized once a vaccine is introduced

- Government support can only alleviate the economic symptoms caused by the virus

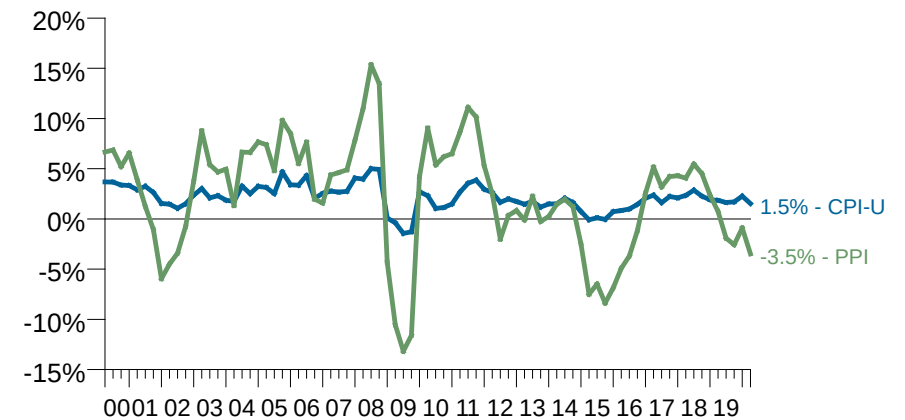
U.S. Economy—Summary

For periods ended March 31, 2020

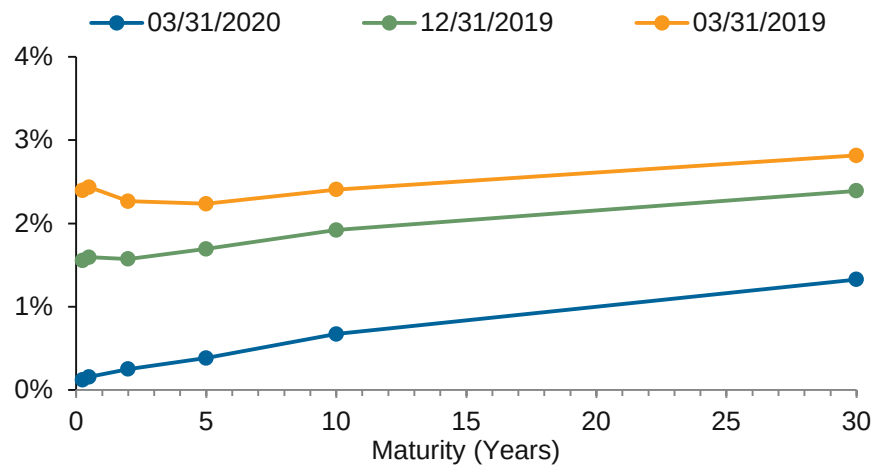
Quarterly Real GDP Growth



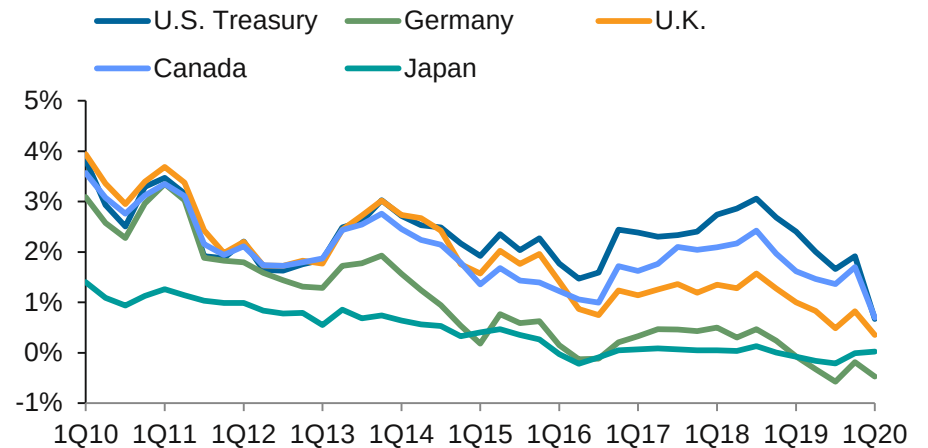
Inflation Year-Over-Year



U.S. Treasury Yield Curves



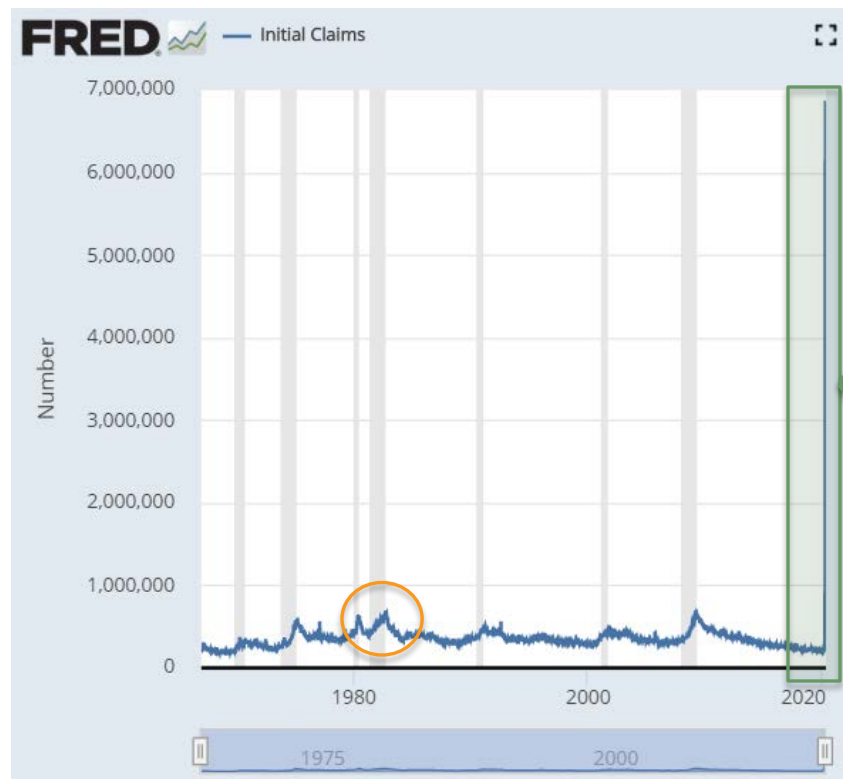
10-Year Global Government Bond Yields



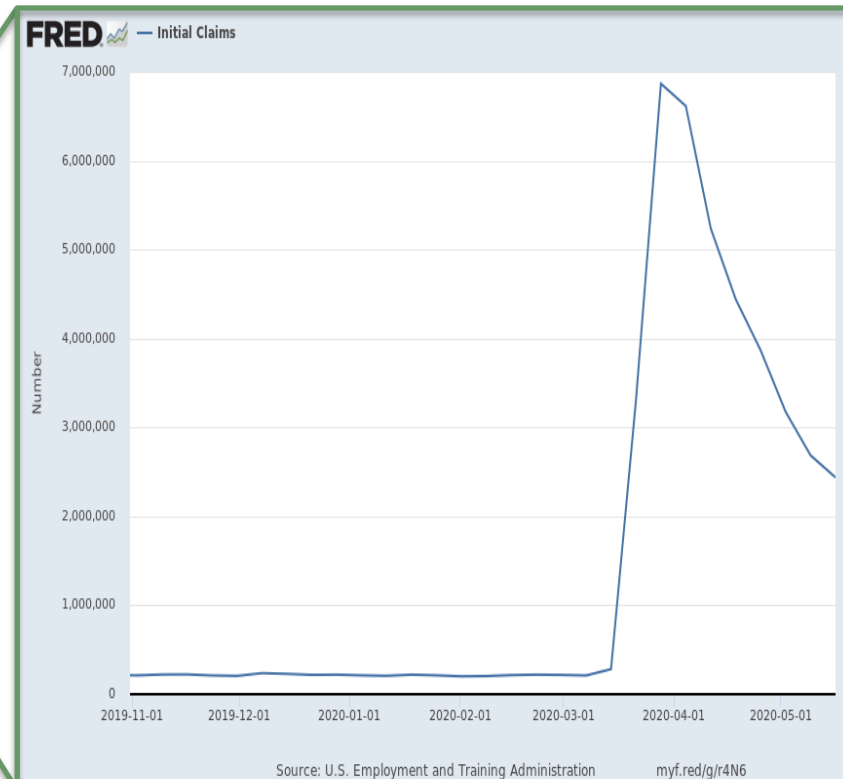
Sources: Bloomberg, Bureau of Labor Statistics, Callan

Unemployment Is Skyrocketing as Businesses Shut Down

Historical Initial Unemployment Claims



Recent Initial Unemployment Claims



Source: St. Louis FRED

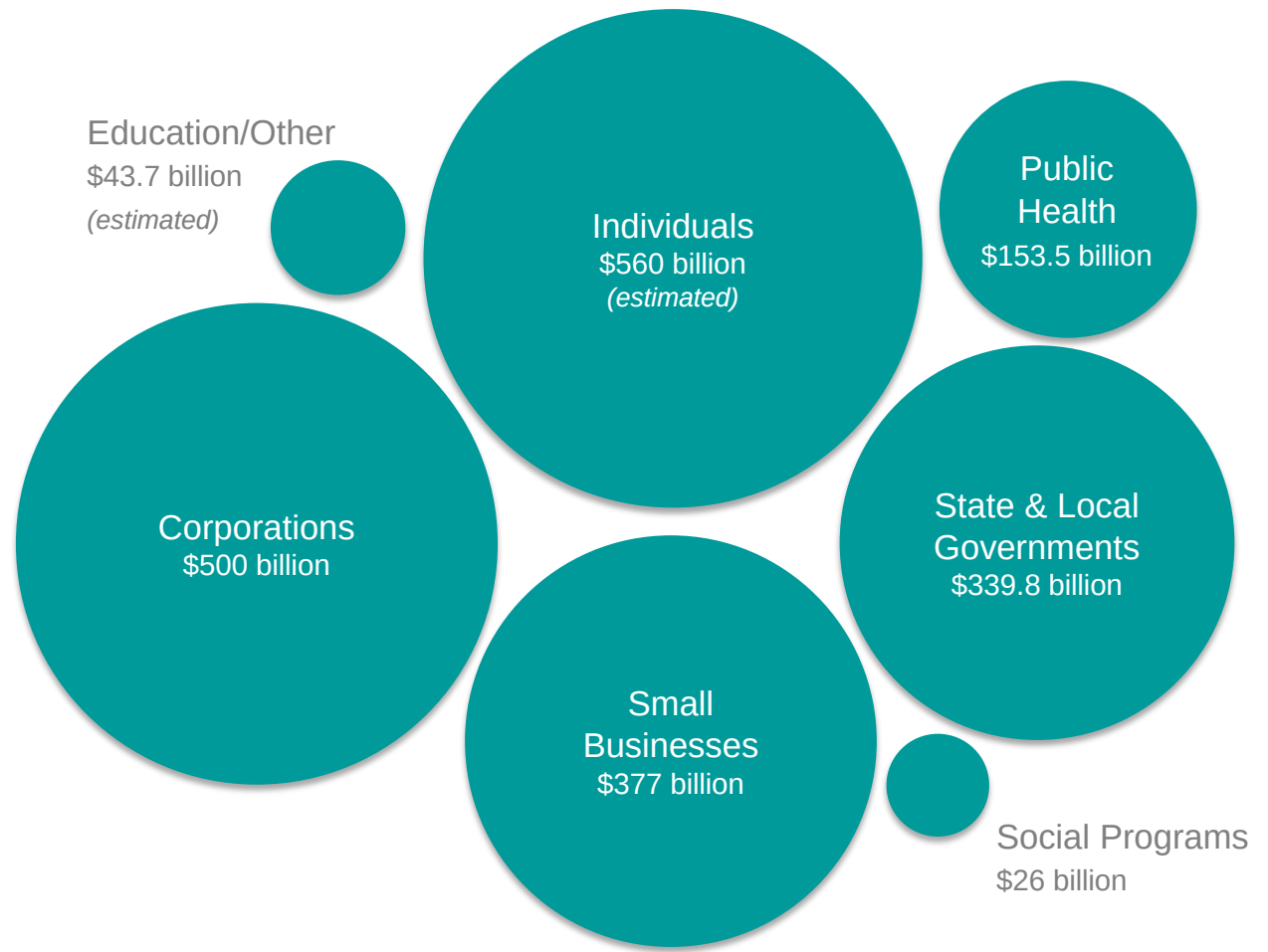
- Initial unemployment claims have skyrocketed:
 - 2.4 M week ending May 16
 - 2.7 M week ending May 9
 - 3.2 M week ending May 2
 - 3.9 M week ending April 25
 - 4.4 M week ending April 18
 - 5.2 M week ended April 11
 - 6.6 M week ended April 4
 - 6.9 M week ended March 28
 - 3.3 M week ending March 21
- Over 38 million jobs lost in the last ten weeks ending May 16, more than all the jobs added since the GFC
- April unemployment rate rose to a record 14.7%

2020 CARES Act Injects \$2.3 Trillion in Fiscal Stimulus

The stimulus equates to roughly 10% of GDP

- Expanded Unemployment Benefits
 - *Relaxed qualifications*
 - *Additional \$600 per week for up to four months*
 - *Potential for 13 weeks of federal benefits after state benefits exhausted*
- Cash Distributions
 - *Up to \$1,200 for individuals*
- Student Loan Relief
 - *Suspended payments and interest for some federal student loans*
 - *More flexibility for federal education grants*
 - *Tax-free employer loan payments*
- Defined Contribution Plan Liquidity
 - *Relaxation of distribution taxes*
 - *Expansion of loan amounts*
- Roughly \$58 billion in airline industry relief
- \$377 billion in small business loans, grants, and loan relief funds
- Federally backed home loan forbearance

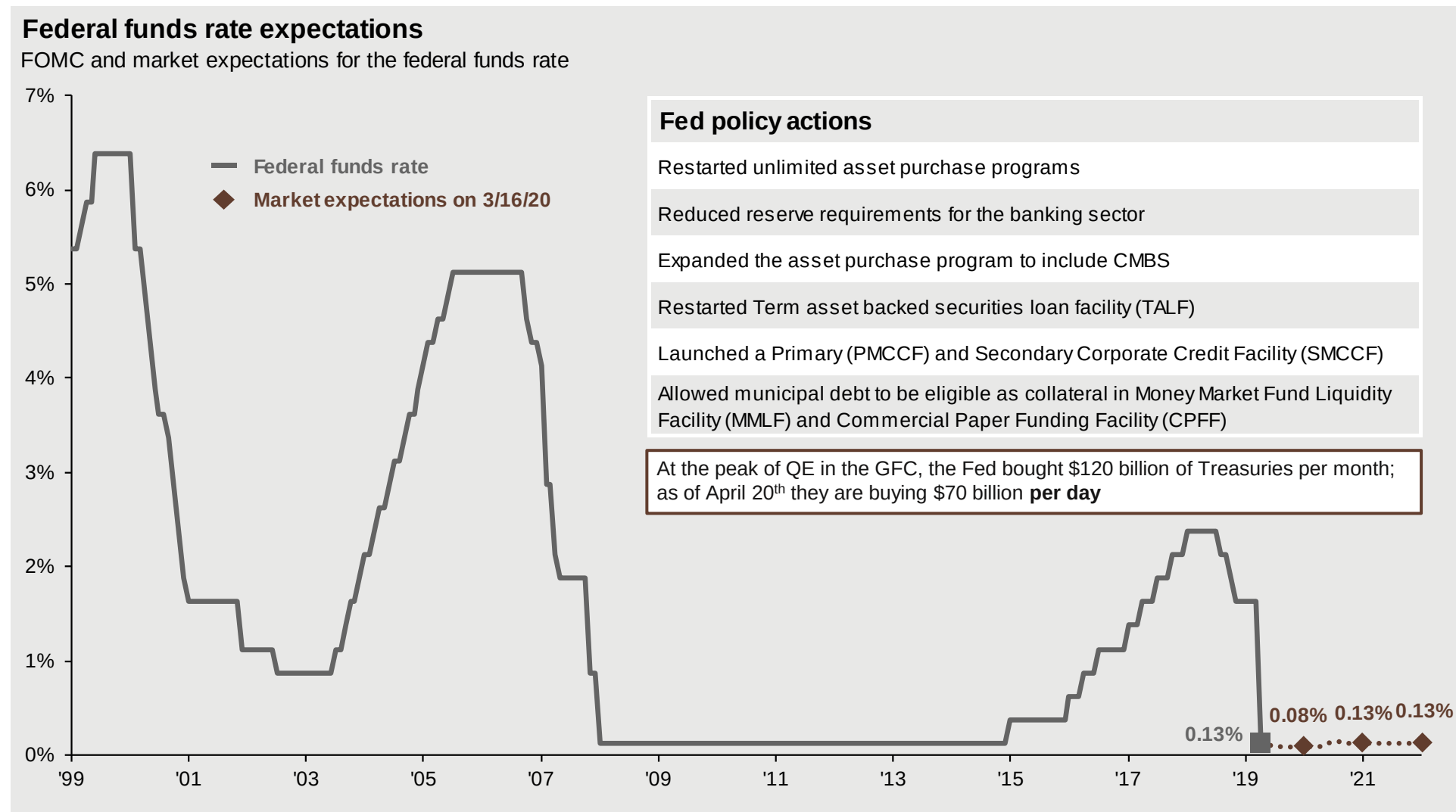
Distribution of the \$2+ Trillion from the CARES Act



Source: NPR.org

Federal Reserve Policy Actions

Federal Funds Rate is set at the lower bound (0.0% to 0.25%)



Source: Bloomberg, FactSet, Federal Reserve, J.P. Morgan Asset Management.

Market expectations are the federal funds rates priced into the fed futures market as of the following date of the March 15, 2020 emergency cut and are through December 2022.

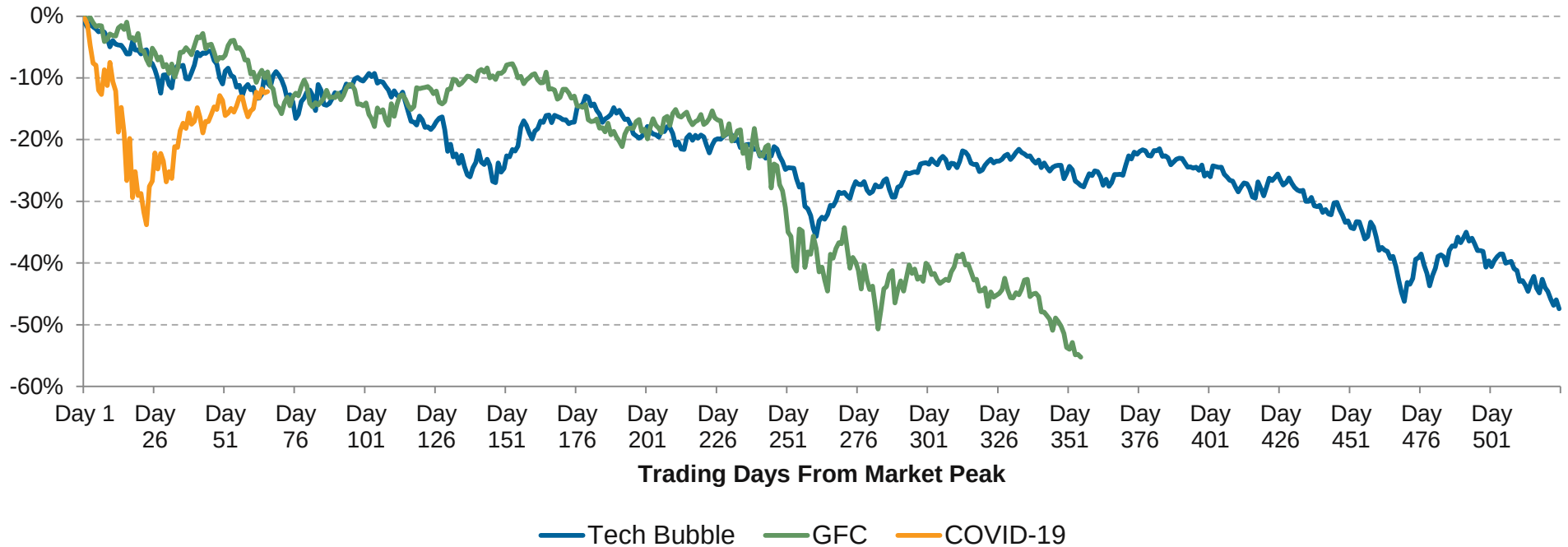
Guide to the Markets – U.S. Data are as of April 15, 2020.

A Rapid and Severe Drawdown

A “Global Hurricane” in the form of a pandemic.

S&P 500 Index Cumulative Returns

Market Peak-to-Trough for Last Two Corrections vs.
Current Path of COVID-19 Correction Through 5/22/20



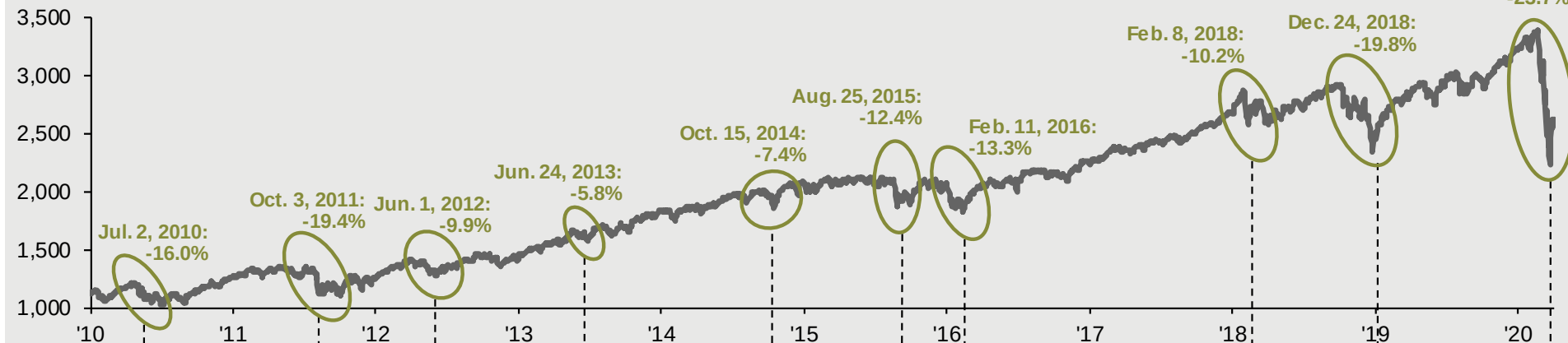
- The sharpest and fastest equity market decline ever: 16 trading days to reach bear market (-20%); -34% after just 23 days
- It took equities 130 days to hit bear market territory during the tech bubble and 191 days in the GFC

Unprecedented Spike in Volatility

VIX reaches record high of 82.69

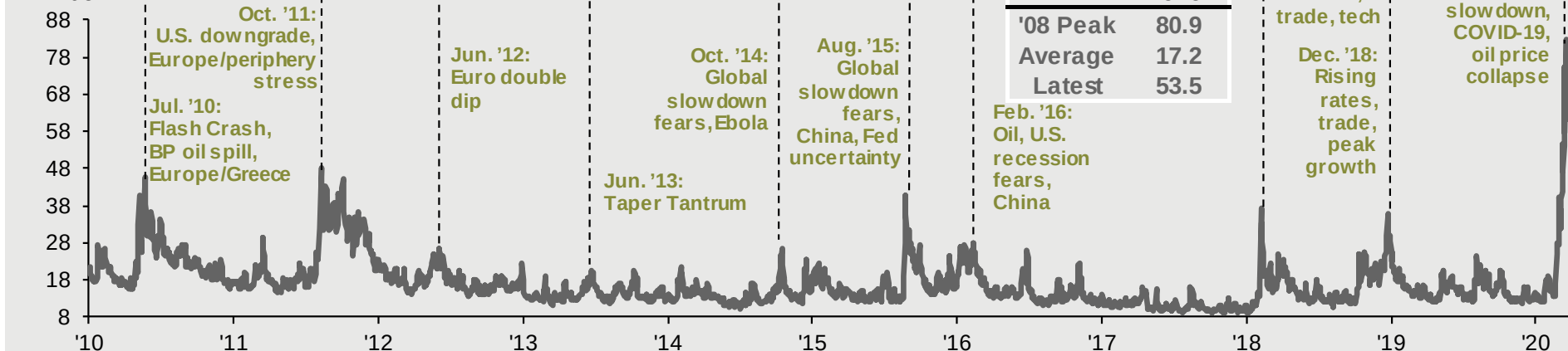
Major pullbacks since the Financial Crisis

S&P 500 Price index



Volatility

VIX Index



VIX	Level
'08 Peak	80.9
Average	17.2
Latest	53.5

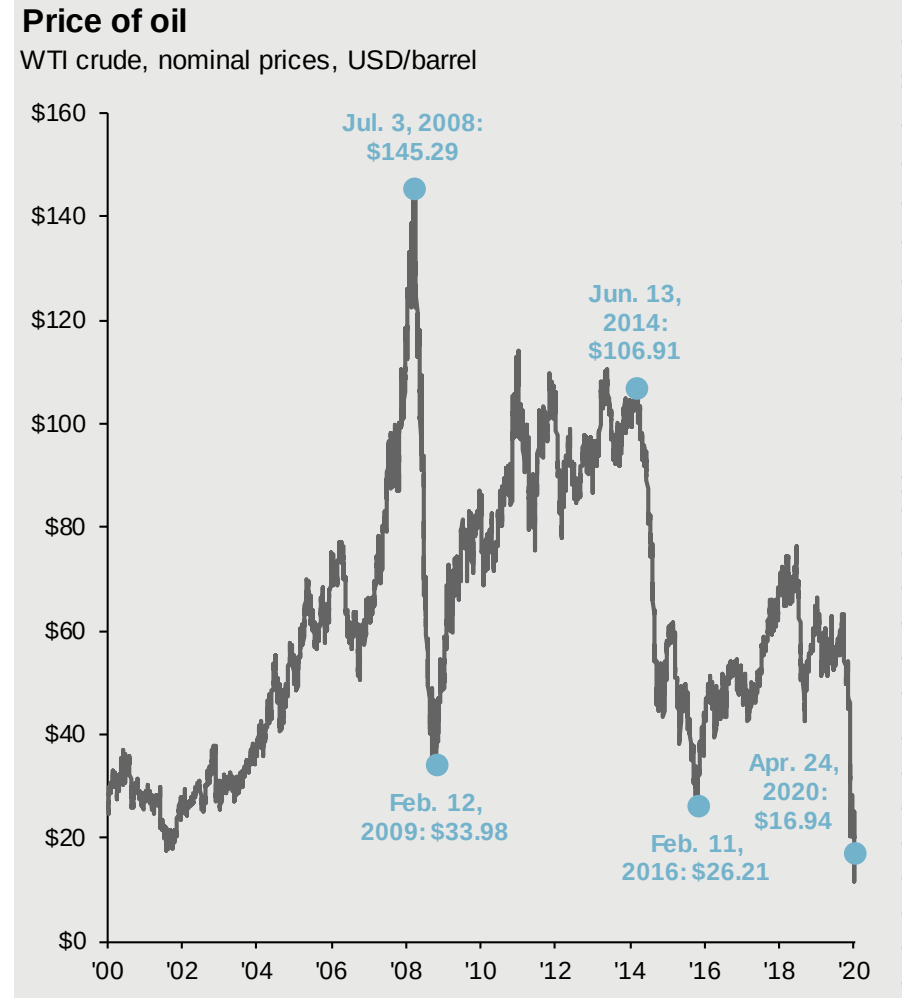
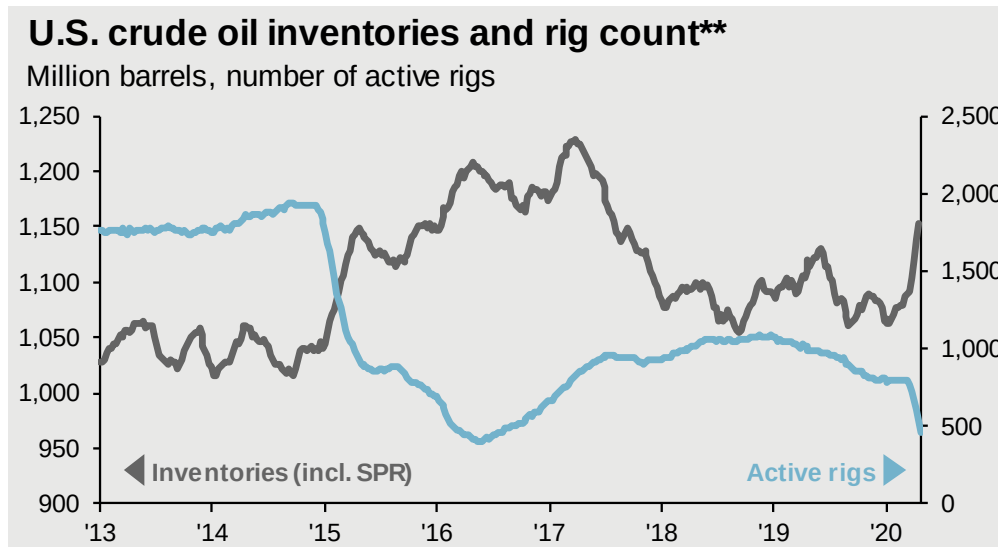
Source: CBOE, FactSet, Standard & Poor's, J.P. Morgan Asset Management.

Drawdowns are calculated as the prior peak to the lowest point.

Guide to the Markets – U.S. Data are as of March 31, 2020.

Oil Prices Collapse

- The price of oil plummeted 65% in the first quarter
- Slowing demand as a result of COVID-19 was exacerbated by supply issues as Russia and Saudi Arabia failed to agree on production limits
- On April 20th, WTI crude futures prices for May delivery dropped below -\$37/bl as technical factors collided with scarce storage capacity



Source: J.P. Morgan Asset Management; (left) EIA; (Right) FactSet; (Bottom left) Baker Hughes.

**U.S. crude oil inventories include the Strategic Petroleum Reserve (SPR). Active rig count includes both natural gas and oil rigs. WTI crude prices are continuous contract NYM prices in USD.

Guide to the Markets – U.S. Data are as of April 24, 2020.

Callan Periodic Table of Investment Returns

Trailing periods as of March 31, 2020

Annual Returns					Trailing Periods				Monthly Returns			
2015	2016	2017	2018	2019	1-Year	3-Year	5-Year	10-Year	Jan 2020	Feb 2020	Mar 2020	YTD 2020
Large Cap Equity	Small Cap Equity	Emerging Market Equity	U.S. Fixed Income	Large Cap Equity	U.S. Fixed Income	Large Cap Equity	Large Cap Equity	Large Cap Equity	U.S. Fixed Income	U.S. Fixed Income	U.S. Fixed Income	U.S. Fixed Income
1.38%	21.31%	37.28%	0.01%	31.49%	8.93%	5.10%	6.73%	10.53%	1.92%	1.80%	-0.59%	3.15%
U.S. Fixed Income	High Yield	Dev ex-U.S. Equity	High Yield	Small Cap Equity	Global ex-U.S. Fixed Income	U.S. Fixed Income	U.S. Fixed Income	Small Cap Equity	Real Estate	Global ex-U.S. Fixed Income	Global ex-U.S. Fixed Income	Global ex-U.S. Fixed Income
0.55%	17.13%	24.21%	-2.08%	25.52%	0.74%	4.82%	3.36%	6.90%	0.84%	-0.20%	-3.22%	-2.68%
Real Estate	Large Cap Equity	Large Cap Equity	Global ex-U.S. Fixed Income	Dev ex-U.S. Equity	High Yield	Global ex-U.S. Fixed Income	High Yield	High Yield	Global ex-U.S. Fixed Income	High Yield	High Yield	High Yield
-0.79%	11.96%	21.83%	-2.15%	22.49%	-6.94%	2.57%	2.78%	5.64%	0.76%	-1.41%	-11.46%	-12.68%
Dev ex-U.S. Equity	Emerging Market Equity	Small Cap Equity	Large Cap Equity	Real Estate	Large Cap Equity	High Yield	Global ex-U.S. Fixed Income	Real Estate	High Yield	Emerging Market Equity	Large Cap Equity	Large Cap Equity
-3.04%	11.19%	14.65%	-4.38%	21.91%	-6.98%	0.77%	2.04%	4.40%	0.03%	-5.27%	-12.35%	-19.60%
Small Cap Equity	Real Estate	Global ex-U.S. Fixed Income	Real Estate	Emerging Market Equity	Dev ex-U.S. Equity	Emerging Market Equity	Small Cap Equity	U.S. Fixed Income	Large Cap Equity	Large Cap Equity	Dev ex-U.S. Equity	Dev ex-U.S. Equity
-4.41%	4.06%	10.51%	-5.63%	18.44%	-14.89%	-1.62%	-0.25%	3.88%	-0.04%	-8.23%	-14.12%	-23.26%
High Yield	Dev ex-U.S. Equity	Real Estate	Small Cap Equity	High Yield	Emerging Market Equity	Dev ex-U.S. Equity	Emerging Market Equity	Dev ex-U.S. Equity	Dev ex-U.S. Equity	Real Estate	Emerging Market Equity	Emerging Market Equity
-4.47%	2.75%	10.36%	-11.01%	14.32%	-17.69%	-2.07%	-0.36%	2.43%	-1.94%	-8.24%	-15.40%	-23.60%
Global ex-U.S. Fixed Income	U.S. Fixed Income	High Yield	Dev ex-U.S. Equity	U.S. Fixed Income	Real Estate	Real Estate	Dev ex-U.S. Equity	Global ex-U.S. Fixed Income	Small Cap Equity	Small Cap Equity	Small Cap Equity	Real Estate
-6.02%	2.65%	7.50%	-14.09%	8.72%	-23.97%	-3.85%	-0.76%	1.39%	-3.21%	-8.42%	-21.73%	-28.53%
Emerging Market Equity	Global ex-U.S. Fixed Income	U.S. Fixed Income	Emerging Market Equity	Global ex-U.S. Fixed Income	Small Cap Equity	Small Cap Equity	Real Estate	Emerging Market Equity	Emerging Market Equity	Dev ex-U.S. Equity	Real Estate	Small Cap Equity
-14.92%	1.49%	3.54%	-14.57%	5.09%	-23.99%	-4.64%	-2.06%	0.69%	-4.66%	-8.88%	-22.76%	-30.61%

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

U.S. Equity: COVID-19 Decimates U.S. Equity Returns

Cyclicals punished; Tech, Staples, and Health Care more resilient

- Energy fell as demand declined and OPEC and Russia refused to cut production, driving down oil prices globally
- Tech fared the best— “FAAMG” stocks averaged -7.9% led by Amazon (+5.5%) and Microsoft (+0.3%)

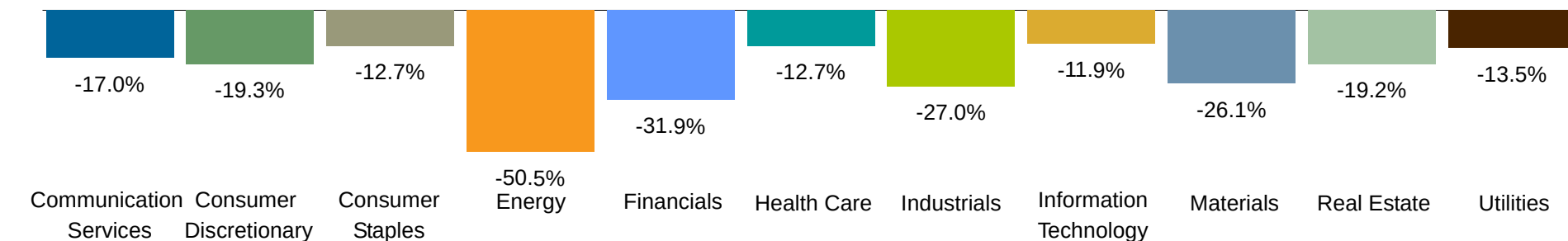
Large cap outpaces small cap for quarter

- Russell 2000 (-30.6%) experienced worst quarter on record
- Perceived safety of larger companies combined with more acute exposure to COVID-19 impact (restaurants, hotels, airlines) drove sell-off
- Russell 2000 Value exposure to Energy (especially E&P companies) and Financials (banks) drove results

Growth outpaces value across market capitalizations

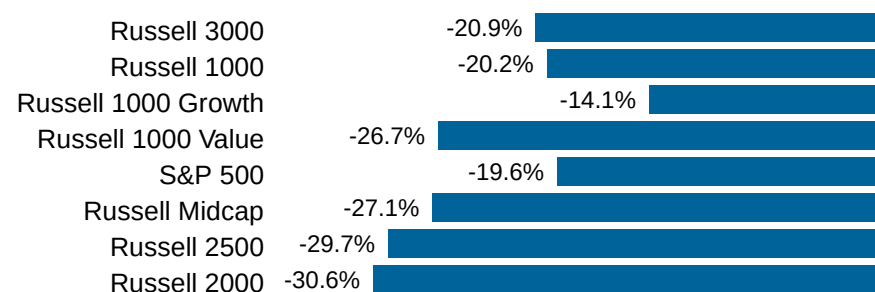
- Spread between Russell 1000 Growth (-14.1%) and Russell 2000 Value (-35.7%) one of widest on record

Economic Sector Quarterly Performance (S&P 500)

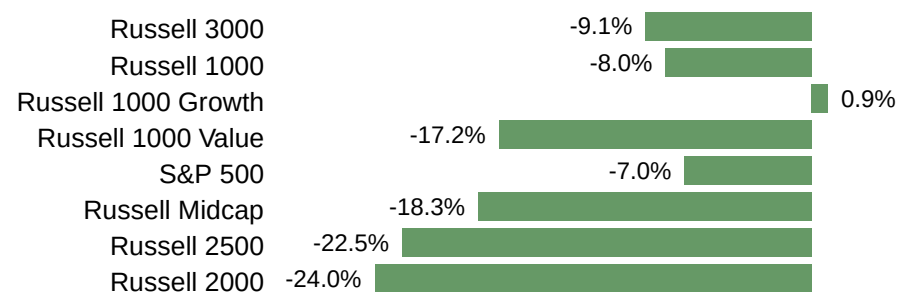


Sources: FTSE Russell, S&P Dow Jones Indices

U.S. Equity: Quarterly Returns



U.S. Equity: One-Year Returns



Global ex-U.S. Equity Performance

Worst sell-off since 2008

- Global economic activity came to a halt with shelter-in-place mandate worldwide
- Decisive actions to contain the outbreak and stimulate the economy allowed China to outperform every developed and developing country

Cyclical sectors imploded

- Energy, Financial, and travel-related industries were derailed by the pandemic and oil price war
- Factor performance favored risk aversion

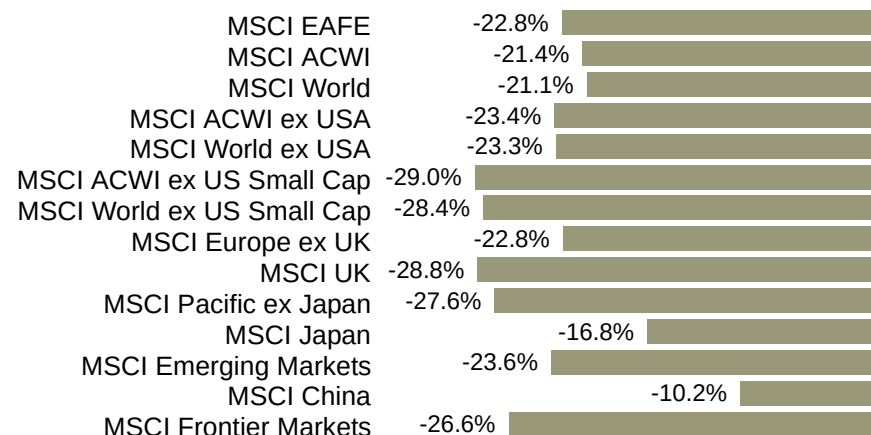
U.S. dollar vs. other currencies

- Safe-haven currencies such as the U.S. dollar, Swiss franc, and yen were bid up as market volatility peaked and outperformed other major currencies

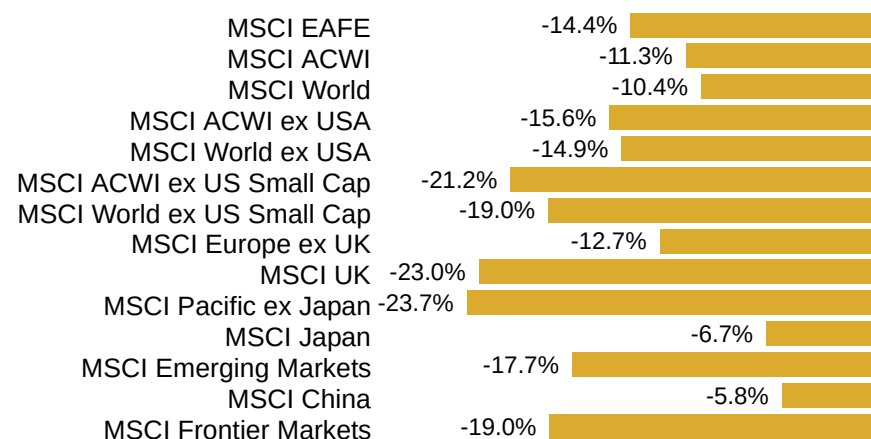
Growth vs. value

- Growth continued to outperform value within markets and capitalizations, supported by Health Care, Consumer Staples, and Information Technology

Global Equity: Quarterly Returns



Global Equity: Annual Returns



Source: MSCI

U.S. Fixed Income Performance

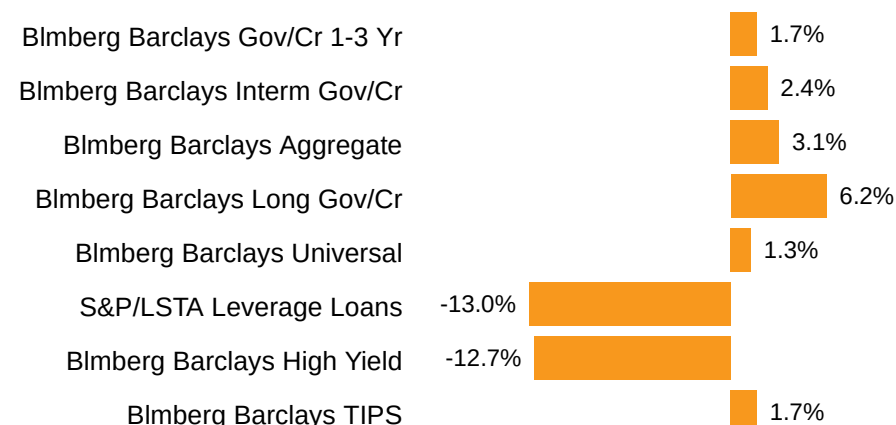
Treasuries rallied as investors sought safety

- The 10-year U.S. Treasury yield reached a low in March of 0.31% before closing the quarter at 0.70%, down sharply from the 2019 year-end level of 1.92%
- The Treasury yield curve steepened as the Fed cut rates to 0% - 0.25%
- TIPS underperformed nominal Treasuries as expectations for inflation sank. The 10-year breakeven spread ended the quarter at 87 bps, down sharply from 177 bps at year-end

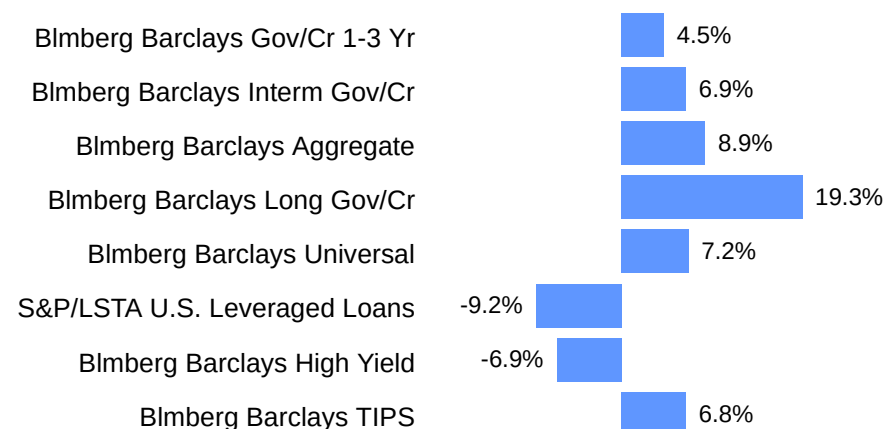
Investors spurned credit risk

- Investment grade and high yield bond funds experienced record outflows as investors flocked to cash
- IG corporate spreads widened by 149 bps to 272 bps, representing the hardest hit sector in the US BB Aggregate Index
 - *Within Industrials, several well-known issuers were downgraded to below investment grade, including Occidental Petroleum and Ford*
- The quality bias was evident as BBB-rated credit (-7.4%) underperformed single A or higher (+0.5%)
- CCC-rated high yield corporates (-20.6%) lagged BB-rated corporates (-10.2%)
- Energy (-38.9%) was the lowest performing high yield bond sub-sector as oil prices collapsed

U.S. Fixed Income: Quarterly Returns



U.S. Fixed Income: Annual Returns



Sources: Bloomberg Barclays, S&P Dow Jones Indices

Real Yields

As of March 31, 2020



Emerging Markets compared to Developed Markets

- The chart to the left shows Emerging Market (EM) and Developed Market (DM) inflation-adjusted yields based on local market inflation expectations.

Divergence in times of market tumult

- In comparison to the DMs, EM real yields spiked during the onset of the COVID-19 crisis.
- This phenomenon is consistent with prior occurrences during periods of market stress.

Current state of real yields

- Real yields EM and DM are near historical lows.

Sources: Eaton Vance, Bloomberg, JP Morgan

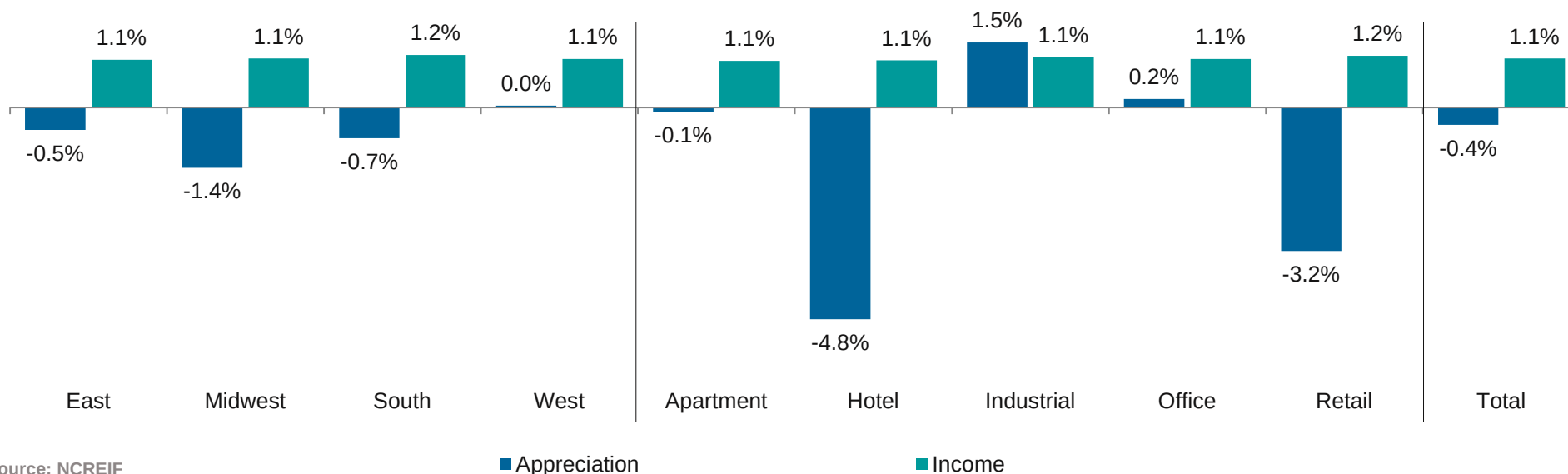
U.S. Private Real Estate Market Trends

Results

- Initial impact of pandemic reflected in Q1 results
- Positive return due to income
- Industrial real estate performed well
- Retail depreciation accelerated this quarter
- Negative returns expected for the second quarter and beyond.

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
NCREIF ODCE	1.0%	4.9%	6.8%	8.5%	11.5%
Appreciation	0.0%	0.7%	2.5%	3.9%	6.3%
Income	1.0%	4.2%	4.2%	4.4%	4.9%
NCREIF Property Index	0.7%	5.3%	6.4%	7.7%	10.2%
Appreciation	-0.4%	0.7%	1.8%	2.9%	5.7%
Income	1.1%	4.5%	4.6%	4.7%	4.6%

NCREIF Property Index Returns by Region and Property Type

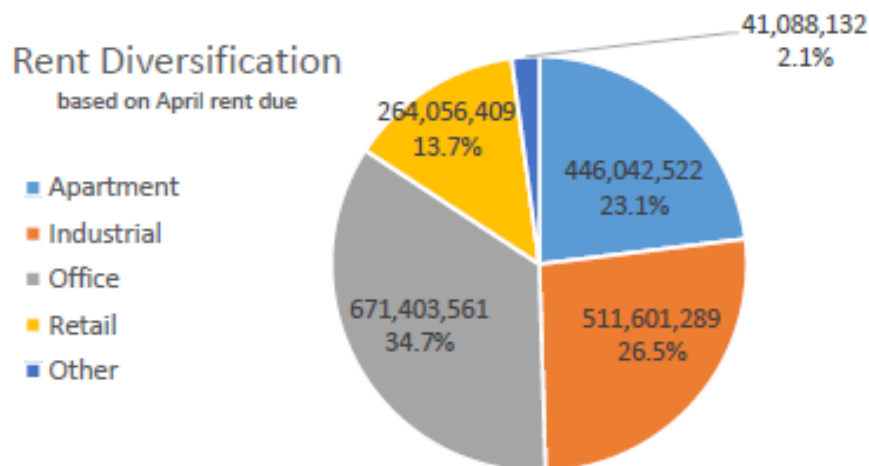


Core Real Estate Fund April Rent Collections

First calendar quarter 2020

NFI-OE Operating Properties

Total Rent Due \$1,934,191,912

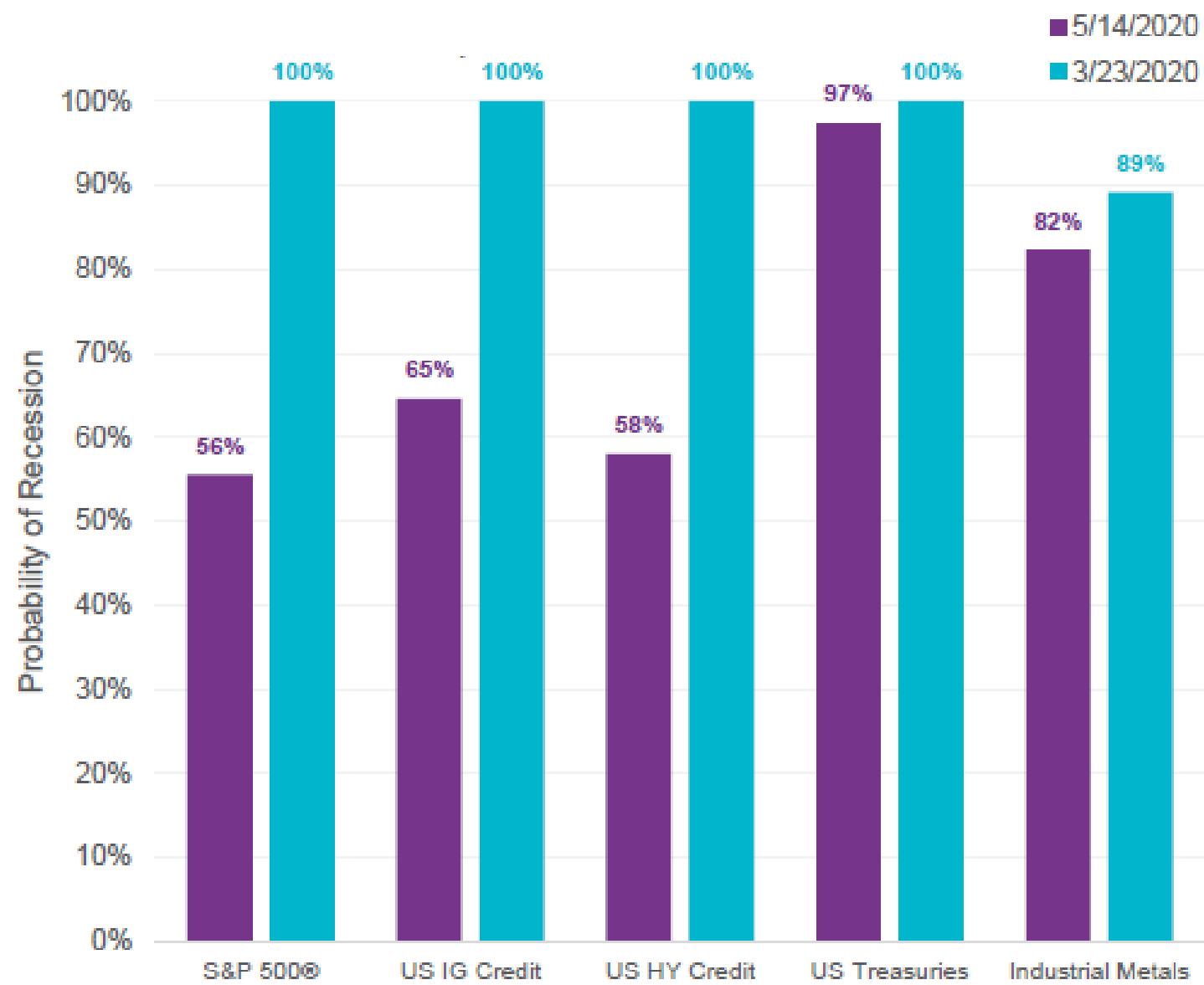


Fund Rent Collection Rates

Percentiles

	⁽¹⁾ Value-weight	⁽²⁾ Equal-weight	(based on ranking fund collection rates)			
			75%	50%	25%	Dispersion
Apartment	91.7%	91.7%	93.7%	92.5%	90.3%	3.4%
Industrial	81.2%	83.1%	88.6%	83.7%	79.5%	7.8%
Office	86.8%	86.3%	90.5%	87.7%	82.1%	7.2%
Retail	36.1%	44.6%	54.1%	42.7%	32.7%	16.2%
Other	89.7%	84.5%	94.7%	89.9%	88.9%	26.8%
Total	79.6%	78.0%	85.7%	79.3%	77.6%	6.0%

Implied Recession Probabilities by Market



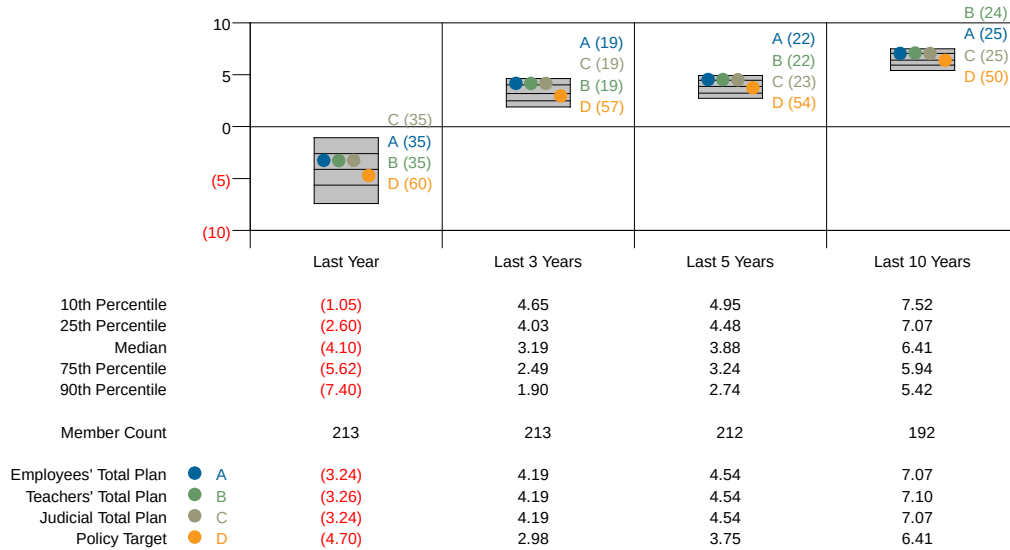
Sources Natixis PRCG, FactSet, Bloomberg. Recession probability for the S&P 500 and Industrial Metals represents drawdown to average peak-to-trough drawdown during recessions. IG and HY probabilities reflect current option-adjusted spread as compared to recessionary and non-recessionary averages. UT Treasuries' probability reflects current change in 5-year yield as compared to average change in a recession.

