University of California Retirement Plan

Actuarial Valuation and Review

As of July 1, 2020

Segal

Segal

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October 16, 2020

Ms. Cheryl Lloyd
Interim Vice President, Human Resources
1111 Franklin Street, 10th Floor
Oakland, CA 94607

Dear Interim Vice President Lloyd:

We are pleased to submit this Actuarial Valuation and Review as of July 1, 2020 for the University of California Retirement Plan ("UCRP" or "the Plan"). It summarizes the actuarial data used in the valuation, analyzes the preceding year's experience, and determines the total funding policy contribution rate for fiscal year 2021-2022.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the University of California to assist in administering the Plan. The census information and financial information on which our calculations were based was prepared by the UC HR Staff. That assistance is gratefully acknowledged.

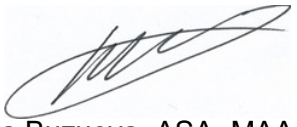
The actuarial calculations were directed under the supervision of Anna Buzueva, ASA, MAAA, and Enrolled Actuary. We are members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, the information supplied in this actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Regents are reasonably related to the experience of and the expectations for the Plan.

We look forward to reviewing this report at the November 2020 Regents meeting.

Sincerely,

Segal

Paul Angelo, FSA, MAAA, EA, FCA
Senior Vice President & Actuary



Anna Buzueva, ASA, MAAA, EA
Senior Actuary

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Section 1: Actuarial Valuation Summary

Purpose and Basis

This report was prepared by Segal to present a valuation of the University of California Retirement Plan ("UCRP" or "the Plan") as of July 1, 2020. The valuation was performed to determine whether the assets and contribution rates are sufficient to provide the prescribed benefits. The measurements shown in this actuarial valuation may not be applicable for other purposes. In particular, the measures herein are not necessarily appropriate for assessing the sufficiency of current Plan assets to cover the estimated cost of settling the Plan's accrued benefit obligations.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law.

The contribution requirements presented in this report are based on:

- The benefit provisions of the Plan, as administered by the UC HR Staff;
- The characteristics of covered active members, inactive vested members, and retired members and beneficiaries as of July 1, 2020, provided by the UC HR Staff;
- The assets of the Plan as of June 30, 2020, provided by the UC Staff;
- Economic assumptions regarding future salary increases and investment earnings;
- Other actuarial assumptions regarding employee terminations, retirement, death, etc. and
- The funding policy adopted by the Regents.

One of the general goals of an actuarial valuation is to establish contributions which fully fund the Plan's liabilities, and which, as a percentage of payroll, remain as level as possible for each generation of active members. Annual actuarial valuations measure the progress toward this goal, as well as test the adequacy of the contribution rates.

In preparing this valuation, we have employed generally accepted actuarial methods and assumptions to evaluate the Plan's liabilities and total funding policy contribution. Our calculations are based upon member data and financial information provided to us by the UC HR Staff.

Section 1: Actuarial Valuation Summary

This information has not been audited by us, but it has been reviewed and found to be generally consistent, both internally and with prior year's information.

The total funding policy contribution is determined as a percentage of payroll. The total funding policy contribution provides a payment for both Normal Cost and to amortize any unfunded or overfunded actuarial accrued liabilities. In this valuation, we have applied the funding policy most recently adopted by the Regents on September 17, 2015. Details of the funding policy are provided in *Section 4, Exhibit III* starting on page 79.

A schedule of current amortization balances and payments may be found in *Section 3, Exhibit F* on page 52. A graphical projection of the Unfunded Actuarial Accrued Liability (UAAL) amortization balances and payments has been included in *Section 3, Exhibit G* starting on page 53.

Valuation Highlights

Contributions

Ref: Pgs. 30, 31

1. The total funding policy contribution rate increased from 33.76% of covered payroll to 34.47% of covered payroll. The increase in the total funding policy contribution rate was mainly due to an investment loss on the actuarial value of assets and actual contributions less than expected under the actuarial funding policy along with adjustments to participant data (as described further on page 9), partially offset by the effect of total payroll growth greater than expected on the Unfunded Actuarial Accrued Liability (UAAL) amortization rate. This total funding policy contribution rate is for the 2021-2022 Plan Year and applies to the non-laboratory segment of UCRP (i.e., campuses, medical centers and Hastings College of Law). Contributions for the laboratories are subject to the terms of the University's contracts with the Department of Energy (DOE). More information on the various UCRP segments can be found in *Section 1*, page 15. Unless otherwise noted, results shown in this report are for all of UCRP.
2. Segal recommends an actuarial funding method that targets 100% funding of the actuarial accrued liability. Generally, this implies payments that are ultimately enough to cover normal cost, interest on the unfunded actuarial accrued liability and the principal balance of that liability. The total funding policy contribution adopted by the Regents meets this standard, however, actual contributions are determined and set each year by the Regents based on various factors as noted in *Section 4, Exhibit II* on page 77.

Ref: Pgs. 77, 78

3. For the Plan Year beginning July 1, 2020, the University contribution rate is 14.5% of covered compensation for the non-laboratory segment of UCRP while the average member rate is about 8% of covered compensation. Member rates are subject to collective bargaining for represented employees. In September 2019, the Regents approved an increase in the University contribution rate to 17% of covered compensation, phased in over six years beginning July 1, 2020.

Ref: Pg. 83

For years in which the actual contributions are less than the total funding policy contributions, future actuarial losses are generated that will lead to increases in future total funding policy contributions. *Appendix A* contains projections that illustrate the effect of such actuarial losses on both future total funding policy contributions and future funded status. In particular, for the 2020/2021 Plan Year, total contributions to UCRP for the non-laboratory segment are projected to fall short of the total funding policy contribution by about $800 million. This shortfall is projected to increase in later years.

4. In July 2017, the Regents approved transfers from the UC Short-Term Investment Pool (STIP) and/or external financing to fully fund the Actuarially Determined Contribution (ADC) for the non-laboratory segment of the Plan during fiscal years 2018-2019 through 2021-2022. For UCRP the ADC is the total funding policy contribution less expected member contributions. A transfer of $500 million from the UC Short-Term Investment Pool (STIP) to UCRP was made during the 2019-2020 fiscal year.

The transfer is reflected in the results shown in this valuation report. Future amounts will be reflected in future actuarial valuations as they are contributed to UCRP.

Assets

Ref: Pg. 25

5. During the 2019-2020 Plan Year, the rate of return on the Market Value of Assets was approximately 1.7%. Based on a partial recognition of this return as well as prior investment experience, the rate of return on the Actuarial Value of Assets was 5.3%, which is less than the expected return of 6.75% for 2019-2020 (based on the July 1, 2019 valuation).

Ref: Pg. 22

6. The total unrecognized investment loss as of July 1, 2020 is about $2.4 billion as compared to a $0.1 billion unrecognized gain in the previous valuation. This investment loss will be recognized in the determination of the Actuarial Value of Assets for valuation purposes over the next few years. This means that, if the Plan earns the current assumed rate of investment return of 6.75% per year (net of investment expenses) on a market value basis, then the deferred losses will be recognized over the next few years as shown in the footnote in *Section 2, Subsection B*.

7. This actuarial valuation report as of July 1, 2020 is based on financial information as of June 30, 2020. Changes in the value of assets subsequent to that date, to the extent that they exist, are not reflected. Declines in asset values will increase the actuarial cost of the Plan, while increases will decrease the actuarial cost of the Plan.

Funded Ratio

Ref: Pgs. 33, 34, 15, 29

8. The Plan's funded ratio on an actuarial value basis decreased from 79.9% as of July 1, 2019 to 78.8% as of July 1, 2020. This decrease in funded ratio is mainly a result of an investment loss on the actuarial value of assets, actual contributions less than expected under the funding policy, and adjustments to participant data (as described further on page 9). On a market value basis, the Plan's funded ratio decreased from 80.1% as of July 1, 2019 to 76.2% as of July 1, 2020 due to similar reasons. The Plan is in an underfunded position as the Actuarial Accrued Liability (AAL) exceeds the Actuarial Value of Assets by $19.8 billion. Information on the funded ratio and UAAL for each UCRP segment can be found in *Section 1*, page 15.

Future Expectations

9. The unrecognized investment losses of $2.4 billion represent about 3.4% of the Market Value of Assets. Unless offset by future investment gains or other favorable experience, the future recognition of the $2.4 billion in market losses is expected to have an impact on the Plan's future funded ratio and future total funding policy contributions. This potential impact may be illustrated as follows:

a. If the deferred losses were recognized immediately in the Actuarial Value of Assets, the funded percentage would decrease from 78.8% to 76.2%.

   For comparison purposes, if all the deferred gains in the July 1, 2019 valuation had been recognized immediately in the July 1, 2019 valuation, the funded percentage would have increased from 79.9% to 80.1%.

b. If the deferred losses were recognized immediately in the Actuarial Value of Assets, the total funding policy contribution would increase from 34.47% of covered payroll to 35.94% of covered payroll.

   For comparison purposes, if all the deferred gains in the July 1, 2019 valuation had been recognized immediately in the July 1, 2019 valuation, the total funding policy contribution rate would have decreased from 33.76% of covered payroll to 33.69% of covered payroll.

Ref: Pg. 81

10. *Appendix A* presents projected valuation results for the non-laboratory segment of UCRP based on contributions already approved by the Regents ("approved contributions" which exclude future transfers from STIP or State Funding except as noted) versus the total funding policy contributions. The scenarios vary based on the 2020-2021 investment returns and the Savings Choice election rate for new hires. Under Scenarios #1 and #3, our longer term projections indicate that the current assets combined with projected future contributions and investment earnings are expected to be sufficient to pay all future expected benefits for all plan members (both current and future). Under Scenario #2 (0% investment return for 2020-2021), based on approved contributions, future assets are expected to be sufficient to pay future expected benefits for current plan members only. Under this Scenario, payment of a portion of the benefits for future plan members is expected to require additional contributions to be made in the future.

Demographic Experience

Ref: Pg. 40-42

11. Overall, the number of active members increased by 5.5% from 127,927 as of July 1, 2019 to 134,953 as of July 1, 2020. The Plan has 80,745 members currently receiving benefits, an increase of 2.1% from 2019. Total monthly benefits in pay status increased by 5.5%, to a level of $306 million. There are also 99,156 inactive members in the Plan who are entitled to future benefits. Within this group of inactive members there are 35,278 inactive members with a vested right to a deferred or immediate vested benefit and 59,499 inactive non-vested members who are entitled to a return of their member contributions or distribution of their Capital Accumulation Provision (CAP) balance. There are also 4,379 members that transferred to the Los Alamos National Security (LANS) or Lawrence Livermore National Security (LLNS) defined benefit plans who will be entitled to a CAP balance payment from UCRP after they separate from employment with LANS or LLNS.

Ref: Pg. 29

12. Following the completion of the July 1, 2019 actuarial valuation, UC provided Segal with revised payroll information as well as some additional records to be included as active members as of July 1, 2019. This revised participant data was used in the UCRP June 30, 2020 Governmental Accounting Standards Board (GASB) 67 and 68 valuation along with adjustments made by Segal for a small group of continuing active multi-tier members who had an unexpected decrease in service. The results

shown within this report as of July 1, 2019 have not been restated for that revised data. The impact of these adjustments to participant data, along with additional data corrections in the July 1, 2020 valuation data, has been calculated and shown separately in *Section 2, Subsection E*.

Actuarial Standard of Practice on Risk Assessment

Ref: Pg. 37

13. Actuarial Standard of Practice No. 51 (ASOP 51) requires actuaries to identify and assess risks that "may reasonably be anticipated to significantly affect the plan's future financial condition". Examples of key risks listed that are particularly relevant to UCRP are asset/liability mismatch risk, investment risk, and longevity risk. The standard also requires an actuary to consider if there is any ongoing contribution risk to the plan, however it does not require the actuary to evaluate the particular ability or willingness of contributing entities to make contributions when due, nor does it require the actuary to assess the likelihood or consequences of future changes in applicable law.

    The actuary's assessment can be qualitative or quantitative (e.g., based on numerical demonstrations). The actuary may use non-numerical methods for assessing risks that might take the form of commentary about potential adverse experience and the likely effect on future results. While the standard does not require that every valuation include a quantitative risk assessment, the actuary may recommend that a more detailed risk assessment be performed. When making that decision, the actuary will take into account such factors as the Plan's design, maturity, size, funded status, asset allocation, cash flow, possible insolvency and current market conditions.

    Since the actuarial valuation results are dependent on a fixed set of assumptions and data as of a specific date, there is risk that emerging results may differ, perhaps significantly, as actual experience is fluid and will not exactly track current assumptions. This potential divergence may have a significant impact on the future financial condition of the plan. We have not been engaged to perform a separate detailed analysis of the potential range of the impact of risk relative to the Plan's future financial condition, but have included a brief discussion of key risks that may affect the Plan in *Section 2, Subsection J*. As noted earlier, *Appendix A* also contains projections under various scenarios. A more detailed assessment of the risks tailored to specific interests or concerns of the Regents would provide the Regents with a better understanding of the inherent risks. This assessment would further discuss and highlight information and risks particular to UCRP such as detailed historical experience and key events, growing plan maturity, heightened contribution sensitivity to asset and liability changes, and projected sensitivity to potential future investment returns through selected scenario or stress test projections.

COVID – 19

14. It is important to note that this actuarial valuation is based on plan assets as of June 30, 2020. Due to the COVID-19 pandemic, market conditions have varied significantly during 2020. The Plan's funded status does not reflect short-term fluctuations of the market, but rather is based on the market values on the last day of the Plan Year. Moreover, this actuarial valuation is based on Plan data as of July 1, 2020 and it does not include any short-term or long-term impacts on mortality of the covered population since July 1, 2020. While it is impossible to determine how the pandemic will continue to affect market conditions and other demographic experience of the Plan prior to next year's valuation, Segal is available to prepare projections of potential outcomes upon request.

Summary of Key Valuation Results

		July 1, 2020 ($ in '000s)	July 1, 2019 ($ in '000s)
Total Funding Policy Contribution:	Percentage of payroll[1]	34.47%	33.76%
	Estimated covered payroll[1]	$12,886,248	$12,035,785
	Estimated annual dollar amount[2]	4,441,890	4,063,281
Actuarial Accrued Liability as of July 1:	Retired members and beneficiaries	$44,665,298	$42,741,027
	Inactive vested members	7,539,483	7,288,912
	Active members	40,883,443	37,752,713
	Total Actuarial Accrued Liability	$93,088,224	$87,782,652
	Normal Cost including administrative expenses for plan year beginning July 1	$2,616,574	$2,484,647
	Normal Cost as a percentage of payroll (beginning of year)	19.96%	20.20%
	Normal Cost as a percentage of payroll (middle of year)	20.62%	20.87%
Assets as of July 1:	Market Value of Assets (MVA)	$70,916,238	$70,278,964
	Actuarial Value of Assets (AVA)	73,318,652	70,170,196
	Actuarial Value of Assets as a percentage of Market Value of Assets	103.39%	99.85%
Funded status as of July 1:	Unfunded Actuarial Accrued Liability on Market Value of Assets basis	$22,171,986	$17,503,688
	Funded percentage on MVA basis	76.2%	80.1%
	Unfunded Actuarial Accrued Liability on Actuarial Value of Assets basis	$19,769,572	$17,612,456
	Funded percentage on AVA basis	78.8%	79.9%
Key assumptions:	Net investment return	6.75%	6.75%
	Price inflation	2.50%	2.50%
	Payroll growth	3.25%	3.25%

[1] Total funding policy contributions and estimated covered payroll are for the Plan Year starting one year after the date of the actuarial valuation. They are shown for the non-laboratory segment of UCRP and exclude the Lawrence Berkeley National Laboratory Segment, the Lawrence Livermore National Laboratory Retained Segment and the Los Alamos National Laboratory Retained Segment of UCRP. Page 15 shows contributions for each of those segments. The Normal Cost plus interest on the July 1, 2020 UAAL represents 30.19% of covered payroll.

[2] Actual contributions are set by the Regents and will be made based on actual payroll.

Summary of Key Valuation Results (continued)

		July 1, 2020	July 1, 2019	Change From Prior Year
Demographic data as of July 1:	**Active Members:**			
	• Number of members	134,953	127,927	5.5%
	• Average age	44.8	45.0	-0.2
	• Average service	9.4	9.4	0.0
	• Total projected compensation	$14,205,528,073	$13,336,334,095	6.5%
	• Average projected compensation	$105,263	$104,250	1.0%
	Retired Members and Beneficiaries:			
	• Number of members:			
	– Service retired	69,898	68,346	2.3%
	– Disability retired	1,250	1,338	-6.6%
	– Beneficiaries[1]	9,597	9,400	2.1%
	– Total	80,745	79,084	2.1%
	• Average age	72.3	71.9	0.4
	• Average monthly benefit	$3,794	$3,671	3.4%
	Inactive Vested Members:			
	• Number of members[2]	99,156	100,864	-1.7%
	• Average Age[3]	50.4	50.0	0.4
	Total Members:	**314,854**	**307,875**	**2.3%**

[1] Includes deferred beneficiaries who are entitled to future benefits.
[2] Includes inactive non-vested members due a refund of member contributions or CAP balance payment and members that transferred to the LANS or LLNS defined benefit plans who will be entitled to a CAP balance payment from UCRP after they separate from employment with LANS or LLNS.
[3] Includes inactive vested members only.

Five-Year History of Total Funding Policy Contributions and Funded Status

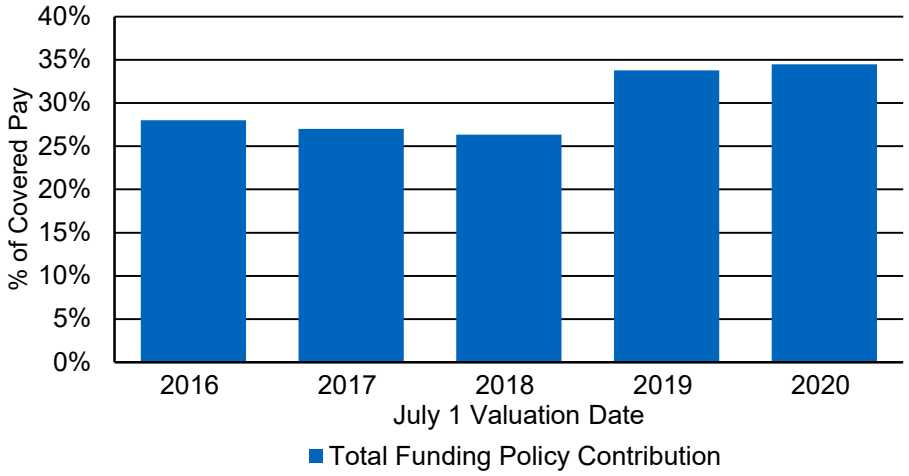
Effective with the July 1, 2008 valuation, a funding policy was adopted that determines total funding policy contributions based on the Plan's normal cost adjusted by an amortization of any surplus or underfunding. The total funding policy contribution rate is effective for the Plan Year starting one year after the date of the actuarial valuation and applies to the non-laboratory segment of UCRP. The total funding policy contribution rate for the 2021-2022 Plan Year is based on this valuation and is 34.47% of payroll.

The Plan's funded percentage (Actuarial Value of Assets divided by Actuarial Accrued Liability) over the past five years is shown below:

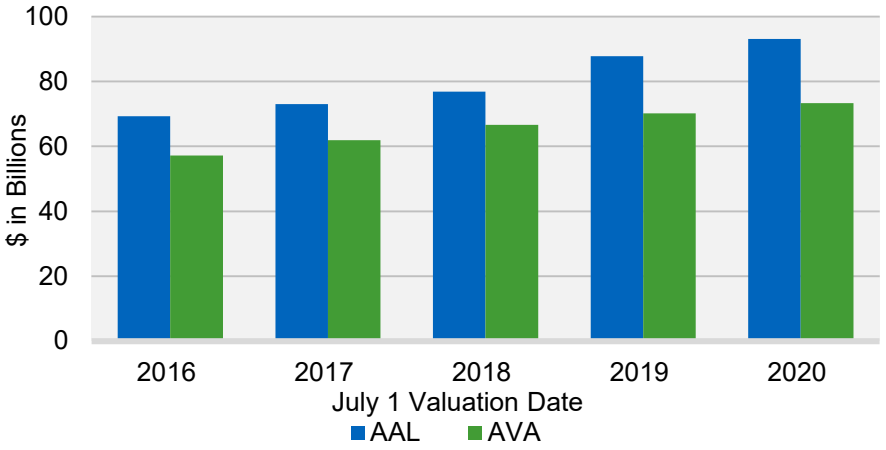
Plan Year Beginning July 1,	AAL $ in Billions	AVA $ in Billions	Funded Percentages
2016	$69.3	$57.2	83%
2017	73.0	61.9	85
2018	76.9	66.6	87
2019	87.8	70.2	80
2020	93.1	73.3	79

Five-Year History as of July 1 Valuation Date

Total Funding Policy Contribution Rate



Actuarial Accrued Liability and Actuarial Value of Assets



Summary of UCRP July 1, 2020 Valuation Results by Segment ($ in '000s)

	Total UCRP	Campus and Medical Centers[1]	Lawrence Berkeley National Laboratory (LBNL)	Lawrence Livermore National Laboratory (LLNL)	Los Alamos National Laboratory (LANL)
Normal Cost (beginning of year)	$2,616,574	$2,553,342	$63,232	$0	$0
Market Value of Assets (MVA)	70,916,238	62,117,922	2,444,867	3,539,178	2,814,271
Actuarial Value of Assets (AVA)	73,318,652	64,222,373	2,527,661	3,659,041	2,909,577
Actuarial Accrued Liability (AAL)	93,088,224	82,952,404	2,978,298	3,961,124	3,196,398
Unfunded Actuarial Accrued Liability on AVA basis	19,769,572	18,730,031	450,637	302,083	286,821
Unfunded Actuarial Accrued Liability on MVA basis	22,171,986	20,834,482	533,431	421,946	382,127
Funded Ratio (AVA/AAL)	78.8%	77.4%	84.9%	92.4%	91.0%
Funded Ratio (MVA/AAL)	76.2%	74.9%	82.1%	89.3%	88.0%
Estimated Covered Payroll for 2020-2021 Plan Year	$13,109,921	$12,794,435	$315,486	$0	$0
Estimated Covered Payroll for 2021-2022 Plan Year	13,196,096	12,886,248	307,986	0	0
Total funding policy contributions[2]					
Percent of payroll[3]		**34.47%**	**N/A**	**N/A**	**N/A**
Estimated dollar amount		**$4,441,890**	**N/A**	**N/A**	**N/A**
Required Contractual Contributions[4]					
Percent of payroll or estimated dollar amount		**N/A**	**15.0%**	**$1,460**	**$18,890**
Number of retired members and beneficiaries[5]	80,745	67,647	2,330	5,609	5,159
Number of inactive members	99,156	90,464	1,718	3,334	3,640
Number of active members	134,953	132,429	2,524	0	0
Average Covered compensation (actual dollars)	$105,263	$104,714	$134,060	N/A	N/A

Note: Results may not add due to rounding.

[1] This is the non-laboratory segment and includes Hastings College of Law.

[2] All total funding policy contributions are based on valuation results as of July 1, 2020. Please see *Section 2, Subsection F* page 30 for more detailed information on this calculation.

[3] The total funding policy contributions shown for the campus and medical centers are for the Plan Year beginning July 1, 2021. Actual contributions for this segment will be set by the Regents.

[4] The contributions shown for the LLNL and LANL Retained Segments are required (subject to available funding by the National Nuclear Security Agency (NNSA)) for the Plan Year beginning July 1, 2020 under the terms of the University's contracts with the Department of Energy, and are due by February 28, 2022. They are not included in the asset values shown above. The Contractual Contributions shown for the LBNL segment of 15.0% is effective for the Plan Year beginning July 1, 2021 and the estimated annual dollar amount of the contribution is $46,198 (also in thousands). The LBNL segment UAAL contribution rate on behalf of new hires in the defined contribution plan ("Savings Choice") effective July 1, 2021 is 7.0% of pay up to the IRC limit.

[5] Includes deferred beneficiaries who are entitled to future benefits.

Important Information on Actuarial Valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast – the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare a valuation, Segal relies on a number of input items. These include:

Plan of benefits	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
Participant data	An actuarial valuation for a plan is based on data provided to the actuary by the University of California (UC). Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Assets	The valuation is based on the Market Value of Assets as of the valuation date, as provided by UC. UC uses an "Actuarial Value of Assets" that differs from market value to gradually reflect year-to-year changes in the Market Value of Assets in determining the contribution requirements.
Actuarial assumptions	In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, termination, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan's assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results, that does not mean that the previous assumptions were unreasonable.

Section 1: Actuarial Valuation Summary

The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

- The actuarial valuation is prepared at the request of UC. Segal is not responsible for the use or misuse of its report, particularly by any other party.
- An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan. Future contribution requirements may differ from those determined in the valuation because of:
  - Differences between actual experience and anticipated experience;
  - Changes in actuarial assumptions or methods;
  - Changes in plan provisions; and
  - Differences between the contribution rates determined by the valuation and those adopted by the Regents.
- If UC is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
- Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. UC should look to their other advisors for expertise in these areas.

As Segal has no discretionary authority with respect to the management or assets of the Plan, it is not a fiduciary in its capacity as actuaries and consultants with respect to the Plan.

Section 2: Actuarial Valuation Results

A. Member Data

The Actuarial Valuation and Review considers the number and demographic characteristics of covered members, including active members, inactive vested members, retired members and beneficiaries.

This section presents a summary of significant statistical data on these member groups.

More detailed information for this valuation year and the preceding valuation can be found in *Section 3, Exhibits A, B,* and *C*.

Member Population: 2011 – 2020

Year Ended June 30	Active Members	Inactive Vested Members[1]	Retired Members and Beneficiaries[2]	Total Non-Actives	Ratio of Non-Actives to Actives	Ratio of Retired Members and Beneficiaries to Actives
2011	115,568	60,903	56,296	117,199	1.01	0.49
2012	116,888	67,318	58,934	126,252	1.08	0.50
2013	118,321	73,589	61,715	135,304	1.14	0.52
2014	120,568	78,229	64,191	142,420	1.18	0.53
2015	123,768	75,165	67,321	142,486	1.15	0.54
2016	128,513	81,595	70,077	151,672	1.18	0.55
2017	129,382	87,052	72,995	160,047	1.24	0.56
2018	129,879	92,617	75,924	168,541	1.30	0.58
2019	127,927	100,864	79,084	179,948	1.41	0.62
2020	134,953	99,156	80,745	179,901	1.33	0.60

[1] Includes inactive members due a refund of member contributions or CAP balance payment and members that transferred to the LANS or LLNS defined benefit plans who will be entitled to a CAP balance payment from UCRP after they separate from employment with LANS or LLNS.

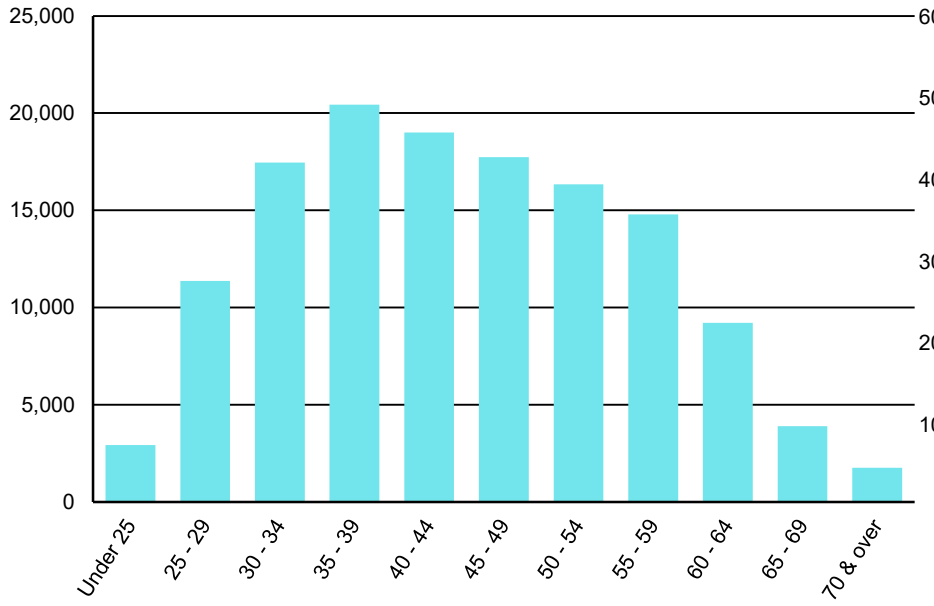
[2] Beginning in 2017, this figure includes deferred retirees and deferred beneficiaries who are entitled to future benefits.