Callan

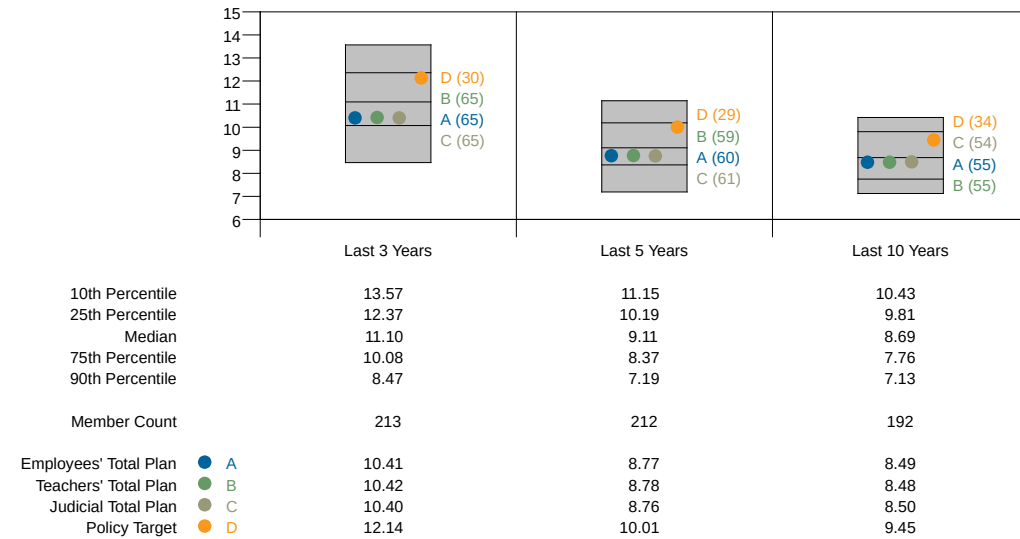
Pension Plan

PERS, TRS, and JRS Performance Dashboard – March 31, 2020

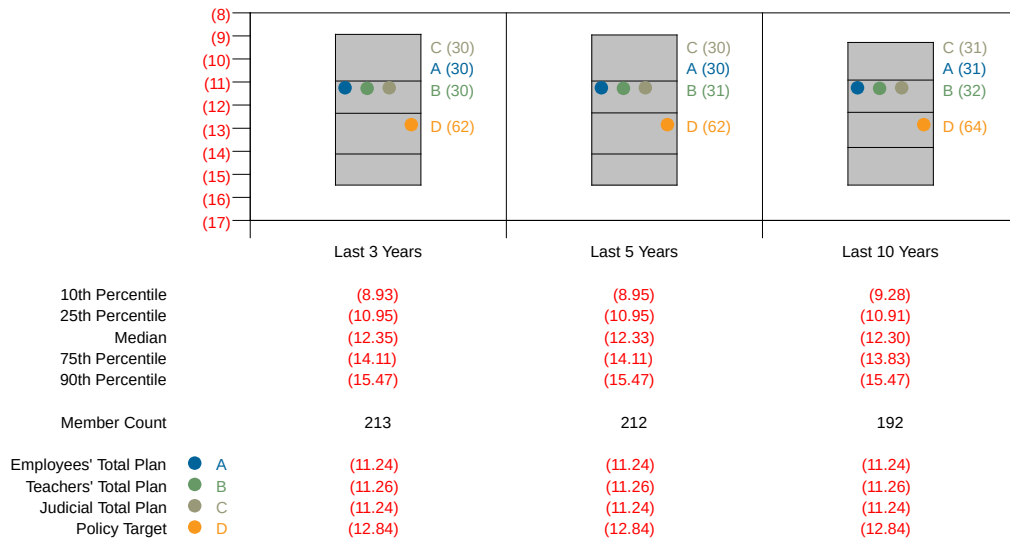
Returns vs Callan Public Fund Sponsor Database



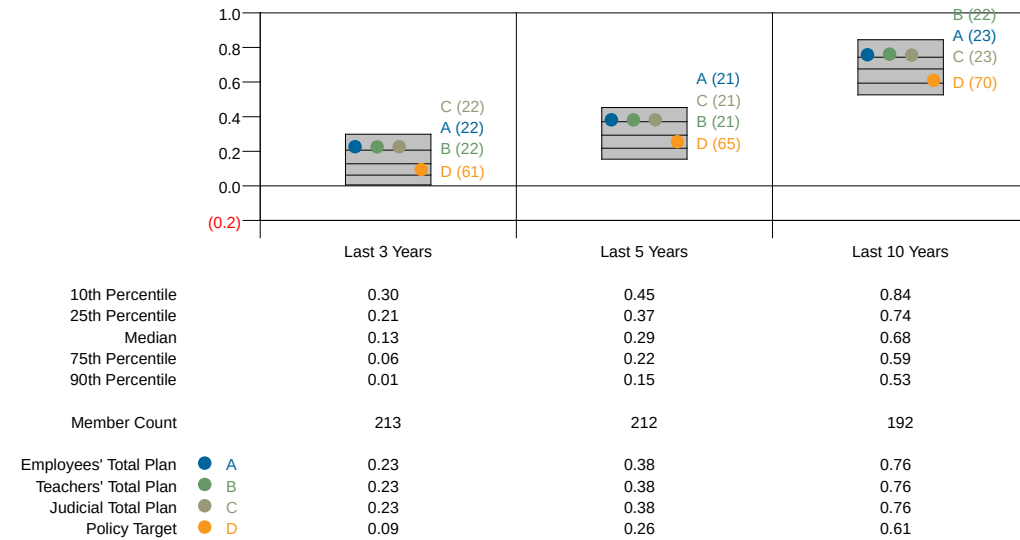
Standard Deviation vs Callan Public Fund Sponsor Database



Maximum Drawdown vs Callan Public Fund Sponsor Database

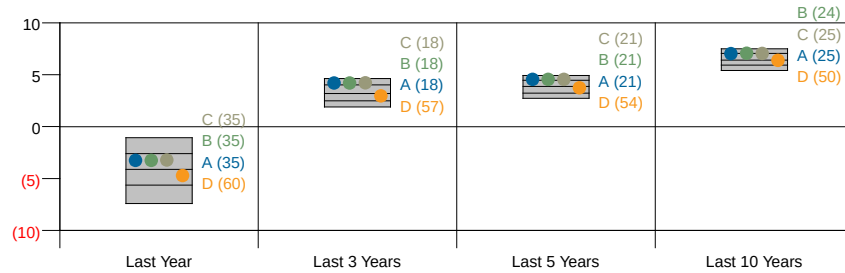


Sharpe Ratio vs Callan Public Fund Sponsor Database



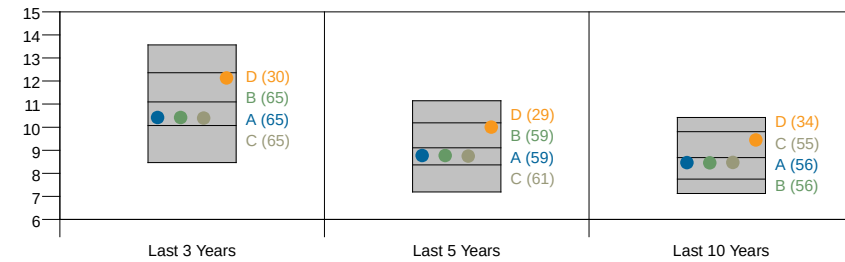
Health Care Plans Performance Dashboard – March 31, 2020

Returns vs Callan Public Fund Sponsor Database



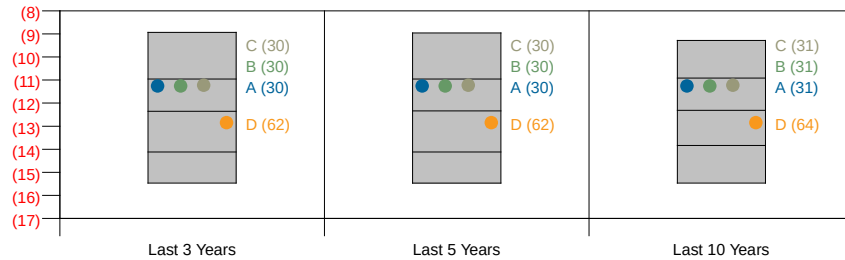
10th Percentile	(1.05)	4.65	4.95	7.52
25th Percentile	(2.60)	4.03	4.48	7.07
Median	(4.10)	3.19	3.88	6.41
75th Percentile	(5.62)	2.49	3.24	5.94
90th Percentile	(7.40)	1.90	2.74	5.42
Member Count	213	213	212	192
PERS Health Plan	● A (3.23)	4.23	4.57	7.06
TRS Health Plan	● B (3.23)	4.23	4.57	7.08
JRS Health Plan	● C (3.21)	4.24	4.58	7.06
Policy Target	● D (4.70)	2.98	3.75	6.41

Standard Deviation vs Callan Public Fund Sponsor Database



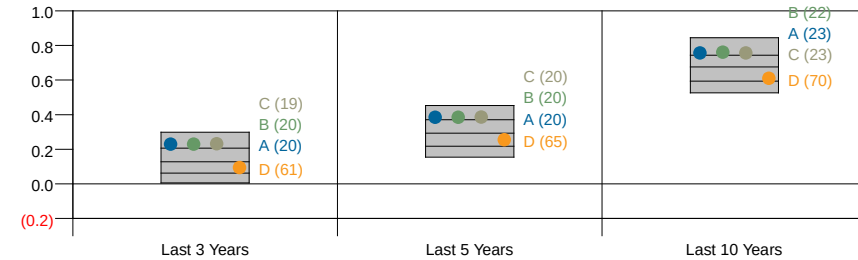
10th Percentile	13.57	11.15	10.43
25th Percentile	12.37	10.19	9.81
Median	11.10	9.11	8.69
75th Percentile	10.08	8.37	7.76
90th Percentile	8.47	7.19	7.13
Member Count	213	212	192
PERS Health Plan	● A 10.42	8.77	8.47
TRS Health Plan	● B 10.42	8.77	8.46
JRS Health Plan	● C 10.40	8.75	8.48
Policy Target	● D 12.14	10.01	9.45

Maximum Drawdown vs Callan Public Fund Sponsor Database



10th Percentile	(8.93)	(8.95)	(9.28)
25th Percentile	(10.95)	(10.95)	(10.91)
Median	(12.35)	(12.33)	(12.30)
75th Percentile	(14.11)	(14.11)	(13.83)
90th Percentile	(15.47)	(15.47)	(15.47)
Member Count	213	212	192
PERS Health Plan	● A (11.25)	(11.25)	(11.25)
TRS Health Plan	● B (11.25)	(11.25)	(11.25)
JRS Health Plan	● C (11.22)	(11.22)	(11.22)
Policy Target	● D (12.84)	(12.84)	(12.84)

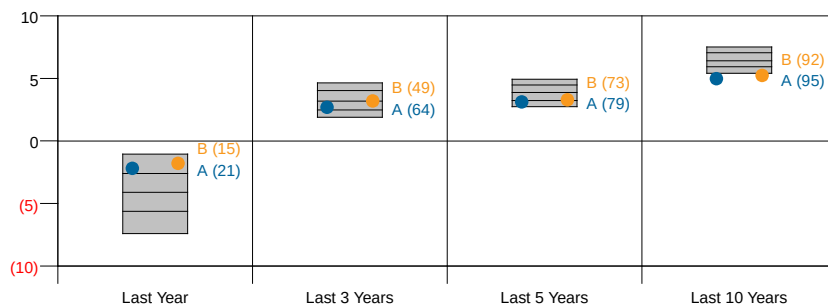
Sharpe Ratio vs Callan Public Fund Sponsor Database



10th Percentile	0.30	0.45	0.84
25th Percentile	0.21	0.37	0.74
Median	0.13	0.29	0.68
75th Percentile	0.06	0.22	0.59
90th Percentile	0.01	0.15	0.53
Member Count	213	212	192
PERS Health Plan	● A 0.23	0.39	0.76
TRS Health Plan	● B 0.23	0.39	0.76
JRS Health Plan	● C 0.23	0.39	0.76
Policy Target	● D 0.09	0.26	0.61

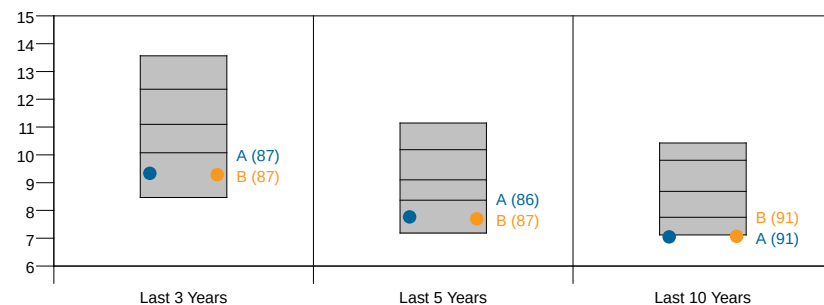
Military Plan Performance Dashboard – March 31, 2020

Returns vs Callan Public Fund Sponsor Database



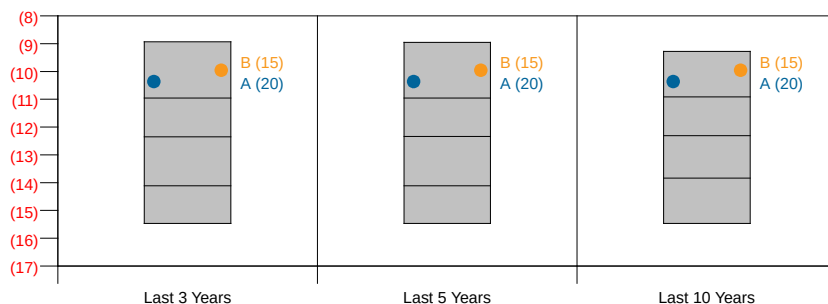
	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	(1.05)	4.65	4.95	7.52
25th Percentile	(2.60)	4.03	4.48	7.07
Median	(4.10)	3.19	3.88	6.41
75th Percentile	(5.62)	2.49	3.24	5.94
90th Percentile	(7.40)	1.90	2.74	5.42
Member Count	213	213	212	192
Military Total Plan	● A (2.19)	2.71	3.13	4.99
Military Policy Target	● B (1.78)	3.21	3.29	5.24

Standard Deviation vs Callan Public Fund Sponsor Database



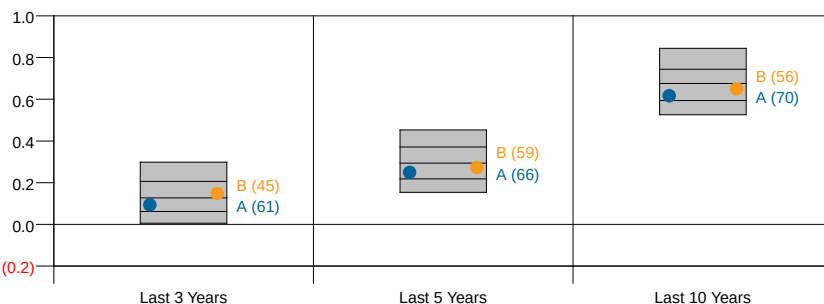
	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	13.57	11.15	10.43
25th Percentile	12.37	10.19	9.81
Median	11.10	9.11	8.69
75th Percentile	10.08	8.37	7.76
90th Percentile	8.47	7.19	7.13
Member Count	213	212	192
Military Total Plan	● A (9.34)	7.77	7.05
Military Policy Target	● B (9.29)	7.70	7.08

Maximum Drawdown vs Callan Public Fund Sponsor Database



	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	(8.93)	(8.95)	(9.28)
25th Percentile	(10.95)	(10.95)	(10.91)
Median	(12.35)	(12.33)	(12.30)
75th Percentile	(14.11)	(14.11)	(13.83)
90th Percentile	(15.47)	(15.47)	(15.47)
Member Count	213	212	192
Military Total Plan	● A (10.36)	(10.36)	(10.36)
Military Policy Target	● B (9.95)	(9.95)	(9.95)

Sharpe Ratio vs Callan Public Fund Sponsor Database

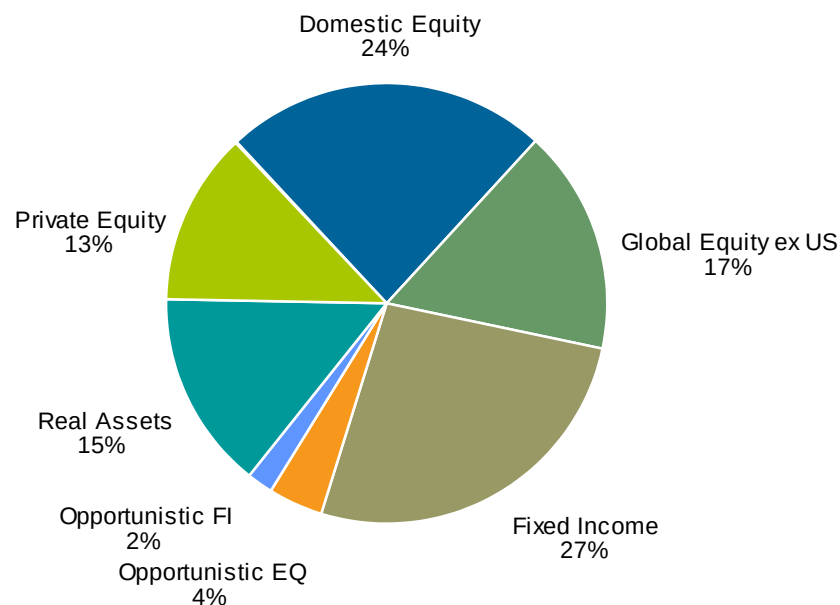


	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	0.30	0.45	0.84
25th Percentile	0.21	0.37	0.74
Median	0.13	0.29	0.68
75th Percentile	0.06	0.22	0.59
90th Percentile	0.01	0.15	0.53
Member Count	213	212	192
Military Total Plan	● A (0.09)	0.25	0.62
Military Policy Target	● B (0.15)	0.27	0.65

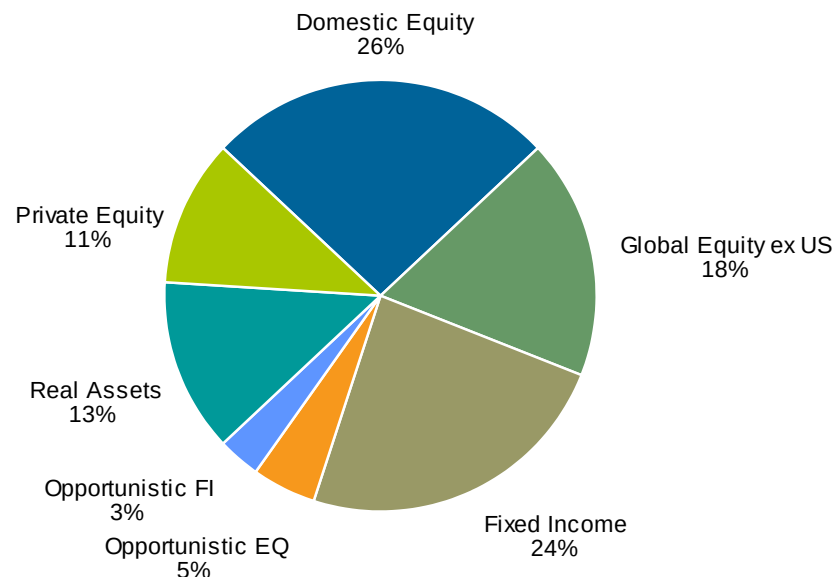
Asset Allocation – Public Employees’ Retirement System

Quarter Ending March 31, 2020

Actual Asset Allocation



Target Asset Allocation



Asset Class	\$000s Actual	Weight Actual	Target	Percent Difference	\$000s Difference
Domestic Equity	2,060,169	23.7%	26.0%	(2.3%)	(202,581)
Global Equity ex US	1,436,617	16.5%	18.0%	(1.5%)	(129,902)
Fixed Income	2,309,772	26.5%	24.0%	2.5%	221,081
Opportunistic EQ	351,401	4.0%	4.8%	(0.8%)	(66,337)
Opportunistic FI	167,338	1.9%	3.2%	(1.3%)	(111,154)
Real Assets	1,269,872	14.6%	13.0%	1.6%	137,627
Private Equity	1,107,713	12.7%	11.0%	1.7%	149,526
Total	8,702,881	100.0%	100.0%		

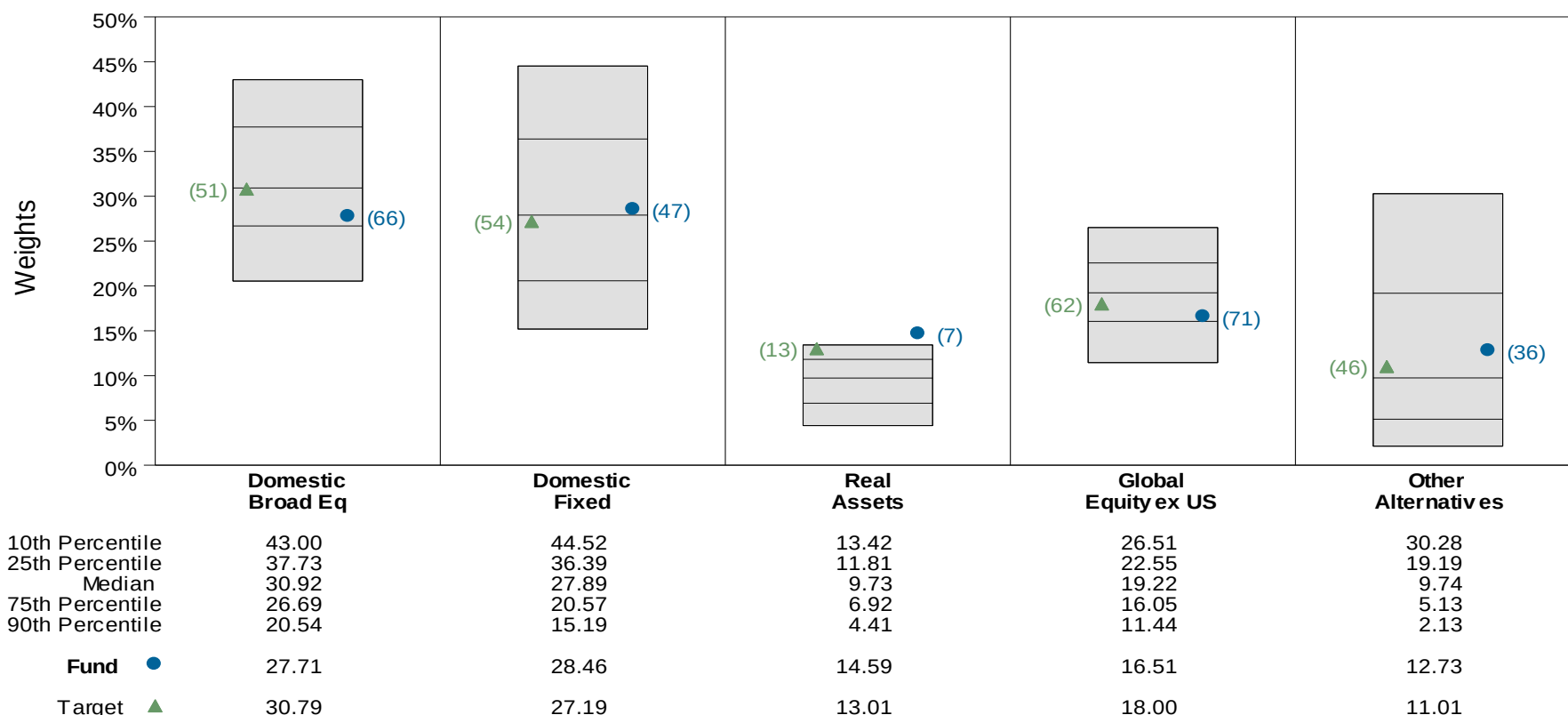
PERS is used as illustrative throughout the presentation.

The other plans exhibit similar modest and understandable variations from strategic target allocations.

Asset Allocation vs. Public Funds (PERS)

Callan Public Fund Database

Asset Class Weights vs Callan Public Fund Sponsor Database



- Public equities are underweight and other asset classes are overweight after the large market moves in the quarter.
 - Following a recent asset allocation revision, fixed income target is now in line with the “average” weighting of other public funds after being historically underweight by a wide margin.
- Weightings to real assets and alternatives are relatively high in comparison to other public funds.

*Note that “Other Alternatives” represents private equity

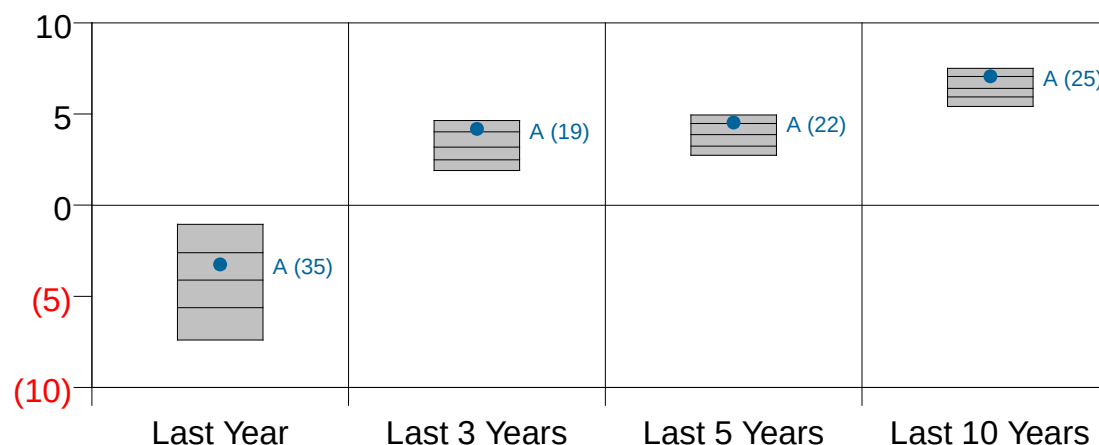
Total Fund Return vs Public Funds (PERS)

Callan Public Fund Database

Returns

for Periods Ended March 31, 2020

Group: Callan Public Fund Sponsor Database



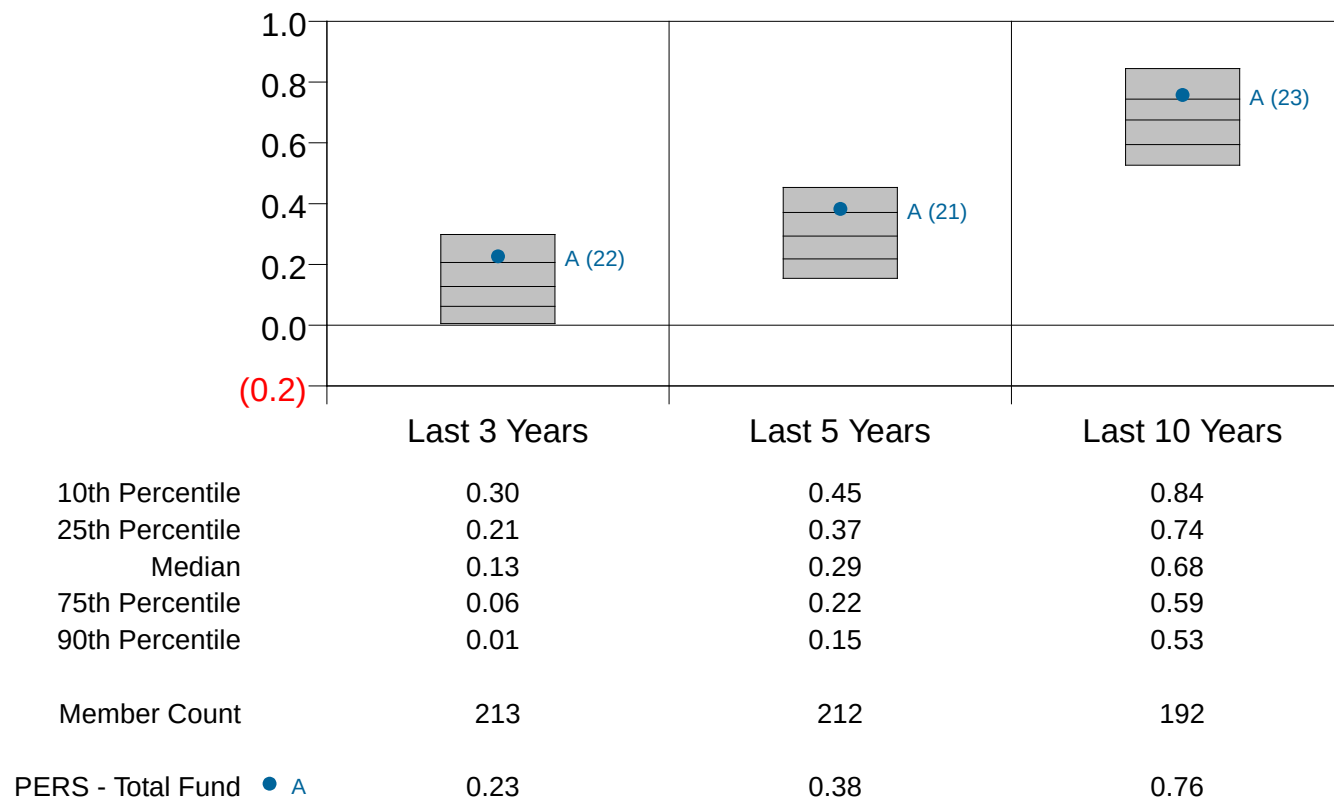
	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	(1.05)	4.65	4.95	7.52
25th Percentile	(2.60)	4.03	4.48	7.07
Median	(4.10)	3.19	3.88	6.41
75th Percentile	(5.62)	2.49	3.24	5.94
90th Percentile	(7.40)	1.90	2.74	5.42
Member Count	213	213	212	192
PERS - Total Fund ● A	(3.24)	4.19	4.54	7.07

- Despite the recent change to the asset allocation, longer-term performance reflects ARMB's prior orientation toward capital growth as opposed to income generation.
- It is worth noting that PERS's lower weight to Domestic Equity – a poorly returning asset class in Q1 – compared to other Public Funds had a strong influence on PERS's return rankings versus the Public Fund peer group.

Total Fund Sharpe Ratio Rankings vs Public Funds (PERS)

Callan Public Fund Database

Sharpe Ratio
for Periods Ended March 31, 2020
Group: Callan Public Fund Sponsor Database

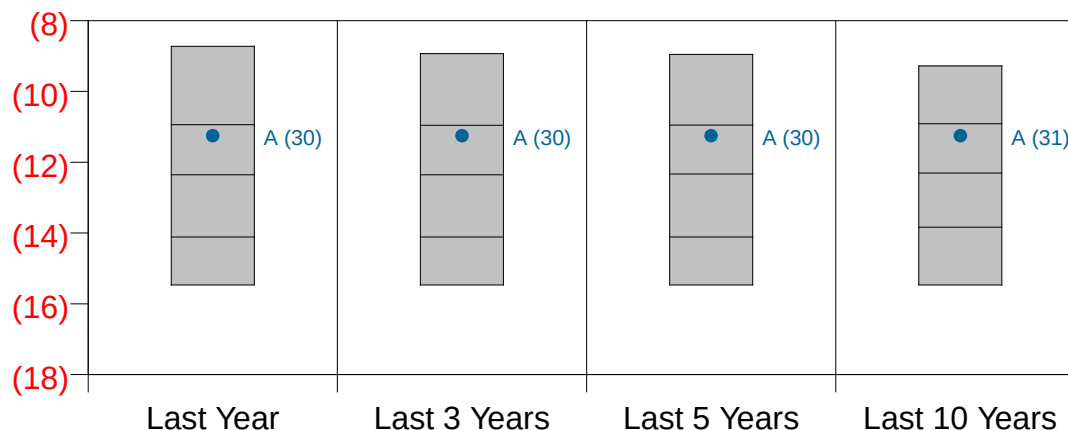


- “Sharpe ratio” is a risk-adjusted measure of excess return above the risk-free rate.
- ARMB’s risk-adjusted return (Sharpe ratio) was above the Public Funds median for the three-, five-, and 10-year periods.

Total Maximum Drawdown Rankings vs Public Funds (PERS)

Callan Public Fund Database

Maximum Drawdown
for Periods Ended March 31, 2020
Group: Callan Public Fund Sponsor Database

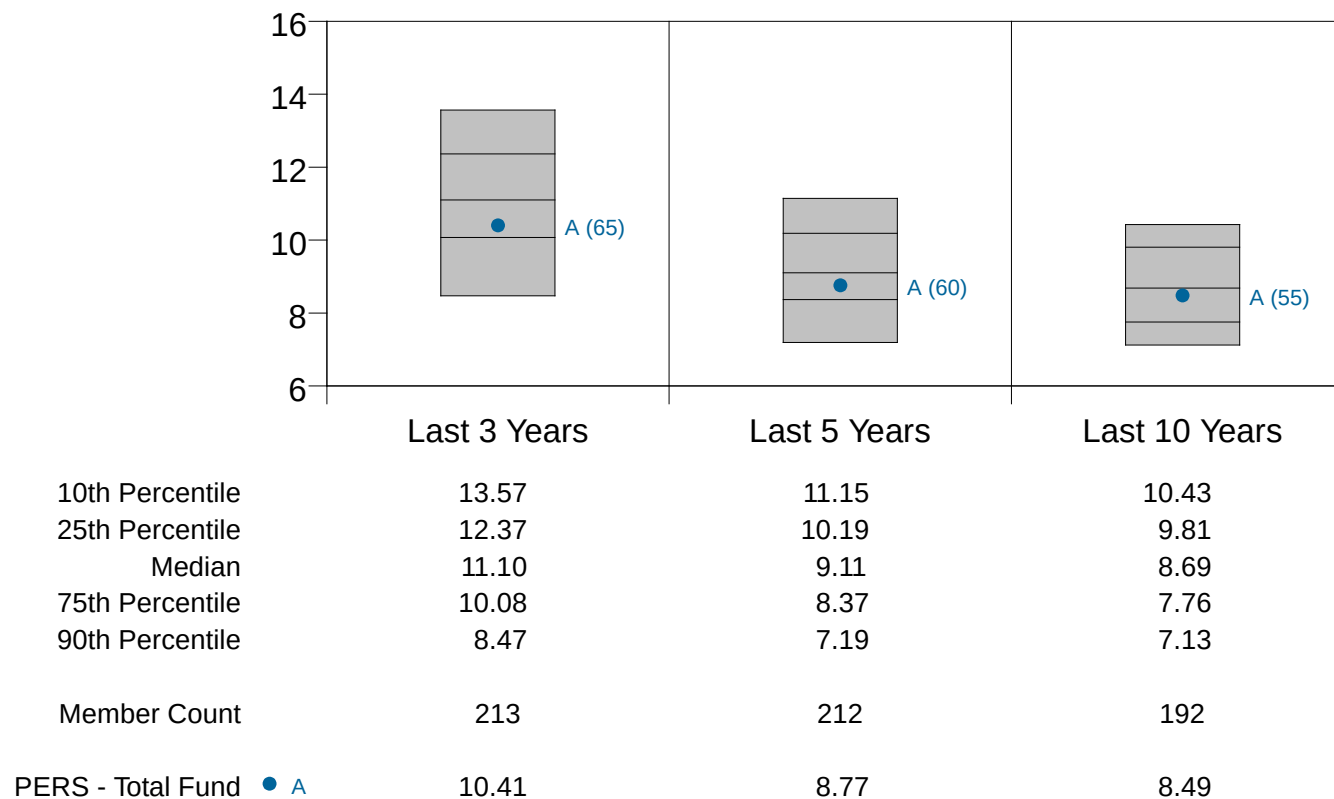


- “Maximum drawdown” is a measure of the largest loss from peak to trough in a given period.
- Lower rankings reflect larger drawdowns (i.e. bigger losses). ARMB’s drawdown rankings for all periods have reflected better than average drawdowns (i.e. lower losses) and have improved over time..
- The drawdown 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

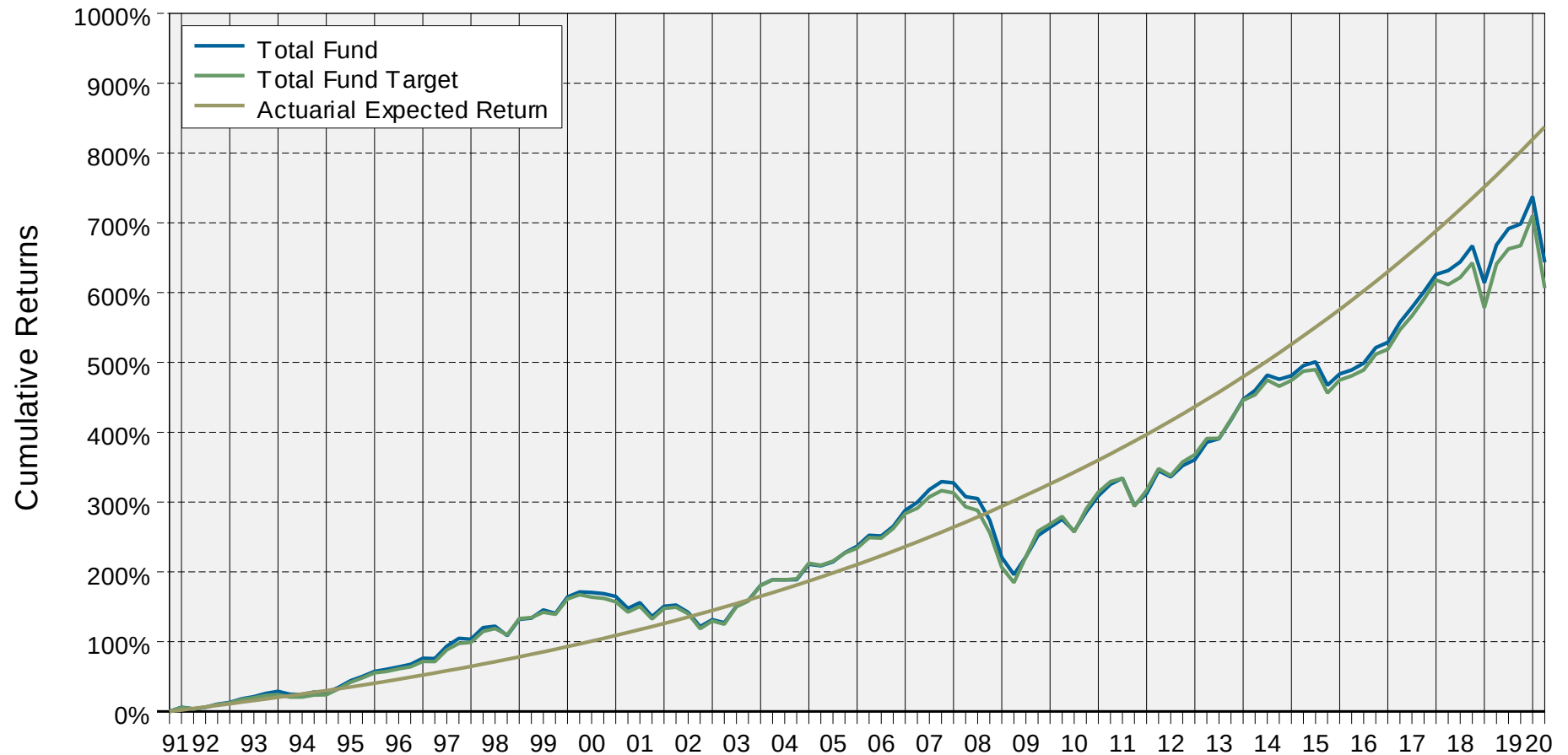
Standard Deviation
for Periods Ended March 31, 2020
Group: Callan Public Fund Sponsor Database



- “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.

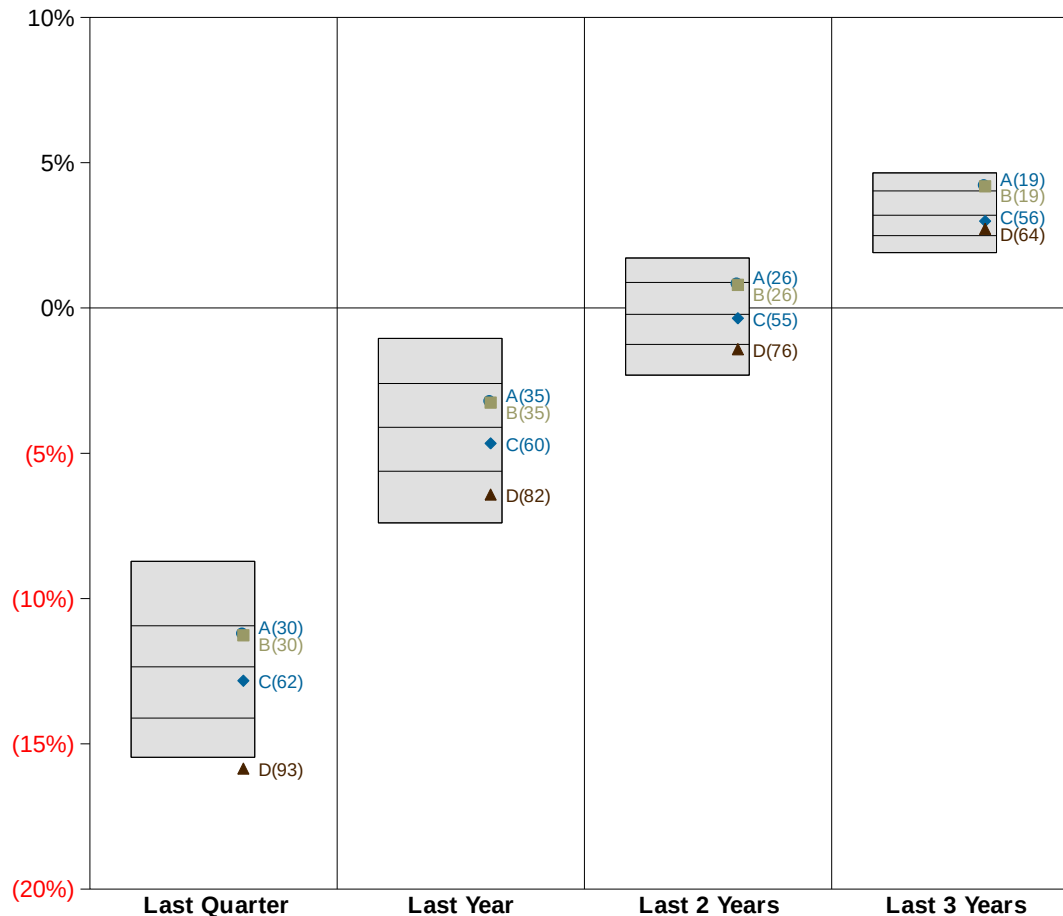
PERS Long-Term Total Fund Performance as of 3/31/20

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.
- Setbacks in 3Q15, 4Q18, and 1Q20 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 3/31/20

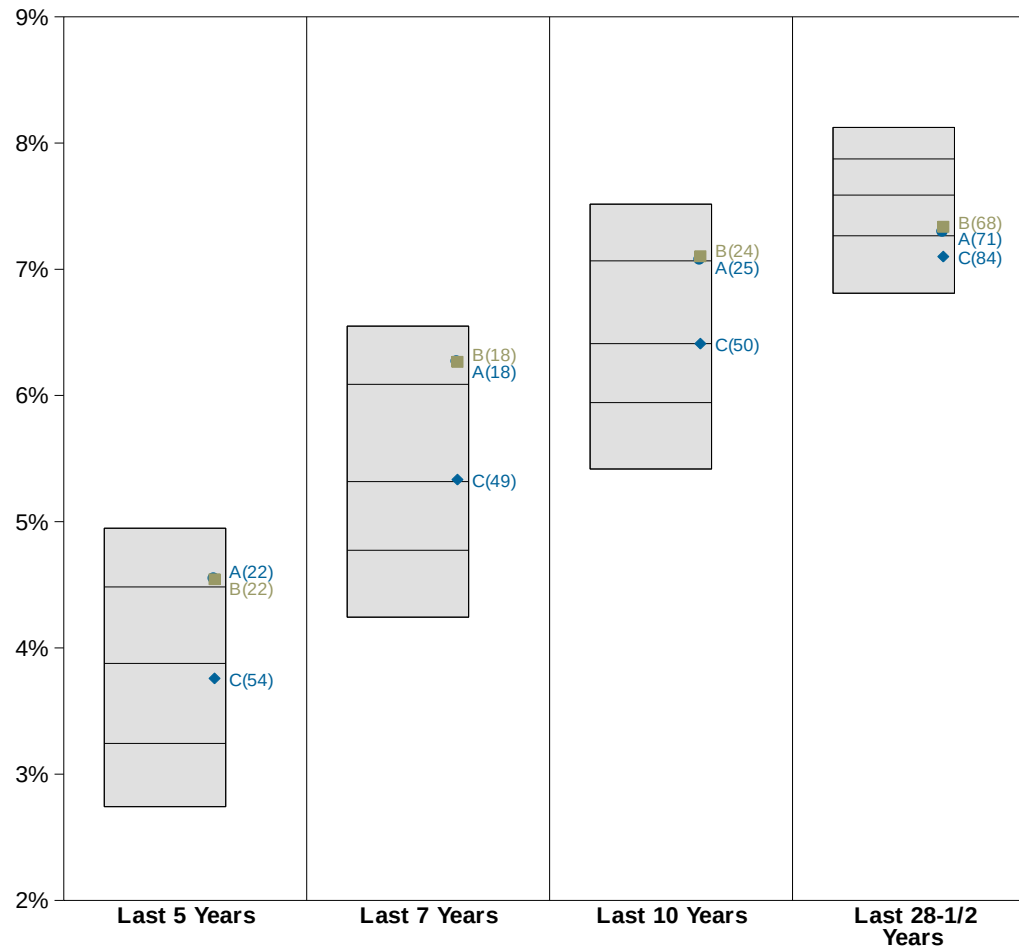


- PERS and TRS have outperformed their target for the last quarter, one-year, two-year, and three-year periods.
- Current quarter outperformance was driven by the manager effect within private equity.

10th Percentile	(8.72)	(1.05)	1.72	4.65
25th Percentile	(10.94)	(2.60)	0.88	4.03
Median	(12.35)	(4.10)	(0.22)	3.19
75th Percentile	(14.11)	(5.62)	(1.25)	2.49
90th Percentile	(15.47)	(7.40)	(2.31)	1.90
PERS Total Plan ● A	(11.24)	(3.24)	0.80	4.19
TRS Total Plan ■ B	(11.26)	(3.26)	0.80	4.19
Target Index ◆ C	(12.83)	(4.66)	(0.36)	2.99
Public Market Proxy ▲ D	(15.85)	(6.42)	(1.42)	2.72

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

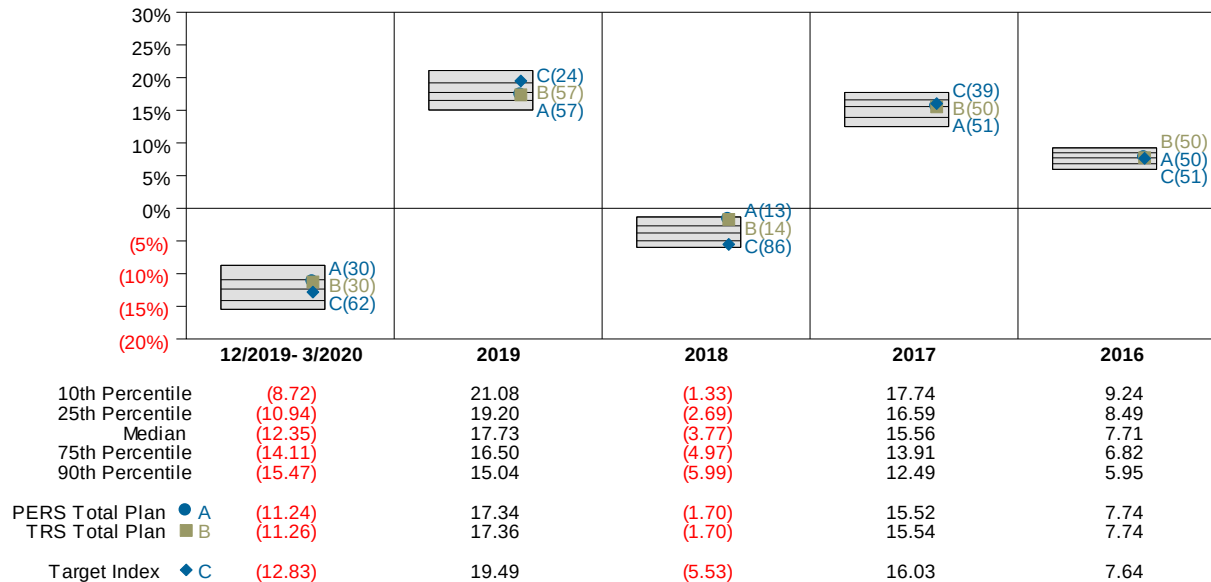
Longer-Term Total Fund Returns as of 3/31/20



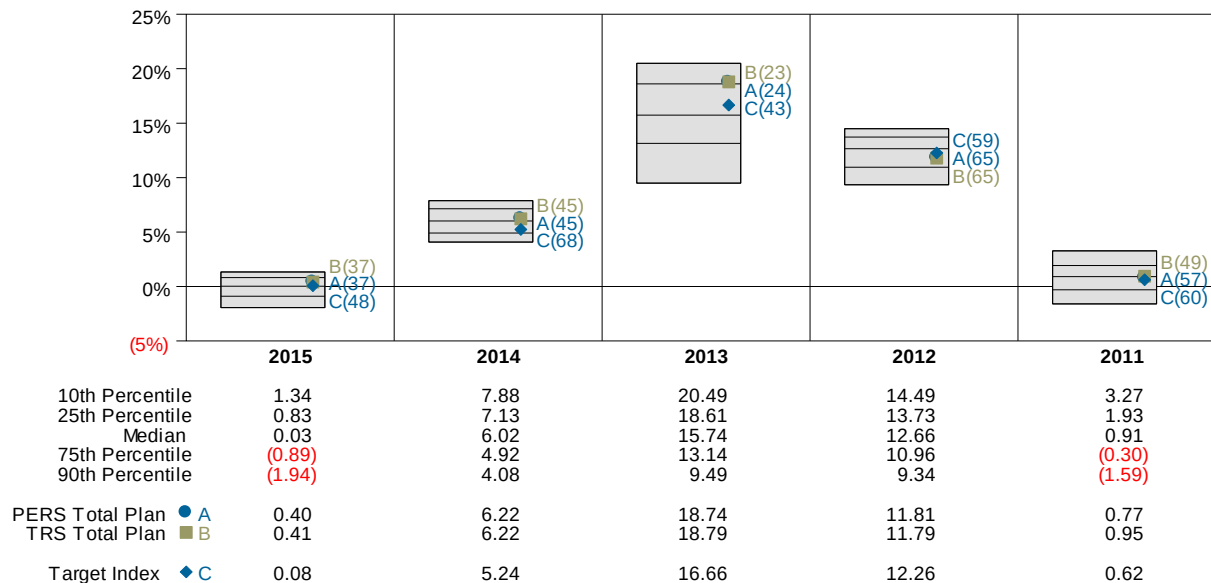
- Five-, seven-, and ten-year performance is above target and median.
- 28½ year return for PERS beats the target by 19 basis points.

10th Percentile	4.95	6.55	7.52	8.12
25th Percentile	4.48	6.09	7.07	7.87
Median	3.88	5.32	6.41	7.59
75th Percentile	3.24	4.77	5.94	7.27
90th Percentile	2.74	4.24	5.42	6.81
PERS Total Plan ● A	4.54	6.26	7.07	7.29
TRS Total Plan ■ B	4.54	6.27	7.10	7.34
Target Index ◆ C	3.76	5.33	6.41	7.10

Calendar Period Total Fund Performance

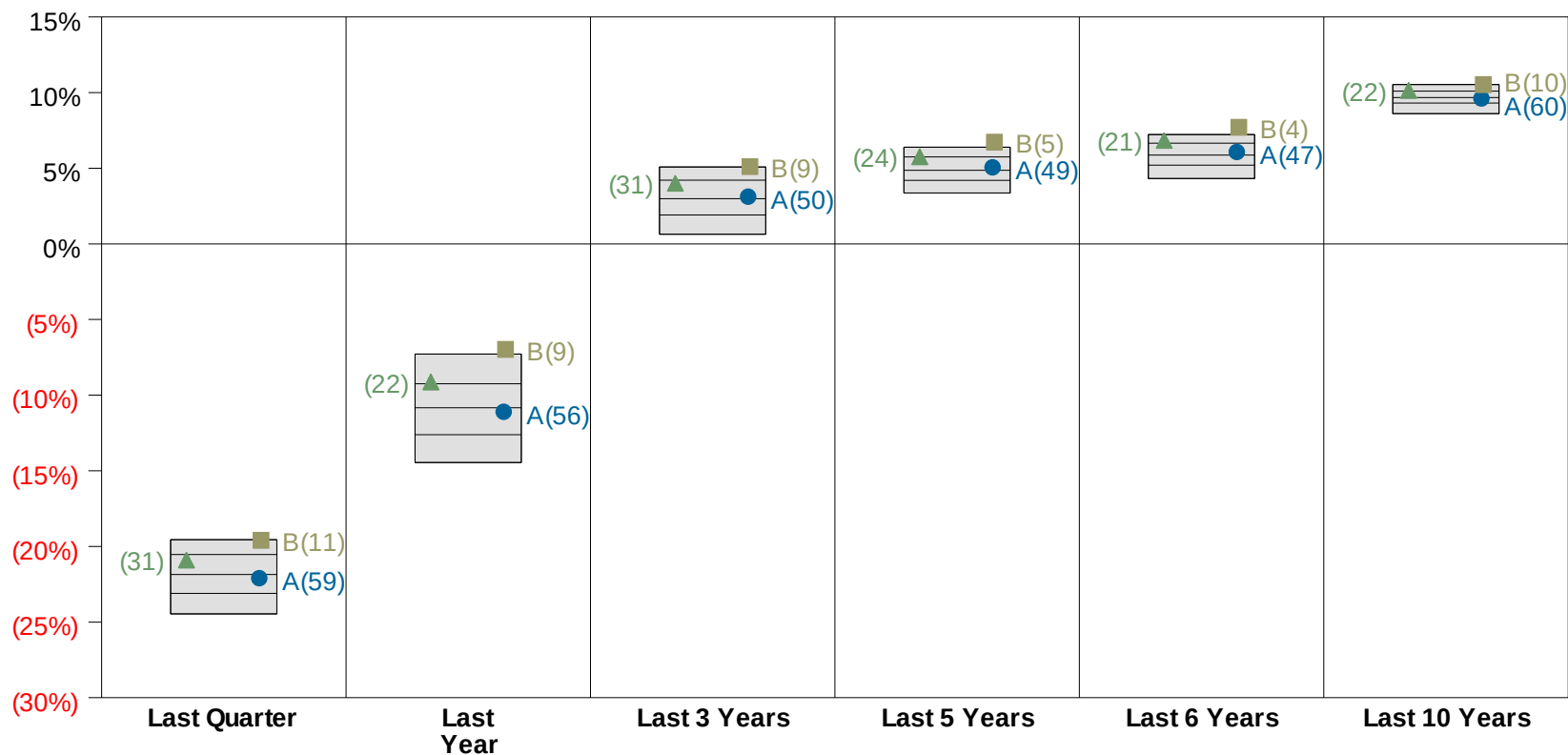


- PERS ranks above median in five and TRS ranks above median in six of the 10 periods shown.
- Peer group range of returns during 2016, 2015, and 2014 were very tight.
- Wide range of peer group returns during calendar 2013 due to varying fixed-income allocations within the Public Fund universe.



Total Domestic Equity through 3/31/20

Performance vs Public Fund - Domestic Equity (Gross)



10th Percentile	(19.55)	(7.28)	5.08	6.39	7.23	10.53
25th Percentile	(20.53)	(9.24)	4.21	5.75	6.66	10.10
Median	(21.86)	(10.83)	2.99	4.86	5.87	9.68
75th Percentile	(23.10)	(12.61)	1.91	4.20	5.21	9.31
90th Percentile	(24.46)	(14.45)	0.63	3.37	4.31	8.61
Domestic Equity Pool Standard	● A (22.21)	(11.21)	2.99	4.94	5.95	9.50
& Poor's 500	■ B (19.60)	(6.98)	5.10	6.73	7.70	10.53
Russell 3000 Index	▲ (20.90)	(9.13)	4.00	5.77	6.84	10.15

Domestic Equity Component Returns

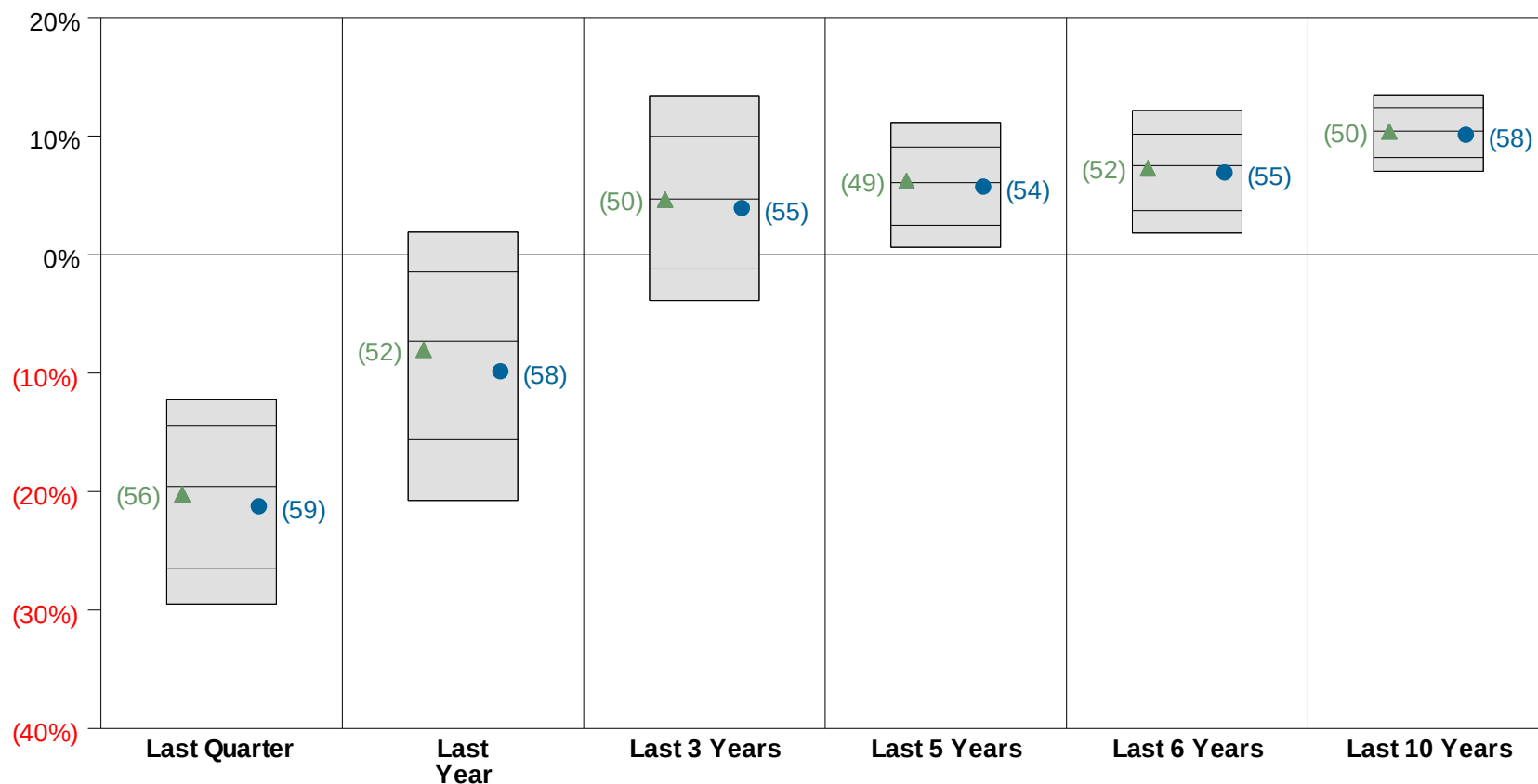
Returns for Periods Ended March 31, 2020

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years
Total Dom Equity Pool	(22.21%)	(11.21%)	2.99%	4.94%	5.95%
Russell 3000 Index	(20.90%)	(9.13%)	4.00%	5.77%	6.84%
Large Cap Managers	(21.39%)	(10.01%)	3.76%	5.58%	6.77%
Russell 1000 Index	(20.22%)	(8.03%)	4.64%	6.22%	7.28%
Small Cap Managers	(32.72%)	(25.01%)	(3.95%)	0.08%	1.17%
Russell 2000 Index	(30.61%)	(23.99%)	(4.64%)	(0.25%)	1.11%

- The large cap composite trailed its benchmark (the Russell 1000 index) over all periods shown in the table.
- The small cap composite has contributed positive excess return when compared to its benchmark (the Russell 2000 index) over the three-year, five-year, and six-year periods.