Active Members

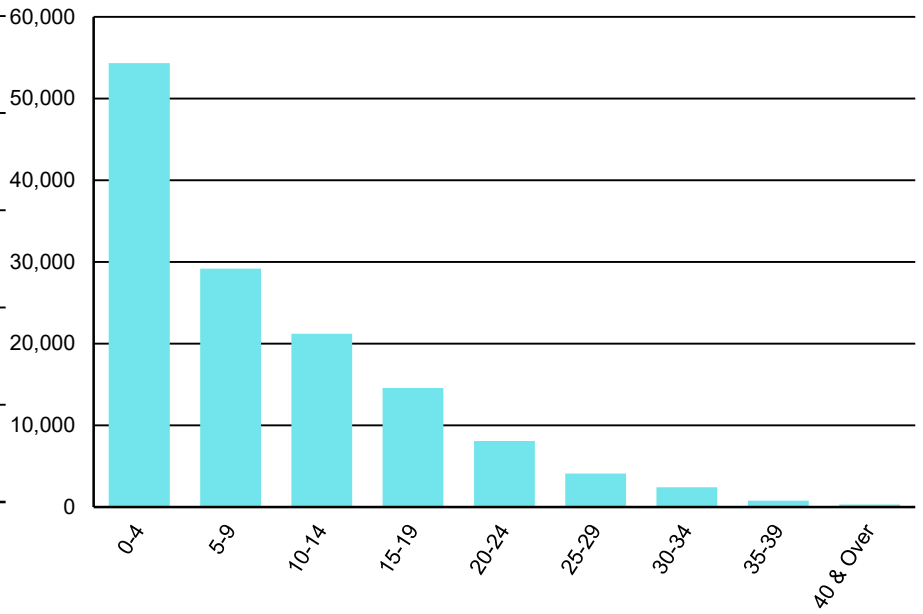
Plan costs are affected by the age, years of service and covered compensation of active members. In this year's valuation, there were 134,953 active members with an average age of 44.8, average years of service of 9.4 years and average covered compensation of $105,263. The 127,927 active members in the prior valuation had an average age of 45.0, average service of 9.4 years and average covered compensation of $104,250.

Distribution of Active Members as of July 1, 2020

Actives by Age



Actives by Years of Service



Inactive Members

In this year's valuation, there were 99,156 inactive members. Within this group of inactive members there are 35,278 members with a vested right to a deferred or immediate vested benefit and 59,499 inactive non-vested members who are entitled to a return of their member contributions or a distribution of their CAP balance. There are also 4,379 members that transferred to the LANS or LLNS defined benefit plans who will be entitled to a CAP balance payment from UCRP after they separate from employment with LANS or LLNS.

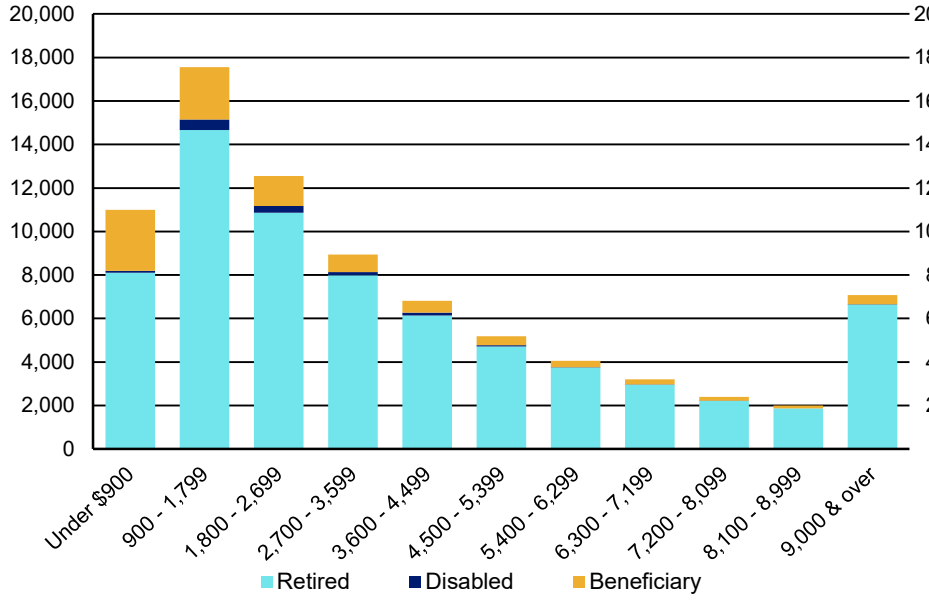
Retired Members

As of July 1, 2020, 71,148 retired members and 9,597 beneficiaries were receiving total monthly benefits of $306,355,428. This includes 119 deferred beneficiaries who are entitled to future benefits. For comparison, in the previous valuation, there were 69,684 retired members and 9,400 beneficiaries receiving monthly benefits of $290,319,453. This included 122 deferred beneficiaries who were entitled to future benefits.

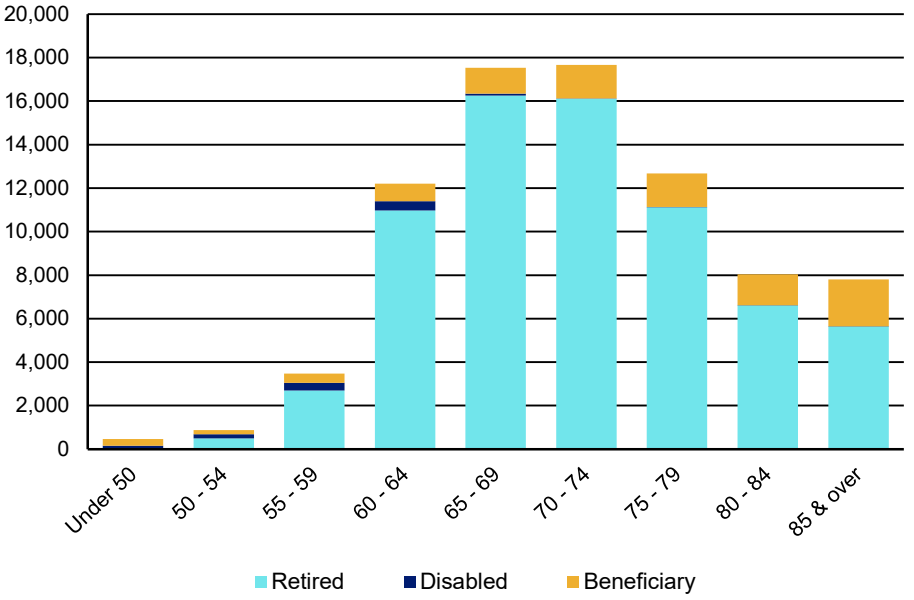
As of July 1, 2020, the average monthly benefit for retired members and beneficiaries is $3,794, compared to $3,671 in the previous valuation. The average age for retired members and beneficiaries is 72.3 in the current valuation, compared with 71.9 in the prior valuation.

Distribution of Retired Members, Disabled Members and Beneficiaries as of July 1, 2020

Retired Members, Disabled Members and Beneficiaries by Type and Monthly Amount



Retired Members, Disabled Members and Beneficiaries by Type and Age



Historical Plan Population

The chart below demonstrates the progression of the active population over the last ten years. The chart also shows the growth and aging among the retired population over the same time period.

Member Statistics: 2011 – 2020

	Active Members			Retired Members, Disabled Members and Beneficiaries		
Year Ended June 30	Count	Average Age	Average Service	Count	Average Age	Average Monthly Amount
2011	115,568	44.9	9.6	56,296	70.2	$2,901
2012	116,888	45.0	9.6	58,934	70.4	2,997
2013	118,321	45.0	9.6	61,715	70.6	3,097
2014	120,568	44.9	9.6	64,191	70.8	3,194
2015	123,768	44.8	9.4	67,321	71.0	3,281
2016	128,513	44.6	9.2	70,077	71.3	3,376
2017	129,382	44.7	9.3	72,995	71.5	3,471
2018	129,879	44.8	9.4	75,924	71.7	3,574
2019	127,927	45.0	9.4	79,084	71.9	3,671
2020	134,953	44.8	9.4	80,745	72.3	3,794

B. Financial Information

Retirement plan funding anticipates that, over the long term, both contributions (net of administrative expenses) and investment earnings (less investment fees) will be needed to cover benefit payments. Retirement plan assets change as a result of the net impact of these income and expense components.

Additional financial information, including a summary of transactions for the valuation year, is presented in *Section 3, Exhibits D* and *E.*

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Regents have approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the valuation asset value and the plan costs are more stable. The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

Determination of Actuarial Value of Assets ($ in '000s)

1	**Market Value of Assets**					**$70,916,238**
2	Calculation of unrecognized return	**Expected Return**	**Actual Return**	**Original Amount**	**Percent Deferred**	**Unrecognized Amount[1]**
a)	Year ended June 30, 2016	$3,995,788	$(1,104,655)	$(5,100,443)	0%	$0
b)	Year ended June 30, 2017	3,923,755	7,866,282	3,942,527	20%	788,506
c)	Year ended June 30, 2018	4,505,104	4,837,553	332,449	40%	132,980
d)	Year ended June 30, 2019	4,828,130	4,018,599	(809,531)	60%	(485,719)
e)	Year ended June 30, 2020	4,732,663	1,184,937	(3,547,726)	80%	(2,838,181)
f)	Total unrecognized return[2]					$(2,402,414)
3	**Actuarial Value of Assets 1 – 2f**					**$73,318,652**
4	Actuarial Value of Assets as a percentage of Market Value of Assets **3 ÷ 1**					103.39%

[1] Recognition at 20% per year over 5 years.

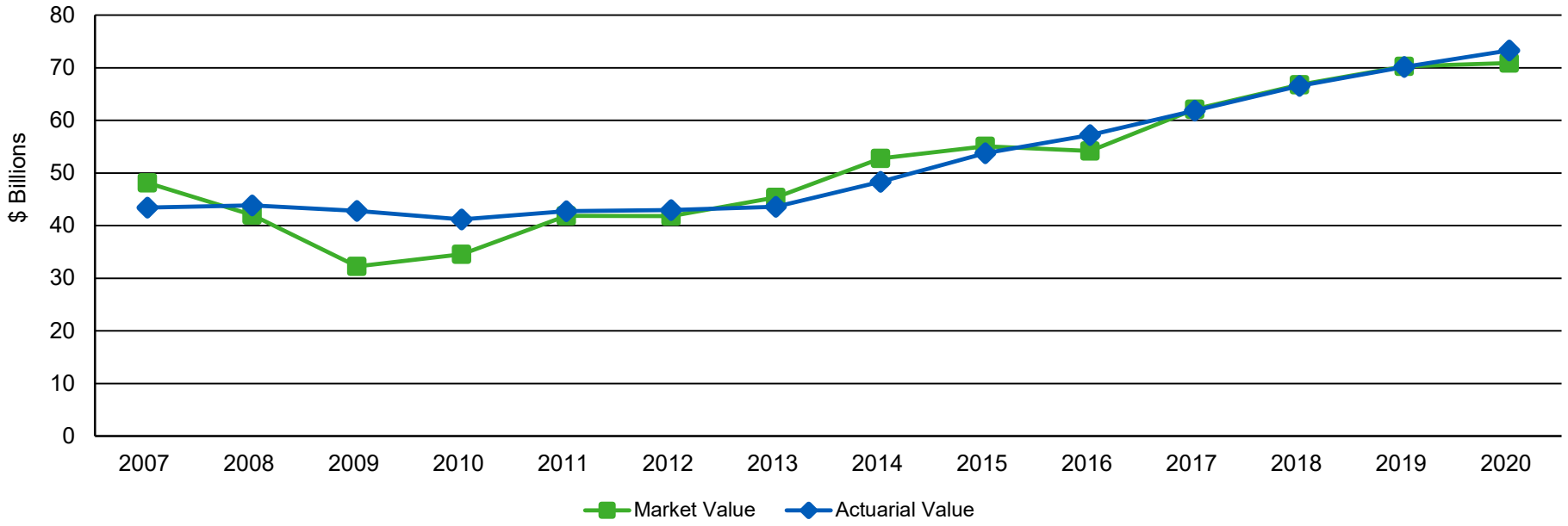
[2] Deferred return as of June 30, 2020 recognized in each of the next four years:

(a) Amount recognized on June 30, 2021	$(16,455)
(b) Amount recognized on June 30, 2022	(804,961)
(c) Amount recognized on June 30, 2023	(871,452)
(d) Amount recognized on June 30, 2024	(709,546)
(e) Total unrecognized return as of June 30, 2020	$(2,402,414)

Section 2: Actuarial Valuation Results

The Market Value and Actuarial Value of Assets are representations of the Plan's financial status. As investment gains and losses are gradually taken into account, the Actuarial Value of Assets tracks the Market Value of Assets. The Actuarial Value of Assets is significant because UCRP's liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the Unfunded Actuarial Accrued Liability is an important element in determining future contribution rates.

Market Value and Actuarial Value of Assets as of June 30, 2007 – 2020



C. Actuarial Experience

To calculate any actuarially determined contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), the actuarially determined contribution will decrease from the previous year. On the other hand, the actuarially determined contribution will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years. This valuation does not reflect any changes in actuarial assumptions.

The total loss is $2.68 billion, which includes $1.03 billion from investment losses, a loss of $0.78 billion from contribution experience and $0.87 billion in losses from all other sources. The net experience variation from individual sources other than investments and contributions was 0.9% of the Actuarial Accrued Liability. A discussion of the major components of the actuarial experience is on the following pages.

Actuarial Experience for Year Ended June 30, 2020 ($ in '000s)

1	Net loss from investments[1]	$1,029,203
2	Net loss from contributions less than expected under funding policy	780,097
3	Net gain from individual salary increases less than assumed	(56,653)
4	Net loss from other experience[2]	929,062
5	**Net experience loss:[3] 1 + 2 + 3 + 4**	**$2,681,709**

[1] Details on next page.
[2] Does not include the effect of plan or assumption changes, if any.
[3] Non-laboratory segment amount is an actuarial experience loss of $2,481,861.

Investment Experience

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on UCRP's investment policy. The rate of return on the Market Value of Assets was 1.69% for the year ended June 30, 2020.

For valuation purposes, the assumed rate of return on the Actuarial Value of Assets was 6.75% for the 2019/2020 Plan Year. The actual rate of return on an actuarial basis for the 2019/2020 plan year was 5.28%. Since the actual return for the year was less than the assumed return, the Plan experienced an actuarial loss during the year ended June 30, 2020 with regard to its investments.