Large Cap Domestic Equity through 3/31/20

Performance vs Callan Large Capitalization (Gross)



10th Percentile (12.25)
 25th Percentile (14.47)
 Median (19.57)
 75th Percentile (26.47)
 90th Percentile (29.49)

1.90
 (1.46)
 (7.30)
 (15.62)
 (20.74)

13.41
 9.97
 4.70
 (1.14)
 (3.88)

11.16
 9.08
 6.08
 2.48
 0.62

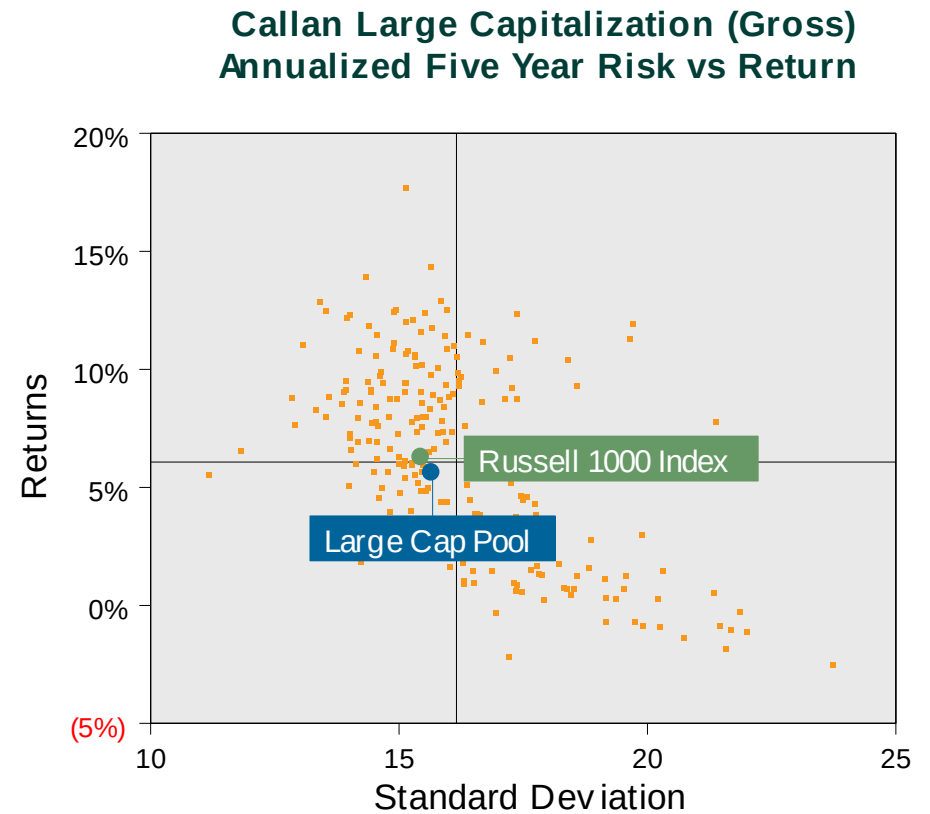
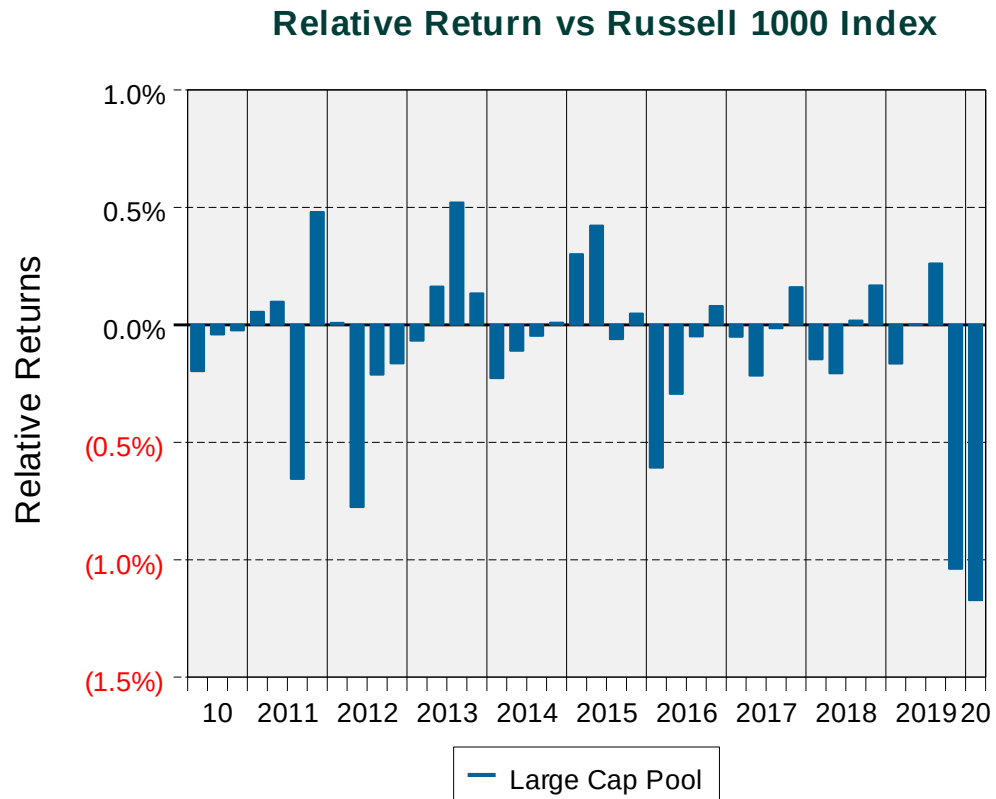
12.15
 10.16
 7.51
 3.72
 1.82

13.47
 12.40
 10.41
 8.18
 7.03

Large Cap Pool ● (21.39)

Russell 1000 Index ▲ (20.22)

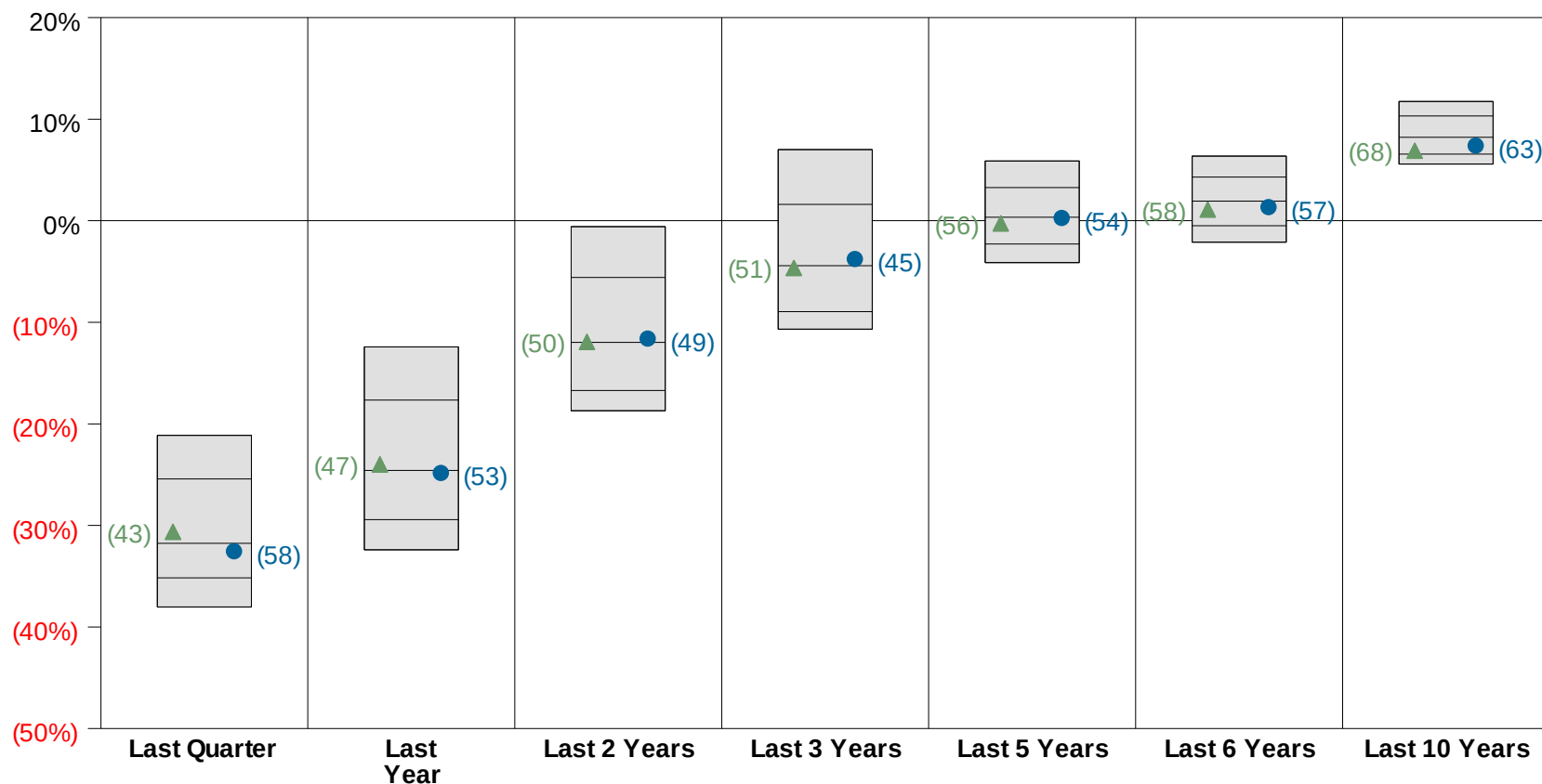
Large Cap Domestic Equity as of 3/31/20



- Long-term performance exhibits market-like returns with similar risk.

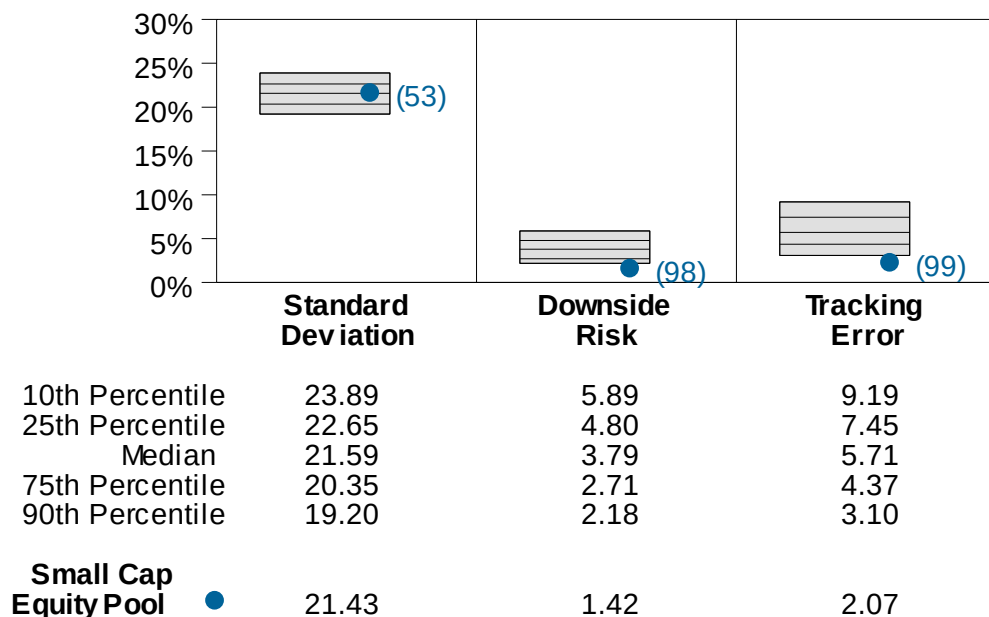
Small Cap Domestic Equity through 3/31/20

Performance vs Callan Small Capitalization (Gross)

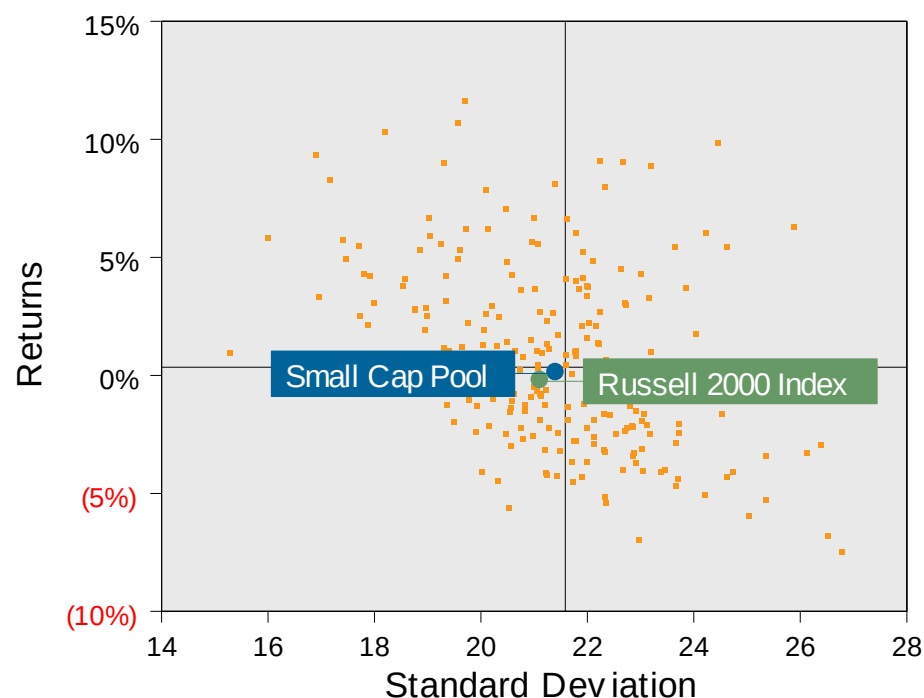


10th Percentile	(21.13)	(12.42)	(0.57)	7.00	5.88	6.37	11.74
25th Percentile	(25.42)	(17.66)	(5.59)	1.60	3.27	4.29	10.32
Median	(31.75)	(24.59)	(11.98)	(4.42)	0.35	1.93	8.22
75th Percentile	(35.15)	(29.42)	(16.72)	(8.96)	(2.30)	(0.49)	6.55
90th Percentile	(38.03)	(32.41)	(18.71)	(10.68)	(4.12)	(2.11)	5.58
Small Cap Pool	(32.72)	(25.01)	(11.78)	(3.95)	0.08	1.17	7.22
Russell 2000 Index	(30.61)	(23.99)	(11.93)	(4.64)	(0.25)	1.11	6.90

Small Cap Domestic Equity through 3/31/20



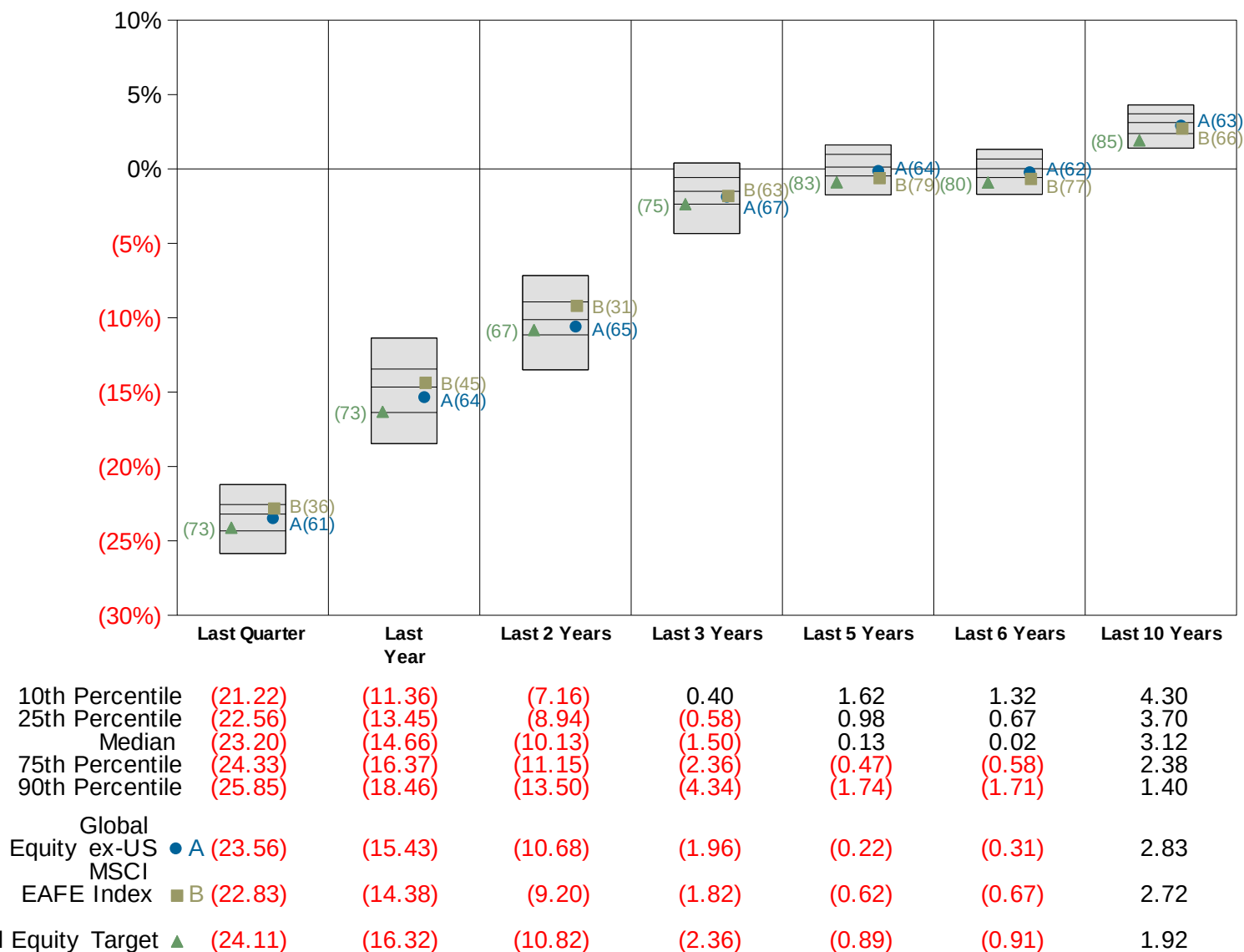
Callan Small Capitalization (Gross)
Annualized Five Year Risk vs Return



- 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 3/31/20

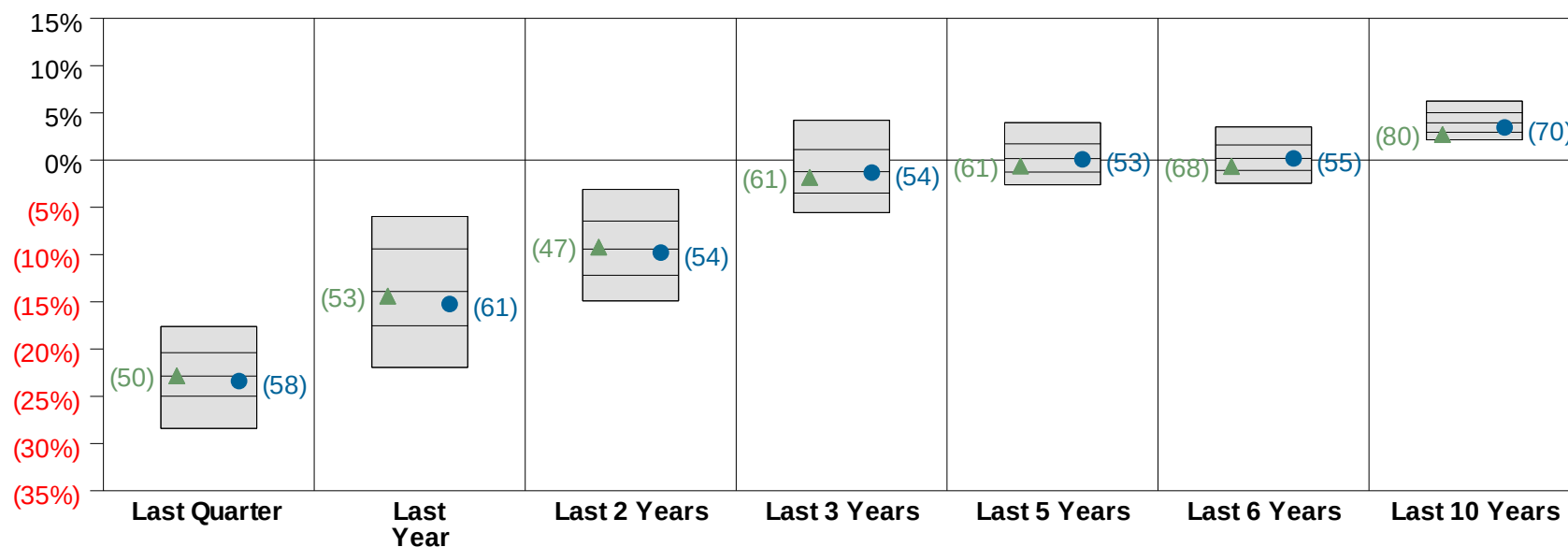
Performance vs Public Fund - International Equity (Gross)



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

International Equity ex Emerging Markets through 3/31/20

Performance vs Callan Non-US Equity (Gross)



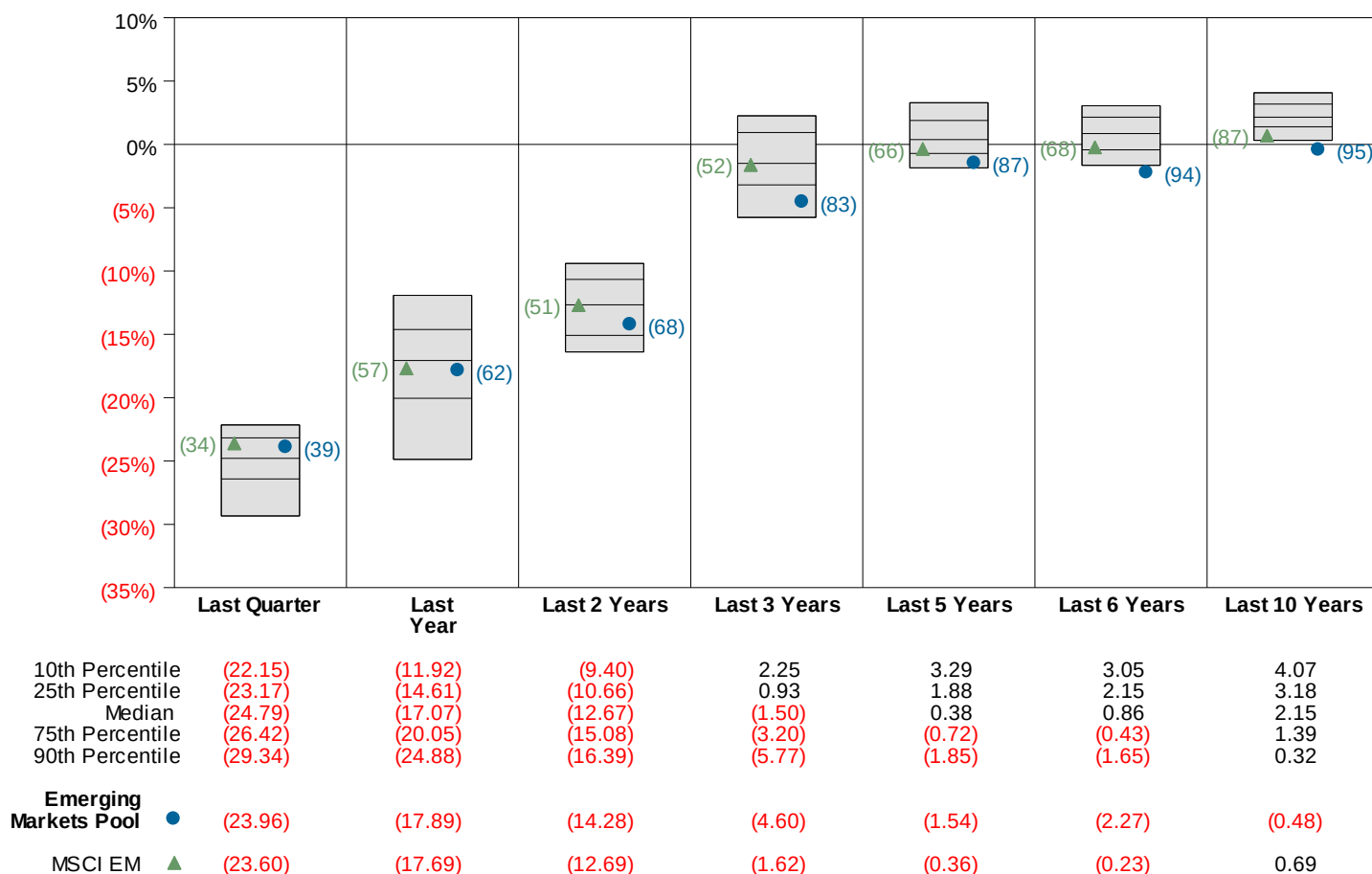
10th Percentile	(17.62)	(5.96)	(3.09)	4.21	3.96	3.52	6.25
25th Percentile	(20.38)	(9.39)	(6.45)	1.12	1.71	1.60	5.01
Median	(22.85)	(13.90)	(9.42)	(1.23)	0.17	0.18	3.94
75th Percentile	(24.98)	(17.53)	(12.19)	(3.48)	(1.27)	(1.09)	2.94
90th Percentile	(28.40)	(21.95)	(14.91)	(5.56)	(2.61)	(2.46)	2.15
Int'l Equity Pool (ex Emerging. Mkt)	● (23.57)	(15.43)	(9.99)	(1.53)	(0.09)	(0.02)	3.25
MSCI EAFE	▲ (22.83)	(14.38)	(9.20)	(1.82)	(0.62)	(0.67)	2.72

International Equity ex Emerging Markets through 3/31/20

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Int'l Equity Pool (ex Emerging Market)	(23.57%)	(15.43%)	(1.53%)	(0.09%)	3.25%
Arrowstreet ACWI ex -US	(21.70%)	(12.45%)	0.16%	0.88%	-
Baillie Gifford ACWI ex US	(19.64%)	(4.84%)	2.78%	3.08%	-
Brandes Investment	(29.41%)	(23.94%)	(6.51%)	(3.01%)	1.89%
Capital Guardian	(20.53%)	(8.32%)	4.17%	3.56%	5.49%
L&G Sci Beta Dev ex US	(24.56%)	-	-	-	-
SSgA World ex US IMI	(23.94%)	(15.42%)	-	-	-
MSCI EAFE Index	(22.83%)	(14.38%)	(1.82%)	(0.62%)	2.72%
MSCI ACWI ex-US IMI Index	(24.11%)	(16.32%)	(2.34%)	(0.66%)	2.14%

Emerging Markets through 3/31/20

Performance vs Callan Emerging Broad (Gross)



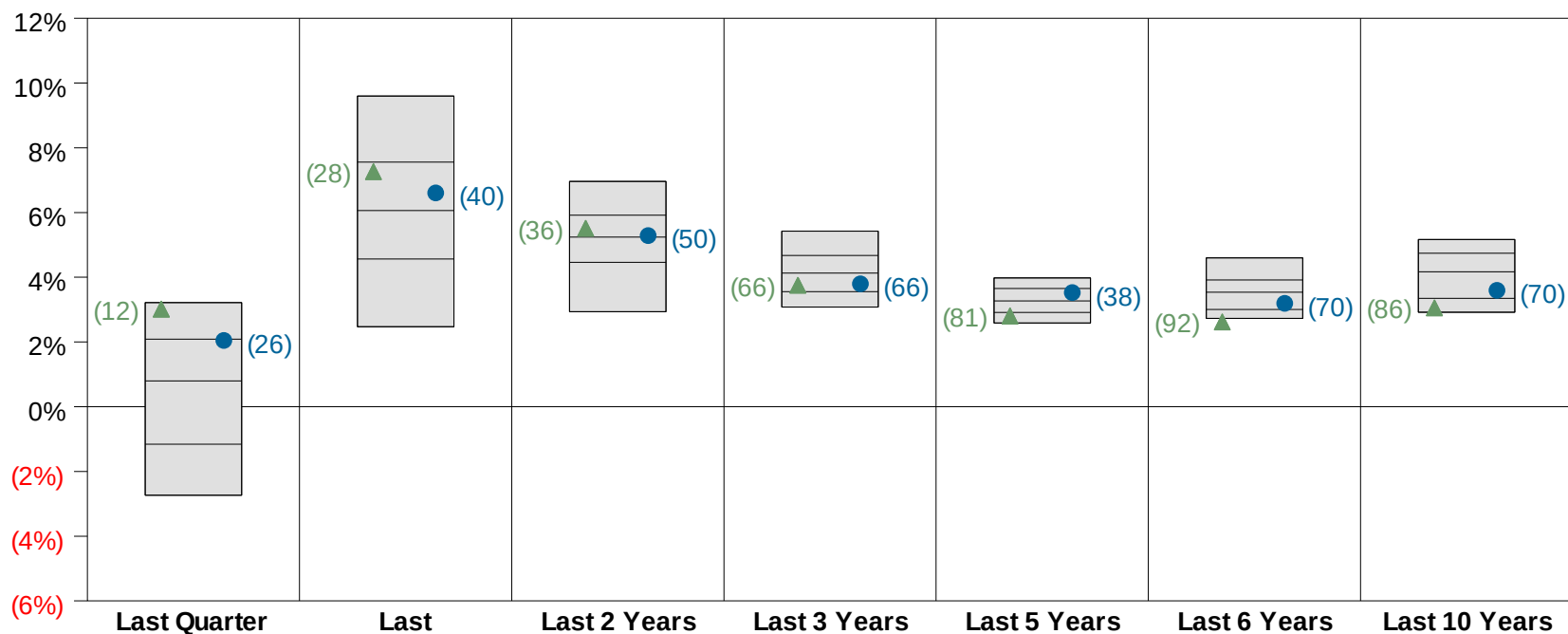
- After underperforming by 3.76% in 2Q17, 1.38% in 3Q17, 1.68% in 4Q17, 4.03% in 2Q18, 1.87% in 1Q19, and 1.41% in 4Q19, the Emerging Markets Pool lags the benchmark and ranks in the bottom quartile for all trailing periods of three years and longer.
- DRZ and Lazard were liquidated and L&G Scientific Beta was funded in 4Q19, leaving only passive and smart beta approaches within the emerging markets equity space.

Emerging Markets Pool through 3/31/20

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Emerging Markets Pool	(23.96%)	(17.89%)	(4.60%)	(1.54%)	(0.48%)
SSgA Emerging Markets	(23.53%)	(17.68%)	-	-	-
L&G SciBeta EM	(25.70%)	-	-	-	-
MSCI EM	(23.60%)	(17.69%)	(1.62%)	(0.36%)	0.69%

Total Fixed Income as of 3/31/20

Performance vs Public Fund - Domestic Fixed (Gross)



10th Percentile	3.22	9.60	6.96	5.42	3.98	4.60	5.17
25th Percentile	2.09	7.56	5.92	4.68	3.65	3.92	4.74
Median	0.80	6.06	5.24	4.13	3.27	3.54	4.17
75th Percentile	(1.16)	4.56	4.46	3.55	2.91	3.01	3.35
90th Percentile	(2.73)	2.47	2.94	3.08	2.58	2.73	2.92

**Total Fixed
Income Pool**



2.00 6.55 5.23 3.75 3.47 3.14 3.54

Fixed Income Target



3.02 7.26 5.52 3.76 2.81 2.62 3.06

- The transition from intermediate Treasury to Aggregate mandates was completed during the fourth quarter of 2019.

Includes In-House and External Portfolios

Opportunistic through 3/31/20

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Opportunistic (T)	(11.21%)	(4.32%)	-	-	-
Alternative Equity Strategies	(15.14%)	(8.15%)	1.97%	3.69%	6.59%
McKinley Healthcare Transformation	(15.13%)	(9.59%)	-	-	-
Russell 1000 Index	(20.22%)	(8.03%)	4.64%	6.22%	10.39%
Other Opportunities	5.09%	4.53%	2.36%	3.04%	-
Project Pearl	0.00%	-	-	-	-
Schroders Insurance Linked	5.76%	1.98%	(1.34%)	-	-
T-Bills + 6%	2.02%	8.26%	7.83%	7.19%	6.64%
Tactical Allocation Strategies	(15.40%)	(7.76%)	-	-	-
PineBridge	(17.55%)	(11.33%)	-	-	-
Pine Bridge Benchmark	(13.95%)	(7.23%)	0.63%	1.01%	2.36%
Fidelity Signals	(13.26%)	(4.16%)	-	-	-
Fidelity Signals Benchmark	(12.71%)	(4.06%)	2.69%	3.08%	5.31%
Alternative Beta					
JP Morgan Systematic Alpha	(5.94%)	(10.28%)	-	-	-
Man Group Alternative Risk Premia	(3.62%)	(2.62%)	-	-	-
T-Bills + 5%	1.78%	7.25%	6.83%	6.19%	5.64%

Real Assets through 3/31/20

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years
Real Assets	(2.71%)	1.64%	5.00%	4.91%	5.53%
Real Assets Target (1)	(12.99%)	(10.03%)	0.20%	2.79%	4.08%
Real Estate Pool	(3.88%)	0.76%	5.19%	6.89%	7.94%
Real Estate Target (2)	(1.70%)	3.28%	5.93%	7.20%	8.26%
Private Real Estate	1.11%	5.33%	6.72%	8.22%	8.72%
NCREIF Total Index	0.71%	5.28%	6.41%	7.65%	8.47%
ARMB REIT	(23.37%)	(15.94%)	(0.09%)	1.91%	5.14%
NAREIT Equity Index	(23.44%)	(15.93%)	0.06%	1.99%	5.18%
 Total Farmland	 0.74%	 2.34%	 3.15%	 3.85%	 4.21%
UBS Farmland	1.10%	2.74%	3.49%	4.28%	4.68%
Hancock Agricultural	(0.03%)	1.51%	2.43%	2.95%	3.20%
ARMB Farmland Target (3)	0.55%	3.84%	5.47%	5.49%	5.71%
 Total Timber	 (1.93%)	 (0.08%)	 2.27%	 1.15%	 2.76%
Timberland Investment Resources	(1.38%)	0.96%	2.29%	1.40%	3.28%
Hancock Timber	(3.40%)	(2.86%)	2.26%	0.49%	1.45%
NCREIF Timberland Index	0.11%	1.30%	2.48%	2.80%	4.07%
 Total Energy Funds	 (10.06%)	 (15.22%)	 (4.04%)	 (4.79%)	 (6.39%)
CPI + 5%	1.58%	6.46%	6.89%	6.70%	6.31%
 Total Infrastructure	 (3.68%)	 6.11%	 11.44%	 8.43%	 -
JPM Infrastructure	(3.38%)	4.25%	8.14%	7.18%	-
IFM Infrastructure	(3.75%)	8.20%	13.70%	12.16%	-
Global Infrastructure Idx	(29.18%)	(21.14%)	(3.24%)	(0.38%)	0.46%

(1) As of 10/01/2019, Real Assets Target is 37.5% NFI-ODCE Value Weight Net Index, 10% FTSE NAREIT All Equity Index, 25% NCREIF Farmland Index, 10% NCREIF Timberland Index, 17.5% CPI+4.

(2) ARMB Custom Real Estate Target is 90% NCREIF Property Index and 10% FTSE NAREIT All Equity REIT Index.

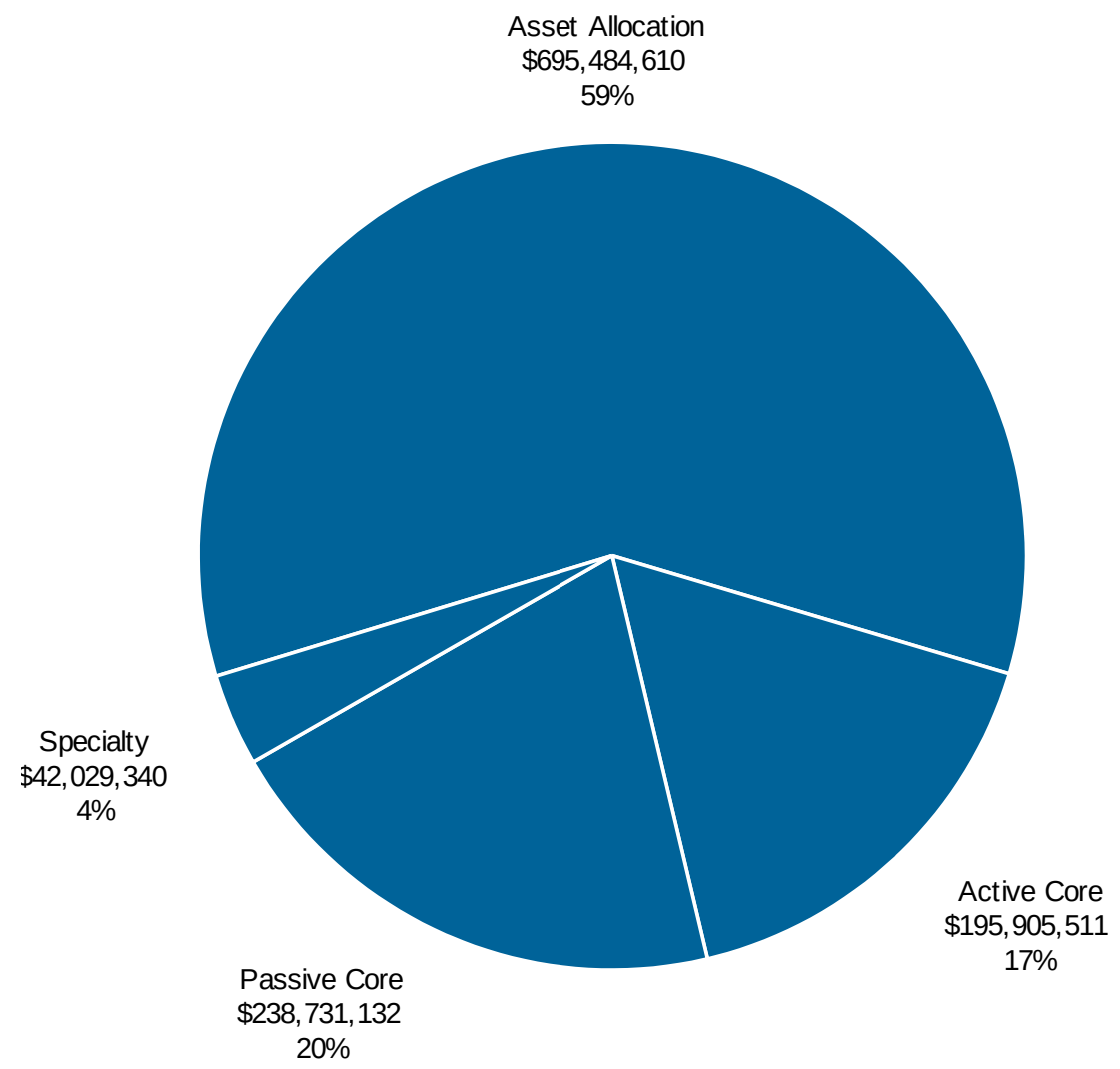
(3) ARMB Custom Farmland Target is leased-only properties in the NCREIF Farmland Index reweighted to reflect 90% row crops and 10% permanent crops until 1/1/08 and 80% row crops and 20% permanent crops thereafter. Farmland and Timber data supplied by the manager and may vary from State Street returns due to timing variations.

Farmland and Timber data supplied by the managers and may vary from State Street returns due to timing variations.

Participant-Directed Plans

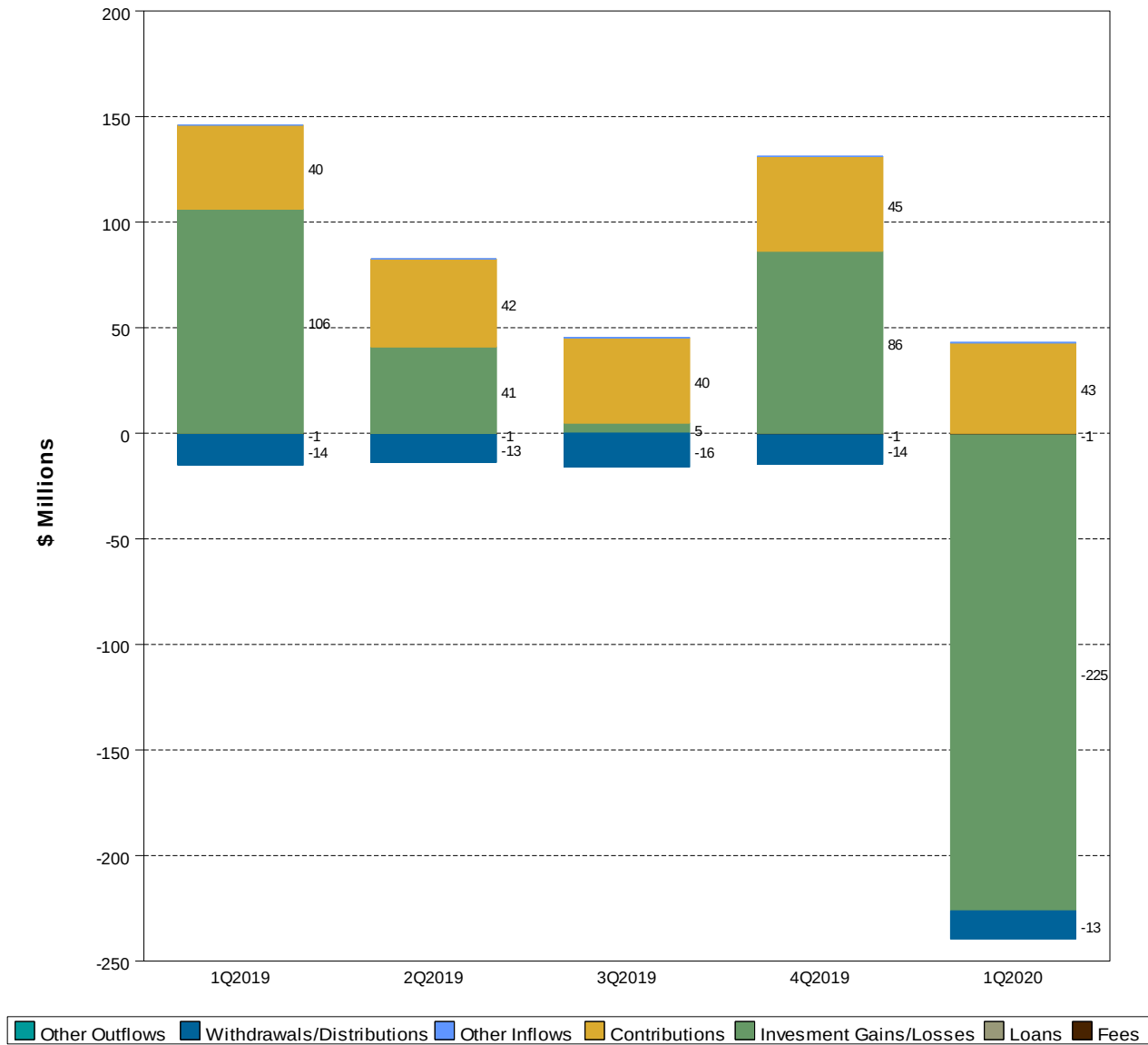
PERS DC Plan

March 31, 2020



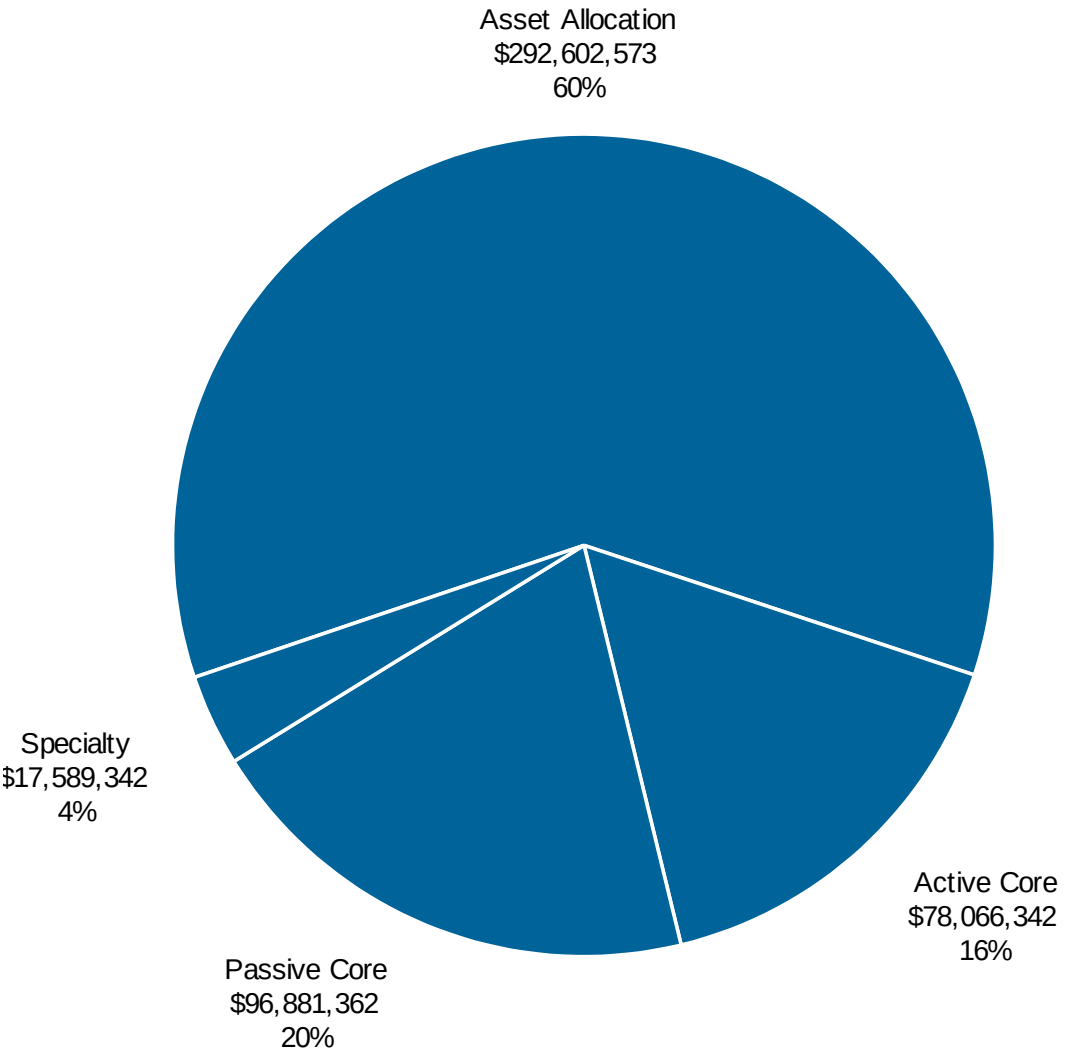
PERS DC Plan: Asset Changes

March 31, 2020



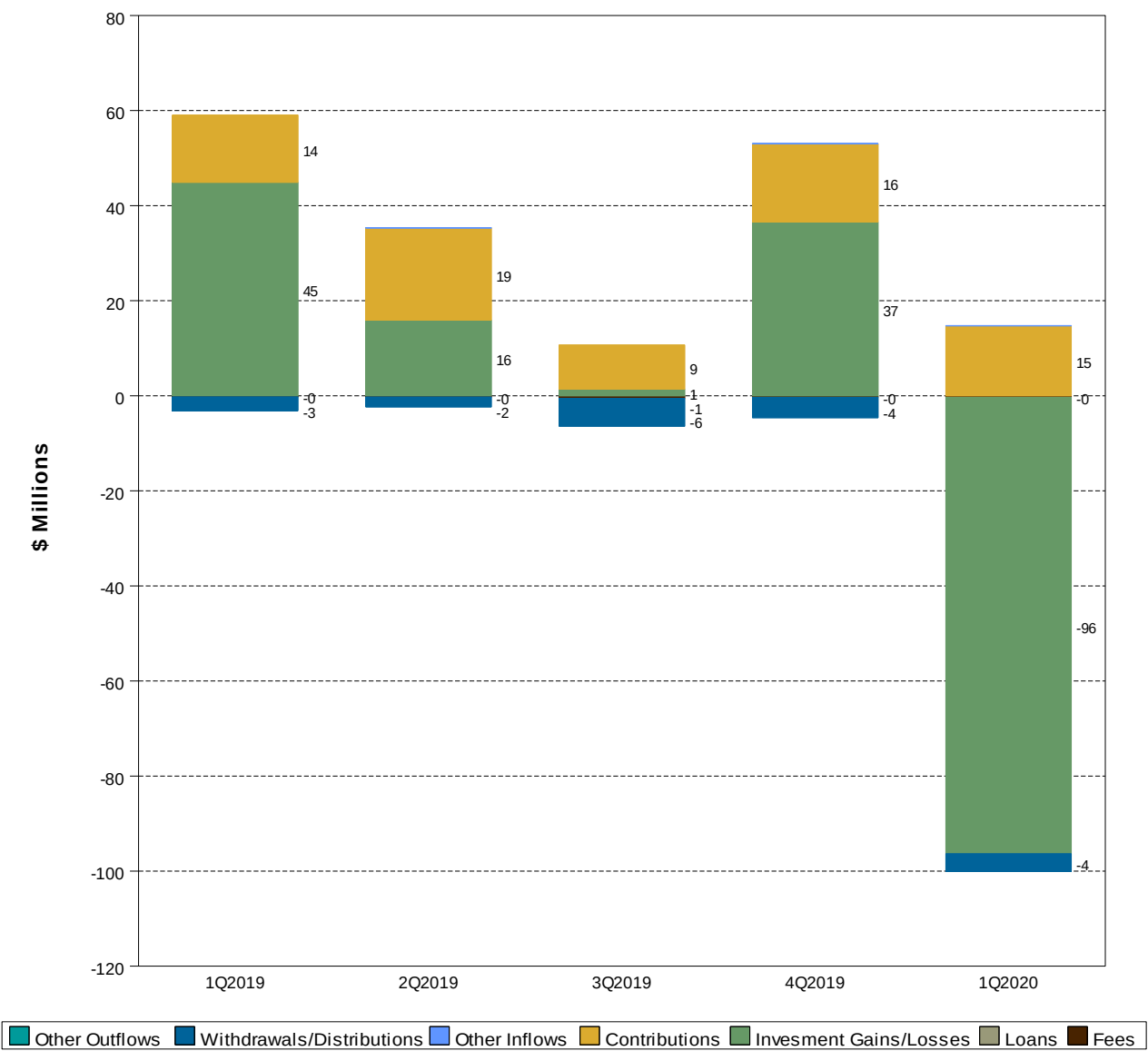
TRS DC Plan

March 31, 2020



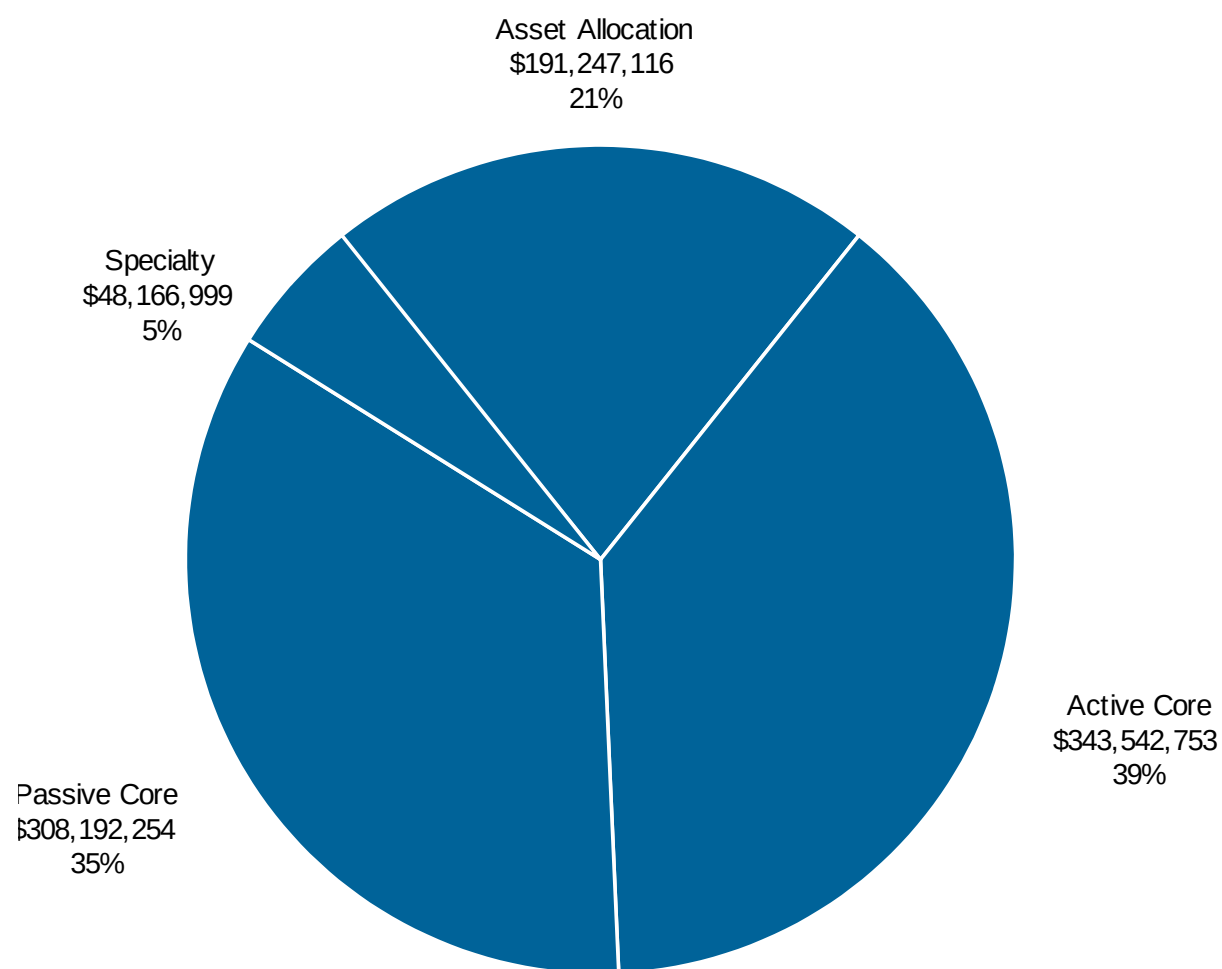
TRS DC Plan: Asset Changes

March 31, 2020



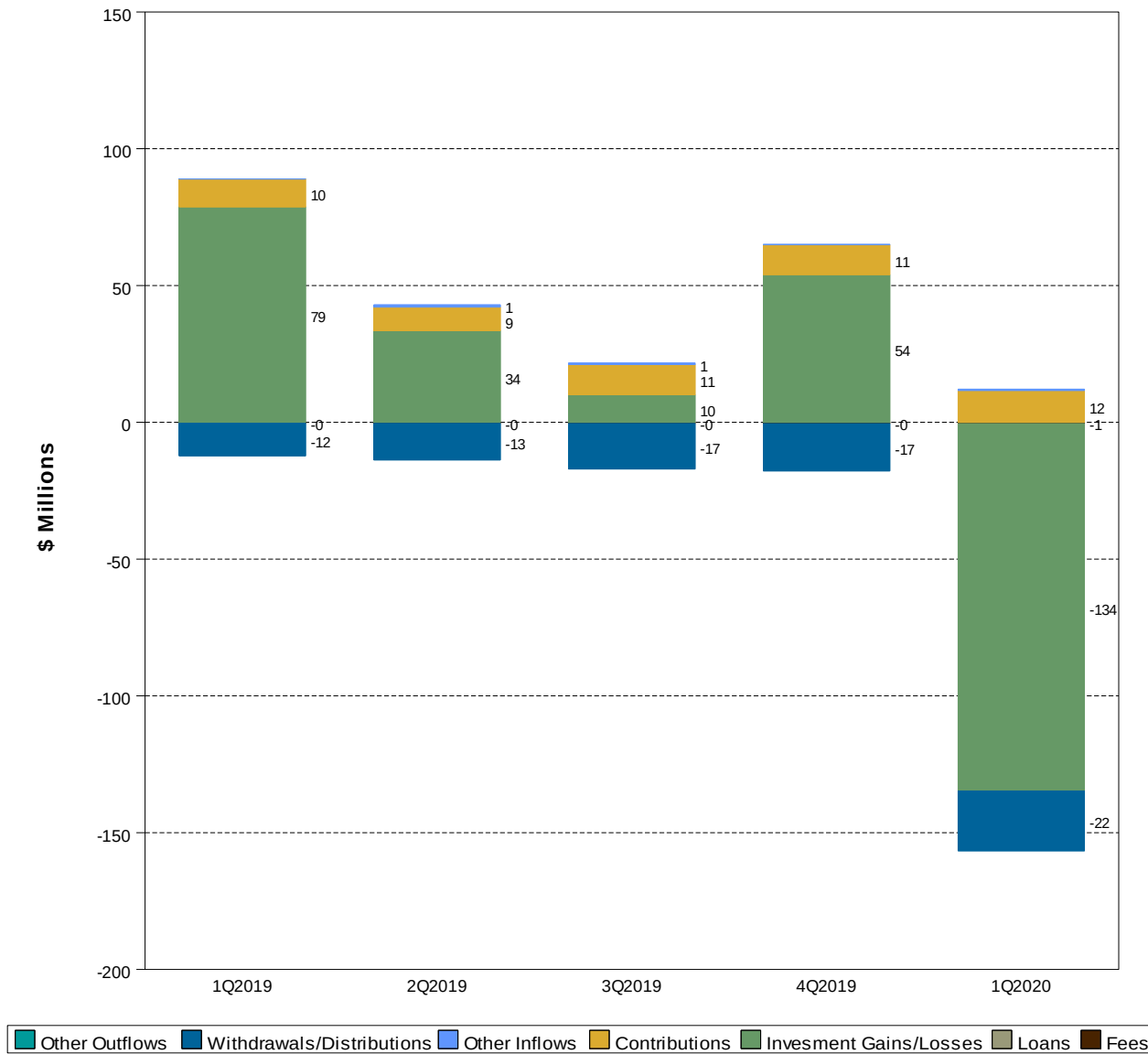
Deferred Comp Plan

March 31, 2020



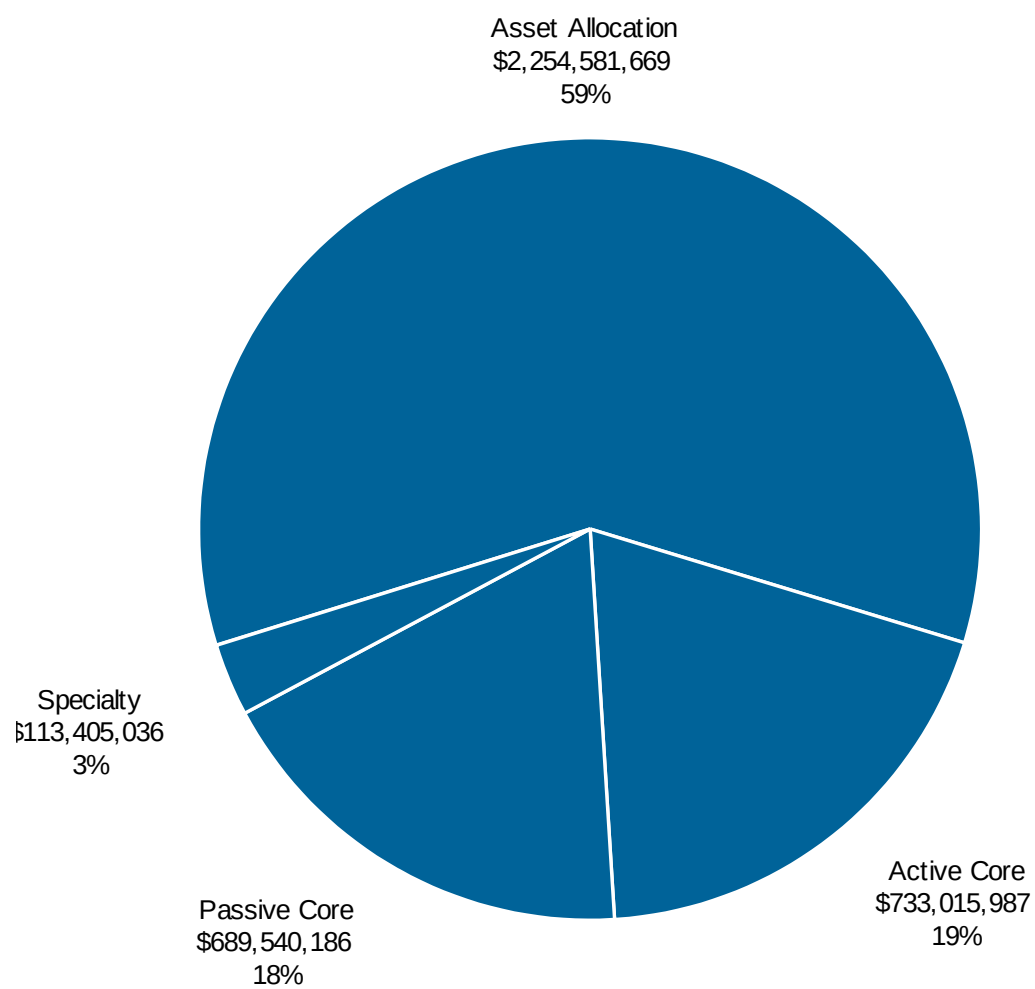
Deferred Comp Plan: Asset Changes

March 31, 2020



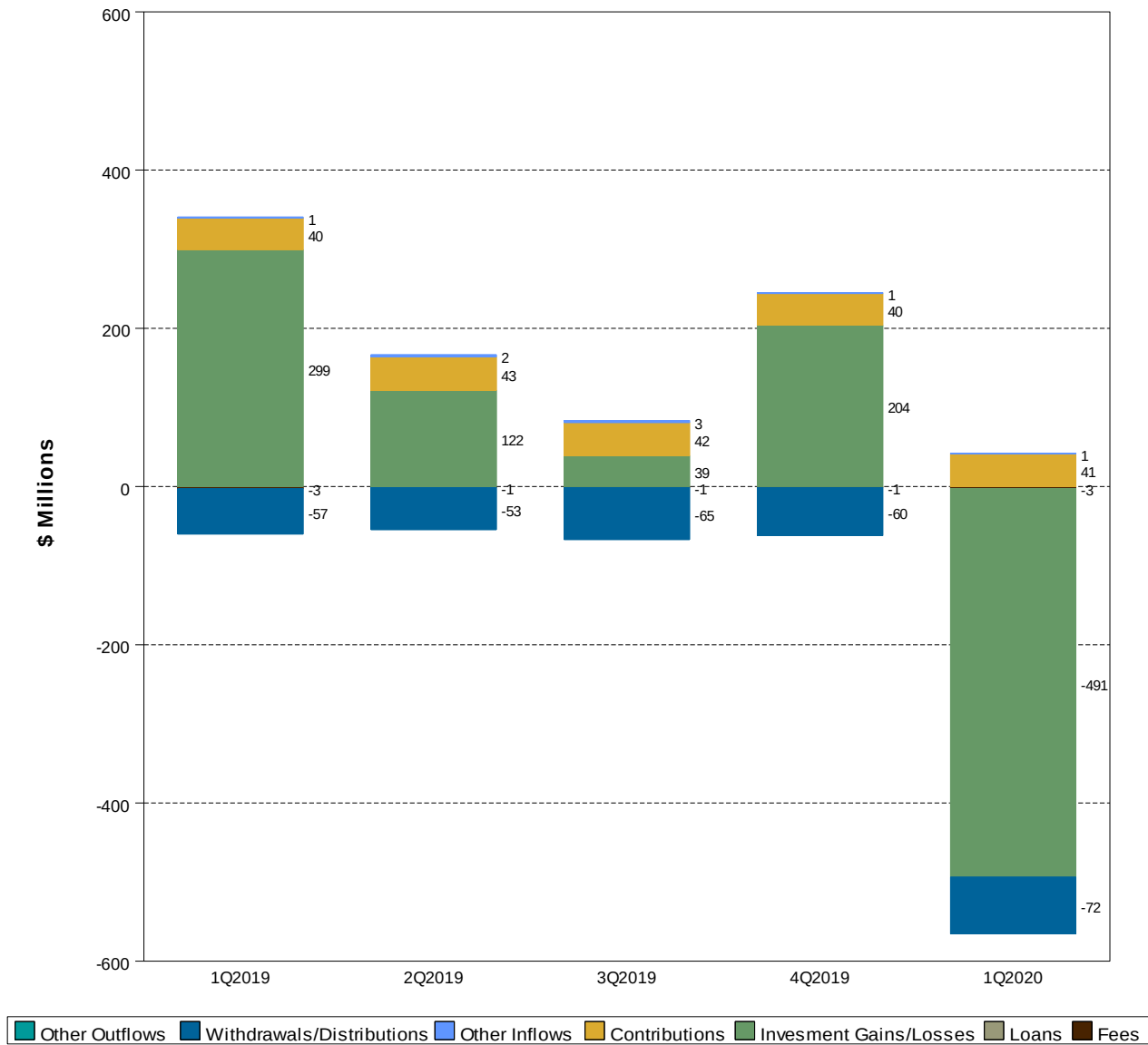
SBS Fund

March 31, 2020



SBS Fund: Asset Changes

March 31, 2020



Individual Account Option Performance: 3/31/20

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	-6.3 26	0.5 16	3.5 12	3.4 6	4.3 10	5.3 74		-0.1 40	0.3 100	0.4 24
CAI MA Tgt Alloc Cons MFs										
Passive Target	-6.6 27	0.5 16	3.5 10	3.4 5	4.3 10	5.5 66				0.4 26
Alaska Long-Term Balanced	-12.2 39	-3.9 36	3.0 27	3.6 21	5.3 25	9.1 65		-0.4 67	0.4 100	0.3 40
CAI MA Tgt Alloc Mod MFs										
Passive Target	-12.5 42	-3.8 34	3.2 24	3.7 19	5.4 23	9.4 63				0.3 38
Target 2010 Trust	-7.9 60	-1.1 62	3.2 41	3.3 36	4.6 19	6.4 60		-0.1 83	0.3 99	0.3 56
CAI Tgt Date 2010										
Custom Index	-8.3 63	-1.2 67	3.3 35	3.4 36	4.7 16	6.6 49				0.3 58
Target 2015 Trust	-9.2 52	-1.8 54	3.4 31	3.7 14	5.3 7	7.5 47		0.2 27	0.3 100	0.3 44
CAI Tgt Date 2015										
Custom Index	-9.7 61	-2.1 59	3.4 31	3.6 17	5.2 8	7.7 42				0.3 56
Target 2020 Trust	-11.4 75	-3.3 66	3.4 25	3.9 11	5.7 3	9.0 23		0.2 19	0.4 99	0.3 56
CAI Tgt Date 2020										
Custom Index	-11.8 82	-3.5 69	3.4 24	3.8 12	5.7 4	9.2 18				0.3 66
Target 2025 Trust	-13.4 76	-4.7 58	3.2 21	4.0 4	6.1 4	10.3 19		0.1 19	0.4 100	0.3 45
CAI Tgt Date 2025										
Custom Index	-13.9 84	-4.9 65	3.2 21	3.9 5	6.1 4	10.5 12				0.3 50
Target 2030 Trust	-15.2 67	-6.1 51	3.0 18	4.0 9	6.4 5	11.5 27		0.0 28	0.3 100	0.2 41
CAI Tgt Date 2030										
Custom Index	-15.7 76	-6.3 53	3.1 16	4.0 9	6.4 5	11.8 22				0.2 44
Target 2035 Trust	-16.7 43	-7.2 30	2.9 15	4.1 9	6.6 3	12.5 44		0.0 20	0.4 100	0.2 23
CAI Tgt Date 2035										
Custom Index	-17.1 52	-7.3 37	3.0 15	4.1 9	6.6 3	12.8 37				0.2 25
Target 2040 Trust	-18.0 34	-8.1 20	2.8 11	4.1 7	6.7 5	13.4 54		-0.0 15	0.4 100	0.2 17
CAI Tgt Date 2040										
Custom Index	-18.4 42	-8.3 22	2.9 10	4.1 7	6.7 5	13.6 43				0.2 18
Target 2045 Trust	-19.0 28	-9.0 17	2.5 11	4.0 5	6.6 3	13.9 67		-0.0 23	0.4 97	0.2 21
CAI Tgt Date 2045										
Custom Index	-19.4 36	-9.1 19	2.6 9	4.0 5	6.6 3	14.1 58				0.2 22

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: 3/31/20

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 CAI Tgt Date 2050	-19.0 21	-9.1 15	2.5 11	4.0 7	6.6 4	13.9 79		-0.1 23	0.4 97	0.2 17
Custom Index	-19.4 27	-9.1 16	2.6 8	4.0 7	6.6 4	14.1 70				0.2 17
Target 2055 Trust CAI Tgt Date 2055	-19.0 15	-9.0 13	2.5 11	4.0 6	6.6 4	13.9 87		-0.1 24	0.4 97	0.2 16
Custom Index	-19.4 20	-9.1 13	2.6 9	4.0 6	6.6 4	14.1 75				0.2 17
Target 2060 Trust CAI Tgt Date 2060	-19.1 18	-9.2 17	2.4 13						0.4 97	
Custom Index	-19.4 20	-9.1 17	2.6 11							

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: 3/31/20

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) Callan S&P 500 Index MFs S&P 500 Index	-19.6 38	-7.0 13	5.1 10	6.7 11	9.6 10	15.2 18		-0.5 10	0.0 90	0.4 11
SSgA Russell 3000 Index Fund (i) CAI Mut Fd: Large Cap Broad Style (Net) Russell 3000 Index	-19.6 33	-7.0 13	5.1 8	6.7 8	9.6 5	15.2 21		0.1 48	0.0 100	0.4 8
SSgA World Equity ex-US Index Fund (i) CAI MF: Non-U.S. Equity Style MSCI ACWI x U.S. Index (Net)	-20.9 59	-9.1 55	4.0 54	5.8 51	9.0 50	15.8 55		-0.0 49	0.5 100	0.3 51
SSgA World Equity ex-US Index Fund (i) CAI MF: Non-U.S. Equity Style MSCI ACWI x U.S. Index (Net)	-20.9 59	-9.1 55	4.0 54	5.8 51	9.0 50	15.8 55		-0.0 49	0.5 100	-0.1 50
SSgA World Equity ex-US Index Fund (i) CAI MF: Non-U.S. Equity Style MSCI ACWI x U.S. Index (Net)	-23.9 59	-16.1 60	-2.0 50	-0.7 48	1.1 63	16.3 63		-0.0 49	0.5 100	-0.1 50
BlackRock Passive US Bd Index Fund (i) Callan Core Bond MFs Blmbg Aggregate	3.1 13	8.8 12								
	3.1 12	8.9 11	4.8 9	3.4 28	3.2 28	3.4 28				0.6 36

Returns:
■ above median
■ third quartile
■ fourth quartile

Risk:
■ below median
■ second quartile
■ first quartile

Risk Quadrant:

 Return
 Risk

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: 3/31/20

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										
BlackRock Strategic Completion Fd	-14.4 44									
Callan Real Assets MFs										
Strategic Completion Custom Index	-14.0 43									
Northern Trust ESG Fund	-18.5 47	-5.7 44								
Callan Lg Cap Broad MF										
MSCI USA ESG	-18.4 47	-5.4 43	6.0 44	6.6 44	9.2 48	14.2 92				0.4 42
International Equity Fund	-24.1 60	-14.0 49	-3.4 67	-3.1 78		16.8 51		-0.9 90	2.9 69	-0.3 78
CAI Mut Fd: Non-U.S. Equity Style										
MSCI ACWI ex US Index	-23.4 55	-15.6 55	-2.0 49	-0.6 48	1.1 64	16.2 67				-0.1 50
T. Rowe Price Small Cap	-26.0 42	-15.5 28	2.5 32	4.3 25	7.9 27	18.8 87		1.1 3	4.6 74	0.2 23
CAI Mut Fd: Sm Cap Broad Style										
Russell 2000 Index	-30.6 54	-24.0 56	-4.6 57	-0.2 54	4.2 57	21.1 55				-0.1 54
T. Rowe Price Stable Value	0.6 1	2.6 1	2.5 2	2.4 1	2.5 1	0.1 89		3.2 5	0.3 8	17.4 2
Callan Stable Value CT										
FTSE 3 Mo T-Bill	0.4 96	2.0 58	1.7 72	1.1 99	0.8 99	0.4 1				-0.1 98
SSgA Inst Treasury Money Market	0.3 8	1.9 12	1.6 9	1.0 10	0.7 12	0.4 8		-3.5 40	0.0 83	-0.4 9
Callan Money Market Funds										
FTSE 3 Mo T-Bill	0.4 1	2.0 1	1.7 3	1.1 2	0.8 2	0.4 3				-0.1 2

Returns:

- above median
- third quartile
- fourth quartile

Risk:

- below median
- second quartile
- first quartile

Risk Quadrant:



Return

Risk

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

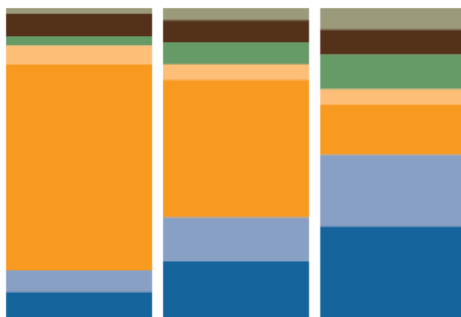
Callan Update

Published Research Highlights from 1Q20

2020 DC Trends Survey



Callan's 2020-2029 Capital Market Assumptions



How DC Plans Can Harness DC Plan Data for Better Outcomes



An Introduction to Our New Hedge Fund Peer Group



Recent Blog Posts

Local Presence for Multinational Managers in China

Fanglue Zhou

Trigger Funds: Here's What You Need to Know

Catherine Beard

Plus our [blog](#) contains a wide array of posts related to the pandemic

Additional Reading

Private Equity Trends quarterly newsletter
Active vs. Passive quarterly charts
Capital Market Review quarterly newsletter
Monthly Updates to the Periodic Table
Market Pulse Flipbook quarterly markets update
Real Assets Reporter quarterly newsletter

Callan Institute Events

Upcoming Conferences, Workshops, and Webinars

Upcoming Webinars

Hedge Fund Overview

May 21, 2020

China Update

July 8, 2020

Register at [callan.com/callan-institute-events](https://www.callan.com/callan-institute-events)

“Research, education, and dialogue are more important than ever in these extraordinary times, which is why I’m pleased to announce that we are adding more webinars, and we plan to expand our events to include roundtables and other interactive digital offerings.”

Barb Gerraty
Director, Callan Institute



On-Demand Webinars

Visit our website for On-Demand webinar options at <https://www.callan.com/on-demand-webinars/>

Our most recent webinar covered strategies in alternatives.

“Callan College”

Introduction to Investments for Institutional Investors

This program familiarizes institutional investor trustees and staff and asset management advisers with basic investment theory, terminology, and practices. It lasts one-and-a-half days and is designed for individuals with less than two years of experience with asset-management oversight and/or support responsibilities.

Alternative Investments for Institutional Investors

Alternative investments like private equity, hedge funds, and real estate can play a key role in any portfolio. In this one-day session, Callan experts will provide instruction about the importance of allocations to alternatives, and how to integrate, evaluate, and monitor them.

Program dates and registration can be found at [callan.com/callan-institute-events](https://www.callan.com/callan-institute-events)

Callan Updates

Firm updates by the numbers, as of March 31, 2020

Total Associates: 193

Ownership

- 100% employees
- Broadly distributed across more than 95 shareholders

Leadership Changes

- No executive additions or departures
- No leadership changes this quarter

Total General and Fund Sponsor Consultants: more than 45

Total Specialty and Research Consultants: more than 60

Total CFA/CAIA/FRMs: more than 55

Total Fund Sponsor Clients: more than 400

AUA: more than \$2.5 trillion

“We’ve been taking precautions to combat the spread of the virus and to safeguard the health of our employees, our clients, and the community at large. Our hearts go out to those directly affected by the virus, and to those whose lives are being disrupted by the downstream social and economic effects.”

- CEO & Chief Research Officer Greg Allen on Callan's COVID-19 Response



June 18, 2020



ARMB 2020 Asset Allocation Strategy

Paul Erlendson
Fund Sponsor Consulting

Steven Center
Fund Sponsor Consulting

Jay Kloepper
Capital Market Research

2020 Callan Capital Market Projections – Standard Set

Risk and return: 2020–2029

		PROJECTED RETURN			PROJECTED RISK		2019 - 2028		
		1-Year Arithmetic	10-Year Geometric*	Real	Standard Deviation	1-Year Arithmetic	10-Year Geometric*	Standard Deviation	
Asset Class	Index								
Equities									
Broad U.S. Equity	Russell 3000	8.55%	7.15%	4.90%	18.10%		8.50%	7.15%	17.95%
Large Cap U.S. Equity	S&P 500	8.35%	7.00%	4.75%	17.70%		8.25%	7.00%	17.10%
Small/Mid Cap U.S. Equity	Russell 2500	9.25%	7.25%	5.00%	21.20%		9.55%	7.25%	22.65%
Global ex-U.S. Equity	MSCI ACWI ex USA	9.10%	7.25%	5.00%	20.50%		9.20%	7.25%	21.10%
Developed ex-U.S. Equity	MSCI World ex USA	8.70%	7.00%	4.75%	19.70%		8.70%	7.00%	19.75%
Emerging Market Equity	MSCI Emerging Markets	10.25%	7.25%	5.00%	25.70%		10.70%	7.25%	27.45%
Fixed Income									
Short Duration Gov't/Credit	Bloomberg Barclays 1-3 Yr G/C	2.70%	2.70%	0.45%	2.10%		3.40%	3.40%	2.10%
Core U.S. Fixed	Bloomberg Barclays Aggregate	2.80%	2.75%	0.50%	3.75%		3.75%	3.75%	3.75%
Long Government	Bloomberg Barclays Long Gov	2.55%	1.80%	-0.45%	12.50%		3.30%	2.55%	12.50%
Long Credit	Bloomberg Barclays Long Cred	3.75%	3.25%	1.00%	10.50%		4.90%	4.45%	10.50%
Long Government/Credit	Bloomberg Barclays Long G/C	3.25%	2.75%	0.50%	10.60%		4.25%	3.75%	10.65%
TIPS	Bloomberg Barclays TIPS	2.50%	2.40%	0.15%	5.05%		3.80%	3.75%	5.05%
High Yield	Bloomberg Barclays High Yield	5.10%	4.65%	2.40%	10.25%		5.75%	5.35%	10.35%
Global ex-U.S. Fixed	Bloomberg Barclays GI Agg xUSD	1.30%	0.90%	-1.35%	9.20%		1.80%	1.40%	9.20%
Emerging Market Sovereign Debt	EMBI Global Diversified	4.70%	4.35%	2.10%	9.50%		5.40%	5.05%	9.50%
Other									
Core Real Estate	NCREIF ODCE	7.05%	6.25%	4.00%	14.00%		7.30%	6.25%	15.70%
Private Equity	Cambridge Private Equity	12.00%	8.50%	6.25%	27.80%		12.40%	8.50%	29.30%
Hedge Funds	Callan Hedge FoF Database	5.25%	5.00%	2.75%	8.70%		5.75%	5.50%	8.85%
Commodities	Bloomberg Commodity	4.30%	2.75%	0.50%	18.00%		4.75%	3.20%	18.00%
Cash Equivalents	90-Day T-Bill	2.25%	2.25%	0.00%	0.90%		2.50%	2.50%	0.90%
Inflation	CPI-U		2.25%		1.50%			2.25%	1.50%

Note that return projections for public markets assume index returns with no premium for active management.

* Geometric returns are derived from arithmetic returns and the associated risk (standard deviation).

Source: Callan LLC

2020 Callan Capital Market Assumptions

Correlation: 2020 - 2029

Large Cap U.S. Eq	1.000																		
Small/Mid Cap U.S. Eq	0.915	1.000																	
Dev. ex-U.S. Eq	0.765	0.775	1.000																
Emerging Market Eq	0.775	0.765	0.845	1.000															
Short Duration	-0.040	-0.065	-0.050	-0.080	1.000														
Core U.S. Fixed	-0.100	-0.125	-0.105	-0.140	0.845	1.000													
Long Government	-0.100	-0.125	-0.110	-0.170	0.770	0.900	1.000												
Long Credit	0.300	0.275	0.230	0.230	0.640	0.840	0.750	1.000											
TIPS	-0.040	-0.075	-0.050	-0.085	0.555	0.640	0.530	0.480	1.000										
High Yield	0.600	0.585	0.570	0.560	-0.030	0.030	-0.100	0.400	0.055	1.000									
Global ex-U.S. Fixed	0.010	0.000	0.050	0.100	0.495	0.530	0.470	0.540	0.400	0.120	1.000								
EM Sovereign Debt	0.530	0.515	0.515	0.545	0.050	0.110	-0.010	0.350	0.180	0.600	0.010	1.000							
Core Real Estate	0.695	0.665	0.660	0.625	-0.005	-0.035	-0.045	0.320	0.000	0.455	-0.050	0.360	1.000						
Private Equity	0.830	0.805	0.795	0.765	-0.160	-0.185	-0.250	0.190	-0.135	0.525	0.060	0.425	0.600	1.000					
Hedge Funds	0.775	0.750	0.745	0.720	0.055	0.100	0.120	0.390	0.085	0.560	-0.050	0.540	0.525	0.635	1.000				
Commodities	0.220	0.210	0.205	0.200	-0.195	-0.100	-0.030	-0.045	0.120	0.100	0.150	0.190	0.200	0.180	0.210	1.000			
Cash Equivalents	-0.030	-0.045	-0.030	-0.065	0.300	0.100	0.040	-0.100	0.120	-0.110	0.000	-0.070	-0.060	0.000	-0.070	0.070	1.000		
Inflation	-0.020	0.020	0.000	0.030	-0.205	-0.280	-0.250	-0.250	0.100	0.070	-0.100	0.000	0.100	0.060	0.200	0.400	0.000	1.000	
	Lg Cap	Sm/Mid	Dev ex-US	Em Market Eq	Sht Dur	Core Fix	Long Gov	Long Credit	TIPS	Hi Yield	Global ex-US Fixed	EMD	Core Real Estate	Private Equity	Hedge Funds	Comm	Cash Equiv	Inflation	

- 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

Source: Callan LLC

Customized ARMB Capital Market Projections – PERS & TRS Target

ARMB Asset Allocation Model 2020-2029

Asset Class	Target Weight	PROJECTED RETURN			PROJECTED RISK	
		1-Year Arithmetic	10-Year Geometric Return		Annualized Standard Deviation	Projected Yield
Public Equities	44.0%					
Broad US Equity	26.0%	8.50%	7.15%		18.10%	2.00%
Global Ex-US Equity	18.0%	9.10%	7.25%		20.50%	3.10%
Fixed Income	24.0%					
ARMB Core Fixed Income	24.0%	2.77%	2.75%		3.55%	3.35%
Opportunistic	8.0%					
Opportunistic	8.0%	6.15%	5.70%		10.60%	2.60%
Private Equity	11.0%					
Private Equity	11.0%	12.00%	8.50%		27.80%	0.00%
Real Assets	13.0%	7.30%	6.50%		14.20%	4.70%
Real Estate	4.88%	7.05%	6.25%		14.00%	4.75%
Timber	1.30%	6.95%	6.05%		14.60%	3.90%
Farmland	3.25%	7.05%	6.10%		15.00%	4.50%
Private Infrastructure	2.28%	7.55%	6.60%		15.20%	5.00%
REITs	1.30%	8.60%	6.70%		20.70%	5.00%
Cash Equivalents	0.0%					
Cash Equivalents	0.0%	2.25%	2.25%		0.90%	2.25%
Inflation			2.25%		1.50%	
Total Fund	100.0%	7.28%	6.64%		12.88%	2.69%

Projection set customized to reflect specific ARMB strategies:

- Real assets, opportunistic and fixed income

Current target projected to generate a return of 6.64% compounded over 10 years, at a risk (standard deviation) of 12.88%

Source: Callan LLC

Customized ARMB Capital Market Projections – Militia

ARMB Asset Allocation Model 2020-2029

Asset Class	Target Weight	1-Year Arithmetic	10-Year Geometric Return	Annualized Standard Deviation	Projected Yield
Public Equities	47.0%				
Broad US Equity	26.0%	8.50%	7.15%	18.10%	2.00%
Global Ex-US Equity	21.0%	9.10%	7.25%	20.50%	3.10%
Fixed Income	45.0%				
ARMB Core Fixed Income	45.0%	2.77%	2.75%	3.55%	3.35%
Opportunistic	8.0%				
Opportunistic	8.0%	6.15%	5.70%	10.60%	2.60%
Private Equity	0.0%				
Private Equity	0.0%	12.00%	8.50%	27.80%	0.00%
Real Assets	0.0%	7.30%	6.50%	14.20%	4.70%
Real Estate	0.00%	7.05%	6.25%	14.00%	4.75%
Timber	0.00%	6.95%	6.05%	14.60%	3.90%
Farmland	0.00%	7.05%	6.10%	15.00%	4.50%
Private Infrastructure	0.00%	7.55%	6.60%	15.20%	5.00%
REITs	0.00%	8.60%	6.70%	20.70%	5.00%
Cash Equivalents	0.0%				
Cash Equivalents	0.0%	2.25%	2.25%	0.90%	2.25%
Inflation			2.25%	1.50%	
Total Fund	100.0%	5.86%	5.56%	9.33%	2.88%

Militia plan does not currently include alternatives

Current target projected to generate a return of 5.56% compounded over 10 years, at a risk (standard deviation) of 9.33%

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: 7.0% nominal, 4.75% real, 4.25% premium over bonds
 - Bonds: 2.75% nominal, 0.50% real, 0.50 % premium over cash
 - Cash: 2.25% nominal, 0.0% real
 - Inflation: 2.25%
 - Underlying economic growth (real GDP) – 2 to 2.5% per year
- Equilibrium expectations:
 - Large Cap Stocks: 8.25% nominal, 6.0% real, 3.25% premium over bonds
 - Bonds: 5% nominal, 2.75% real, 1.75% premium over cash
 - Cash: 3.25% nominal, 1.0% 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	2020-2029 10-Year Annualized Return	2020-2039 20-Year Annualized Return	2020-2044 25-Year Annualized Return	2020-2049 30-Year Annualized Return	Long-Term Annualized Equilibrium Return	Projected Standard Deviation
Broad US Equity	7.15%	7.30%	7.50%	7.70%	8.45%	18.12%
Large Cap US Equity	7.00%	7.15%	7.35%	7.50%	8.25%	17.70%
Small/Mid Cap US Equity	7.25%	7.60%	7.85%	8.10%	9.05%	21.20%
Global ex-US Equity	7.25%	7.50%	7.70%	7.90%	8.75%	20.49%
Developed ex-US Equity	7.00%	7.10%	7.30%	7.50%	8.25%	19.70%
Emerging Market Equity	7.25%	7.90%	8.15%	8.40%	9.50%	25.70%
Core US Fixed	2.75%	3.25%	3.75%	4.00%	5.00%	3.75%
ARMB Fixed Income	2.75%	3.20%	3.70%	3.95%	4.95%	3.57%
Opportunistic	5.70%	6.00%	6.30%	6.50%	7.35%	10.58%
Core Real Estate	6.25%	6.25%	6.40%	6.50%	7.00%	14.00%
Timber	6.05%	6.50%	6.65%	6.75%	7.20%	14.60%
Farmland	6.10%	6.50%	6.65%	6.85%	7.30%	15.00%
Infrastructure, Private	6.60%	6.75%	6.85%	7.00%	7.40%	15.20%
US REITs	6.70%	7.00%	7.25%	7.50%	8.00%	20.70%
Real Assets	6.47%	6.66%	6.81%	6.96%	7.45%	14.12%
Hedge Funds	5.00%	5.25%	5.50%	5.50%	6.10%	8.70%
Private Equity	8.50%	9.30%	9.40%	9.50%	10.00%	27.80%
Cash Equivalents	2.25%	2.50%	2.65%	2.85%	3.25%	0.90%
Inflation	2.25%	2.25%	2.25%	2.25%	2.25%	1.50%

Source: Callan LLC

Focus on 20-Year Horizon – PERS (\$18 b) & TRS (\$8.8 b at 12/31/19)

Achieve 4.88% Real Return over 20-Year Horizon

ARMB adopted new target portfolio following 2019 asset-liability study

- 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
- New target altered the risk posture of the plans and acknowledged future liquidity needs
 - Less exposure to equity is required to meet the 7.13 return target over longer time horizons, with higher expected return

Portfolios optimized using broad US and non-US equity, broad US fixed income, real assets and private equity

- Opportunistic 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
 - 37.5% Real estate
 - 10% Timber
 - 25% Farmland
 - 17.5% Private Infrastructure
 - 10% REITs

Fixed income modeled as 95% broad market (BB Aggregate) and 5% cash

Allocations to real assets (13%), private equity (12%) and opportunistic (6%) held constant across range of mixes modeled for comparison

Focus On 20-Year Horizon – PERS and TRS

Target 7.13% Nominal/4.88% Real Return

		PERS/TRS							Public Market
		Target	Target 7.13	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5	Proxy
Broad US Equity		26	28	22	25	28	31	34	45
Global ex-US Equity		18	19	15	17	19	21	23	30
ARMB Fixed Income		24	22	32	27	22	17	12	25
Opportunistic		8	6	6	6	6	6	6	0
Real Assets		13	13	13	13	13	13	13	0
Private Equity		11	12	12	12	12	12	12	0
Totals		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
10-Year Projection	Projected Arithmetic Return	7.28%	7.51%	6.91%	7.21%	7.51%	7.81%	8.10%	7.26%
	10-year Compound Return	6.64%	6.79%	6.39%	6.60%	6.79%	6.97%	7.15%	6.53%
	Projected Standard Deviation	12.88%	13.55%	11.74%	12.65%	13.55%	14.46%	15.38%	13.55%
20-Year Projection	Projected Arithmetic Return	7.60%	7.83%	7.26%	7.54%	7.83%	8.12%	8.40%	7.52%
	20-year Compound Return	6.98%	7.13%	6.76%	6.95%	7.13%	7.30%	7.47%	6.81%
	Projected Standard Deviation	12.88%	13.55%	11.74%	12.65%	13.55%	14.46%	15.38%	13.55%
Equity		55%	59%	49%	54%	59%	64%	69%	75%
Inv Grade Fixed		24%	22%	32%	27%	22%	17%	12%	25%
Alts		24%	25%	25%	25%	25%	25%	25%	0%

Range of mixes varies by 5% increments to fixed income exposure; Target 7.13 is equivalent to Mix 3 (21.8% fixed income)

Target 7.13 represents an adjustment to the current plan target to meet the goal of 7.13% return over 20 years

Real assets and private equity held to current portfolio targets, opportunistic reduced to 6% in alternative mixes

Public market proxy shows the expected return for a portfolio restricted to public markets and held to the risk (standard deviation) of the portfolio that targets 7.13% nominal return (4.88% ARMB real return target + Callan's 2.25% inflation expectation)

Source: Callan LLC

Focus on 20-Year Time Horizon

Compare Return and Risk for Diversified and Public Markets-Only Portfolios

- Target 7.13 shown at left is expected to generate a long-term (20-year) return that meets the plan's real return target
- Greater return for the same level of risk as a portfolio restricted to the public markets
- Modest adjustment to the current target
 - 3% less fixed income
 - 1% more private equity
 - 2% more public equity

		Target 7.13	Public Market Proxy
	Broad US Equity	28	45
	Global ex-US Equity	19	30
	ARMB Fixed Income	22	25
	Opportunistic	6	0
	Real Assets	13	0
	Private Equity	12	0
	Totals	100.00	100.00
10-Year Projection	Projected Arithmetic Return	7.51%	7.26%
	10-year Compound Return	6.79%	6.53%
	Projected Standard Deviation	13.55%	13.55%
20-Year Projection	Projected Arithmetic Return	7.83%	7.52%
	20-year Compound Return	7.13%	6.81%
	Projected Standard Deviation	13.55%	13.55%
	Equity	59%	75%
	Inv Grade Fixed	22%	25%
	Alts	25%	0%

Focus on 20-Year Horizon – Militia (\$43 M at 12/31/19)

Militia target is more conservative (greater fixed income exposure) than PERS/TRS, does not include alternative asset classes

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

- Opportunistic is modeled as 60/40 exposure to public market stocks and bonds
- 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
 - 37.5% *Real estate*
 - 10% *Timber*
 - 25% *Farmland*
 - 17.5% *Private Infrastructure*
 - 10% *REITs*

Range of alternative portfolios is anchored around Mix 3, which replicates the expected risk of the current target portfolio

Focus On 20-Year Horizon – Militia Asset Mix Alternatives

Target Range of Mixes Centered Around Mix 3M – Diversified Mix With Same Risk as Target

	Military Target	Mix 1M	Mix 2M	Mix 3M	Mix 4M	Mix 5M	Public Market Proxy
Broad US Equity	26	16	18	20	22	25	31
Global ex-US Equity	21	10	11	13	14	15	21
ARMB Fixed Income	45	56	51	46	41	36	48
Opportunistic	8	6	6	6	6	6	0
Real Assets	0	6	7	7	8	9	0
Private Equity	0	7	7	8	9	10	0
Totals	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Projected Arithmetic Return	5.86%	5.40%	5.71%	6.02%	6.34%	6.65%	5.86%
10-year Compound Return	5.56%	5.22%	5.47%	5.72%	5.96%	6.19%	5.56%
Projected Standard Deviation	9.33%	7.60%	8.45%	9.33%	10.22%	11.13%	9.33%
Projected Arithmetic Return	6.18%	5.77%	6.07%	6.38%	6.69%	7.00%	6.18%
20-year Compound Return	5.89%	5.61%	5.86%	6.10%	6.33%	6.56%	5.89%
Projected Standard Deviation	9.33%	7.60%	8.45%	9.33%	10.22%	11.13%	9.33%
Equity	47%	32%	37%	41%	45%	50%	52%
Inv Grade Fixed	45%	56%	51%	46%	41%	36%	48%
Alts	0%	12%	14%	15%	17%	18%	0%

Range of mixes varies by 5% increments to fixed income exposure; range of mixes centers around Mix 3, with the same risk as target

Current target has an expected return of 5.89% over 20 years

Opportunistic reduced to 6% in alternative mixes, private equity and real assets introduced as potential asset classes

Mix 3 shows expected return for portfolio with same expected risk as the current target, but includes private equity and real assets

Public market proxy shows the expected return for a portfolio restricted to public markets and held to the risk (standard deviation) of the current target and the diversified Mix 3

Source: Callan LLC

Diversification Benefit to Alternatives

Table compares portfolios with the same expected return over 10-year horizon

Portfolios without private equity and real assets expected to generate higher risk for the same level of return

Alternatives provide diversification benefit, at the cost of illiquidity and greater complexity.

Returns are represented as net of fee for all asset classes

Portfolios Including Alternatives

	Military Target	Mix 1M	Mix 2M	Mix 3M	Mix 4M	Mix 5M
Broad US Equity	26	16	18	20	22	25
Global ex-US Equity	21	10	11	13	14	15
ARMB Fixed Income	45	56	51	46	41	36
Opportunistic	8	6	6	6	6	6
Real Assets	0	6	7	7	8	9
Private Equity	0	7	7	8	9	10
Totals	100.00	100.00	100.00	100.00	100.00	100.00
Projected Arithmetic Return	5.86%	5.40%	5.71%	6.02%	6.34%	6.65%
10-year Compound Return	5.56%	5.22%	5.47%	5.72%	5.96%	6.19%
Projected Standard Deviation	9.33%	7.60%	8.45%	9.33%	10.22%	11.13%

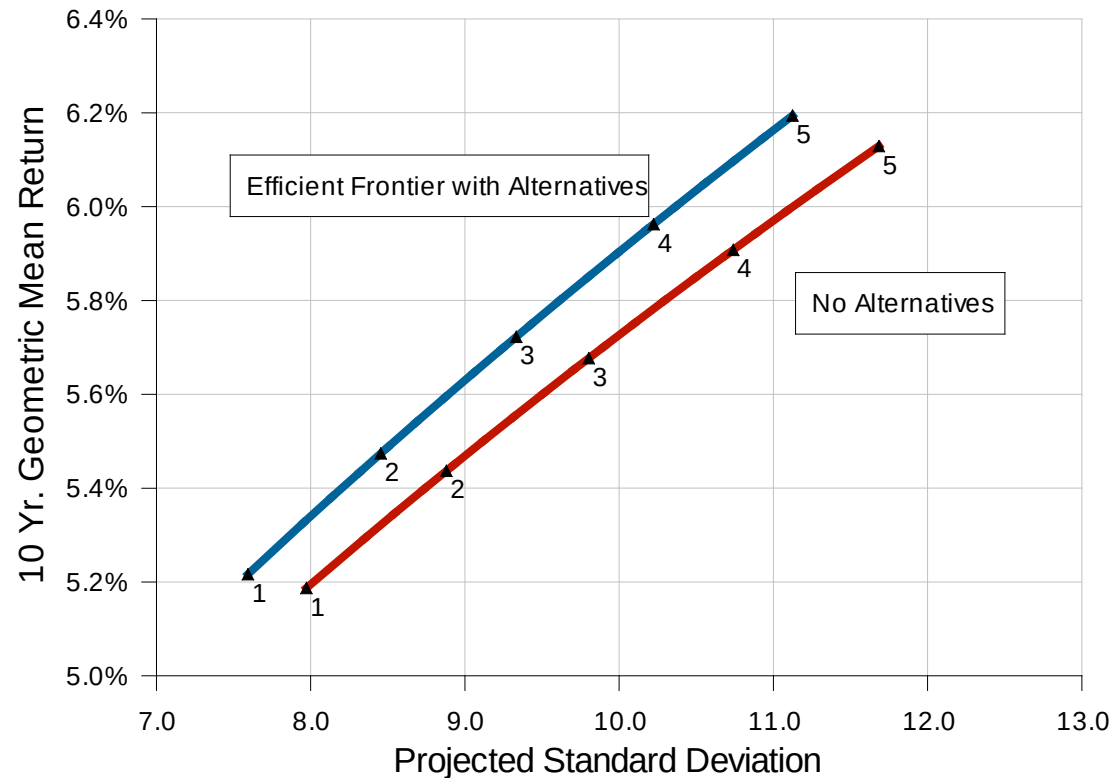
No Alternatives

	Military Target	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
Broad US Equity	26	24	28	31	34	37
Global ex-US Equity	21	16	18	20	22	24
ARMB Fixed Income	45	54	49	43	38	33
Opportunistic	8	6	6	6	6	6
Real Assets	0	0	0	0	0	0
Private Equity	0	0	0	0	0	0
Totals	100.00	100.00	100.00	100.00	100.00	100.00
Projected Arithmetic Return	5.86%	5.40%	5.71%	6.02%	6.34%	6.65%
10-year Compound Return	5.56%	5.19%	5.44%	5.68%	5.91%	6.13%
Projected Standard Deviation	9.33%	7.97%	8.88%	9.80%	10.74%	11.68%
Difference in risk		0.38%	0.43%	0.47%	0.52%	0.56%

Source: Callan LLC

Diversification Benefit to Alternatives

Efficient Frontier Comparison



Addition of private equity and real assets can provide a diversification benefit to the Militia fund: greater return per unit of risk taken.

Consideration of cost, complexity and illiquidity are important. Long time horizon for benefit payments suggests long investment time horizon for the fund. Funded status may not compel the plan to seek higher return, but diversification of growth assets in a more conservative portfolio can still reap benefits to the fund.

Source: Callan LLC

Callan

Appendix

2020 Correlation Assumptions for Customized ARMB Asset Class Set

Correlation Matrix	Broad US	Large	SMID	Glb ex US	Int'l	Emerge	Dom Fix	ARMB Fix	Opp	Priv Eq	Real A	RE	Timber	Farm	Infra	REITs	HF	Cash	CPI
Broad US Equity	1.000																		
Large Cap US Equity	0.996	1.000																	
Small/Mid Cap US Equity	0.949	0.915	1.000																
Global ex-US Equity	0.808	0.795	0.799	1.000															
Developed ex-US Equity	0.779	0.765	0.775	0.986	1.000														
Emerging Market Equity	0.785	0.775	0.765	0.923	0.845	1.000													
Core US Fixed	-0.107	-0.100	-0.125	-0.120	-0.105	-0.140	1.000												
ARMB Fixed Income	-0.108	-0.100	-0.125	-0.120	-0.105	-0.141	1.000	1.000											
Opportunistic	0.985	0.990	0.901	0.781	0.753	0.758	0.041	0.041	1.000										
Private Equity	0.837	0.830	0.805	0.813	0.795	0.765	-0.185	-0.185	0.807	1.000									
Real Assets	0.720	0.714	0.692	0.693	0.678	0.653	-0.085	-0.086	0.705	0.643	1.000								
Core Real Estate	0.699	0.695	0.665	0.672	0.660	0.625	-0.035	-0.036	0.693	0.600	0.967	1.000							
Timber	0.614	0.610	0.585	0.585	0.575	0.545	-0.120	-0.122	0.596	0.525	0.939	0.860	1.000						
Farmland	0.616	0.610	0.595	0.591	0.580	0.550	-0.120	-0.122	0.596	0.535	0.943	0.885	0.900	1.000					
Infrastructure, Private	0.656	0.655	0.615	0.625	0.615	0.580	-0.070	-0.071	0.648	0.545	0.951	0.895	0.890	0.885	1.000				
US REITs	0.746	0.730	0.750	0.737	0.700	0.740	-0.100	-0.101	0.719	0.820	0.775	0.700	0.740	0.600	0.700	1.000			
Hedge Funds	0.781	0.775	0.750	0.763	0.745	0.720	0.100	0.099	0.792	0.635	0.547	0.525	0.450	0.465	0.465	0.640	1.000		
Cash Equivalents	-0.034	-0.030	-0.045	-0.042	-0.030	-0.065	0.100	0.113	-0.016	0.000	-0.101	-0.060	-0.140	-0.130	-0.110	-0.060	-0.070	1.000	
Inflation	-0.011	-0.020	0.020	0.009	0.000	0.030	-0.280	-0.280	-0.060	0.060	0.078	0.100	0.015	0.025	0.065	0.140	0.200	0.000	1.000

Source: Callan LLC

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ALASKA RETIREMENT MANAGEMENT BOARD

Portfolio Update

Bob Mitchell, CFA
Chief Investment Officer
June 18-19, 2020

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?

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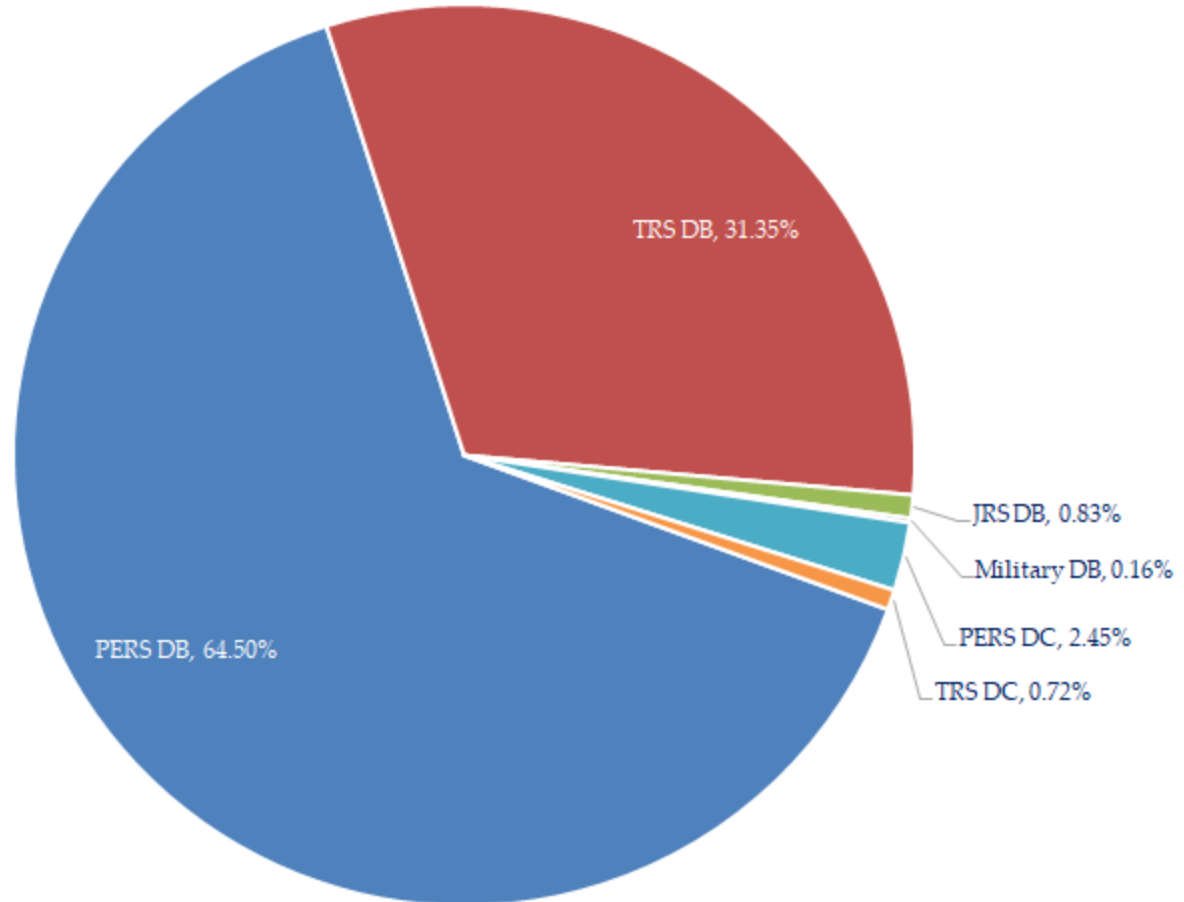
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Monitor Results

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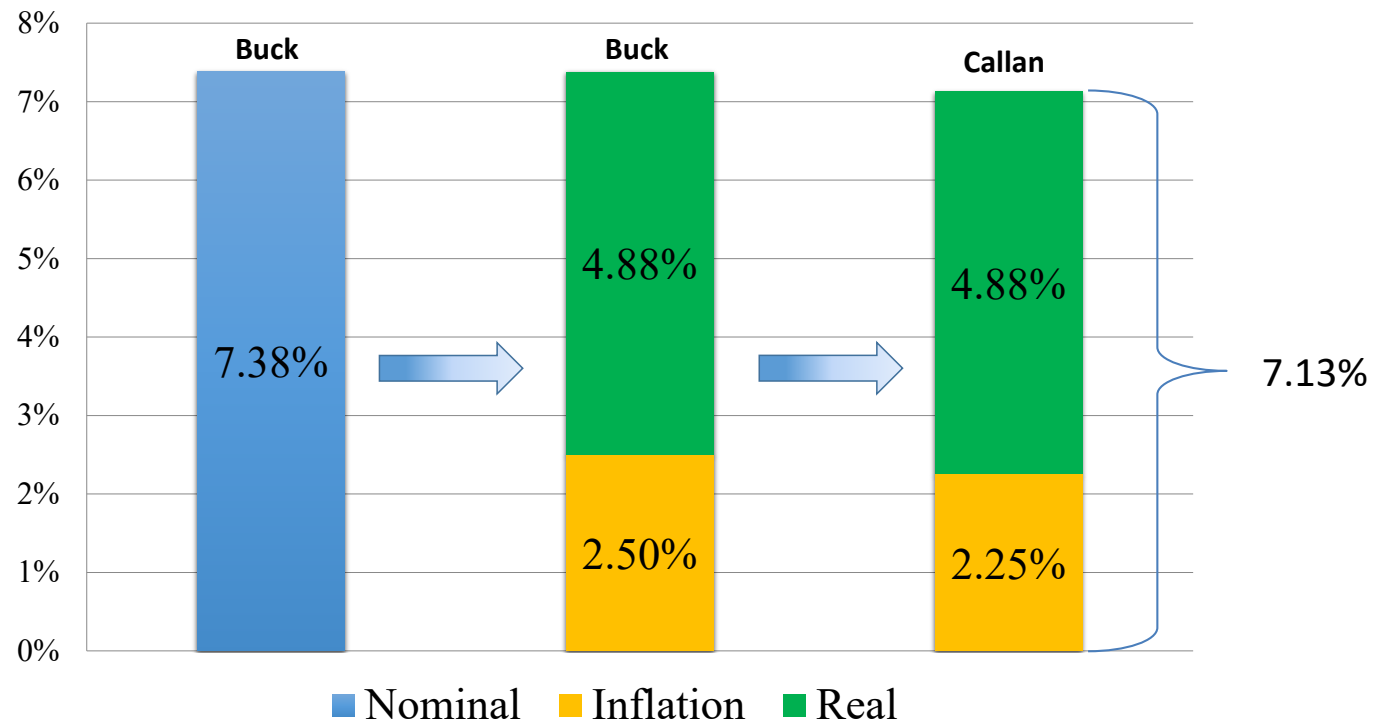
Breakdown of “DB” Assets by Plan



Fund's Purpose

Achieve the “expected long-term total return, as determined by the actuarially-required rate of return, while minimizing risk as determined by the projected standard deviation of the range of potential future returns.”

– ARMB Policy & Procedures Manual



Key Board Decisions

Determine Investment Objective

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

Determine Asset Allocation

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Oversee Implementation

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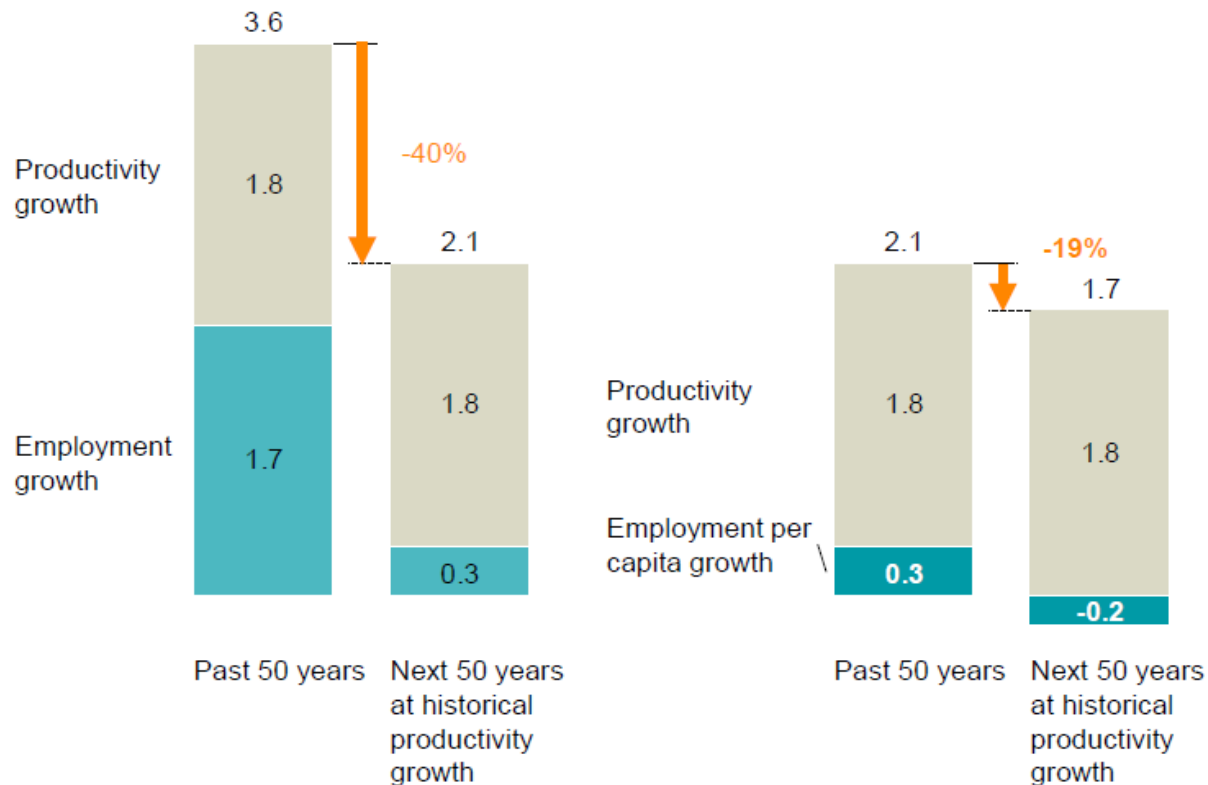
Growth Levels Projected to Fall

G19 and Nigeria

Compound annual growth rate, %

GDP

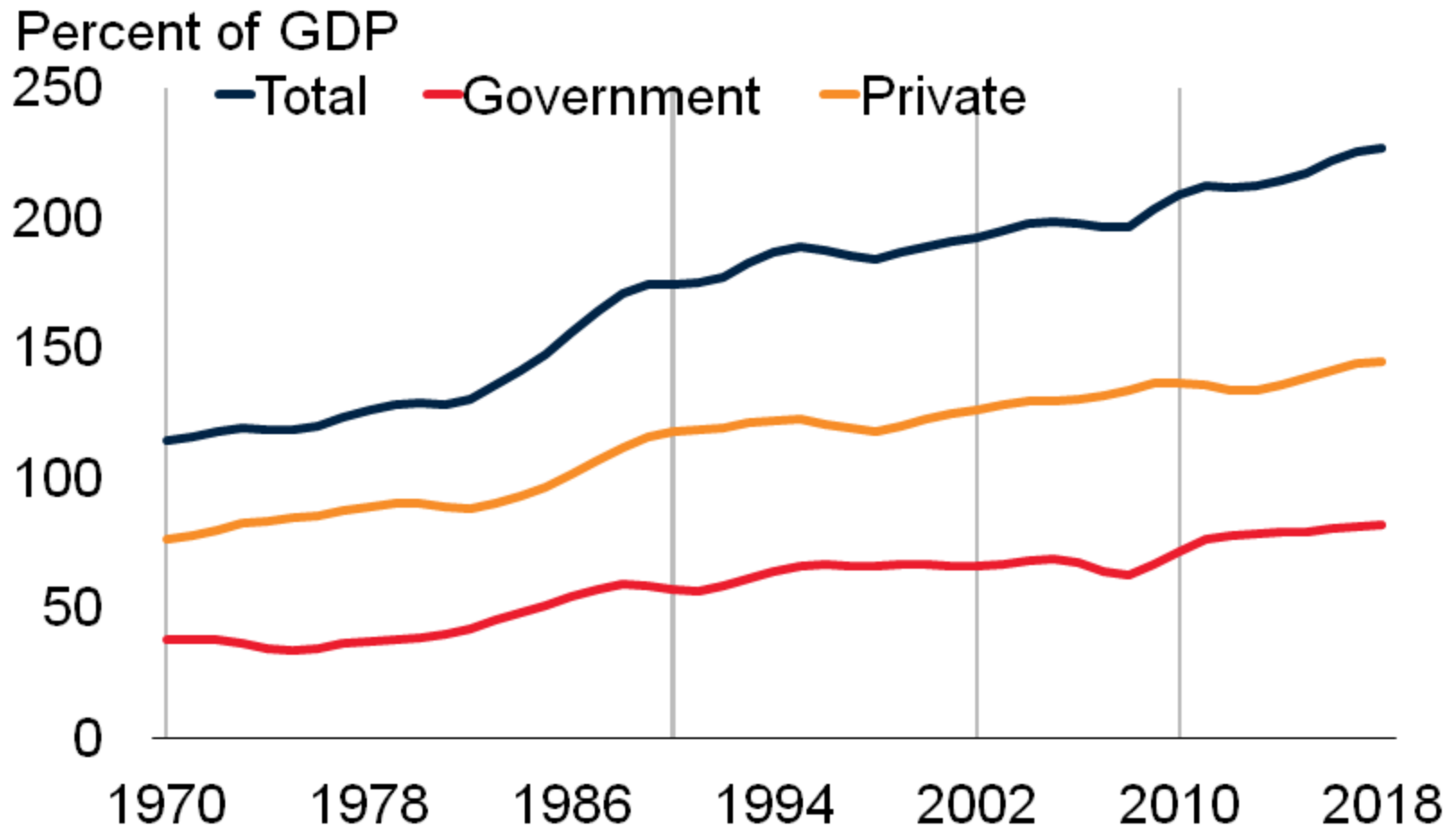
Per capita GDP



NOTE: Numbers may not sum due to rounding.