Investment Experience for Year Ended June 30, 2020

		Market Value ($ in '000s)	Actuarial Value ($ in '000s)
1	Net investment income	$1,184,937	$3,696,118
2	Average value of assets[1]	70,113,522	70,004,755
3	Rate of return: 1 ÷ 2	1.69%	5.28%
4	Assumed rate of return	6.75%	6.75%
5	Expected investment income: 2 x 4	$4,732,663	$4,725,321
6	**Actuarial gain/(loss): 1 – 5**	**$(3,547,726)**	**$(1,029,203)**

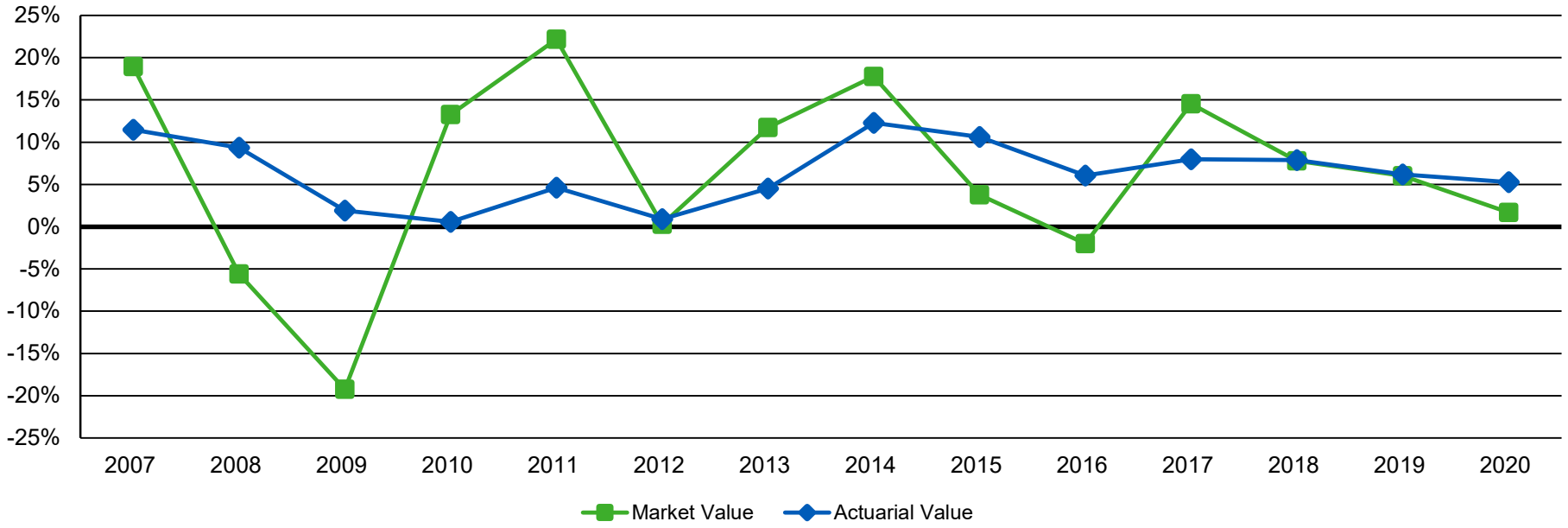
Note: Results may not add due to rounding.

[1] Assumes that non-investment cash-flows (i.e., benefit payments, contributions, and administrative expenses) all occur at mid-year on average, except for the following: STIP transfers are assumed to occur one-quarter into the year on average, and LLNL and LANL employer contributions are assumed to occur two-thirds into the year on average.

Section 2: Actuarial Valuation Results

Section 2, Subsection B described the actuarial asset valuation method that gradually recognizes fluctuations in the market value rate of return. The goal of this is to stabilize the actuarial rate of return and to produce more level pension plan costs.

Market and Actuarial Rates of Return for Years Ended June 30, 2007 – 2020



Contribution Experience

Contributions for the year ended June 30, 2020 totaled $3.46 billion, compared to the projected amount of $4.23 billion. This resulted in a loss of $0.78 billion for the year, when adjusted for timing.

Non-Investment Experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:

- the extent of turnover among participants,
- retirement experience (earlier or later than projected),
- mortality (more or fewer deaths than projected),
- the number of disability retirements (more or fewer than projected),
- salary increases (greater or smaller than projected),
- cost-of-living adjustments (COLAs) higher or lower than anticipated, and
- administrative expenses different than assumed.

The net loss from this other experience for the year ended June 30, 2020 amounted to $872.4 million, which is 0.9% of the Actuarial Accrued Liability. This amount includes $661.5 million due to adjustments to participant data that were described in further detail on page 9. See *Section 2, Subsection E* for a detailed development of the Unfunded Actuarial Accrued Liability.

D. Other Changes in the Actuarial Accrued Liability

The Actuarial Accrued Liability as of July 1, 2020 is $93.1 billion, an increase of $5.3 billion, or 6.0%, from the Actuarial Accrued Liability as of the prior valuation date. The liability is expected to grow each year with Normal Cost and interest, and to decline due to benefit payments made. Additional fluctuations can occur due to actual experience that differs from expected (as discussed in the previous subsection).

Actuarial Assumptions

There are no changes in actuarial assumptions reflected in this report.

Details on actuarial assumptions and methods are in *Section 4, Exhibit I*.

Plan Provisions

Members who are represented by the EX and SX bargaining units that were in the 2016 Tier, will accrue future service under the Modified 2013 Tier after ratification of contracts in early 2020. This change in Plan Provisions had no material impact on the Actuarial Accrued Liability as of July 1, 2020.

A summary of plan provisions is provided in *Section 4, Exhibit II*.

E. Development of Unfunded Actuarial Accrued Liability

Development for Year Ended June 30, 2020 ($ in '000s)

1	**Unfunded Actuarial Accrued Liability at beginning of year**		**$17,612,455**
2	Total Normal Cost at beginning of year		2,484,647
3	Expected total funding policy and required contractual contributions		(4,229,238)
4	Interest		
	a) For whole year **1 + 2**	$1,356,555	
	b) For partial year **3**[1]	(136,556)	
	Total interest		1,219,999
5	Expected Unfunded Actuarial Accrued Liability at end of year		$17,087,863
6	Changes due to:		
	a) Investment return less than expected, after asset smoothing	$1,029,203	
	b) Actual contributions less than expected under funding policy	780,097	
	c) Individual salary increases lower than expected	(56,653)	
	d) Data revisions[2]	661,466	
	e) Other experience loss[3]	267,596	
	Total changes[4]		2,681,709
7	**Unfunded Actuarial Accrued Liability at end of year**		**$19,769,572**

[1] Expected contributions for LLNL and LANL are calculated as of the end of the year, therefore no interest has been included on those amounts.
[2] Reflects revised data as noted on page 9 that was used in the June 30, 2020 GASB 67 and 68 valuation, along with additional data corrections in the July 1, 2020 valuation data files. This amount is partially offset by a gain for continuing active employees who did not accrue a full year of service from July 1, 2019 through July 1, 2020.
[3] Includes effect of differences in actual versus expected experience including mortality, disability, termination and retirement experience.
[4] Non-laboratory segment amount is a net actuarial experience loss of $2,481,861.

F. Total Funding Policy Contribution

The funding policy adopted determines total funding policy contributions based on the Plan's normal cost adjusted by an amortization of any surplus (overfunding) or underfunding. The total funding policy contribution is for the Plan Year beginning one year after the valuation date.

The Regents set the funding policy used to calculate the total funding policy contribution based on layered amortization periods. The calculation of the total funding policy contribution rates for the current and prior valuation are shown below.

The total funding policy contribution rate applies to the non-laboratory segment of UCRP (i.e., campuses, medical centers and Hastings College of Law). Contributions for the laboratories are subject to the terms of the University's contracts with the Department of Energy. For more information on the various UCRP segments see *Section 1*, page 15. For more details on the UCRP funding policy see *Section 4, Exhibit III*.

The total funding policy contribution rate as of July 1, 2020 is based on all of the data described in the previous sections, the actuarial assumptions described in *Section 4, Exhibit I* and the Plan provisions adopted at the time of preparation of the Actuarial Valuation. They include all changes affecting future costs, adopted benefit changes, actuarial gains and losses and changes in the actuarial assumptions.

Total Funding Policy Contribution (Non-Laboratory Segment of UCRP)

		July 1, 2020		July 1, 2019	
		Amount ($ in '000s)	% of Covered Payroll	Amount ($ in '000s)	% of Covered Payroll
1	Total Normal Cost (beginning of year)	$2,553,342	19.96%	$2,425,984	20.20%
2	Actuarial Accrued Liability	82,952,404		77,681,973	
3	Actuarial Value of Assets	64,222,373		60,961,902	
4	Unfunded Actuarial Accrued Liability **2 - 3**	18,730,031		16,720,071	
5	Amortization of Unfunded Actuarial Accrued Liability[1]	1,714,514	13.40%	1,499,303	12.48%
6	Total funding policy contribution **1 + 5**		33.36%		32.68%
7	**Total funding policy contribution, adjusted for timing[2]**	**$4,441,890**	**34.47%**	**$4,063,281**	**33.76%**
8	Estimated covered payroll[3]	$12,886,248		$12,035,785	

[1] Layered amortization of Unfunded Actuarial Accrued Liability (UAAL). See *Section 3, Exhibit F* for more details.
[2] The total funding policy contribution includes an adjustment to account for contributions made throughout the year. No additional adjustment is included to account for contributions not starting until the beginning of the next Plan Year. Actual contributions are set by the Regents and will be made based on actual payroll.
[3] Estimated covered payroll shown for July 1, 2020 is for the 2021-2022 Plan Year and for July 1, 2019 is for the 2020-2021 Plan Year.

Reconciliation of Total Funding Policy Contribution Rate

The chart below details the changes in the total funding policy contribution from the prior valuation to the current year's valuation.

Reconciliation of Total Funding Policy Contribution Rate from July 1, 2019 to July 1, 2020

	Contribution Rate
Total Funding Policy Contribution Rate as of July 1, 2019	**33.76%**
• Effect of investment return less than expected, after asset smoothing	0.63%
• Effect of actual contributions less than expected	0.54%
• Effect of individual salary increases lower than expected	(0.03%)
• Effect of total payroll growth greater than expected on UAAL amortization rate	(0.64%)
• Effect of lower normal cost of 2013 Tier, Modified 2013 Tier and 2016 Tier	(0.15%)
• Effect of data revisions[1]	0.24%
• Effect of other losses[2]	0.12%
Total change	0.71%
Total Funding Policy Contribution Rate as of July 1, 2020	**34.47%**

[1] Reflects revised data as noted on page 9 that was used in the June 30, 2020 GASB 67 and 68 valuation, along with additional data corrections in the July 1, 2020 valuation data files. This amount is partially offset by a gain for continuing active employees who did not accrue a full year of service from July 1, 2019 through July 1, 2020.

[2] Includes effect of differences in actual versus expected experience including mortality, disability, termination and retirement experience.

Normal Cost

The derivation of the employer Normal Cost is shown below:

		July 1, 2020		July 1, 2019	
		Amount ($ in '000s)	% of Covered Payroll	Amount ($ in '000s)	% of Covered Payroll
1	Total Normal Cost (middle of year)	$2,703,441	20.62%	$2,567,135	20.87%
2	Expected Employee Contributions (middle of year)	(1,035,473)	(7.90%)	(973,715)	(7.92%)
3	**Employer Normal Cost 1 - 2**	**$1,667,968**	**12.72%**	**$1,593,420**	**12.95%**
4	Estimated Covered Payroll[1]	$13,109,921		$12,301,154	

The total Normal Cost as a percentage of payroll (middle of year) for each tier is as follows:

	July 1, 2020	July 1, 2019
1976 Tier	21.59%	21.70%
2013 Tier	19.05%	19.18%
Modified 2013 Tier	20.23%	20.28%
2016 Tier	18.14%	18.25%
Safety	31.03%	31.26%
Tier Two	10.80%	10.85%

[1] Estimated covered payroll shown for July 1, 2020 is for the 2020-2021 Plan Year and for July 1, 2019 is for the 2019-2020 Plan Year.

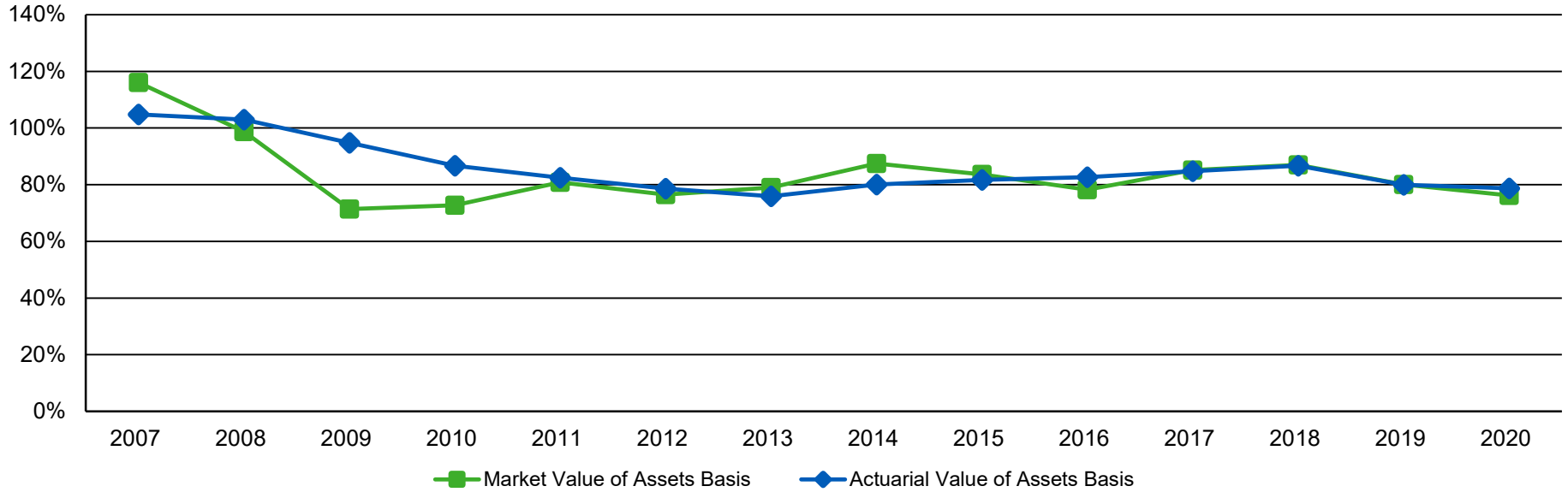
G. Funded Status

A commonly reported piece of information regarding the Plan's financial status is the funded ratio. These ratios compare the Market and Actuarial Value of Assets to the Actuarial Accrued Liability of the Plan. High ratios indicate a well-funded plan with assets sufficient to cover the Plan's Actuarial Accrued Liability. Lower ratios may indicate recent changes to benefit structures, funding of the plan below actuarial requirements, poor asset performance, or a variety of other changes.

The chart below depicts a history of the funded ratio for the Plan. The chart on the next page shows the Plan's schedule of funding progress for the last ten years.

The funded status measures shown in this valuation are appropriate for assessing the need for or amount of future contributions. However, they are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligations. As the chart below shows, the measures are different depending on whether the Actuarial or Market Value of Assets is used.