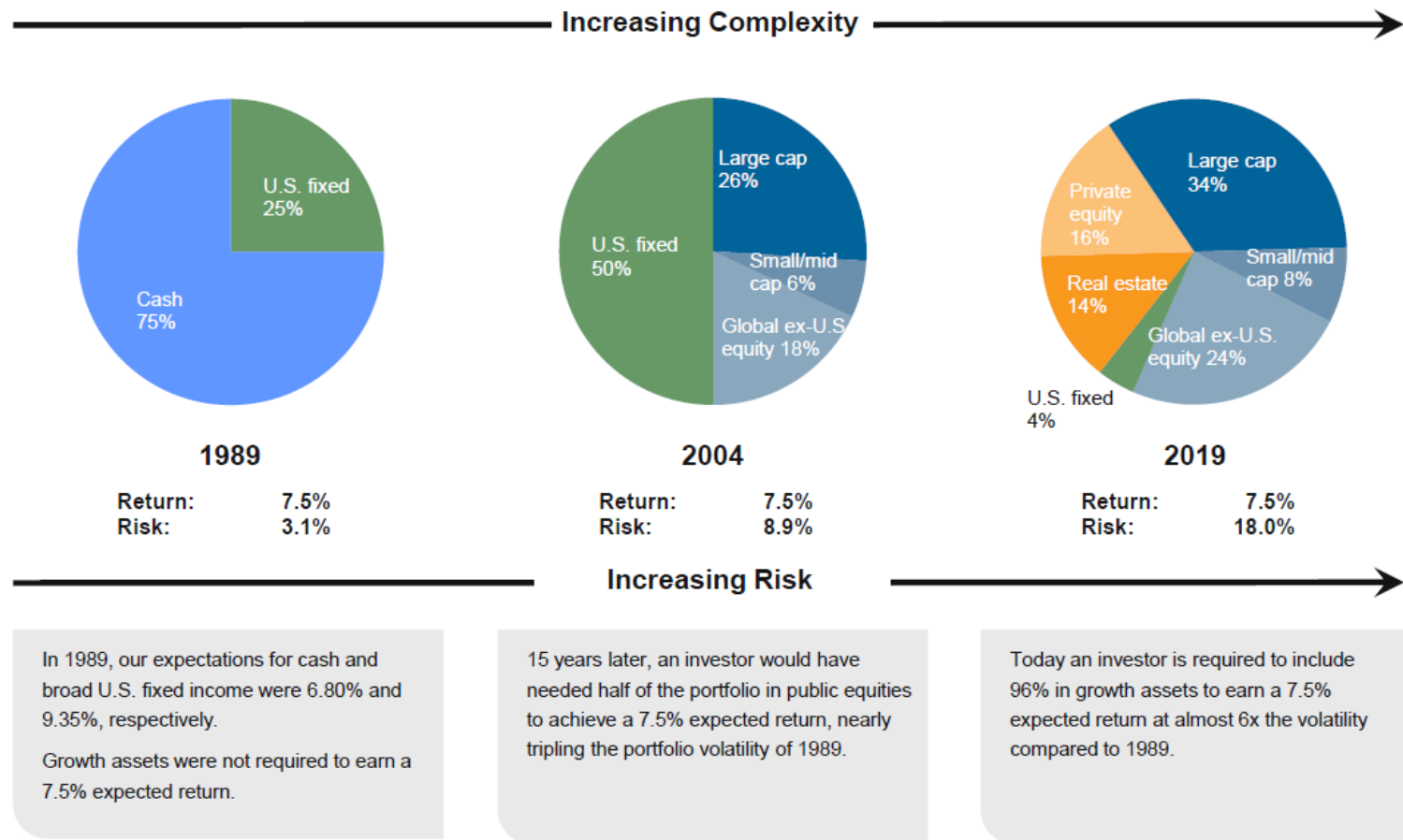
SOURCE: The Conference Board Total Economy Database; United Nations Population Division; McKinsey Global Institute analysis

Debt Levels Continue to Rise



Expected Returns have been Falling

7.5% Expected Returns Over Past 30+ Years

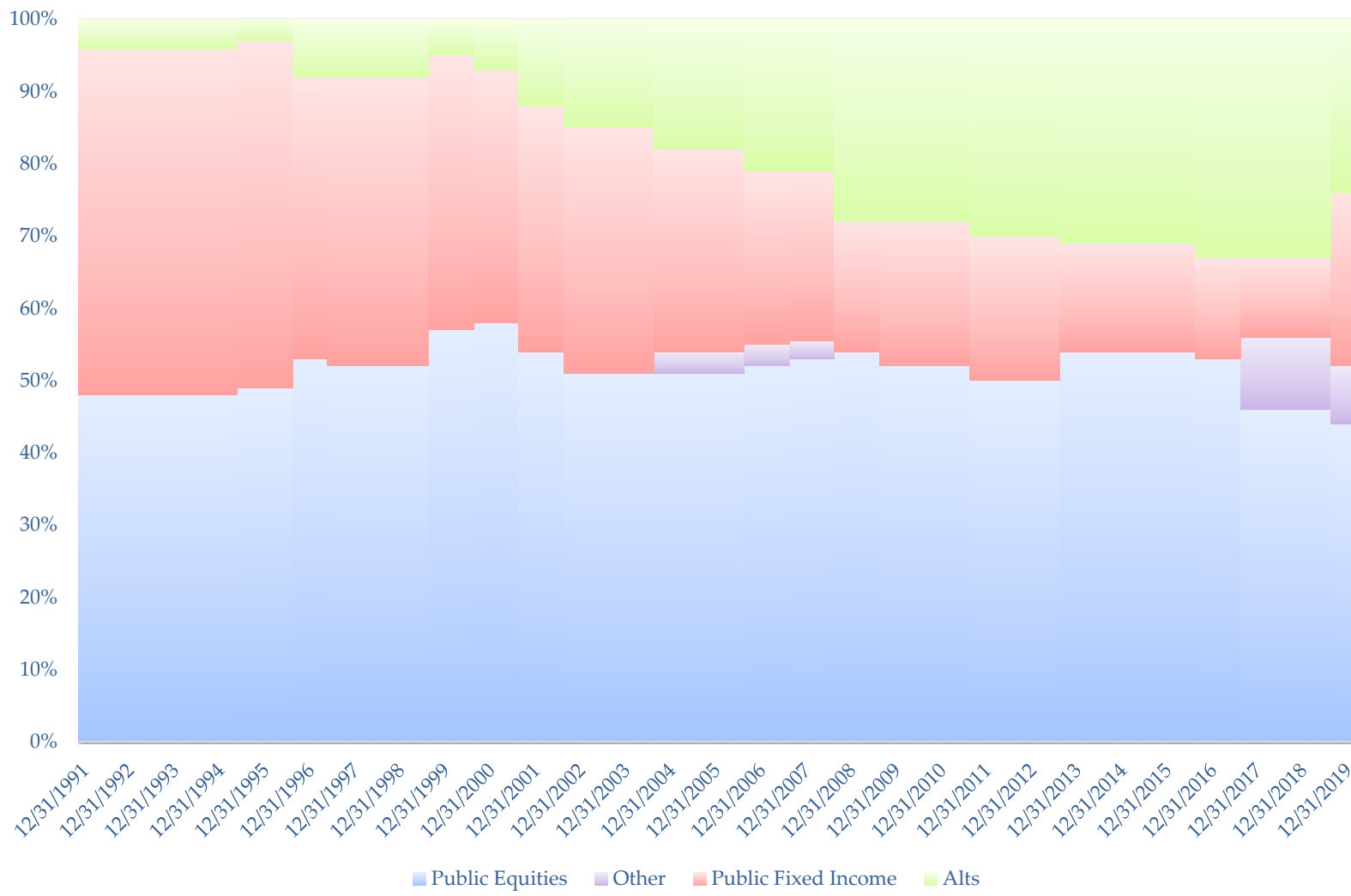


Source: Callan

ARMB Asset Allocation

- Ensure adequate liquidity
- Focus on cost
 - While returns are unknowable, costs are
 - Be mindful of costs, but not myopic
 - Have confidence we will get something for what we are spending
 - Don't over-diversify mandates (move lower in fee waterfall)
- Raise the bar for Alt investments
 - Relinquish rebalancing benefit
 - Less return history (for many investments)
 - More opaque (harder to understand risks)
 - Manager/strategy selection decision is important
 - Higher cost
- Take meaningful active risk where the odds are good; diversify approaches
 - Less security selection; more tactical allocation and alternative beta

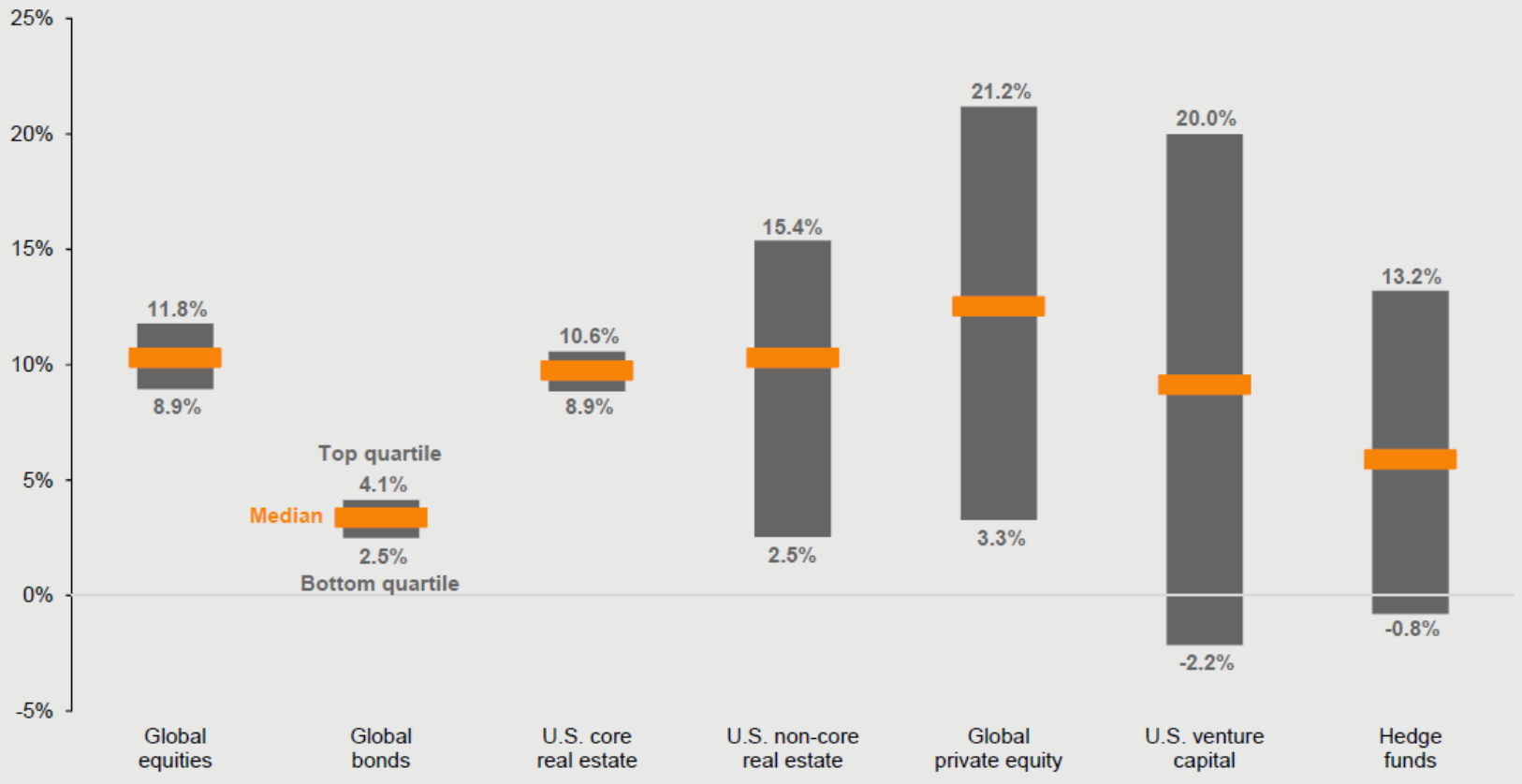
ARMB Allocation Over Time



Manager Dispersion

Private and public manager dispersion

Based on returns over a 10 year window*



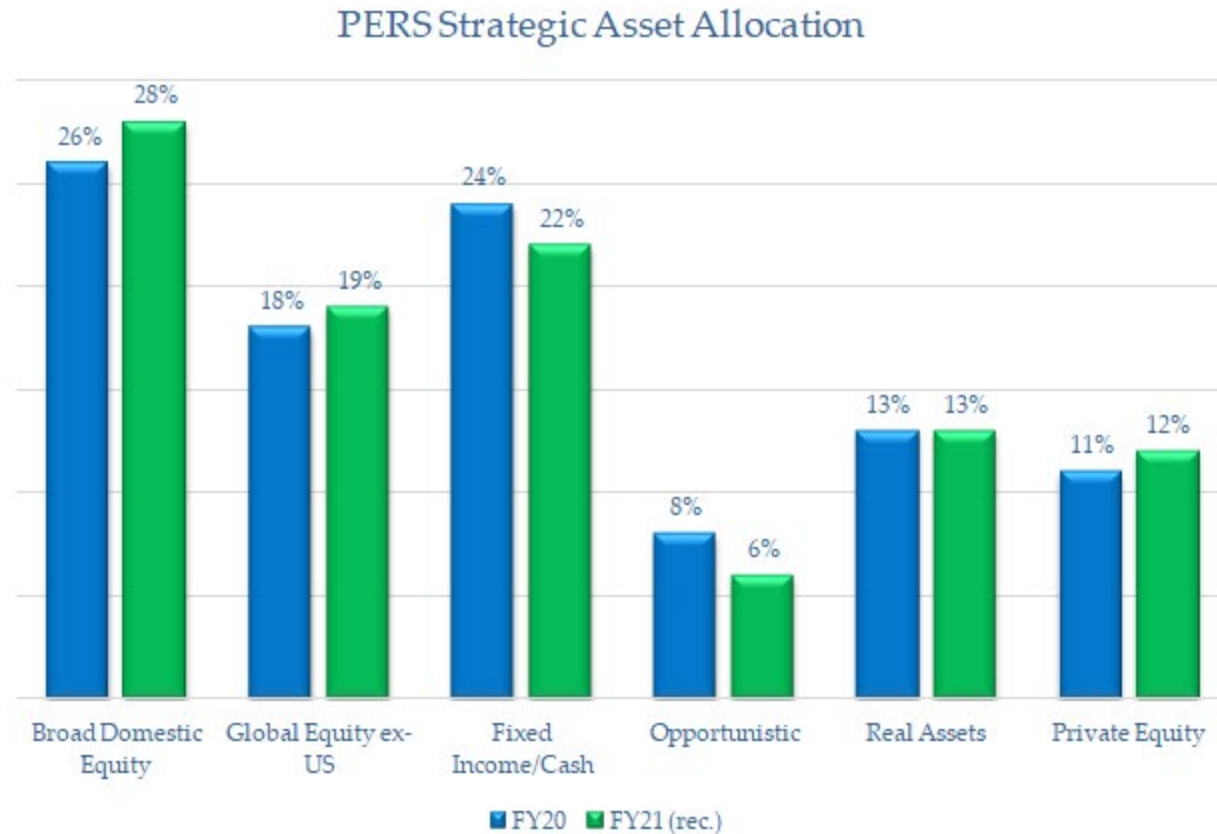
Sources: Lipper, NCREIF, Cambridge Associates, HFRI, J.P. Morgan Asset Management.

Global equities (large cap) and global bonds dispersion are based on the world large stock and world bond categories, respectively. *Manager dispersion is based on: 2Q 2009 – 2Q 2019 annual returns for global equities, global bonds and U.S. core real estate. Hedge funds are based on 4Q 2009 to 4Q 2019 annual returns. U.S. non-core real estate, U.S. private equity and U.S. venture capital are represented by the 10-year horizon internal rate of return (IRR) ending 2Q 2019.

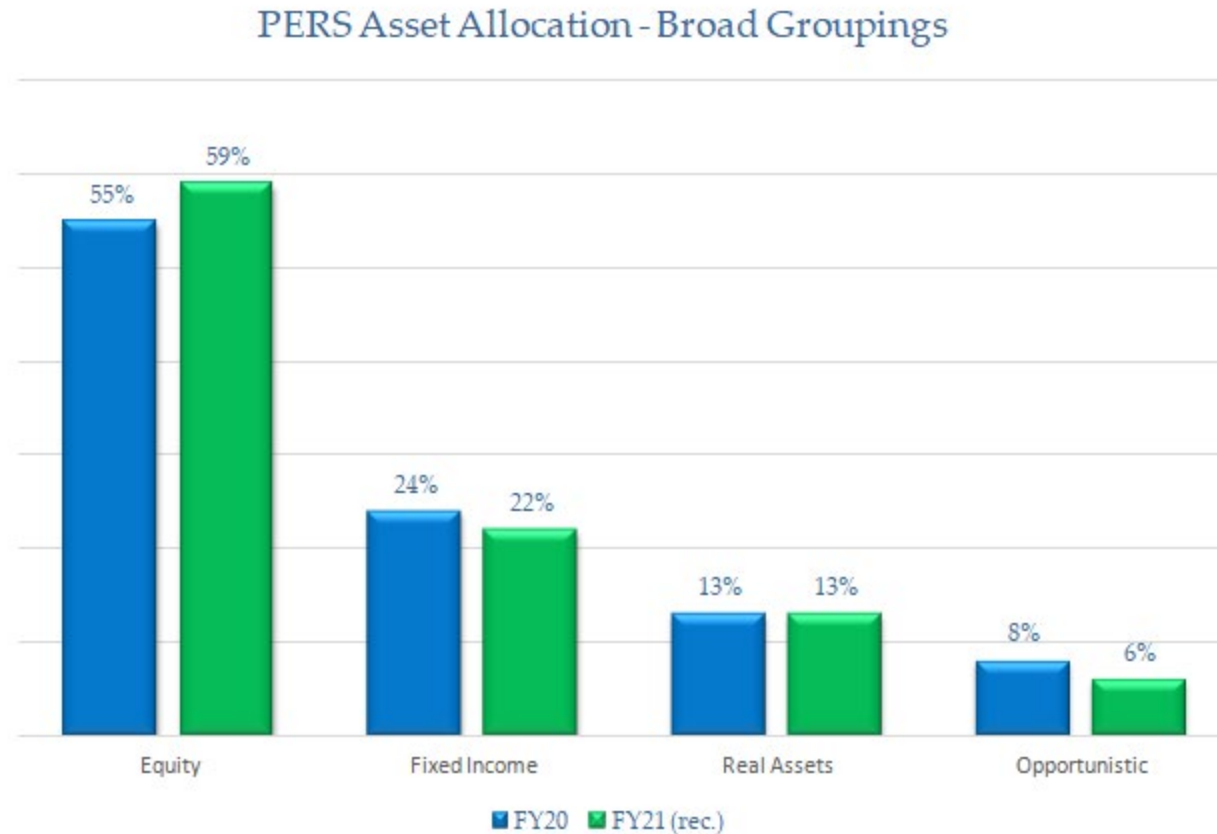
Data is based on availability as of February 29, 2020.

J.P.Morgan
Asset Management

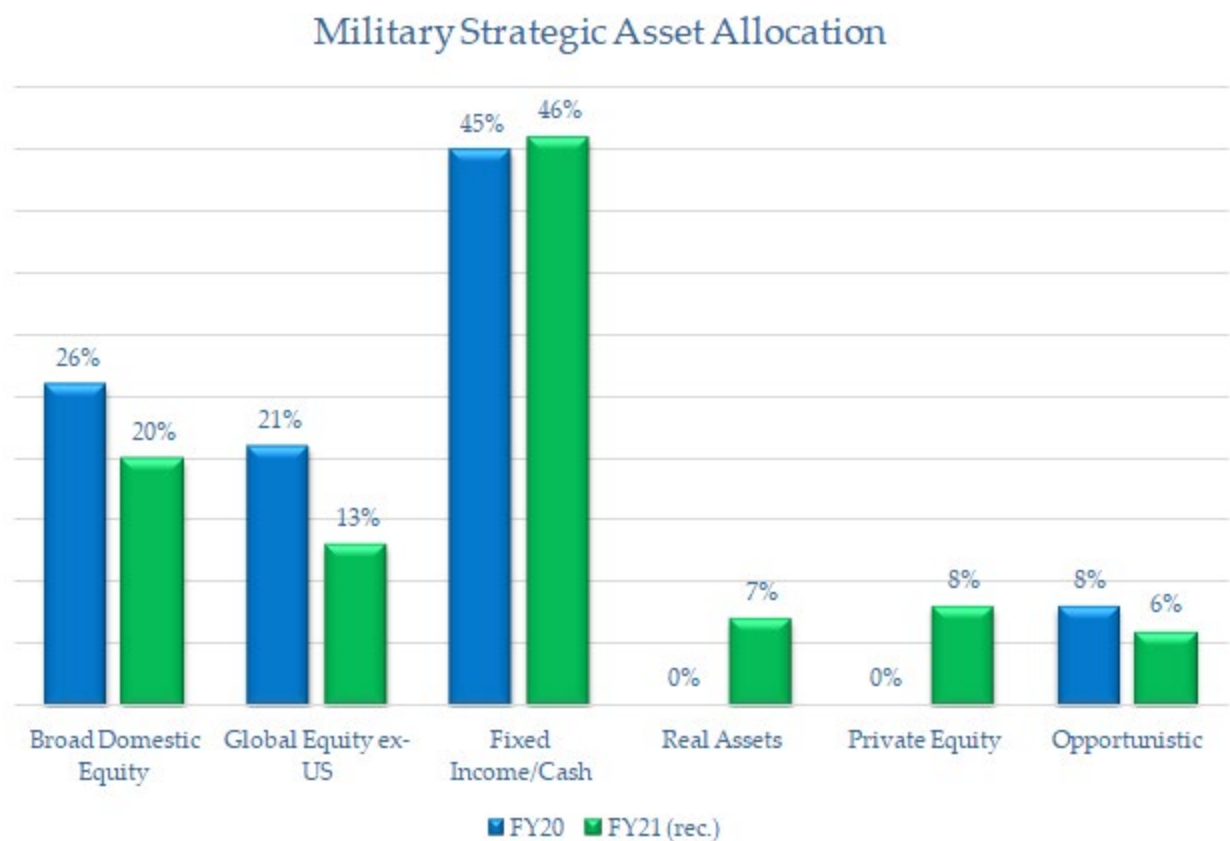
PERS Asset Allocation – FY20 vs. FY21 (rec.)



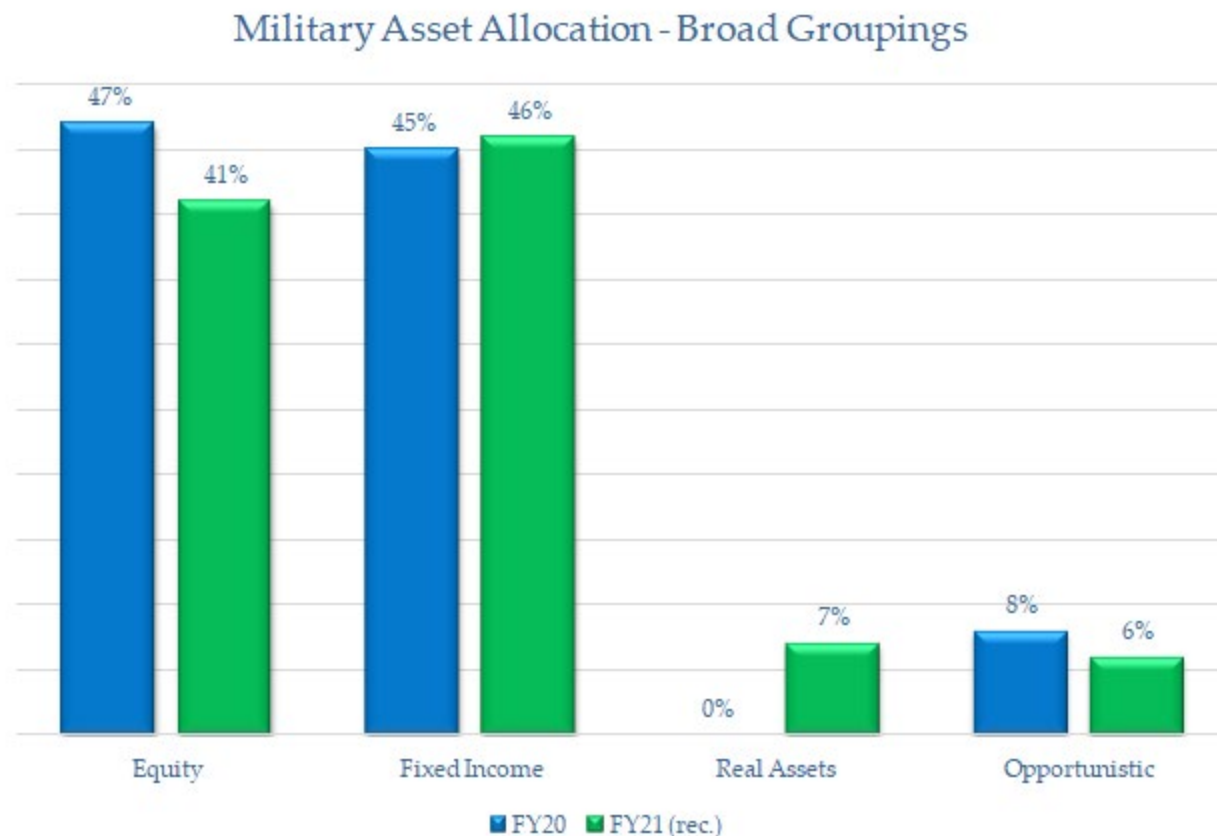
PERS Broad Groupings – FY20 vs. FY21 (rec.)



Military Asset Allocation – FY20 vs. FY21



Military Asset Allocation – FY20 vs. FY21



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

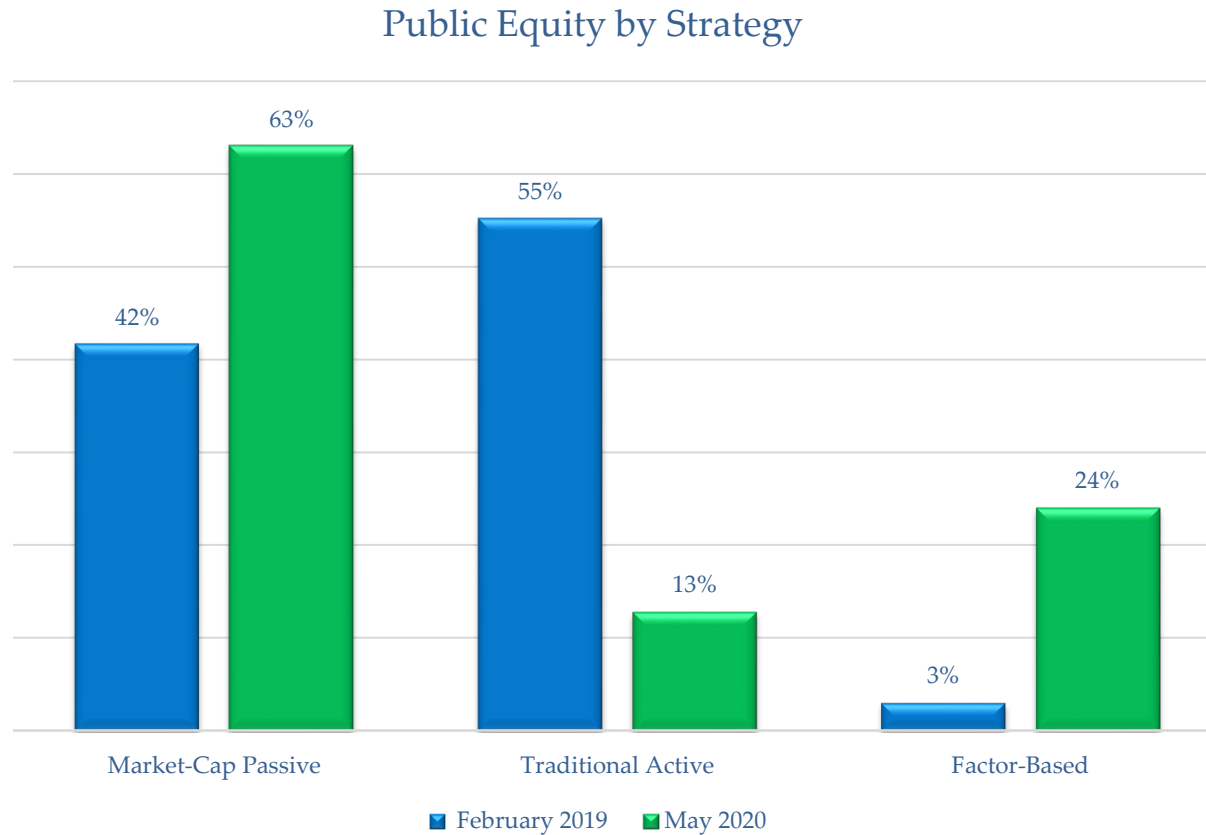
Monitor Results

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

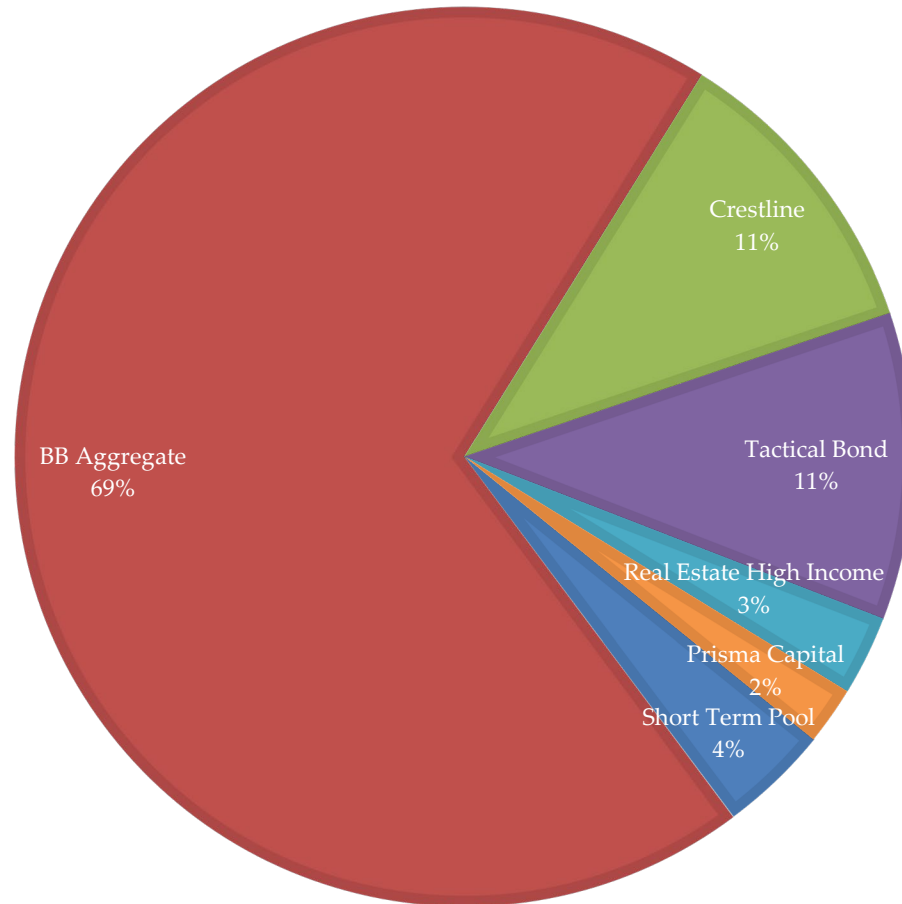
ARMB Manager Structure

- Public Equity
 - Increased passive and factor-based investments, reduced traditional active
- Fixed Income
 - Broadened mandate
 - Increased active risk via allocations to unconstrained bond, structured real estate debt and private debt strategies
- Private Equity
 - Implementing via limited partnerships; employing two gatekeepers and staff-directed investments
- Real Assets
 - Moving out of non-core real estate, in favor of core and public real estate
- Opportunistic
 - Distinct strategies focused on diversifying active risk

Public Equity Composition

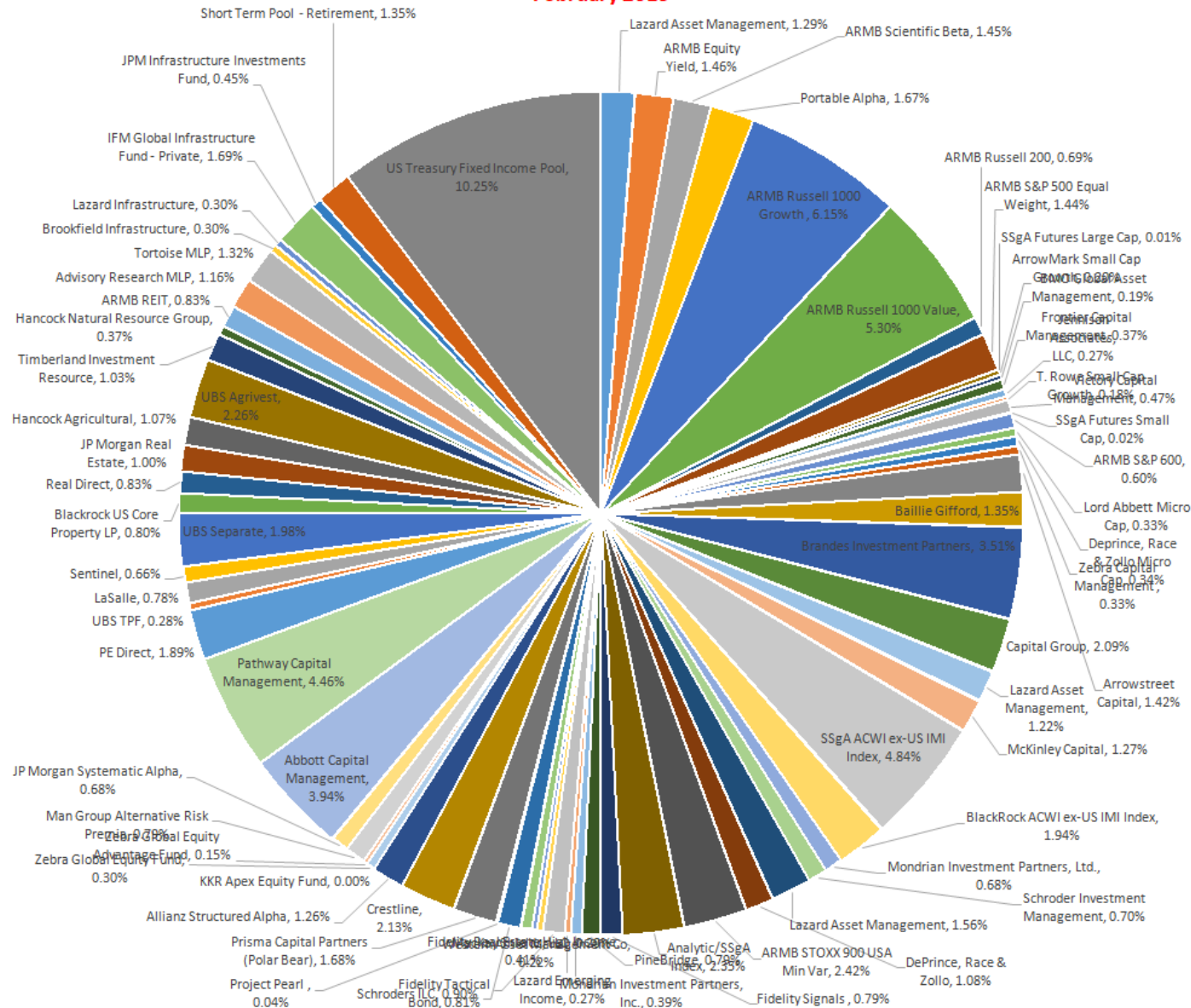


Fixed Income Composition

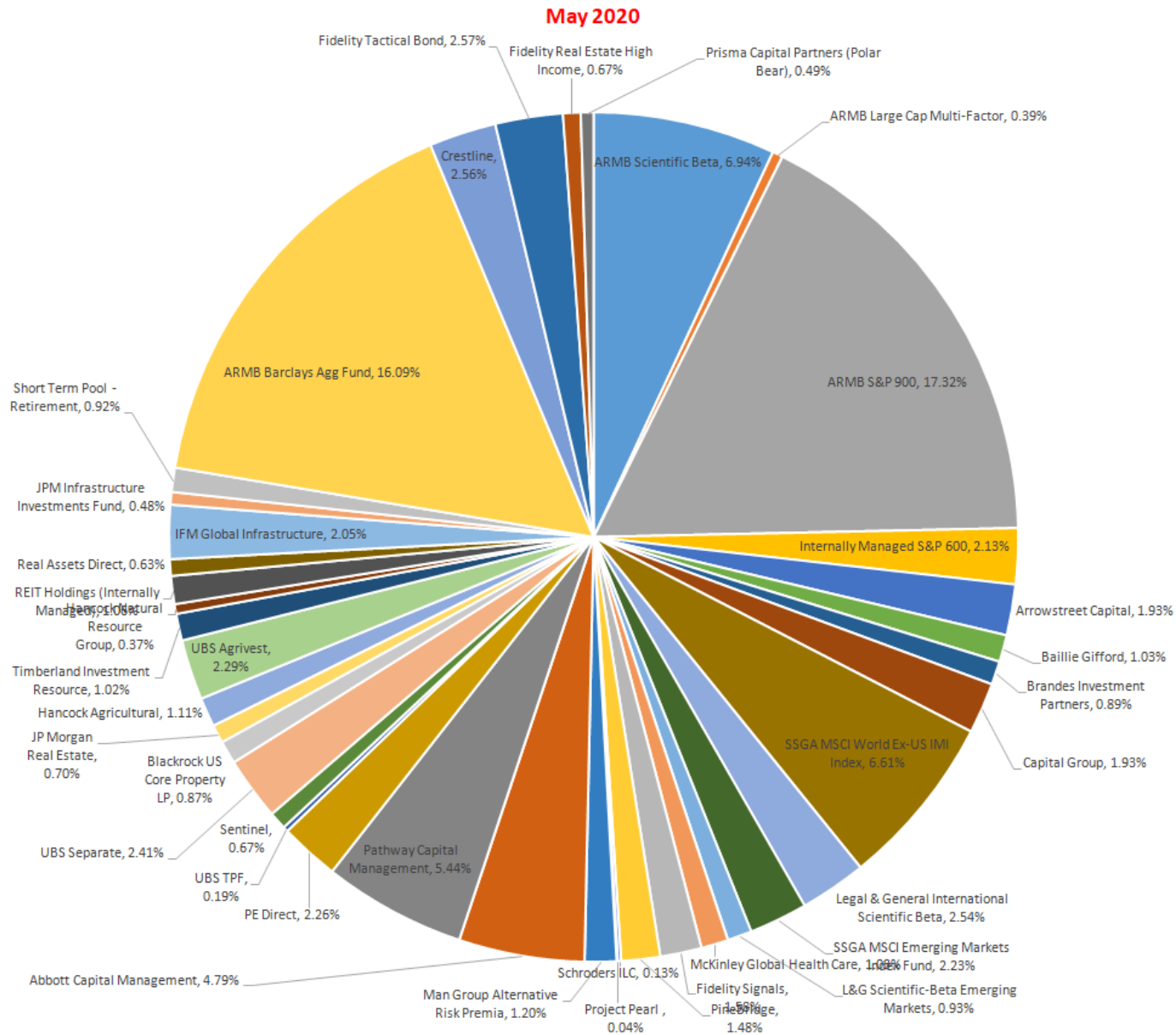


Investment Mandates

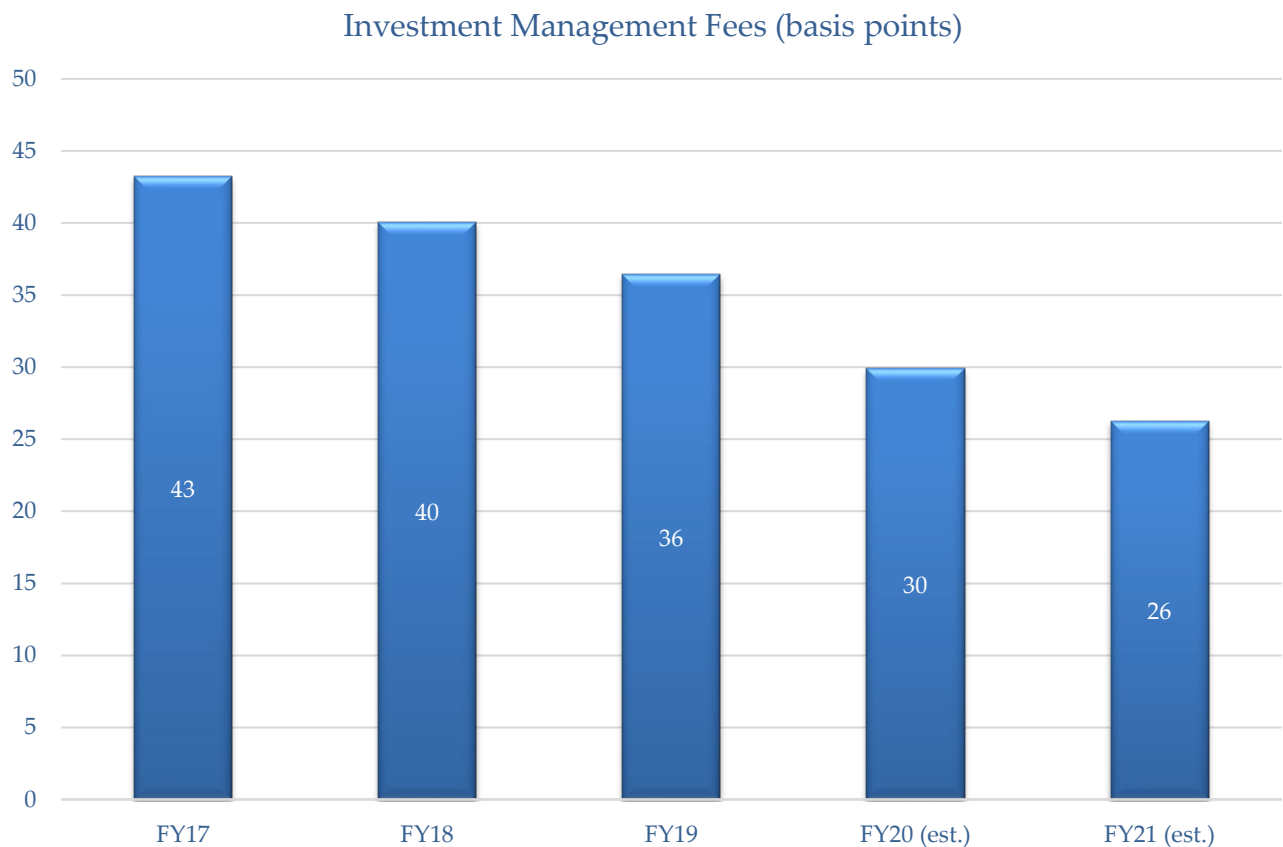
February 2019



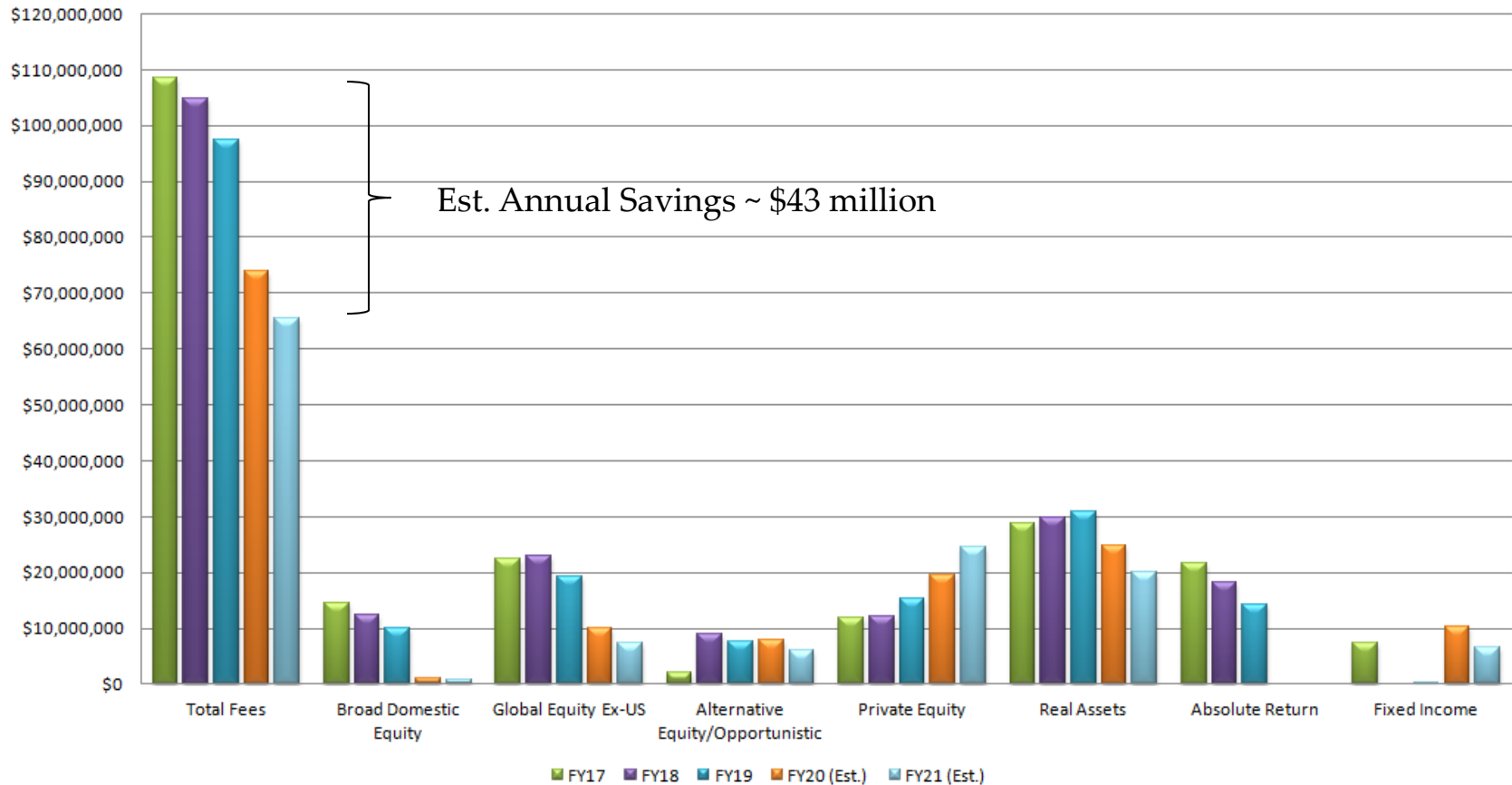
Investment Mandates



Progression of Investment Management Fees



Fees Paid by Asset Class



Key Board Decisions

Determine Investment Objective

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

Determine Asset Allocation

- Strategic
- Tactical

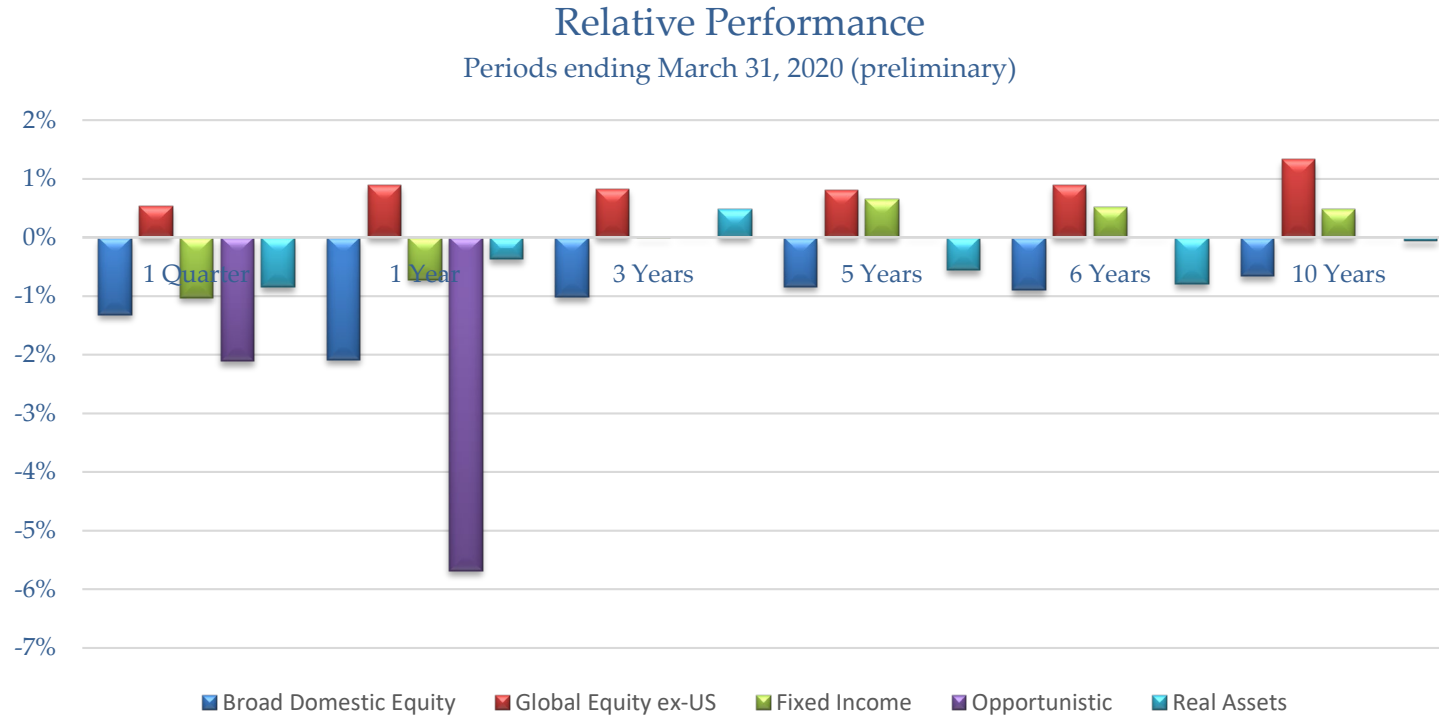
Oversee Implementation

- 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 Class-Level Performance



	1 Quarter	1 Year	3 Years	5 Years	6 Years	10 Years
Broad Domestic Equity	-1.31%	-2.08%	-1.01%	-0.83%	-0.89%	-0.65%
Global Equity ex-US	0.54%	0.89%	0.83%	0.80%	0.89%	1.33%
Fixed Income	-1.02%	-0.71%	-0.01%	0.66%	0.52%	0.48%
Opportunistic	-2.10%	-5.68%	0.00%	0.00%	0.00%	0.00%
Real Assets	-0.84%	-0.36%	0.48%	-0.55%	-0.79%	-0.06%
Private Equity	21.17%	25.17%	18.36%	12.51%	11.87%	8.56%

Summary

- Expected market returns continue to be challenging
- The liquidity profile of the portfolio has been improved, facilitating rebalancing
- The manager structure has been examined across the portfolio with an eye toward simplification, focus and net-of-fee outcomes
 - Equities – increased passive and factor investing, decreased active
 - Fixed Income – broadened mandate to include broad market investment grade bonds, and specialist public and private strategies
 - Real Assets – emphasized core real estate at the expense of non-core
 - Opportunistic – continues to evolve as the manager structure of other asset classes change
- The cost structure has fallen and the portfolio is simpler
- Going forward – examining the relationships between various active strategies will likely result in further improvements in expected risk-adjusted performance

Presentation to: **Alaska Retirement Management Board**

June 2020

“Legal & General” also seen as “we” throughout this presentation relates to Legal & General Investment Management America (“LGIMA”), an SEC registered investment advisor, Legal & General Investment Management (“LGIM”), an FCA registered advisor, LGIM Asia an adviser registered with the Hong Kong Securities and Futures Commission and LGIM International (“LGIMI”), an FCA registered advisor and SEC registered investment advisor. The foregoing is for the services of only LGIMA.

The foregoing is based on data provided by LGIMA for the purposes of providing this analysis in response to an unsolicited request and should not be relied upon in making an investment until a full investment advisory assessment can be provided.

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Executive summary

Today's presentation will cover the following points:

- Multi-factor equity indices, also known simply as factor investing, **can be attractive complements to market cap weighted indices and fundamental active investing.**
- Factor investing **continues to evolve**, both in terms of the factors themselves and the investment strategies through which they are captured.
- An investor's **objectives and risk tolerance** should guide factor implementation.
- Factor investing represents a significant component of the ARMB's portfolio, so **relative risk-adjusted performance** is an important metric.
- Compared to the current implementation, the **HFI MBMS 6F (Sector Neutral)** results in more diversified factor exposures, with the goal of **mitigating the potential for underperformance versus the policy benchmark.**

Factor based introduction

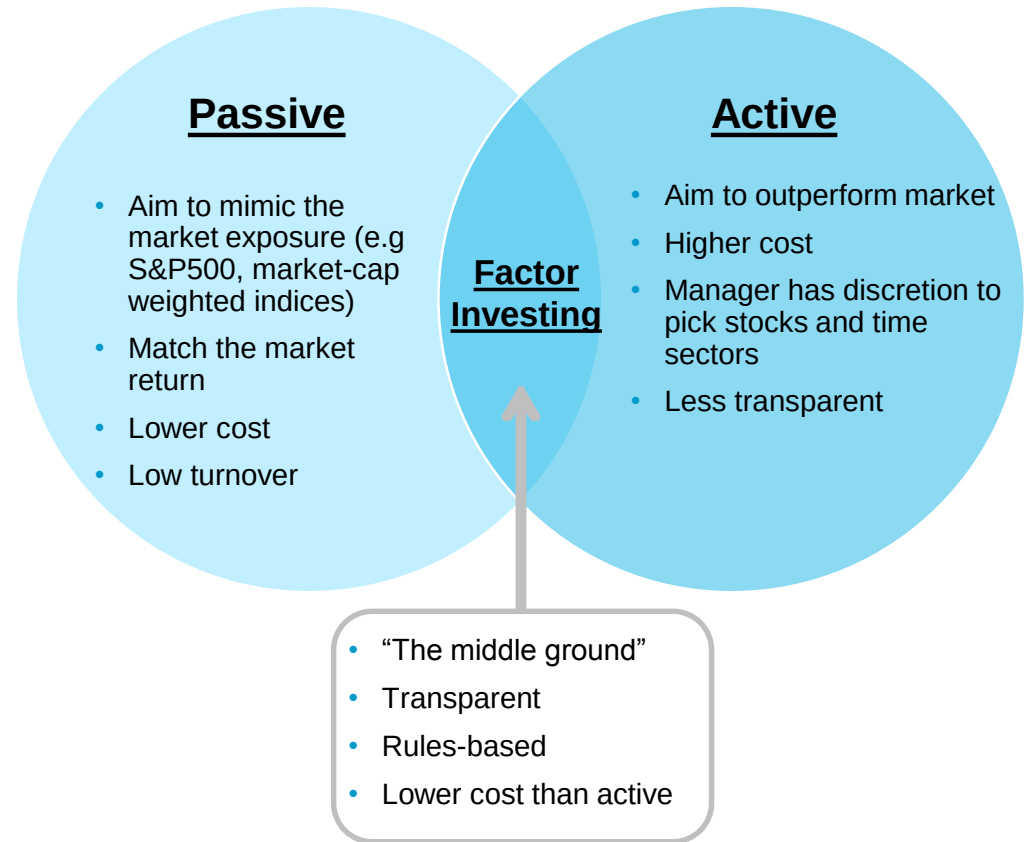
- How are investors using factor based strategies?

1. Active:

- As a replacement of active managers who are charging high fees for returns that are explained by factors.
- A lower cost, transparent, and diversified complement to active managers

2. Passive:

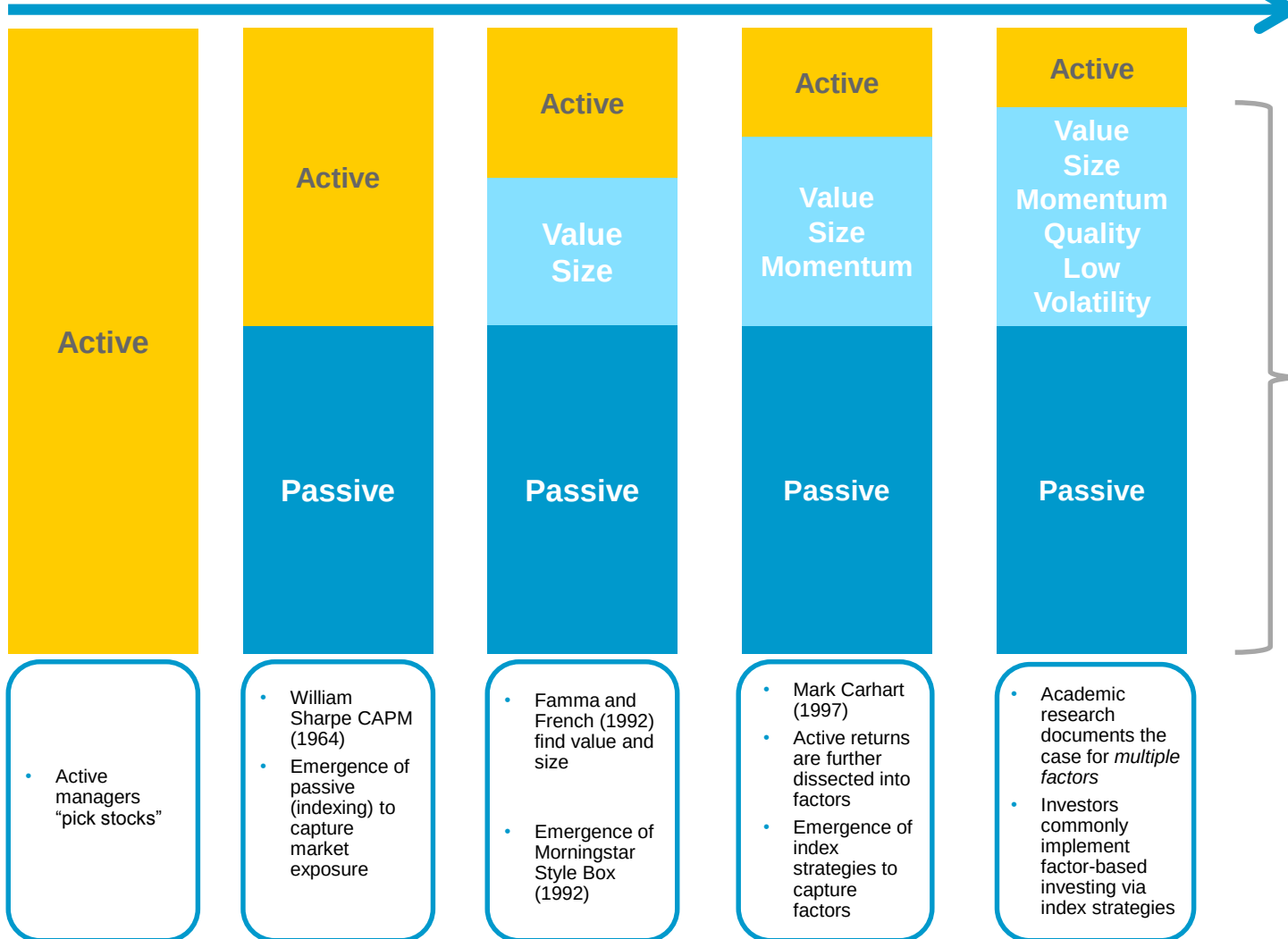
- Diversification versus market cap weighted strategies that have become increasingly driven by a small number of large cap growth and technology stocks.