Funded Ratio for Years Beginning July 1, 2007 – 2020



Schedule of Funding Progress for Years Beginning July 1, 2011 – 2020 ($ in '000s)

Actuarial Valuation Date as of July 1,	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b) - (a)	Funded Ratio (%) (a) / (b)	Projected Covered Payroll[1] (c)	UAAL as a Percentage of Covered Payroll (%) [(b) - (a)] / (c)
2011	$42,757,271	$51,831,306	$9,074,035	82.5%	$8,163,021	111.2%
2012	42,965,028	54,619,620	11,654,592	78.7	8,598,114	135.5
2013	43,572,353	57,380,961	13,808,608	75.9	8,836,498	156.3
2014	48,327,981	60,417,177	12,089,196	80.0	9,299,817	130.0
2015	53,762,286	65,841,255	12,078,969	81.7	9,927,833	121.7
2016	57,228,542	69,305,423	12,076,881	82.6	10,607,630	113.9
2017	61,884,530	72,965,272	11,080,742	84.8	11,095,864	99.9
2018	66,577,372	76,881,052	10,303,680	86.6	11,596,220	88.9
2019	70,170,196	87,782,652	17,612,456	79.9	12,301,154	143.2
2020	73,318,652	93,088,224	19,769,572	78.8	13,109,921	150.8

[1] Covered payroll is reduced to anticipate members who leave active status during the year.

H. Actuarial Liabilities

	July 1, 2020 ($ in '000s)	July 1, 2019 ($ in '000s)
Actuarial Accrued Liability		
Members in pay status		
• Retirees[1]	$41,167,390	$39,403,368
• Beneficiaries[2]	2,888,111	2,707,183
• Disableds	609,797	630,476
– Total in pay status	$44,665,298	$42,741,027
Active members		
• 1976 Tier members	$35,502,013	$34,512,805
• 2013 Tier members	2,327,217	1,610,523
• Modified 2013 Tier members	1,847,009	1,115,643
• 2016 Tier members	963,910	298,390
• Safety	243,294	215,352
– Total actives	$40,883,443	$37,752,713
Inactive members		
• Vested	$7,039,327	$6,808,487
• Non-vested	500,156	480,425
– Total inactive	$7,539,483	$7,288,912
Total Actuarial Accrued Liability	**$93,088,224**	**$87,782,652**
Actuarial Present Value of Projected Benefits		
• Members in pay status[1, 2]	$44,665,298	$42,741,027
• Active members	65,050,135	60,575,105
• Inactive members	7,539,483	7,288,912
Total Present Value of Projected Benefits	**$117,254,916**	**$110,605,044**

[1] For July 1, 2020, includes a liability of $39.0 million for Lump Sum Cashouts, CAP balance payments and refunds of member contributions that were paid on or after July 1, 2020. For July 1, 2019, includes a liability of $11.7 million for Lump Sum Cashouts, CAP balance payments and refunds of member contributions that were paid on or after July 1, 2019.
[2] Includes liability for deferred beneficiaries.

I. Volatility Ratios

Retirement plans are subject to volatility in the level of total funding policy contributions. This volatility tends to increase as retirement plans become more mature.

The Asset Volatility Ratio (AVR), which is equal to the Market Value of Assets divided by total payroll, provides an indication of the potential funding policy contribution volatility for any given level of investment volatility. A higher AVR indicates that the plan is subject to a greater level of contribution volatility. This is a current measurement since it is based on the current level of assets.

The current AVR is about 5.4. This means that a 1% asset gain or loss (relative to the assumed investment return) translates to about 5.4% of one-year's payroll. Since actuarial gains and losses are amortized over 20 years, there would be a 0.5% of payroll decrease/(increase) in the total funding policy contribution for each 1% asset gain/(loss).

The Liability Volatility Ratio (LVR), which is equal to the Actuarial Accrued Liability divided by payroll, provides an indication of the longer-term potential for contribution volatility for any given level of investment volatility. This is because, over an extended period of time, the plan's assets should track the plan's liabilities.

The LVR also indicates how volatile contributions will be in response to changes in the Actuarial Accrued Liability due to actual experience or to changes in actuarial assumptions. The current LVR is about 7.1. This is about 31% higher than the AVR. Therefore, we would expect that contribution volatility will increase over the long term.

Volatility Ratios for Year Ended June 30, 2011 – 2020

Year Ended June 30	Asset Volatility Ratio	Liability Volatility Ratio
2011	5.1	6.3
2012	4.9	6.4
2013	5.1	6.5
2014	5.7	6.5
2015	5.5	6.6
2016	5.1	6.5
2017	5.6	6.6
2018	5.8	6.6
2019	5.7	7.1
2020	5.4	7.1

J. Risk Assessment

Since the actuarial valuation results are dependent on a fixed set of assumptions and data as of a specific date, there is risk that emerging results may differ, perhaps significantly, as actual experience is fluid and will not exactly track current assumptions. This potential divergence may have a significant impact on the future financial condition of the plan.

This section does not contain a detailed analysis of the potential range of future measurements, but does include a concise discussion of some of the primary risks that may affect the Plan's future financial condition. Note that *Appendix A* presents projected valuation results for the non-laboratory segment of UCRP based on contributions already approved by the Regents versus the total funding policy contributions. The scenarios vary 2020-2021 investment returns and the Savings Choice election rate for new hires. A more detailed assessment of the risks would provide the Regents with a further understanding of the risks inherent in the Plan that can inform both financial preparation and future decision making. This assessment would enable us to work with the Regents to highlight and illustrate particular risks or potential future outcomes it may be interested in discussing and could include tailored scenario testing, sensitivity testing, stress testing and stochastic modeling.

This section provides descriptions and basic assessments of the primary risks that are likely to have an ongoing influence on the Plan's financial health, as well as a discussion of historical trends and maturity measures.

Risk Assessments

- Asset/Liability Mismatch Risk (the potential that future plan experience does not affect asset and liability values in the same way, causing them to diverge)

  The most significant asset/liability mismatch risk to the Plan is investment risk, as discussed below. In fact, investment risk has the potential to impact asset/liability mismatch in two ways. The first mismatch is evident in annual valuations: when asset values deviate from assumptions, they are typically independent from liability changes. The second mismatch can be caused when systemic asset deviations from assumptions may signal the need for an assumption change, which causes liability values and contribution rates to move in the opposite direction from any changes in the expected experience of asset growth rates.

  Asset/liability mismatch can also be caused by demographic assumption risk such as longevity, which affects liabilities but have no impact on asset levels. This risk is also discussed below.

- Investment Risk (the risk that investment returns will be different than expected)

  The investment return assumption is a long-term, static assumption for valuation purposes even though in reality market experience can be quite volatile in any given year. That volatility can cause significant changes in the financial health of the system, affecting both funded status and contribution rates. The inherent year-to-year volatility is reduced by smoothing through the Actuarial Value of Assets, however

investment experience can still have a sizable impact. As discussed in *Section 2, Subsection I*, *Volatility Ratios* on page 36, a 1% asset gain or loss (relative to the assumed investment return) translates to about 5.4% of one-year's payroll. Since actuarial gains and losses are amortized over 20 years, there would be a 0.5% of payroll decrease/(increase) in the total funding policy contribution for each 1% asset gain/(loss).

The single period market value rate of return over the last 10 years has ranged from a low of -2.00% to a high of 22.17%.

- Longevity Risk (the risk that mortality experience will be different than expected)

  The actuarial valuation includes current life expectancy assumptions and an expectation of future improvement in life expectancy, which are significant assumptions given the relatively long duration of liabilities for pension plans. Emerging plan experience that does not match these expectations will result in increases or decreases in the actuarially determined contribution over time. This risk can be reduced by using tables appropriate for the Plan (public experience tables) that are weighted by benefit levels, and by using generational mortality projections.

- Contribution Risk

  This risk is defined as the potential for actual future contributions deviating from expected future contributions. For years in which the actual contributions are less than the total funding policy contributions, future actuarial losses are generated that will lead to increases in future total funding policy contributions. As noted earlier, *Appendix A* contains projections that illustrate the effect of such actuarial losses on both future total funding policy contributions and future funded status.

  In particular, the total actual contributions to UCRP for the 2019/2020 Plan Year did not meet the total funding policy contribution for that Plan Year. Furthermore, for the 2020/2021 Plan Year, total contributions to UCRP for the non-laboratory segment (including the approved increase in contribution rates and the approved transfers from STIP) are projected to fall short of the total funding policy contribution by about $800 million. This shortfall is projected to increase in later years.

- Other Risks

  In addition to longevity, the valuation includes a variety of other assumptions that are unlikely to match future experience exactly. One example is projected salary scales over time. As salary is central to the determination of benefits paid in retirement, deviations from the projected salary scales could have a material impact on the benefits anticipated for each member. Examples of demographic assumptions include retirement, termination and disability assumptions, and will likely vary in significance for different cost groups (for example, disability assumptions are typically more significant for safety groups).

Evaluation of Historical Trends

Past experience can help demonstrate the sensitivity of key results to the Plan's actual experience. Over the past ten years:

- The funded percentage on the Actuarial Value of Assets basis has decreased from 82.5% to 78.8%. This is primarily due to strengthening of actuarial assumptions through multiple assumption changes as discussed below and average investment returns lower than the assumption on a smoothed basis. For a more detailed history see *Section 2, Subsection G, Funded Status* starting on page 33.
- The primary source of new UAAL was the strengthening of assumptions through multiple assumption changes. For example, the assumption change in 2015 changed the discount rate from 7.50% to 7.25% and updated mortality tables, adding $2.2 billion in unfunded liability. The assumption change in 2019 changed the discount rate from 7.25% to 6.75% and updated mortality tables, adding $7.5 billion in unfunded liability. For more details on the unfunded liability changes for the non-laboratory segment of UCRP see *Section 3, Exhibit F, Table of Amortization Bases* starting on page 52.
- The plan's funding policy effectively deals with these unfunded liabilities over time. This can be seen most clearly in *Section 3, Exhibit G, Projection of UAAL Balances and Payments* starting on page 53.

Maturity Measures

In the last ten years the ratio of members in pay status to active participants has increased from 0.49 to 0.60. An increased ratio indicates that the plan has grown in maturity over time. This is to be expected, but is also informative for understanding plan sensitivity to particular risks. For more details see *Section 2, Subsection A, Member Data* on page 18.

As pension plans mature, the cash needed to fulfill benefit obligations will increase over time. Therefore, cash flow projections and analysis should be performed to assure that the Plan's asset allocation is aligned to meet emerging pension liabilities. For the prior year, benefits paid and administrative expenses were $548 million more than contributions received. Plans with high levels of negative cash flows have a need for a larger allocation to income generating assets, which can create a drag on investment return. This plan currently has relatively moderate levels of negative cash flows.

A further discussion of plan maturity measures and how they relate to changes in assets and liabilities is included in *Section 2, Subsection I, Volatility Ratios* starting on page 36.

Section 3: Supplemental Information

Exhibit A – Table of Plan Coverage

Active Members

Category	Year Ended July 1 2020	Year Ended July 1 2019	Change From Prior Year
1976 Tier Members:[1]			
• Number	65,357	69,086	-5.4%
• Average age	50.8	50.2	0.6
• Average service credit	15.7	15.0	0.7
• Total covered compensation	$7,730,302,883	$8,005,591,561	-3.4%
• Average covered compensation	$118,278	$115,879	2.1%
2013 Tier Members:[2]			
• Number	18,561	18,874	-1.7%
• Average age	42.2	41.5	0.7
• Average service credit	5.3	4.1	1.2
• Total covered compensation	$1,901,840,464	$1,885,397,272	0.9%
• Average covered compensation	$102,464	$99,894	2.6%
Modified 2013 Tier Members:[2]			
• Number	27,549	23,255	18.5%
• Average age	37.2	36.7	0.5
• Average service credit	3.1	2.5	0.6
• Total covered compensation	$2,531,449,738	$2,070,670,833	22.3%
• Average covered compensation	$91,889	$89,042	3.2%

[1] Includes 4 members with Tier Two Benefits.
[2] Includes multi-tier members earning future Service Credit under this tier.

Exhibit A – Table of Plan Coverage (continued)

Active Members (continued)

Category	Year Ended July 1 2020	Year Ended July 1 2019	Change From Prior Year
2016 Tier Members:[1]			
• Number	23,062	16,306	41.4%
• Average age	39.0	38.6	0.4
• Average service credit	2.2	1.2	1.0
• Total covered compensation	$1,989,069,571	$1,325,737,812	50.0%
• Average covered compensation	$86,249	$81,304	6.1%
Safety Members:			
• Number	424	406	4.4%
• Average age	42.4	41.9	0.5
• Average service credit	10.0	9.7	0.3
• Total covered compensation	$52,865,417	$48,936,617	8.0%
• Average covered compensation	$124,683	$120,534	3.4%
All active Members:[2]			
• Number	134,953	127,927	5.5%
• Average age	44.8	45.0	-0.2
• Average service credit	9.4	9.4	0.0
• Total covered compensation	$14,205,528,073	$13,336,334,095	6.5%
• Average covered compensation	$105,263	$104,250	1.0%

[1] Includes multi-tier members earning future Service Credit under this tier.
[2] As of July 1, 2020 there were also 11,347 active employees who were part of the Savings Choice plan, as reported by Fidelity.

Exhibit A – Table of Plan Coverage (continued)

Non-Active Members

Category	Year Ended July 1[1] 2020	2019	Change From Prior Year
Inactive vested members:			
• Number	35,278	36,463	-3.2%
• Average age	50.4	50.0	0.4
• Total monthly benefit[2]	$63,227,022	$62,615,843	1.0%
• Average monthly benefits	$1,792	$1,717	4.4%
Inactive non-vested members:			
• Number[3]	63,878	64,401	-0.8%
• Average member refund and CAP balance	$7,830	$7,394	5.9%
Retired members:			
• Number in pay status	69,898	68,346	2.3%
• Average age	72.2	71.8	0.4
• Total monthly benefit	$278,336,058	$264,048,970	5.4%
• Average monthly benefit	$3,982	$3,863	3.1%
Disabled members:			
• Number in pay status	1,250	1,338	-6.6%
• Average age	58.3	58.2	0.1
• Total monthly benefit	$2,916,082	$2,997,974	-2.7%
• Average monthly benefit	$2,333	$2,241	4.1%
Beneficiaries:			
• Number in pay status[4]	9,597	9,400	2.1%
• Average age	75.2	74.7	0.5
• Total monthly benefit	$25,103,288	$23,272,509	7.9%
• Average monthly benefit	$2,616	$2,476	5.7%

Note: Monthly benefits shown include temporary Social Security Supplement.

[1] CAP balances total $1.060 billion as of July 1, 2020 and $1.075 billion as of July 1, 2019 for all members.
[2] Benefit is calculated based on assumed retirement age or current age if later.
[3] For July 1, 2020, includes 4,379 members that transferred to the LANS or LLNS defined benefit plans who will be entitled to a CAP balance payment from UCRP after they separate employment with LANS or LLNS. For July 1, 2019, 4,692 members were included.
[4] For July 1, 2020, includes 119 deferred beneficiaries who are entitled to future benefits. For July 1, 2019, 122 deferred beneficiaries were included.