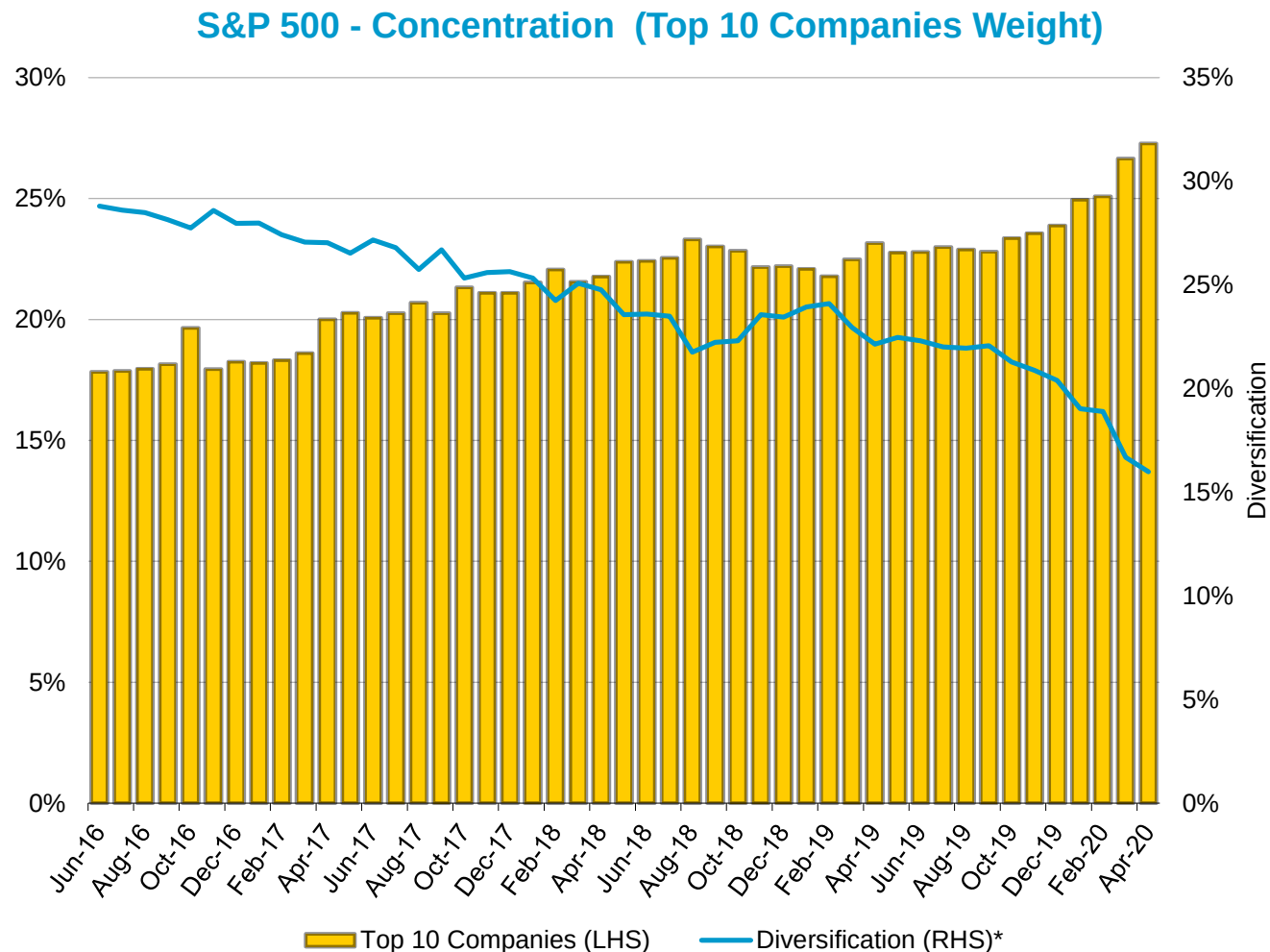
History of factors

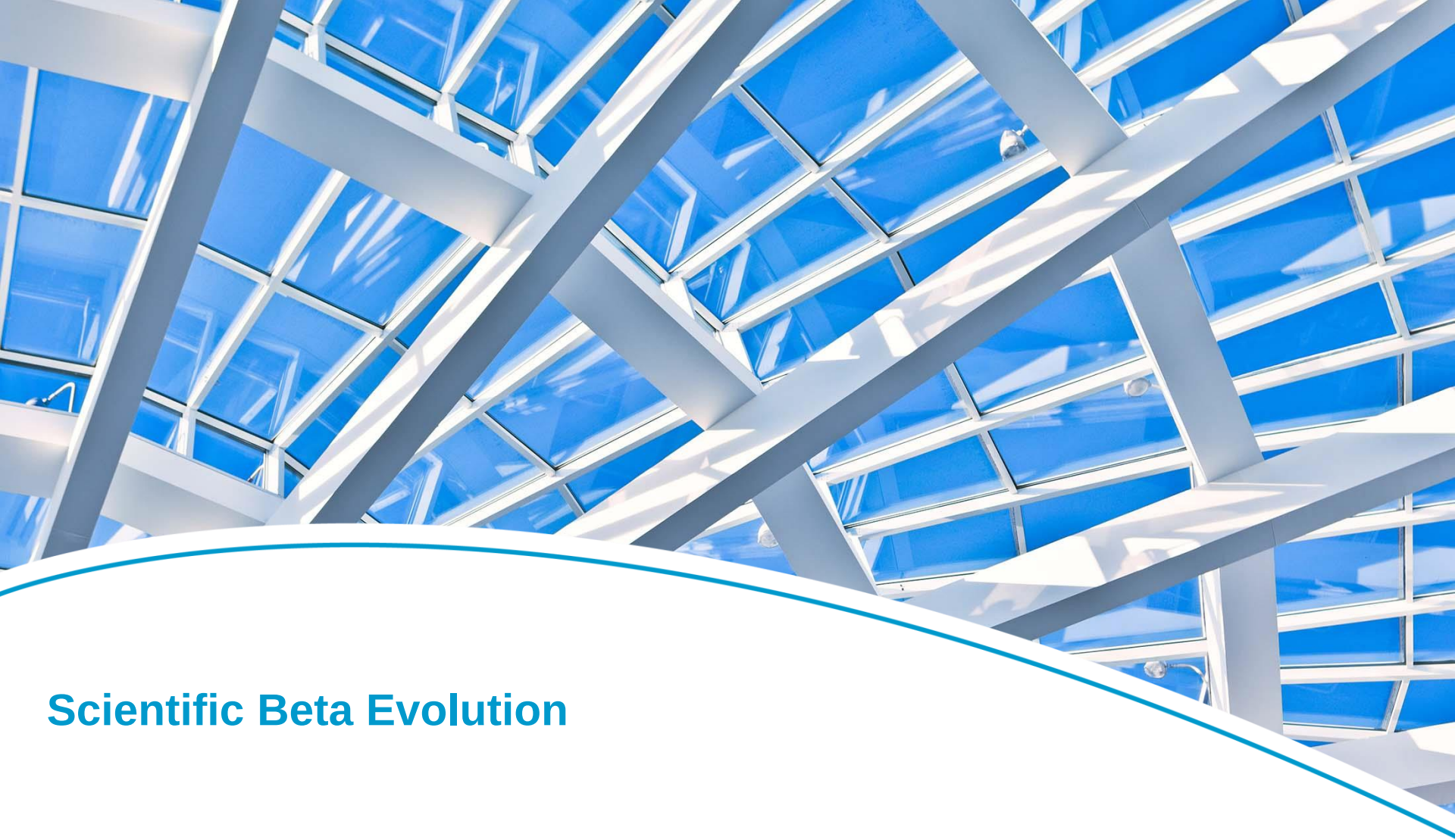
1960

Present



S&P 500 – Concentration Trend (2016 – 2020)





Scientific Beta Evolution

Scientific Beta methodology major enhancements

Four-Factor indices

- Size, Value, Momentum, Low Volatility

Outcome:

- Diversified, transparent, and low cost factor exposure

2013

Six-Factor indices

- Including **High profitability** and **Low investment**.

Improvements:

- Factor diversification
- Decreased severity and durations of drawdowns

2016

High Factor Intensity (HFI) filter

Improvements:

- Increased factor intensity
- More diversified factor exposures

2017

Scientific Beta factors

Quality introduced in
2016

Factor Tilt					
Size	Momentum	Volatility	Valuation	Low Investment	High Profitability
Large Cap	High Momentum	High Volatility	Value	High Investment	High Profitability
Mid Cap	Low Momentum	Low Volatility	Growth	Low Investment	Low Profitability
Stock Selection Criteria					
Free-float adjusted market cap	Cumulative return over the past year omitting the most recent month	Volatility of weekly returns over past two years	Book-to- market ratio	Growth of total assets over past two years	Past year gross profit/total assets

Six factors grounded in economic rationale

Economic research provides risk-based and behavioural-based explanations for factors, illustrated in the table below:

Factor	Risk-based explanation	Behavioural explanation
Value	Costly reversibility of assets in place: high sensitivity to economic shocks in bad times	Overreaction to bad news and extrapolation of the recent past leads to under-pricing
Momentum	High expected growth firms are more sensitive to shocks to expected growth	Investor overconfidence and self-attribution bias leads to returns continuation in the short term
Low Risk	Liquidity-constrained investors have to sell leveraged positions in low risk assets in bad times when liquidity constraints become binding	Disagreement of investors about high risk stocks leads to overpricing due to short sales constraints
Size	Low liquidity, high distress and downside risk is compensated by higher returns	Limited investor attention to smaller cap stocks
Profitability	Firms facing high cost of capital will invest only in the most profitable projects	Investors do not discern high and low profitability in growth firms
Investment	Low investment reflects firms' limited scope for projects given high cost of capital	Investors under-price low investment firms due to expectation errors

The dimensions of Quality investing

High Profitability and Low Investment Factor Indices

- Authors have documented profitability and investment as factors which explain the cross-section of stock returns more recently (e.g. **Fama and French, 2014**; Novy-Marx, 2013, Cooper et al., 2008, Titman et al., 2004).
- These authors have differed on characteristics that can be used as a proxy for profitability or investment factors, but have presented robust evidence that there is a premium associated with these factors.
- Novy-Marx (2013) notes that profitability exhibits negative correlation with the value factor.
- Cooper (2008) notes that the investment factor is a significant explanatory factor, even after controlling for factors such as value, size and momentum.

Factor Discovery and Reference Literature

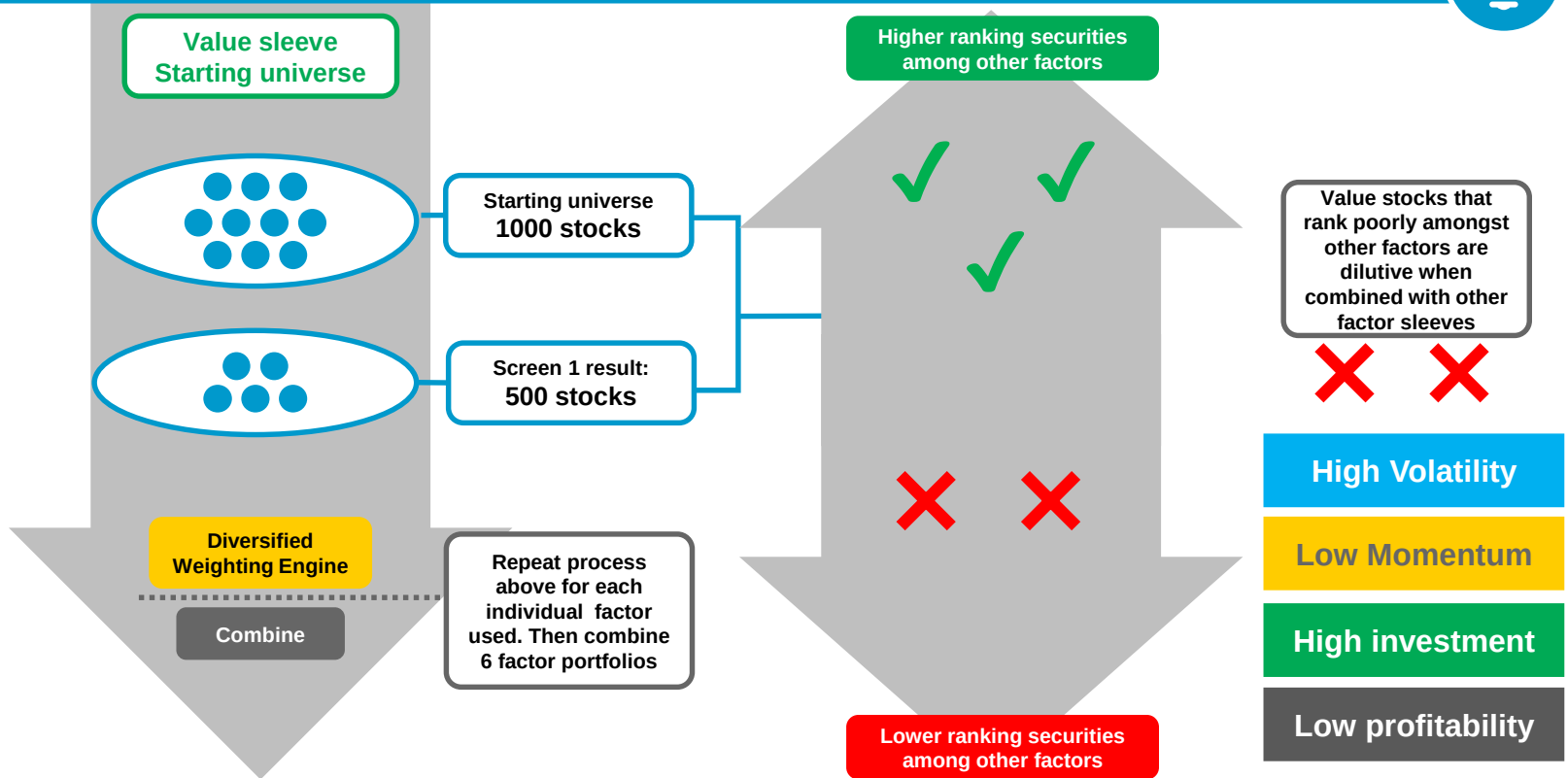
	Factor Definition	Within US Equities	International Equities
High Profitability	Stocks of firms with high profitability (gross profitability or return on equity) have high returns	Novy-Marx (2013), Hou, Xue and Zhang (2014a, 2014b), Fama and French (2014)	Ammann, Odoni, Oesch (2012)
Low Investment	Stocks of firms with low investment (e.g. change in total assets or change in book-value) have high returns	Cooper, Gulen, and Schill (2008), Aharoni et al. (2013), Hou, Xue, Zhang (2014a, 2014b), Fama and French (2014)	Ammann, Odoni, Oesch (2012), Watanabe et al. (2014)

Non-High factor intensity filter

Value factor example

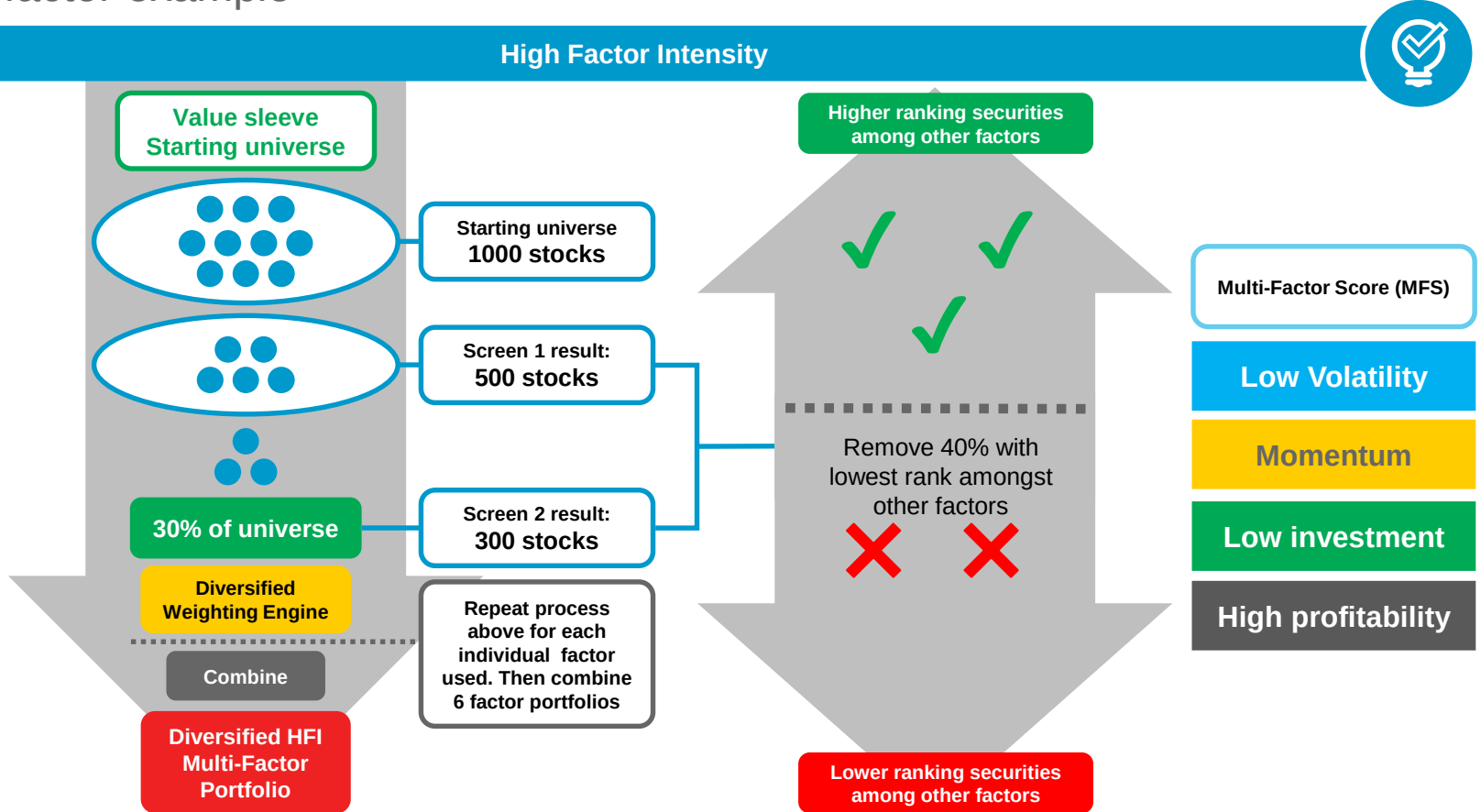


Prior to the discovery of high factor intensity



High factor intensity filter

Value factor example



Multi-Factor Score (MFS): Arithmetic average of a stock's ranks with respect to the four rewarded factor tilts

HFI filter eliminates stocks with the lowest multi-factor scores, resulting in 30% of stocks remaining

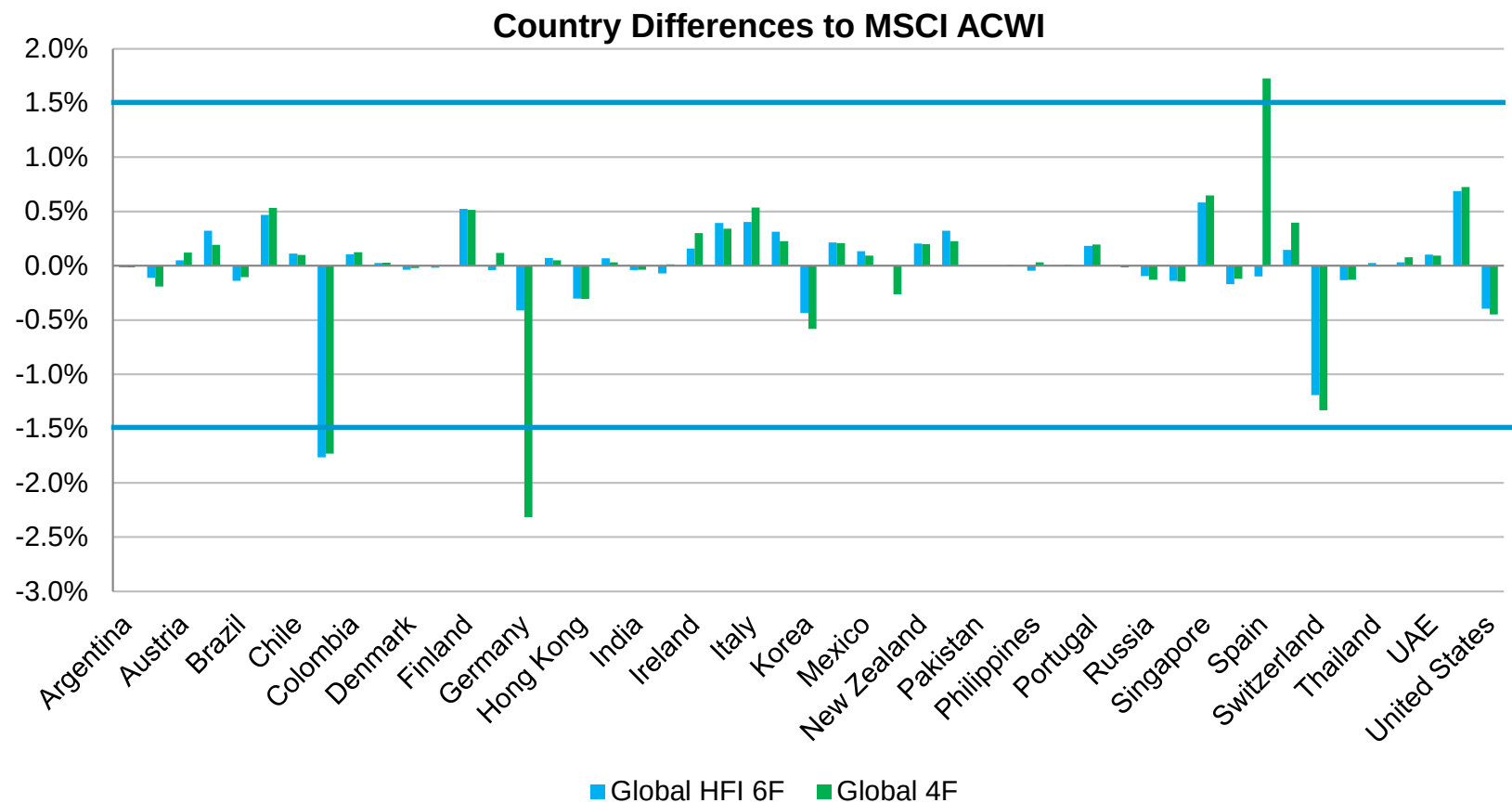


Risk Constraints for Factor Based Indices

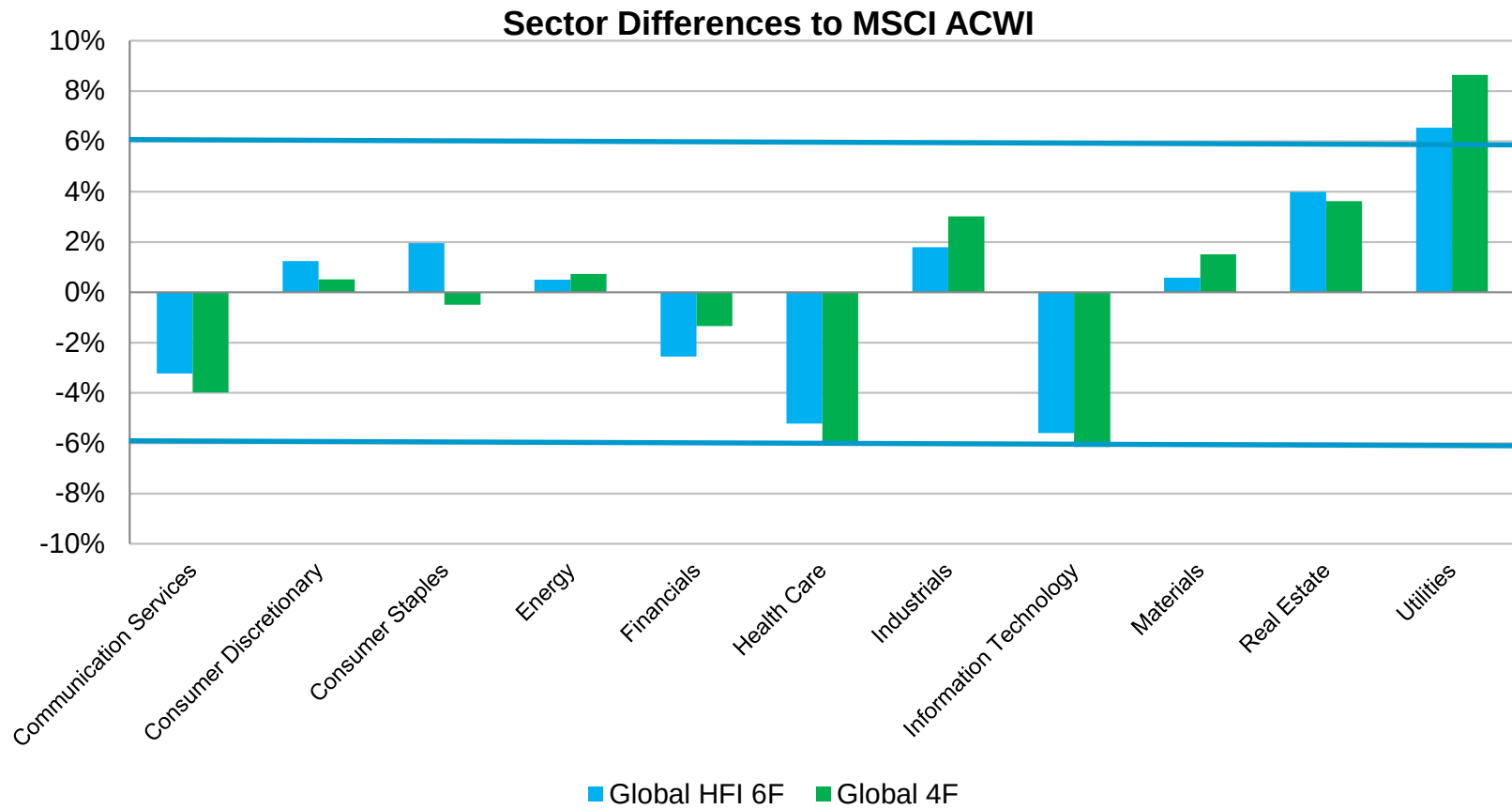
Sector – Maintain sector neutrality relative to cap-weighted reference

Country – Maintain country neutrality relative to cap-weighted reference

Country breakdown



Sector breakdown



Implicit risk of factor investing

Sectors and Countries

Countries:

- Factor investing has been documented to work best when performed within **economically-integrated regions** (Griffin, 2002).
- Scientific Beta utilizes a regional approach to building factor indices, **controlling unrewarded geographical risks**.
- Restricting countries further may be less appealing relative to the sector control option where there are larger deviations.

Sectors:

- Sector deviation results in **higher tracking error** relative to the cap-weighted index and greater exposure to **macroeconomic cycles**.
- Scientific Beta offers a **sector-neutral risk-control** option for all of its indices.
- The trade-off is some **factor dilution** and **increased volatility**.

Recommendation:

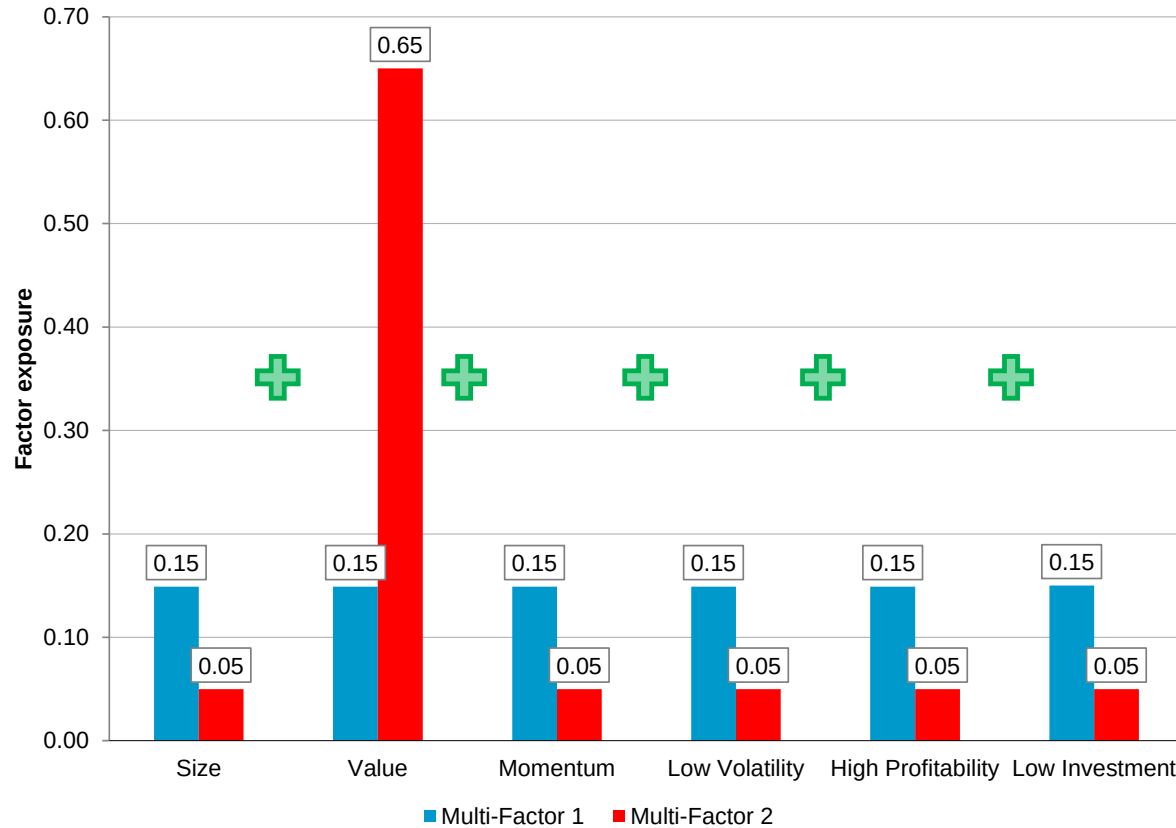
- Utilize the **sector control option to reduce tracking error, relative drawdowns, and macroeconomic sensitivity**, while maintaining strong factor exposures.



Metrics for Evaluating Factor Based Indices

Factor Intensity example

Measure of aggregate factor exposure to the rewarded risk factors. Factor Intensity sums the values for size, value, momentum, low volatility, high profitability, and low investment. A strategy with high factor intensity can be regarded as having higher aggregate exposure to the rewarded risk factors.



=

0.90
Factor Intensity

=

0.90
Factor Intensity

Factor Deconcentration example

Assesses the diversification of factor exposures of a portfolio and focuses, therefore, on factor diversification in terms of exposures. It is computed as the inverse of the sum of squared relative betas. If factor exposures are perfectly diversified (i.e. the same exposures to all risk factors), then the ratio is equal to six.

Benchmark	Size	Value	Momentum	Low Volatility	High Profitability	Low Investment	Factor Intensity
Multi-Factor 1	0.15	0.15	0.15	0.15	0.15	0.15	0.90



6.00
Factor
Deconcentration

Benchmark	Size	Value	Momentum	Low Volatility	High Profitability	Low Investment	Factor Intensity
Multi-Factor 2	0.05	0.65	0.05	0.05	0.05	0.05	0.90

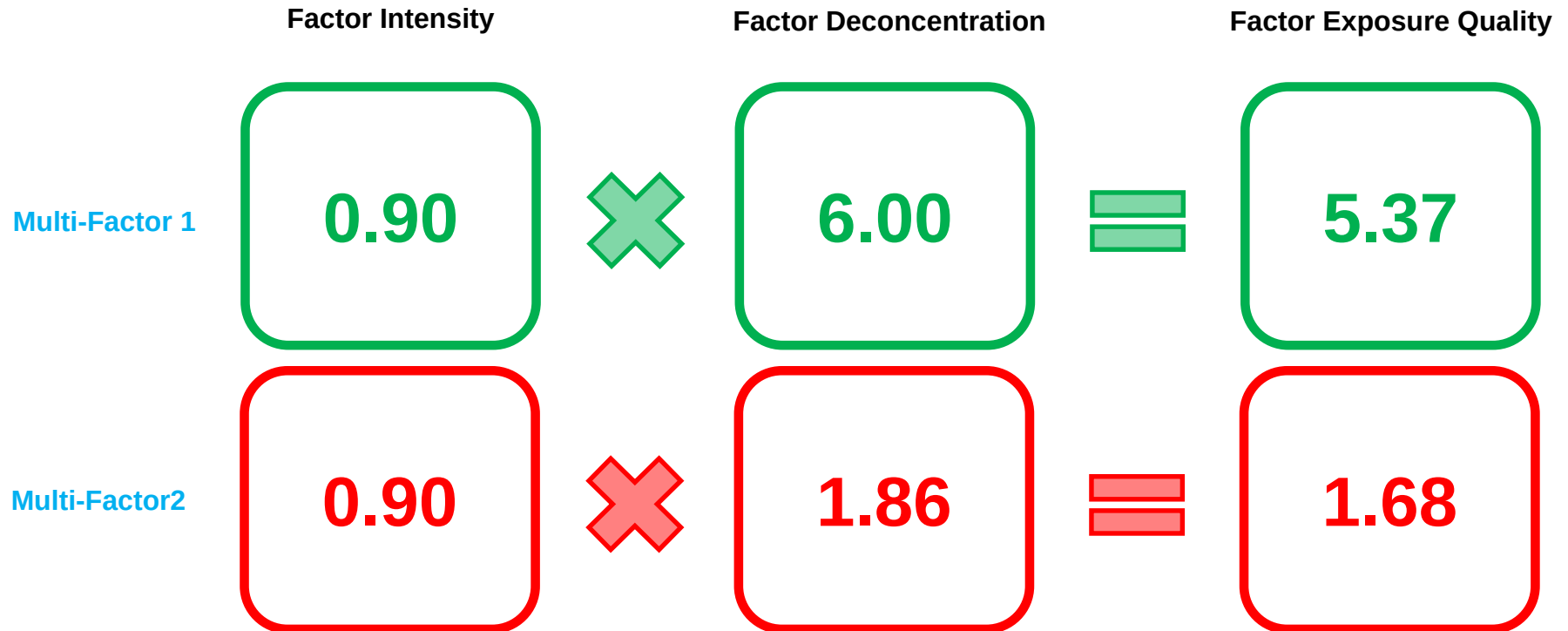


1.86
Factor
Deconcentration

Factor Exposure Quality example

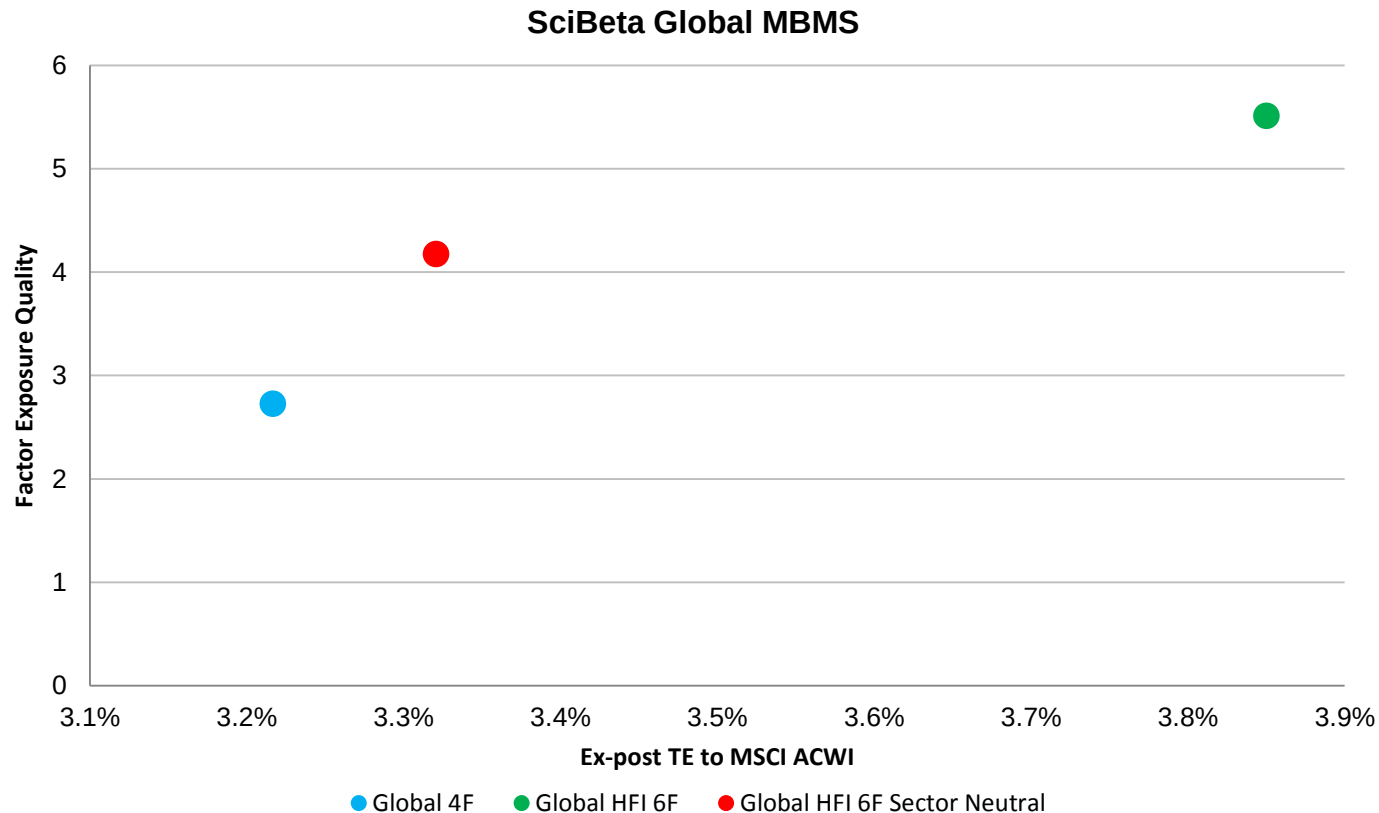
Measure that assesses the quality of the factor exposure, which is evaluated both by its factor intensity and by its level of factor deconcentration.

High Factor Exposure Quality = High Factor Intensity *and* Factor Deconcentration



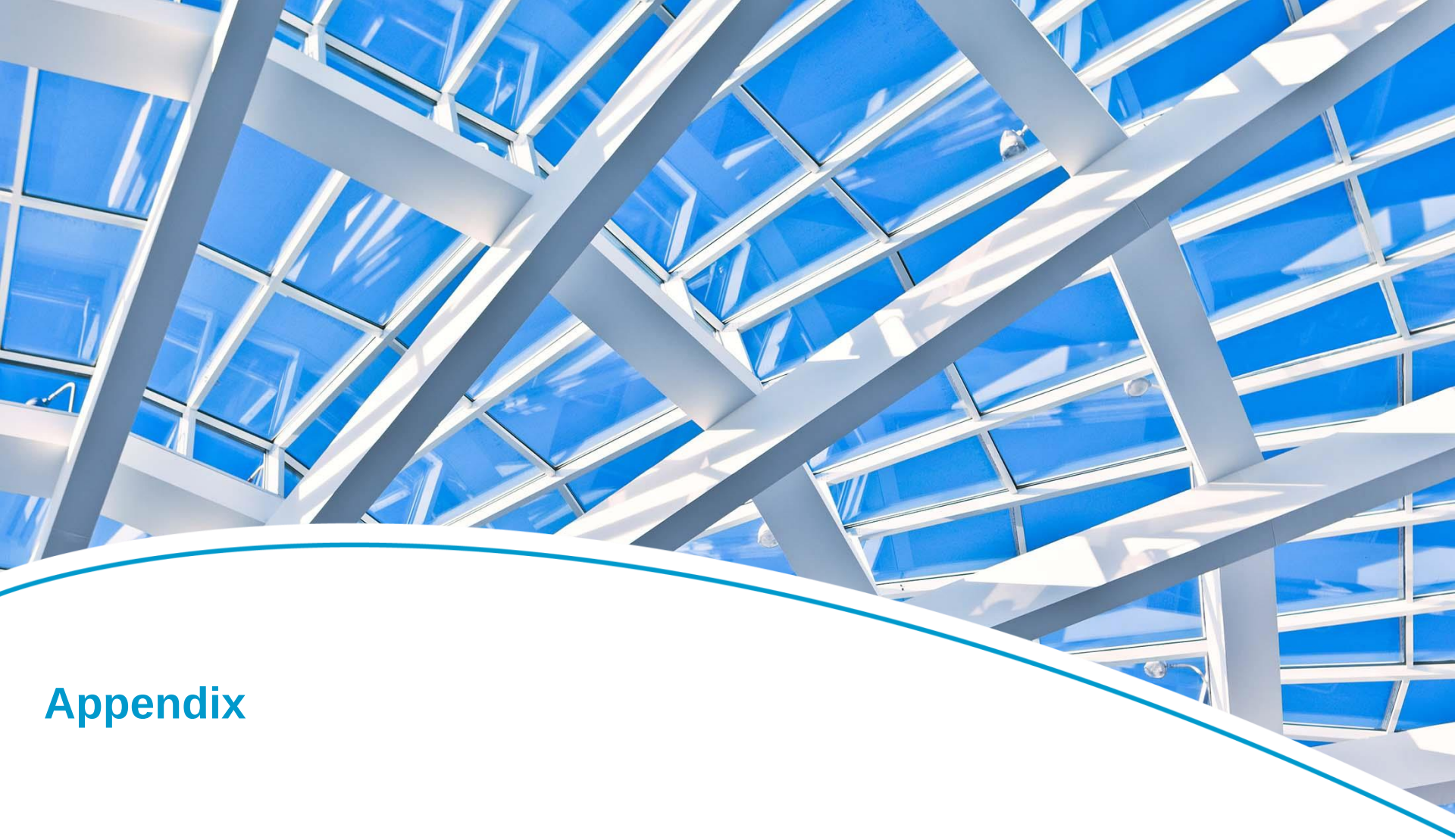
ARMB: Factor exposure quality & tracking error trade-off

As factor exposure is increased, tracking error increases and volatility decreases.



Conclusion

- Factor investing represents a significant component of the ARMB's portfolio, so **relative risk-adjusted performance** is an important metric.
- Adding **Profitability** and **Low Investment** can **increase factor diversification**, lessening relative drawdowns when other factors aren't working as well.
- Adding the **High Factor Intensity** filter leads to **appreciable differences in factor intensity and diversification**.
- Adding the **sector risk control** can reduce tracking error, macroeconomic risk, and relative draw-downs, **helping to stay the course** with the intention of less deviation from the policy index for prolonged periods of time.
- Compared to the current implementation, the **6F MBMS HFI Sector Neutral** results in more diversified factor exposures, with the goal of **mitigating the potential for underperformance versus the policy benchmark**.



Appendix

Risk and return characteristics

Standard Four- and HFI Six- Factor Comparison

Data: June 2002 - March 2020	US				Developed ex US				Emerging Markets			
	S&P 500	MBMS 4F EW	HFI MBMS 6F EW	HFI MBMS 6F EW Sector Neutral	MSCI World ex US	MBMS 4F EW	HFI MBMS 6F EW	HFI MBMS 6F EW Sector Neutral	MSCI EM	MBMS 4F EW	HFI MBMS 6F EW	HFI MBMS 6F EW Sector Neutral
Annual Returns	7.73%	8.82%	9.88%	10.10%	4.70%	7.38%	8.64%	8.28%	8.21%	10.45%	11.74%	11.24%
Annual Volatility	14.30%	13.76%	13.05%	13.53%	16.68%	15.21%	14.61%	14.75%	21.24%	18.95%	18.48%	18.81%
Sharpe Ratio	0.43	0.53	0.64	0.63	0.19	0.39	0.49	0.46	0.32	0.47	0.55	0.52
Max Drawdown	50.95%	46.97%	41.77%	42.56%	56.63%	52.64%	49.21%	49.24%	61.59%	54.73%	52.01%	54.55%
Max Relative Drawdown	-	13.91%	12.87%	8.94%	-	7.48%	8.85%	8.99%	-	22.50%	22.11%	17.68%
Annual Relative Returns	-	1.09%	2.15%	2.38%	-	2.68%	3.94%	3.57%	-	2.24%	3.52%	3.02%
Annual TE	-	3.73%	4.19%	3.84%	-	3.59%	4.20%	3.85%	-	5.36%	5.78%	5.08%
Extreme TE	-	6.01%	8.24%	7.66%	-	8.70%	10.20%	9.38%	-	14.56%	14.33%	13.14%
Information Ratio	-	0.29	0.51	0.62	-	0.75	0.94	0.93	-	0.42	0.61	0.59
Bull Relative Return	-	-1.02%	-1.56%	0.43%	-	-3.06%	-3.51%	-3.09%	-	-7.82%	-7.50%	-6.55%
Bear Relative Return	-	2.99%	5.53%	3.93%	-	5.71%	7.90%	7.08%	-	6.60%	8.17%	7.00%
Factor Intensity	0.04	0.48	0.84	0.77	0.03	0.51	0.81	0.64	0.03	0.37	0.61	0.51
Market	1.00	0.93	0.88	0.91	1.01	0.89	0.86	0.87	1.00	0.87	0.86	0.88
Size	0.00	0.21	0.17	0.16	-0.01	0.07	0.04	0.03	0.02	0.03	0.02	0.02
Value	0.01	0.08	0.16	0.18	0.00	0.14	0.21	0.17	0.00	-0.02	0.02	0.03
Momentum	-0.02	0.14	0.18	0.17	-0.02	0.08	0.10	0.12	0.01	0.06	0.09	0.07
Low Volatility	0.01	0.09	0.11	0.02	0.03	0.14	0.16	0.13	-0.03	0.11	0.11	0.07
High Profitability	0.01	-0.06	0.08	0.10	0.00	0.10	0.23	0.13	-0.04	0.06	0.18	0.12
Low Investment	0.02	0.01	0.14	0.14	0.02	-0.02	0.08	0.05	0.07	0.14	0.20	0.20
Factor Exposure Quality	0.05	1.30	4.79	3.95	0.01	2.23	3.85	3.19	0.00	1.33	2.53	2.07
Annual 2-way turnover	7.00%	72.60%	71.00%	85.60%	8.20%	76.00%	75.00%	85.60%	20.00%	84.80%	86.80%	96.20%
Avg. Capacity (mn US\$)	110,989	26,865	32,131	35,327	43,471	11,721	13,540	17,246	21,928	3,973	4,336	5,176
Effective # stocks	85	270	218	186	260	521	411	332	50	297	228	161

Factor intensity and exposures through March 2020

Risk and return characteristics through March 2020

Turnover, avg capacity and effective # stocks representative of SciBeta broad cap weighted index

SciBeta calendar year performance: March 2020 YTD

SciBeta MBMS United States HFI

Performance	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 YTD	2016 - 2019 Annualized
SciBeta US HFI 6F EW Relative	-0.26%	11.40%	7.66%	2.79%	2.75%	6.08%	-1.14%	5.46%	4.98%	-0.66%	0.95%	4.11%	1.72%	-0.65%	-1.24%	-1.36%	-3.51%	-3.78%	-1.63%
SciBeta US HFI 6F SN EW Relative	1.15%	13.09%	8.93%	2.31%	5.11%	3.93%	1.37%	5.01%	1.43%	0.50%	1.51%	1.68%	1.29%	1.13%	0.03%	-0.75%	-2.47%	-4.23%	-0.47%
S&P 500 Absolute	28.68%	10.88%	4.91%	15.79%	5.49%	-37.00%	26.46%	15.06%	2.11%	16.00%	32.39%	13.69%	1.38%	11.96%	21.83%	-4.38%	31.49%	-19.60%	14.43%

SciBeta MBMS Developed ex US HFI

Performance	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 YTD	2016 - 2019 Annualized
SciBeta Dev ex US HFI 6F EW Relative	3.26%	10.76%	3.19%	6.26%	-1.01%	7.98%	-4.49%	9.18%	6.61%	-0.07%	2.19%	5.25%	7.76%	0.04%	4.17%	0.86%	-3.10%	-1.22%	0.48%
SciBeta Dev ex US HFI 6F EW Relative SN	4.77%	9.61%	3.80%	6.07%	-1.43%	7.70%	-5.82%	8.34%	5.03%	-0.86%	0.72%	4.94%	7.93%	0.53%	3.93%	0.50%	-2.93%	-1.16%	0.48%
MSCI World ex US Absolute	39.42%	20.38%	14.47%	25.71%	12.44%	-43.56%	33.67%	8.95%	-12.21%	16.41%	21.02%	-4.32%	-3.04%	2.75%	24.21%	-14.09%	22.49%	-23.26%	7.65%

SciBeta MBMS Emerging Markets HFI

Performance	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 YTD	2016 - 2019 Annualized
SciBeta Emerging 6F HFI EW Relative	12.60%	7.03%	-7.60%	5.60%	0.58%	8.96%	-5.65%	14.31%	9.82%	7.11%	3.18%	4.71%	2.57%	-5.28%	-7.66%	0.92%	-10.60%	-1.86%	-2.87%
SciBeta Emerging 6F HFI EW SN Relative	7.97%	5.59%	-4.59%	4.06%	0.28%	6.81%	-6.80%	12.69%	7.05%	9.22%	3.45%	3.74%	2.40%	-4.64%	-6.70%	1.98%	-7.98%	-1.72%	-1.54%
MSCI Emerging Markets Absolute	55.82%	25.55%	34.00%	32.14%	39.42%	-53.33%	78.51%	18.88%	-18.42%	18.22%	-2.60%	-2.19%	-14.92%	11.19%	37.28%	-14.57%	18.42%	-23.60%	9.20%

SciBeta calendar year performance: March 2020 YTD

SciBeta MBMS United States HFI

Performance	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 YTD	2016 - 2019 Annualized
SciBeta US HFI 6F EW Relative	-0.26%	11.40%	7.66%	2.79%	2.75%	6.08%	-1.14%	5.46%	4.98%	-0.66%	0.95%	4.11%	1.72%	-0.65%	-1.24%	-1.36%	-3.51%	-3.78%	-1.63%
S&P 500 Absolute	28.68%	10.88%	4.91%	15.79%	5.49%	-37.00%	26.46%	15.06%	2.11%	16.00%	32.39%	13.69%	1.38%	11.96%	21.83%	-4.38%	31.49%	-19.60%	14.43%

Relative Performance	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 YTD	2016 - 2019 Annualized
Low volatility HFI	-4.68%	10.12%	4.53%	6.38%	1.49%	11.03%	-4.65%	2.76%	9.43%	-1.93%	-0.93%	5.24%	2.47%	-0.81%	-2.19%	0.84%	-3.58%	-1.63%	-1.26%
Size HFI	4.37%	12.85%	9.52%	1.57%	0.76%	1.60%	5.03%	10.43%	1.94%	-0.49%	0.10%	6.31%	2.35%	0.82%	-4.01%	-2.29%	-3.57%	-6.75%	-2.21%
Value HFI	1.65%	13.62%	12.53%	3.87%	7.09%	3.96%	2.05%	5.14%	2.56%	-0.84%	0.53%	5.72%	-1.85%	3.69%	-3.45%	-3.33%	-5.89%	-6.44%	-2.20%
Momentum HFI	-1.27%	11.71%	12.71%	1.76%	5.10%	2.45%	-7.18%	5.44%	4.74%	-1.81%	2.72%	0.72%	4.00%	-6.53%	3.08%	-5.21%	-3.16%	-0.82%	-3.26%
High profitability HFI	-0.39%	8.58%	3.55%	-1.45%	1.65%	8.07%	1.04%	4.08%	6.47%	0.05%	2.01%	3.43%	4.04%	-2.09%	0.59%	2.50%	-1.52%	-1.69%	0.00%
Low investment HFI	-1.32%	10.95%	3.41%	4.66%	0.42%	9.34%	-3.05%	4.86%	4.79%	0.94%	1.23%	3.21%	-0.62%	1.16%	-1.39%	-0.62%	-3.72%	-5.50%	-1.03%

SciBeta MBMS Developed ex US HFI

Performance	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 YTD	2016 - 2019 Annualized
SciBeta Dev ex US HFI 6F EW Relative	3.26%	10.76%	3.19%	6.26%	-1.01%	7.98%	-4.49%	9.18%	6.61%	-0.07%	2.19%	5.25%	7.76%	0.04%	4.17%	0.86%	-3.10%	-1.22%	0.48%
MSCI World ex US Absolute	39.42%	20.38%	14.47%	25.71%	12.44%	-43.56%	33.67%	8.95%	-12.21%	16.41%	21.02%	-4.32%	-3.04%	2.75%	24.21%	-14.09%	22.49%	-23.26%	7.65%

Relative Performance	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 YTD	2016 - 2019 Annualized
Low volatility HFI	-1.77%	13.38%	-0.96%	5.68%	-1.68%	11.58%	-8.06%	5.23%	10.24%	-0.83%	0.28%	6.13%	7.74%	-1.71%	1.20%	4.28%	-2.24%	1.10%	0.62%
Size HFI	8.07%	12.58%	4.35%	7.50%	-4.73%	4.13%	-2.92%	10.64%	5.90%	0.84%	0.74%	4.33%	9.70%	-0.61%	4.80%	0.68%	-3.69%	-3.89%	0.25%
Value HFI	6.32%	12.17%	4.83%	7.70%	-0.29%	7.41%	0.93%	9.25%	3.64%	-0.69%	3.43%	3.65%	5.02%	3.14%	3.62%	0.13%	-4.18%	-4.29%	0.69%
Momentum HFI	1.82%	10.44%	8.92%	6.14%	1.12%	7.71%	-11.17%	13.70%	6.01%	-0.36%	4.65%	5.58%	8.72%	-3.41%	7.90%	-1.59%	-2.42%	1.10%	-6.81%
High profitability HFI	0.00%	8.50%	1.19%	4.68%	-0.78%	8.92%	-1.20%	6.60%	9.04%	2.07%	2.02%	6.36%	9.97%	0.59%	2.76%	1.51%	-1.52%	-0.27%	0.88%
Low investment HFI	5.46%	8.33%	1.19%	5.47%	0.13%	8.95%	-4.81%	9.79%	4.82%	-1.66%	2.07%	5.39%	5.44%	2.36%	4.29%	0.38%	-4.26%	-0.96%	0.69%

SciBeta MBMS Emerging Markets HFI

Performance	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 YTD	2016 - 2019 Annualized
SciBeta Emerging 6F HFI EW Relative	12.60%	7.03%	-7.60%	5.60%	0.58%	8.96%	-5.65%	14.31%	9.82%	7.11%	3.18%	4.71%	2.57%	-5.28%	-7.66%	0.92%	-10.60%	-1.86%	-2.87%
MSCI Emerging Markets Absolute	55.82%	25.55%	34.00%	32.14%	39.42%	-53.33%	78.51%	18.88%	-18.42%	18.22%	-2.60%	-2.19%	-14.92%	11.19%	37.28%	-14.57%	18.42%	-23.60%	9.20%

Relative Performance	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 YTD	2016 - 2019 Annualized
Low volatility HFI	9.30%	4.08%	-11.58%	4.68%	-6.60%	14.02%	-14.04%	14.06%	12.96%	6.75%	2.31%	6.47%	4.28%	-5.13%	-11.21%	3.11%	-12.58%	-0.31%	-3.40%
Size HFI	15.31%	5.10%	-8.40%	3.97%	0.04%	6.39%	0.24%	18.38%	6.22%	11.67%	3.09%	7.16%	5.34%	-6.88%	-6.38%	1.94%	-11.01%	-2.82%	-2.81%
Value HFI	19.93%	12.50%	-8.55%	5.42%	5.92%	7.95%	-3.62%	12.31%	6.80%	1.43%	4.55%	0.47%	-0.53%	-0.02%	-8.56%	2.41%	-13.33%	-4.29%	-1.99%
Momentum HFI	15.18%	11.54%	0.28%	6.33%	5.99%	3.35%	-12.48%	12.12%	7.64%	10.01%	3.25%	4.81%	2.67%	-9.83%	-3.63%	-2.59%	-9.72%	0.60%	-4.11%
High profitability HFI	12.33%	3.12%	-8.57%	6.83%	-2.90%	9.06%	5.51%	14.86%	12.44%	8.38%	1.41%	6.43%	2.04%	-6.25%	-8.79%	-1.93%	-7.10%	-2.52%	-3.39%
Low investment HFI	7.22%	3.59%	-11.48%	5.71%	-1.46%	14.32%	-9.52%	14.34%	12.95%	4.64%	4.29%	2.55%	1.56%	-3.55%	-7.13%	2.78%	-10.29%	-2.35%	-1.68%

Sources: LGIMA, ERI Scientific Beta, MSCI, Bloomberg. March 16, 2018 is live date of indices.

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ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Recommend Change to Scientific
Beta Investment Implementation

ACTION: X

DATE: June 18-19, 2020

INFORMATION:

BACKGROUND

Scientific Beta has created a set of global equity indices that attempt to provide exposure to historically-rewarded risk factors in a diversified manner. Indices have also been created that seek exposure to multiple factors simultaneously in an attempt to achieve more consistent relative outperformance.

In June 2016, the Alaska Retirement Management Board (ARMB) authorized investment in a mandate that attempts to track the performance of the Scientific Beta United States Diversified Multi-Beta Multi-Strategy 4-Factor Equal-Weight Index. The ARMB subsequently authorized investment in international developed market (June 2017) and emerging market (September 2018) versions of this index.

The ARMB has recently repositioned its domestic equity manager structure (June 2019) and its international equity manager structure (September 2019), placing more emphasis on passive and multi-factor strategies. As a result, the efficiency of relative outperformance from the multi-factor investments has become a more important consideration.

STATUS

The implementation choices relating to Scientific Beta multi-factor indices have grown over time. In 2016, the number of factors available in Scientific Beta's flagship product grew from four – low volatility, momentum, size and value – to six following the introduction of the high profitability and low investment factors. Additionally, Scientific Beta has developed a version of its indices that provide a more intense exposure to compensated factors and now offers sector-neutral, country-neutral and beta-neutral versions.

Scientific Beta has introduced a measure known as factor exposure quality that provides a more comparable means for evaluating these implementation options. This measure incorporates factor intensity and factor diversification. As a result, investors now have more choices available to them, and can more intentionally select indices that trade-off factor exposure quality with expected tracking error.

The ARMB has received educational presentations on factor investing and the evolution of multi-factor implementation options from Scientific Beta as recently as May 2020, and from Legal & General during the June 2020 meeting.

As discussed in these presentations, Scientific Beta's suite of 6 factor, high-factor-intensity, sector-neutral diversified multi-beta multi-strategies provide higher levels of factor exposure quality with similar levels of historical tracking error. Staff expects that adopting this broader approach should lead to improved risk-adjusted relative performance.

RECOMMENDATION

Authorize staff to migrate the existing Scientific Beta mandates to the six-factor, high factor intensity, sector-neutral implementations for the United States, the international developed market and the international emerging market mandates, subject to successful contract negotiations.

**STATE OF ALASKA
DEPARTMENT OF REVENUE**

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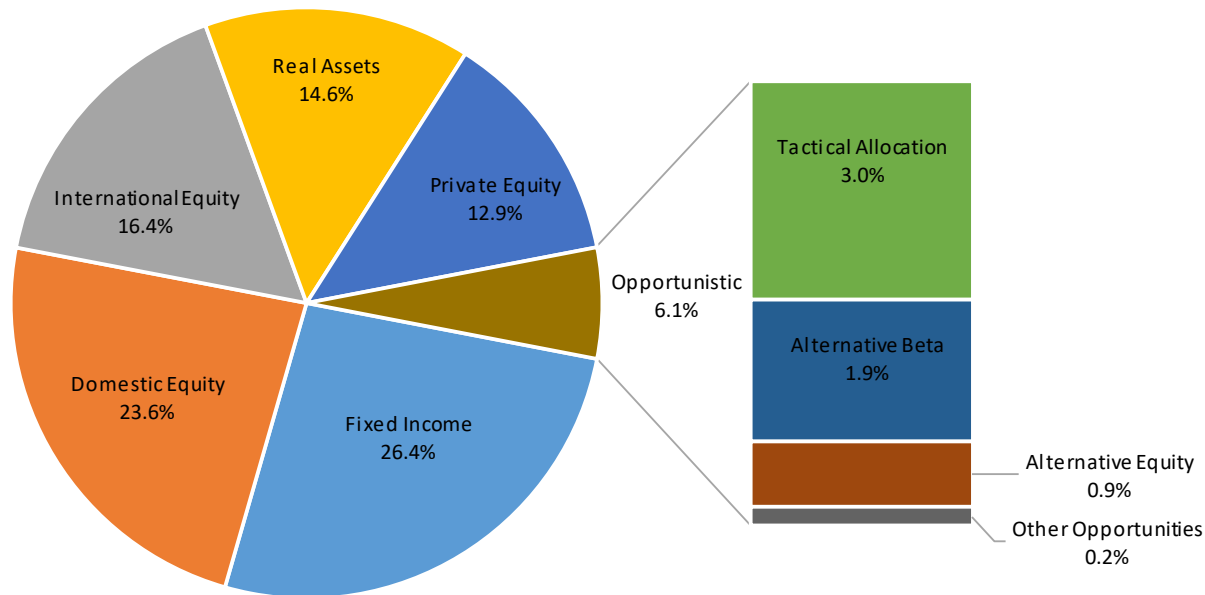
Opportunistic

June 2020

Steve Sikes
Manager of Opportunistic Strategies & Real Assets

Alaska Retirement Management Board

ARMB Actual Asset Allocation
March 31, 2020



Opportunistic represents \$1.5 billion of ARMB's \$24.7 billion of total defined benefit assets as of March 31, 2020.

Source: State Street Bank and Trust Company. Percentages reflect combined defined benefit pension and health care portfolios. Percentages may not add to 100% due to rounding.

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Opportunistic Portfolio

Portfolio Role: Provide unique sources of return not available in traditional asset classes

Strategy: Tactical asset allocation, alternative beta, thematic mandates, and strategies that do not fit well in other asset classes

Return Expectations: Exceed benchmark over rolling 6 year periods

Benchmark: 60% Russell 1000/ 40% Bloomberg Barclays U.S. Aggregate

Implementation: External managers are utilized in the management of the assets

FY20 Target Allocation: 8% +/- 4%

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History

- Asset Class created in July 1, 2017 from preexisting asset class Alternative Equity which was redefined to include securities with characteristics of both stocks and bonds and renamed “Opportunistic.”
- Manager line up has changed significantly since asset class was created.
 - Most equity and fixed income specific strategies have been terminated or moved.
 - Multi-asset investment strategies were implemented in 2018.
 - McKinley Healthcare Transformation strategy funded in 2019.
 - Alternative Risk Premia strategies were moved into the asset class from Absolute Return.
- Asset class underweight target in FY20 as capacity was reserved for Risk Parity consideration.

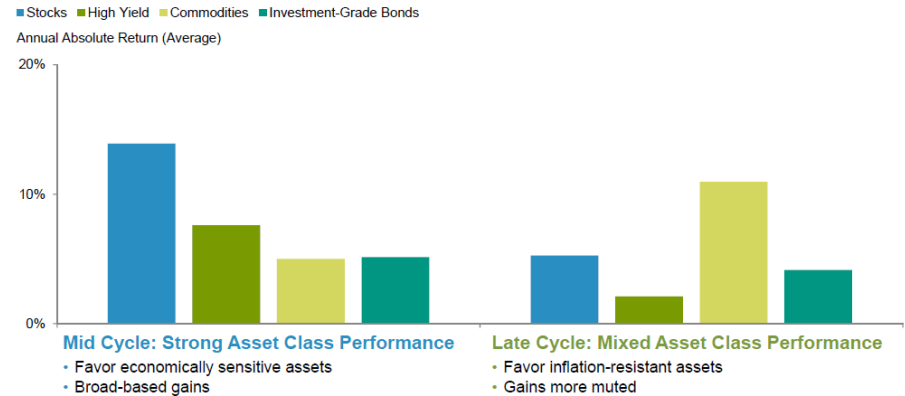
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Tactical Asset Allocation

Fidelity Signaling

- Portfolio tactically allocates across a basket of global asset classes based primarily on business cycle assessment. A portion of the risk budget is also invested based on value and momentum signals across asset classes and other macro research inputs.
- Excess return expectation is 55bps over market cycle.

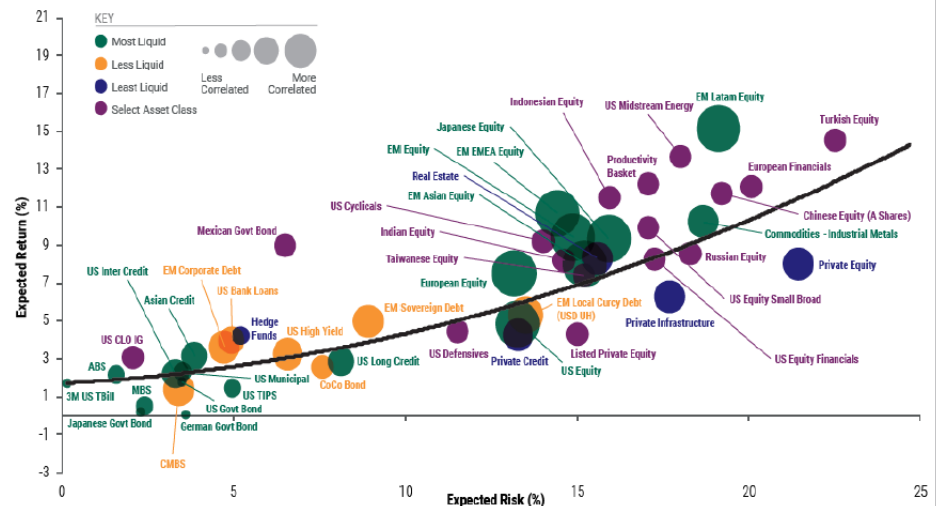
Asset Class Performance in Mid- and Late-Cycle Phases (1950–2016)



PineBridge

- Dynamic global asset allocation strategy based on 5-year capital market line and assessment of which asset classes have the highest potential for improvement over the next 9-18 months.
- Excess return expectation is 2% over market cycle.

Capital Market Line (Local Currency View)



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Alternative Beta

Man Group Alternative Risk Premia

- Portfolio seeks to capture returns from bearing risks separate from traditional market risks. The risk premia includes aspects of momentum, carry, value and defensive strategies.
- Strategy invests in long and short bonds, equities, currencies, and commodities and risk premia weights are equally allocated based on their risk contribution to the overall portfolio.

The goal of the strategy is for ARMB is to gain exposure to a cost-effective return stream that differs from traditional market beta to benefit the overall portfolio's risk-adjusted return and diversification.

Return expectations is 4% to 6% with $\sim .75$ Sharpe Ratio.

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Alternative Equity / Other Opportunities

McKinley Capital Healthcare Transformation

- Global public equity portfolio targeting companies that will benefit from the transformation of the healthcare industry as rising costs and technology promote change. McKinley uses quantitative approaches to identify these companies and then applies it's traditional growth and momentum processes to build the portfolio.

Other Opportunities

- Largest investment is in Insurance Linked Securities which is being wound down due to poor performance.

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Fiscal Year 2020 Asset Class Developments:

Risk Parity

- Due to the recent COVID-19 related spike in volatility, the resulting very low levels of fixed income rates, and the amounts of leverage used in the strategy, staff is recommending the ARMB not pursue an investment in Risk Parity.
- Staff believes the approach remains appealing but given current market characteristics staff also believes caution is warranted due to high model risk and the reliance on levered fixed income for diversification.

JP Morgan Systematic Alpha

- ARMB recently terminated its investment in the strategy due to disappointing returns and lack of diversification benefit.
- Staff does not recommend a replacement for JP Morgan due to expected lower target asset class weight in FY21.

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Performance of focus strategies:

<i>as of March 31, 2020</i>	<i>Inception Date</i>	<i>Quarter</i>	<i>1 Year</i>	<i>Since Inception Annualized</i>
Opportunistic	7/1/2017	-12.97%	-6.38%	0.94%
Benchmark		<u>-10.87%</u>	<u>-0.70%</u>	<u>4.81%</u>
		-2.10%	-5.69%	-3.88%
Fidelity Signaling Portfolio	11/1/2018	-13.26%	-4.16%	0.98%
Benchmark		<u>-12.71%</u>	<u>-4.06%</u>	<u>1.03%</u>
		-0.55%	-0.09%	-0.04%
PineBridge Portfolio	11/1/2018	-17.55%	-11.33%	-5.78%
Benchmark		<u>-12.66%</u>	<u>-4.45%</u>	<u>0.60%</u>
		-4.88%	-6.88%	-6.38%
Man Group (net)	9/1/2017	-4.95%	-3.24%	0.32%
Benchmark		<u>1.78%</u>	<u>7.26%</u>	<u>6.98%</u>
		-6.74%	-10.50%	-6.66%
McKinley Health Care	3/1/2019	-15.14%	-9.60%	-8.92%
Benchmark		<u>-21.37%</u>	<u>-11.26%</u>	<u>-9.40%</u>
		6.22%	1.66%	0.48%

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Fiscal Year 2021 Recommendations

- Focus asset class around multi-asset strategies. Identify additional strategies which complement ARMB's current investments in PineBridge and Fidelity.
- Work with internal research group to develop optimal weighting methodology based on relative returns with other Opportunistic strategies and other active strategies in the portfolio. This analysis will be performed in connection with the consideration of additional multi-asset strategies.
- Change the Opportunistic Asset Class benchmark from 60% Russell 1000 / 40% Bloomberg Barclays Aggregate to 60% ACWI IMI / 40% Bloomberg Barclays Aggregate to better reflect ARMB's overall plan benchmark which includes international equity.

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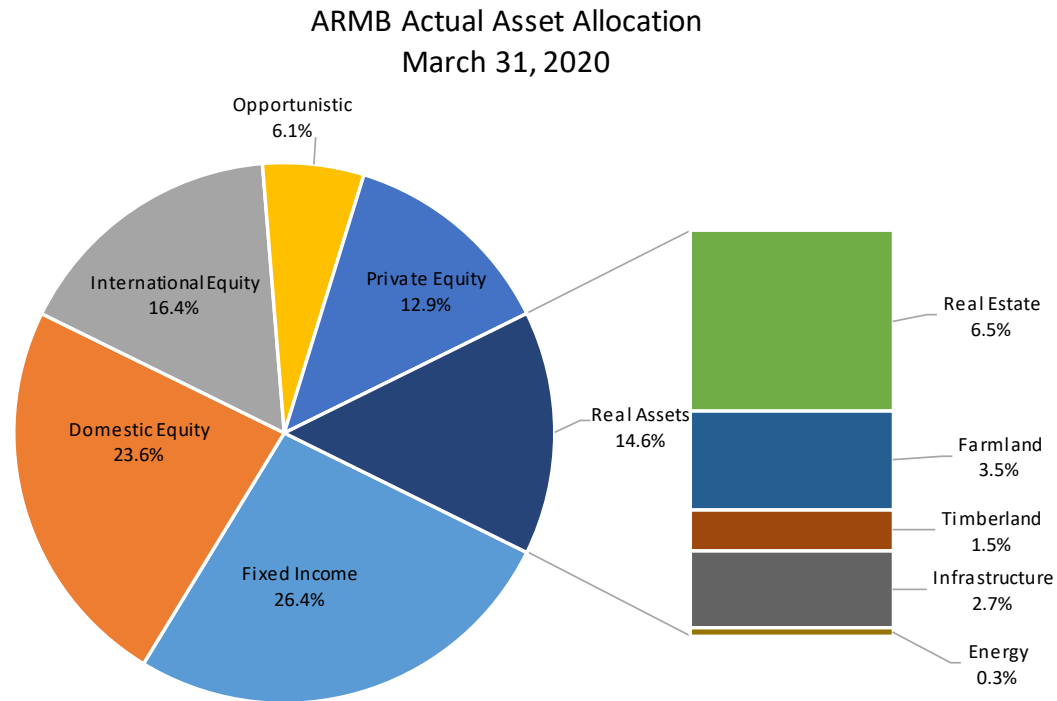
**Real Assets
Manager Structure**

June 2020

Steve Sikes
Manager of Opportunistic Strategies & Real Assets

Alaska Retirement Management Board

Real Assets Portfolio



Real Assets represent \$3.6 billion of ARMB's \$24.7 billion of total defined benefit assets as of March 31, 2020.

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Background

- In September 2019, ARMB approved the Fiscal Year 2020 Real Assets Plan as recommend by Callan and staff. In that plan, Callan identified several areas relating to portfolio structure for additional review. Staff has conducted additional analysis on these items.
- This presentation will identify actions to address the portfolio structure questions raised by Callan. These actions will:
 - 1) refine strategic focus of the portfolio;
 - 2) simplify account structure;
 - 3) calibrate portfolio size toward longer term strategic weights;
 - 4) reduce fees; and,
 - 5) reduce operational and administrative cost.

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Real Estate Portfolio – Recommendations

Callan Review

- Evaluate existing separate account managers (LaSalle, Sentinel, and UBS) to determine the role and position of their portfolio as they fit within the broader real asset program's objectives and goals. Based on the evaluation, recommend if the separate account assets should remain in place.

Action

- Staff evaluated the real estate separate accounts and believe both the UBS and Sentinel separate account mandates continue to play a meaningful role in ARMB's portfolio. Both portfolios have produced superior returns, have relatively low fees, are sufficiently diversified, when considered within the broader real estate portfolio, and allow ARMB to maintain control of assets and investment guidelines.
- Redeem entirely from legacy open-end fund position in JP Morgan Strategic Property Fund and UBS Trumbull Property Fund and use proceeds to increase investment in Sentinel separate account by \$125 million and BlackRock open-end fund by \$100 million.
- REIT exposure will be increased toward 15% strategic target as capital is returned from non-core investments.

Results

- Improve strategic focus of the portfolio
- Simplify portfolio
- Lower management fees

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Real Estate Portfolio – Manager Structure

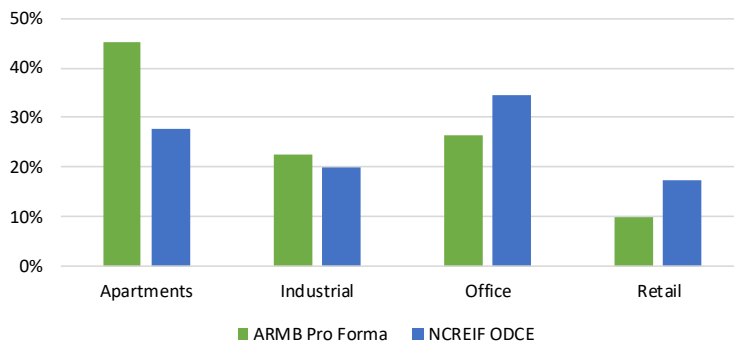
- UBS and Sentinel separate accounts will continue to anchor core investment strategies. ARMB has 100% ownership and control of properties, which is beneficial in managing strategy and liquidity. Performance relative to NCREIF ODCE has been strong on both a total return basis and an income basis.

as of March 31, 2020	1 Year		5 year		10year		15 year	
	Income	Total	Income	Total	Income	Total	Income	Total
UBS Separate Account (net)	4.55%	6.75%	4.41%	10.83%	4.78%	11.90%	5.17%	8.93%
Sentinal Separate Account (net)	4.64%	6.73%	4.85%	9.37%	4.94%	10.73%	5.11%	8.54%
NCREIF ODCE Value Wt (net)	3.24%	3.93%	3.43%	7.48%	3.94%	10.42%	4.20%	6.49%

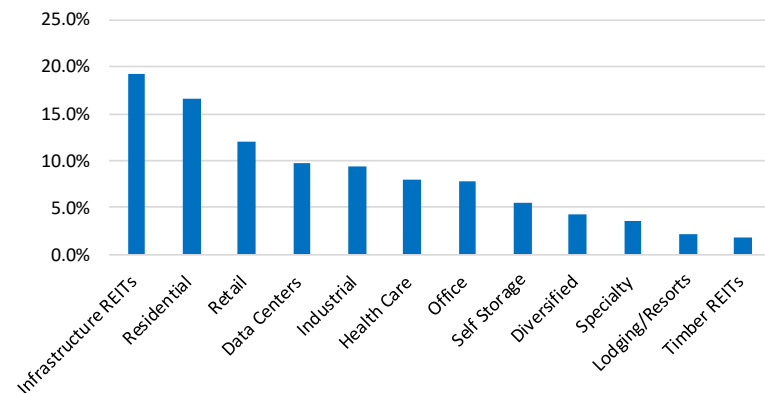
Source: Callan

- Portfolio will likely be overweight Apartments and Industrial which is attractive in the current economic environment and stage of the business cycle.

**ARMB Pro Forma Core Portfolio
vs. NCREIF ODCE Index**



FTSE NAREIT Sector Weights



Alaska Retirement Management Board

Real Estate Portfolio – Sector Projections

- The industrial and apartment sectors are expected to have relatively attractive income and total returns compared to office and retail.
- The industrial and retail sectors are experiencing secular change as the internet reshapes how goods are purchased.
- Well located apartment properties in markets with favorable supply/demand characteristics are expected to continue to produce attractive returns. Apartments have the highest cash pay-out ratio which is ideal for meeting ARMB's cash needs.

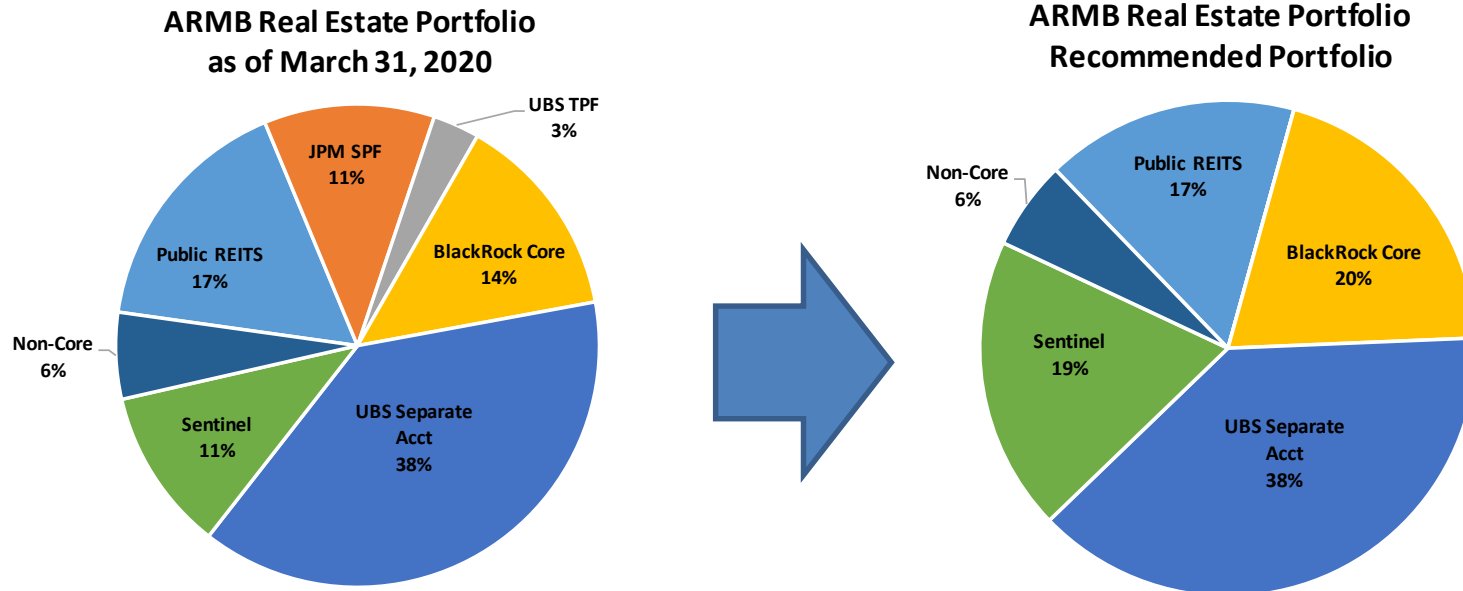
Forecast risk-return profile by sector (2019-2021)²

Sector	Current Cap Rate	Dividend Pay-Out Ratio	Dividend Yield	NOI Growth	Cap Rate Shift Effect	Total Return	Exit Cap Rate
Industrial	4.8	x 68.5	= 3.2	+ 5.2	+ 1.0	= 9.4	4.7
Apartment	4.2	x 75.5	= 3.2	+ 3.0	+ -0.6	= 5.5	4.3
Office	4.5	x 59.9	= 2.8	+ 3.0	+ -0.5	= 5.2	4.6
Retail	4.6	x 70.0	= 3.3	+ 1.5	+ -0.6	= 4.1	4.7
NPI	4.5	x 67.3	= 3.0	+ 3.0	+ -0.3	= 5.7	4.5

Source: BlackRock

Alaska Retirement Management Board

Real Estate Portfolio – Sector Allocations



Risk	Mitigant
Concentration Risk	Idiosyncratic risk diversifies quickly as assets are added to the portfolio and is considered well diversified above 15 assets. BlackRock analysis indicates idiosyncratic risk is not meaningfully higher based on proposed actions.
Reduced Primary Market Exposure	Primary market and large asset exposure will be achieved through increased allocation to open-end commingled funds and public REITS.
Tracking Error	Portfolio will be different from ODCE Index but strong track records from separate account managers and strategic positioning are appealing.

Alaska Retirement Management Board

Farmland Portfolio – Recommendations

Callan Review

- Evaluate existing separate account managers (Hancock and UBS) to determine the role and position of their portfolio as they fit within the broader real asset program's objectives and goals. Evaluate their experience and ability to pursue permanent crop investments.

Action

- Staff reviewed the existing farmland separate accounts and recommend consolidating accounts with UBS Agrinvest.
- Over the long term, leased annual crops have produced higher returns with lower volatility. Leased permanent crops have higher risk due to the additional capital investment required and reduced ability to respond to changing market conditions.
- UBS Agrinvest is suitable to invest in both row and permanent crops.

Results

- Single manager approach will help optimize overall portfolio structure and strategy.
- Reduced investment management fees and property management expense.
- Reduced administration cost through improved economies of scale – audit, legal, appraisal, etc.

Alaska Retirement Management Board

Farmland Portfolio – Manager Structure

Performance

<i>as of March 31, 2020</i>	Portfolio NAV (\$MM)	Acres	Property Count	5yr Rtn (net)	10yr Rtn (net)
UBS Agrivest	587.6	97,322	67	4.29%	8.02%
Hancock	288.3	50,615	23	2.95%	5.49%
Total	875.9	147,937	90	3.85%	7.11%

Risk	Mitigant
Manager strategy diversification	UBS Agrivest is a long time investment manager for ARMB and has proven themselves as disciplined and successful. Their preference for leased based investing is aligned with ARMB's need for stable current income.
Loss of Key Person(s)	Experienced staff. Good reputation in market facilitates recruiting top people if needed.
No Backup Manager	Leased-based approach and depth of institutional management market should make transition relatively straightforward if needed.

Alaska Retirement Management Board

Timberland Portfolio – Recommendations

Callan Review

- Review existing separate accounts, Hancock Natural Resource Group (Hancock) and Timberland Investment Resources (TIR). Instruct managers to provide comprehensive timberland outlook and propose strategies to increase returns.

Action

- Staff reviewed the existing timberland separate accounts and recommend consolidating accounts with TIR.
- While past performance has been disappointing, supply and demand conditions appear favorable for future returns, particularly in the U.S. South, due to significant increases in new sawmill capacity and continued increases in residential construction. Timberland also adds a diversification benefit to the Real Assets portfolio.
- Given TIR's value approach, portfolio results should benefit from this philosophy and strategy over time.

Results

- Single manager approach will help optimize overall portfolio structure and strategy.
- Reduced investment management fees and property management expense.
- Reduced administration cost through improved economies of scale – audit, legal, appraisal, etc.

Alaska Retirement Management Board

Timberland Portfolio – Manager Structure

Performance

<i>as of March 31, 2020</i>	Portfolio NAV (\$MM)	Acres	Property Count	5yr Rtn (net)	10yr Rtn (net)
TIR	267.4	133,374	14	1.40%	3.00%
Hancock	99.6	33,500	3	0.49%	4.77%
Total	367	166,874	17	1.15%	3.66%

Risk	Mitigant
Manager strategy diversification	TIR has experience to manage Pacific Northwest properties currently managed by Hancock.
Loss of Key Person(s)	Depth of experience.
No Backup Manager	Core approach and depth of institutional manager market should make transition relatively straightforward if needed.

Alaska Retirement Management Board

Infrastructure Portfolio – Recommendations

Callan Review

- Review infrastructure portfolio. Activate dividend option from both IFM and JP Morgan. Use these distributions to rebalance and fund other components of the real assets program as necessary (i.e. REITS).

Action

- Staff reviewed the infrastructure portfolio and believe both funds remain attractive components of ARMB's Real Assets portfolio. The IFM and JPM funds are a good complement to each other, and together, represent a well diversified portfolio of infrastructure assets for ARMB.
- Currently, the IFM investment is much larger than JP Morgan. Staff will look to rebalance these positions over time to improve diversification. The IFM dividend option has been activated. The JPM dividend will be reinvested to help balance exposures over time.
- JP Morgan infrastructure investment recently converted to currency hedged version, consistent with ARMB's investment in the IFM fund.

Results

- Maintain investments in IFM and JPM portfolio

Alaska Retirement Management Board

Real Assets – Manager Action Summary

<i>\$ millions as of March 31, 2020</i>				
	Retain	Terminate	Actual Net Asset Value	Pro Forma Net Asset Value
Core Real Estate				
J.P. Morgan Strategic Property Fund		X	183.6	-
UBS Trumbull Property Fund		X	50.2	-
BlackRock US Core Property Fund	X		222.6	322.6
Sentinel Separate Account	X		175.2	309.0
UBS Separate Account	X		618.9	618.9
Total			1,250.5	1,250.5
Farmland				
Hancock Agricultural Investment Group		X	288.3	-
UBS Agrivest, LLC	X		587.6	875.9
Total			875.9	875.9
Timberland				
Hancock Natural Resource Group		X	99.6	-
Timberland Investment Resources	X		267.4	367.0
Total			367.0	367.0

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Real Assets Manager Structure

ACTION: X

DATE: June 18-19, 2020

INFORMATION:

BACKGROUND

In September 2019, the Alaska Retirement Management Board approved the Fiscal Year 2020 Real Assets Plan as recommend by Callan and staff. In that plan, Callan identified several areas relating to portfolio structure for additional review. Staff has conducted additional analysis on these items.

STATUS

Based on a review of the portfolio and each of the investment mandates staff recommends the manager structure changes described in the table below:

Core Real Estate	Retain	Terminate
J.P. Morgan Strategic Property Fund		X
UBS Trumbull Property Fund		X
BlackRock US Core Property Fund	X	
Sentinel Separate Account	X	
UBS Separate Account	X	
Farmland		
Hancock Agricultural Investment Group		X
UBS Agrinvest, LLC	X	
Timberland		
Hancock Natural Resource Group		X
Timberland Investment Resources	X	
Infrastructure		
IFM Global Infrastructure Fund	X	
J.P. Morgan Infrastructure Fund	X	

These manager changes are expected to produce the following portfolio results:

- 1) refine strategic focus of the portfolio;
- 2) simplify account structure;
- 3) calibrate portfolio size toward longer term strategic weights;
- 4) reduce fees; and,
- 5) reduce operational and administrative cost.

The Real Assets portfolio is still expected to be sufficiently diversified and manager concentration risks are mitigated through the depth of the organizations and the ability to replace managers if needed.

RECOMMENDATION

The Alaska Retirement Management Board adopt the proposed changes as detailed in the preceding table.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Farmland Investment Guidelines

ACTION: X

DATE: June 18-19, 2020

INFORMATION:

BACKGROUND

As part of the Real Assets manager structure review, staff is recommending that all farmland assets be consolidated into one account with UBS Farmland Investors, LLC

The current Farmland Investment Guidelines require a minimum of two investment managers and therefore a revision is required to the Farmland Investment Guidelines to implement the recommendation to consolidate assets with one investment manager.

STATUS

The proposed Farmland Investment Guidelines have been revised to remove the requirement that the portfolio include a minimum of two investment managers.

Staff believes the farmland investment manager market is deep enough where a replacement manager could be put in place relatively quickly if needed. Efficiencies around fee structure, operational expenses, and management efficiency can be gained by having a single manager.

RECOMMENDATION

The ARMB approve Resolution 2020-02 which adopts the revised Farmland Investment Guidelines.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
Relating to Farmland Investment Guidelines

Resolution 2020-02

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 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 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 established an asset allocation for the funds that considers earnings and liabilities on a current as well as a future basis; and

WHEREAS, the Board has authorized investment in real estate assets for the Public Employees' Retirement System, Teachers' Retirement System, and Judicial Retirement System, including investments for those systems in the State of Alaska Retirement and Benefit Plans Trust; and

WHEREAS, the Board establishes and from time to time as necessary, modifies investment policies, procedures, and guidelines for real estate;

NOW THEREFORE, BE IT RESOLVED THAT THE ALASKA RETIREMENT MANAGEMENT BOARD adopts the revised Farmland Investment Guidelines, attached hereto and made a part hereof. This resolution repeals and replaces Resolution 2018-20.

DATED at Juneau, Alaska this ____ day of June, 2020.

Chair

ATTEST:

Secretary

APPENDIX E

ALASKA RETIREMENT MANAGEMENT BOARD FARMLAND INVESTMENT POLICIES, PROCEDURES AND GUIDELINES

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ALASKA RETIREMENT MANAGEMENT BOARD FARMLAND INVESTMENT POLICIES, PROCEDURES AND GUIDELINES

I. INVESTMENT OBJECTIVES

A. Investments in Farmland and Other Farmland Related Assets

The Alaska Retirement Management Board (ARMB) will invest in Farmland with the goals of portfolio diversification and attaining the optimum return on the portfolio, consistent with the assumption of prudent risk and safety of principal. ARMB recognizes the need to use active investment management in order to obtain the highest attainable total investment return (measured as income plus appreciation) within ARMB's framework of prudence and managed risk.

ARMB will select Separate Account Investment Managers (**Managers**) who have the discretion to invest in Farmland, subject to ARMB's approval of an Annual Strategic/Tactical Plan and an Annual Investment Plan. In order for Farmland investments to be considered, the Manager must demonstrate that it is able to: add value through its Farmland knowledge, experience and strategy; underwrite the risks of the investment which is contemplated; and comply with the intent of the Farmland Investment Policies, Procedures and Guidelines (**Guidelines**).

Single property and multi property strategies will be considered.

B. Asset Allocation

The ARMB allocation to Farmland investments shall be determined by the Board of Trustees and reviewed annually.

Farmland Investments will be allocated 60% to row crops and 40% to permanent crops, +/- ten (10%) percent

Allocated capital to Managers will be defined as invested capital based on ARMB's cost.

C. Portfolio Return Objective

1. Total Return

Over rolling 6 year periods, the equity Farmland investment portfolio is expected to generate a net-of-fee total return between public equities and fixed income using a time-weighted rate of return calculation. The inflation index used to calculate the actual real rate of return is the CPI All Urban.

2. Income Return

Income, which is defined as cash distributed to ARMB, is expected to produce 4.0% returns over rolling five-year periods with a minimum of 3.0% distributed income after fees and projected capital expenditures.

II. PROGRAM RISK MANAGEMENT AND IMPLEMENTATION

The selection and management of assets in the Farmland portfolio of the ARMB will be guided by the principles of preserving investment capital, attaining the optimum return on the portfolio consistent with the assumption of prudent risk, generating current income, being sensitive to inflation, maintaining diversification of assets and diversification of management responsibility.

In Farmland investment, there is an inherent risk that the actual income and return of capital will vary from the amounts expected. The ARMB will manage the investment risk associated with Farmland in several ways:

A. Institutional Quality

All assets must be of institutional investment quality as evidenced by a precedent of institutional investment in similar properties; i.e., properties that have high percentage of Class I & II soils or other soil types appropriate for the production of the targeted commodity, adequate sources of water for irrigation (if applicable) at reasonable costs, located in well established agricultural regions.

“Eligible Properties” mean real property in which ownership in fee vests in ARMB or an ARMB Title Holding Entity. Subsurface, water or other property rights will be acquired and/or retained consistent with use of the property for Farmland, and the terms of acquisition shall include the most favorable rights and terms accorded to any other participant in any controlling or overriding master lease or utilization type agreement which might be applicable to the use of the property (for example, if the ARMB property is a portion of a larger agricultural unit). For purposes of this definition, real property includes any property treated as real property either by local law or state law or for federal income tax purposes.

Investments will be located in the United States of America. International investments are not permitted.

B. Diversification

The Farmland portfolio will be diversified as to crop type, property type and geographical location. Diversification reduces the impact on the portfolio of any one investment. Diversification compliance will be monitored on a quarterly basis for compliance with ARMB’s Guidelines by staff.

For purposes of calculating diversification compliance, the overall Farmland portfolio size will be considered the allocation to Farmland. Unless exceptional circumstances justify a deviation, the maximum percentage of the Farmland portfolio investment for each of the identified categories is as follows:

Controlled Investments:	100 %
<i>(ARMB can liquidate within 180 days –targeted, not guaranteed))</i>	
Non-Controlled Investments:	50%
<i>(ARMB cannot liquidate within 180 days)</i>	
Public Equity:	0 %
Public Debt:	0 %
Private Equity:	100 %
Private Debt:	0 %

Geographic:

ARMB will avoid over-concentration in areas of similar Farmland performance. The consultant will monitor ARMB's concentrations in this area. The consultant will report its conclusions regarding the acceptability of ARMB's concentration limits quarterly.

Properties Within the Same NCREIF Farmland Region	40%
Single Property Investment:*	15%
<i>(acquisition cost plus projected capital additions and improvements)</i>	
Single-Tenant/Sub-Tenant (any one firm):	15%
Crop Type (with a band of +/- 10%)	
Row Crop	60%
Permanent Crop	40%
Properties Producing the Same Commodity	30%

Exceptional circumstances justifying a deviation – When circumstances arise of a temporary nature, such as an unexpected re-valuation of assets, a transfer of assets among managers, or an event in which it would be in the fiduciary interest of the ARMB to do so, the limits set forth in paragraph II.B of ARMB Policies may be exceeded provided that ARMB concurs.

* Exception for high cost markets shall be approved annually by the ARMB through its Annual Investment Plan.

Reinvestment of allocation by the investment manager shall require approval by the Chief Investment Officer (CIO). The CIO has discretion in determining the reinvestment amount to authorize. Amounts may reflect the original allocation or may recognize some portion of any realized gains or losses.

CIO Discretionary Investment Authority – The CIO shall have the following discretionary investment authority:

- a) To increase or decrease existing separate account allocations and investments in open-end funds;
- b) To commit to new investment funds up to \$100 million for each fund; and,
- c) To engage consultants and take other action as may be necessary to ensure sufficient due diligence is performed on all investments under consideration.

The CIO shall exercise this discretion within Board approved asset allocations, investment plans, and guidelines as they may apply.

The CIO will provide prior notification to the Chair of ARMB before committing to any investments under this authority. All discretionary CIO investment actions shall be reported to the Board.

C. Implementation Approach

~~The ARMB will implement an investment process for Farmland which will, over time, include a minimum of two (2) qualified investment managers who have been selected on a competitive basis.~~ The ARMB will endeavor to allocate specific funds to qualified managers on a separate account basis. Selected managers will seek Farmland investment opportunities in privately-placed equity sectors. Investments will be made on a discretionary basis subject to ARMB Staff approval of the Annual Strategic/Tactical Plans prepared by Managers and Staff's approval of the Annual Investment Plan.

All allocation of funds to a manager (including additional investment with existing accounts) and investment strategy must be recommended to Staff and be accompanied by an investment report which, at a minimum, includes the following: market information; investment alternatives; fee structure and comparison to other alternatives; demonstration of compliance with the Guidelines and the then current Annual Investment Plan; historical performance of Manager (cash-based internal rates of return and industry standard); projected returns (income and appreciation); and positive and negative attributes of the investment strategy.

On a selective basis, a member of ARMB may visit the site of a Farmland investment for the purpose of rendering a report to ARMB supplementing reports provided by Staff or others.

D. Prudent Leverage

The total amount of leverage placed on the aggregate Separate Account assets will not exceed ten percent (10%) of the total market value of the Farmland separate account portfolio. Directly-owned properties will not be leveraged by the separate account investment manager unless, with approval from the Chief Investment Officer, the property was encumbered by debt at the time of purchase and leaving the debt in place can be

justified on a risk-return basis. With authorization by the ARMB, the Chief Investment Officer may place leverage on a pool of existing core Farmland assets held in ARMB's separate account portfolio in a manner consistent with the ARMB's Guidelines.

E. Directly Operated Agriculture Properties

Directly operated agriculture properties are permitted. Managers will select operators for agricultural properties who have relevant experience and who have demonstrated expertise in operating that property's crop type.

F. Lease Structure

All leases must be of institutional investment quality with a precedent of institutional investment in similar properties; Leases will be structured with fixed cash rents, or participating rents calculated as a percentage of gross income. A lease structure incorporating both fixed cash rent and participating rent is also acceptable.

G. Manager Business Plan; Annual Strategic/Tactical Plan; Disposition/Exit Strategy

A Business Plan (including property operating budgets) will be completed by each manager for each asset under its management. The Business Plan will identify the current and anticipated competitive position for each property in order to set tactical and strategic objectives and will prescribe in appropriate detail a disposition and exit strategy respecting the particular investments. Part of this process is to evaluate the potential timing of dispositions. The Annual Strategic/Tactical Plan will describe the expectation of the manager with respect to acquisitions and dispositions.

H. Fee Structure

Involvement in any venture will be done on a fee basis that is competitive. The preferred method of calculating manager fees will be based upon a formula, which considers 1) the cost basis of assets under management and 2) market value of the assets under management. All fee structures will be approved by ARMB.

I. Single Asset Ownership Structure (Applies to Separate Accounts Only)

Provided that the goals of these guidelines are followed, ARMB may invest in separate, specific Farmland assets. However, such investments will be undertaken in a fashion structured to limit ARMB's liability to the amount of its investment.

J. Reporting System

Staff will develop and implement a comprehensive and responsive reporting and monitoring system for the entire portfolio, individual investments and individual managers.

The reporting and monitoring system will endeavor to identify under-performing investments, control portfolio diversification deficiencies and inherent conflicts of interest, thereby facilitating active portfolio management. A cash-based internal rate of return (IRR) will be used when evaluating the long-term performance of an investment. Time-weighted returns will be used to measure comparative performance.

K. Distribution of Current Income

All separate account income less expenses and prudent operating reserves will be distributed to ARMB or its designee on a quarterly basis and not automatically reinvested in the Account.

L. Lines of Responsibility

Well defined lines of responsibility and accountability will be required of all participants in ARMB's Farmland investment program. Participants are identified as:

ARMB – The fiduciaries appointed by the Governor to represent the beneficiaries' interest which shall retain final authority over all Farmland investment decisions.

Staff – Investment professionals on the staff of the Department of Revenue and assigned ARMB responsibilities who will assist in the Farmland equity investment program's design, policy implementation and administration.

Separate Account Managers – Qualified entities that provide institutional Farmland investment management services and maintain a discretionary relationship with ARMB subject to Staff's approval of Annual Business Plans and Annual Strategic/Tactical plans, prepared by Managers.

III. CONFLICTS OF INTEREST

In Farmland investment, separate and distinct from other asset classes, the Manager of a Separate Account or Commingled Fund may have direct or significant control over the operations of the assets. Additionally, Managers may now or in the future maintain or manage properties and provide discretionary or non-discretionary advisory services for a number of other accounts and clients, including accounts affiliated with the Manager. These inherent or potential conflicts of interest if openly described and regulated may contribute to the lower volatility associated with the asset class, but it also creates a need for a higher oversight standard by the plan sponsor. Staff and ARMB will maintain this oversight in at least the following ways:

A. Property Valuation

The following valuation procedures shall be applied to all farmland assets managed in separate accounts for the Alaska Retirement Management Board:

- 1) All assets shall be appraised at the time of acquisition.
- 2) All assets shall be appraised annually during the quarter ending March 31 unless the property was acquired during the preceding twelve months in which case, based on a recommendation from the advisor, staff may allow an appraisal update or waive the appraisal requirement if such appraisal would not be a cost effective exercise.
- 3) All property valuations shall be reviewed internally by advisors for the quarters ending in June, September, and December. If changes in market conditions, expected cash flows, or other factors suggest a property valuation has likely changed by more than 3% to 5% the advisor shall prepare a documented internal valuation and record the resulting value in the financial statements.
- 4) Appraisals will be prepared by a qualified independent third party entity in accordance with industry standards. Appraisers shall be selected by the advisor in a manner that achieves a high quality appraisal at a reasonable cost.
- 5) Advisor shall attempt to rotate appraisers on each property every three years.

B. Property Management

The selection of on-site property management will generally be left to the discretion of the Manager. It is expected that the Manager will retain the highest caliber, market rate property management service either through a third party fee manager or the Manager's affiliated property management division. This business relationship will be periodically reviewed by Staff and ARMB.

IV. INSURANCE COVERAGE

The Manager will obtain insurance for the physical properties and assets under its control. The coverage will be in such amounts and against such risks as, in the Manager's professional judgment, shall be in accordance with sound institutional practices applicable to such properties or assets in the specific geographic area. It is expected that such insurance will include, but not be limited to, casualty loss, including where deemed appropriate by the Manager, disaster-type insurance coverage; comprehensive general liability; and title insurance.

V. UNRELATED BUSINESS INCOME TAX

The Manager will provide ARMB with an opinion of counsel satisfactory to ARMB that the standard lease or subsequent revisions to the standard lease used to lease Account Property will not generate unrelated business taxable income under the federal income tax law or any other tax provisions that could affect ARMB's tax-exempt status existing at the time. The Manager shall investigate as to whether ARMB shall be entitled to any property tax exemptions.

VI. ENVIRONMENTAL EVALUATIONS

As a standard procedure during the pre-acquisition analysis, the Manager will initiate a formal evaluation for each property through the selection of an environmental consultant. In carrying out the review, appropriate procedures based on standards of the locale and conditions known to exist in the locale shall be undertaken and such procedures should at a minimum include:

- Appointment of an environmental consultant with specific experience in testing and removal of asbestos and other environmental hazards.
- A site survey will be conducted to determine from the available evidence whether hazardous chemicals or environmentally dangerous materials exist or have existed on the subject property, including, at a minimum, a Phase I report.

ARMB may invest in properties, which contain asbestos and other toxic substances, only if the following conditions are met:

- The substance and potential risks are thoroughly disclosed.
- The property is not in violation of any federal, state or local law, ordinance, or regulation relating to the property's environmental condition.
- The estimated cost of the removal or containment programs will be reflected in the purchase assumptions.
- The substance can be properly contained or removed in accordance with the then current Environmental Protection Agency Standards.
- The leasing rollover pattern in the property will accommodate a removal program in the future.

VII. PROCEDURES FOR INVESTMENT

A. Delegation of Responsibilities

The Farmland investment program will be implemented and monitored through the coordinated efforts of the ARMB; Staff and; the qualified Manager(s). Delegation of responsibilities for each participant is described in the following sections: A summary of the delegation is attached:

1. ARMB

ARMB will retain final authority over all Farmland investment strategy decisions except for Business Plan variances as set forth in the Guidelines Section VIII; approve the Guidelines, the Annual Investment Plan and any periodic revisions to these documents which ARMB deems to be appropriate and prudent for the investment of ARMB assets; retain qualified investment managers and Farmland consultants; and set investment limits.

2. Staff

Staff will coordinate program compliance among all participants and communicate the investment policies, objectives and performance criteria to the Managers and monitor diversification compliance on a quarterly basis. Staff will also coordinate the receipt and distribution of capital. Staff will periodically review the Managers' and portfolio's performance in relation to target returns; review and approve the Manager's Annual Business Plan and Annual Strategic/Tactical Plan; review and recommend an Annual Investment Plan; and recommend revisions to the Farmland Investment Policy Procedures and Guidelines. Staff will also review and approve the detailed property operating budgets prior to the start of each fiscal year and revisions to the property operating budgets in accordance with Section VIII of these Guidelines.

3. Managers

Separate account investment managers will acquire and manage Farmland investments on behalf of ARMB and in accordance with the then current and approved Annual Business, Annual Strategic/Tactical Plans, and the objectives set forth in the Annual Investment Plan and the Guidelines. Managers will prepare Annual Business (including property operating budgets) and Annual Strategic/Tactical Plans for Staff review and approval.

B. Investment Procedure

Farmland investments, in compliance with ARMB's Policies, shall be acquired through the following process:

Separate Accounts:

Annually, Staff will prepare an Investment Plan after reviewing the Annual Business and Strategic/Tactical Plans of the separate account investment managers. This document will recommend, as appropriate, revisions to the ARMB Guidelines, additional allocations to existing managers, and revisions to the Annual Business and Strategic/Tactical Plans of each respective separate account investment manager. Staff shall review the Manager's Annual Business Plans and Annual Strategic/Tactical Plans for consistency with the Annual Investment Plan. Staff will approve all Plans prepared by the Managers.

Investments will be made on a discretionary basis by separate account investment managers in accordance with their approved Annual Business and Strategic/Tactical Plans. Investments will be approved in accordance with Managers' standard internal investment approval process, which may involve levels of authority delegated to senior officers and/or one or more investment committees. Upon the request of ARMB, separate account investment managers will provide copies of their internal Investment Committee reports for each asset purchased.

VIII. DELEGATION OF AUTHORITY

ARMB shall delegate authority to Staff to approve the following:

- Each separate account Manager's detailed property operating budgets for each fiscal year;
- Annual Business Plans and Annual Tactical/Strategic Plans prepared by ARMB's separate account Managers;
- Revised property operating budgets and variances in approved Annual Business Plans for unanticipated, significant leasing activity; and
- Line item variances in approved capital expenditure budgets in amounts up to \$500,000 with a cumulative fiscal year maximum of \$3,000,000 per Investment Manager for other capital expenditures not related to leasing activity (such as repairs for building damage or defects).

IX. CONFIDENTIALITY

Pursuant to 15 AAC 112.770, ARMB shall withhold from other persons all information furnished to it by Manager(s) or Consultant(s) which is reasonably designated by Manager(s) or Consultant(s) as being confidential or proprietary, within the meaning of Alaska Statutes regarding rights to public information, except to the extent that the information is needed by ARMB in order to adequately report on the status and performance of the portfolio, or to comply with a court subpoena or with an official criminal investigation.

Those portions of reports provided pursuant to Part II section I (Reporting System) of these Guidelines shall be considered confidential pursuant to 15 AAC 112.770 to the extent that information is reasonably designated by Manager(s) as being confidential or proprietary, or to the extent the disclosure of which would unfairly prejudice the ability of Manager(s) or ARMB to manage, lease, market or sell such property or Assets.

X. REVISIONS

This document is to be reviewed no less than annually and revised as appropriate.

XI. FARMLAND SEPARATE ACCOUNT INVESTMENT MANAGERS

The following investment managers will acquire institutional-grade farmland properties on a discretionary basis for the Alaska Retirement Management Board:

UBS Farmland Investors LLC

James B. McCandless
10 State House Square, 15th Floor
Hartford, CT 06103-3604
Telephone: 860-616-9200
Fax: 860-616-9204
E-mail: james.mccandless@ubs.com
Web site: www.ubs.com

**Hancock Agricultural Investment
Group**

~~Oliver Williams
197 Clarendon Street
C-08-99
Boston, MA 02116-5010
Telephone: 617-747-1645
Fax: 617-747-8645
E-mail: owilliams@harg.com
Web site: www.haig.jhancock.com~~

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Telephone: 860-616-9200
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Attachment 1

FARMLAND INVESTMENT POLICIES, PROCEDURES AND GUIDELINES - Delegation of Responsibilities "Attachment 1"					
	Frequency	Separate Account Investment Managers	Consultant	Staff	Board
Farmland Investment Policies Procedures and Guidelines Review and Revise	Annually			P, R	A
Separate Account Investment Manager Selection Request for Proposals (RFP)	Periodically		P, G, R	P, G, R	A
Farmland Investment Plan	Annually			P, R	A
Separate Account Business Plan and Strategic/Tactical Plan	Annually	P, R		A	
Quarterly Performance	Quarterly		P		
Portfolio/Property Diversification Compliance	Quarterly	P		M	
Geographic Concentration Limit	Quarterly	P		M	
A = Approve G = Grade P = Prepare	R = Recommend M = Monitor				

APPENDIX E

ALASKA RETIREMENT MANAGEMENT BOARD FARMLAND INVESTMENT POLICIES, PROCEDURES AND GUIDELINES

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ALASKA RETIREMENT MANAGEMENT BOARD FARMLAND INVESTMENT POLICIES, PROCEDURES AND GUIDELINES

I. INVESTMENT OBJECTIVES

A. Investments in Farmland and Other Farmland Related Assets

The Alaska Retirement Management Board (ARMB) will invest in Farmland with the goals of portfolio diversification and attaining the optimum return on the portfolio, consistent with the assumption of prudent risk and safety of principal. ARMB recognizes the need to use active investment management in order to obtain the highest attainable total investment return (measured as income plus appreciation) within ARMB's framework of prudence and managed risk.

ARMB will select Separate Account Investment Managers (**Managers**) who have the discretion to invest in Farmland, subject to ARMB's approval of an Annual Strategic/Tactical Plan and an Annual Investment Plan. In order for Farmland investments to be considered, the Manager must demonstrate that it is able to: add value through its Farmland knowledge, experience and strategy; underwrite the risks of the investment which is contemplated; and comply with the intent of the Farmland Investment Policies, Procedures and Guidelines (**Guidelines**).

Single property and multi property strategies will be considered.

B. Asset Allocation

The ARMB allocation to Farmland investments shall be determined by the Board of Trustees and reviewed annually.

Farmland Investments will be allocated 60% to row crops and 40% to permanent crops, +/- ten (10%) percent

Allocated capital to Managers will be defined as invested capital based on ARMB's cost.

C. Portfolio Return Objective

1. Total Return

Over rolling 6 year periods, the equity Farmland investment portfolio is expected to generate a net-of-fee total return between public equities and fixed income using a time-weighted rate of return calculation. The inflation index used to calculate the actual real rate of return is the CPI All Urban.

2. Income Return

Income, which is defined as cash distributed to ARMB, is expected to produce 4.0% returns over rolling five-year periods with a minimum of 3.0% distributed income after fees and projected capital expenditures.

II. PROGRAM RISK MANAGEMENT AND IMPLEMENTATION

The selection and management of assets in the Farmland portfolio of the ARMB will be guided by the principles of preserving investment capital, attaining the optimum return on the portfolio consistent with the assumption of prudent risk, generating current income, being sensitive to inflation, maintaining diversification of assets and diversification of management responsibility.

In Farmland investment, there is an inherent risk that the actual income and return of capital will vary from the amounts expected. The ARMB will manage the investment risk associated with Farmland in several ways:

A. Institutional Quality

All assets must be of institutional investment quality as evidenced by a precedent of institutional investment in similar properties; i.e., properties that have high percentage of Class I & II soils or other soil types appropriate for the production of the targeted commodity, adequate sources of water for irrigation (if applicable) at reasonable costs, located in well established agricultural regions.

“Eligible Properties” mean real property in which ownership in fee vests in ARMB or an ARMB Title Holding Entity. Subsurface, water or other property rights will be acquired and/or retained consistent with use of the property for Farmland, and the terms of acquisition shall include the most favorable rights and terms accorded to any other participant in any controlling or overriding master lease or utilization type agreement which might be applicable to the use of the property (for example, if the ARMB property is a portion of a larger agricultural unit). For purposes of this definition, real property includes any property treated as real property either by local law or state law or for federal income tax purposes.

Investments will be located in the United States of America. International investments are not permitted.

B. Diversification

The Farmland portfolio will be diversified as to crop type, property type and geographical location. Diversification reduces the impact on the portfolio of any one investment. Diversification compliance will be monitored on a quarterly basis for compliance with ARMB’s Guidelines by staff.

For purposes of calculating diversification compliance, the overall Farmland portfolio size will be considered the allocation to Farmland. Unless exceptional circumstances justify a deviation, the maximum percentage of the Farmland portfolio investment for each of the identified categories is as follows:

Controlled Investments:	100 %
<i>(ARMB can liquidate within 180 days –targeted, not guaranteed))</i>	
Non-Controlled Investments:	50%
<i>(ARMB cannot liquidate within 180 days)</i>	
Public Equity:	0 %
Public Debt:	0 %
Private Equity:	100 %
Private Debt:	0 %

Geographic:

ARMB will avoid over-concentration in areas of similar Farmland performance. The consultant will monitor ARMB's concentrations in this area. The consultant will report its conclusions regarding the acceptability of ARMB's concentration limits quarterly.

Properties Within the Same NCREIF Farmland Region	40%
Single Property Investment:*	15%
<i>(acquisition cost plus projected capital additions and improvements)</i>	
Single-Tenant/Sub-Tenant (any one firm):	15%
Crop Type (with a band of +/- 10%)	
Row Crop	60%
Permanent Crop	40%
Properties Producing the Same Commodity	30%

Exceptional circumstances justifying a deviation – When circumstances arise of a temporary nature, such as an unexpected re-valuation of assets, a transfer of assets among managers, or an event in which it would be in the fiduciary interest of the ARMB to do so, the limits set forth in paragraph II.B of ARMB Policies may be exceeded provided that ARMB concurs.

* Exception for high cost markets shall be approved annually by the ARMB through its Annual Investment Plan.

Reinvestment of allocation by the investment manager shall require approval by the Chief Investment Officer (CIO). The CIO has discretion in determining the reinvestment amount to authorize. Amounts may reflect the original allocation or may recognize some portion of any realized gains or losses.

CIO Discretionary Investment Authority – The CIO shall have the following discretionary investment authority:

- a) To increase or decrease existing separate account allocations and investments in open-end funds;
- b) To commit to new investment funds up to \$100 million for each fund; and,
- c) To engage consultants and take other action as may be necessary to ensure sufficient due diligence is performed on all investments under consideration.

The CIO shall exercise this discretion within Board approved asset allocations, investment plans, and guidelines as they may apply.

The CIO will provide prior notification to the Chair of ARMB before committing to any investments under this authority. All discretionary CIO investment actions shall be reported to the Board.

C. Implementation Approach

The ARMB will endeavor to allocate specific funds to qualified managers on a separate account basis. Selected managers will seek Farmland investment opportunities in privately-placed equity sectors. Investments will be made on a discretionary basis subject to ARMB Staff approval of the Annual Strategic/Tactical Plans prepared by Managers and Staff's approval of the Annual Investment Plan.

All allocation of funds to a manager (including additional investment with existing accounts) and investment strategy must be recommended to Staff and be accompanied by an investment report which, at a minimum, includes the following: market information; investment alternatives; fee structure and comparison to other alternatives; demonstration of compliance with the Guidelines and the then current Annual Investment Plan; historical performance of Manager (cash-based internal rates of return and industry standard); projected returns (income and appreciation); and positive and negative attributes of the investment strategy.

On a selective basis, a member of ARMB may visit the site of a Farmland investment for the purpose of rendering a report to ARMB supplementing reports provided by Staff or others.

D. Prudent Leverage

The total amount of leverage placed on the aggregate Separate Account assets will not exceed ten percent (10%) of the total market value of the Farmland separate account portfolio. Directly-owned properties will not be leveraged by the separate account investment manager unless, with approval from the Chief Investment Officer, the property was encumbered by debt at the time of purchase and leaving the debt in place can be justified on a risk-return basis. With authorization by the ARMB, the Chief Investment

Officer may place leverage on a pool of existing core Farmland assets held in ARMB's separate account portfolio in a manner consistent with the ARMB's Guidelines.

E. Directly Operated Agriculture Properties

Directly operated agriculture properties are permitted. Managers will select operators for agricultural properties who have relevant experience and who have demonstrated expertise in operating that property's crop type.

F. Lease Structure

All leases must be of institutional investment quality with a precedent of institutional investment in similar properties; Leases will be structured with fixed cash rents, or participating rents calculated as a percentage of gross income. A lease structure incorporating both fixed cash rent and participating rent is also acceptable.

G. Manager Business Plan; Annual Strategic/Tactical Plan; Disposition/Exit Strategy

A Business Plan (including property operating budgets) will be completed by each manager for each asset under its management. The Business Plan will identify the current and anticipated competitive position for each property in order to set tactical and strategic objectives and will prescribe in appropriate detail a disposition and exit strategy respecting the particular investments. Part of this process is to evaluate the potential timing of dispositions. The Annual Strategic/Tactical Plan will describe the expectation of the manager with respect to acquisitions and dispositions.

H. Fee Structure

Involvement in any venture will be done on a fee basis that is competitive. The preferred method of calculating manager fees will be based upon a formula, which considers 1) the cost basis of assets under management and 2) market value of the assets under management. All fee structures will be approved by ARMB.

I. Single Asset Ownership Structure (Applies to Separate Accounts Only)

Provided that the goals of these guidelines are followed, ARMB may invest in separate, specific Farmland assets. However, such investments will be undertaken in a fashion structured to limit ARMB's liability to the amount of its investment.

J. Reporting System

Staff will develop and implement a comprehensive and responsive reporting and monitoring system for the entire portfolio, individual investments and individual managers. The reporting and monitoring system will endeavor to identify under-performing

investments, control portfolio diversification deficiencies and inherent conflicts of interest, thereby facilitating active portfolio management. A cash-based internal rate of return (IRR) will be used when evaluating the long-term performance of an investment. Time-weighted returns will be used to measure comparative performance.

K. Distribution of Current Income

All separate account income less expenses and prudent operating reserves will be distributed to ARMB or its designee on a quarterly basis and not automatically reinvested in the Account.

L. Lines of Responsibility

Well defined lines of responsibility and accountability will be required of all participants in ARMB's Farmland investment program. Participants are identified as:

ARMB – The fiduciaries appointed by the Governor to represent the beneficiaries' interest which shall retain final authority over all Farmland investment decisions.

Staff – Investment professionals on the staff of the Department of Revenue and assigned ARMB responsibilities who will assist in the Farmland equity investment program's design, policy implementation and administration.

Separate Account Managers – Qualified entities that provide institutional Farmland investment management services and maintain a discretionary relationship with ARMB subject to Staff's approval of Annual Business Plans and Annual Strategic/Tactical plans, prepared by Managers.

III. CONFLICTS OF INTEREST

In Farmland investment, separate and distinct from other asset classes, the Manager of a Separate Account or Commingled Fund may have direct or significant control over the operations of the assets. Additionally, Managers may now or in the future maintain or manage properties and provide discretionary or non-discretionary advisory services for a number of other accounts and clients, including accounts affiliated with the Manager. These inherent or potential conflicts of interest if openly described and regulated may contribute to the lower volatility associated with the asset class, but it also creates a need for a higher oversight standard by the plan sponsor. Staff and ARMB will maintain this oversight in at least the following ways:

A. Property Valuation

The following valuation procedures shall be applied to all farmland assets managed in separate accounts for the Alaska Retirement Management Board:

- 1) All assets shall be appraised at the time of acquisition.

- 2) All assets shall be appraised annually during the quarter ending March 31 unless the property was acquired during the preceding twelve months in which case, based on a recommendation from the advisor, staff may allow an appraisal update or waive the appraisal requirement if such appraisal would not be a cost effective exercise.
- 3) All property valuations shall be reviewed internally by advisors for the quarters ending in June, September, and December. If changes in market conditions, expected cash flows, or other factors suggest a property valuation has likely changed by more than 3% to 5% the advisor shall prepare a documented internal valuation and record the resulting value in the financial statements.
- 4) Appraisals will be prepared by a qualified independent third party entity in accordance with industry standards. Appraisers shall be selected by the advisor in a manner that achieves a high quality appraisal at a reasonable cost.
- 5) Advisor shall attempt to rotate appraisers on each property every three years.

B. Property Management

The selection of on-site property management will generally be left to the discretion of the Manager. It is expected that the Manager will retain the highest caliber, market rate property management service either through a third party fee manager or the Manager's affiliated property management division. This business relationship will be periodically reviewed by Staff and ARMB.

IV. INSURANCE COVERAGE

The Manager will obtain insurance for the physical properties and assets under its control. The coverage will be in such amounts and against such risks as, in the Manager's professional judgment, shall be in accordance with sound institutional practices applicable to such properties or assets in the specific geographic area. It is expected that such insurance will include, but not be limited to, casualty loss, including where deemed appropriate by the Manager, disaster-type insurance coverage; comprehensive general liability; and title insurance.

V. UNRELATED BUSINESS INCOME TAX

The Manager will provide ARMB with an opinion of counsel satisfactory to ARMB that the standard lease or subsequent revisions to the standard lease used to lease Account Property will not generate unrelated business taxable income under the federal income tax law or any other tax provisions that could affect ARMB's tax-exempt status existing at the time. The Manager shall investigate as to whether ARMB shall be entitled to any property tax exemptions.

VI. ENVIRONMENTAL EVALUATIONS

As a standard procedure during the pre-acquisition analysis, the Manager will initiate a formal evaluation for each property through the selection of an environmental consultant. In carrying out the review, appropriate procedures based on standards of the locale and conditions known to exist in the locale shall be undertaken and such procedures should at a minimum include:

- Appointment of an environmental consultant with specific experience in testing and removal of asbestos and other environmental hazards.
- A site survey will be conducted to determine from the available evidence whether hazardous chemicals or environmentally dangerous materials exist or have existed on the subject property, including, at a minimum, a Phase I report.