Exhibit B – Members in Active Service as of July 1, 2020
By Age, Years of Service, and Average Covered Compensation

All Active Members

		Years of Service								
Age	**Total**	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40 & over**
Under 25	2,925	2,922	3	- -	- -	- -	- -	- -	- -	- -
	$61,273	$61,291	$43,827	- -	- -	- -	- -	- -	- -	- -
25 - 29	11,373	10,325	1,041	7	- -	- -	- -	- -	- -	- -
	$73,750	$73,999	$71,373	$60,204	- -	- -	- -	- -	- -	- -
30 - 34	17,451	11,955	4,749	732	15	- -	- -	- -	- -	- -
	$87,567	$88,189	$87,742	$76,647	$69,670	- -	- -	- -	- -	- -
35 - 39	20,434	10,155	6,220	3,456	586	17	- -	- -	- -	- -
	$98,903	$97,264	$104,318	$96,255	$86,150	$74,829	- -	- -	- -	- -
40 - 44	19,012	6,584	5,656	4,159	2,135	472	6	- -	- -	- -
	$107,384	$97,997	$116,501	$114,627	$100,689	$95,659	$98,141	- -	- -	- -
45 - 49	17,731	4,497	3,957	4,402	3,119	1,465	280	11	- -	- -
	$112,566	$99,322	$113,880	$122,909	$119,491	$105,188	$105,917	$102,994	- -	- -
50 - 54	16,347	3,311	2,997	3,346	3,375	2,117	893	298	10	- -
	$114,296	$96,196	$110,596	$116,876	$126,405	$126,537	$114,403	$100,257	$83,759	- -
55 - 59	14,797	2,526	2,262	2,633	2,788	2,144	1,417	857	168	2
	$115,640	$96,077	$110,441	$108,897	$118,854	$134,431	$138,886	$112,506	$112,554	$85,783
60 - 64	9,211	1,376	1,507	1,606	1,612	1,236	949	693	211	21
	$123,676	$100,224	$113,378	$107,871	$117,383	$133,122	$165,557	$166,134	$133,924	$138,403
65 - 69	3,908	503	599	637	673	444	392	397	221	42
	$144,324	$108,793	$122,309	$117,781	$132,421	$151,548	$176,805	$201,174	$217,536	$175,010
70 & over	1,764	200	206	237	255	173	148	155	157	233
	$180,393	$130,110	$141,429	$138,951	$168,613	$176,290	$194,530	$223,052	$233,792	$242,758
Total	**134,953**	**54,354**	**29,197**	**21,215**	**14,558**	**8,068**	**4,085**	**2,411**	**767**	**298**
	$105,263	**$89,356**	**$106,314**	**$111,523**	**$118,046**	**$126,295**	**$143,065**	**$148,070**	**$173,123**	**$224,802**

Average Age: 44.8
Average Years of Service: 9.4

Exhibit B – Members in Active Service as of July 1, 2020 (continued)
By Age, Years of Service, and Average Covered Compensation

1976 Tier Active Members[1]

		Years of Service								
Age	**Total**	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40 & over**
Under 25	2	2	- -	- -	- -	- -	- -	- -	- -	- -
	$82,640	$82,640	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	234	8	219	7	- -	- -	- -	- -	- -	- -
	$66,910	$72,429	$66,923	$60,204	- -	- -	- -	- -	- -	- -
30 - 34	2,964	33	2,212	704	15	- -	- -	- -	- -	- -
	$85,015	$74,699	$88,067	$76,238	$69,670	- -	- -	- -	- -	- -
35 - 39	7,012	45	3,086	3,288	576	17	- -	- -	- -	- -
	$98,137	$95,508	$103,113	$95,771	$85,877	$74,829	- -	- -	- -	- -
40 - 44	9,570	79	3,027	3,929	2,065	464	6	- -	- -	- -
	$112,035	$111,747	$119,181	$114,734	$100,267	$95,170	$98,141	- -	- -	- -
45 - 49	11,293	72	2,269	4,191	3,048	1,432	271	10	- -	- -
	$117,868	$114,316	$115,406	$123,193	$119,595	$105,316	$104,447	$105,211	- -	- -
50 - 54	11,420	52	1,671	3,169	3,281	2,070	870	297	10	- -
	$119,639	$101,795	$110,254	$116,421	$126,579	$126,701	$114,454	$100,407	$83,759	- -
55 - 59	11,060	51	1,287	2,483	2,698	2,117	1,404	851	167	2
	$120,301	$103,426	$110,048	$108,333	$118,509	$134,869	$139,013	$112,083	$111,659	$85,783
60 - 64	7,090	48	886	1,517	1,561	1,223	940	687	208	20
	$128,344	$108,544	$110,247	$106,616	$116,459	$133,274	$165,645	$166,367	$133,495	$139,156
65 - 69	3,165	32	380	621	655	436	386	394	219	42
	$150,355	$104,049	$119,913	$116,929	$131,706	$150,242	$176,812	$201,158	$217,972	$175,010
70 & over	1,547	53	150	233	252	172	146	153	156	232
	$186,461	$139,073	$137,102	$139,515	$168,101	$176,751	$195,112	$222,601	$233,495	$242,584
Total	**65,357**	**475**	**15,187**	**20,142**	**14,151**	**7,931**	**4,023**	**2,392**	**760**	**296**
	$118,278	**$107,463**	**$107,984**	**$111,254**	**$117,840**	**$126,457**	**$143,198**	**$147,937**	**$172,911**	**$224,948**

Average Age: 50.8
Average Years of Service: 15.7

[1] Includes active members with Tier Two benefits.

Exhibit B – Members in Active Service as of July 1, 2020 (continued)
By Age, Years of Service, and Average Covered Compensation

2013 Tier Active Members[1]

		Years of Service								
Age	**Total**	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40 & over**
Under 25	97	97	- -	- -	- -	- -	- -	- -	- -	- -
	$63,896	$63,896	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	1,705	1,213	492	- -	- -	- -	- -	- -	- -	- -
	$66,486	$65,282	$69,456	- -	- -	- -	- -	- -	- -	- -
30 - 34	3,090	1,645	1,433	12	- -	- -	- -	- -	- -	- -
	$80,251	$78,769	$81,927	$83,256	- -	- -	- -	- -	- -	- -
35 - 39	4,151	2,038	2,050	62	1	- -	- -	- -	- -	- -
	$103,428	$100,274	$106,838	$94,243	$108,018	- -	- -	- -	- -	- -
40 - 44	3,338	1,381	1,855	83	17	2	- -	- -	- -	- -
	$112,691	$107,926	$116,399	$112,715	$92,722	$131,877	- -	- -	- -	- -
45 - 49	2,066	879	1,067	82	27	10	1	- -	- -	- -
	$112,753	$109,702	$115,268	$117,848	$110,803	$83,335	$39,648	- -	- -	- -
50 - 54	1,529	596	789	77	38	18	10	1	- -	- -
	$114,995	$110,627	$118,082	$118,414	$115,549	$124,885	$91,457	$55,795	- -	- -
55 - 59	1,272	546	610	52	45	11	6	2	- -	- -
	$116,674	$110,168	$119,938	$129,096	$144,638	$90,633	$79,208	$200,931	- -	- -
60 - 64	836	335	411	47	24	9	5	4	1	- -
	$125,024	$116,736	$127,697	$142,231	$143,268	$116,649	$161,307	$172,169	$262,046	- -
65 - 69	363	180	151	9	14	4	3	1	1	- -
	$135,490	$126,920	$138,033	$136,857	$161,742	$258,927	$148,824	$259,970	$256,130	- -
70 & over	114	61	48	1	1	1	1	- -	1	- -
	$157,273	$150,717	$161,990	$130,105	$229,550	$97,000	$223,074	- -	$280,116	- -
Total	**18,561**	**8,971**	**8,906**	**425**	**167**	**55**	**26**	**8**	**3**	**- -**
	$102,464	**$96,090**	**$107,448**	**$117,032**	**$128,790**	**$118,628**	**$111,752**	**$175,788**	**$266,097**	**- -**

Average Age: 42.2
Average Years of Service: 5.3

[1] Includes multi-tier active members earning future service under the 2013 Tier.

Exhibit B – Members in Active Service as of July 1, 2020 (continued)
By Age, Years of Service, and Average Covered Compensation

Modified 2013 Tier Active Members[1]

		Years of Service								
Age	**Total**	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40 & over**
Under 25	1,750	1,747	3	- -	- -	- -	- -	- -	- -	- -
	$62,835	$62,868	$43,827	- -	- -	- -	- -	- -	- -	- -
25 - 29	5,533	5,227	306	- -	- -	- -	- -	- -	- -	- -
	$83,286	$83,694	$76,321	- -	- -	- -	- -	- -	- -	- -
30 - 34	6,731	5,733	989	9	- -	- -	- -	- -	- -	- -
	$96,940	$97,308	$94,841	$93,039	- -	- -	- -	- -	- -	- -
35 - 39	4,810	3,830	926	53	1	- -	- -	- -	- -	- -
	$101,068	$100,643	$102,140	$113,499	$77,838	- -	- -	- -	- -	- -
40 - 44	2,917	2,217	619	65	13	3	- -	- -	- -	- -
	$99,252	$97,777	$102,561	$118,050	$100,948	$91,789	- -	- -	- -	- -
45 - 49	2,157	1,617	471	54	12	2	- -	1	- -	- -
	$98,437	$96,417	$103,061	$119,396	$100,285	$74,355	- -	$80,829	- -	- -
50 - 54	1,628	1,155	406	39	19	8	1	- -	- -	- -
	$91,023	$87,969	$93,848	$136,807	$122,492	$95,207	$54,096	- -	- -	- -
55 - 59	1,181	831	273	47	20	8	1	1	- -	- -
	$85,149	$83,517	$84,145	$116,768	$97,200	$78,101	$70,521	$59,224	- -	- -
60 - 64	613	417	161	17	16	1	1	- -	- -	- -
	$84,338	$81,467	$84,809	$112,738	$124,359	$127,427	$39,899	- -	- -	- -
65 - 69	189	131	55	1	- -	- -	1	- -	1	- -
	$87,580	$86,439	$88,361	$160,316	- -	- -	$125,408	- -	$83,495	- -
70 & over	40	32	5	1	1	- -	- -	1	- -	- -
	$79,605	$78,821	$90,842	$69,282	$48,248	- -	- -	$90,169	- -	- -
Total	**27,549**	**22,937**	**4,214**	**286**	**82**	**22**	**4**	**3**	**1**	**- -**
	$91,889	**$90,776**	**$95,856**	**$118,682**	**$108,572**	**$88,089**	**$72,481**	**$76,740**	**$83,495**	**- -**

Average Age: 37.2
Average Years of Service: 3.1

[1] Includes multi-tier active members earning future service under the Modified 2013 Tier.

Exhibit B – Members in Active Service as of July 1, 2020 (continued)
By Age, Years of Service, and Average Covered Compensation

2016 Tier Active Members[1]

		Years of Service								
Age	**Total**	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40 & over**
Under 25	1,070	1,070	- -	- -	- -	- -	- -	- -	- -	- -
	$58,340	$58,340	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	3,844	3,832	12	- -	- -	- -	- -	- -	- -	- -
	$63,355	$63,347	$66,124	- -	- -	- -	- -	- -	- -	- -
30 - 34	4,612	4,526	83	3	- -	- -	- -	- -	- -	- -
	$80,216	$80,127	$84,935	$84,602	- -	- -	- -	- -	- -	- -
35 - 39	4,397	4,224	141	29	3	- -	- -	- -	- -	- -
	$93,133	$92,716	$105,608	$95,792	$67,664	- -	- -	- -	- -	- -
40 - 44	3,116	2,897	147	59	13	- -	- -	- -	- -	- -
	$94,498	$93,026	$120,617	$100,017	$102,020	- -	- -	- -	- -	- -
45 - 49	2,153	1,920	145	59	17	12	- -	- -	- -	- -
	$97,996	$96,418	$113,896	$108,501	$115,641	$81,707	- -	- -	- -	- -
50 - 54	1,707	1,482	127	53	26	14	5	- -	- -	- -
	$99,268	$96,174	$121,975	$126,523	$105,126	$111,063	$87,050	- -	- -	- -
55 - 59	1,251	1,088	82	49	20	6	5	1	- -	- -
	$101,337	$97,920	$126,442	$107,687	$127,876	$136,120	$193,445	$248,971	- -	- -
60 - 64	662	573	45	24	10	3	3	2	2	- -
	$108,253	$103,320	$143,746	$115,714	$190,980	$122,460	$186,920	$74,145	$114,567	- -
65 - 69	187	160	11	6	2	4	2	2	- -	- -
	$115,891	$107,650	$151,296	$170,181	$90,202	$186,476	$243,145	$174,823	- -	- -
70 & over	63	54	3	2	1	- -	1	1	- -	1
	$137,235	$128,429	$113,112	$112,611	$357,189	- -	$80,925	$425,000	- -	$282,965
Total	**23,062**	**21,826**	**796**	**284**	**92**	**39**	**16**	**6**	**2**	**1**
	$86,249	**$84,601**	**$114,712**	**$110,353**	**$122,101**	**$114,497**	**$158,153**	**$195,318**	**$114,567**	**$282,965**

Average Age: 39.0
Average Years of Service: 2.2

[1] Includes multi-tier active members earning future service under the 2016 Tier.