ARMB may invest in properties, which contain asbestos and other toxic substances, only if the following conditions are met:

- The substance and potential risks are thoroughly disclosed.
- The property is not in violation of any federal, state or local law, ordinance, or regulation relating to the property's environmental condition.
- The estimated cost of the removal or containment programs will be reflected in the purchase assumptions.
- The substance can be properly contained or removed in accordance with the then current Environmental Protection Agency Standards.
- The leasing rollover pattern in the property will accommodate a removal program in the future.

VII. PROCEDURES FOR INVESTMENT

A. Delegation of Responsibilities

The Farmland investment program will be implemented and monitored through the coordinated efforts of the ARMB; Staff and; the qualified Manager(s). Delegation of responsibilities for each participant is described in the following sections: A summary of the delegation is attached:

1. ARMB

ARMB will retain final authority over all Farmland investment strategy decisions except for Business Plan variances as set forth in the Guidelines Section VIII; approve the Guidelines, the Annual Investment Plan and any periodic revisions to these documents which ARMB deems to be appropriate and prudent for the investment of ARMB assets; retain qualified investment managers and Farmland consultants; and set investment limits.

2. Staff

Staff will coordinate program compliance among all participants and communicate the investment policies, objectives and performance criteria to the Managers and monitor diversification compliance on a quarterly basis. Staff will also coordinate the receipt and distribution of capital. Staff will periodically review the Managers' and portfolio's performance in relation to target returns; review and approve the Manager's Annual Business Plan and Annual Strategic/Tactical Plan; review and recommend an Annual Investment Plan; and recommend revisions to the Farmland Investment Policy Procedures and Guidelines. Staff will also review and approve the detailed property operating budgets prior to the start of each fiscal year and revisions to the property operating budgets in accordance with Section VIII of these Guidelines.

3. Managers

Separate account investment managers will acquire and manage Farmland investments on behalf of ARMB and in accordance with the then current and approved Annual Business, Annual Strategic/Tactical Plans, and the objectives set forth in the Annual Investment Plan and the Guidelines. Managers will prepare Annual Business (including property operating budgets) and Annual Strategic/Tactical Plans for Staff review and approval.

B. Investment Procedure

Farmland investments, in compliance with ARMB's Policies, shall be acquired through the following process:

Separate Accounts:

Annually, Staff will prepare an Investment Plan after reviewing the Annual Business and Strategic/Tactical Plans of the separate account investment managers. This document will recommend, as appropriate, revisions to the ARMB Guidelines, additional allocations to existing managers, and revisions to the Annual Business and Strategic/Tactical Plans of each respective separate account investment manager. Staff shall review the Manager's Annual Business Plans and Annual Strategic/Tactical Plans for consistency with the Annual Investment Plan. Staff will approve all Plans prepared by the Managers.

Investments will be made on a discretionary basis by separate account investment managers in accordance with their approved Annual Business and Strategic/Tactical Plans. Investments will be approved in accordance with Managers' standard internal investment approval process, which may involve levels of authority delegated to senior officers and/or one or more investment committees. Upon the request of ARMB, separate account investment managers will provide copies of their internal Investment Committee reports for each asset purchased.

VIII. DELEGATION OF AUTHORITY

ARMB shall delegate authority to Staff to approve the following:

- Each separate account Manager's detailed property operating budgets for each fiscal year;
- Annual Business Plans and Annual Tactical/Strategic Plans prepared by ARMB's separate account Managers;
- Revised property operating budgets and variances in approved Annual Business Plans for unanticipated, significant leasing activity; and
- Line item variances in approved capital expenditure budgets in amounts up to \$500,000 with a cumulative fiscal year maximum of \$3,000,000 per Investment Manager for other capital expenditures not related to leasing activity (such as repairs for building damage or defects).

IX. CONFIDENTIALITY

Pursuant to 15 AAC 112.770, ARMB shall withhold from other persons all information furnished to it by Manager(s) or Consultant(s) which is reasonably designated by Manager(s) or Consultant(s) as being confidential or proprietary, within the meaning of Alaska Statutes regarding rights to public information, except to the extent that the information is needed by ARMB in order to adequately report on the status and performance of the portfolio, or to comply with a court subpoena or with an official criminal investigation.

Those portions of reports provided pursuant to Part II section I (Reporting System) of these Guidelines shall be considered confidential pursuant to 15 AAC 112.770 to the extent that information is reasonably designated by Manager(s) as being confidential or proprietary, or to the extent the disclosure of which would unfairly prejudice the ability of Manager(s) or ARMB to manage, lease, market or sell such property or Assets.

X. REVISIONS

This document is to be reviewed no less than annually and revised as appropriate.

XI. FARMLAND SEPARATE ACCOUNT INVESTMENT MANAGERS

The following investment managers will acquire institutional-grade farmland properties on a discretionary basis for the Alaska Retirement Management Board:

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Web site: www.ubs.com

Attachment 1

FARMLAND INVESTMENT POLICIES, PROCEDURES AND GUIDELINES - Delegation of Responsibilities "Attachment 1"					
	Frequency	Separate Account Investment Managers	Consultant	Staff	Board
Farmland Investment Policies Procedures and Guidelines Review and Revise	Annually			P, R	A
Separate Account Investment Manager Selection Request for Proposals (RFP)	Periodically		P, G, R	P, G, R	A
Farmland Investment Plan	Annually			P, R	A
Separate Account Business Plan and Strategic/Tactical Plan	Annually	P, R		A	
Quarterly Performance	Quarterly		P		
Portfolio/Property Diversification Compliance	Quarterly	P		M	
Geographic Concentration Limit	Quarterly	P		M	
A = Approve G = Grade P = Prepare	R = Recommend M = Monitor				

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Timberland Investment Guidelines

ACTION: X

DATE: June 18-19, 2020

INFORMATION:

BACKGROUND

As part of the Real Assets manager structure review, staff is recommending that all timberland assets be consolidated into one account with Timberland Investment Resources.

The current Timberland Investment Guidelines require a minimum of two investment managers and therefore a revision is required to the Timberland Investment Guidelines to effect the recommendation to consolidate assets with one investment manager.

Additionally, the investment objective has changed from a minimum 5% net real total rate of return to a net of fee total return between public equities and fixed income over rolling six year periods. The Timberland Investment Guidelines have not yet been revised to reflect this change.

STATUS

The proposed Timberland Guidelines have been revised to remove the requirement that the portfolio include a minimum of two investment managers and to reflect the revised investment objective.

Staff believes the timberland investment manager market is deep enough where a replacement manager could be put in place relatively quickly if needed. Efficiencies around fee structure, operational expenses, and management efficiency can be gained by having a single manager.

RECOMMENDATION

The ARMB approve Resolution 2020-03 which adopts the revised Timberland Investment Guidelines.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
Relating to Timberland Investment Guidelines

Resolution 2020-03

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 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 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 established an asset allocation for the funds that considers earnings and liabilities on a current as well as a future basis; and

WHEREAS, the Board has authorized investment in timberland assets for the Public Employees' Retirement System, Teachers' Retirement System, and Judicial Retirement System, including investments for those systems in the State of Alaska Retirement and Benefit Plans Trust; and

WHEREAS, the Board establishes and from time to time as necessary, modifies investment policies, procedures and guidelines for timberland;

NOW THEREFORE BE IT RESOLVED THAT THE ALASKA RETIREMENT MANAGEMENT BOARD adopt the Timberland Investment Guidelines, attached hereto and made a part hereof.

This resolution repeals and replaces Resolution 2017-16.

DATED at Juneau, Alaska this ____ day of June, 2020.

Chair

ATTEST:

Secretary

Timberland

ARMB Investment Guidelines

Section 1. Investment Objective

To develop a diversified portfolio of Timberland Investments with a focus on total return which will seek to produce a ~~minimum 5% net real total rate of return net-of-fee~~ total return between public equities and fixed income over rolling ~~six~~five-year periods. Portfolio risk shall reflect, in each ARMB Timberland Advisor's (as defined in Section 2 below) judgment, the lowest expected risk profile required to achieve the return objectives. Each ARMB Timberland Advisor will place an emphasis on the preservation of capital and diversify the Timberland Investments to minimize risk. To the extent return objectives can be met, current income shall be given preference over appreciation.

Section 2. ARMB Timberland Advisor Selection

ARMB will select qualified investment managers who have the discretion to invest in Timberland ("ARMB Timberland Advisors). In order for entities to be considered, the entity must demonstrate that it is able to add value through its Timberland knowledge, experience and strategy; evaluate the risks of each Timberland Investment which is contemplated; and, comply with these ARMB Timberland Investment Guidelines (the "ARMB Investment Guidelines").

~~ARMB will implement an investment process for Timberland which will, over time, include a minimum of two (2) qualified ARMB Timberland Advisors who have been selected on a competitive basis.~~ Each ARMB Timberland Advisor will provide services according to an agreed upon investment management agreement (contract) and the ARMB Investment Guidelines. ARMB will endeavor to allocate specific funds to each ARMB Timberland Advisor on a separate account basis (each a "Separate Account"). ARMB Timberland Advisors will invest funds on a discretionary basis in Timberland Investment opportunities to the extent of its specific allocation and Separate Account.

Compensation for investment management services will be done on a fee basis that is competitive. The preferred method of calculating ARMB Timberland Advisor fees will be based upon a formula, which considers 1) the cost basis of assets under management and 2) market value of the assets under management.

Section 3. Allocation

ARMB's allocation to Timberland Investments shall be determined by the Board of Trustees and reviewed annually.

Reinvestment of allocation by the investment manager shall require approval by the Chief Investment Officer (CIO). The CIO has discretion in determining the reinvestment amount to authorize. Amounts may reflect the original allocation or may recognize some portion of any realized gains or losses.

CIO Discretionary Investment Authority – The CIO shall have the following discretionary investment authority:

- a) To increase or decrease existing separate account allocations and investments in open-end funds;

- b) To commit to new investment funds up to \$100 million for each fund; and,
- c) To engage consultants and take other action as may be necessary to ensure sufficient due diligence is performed on all investments under consideration.

The CIO shall exercise this discretion within Board approved asset allocations, investment plans, and guidelines as they may apply.

The CIO will provide prior notification to the Chair of ARMB before committing to any investments under this authority. All discretionary CIO investment actions shall be reported to the Board.

Section 4. Advisor Performance Benchmark

NCREIF Timberland Index

Section 5. Investment Constraints

(a) Each property underlying a Timberland Investment will be commercial timberland in accordance with the standards and customs of the region in which the property is located. Although commercial attributes vary significantly across regions and among forest types, generally, properties will be characterized by adequate timber stocking, sufficient productivity, established timber markets, and ready access.

(b) Location: Timberland Investments will be located inside the United States of America.

(c) Diversification and Concentration: Each ARMB Timberland Advisor will undertake to ensure that the Timberland Investments under its control are adequately diversified. While each ARMB Timberland Advisor will seek to invest across the primary timberland regions of the United States as defined by the National Council of Real Estate Investment Fiduciaries (NCREIF) Timberland Index, geographic diversification will ultimately depend on the availability of attractive investment opportunities, as well as potential diversification by species, age classes of trees and suitability for a variety of end products.

(d) Leverage: The total amount of leverage placed on the aggregate Separate Accounts allocated to all ARMB Timberland Advisors for investment will not exceed ten percent (10%) of the total market value of all such Timberland Investments at the time such leverage is incurred. The purchase or refinance of Timberland Investments with debt and borrowing against Timberland Investments shall be permitted only with the prior consent of ARMB's Chief Investment Officer. The Advisor will not cause the Account to incur indebtedness without ARMB's prior consent.

(e) Allocation: Each ARMB Timberland Advisor may exceed its Separate Account Allocation by up to 5% for the purposes of capital expenditures on existing assets and/or the completion of an acquisition.

(f) Non-Routine Activity: Each ARMB Timberland Advisor will seek the prior approval of ARMB's Chief Investment Officer before entering into any arrangements which provide ancillary income

activity from the Timberland which are not routinely associated with Timberland Investments. Examples include mining, wind farms, and utility infrastructure.

Section 6. ARMB Timberland Advisor Annual Portfolio Review

Annually, each ARMB Timberland Advisor will submit an annual portfolio review to ARMB staff (“Staff”) which shall include an annual business plan addressing each Timberland Investment in the portfolio in its Separate Account and an annual portfolio level strategic plan. The objective of this effort is to facilitate Staff’s monitoring of the Timberland Investments to ensure existing investments and future strategy are consistent with ARMB’s objectives and to recognize any program changes, which may require ARMB approval, to facilitate the efficient operation of the investment program. Each ARMB Timberland Advisor will collaborate with Staff to identify the specific content of the business plan and strategic plan for the Timberland Investments in its Separate Account, but should consider the following:

Annual business plans will focus on past performance and future performance expectations for existing assets in the portfolio. Information should include performance analysis, hold/sell analysis, and investment budgets including explanations for future capital budget items.

Annual portfolio level strategic plans will focus on overall portfolio and market performance, portfolio diversification, market conditions, and strategy for acquisitions and disposition for the upcoming year. The strategic plan should also include any recommendations to improve the ARMB Investment Guidelines and/or ARMB’s Timberland investment strategy.

Section 7. Ownership Structure

Timberland Investments will be owned in a structure designed to limit ARMB’s liability to the amount of its capital commitment to such Timberland Investment and, where feasible, to recognize and preserve tax-exempt status.

Section 8. Reporting System

Staff will develop and implement a comprehensive and responsive reporting and monitoring system for all Timberland Investments and each ARMB Timberland Advisor. In order to facilitate active portfolio management, Staff will develop a reporting and monitoring system which will endeavor to identify underperforming investments, control portfolio diversification deficiencies and manage inherent conflicts of interest. A cash-based internal rate of return (IRR) will be used when evaluating the long-term performance of a Timberland Investment. Time-weighted returns will be used to measure comparative performance.

Section 9. Lines of Responsibility

The Timberland investment program will be implemented and monitored through the coordinated efforts of the ARMB, Staff, and the ARMB Timberland Advisors. A description of the program participants and their general responsibilities are as follows:

ARMB – The statutorily created board which is the fiduciary for the retirement trust funds, comprised of trustees appointed by the Governor to represent the beneficiaries’ interest. ARMB hires qualified ARMB

Timberland Advisors and consultants; approves the ARMB Investment Guidelines and revisions to them; and approves the Annual Investment Plan prepared by Staff.

Staff - Investment professionals on staff at the Department of Revenue assigned to ARMB Timberland Investments, who will assist in the Timberland investment program's design, policy implementation, and administration. Staff coordinates program and guidelines compliance among all participants and communicates the investment policies, objectives, and performance criteria to the ARMB Timberland Advisors; monitors diversification compliance on a quarterly basis; and coordinates the receipt and distribution of capital. Staff will review and approve each ARMB Timberland Advisor's annual business plan, including revisions to the investment budgets in accordance with Section 13 hereof, and annual portfolio level strategic plan. Staff will recommend, to ARMB, revisions to the Timberland Investment Guidelines as may be necessary from time to time.

Annually, Staff will prepare an Annual Investment Plan after reviewing the annual business and annual portfolio level strategic plan prepared by the ARMB Timberland Advisors. This document will recommend, as appropriate, revisions to the overall Timberland Investment strategy, revisions to the Timberland Investment Guidelines, and make recommendations for additional allocations to the ARMB Timberland Advisors as may be desirable.

ARMB Timberland Advisors – Qualified entities selected by ARMB that provide institutional Timberland investment management services to ARMB. ARMB Timberland Advisors will invest and manage the Timberland Investment portfolios in accordance with their contracts.

Section 10. Property Management

The selection of on-site property management will generally be left to the discretion of the applicable ARMB Timberland Advisor. It is expected the ARMB Timberland Advisor will retain the highly qualified, market rate property management service either through a third party fee manager or the ARMB Timberland Advisor's affiliated property management division. This business relationship will be periodically reviewed by Staff and ARMB.

Section 11. Insurance Coverage

Each ARMB Timberland Advisor shall obtain insurance coverage with respect to the Timberland and the Timberland Investments in such amounts and against such risks as, in such ARMB Timberland Advisor's professional judgment, are in accordance with sound institutional practices applicable to Timberland Investments.

Section 12. Environmental Evaluations

As part of the pre-acquisition analysis for all prospective new Timberland Investments, each ARMB Timberland Advisor shall conduct a Phase 1 Environmental Site Assessment to identify the presence or likely presence of hazardous substances or petroleum products under conditions that indicate an imminent,

existing or past release, or a material threat of a release into structures, or into the ground, groundwater or surface water.

Section 13. Delegation of Authority

ARMB shall delegate authority to Staff to approve the following:

- Annual business plans and annual portfolio strategic plans prepared by the ARMB Timberland Advisors;
- Revised investment budgets and variances in approved annual business plans for unanticipated activity; and
- Line item variances in approved capital expenditure budgets in amounts up to \$500,000 with a cumulative fiscal year maximum of \$3,000,000 per Advisor.

Section 14. Confidentiality

Pursuant to 15 AAC 112.770, ARMB shall withhold from other persons all information furnished to it by ARMB Timberland Advisor(s) or consultant(s) which is reasonably designated by ARMB Timberland Advisor(s) or consultant(s) as being confidential or proprietary, within the meaning of Alaska Statutes regarding rights to public information, except to the extent that the information is needed by ARMB in order to adequately report on the status and performance of the portfolio, or to comply with a court subpoena or with an official criminal investigation.

Those portions of reports provided pursuant to the Agreement with ARMB Timberland Advisor(s) shall be considered confidential pursuant to 15 AAC 112.770 to the extent that information is reasonably designated by ARMB Timberland Advisor(s) as being confidential or proprietary, or to the extent the disclosure of which would unfairly prejudice the ability of ARMB Timberland Advisor(s) or ARMB to manage, lease, market or sell such property or Assets.

Section 15. Unrelated Business Income Tax

Each ARMB Timberland Advisor will manage its respective Separate Account with a view toward minimizing the recognition of unrelated business taxable income (“UBTI”) to the extent consistent with the Investment Objective set forth in Section 1 above. Each ARMB Timberland Advisor will consult with ARMB prior to entering into any transaction that could reasonably be expected to result in the recognition of significant amounts of UBTI.

Section 16. Revisions

The ARMB Investment Guidelines are to be reviewed no less than annually and revised as appropriate.

Section 17. ARMB Timberland Advisors

The following entities have been selected and appointed as ARMB Timberland Advisors to acquire Timberland properties on a discretionary basis for the Alaska Retirement Management Board:

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115 Perimeter Center Place, Suite 940

Atlanta, GA 30346

Telephone: 404-848-2000

Fax: 404-848-2006

www.tirlc.com

~~Hancock Timber Resource Group~~ ~~197 Clarendon Street~~ ~~C-08-99~~ ~~Boston, MA 02116-5010~~ ~~Telephone: 617-747-1600~~ ~~Fax: 617-747-1516~~ ~~www.hancoektimber.com~~	~~Timberland Investment Resources, LLC~~ ~~115 Perimeter Center Place, Suite 940~~ ~~Atlanta, GA 30346~~ ~~Telephone: 404-848-2000~~ ~~Fax: 404-848-2006~~ ~~www.tirlc.com~~

Section 18. Definitions

(a) “Timber” means trees growing on Timberland, or trees which have been cut but not removed from Timberland.

(b) “Timberland” means real property which is to be planted with Timber or real property on which Timber is growing.

(c) “Timberland Investment” means, in general, all interests (including fee ownership, leasehold interests or management rights) in Timberland; timber deeds, timber cutting contracts and other rights, contracts or agreements relating to the ownership, cutting and/or use of Timber; options to acquire or sell Timber or Timberland or interests therein; mineral rights (including oil and gas rights), biomass or carbon credits attendant to the ownership of Timberland; and personal property, both tangible and intangible, directly associated or connected with the use of Timberland.

Timberland

ARMB Investment Guidelines

Section 1. Investment Objective

To develop a diversified portfolio of Timberland Investments with a focus on total return which will seek to produce a net-of-fee total return between public equities and fixed income over rolling six-year periods. Portfolio risk shall reflect, in each ARMB Timberland Advisor's (as defined in Section 2 below) judgment, the lowest expected risk profile required to achieve the return objectives. Each ARMB Timberland Advisor will place an emphasis on the preservation of capital and diversify the Timberland Investments to minimize risk. To the extent return objectives can be met, current income shall be given preference over appreciation.

Section 2. ARMB Timberland Advisor Selection

ARMB will select qualified investment managers who have the discretion to invest in Timberland ("ARMB Timberland Advisors). In order for entities to be considered, the entity must demonstrate that it is able to add value through its Timberland knowledge, experience and strategy; evaluate the risks of each Timberland Investment which is contemplated; and, comply with these ARMB Timberland Investment Guidelines (the "ARMB Investment Guidelines").

Each ARMB Timberland Advisor will provide services according to an agreed upon investment management agreement (contract) and the ARMB Investment Guidelines. ARMB will endeavor to allocate specific funds to each ARMB Timberland Advisor on a separate account basis (each a "Separate Account"). ARMB Timberland Advisors will invest funds on a discretionary basis in Timberland Investment opportunities to the extent of its specific allocation and Separate Account.

Compensation for investment management services will be done on a fee basis that is competitive. The preferred method of calculating ARMB Timberland Advisor fees will be based upon a formula, which considers 1) the cost basis of assets under management and 2) market value of the assets under management.

Section 3. Allocation

ARMB's allocation to Timberland Investments shall be determined by the Board of Trustees and reviewed annually.

Reinvestment of allocation by the investment manager shall require approval by the Chief Investment Officer (CIO). The CIO has discretion in determining the reinvestment amount to authorize. Amounts may reflect the original allocation or may recognize some portion of any realized gains or losses.

CIO Discretionary Investment Authority – The CIO shall have the following discretionary investment authority:

- a) To increase or decrease existing separate account allocations and investments in open-end funds;
- b) To commit to new investment funds up to \$100 million for each fund; and,

- c) To engage consultants and take other action as may be necessary to ensure sufficient due diligence is performed on all investments under consideration.

The CIO shall exercise this discretion within Board approved asset allocations, investment plans, and guidelines as they may apply.

The CIO will provide prior notification to the Chair of ARMB before committing to any investments under this authority. All discretionary CIO investment actions shall be reported to the Board.

Section 4. Advisor Performance Benchmark

NCREIF Timberland Index

Section 5. Investment Constraints

(a) Each property underlying a Timberland Investment will be commercial timberland in accordance with the standards and customs of the region in which the property is located. Although commercial attributes vary significantly across regions and among forest types, generally, properties will be characterized by adequate timber stocking, sufficient productivity, established timber markets, and ready access.

(b) Location: Timberland Investments will be located inside the United States of America.

(c) Diversification and Concentration: Each ARMB Timberland Advisor will undertake to ensure that the Timberland Investments under its control are adequately diversified. While each ARMB Timberland Advisor will seek to invest across the primary timberland regions of the United States as defined by the National Council of Real Estate Investment Fiduciaries (NCREIF) Timberland Index, geographic diversification will ultimately depend on the availability of attractive investment opportunities, as well as potential diversification by species, age classes of trees and suitability for a variety of end products.

(d) Leverage: The total amount of leverage placed on the aggregate Separate Accounts allocated to all ARMB Timberland Advisors for investment will not exceed ten percent (10%) of the total market value of all such Timberland Investments at the time such leverage is incurred. The purchase or refinance of Timberland Investments with debt and borrowing against Timberland Investments shall be permitted only with the prior consent of ARMB's Chief Investment Officer. The Advisor will not cause the Account to incur indebtedness without ARMB's prior consent.

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ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Asset Allocations –
Resolutions 2020-04 and 2020-05

DATE: June 18-19, 2020

ACTION: X

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:

On April 22, 2020, CIO Bob Mitchell and Deputy CIO Zachary Hanna participated in a meeting with Paul Erlendson, Steve Center, and Jay Kloepfer of Callan LLC (Callan) and Investment Advisory Council members Dr. William Jennings, Dr. Jerrold Mitchell, and Ruth Ryerson. The participants reviewed Callan's work to identify potential asset allocation mixes for the ARMB to consider for the upcoming fiscal year.

Based on feedback received from this meeting, and subsequent discussions with Jay Kloepper, Callan has presented its recommendations regarding asset allocation mixes at this meeting.

Staff recommend the following strategic asset allocations after considering current asset allocations and a range of optimal portfolios produced by Callan:

Resolution 2020-04

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 2020-05

Alaska National Guard and Naval Militia Retirement Systems

RECOMMENDATION:

The Alaska Retirement Management Board adopt Resolutions 2020-04 and 2020-05, approving the asset allocations for fiscal year 2021.

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 2020-04

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, 2020, 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

- Retirement Trust
- Retirement Health Care Trust

Target Asset Allocation: PERS-TRS-JRS

Asset Class	Allocation	Range
Broad Domestic Equity	28%	± 6%
Global Equity Ex-US	19%	± 4%
Fixed Income	22%	± 10%
Opportunistic	6%	± 4%
Real Assets	13%	± 7%
Private Equity	12%	± 6%
Total	100%	
Projected 20 Year Geometric Return	7.13%	
Projected Standard Deviation	13.55%	

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	60% MSCI ACWI IMI Net 40% BB US Aggregate
Real Assets	37.5% NFI-ODCE 10% FTSE-NAREIT 25% NCREIF Farmland 10% NCREIF Timberland 17.5% CPI+4%
Private Equity	1/3 S&P 500 1/3 Russell 2000 1/3 MSCI EAFE Net

Public Market Proxy Portfolio

Total Fund Proxy Expectations:	45% Russell 3000
20 Year Geometric Return: 6.81%	30% MSCI ACWI Ex-US IMI Net
Standard Deviation: 13.55%	25% BB US Aggregate

This resolution repeals and replaces Resolution 2020-01.

DATED at Juneau, Alaska this ____ day of June, 2020.

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 2020-05

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, 2020:

Target Asset Allocation: NGNMRS

Asset Class	Allocation	Range
Broad Domestic Equity	20%	± 6%
Global Equity Ex-US	13%	± 4%
Fixed Income	46%	± 10%
Opportunistic	6%	± 4%
Real Assets	7%	+ 4%
Private Equity	8%	± 4%
Total	100%	
Projected 20 Year Geometric Return	6.10%	
Projected Standard Deviation	9.33%	

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	60% MSCI ACWI IMI Net 40% BB US Aggregate
Real Assets	37.5% NFI-ODCE 10% FTSE-NAREIT 25% NCREIF Farmland 10% NCREIF Timberland 17.5% CPI+4%
Private Equity	1/3 S&P 500 1/3 Russell 2000 1/3 MSCI EAFE Net

Public Market Proxy Portfolio

Total Fund Proxy Expectations: 20 Year Geometric Return: 5.89% Standard Deviation: 9.33%	31% Russell 3000 21% MSCI ACWI Ex-US IMI Net 48% BB US Aggregate

This resolution repeals and replaces Resolution 2019-06.

DATED at Juneau, Alaska this ____ day of June, 2020.

Chair

ATTEST:

Secretary

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	<u>Foreign Exchange Costs</u>	ACTION:	<u> </u>
	<u>Peer Comparison Request</u>		
DATE:	<u>June 18-19, 2020</u>	INFORMATION:	<u> X </u>

BACKGROUND:

At the December 2019 Audit Committee meeting staff presented an analysis of the indirect foreign exchange services executed by Alaska Retirement Management Board's (ARMB) custodian from July 2011 through June 2018.

During the presentation, Acting Commissioner Mike Barnhill requested staff reach out to peer pension organizations to inquire about information regarding their cost to settle FX transactions. CIO Mitchell offered that staff would contact international equity managers and report on their feedback.

STATUS:

Staff consulted with Callan, who subsequently sent an inquiry to two firms specializing in transaction cost analysis (TCA) for institutional investors. A plan level comparative metric is not currently commercially available as the TCA firms do not believe the results are actionable. Plans vary by size, allocation, strategy, portfolio characteristics, and benchmark which can drive significant differences in costs that are not reflective of trading performance.

A more actionable analysis can be conducted at the manager level. During calendar year 2019, the four active international investment managers in the ARMB's portfolio transacted approximately \$1.3 billion in foreign exchange at a weighted average cost of 0.008%. This aggregate manager performance compares closely to the peer group median as provided in a benchmark by Zeno AN Solutions, a TCA firm.

In conclusion, while directly comparing foreign exchange costs with ARMB's institutional peer group may not be feasible at this time, staff has conducted a comparative analysis using available data and determined that the ARMB's active manager foreign exchange transaction costs are within expectations and near median, relative to an institutional peer group.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Participant-Directed Plans
JP Morgan Smart Spending

ACTION: X

DATE: June 18-19, 2020

INFORMATION: _____

BACKGROUND

In September of 2017, Division of Retirement and Benefits and Treasury staff began working together to identify objective criteria for retiree income solutions to improve participants' expected retirement experience. The following criteria were developed:

1. Reliable and forecasted monthly distribution
2. Survivor benefits
3. Cost effective
4. Participant withdrawal flexibility
5. Minimize counterparty risk
6. Customizable to meet participants' specific needs

STATUS

Staff evaluated multiple strategies designed to meet the above criteria. These solutions fall into two broad categories, guaranteed solutions and retiree income solutions. Guaranteed solutions include immediate and deferred annuities and guaranteed minimum withdrawal strategies. Retiree income solutions include strategies that help give retirees guidelines, but not guarantees, for drawing down income in retirement, and include such products as bond ladders, endowment strategies, and other spenddown solutions. Staff recommends that the board include a retiree income strategy as part of the solution set for the plans' participants. Of the options currently available in this rapidly changing industry, staff recommends JP Morgan Smart Spending (Smart Spending). Smart Spending meets the above criteria as follows:

1. The product provides an online tool that communicates to participants an annual estimated withdrawal amount for distribution designed to make their assets in the fund last for 35 years. Assuming retirement at age 65, the balance in the fund is designed to last until the participant is 100 years old. It is up to participants to independently initiate the withdrawal process of these amounts using the periodic payment option on the Empower platform.
 2. Any remaining unexpended participant balance in the fund is available to participant beneficiaries.
 3. The investment management fee is anticipated to be competitive with other plan investment options, including the current managed account services.
-

4. Participants may divest at any time, follow the recommended withdrawal amount or withdraw more or less as they prefer. The online tool will allow them to see the effect of these changes on their future distributions.
5. As a recommended guideline for expenditure, rather than a guaranteed option, there is no insurance component to the product and no significant counterparty risk.
6. The product allows participants the flexibility to adjust the magnitude of monthly or annual draws to meet their differing needs over time.

The Smart Spending portfolios are anticipated to be offered in five-year increments, or vintages, similar to the ARMB's current target date offerings, and are designed for participants to use the vintage that terminates the year they reach age 100.

RECOMMENDATION

The Alaska Retirement Management Board direct staff to contract with JP Morgan to offer one or more Smart Spending funds in the Alaska Supplemental Annuity Plan, the Defined Contribution Retirement Plans and the Deferred Compensation Plan, subject to successful contract negotiations.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Securities Lending
Commingled Funds

ACTION: X

DATE: June 18-19, 2020

INFORMATION:

BACKGROUND

Securities lending is a temporary lending of securities executed by a lender to a borrower of securities, for a stipulated duration, at a certain fee. The Alaska Retirement Management Board (ARMB) has engaged State Street to act as the lending agent, lending securities in participating public security investment mandates. The ARMB received a presentation from State Street on the securities lending program at its May 2020 meeting.

In November 2019 the ARMB restructured its international equity manager structure, resulting in a large portion of the investments being moved to passively-managed commingled non-lending funds with State Street Global Advisers (SSGA) where they no longer participate in the ARMB's securities lending program.

STATUS

The net asset value in the commingled international equity funds for the defined benefit programs as of the end of March 2020 were:

SSGA MSCI World Ex-US IMI Index Fund	\$1,380,293,595
SSGA MSCI Emerging Markets Index Fund	\$ 491,264,188

State Street offers shares in these funds that participate in each fund's securities lending program. Participation in the lending versions of these funds will reduce the management fees by .25 bps for an annual savings of approximately \$55,000. Additionally, these funds are estimated to generate an additional \$1.15 million annually in lending revenues to the ARMB defined benefit plans.

The primary characteristics of this program are as follows:

- 70/30 revenue split with SSGA
 - 102/105 collateralization levels
 - Expansion of collateral to include U.S. Treasuries and Agency securities
 - Minimum spread for cash collateral of 25bps
 - Investment of cash collateral in State Street Navigator fund
 - Full borrower level indemnification for both cash and noncash collateral loans
-

RECOMMENDATION

The Alaska Retirement Management Board direct staff to contract with SSGA to transition its investments in the MSCI World ex-US IMI Index and the MSCI Emerging Markets Index for the defined benefit plans to the securities lending options offered for these mandates, subject to successful contract negotiations.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Opportunistic Benchmark Change

ACTION: X

DATE: June 18-19, 2020

INFORMATION:

BACKGROUND

The current benchmark for the Opportunistic Asset Class is as follows:

60% Russell 1000
40% Bloomberg Barclays Aggregate Index

STATUS

The Opportunistic Asset Class is made up of a collection of global investment strategies while its benchmark is 100% domestic. A global benchmark would be a better reflection of the portfolio strategies and ARMB's approach to building diversified portfolios which includes international equity.

The MSCI ACWI IMI Index includes large and small cap equities in developed markets as well as emerging markets. This universe is better reflective of the opportunity set employed by the investment managers in the Opportunistic Asset Class.

Proposed Opportunistic Asset Class benchmark effective July 1, 2020:

60% MSCI ACWI IMI
40% Bloomberg Barclays Aggregate

RECOMMENDATION

The Alaska Retirement Management Board revise the benchmark for the Opportunistic Asset Class to 60% MSCI ACWI IMI and 40% Bloomberg Barclays Aggregate Index effective July 1, 2020.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Target Date Funds – Building Blocks
U.S. Equity Guidelines Modification

ACTION: X

DATE: June 18-19, 2020

INFORMATION:

BACKGROUND

The participant directed plans under the fiduciary responsibility of Alaska Retirement Management Board (ARMB)—Deferred Compensation Plan, Supplemental Annuity Plan and PERS/TRS Defined Contribution Retirement Plans—offer target date and balanced trusts for the plan participants. The characteristics of the Balanced, Long Term Balanced, and Target Date Trusts are determined by an allocation to underlying building blocks trusts. These building blocks include: U.S. Equity, International Equity (including Emerging Markets), U.S. Bond, and Money Market trusts.

The values of these building block funds, as of April 30, 2020 were:

Money Market	\$102,033,147
U.S. Bond	\$1,252,039,149
U.S. Equity	\$1,636,810,615
International Equity	\$694,957,154
<u>Total</u>	<u>\$3,685,840,065</u>

STATUS

The current investment guidelines for the U.S. Equity Trust has the following issuer restriction:

“No more than 5% of the Trust may be invested in any one issuer, except for securities issued or guaranteed by the U.S., state or local governments, or any of their related agencies or instrumentalities and for the custodian’s short term investment fund(s).

Under normal conditions and subject to the 5% issuer restriction noted above, the weight of an individual issuer in the Trust is anticipated to be within +/- 40 basis points of that issuer’s weight in the Index. Deviations from such anticipated range for individual issuers are acceptable if in the judgment of the Trustee the deviations do not contribute significantly to the overall risk of the portfolio, but in no event at time of purchase shall such weight exceed +/- 60 basis points of that issuer’s weight in the Index.”

The U.S. Equity Trust is currently benchmarked to the Russell 3000 Index. During the month of May 2020, shares of Microsoft (MSFT) exceeded 5% of the index on at least three separate days, with shares of Apple (AAPL) also approaching this limit. The issuer restriction in the US Equity

Trust guideline may prevent the investment manager from adhering to the investment guidelines if the index issuer weight is greater than 5%.

RECOMMENDATION

The Alaska Retirement Management Board direct staff to direct T. Rowe to modify the investment guidelines for the U.S. Equity Trust as indicated in the attached red-line document.

T. ROWE PRICE
INVESTMENT GUIDELINES
ALASKA U.S. EQUITY MARKET TRUST

Sponsored by T. Rowe Price Trust Company

~~December 9, 2011~~ _____, 2020

Investment Objective

The Alaska U.S. Equity Market Trust ("**Trust**") seeks to provide long-term capital appreciation by investing primarily in the equity securities of large, medium, and smaller-sized companies based in the United States.

Standard for Investment Results

The Trust's gross performance is measured against the Russell 3000 ("**Index**"). However, it is understood that performance is not guaranteed.

Investment Guidelines

1. **General.** Under normal conditions, the Trust will invest substantially in the equity securities that make up the Index, including large, medium, and smaller-sized companies.
2. **Issuer Restriction.** ~~No more than 5% of the Trust may be invested in any one issuer, except for securities issued or guaranteed by the U.S., state or local governments, or any of their related agencies or instrumentalities and for the custodian's short term investment fund(s).~~

~~Under normal conditions, and subject to the 5% issuer restriction noted above, the weight of an individual issuer in the Trust is anticipated to be within +/- 40 basis points of that issuer's weight in the Index. Deviations from such anticipated range for individual issuers are acceptable if in the judgment of the Trustee the deviations do not contribute significantly to the overall risk of the portfolio, but in no event at time of purchase shall such weight exceed +/- 60 basis points of that issuer's weight in the Index. Securities issued or guaranteed by the U.S., state or local governments, or any of their related agencies or instrumentalities and the custodian's short term investment fund(s) are excluded from this limitation.~~

3. **Sector Restriction.** Under normal conditions, the weight of a sector in the Trust is anticipated to be within +/- 100 basis points of that sector's weight in the Index. Deviations from such anticipated range for sectors are acceptable if in the judgment of the Trustee the deviations do not contribute significantly to

the overall risk of the portfolio, but in no event at time of purchase shall such weight exceed +/-150 basis points of that sector's weight in the Index.

4. **Cash Reserves.** The Trust may establish or maintain cash reserves. Under normal conditions, cash reserves are anticipated to be less than 5% of the Trust, but may increase to enable the Trust to address buying and selling activities or in light of subscription or redemption activity for the Trust.

Cash reserves may be invested in short-term investment fund(s) offered by the Trust's custodian.

5. **Prohibited Investments.** The Trust will not invest in swaps and other derivatives, stock index futures, and/or options.
6. **Prohibited Activities.** Use of leverage is prohibited. Additionally, the Trust is not permitted to engage in securities lending activities.

Unless otherwise stated, all limits apply at time of purchase.

The investment program for the Trust is set forth in the Plan and Declaration of Trust for the Alaska Common Trust Fund, as amended from time to time. These Investment Guidelines may be amended at any time so long as the amended Guidelines are within the investment program set forth in the then-current Declaration of Trust. The standards for investment results as described above are objectives, before all applicable fees.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Domestic Fixed Income Guidelines

ACTION: X

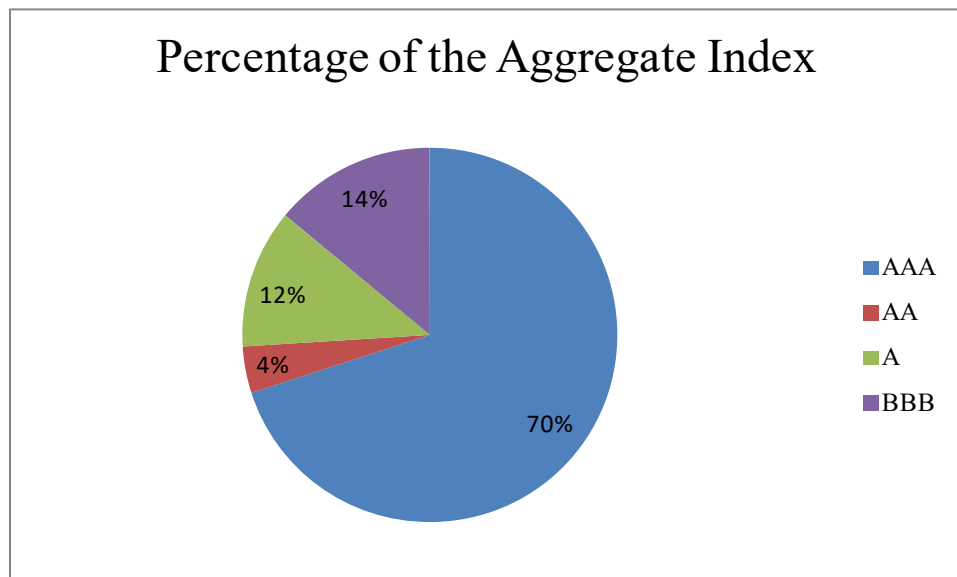
DATE: June 18-19, 2020

INFORMATION:

BACKGROUND

Staff manages an investment-grade fixed income mandate for the Alaska Retirement Management Board (ARMB). As of June 3, 2020, the market value of this mandate was approximately \$4.2 billion. The portfolio is benchmarked against the Bloomberg Barclays Aggregate Index (Benchmark).

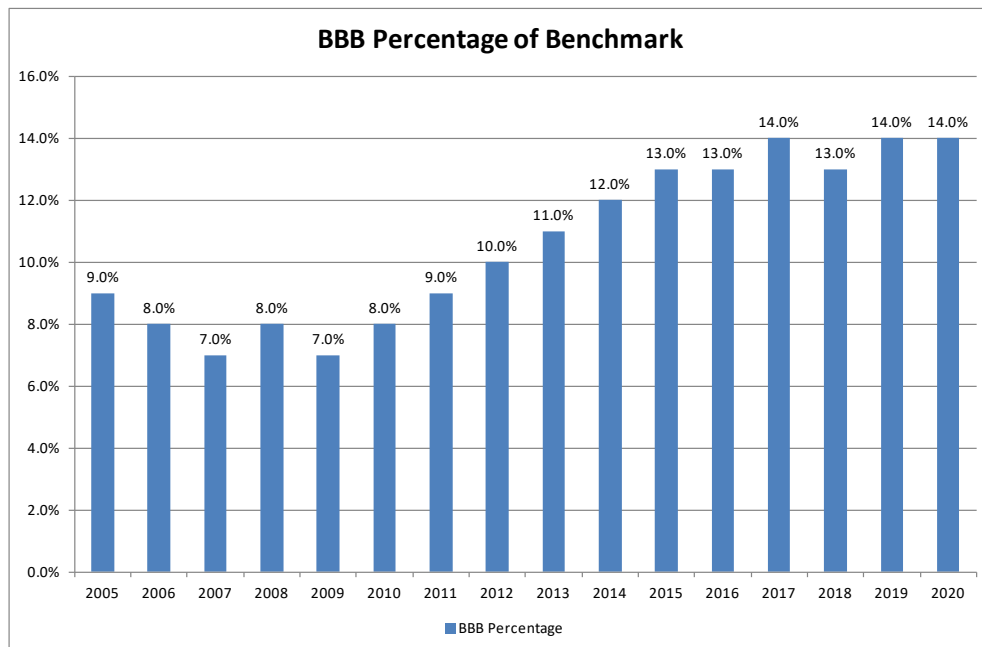
Credit ratings are measures that attempt to provide an indicator of the level of credit risk for a security. The distribution of credit ratings of the Benchmark is shown below. The highest-rated securities are AAA and the lowest-rated securities are BBB. Any securities rated below BBB are considered non-investment grade, or high yield.



The current Domestic Fixed Income Investment Guidelines contain a set of constraints. These take the form of percentage constraints, and a tracking error constraint. One of the percentage constraints sets a limit on the amount of BBB securities that can be held in the portfolio at 15%.

STATUS

The proportion of the Benchmark that is rated BBB has been increasing in recent years and is approaching the BBB percentage limit in the investment guidelines.



Staff's ability to actively position BBB securities relative to the Benchmark has become more constrained. Staff recommends modifying this constraint, capping it at 5% over the Benchmark weight, and also applying this constraint to securities rated below BBB. The recommended change is captured in the attached red-line version of the investment guidelines.

Additionally, the attached red-line version of the investment guidelines contains modifications intended to clarify how ratings criteria are applied.

RECOMMENDATION

The ARMB approve Resolution 2020-06 which adopts the revised Domestic Fixed Income Investment Guidelines.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
Relating to Domestic Fixed Income Guidelines

Resolution ~~2019~~2020-06

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 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 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 established an asset allocation for the funds that considers earnings and liabilities on a current as well as a future basis; and

WHEREAS, the Board has authorized investment in fixed income securities; and

WHEREAS, the Board will establish and from time to time as necessary modify guidelines for fixed income securities.

NOW THEREFORE BE IT RESOLVED THAT THE ALASKA RETIREMENT MANAGEMENT BOARD adopts the attached Domestic Fixed Income Guidelines, attached hereto and made a part hereof, regarding investment in domestic fixed income securities.

This resolution repeals and replaces Resolution ~~2007-24~~2019-06.

DATED at Juneau, Alaska this ____ day of June, 2020.

Chair

ATTEST:

Secretary _____

DOMESTIC FIXED INCOME GUIDELINES

- A. Purpose.** The emphasis of investments in fixed income securities shall be diversification, subject to defined constraints, to minimize risk, to generate income, and to provide liquidity as required.
- B. Investment Management Service to be Performed.** Domestic fixed income Contractors shall invest and reinvest the cash and securities allocated to them and deposited in their account, without distinction between principal and income, in a portfolio consisting of fixed income securities. These securities will be selected and retained by Contractors solely on the basis of their independent judgment relating to economic conditions, financial conditions, market timing, or market analysis, and will not be subject to direction from the ARMB.
- C. Performance Standards.** Contractors are expected to have returns, net of fees, in excess of the appropriate benchmark over rolling 6-year periods with an ex-ante tracking error, defined as the annualized standard deviation of returns relative to the index, of less than two percent. The benchmark is the Bloomberg Barclays Aggregate Index.
- D. Investment Structure.** Permissible U.S. dollar denominated debt investments shall be limited to the following:
1. Money market investments comprising:
 - a. Repurchase agreements collateralized only by U.S. Treasury obligations, including bills, notes, and bonds, and only when the collateral carries a market value equal to or greater than 102% of the amount of the repurchase agreements, and only when the custodial bank appointed by retirement funds will take custody of the collateral;
 - b. Commercial paper rated at least Prime-1 by Moody's Investor Services, Inc. and A-1 by Standard and Poor's Corporation;
 - c. Negotiable certificates of deposit, provided that an issuing bank must have total assets in excess of \$5 billion.
 2. United States Treasury obligations including bills, notes, bonds, other debt obligations issued by the United States Treasury, and backed by the full faith and credit of the U.S. Government.
 3. Other full faith and credit obligations of the U.S. Government.
 4. Securities issued or guaranteed by agencies and instrumentalities of the U.S. Government, but not explicitly backed by the full faith and credit of the U.S. Government.

5. Securities issued or guaranteed by municipalities in the United States.
6. Obligations of foreign governments, sovereign states, supranational entities, and their instrumentalities denominated in U.S. dollars.
7. Investment grade corporate debt securities comprising:
 - a. Corporate debt issued in the U.S. capital markets by U.S. companies;
 - b. Euro-dollar debt (that is, U.S. dollar-denominated securities issued outside the U.S. capital markets by U.S. companies or by foreign issuers);
 - c. Yankee debt (that is, U.S. dollar-denominated obligations and issued in the U.S. capital markets by foreign issuers).
8. Asset-backed Securities (ABS).
9. Agency and non-agency mortgage-backed securities backed by loans secured by residential, multifamily and commercial properties including, but not limited to pass-throughs, collateralized mortgage loans (CMO's), project loans, construction loans and adjustable rate mortgages.
10. High yield securities ~~, up to 5% of the portfolio's assets at the time of purchase,~~ including the following securities and constraints:
 - a. Convertible bonds;
 - b. Preferred stock;
 - c. Warrants and common stock only if issued in conjunction with or related to bonds purchased by the manager;
 - d. Common stock received from the conversion of a convertible security, the exercise of a warrant or the restructuring of an issuer's debt should be sold within 90 days of receipt or within 90 days of expiration of a restructuring period. If more time is needed, the Chief Investment Officer must affirm in writing that it is in the Fund's best interest to allow more time.
11. Total return swaps referenced to components or sub-components of fixed income indices. To mitigate interest rate risk, the proceeds may not be invested in securities with a maturity beyond 90 days, unless invested in the Department of Revenue internally-managed Short-Term Fixed Income Pool.
12. The Alaska Department of Revenue's internally managed short-term or substantially similar portfolio.

E. Portfolio Constraints. The Contractor of the fixed-income portfolio shall apply appropriate diversification standards subject, however, to the following limitations based on the current market value of assets:

1. The portfolio's effective duration may not exceed a band of +/- 20% around the modified adjusted duration (or effective duration) of the Bloomberg Barclays Aggregate Index, unless the investment agreement with an external Contractor specifically allows for a different band.
2. Investments in fixed-income securities shall be placed solely in U.S. dollar denominated debt instruments.
3. The Contractor may not invest more than 40% of the portfolio's assets in investment grade corporate debt.
4. Up to 5% of the portfolio's assets at the time of purchase may be comprised of high yield securities. Other than for high yield securities, or for unrated United States Treasury obligations, securities issued or guaranteed by agencies and instrumentalities of the U.S. Government, and agency mortgage-backed securities, Corporate, asset-backed and non-agency mortgage securities must be rated investment grade. The investment grade rating is defined as the median rating of the following three rating agencies: Standard & Poor's Corporation, Moody's and Fitch. Securities may contain only two of these ratings. In such instances, the rating is defined as the lower of the two ratings. Asset-backed and non-agency mortgage securities may be purchased if only rated by one of these agencies if they are rated AAA at the time of purchase. Corporate bonds may be purchased if rated by two of these agencies.
5. The Contractor may not invest more than the benchmark weight plus 15% of the portfolio's assets in BBB+ to BBB-rated debt rated below A-, or equivalent by Standard and Poor's Corporation or the equivalents at Moody's or Fitch.
6. The Contractor may not invest more than 25% of the portfolio's assets in any one corporate sector as defined by the Bloomberg Barclays Aggregate Index.
7. The Contractor may not purchase more than 10% of the currently outstanding par value of any corporate bond issue.
8. The Contractor may not invest more than 5% of the portfolio's assets in corporate bonds of any one company or affiliated group.
9. There shall be no investment in private placements, except Rule 144A securities.
10. The Contractor shall not sell securities short.
11. The Contractor shall not purchase securities on margin.

12. The Contractor shall not utilize options or futures.

13. Internally Managed Assets: the Contractor may only execute trades with dealers that have a minimum of \$200,000,000 in capital. This requirement does not apply to or restrict trades with direct issuers of commercial paper and mortgage-backed securities otherwise eligible for investment under these guidelines. The dealers must be able to execute orders promptly at the most favorable prices reasonably attainable.

14. Externally Managed Assets: Internal cross trading is permitted but only in accordance with requirements under: (1) 29 U.S.C. §1108(b)(19); (2) 29 C.F.R. §2550.408b-19; and (3) 26 U.S.C. §4975(d)(22).

F. Required Remedies. Recognizing that ratings and relative asset worth may change, the Contractor shall liquidate invested securities with care and prudence when the credit rating of a security falls below the minimum standards set in these guidelines or when the relative market value of that investment type exceeds the levels of holdings permitted in these guidelines. The Contractor is required to notify the chief investment officer to discuss the situation and the proposed liquidation strategy if it is not prudent simply to liquidate immediately.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
Relating to Domestic Fixed Income Guidelines

Resolution 2020-06

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 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 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 established an asset allocation for the funds that considers earnings and liabilities on a current as well as a future basis; and

WHEREAS, the Board has authorized investment in fixed income securities; and

WHEREAS, the Board will establish and from time to time as necessary modify guidelines for fixed income securities.

NOW THEREFORE BE IT RESOLVED THAT THE ALASKA RETIREMENT MANAGEMENT BOARD adopts the attached Domestic Fixed Income Guidelines, attached hereto and made a part hereof, regarding investment in domestic fixed income securities.

This resolution repeals and replaces Resolution 2019-06.

DATED at Juneau, Alaska this ____ day of June, 2020.

Chair

ATTEST:

Secretary

DOMESTIC FIXED INCOME GUIDELINES

- A. Purpose.** The emphasis of investments in fixed income securities shall be diversification, subject to defined constraints, to minimize risk, to generate income, and to provide liquidity as required.
- B. Investment Management Service to be Performed.** Domestic fixed income Contractors shall invest and reinvest the cash and securities allocated to them and deposited in their account, without distinction between principal and income, in a portfolio consisting of fixed income securities. These securities will be selected and retained by Contractors solely on the basis of their independent judgment relating to economic conditions, financial conditions, market timing, or market analysis, and will not be subject to direction from the ARMB.
- C. Performance Standards.** Contractors are expected to have returns, net of fees, in excess of the appropriate benchmark over rolling 6-year periods with an ex-ante tracking error, defined as the annualized standard deviation of returns relative to the index, of less than two percent. The benchmark is the Bloomberg Barclays Aggregate Index.
- D. Investment Structure.** Permissible U.S. dollar denominated debt investments shall be limited to the following:
1. Money market investments comprising:
 - a. Repurchase agreements collateralized only by U.S. Treasury obligations, including bills, notes, and bonds, and only when the collateral carries a market value equal to or greater than 102% of the amount of the repurchase agreements, and only when the custodial bank appointed by retirement funds will take custody of the collateral;
 - b. Commercial paper rated at least Prime-1 by Moody's Investor Services, Inc. and A-1 by Standard and Poor's Corporation;
 - c. Negotiable certificates of deposit, provided that an issuing bank must have total assets in excess of \$5 billion.
 2. United States Treasury obligations including bills, notes, bonds, other debt obligations issued by the United States Treasury, and backed by the full faith and credit of the U.S. Government.
 3. Other full faith and credit obligations of the U.S. Government.
 4. Securities issued or guaranteed by agencies and instrumentalities of the U.S. Government, but not explicitly backed by the full faith and credit of the U.S. Government.

5. Securities issued or guaranteed by municipalities in the United States.
6. Obligations of foreign governments, sovereign states, supranational entities, and their instrumentalities denominated in U.S. dollars.
7. Investment grade corporate debt securities comprising:
 - a. Corporate debt issued in the U.S. capital markets by U.S. companies;
 - b. Euro-dollar debt (that is, U.S. dollar-denominated securities issued outside the U.S. capital markets by U.S. companies or by foreign issuers);
 - c. Yankee debt (that is, U.S. dollar-denominated obligations and issued in the U.S. capital markets by foreign issuers).
8. Asset-backed Securities (ABS).
9. Agency and non-agency mortgage-backed securities backed by loans secured by residential, multifamily and commercial properties including, but not limited to pass-throughs, collateralized mortgage loans (CMO's), project loans, construction loans and adjustable rate mortgages.
10. High yield securities including the following securities and constraints:
 - a. Convertible bonds;
 - b. Preferred stock;
 - c. Warrants and common stock only if issued in conjunction with or related to bonds purchased by the manager;
 - d. Common stock received from the conversion of a convertible security, the exercise of a warrant or the restructuring of an issuer's debt should be sold within 90 days of receipt or within 90 days of expiration of a restructuring period. If more time is needed, the Chief Investment Officer must affirm in writing that it is in the Fund's best interest to allow more time.
11. Total return swaps referenced to components or sub-components of fixed income indices. To mitigate interest rate risk, the proceeds may not be invested in securities with a maturity beyond 90 days, unless invested in the Department of Revenue internally-managed Short-Term Fixed Income Pool.
12. The Alaska Department of Revenue's internally managed short-term or substantially similar portfolio.

E. Portfolio Constraints. The Contractor of the fixed-income portfolio shall apply appropriate diversification standards subject, however, to the following limitations based on the current market value of assets:

1. The portfolio's effective duration may not exceed a band of +/- 20% around the modified adjusted duration (or effective duration) of the Bloomberg Barclays Aggregate Index, unless the investment agreement with an external Contractor specifically allows for a different band.
2. Investments in fixed-income securities shall be placed solely in U.S. dollar denominated debt instruments.
3. The Contractor may not invest more than 40% of the portfolio's assets in investment grade corporate debt.
4. Up to 5% of the portfolio's assets at the time of purchase may be comprised of high yield securities. Other than for high yield securities, or for unrated United States Treasury obligations, securities issued or guaranteed by agencies and instrumentalities of the U.S. Government, and agency mortgage-backed securities, securities must be rated investment grade. The rating is defined as the median rating of the following three rating agencies: Standard & Poor's Corporation, Moody's and Fitch. Securities may contain only two of these ratings. In such instances, the rating is defined as the lower of the two ratings. Asset-backed and non-agency mortgage securities may be purchased if only rated by one of these agencies if they are rated AAA at the time of purchase.
5. The Contractor may not invest more than the benchmark weight plus 5% of the portfolio's assets in debt rated below A-, or equivalent.
6. The Contractor may not invest more than 25% of the portfolio's assets in any one corporate sector as defined by the Bloomberg Barclays Aggregate Index.
7. The Contractor may not purchase more than 10% of the currently outstanding par value of any corporate bond issue.
8. The Contractor may not invest more than 5% of the portfolio's assets in corporate bonds of any one company or affiliated group.
9. There shall be no investment in private placements, except Rule 144A securities.
10. The Contractor shall not sell securities short.
11. The Contractor shall not purchase securities on margin.
12. The Contractor shall not utilize options or futures.

13. Internally Managed Assets: the Contractor may only execute trades with dealers that have a minimum of \$200,000,000 in capital. This requirement does not apply to or restrict trades with direct issuers of commercial paper and mortgage-backed securities otherwise eligible for investment under these guidelines. The dealers must be able to execute orders promptly at the most favorable prices reasonably attainable.
14. Externally Managed Assets: Internal cross trading is permitted but only in accordance with requirements under: (1) 29 U.S.C. §1108(b)(19); (2) 29 C.F.R. §2550.408b-19; and (3) 26 U.S.C. §4975(d)(22).

F. Required Remedies. Recognizing that ratings and relative asset worth may change, the Contractor shall liquidate invested securities with care and prudence when the credit rating of a security falls below the minimum standards set in these guidelines or when the relative market value of that investment type exceeds the levels of holdings permitted in these guidelines. The Contractor is required to notify the chief investment officer to discuss the situation and the proposed liquidation strategy if it is not prudent simply to liquidate immediately.

PUBLIC COMMENTS:

Public comment was given by the following people:

1. Mr. Doug Woodby (Verbal)
2. Mr. Elaine Schroeder (Verbal/Letter)
3. Mr. Richard Farnell (Verbal)

June 18, 2020

To: Chairman Johnson and members of the Alaska Retirement Management Board

Below is a copy of the testimony I gave to the ARMB today:

My name is Elaine Schroeder and I have lived in Juneau for 40 years. My husband is retired from the Alaska Department of Fish and Game and we are beneficiaries of PERS. I am co-chair of 350Juneau.

I would like to thank you for planning the upcoming sessions on ESG. Although I and 350Juneau are deeply concerned about the impacts of the climate crisis and the moral implications of continuing to invest in the production of the fossil fuels that cause it, our past testimonies to your board have exclusively focused on the financial performance of our pension funds, especially in light of the many years of poor energy sector performance, not to mention the current crash of fossil fuel stocks. The growing awareness of climate risk to public funds has certainly motivated a growing number of US state and city pension funds to divest from fossil fuels

.
As with all public funds, the prudent-investor rule applies According to an Alaska statute concerning the ARMB, "The fiduciary of a state fund shall apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the fund entrusted to the fiduciary."

We ask that you demonstrate transparency and responsivity to beneficiary concerns by responding to our past and present requests for information.

Again, we appreciate this upcoming ESG session, but our concerns are fiduciary and financial. The plummeting performance of fossil fuel investments and their grim outlook provide sufficient justification to divest the funds of fossil fuel investments.

I would like to thank you for your efforts to protect our pensions and for your attention to our concerns.

Sincerely, Elaine Schroeder, co-chair, 350Juneau
eschroederjnu@gmail.com