Exhibit B – Members in Active Service as of July 1, 2020 (continued)
By Age, Years of Service, and Average Covered Compensation

Active Safety Members

		Years of Service								
Age	**Total**	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40 & over**
Under 25	6	6	- -	- -	- -	- -	- -	- -	- -	- -
	$78,858	$78,858	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	57	45	12	- -	- -	- -	- -	- -	- -	- -
	$94,448	$90,238	$110,233	- -	- -	- -	- -	- -	- -	- -
30 - 34	54	18	32	4	- -	- -	- -	- -	- -	- -
	$105,933	$96,888	$113,517	$85,969	- -	- -	- -	- -	- -	- -
35 - 39	64	18	17	24	5	- -	- -	- -	- -	- -
	$123,108	$109,286	$126,846	$130,233	$125,957	- -	- -	- -	- -	- -
40 - 44	71	10	8	23	27	3	- -	- -	- -	- -
	$130,622	$107,081	$128,897	$131,113	$137,167	$151,015	- -	- -	- -	- -
45 - 49	62	9	5	16	15	9	8	- -	- -	- -
	$137,970	$107,142	$143,688	$139,376	$133,685	$147,129	$163,996	- -	- -	- -
50 - 54	63	26	4	8	11	7	7	- -	- -	- -
	$137,481	$120,911	$115,727	$120,985	$169,037	$149,231	$168,967	- -	- -	- -
55 - 59	33	10	10	2	5	2	1	2	1	- -
	$146,973	$132,531	$168,434	$128,209	$123,508	$132,220	$114,955	$162,514	$262,092	- -
60 - 64	10	3	4	1	1	- -	- -	- -	- -	1
	$133,297	$139,190	$143,826	$125,196	$91,562	- -	- -	- -	- -	$123,341
65 - 69	4	- -	2	- -	2	- -	- -	- -	- -	- -
	$184,201	- -	$164,648	- -	$203,754	- -	- -	- -	- -	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**424**	**145**	**94**	**78**	**66**	**21**	**16**	**2**	**1**	**1**
	$124,683	**$104,598**	**$126,736**	**$129,033**	**$141,130**	**$146,965**	**$163,106**	**$162,514**	**$262,092**	**$123,341**

Average Age: 42.4
Average Years of Service: 10.0

Exhibit C – Reconciliation of Member Data

	Active Members	Inactive Vested Members[1]	Retired Members	Disabled Members	Beneficiaries[2]	Total
Number as of July 1, 2019	**127,927**	**100,864**	**68,346**	**1,338**	**9,400**	**307,875**
New members	13,270	0	0	0	727[3]	13,997
Terminations – with vested rights	(6,253)	6,253	0	0	0	0
Contribution refunds[4]	(1,342)	(2,173)	0	(1)	0	(3,516)
Retirements	(2,146)	(779)	3,032	(107)	0	0
New disabilities	(57)	(37)	(16)	110	0	0
Lump sum cashouts	(326)	(374)	0	(16)	0	(716)
Benefits expired	0	0	0	0	0	0
Return to work	1,685	(1,669)	(15)	(1)	0	0
Died with or without beneficiary[5]	(130)	(1,098)	(1,457)	(35)	(375)	(3,095)
Data adjustments[6]	2,325	(1,831)	8	(38)	(155)	309
Number as of July 1, 2020	**134,953**	**99,156**	**69,898**	**1,250**	**9,597**	**314,854**

Note: There were approximately 44 QDRO/Alternate Payees who received a lump sum cashout during 2019-2020.

[1] Includes inactive non-vested members due a refund of member contributions or CAP balance payment and members that transferred to the LANS or LLNS defined benefit plans who will be entitled to a CAP balance payment from UCRP after they separate employment with LANS or LLNS.
[2] Includes 119 deferred beneficiaries who are entitled to future benefits as of July 1, 2020. Includes 122 deferred beneficiaries as of July 1, 2019.
[3] Includes 54 new QDRO/Alternate Payees.
[4] Includes those members who terminated and received a refund of member contributions or a distribution of their CAP balance.
[5] Includes 1,088 members who were reported with a date of death prior to July 2, 2019 for the first time in the July 1, 2020 data.
[6] Active counts increased by 2,351 and inactive vested member counts decreased by 1,851 in the July 1, 2019 revised data used in the June 30, 2020 GAS 67 and 68 report when compared to the data used in the July 1, 2019 funding valuation report.

Exhibit D – Summary Statement of Income and Expenses on a Market Value Basis

	Year Ended June 30, 2020 ($ in '000s)		Year Ended June 30, 2019 ($ in '000s)	
Net assets at market value at the beginning of the year		**$70,278,964**		**$66,773,590**
Contribution income:				
• Employer contributions[1]	$2,444,026		$2,408,651	
• Member contributions	1,019,302		956,544	
• Less administrative expenses	(65,990)		(61,982)	
Net contribution income		*$3,397,338*		*$3,303,213*
Investment income:				
• Interest and dividends	$1,084,966		$1,200,430	
• Asset appreciation	70,297		2,780,825	
• Securities lending income	86,692		143,036	
• Securities lending fees and rebates	(57,432)		(106,489)	
Net investment income		*$1,184,523*		*$4,017,802*
Other income:		*$414*		*$796*
Total income available for benefits		**$4,582,275**		**$7,321,811**
Less benefit payments:		**$(3,945,001)**		**$(3,816,437)**
Change in net assets at market value		**$637,274**		**$3,505,374**
Net assets at market value at the end of the year		**$70,916,238**		**$70,278,964**

Note: Results may not add due to rounding.

[1] Including STIP Transfers of $500.0 million for 2019-2020 and $500.0 million for 2018-2019. Also includes employer contributions towards paying down UCRP's UAAL on behalf of members in the Savings Choice Plan.

Exhibit E – Summary Statement of Plan Assets

	Year Ended June 30, 2020 ($ in '000s)		Year Ended June 30, 2019 ($ in '000s)	
Cash equivalents		*$1,441,794*		*$2,362,543*
Accounts receivable:				
• Contributions	$175,635		$168,199	
• Interest and dividends	38,184		55,394	
• Investment of cash collateral	4,618,840		3,933,691	
• Securities sales and other	2,042,218		1,025,833	
Total accounts receivable		*$6,874,877*		*$5,183,117*
Investments:				
• Equity securities	$31,912,027		$26,847,780	
• Fixed income securities	12,961,756		13,875,271	
• Real estate	5,141,921		5,459,971	
• Commingled funds	20,272,590		22,583,780	
• Derivative investments	(2,481)		3,697	
Total investments at market value		*$70,285,813*		*$68,770,499*
Total assets		**$78,602,484**		**$76,316,161**
Accounts payable:				
• Payable for securities purchased	$(2,368,735)		$(1,726,625)	
• Member withdrawals, refunds and other	(698,622)		(377,960)	
• Collateral held for securities lending	(4,618,889)		(3,932,612)	
Total accounts payable		**$(7,686,246)**		**$(6,037,197)**
Net assets at market value		**$70,916,238**		**$70,278,964**
Net assets at actuarial value		**$73,318,652**		**$70,170,196**

Note: Results may not add due to rounding.

Exhibit F – Table of Amortization Bases

Non-Laboratory Segment of UCRP

Type	Date Established	Initial Amount ($ in '000s)	Initial Period	Outstanding Balance ($ in '000s)	Years Remaining	Annual Payment[1] ($ in '000s)
Restart Amortization[2]	July 1, 2010	$5,389,886	30	$4,632,568	20	$401,706
Actuarial Loss	July 1, 2011	905,208	30	794,851	21	67,343
Change in Assumptions	July 1, 2011	1,513,127	15	799,269	6	155,870
Plan Amendment	July 1, 2011	(59,179)	15	(31,260)	6	(6,096)
Actuarial Loss	July 1, 2012	2,457,582	30	2,200,506	22	182,513
Actuarial Loss	July 1, 2013	1,866,282	30	1,701,130	23	138,367
Actuarial Gain	July 1, 2014	(886,657)	30	(821,492)	24	(65,630)
Actuarial Gain	July 1, 2015	(1,440,456)	20	(1,240,938)	15	(125,625)
Change in Assumptions	July 1, 2015	1,850,713	20	1,594,370	15	161,404
Actuarial Loss	July 1, 2016	450,296	20	402,062	16	39,212
Actuarial Gain	July 1, 2017	(452,535)	20	(417,311)	17	(39,350)
Actuarial Gain	July 1, 2018	(208,223)	20	(197,702)	18	(18,080)
Actuarial Loss	July 1, 2019	157,072	20	153,135	19	13,620
Change in Assumptions	July 1, 2019	6,850,706	20	6,678,981	19	594,049
Actuarial Loss	July 1, 2020	2,481,861	20	2,481,861	20	215,211
Total				**$18,730,030**		**$1,714,514**

The average effective remaining amortization period as of July 1, 2020 is 17.97 years.

Note: Effective with the July 1, 2015 valuation, the Regents approved a change to the amortization periods used for actuarial experience gains and changes in actuarial assumptions to be 20 years. The amortization periods for amortization bases established in prior valuations are not affected.

[1] Level dollar amount. Payment shown is as of beginning of year. The amounts shown are based on results for the non-laboratory segment of UCRP (i.e., campuses, medical centers and Hastings College of Law). They are used in the determination of the total funding policy contribution shown in *Section 2, Subsection F*, page 30. For more details on the UCRP funding policy please see *Section 4, Exhibit III*.

[2] The July 1, 2010 amortization bases were combined into a single amortization base and amortized over 30 years as a level dollar amount.

Exhibit G – Projection of UAAL Balances and Payments

Outstanding Balance of $18.73 Billion in Net UAAL as of July 1, 2020

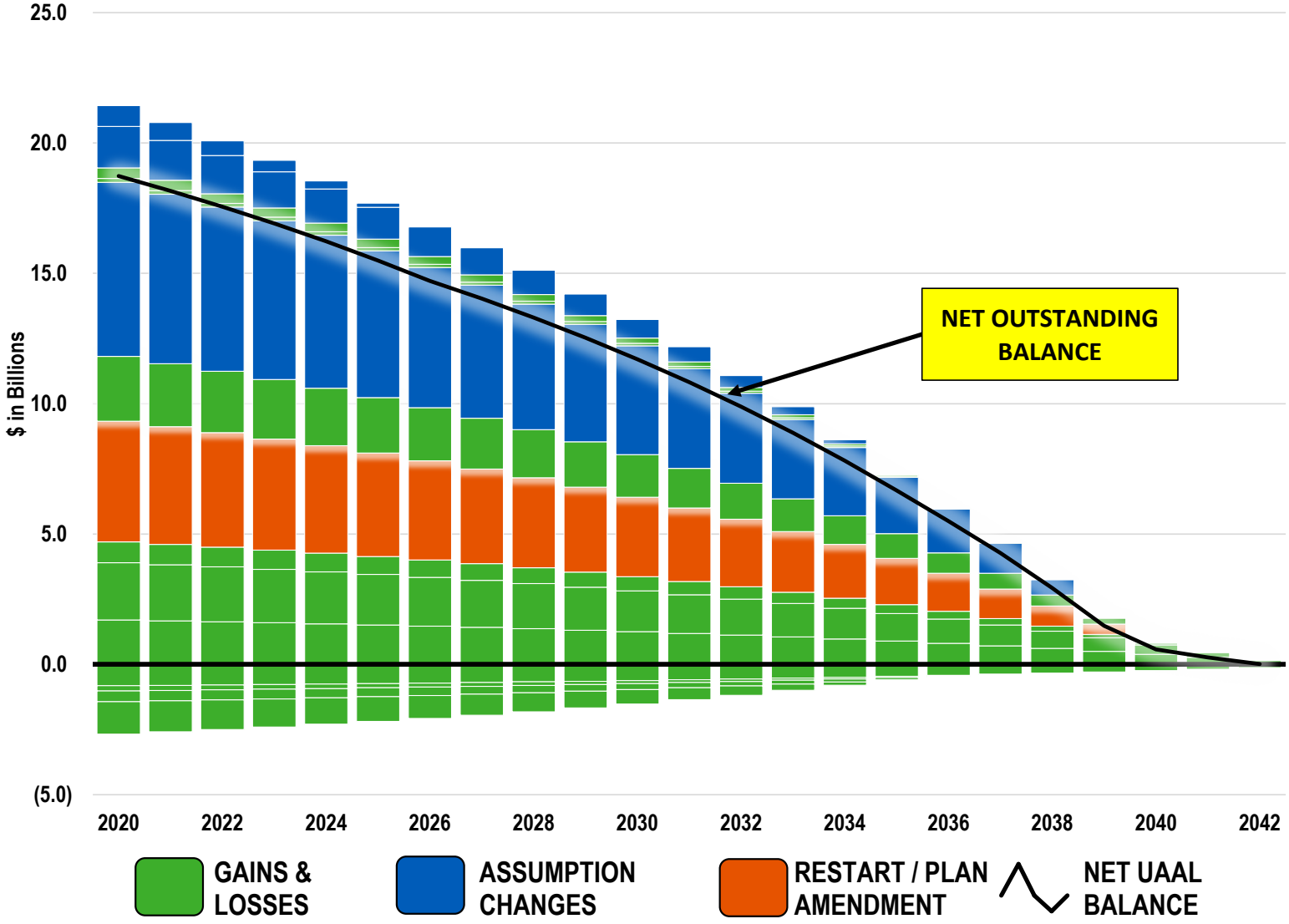


Exhibit G – Projection of UAAL Balances and Payments (continued)

Annual Payments Required to Amortize $18.73 Billion in Net UAAL as of July 1, 2020

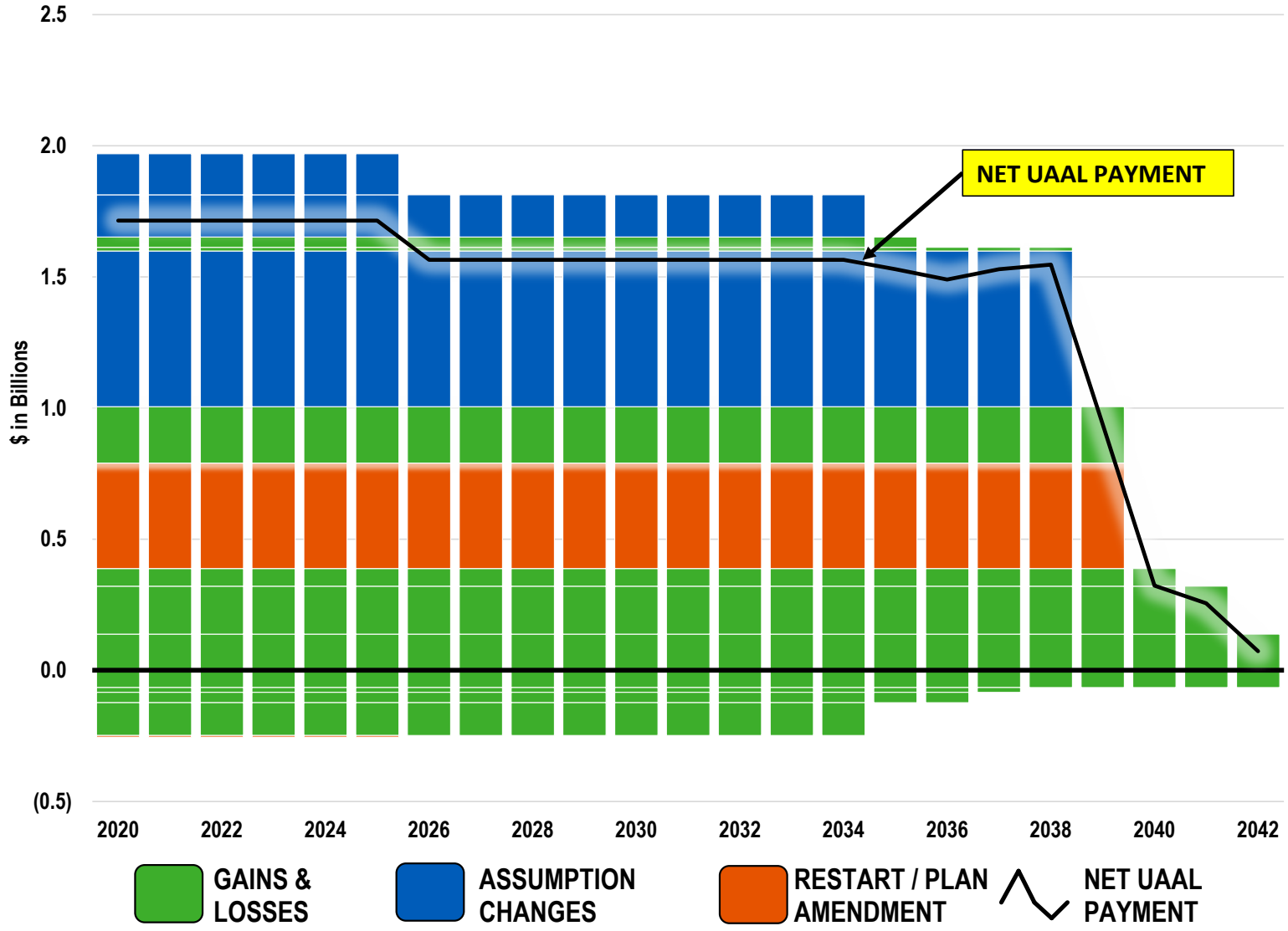


Exhibit H – Definition of Pension Terms

The following list defines certain technical terms for the convenience of the reader:

Actuarial Accrued Liability for Actives:	The equivalent of the accumulated Normal Costs allocated to the years before the valuation date.
Actuarial Accrued Liability for Pensioners and Beneficiaries:	Actuarial Present Value of lifetime benefits to existing pensioners and beneficiaries. This sum takes account of life expectancies appropriate to the ages of the annuitants and the interest that the sum is expected to earn before it is entirely paid out in benefits.
Actuarial Cost Method:	A procedure allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability that are used to determine the recommended contribution.
Actuarial Gain or Loss:	A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., assets earn more than projected, salary increases are less than assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results yield actuarial liabilities that are larger than projected.
Actuarially Equivalent:	Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial Present Value (APV):	The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. Each such amount or series of amounts is: Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.) Multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination, etc.) on which the payment is conditioned, and Discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Section 3: Supplemental Information

Actuarial Present Value of Future Benefits:	The Actuarial Present Value of benefit amounts expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, anticipated future compensation, and future service credits. The Actuarial Present Value of Future Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive members entitled to either a refund of member contributions or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.
Actuarial Valuation:	The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan, as well as Actuarially Determined Contributions.
Actuarial Value of Assets (AVA):	The value of the Plan's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly plans use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the Actuarially Determined Contribution.
Actuarially Determined:	Values that have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the Plan.
Actuarially Determined Contribution (ADC) or Total Funding Policy Contribution:	The contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the Plan's funding policy. The ADC consists of the employer Normal Cost and the Amortization Payment.
Amortization Method:	A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the Unfunded Actuarial Accrued Liability. Under the Level Percentage of Pay method, the Amortization Payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the Unfunded Actuarial Accrued Liability. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.
Amortization Payment:	The portion of the pension plan contribution, or ADC, that is intended to pay off the Unfunded Actuarial Accrued Liability.

Section 3: Supplemental Information

Assumptions or Actuarial Assumptions:	The estimates upon which the cost of the Plan is calculated, including: • Investment return - the rate of investment yield that the Plan will earn over the long-term future; • Mortality rates - the rate or probability of death at a given age for employees and pensioners; • Retirement rates - the rate or probability of retirement at a given age or service; • Disability rates – the rate or probability of disability retirement at a given age; • Termination rates - the rate or probability at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement; • Salary increase rates - the rates of salary increase due to inflation, real wage growth and merit and promotion increases.
Closed Amortization Period:	A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 20 years, it is 19 years at the end of one year, 18 years at the end of two years, etc. See Open Amortization Period.
Decrements:	Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.
Defined Benefit Plan:	A retirement plan in which benefits are defined by a formula based on the member's compensation, age and/or years of service.
Defined Contribution Plan:	A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.
Experience Study:	A periodic review and analysis of the actual experience of the Plan that may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified based on recommendations from the Actuary.
Funded Ratio:	The ratio of the Actuarial Value of Assets (AVA) to the Actuarial Accrued Liability (AAL). Plans sometimes also calculate a market funded ratio, using the Market Value of Assets (MVA), rather than the AVA.
Investment Return:	The rate of earnings of the Plan from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.
Normal Cost:	The portion of the Actuarial Present Value of Future Benefits and expenses allocated to a valuation year by the Actuarial Cost Method. Any payment with respect to an Unfunded Actuarial Accrued Liability is not part of the Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of member contributions and employer Normal Cost unless otherwise specifically stated.

Section 3: Supplemental Information

Open Amortization Period:	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. If the initial period is set as 30 years, the same 30-year period is used in each future year in determining the Amortization Period.
Unfunded Actuarial Accrued Liability:	The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative, in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus or an Overfunded Actuarial Accrued Liability.
Valuation Date or Actuarial Valuation Date:	The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Benefits is determined. The expected benefits to be paid in the future are discounted to this date.

Section 4: Actuarial Valuation Basis

Exhibit I – Actuarial Assumptions and Methods

Rationale for Assumptions:

The information and analysis used in selecting most of the assumptions that have a significant effect on this actuarial valuation are shown in the July 1, 2014 through June 30, 2018 Actuarial Experience Study report dated July 2, 2019. The Regents of the University of California approved a net investment return assumption, inflation assumption, and various salary assumptions that differ from what was shown in that report. The assumptions adopted by the Regents are generally more conservative than those recommended in that study.

Economic Assumptions

Net Investment Return:	6.75%; net of investment expenses (including 2.50% for inflation). Based on the Actuarial Experience Study reference above, expected investment expenses represent about 0.80% of the Market Value of Assets.
Consumer Price Index:	Increase of 2.50% per year. COLA increases are assumed to be 2.00% per year.
Administrative Expenses:	0.40% of payroll added to Normal Cost.
Increase in Internal Revenue Code Section 401(a)(17) and PEPRA Compensation Limit:	Increase of 2.50% per year from the valuation date.
Increase in 415 Dollar Limit:	Increase of 2.50% per year from the valuation date.

Section 4: Actuarial Valuation Basis

Salary Increases:

The annual rate of compensation increase includes: inflation at 2.50%, plus "across the board" salary increases of 0.75% per year, plus the following merit and promotion increases:

Years of Service	Rate (%)	
	Faculty	Staff & Safety
Less than 1	2.70	2.50
1 – 2	2.70	2.30
2 – 3	2.65	2.10
3 – 4	2.65	1.90
4 – 5	2.65	1.80
5 – 6	2.65	1.65
6 – 7	2.60	1.50
7 – 8	2.60	1.45
8 – 9	2.55	1.40
9 – 10	2.50	1.35
10 – 11	2.40	1.25
11 – 12	2.40	1.10
12 – 13	2.30	1.00
13 – 14	2.20	1.00
14 – 15	2.10	0.95
15 – 16	2.00	0.95
16 – 17	2.00	0.90
17 – 18	2.00	0.85
18 – 19	2.00	0.80
19 – 20	2.00	0.80
20 – 21	2.00	0.75
21 – 22	2.00	0.70
22 – 23	2.00	0.65
23 – 24	2.00	0.65
24 – 25	2.00	0.65
25 – 26	1.90	0.65
26 – 27	1.80	0.65
27 – 28	1.70	0.65
28 – 29	1.60	0.65
29 – 30	1.50	0.50
30 & Over	1.25	0.40

Demographic Assumptions

Post-Retirement Mortality Rates:

Healthy

- **Faculty Members:** Pub-2010 Healthy Teacher Amount-Weighted Above-Median Mortality Table multiplied by 90% for males and 95% for females, projected generationally with the two-dimensional mortality improvement scale MP-2018.
- **Staff & Safety Members:** Pub-2010 Healthy Teacher Amount-Weighted Above-Median Mortality Table multiplied by 100% for males and 110% for females, projected generationally with the two-dimensional mortality improvement scale MP-2018.

Disabled

- Pub-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Table, projected generationally with the two-dimensional mortality improvement scale MP-2018.

Beneficiaries

- Pub-2010 Contingent Survivor Amount-Weighted Above-Median Mortality Table multiplied by 100% for males and 90% for females, projected generationally with the two-dimensional mortality improvement scale MP-2018.

The Pub-2010 mortality tables and adjustments as shown above reasonably reflect the mortality experience as of the measurement date. These mortality tables were adjusted to future years using the generational projection to reflect future mortality improvement between the measurement date and those years.

Pre-Retirement Mortality Rates:

- Pub-2010 Teacher Employee Amount-Weighted Above-Median Mortality Table, projected generationally with the two-dimensional mortality improvement scale MP-2018.

	Rate (%)	
Age	Male	Female
20	0.03	0.01
25	0.02	0.01
30	0.02	0.01
35	0.03	0.02
40	0.04	0.03
45	0.06	0.05
50	0.10	0.07
55	0.16	0.10
60	0.24	0.15
65	0.39	0.25

All pre-retirement deaths are assumed to be non-duty related.

Note: Generational projections beyond the base year (2010) are not reflected in the above mortality rates.

Section 4: Actuarial Valuation Basis

Disability Incidence:

Age	Rate (%) Male	Female
20	0.01	0.01
25	0.01	0.01
30	0.02	0.02
35	0.03	0.03
40	0.05	0.08
45	0.08	0.14
50	0.13	0.22
55	0.18	0.28
60	0.20	0.30
65	0.15	0.23
70	0.12	0.18

All disabilities are assumed to be non-duty related.

Section 4: Actuarial Valuation Basis

Termination:

Years of Service	Rate (%)	
	Faculty	Staff & Safety
Less than 1	21.00	20.00
1 – 2	13.00	17.50
2 – 3	8.75	14.00
3 – 4	7.25	11.00
4 – 5	5.75	9.25
5 – 6	5.50	8.75
6 – 7	5.25	7.50
7 – 8	5.00	6.75
8 – 9	4.50	5.75
9 – 10	4.00	5.25
10 – 11	3.50	4.75
11 – 12	3.25	4.25
12 – 13	3.00	4.00
13 – 14	2.75	3.75
14 – 15	2.50	3.50
15 – 16	2.25	3.25
16 – 17	2.00	3.00
17 – 18	1.75	2.75
18 – 19	1.50	2.50
19 – 20	1.50	2.25
20 & Over	1.25	2.00

The greater of a refund of member contributions and a deferred annuity or lump sum is valued when a member terminates.

No termination is assumed after a member is first assumed to retire.

Section 4: Actuarial Valuation Basis

Retirement Rates:

	Retirement Rates[1] (%)						
	1976 Tier Faculty[2]		2013 & 2016 Tier Faculty[2]		1976 Tier Staff[3]		
Age	Less than 20 Years	20 & More Years	Less than 20 Years	20 & More Years	Less than 10 Years	10 – 20 Years	20 & More Years
50	1.00	1.15	0.00	0.00	2.25	3.00	5.25
51	1.00	1.15	0.00	0.00	1.50	2.00	3.50
52	1.00	1.15	0.00	0.00	1.88	2.50	4.38
53	1.00	1.15	0.00	0.00	1.88	2.50	4.38
54	1.00	1.15	0.00	0.00	2.25	3.00	5.25
55	1.50	1.73	1.00	1.15	3.00	4.00	7.00
56	1.50	1.73	1.00	1.15	3.38	4.50	7.88
57	1.50	1.73	1.00	1.15	3.38	4.50	7.88
58	1.50	1.73	1.00	1.15	4.50	6.00	10.50
59	2.75	3.16	1.00	1.15	7.13	9.50	16.63
60	4.00	4.60	1.50	1.73	8.25	11.00	19.25
61	4.50	5.18	1.50	1.73	9.75	13.00	22.75
62	5.00	5.75	1.50	1.73	11.25	15.00	26.25
63	5.00	5.75	1.50	1.73	12.00	16.00	28.00
64	6.00	6.90	2.75	3.16	14.25	19.00	28.00
65	8.00	9.20	20.00	23.00	22.50	25.00	25.00
66	8.00	9.20	15.00	17.25	22.50	25.00	25.00
67	10.00	11.50	15.00	17.25	22.50	25.00	25.00
68	10.00	11.50	15.00	17.25	22.50	25.00	25.00
69	13.00	14.95	13.00	14.95	22.50	25.00	25.00
70	13.00	14.95	13.00	14.95	22.50	25.00	25.00
71	13.00	14.95	13.00	14.95	22.50	25.00	25.00
72	13.00	14.95	13.00	14.95	22.50	25.00	25.00
73	13.00	14.95	13.00	14.95	22.50	25.00	25.00
74	13.00	14.95	13.00	14.95	22.50	25.00	25.00
75	13.00	14.95	13.00	14.95	100.00	100.00	100.00
76	13.00	14.95	13.00	14.95	100.00	100.00	100.00
77	13.00	14.95	13.00	14.95	100.00	100.00	100.00
78	13.00	14.95	13.00	14.95	100.00	100.00	100.00
79	13.00	14.95	13.00	14.95	100.00	100.00	100.00
80 & Over	100.00	100.00	100.00	100.00	100.00	100.00	100.00

[1] Retirement rate assumptions for all tiers are set to zero until the next July 1 following the valuation date. In other words, we assume no retirements until the next July 1. Rates are rounded to two decimals for illustration only.

[2] These rates are first developed for members with less than 20 years of service. 115% of the base rates are then used for members with 20 or more years of service.

[3] These rates are first developed for members with 10 to 20 years of service. For ages under 65, 75% of the base rates are used for those with less than 10 years of service. For ages under 65, 175% of the base rates are used for those with 20 or more years of service, except the age 64 rate is set equal to age 63. For ages over 65, 90% of the base rates are used for those with less than 10 years of service.

Section 4: Actuarial Valuation Basis

Retirement Rates (continued):

	Retirement Rates[1] (%)						
	Modified 2013 Tier Staff[2]			2013 & 2016 Tier Staff[2]			
Age	Less than 10 Years	10 – 20 Years	20 & More Years	Less than 10 Years	10 – 20 Years	20 & More Years	Safety
50	1.31	1.75	3.06	0.00	0.00	0.00	22.00
51	1.13	1.50	2.63	0.00	0.00	0.00	17.00
52	1.13	1.50	2.63	0.00	0.00	0.00	8.00
53	1.13	1.50	2.63	0.00	0.00	0.00	15.00
54	1.31	1.75	3.06	0.00	0.00	0.00	20.00
55	1.50	2.00	3.50	2.25	3.00	5.25	20.00
56	1.88	2.50	4.38	1.50	2.00	3.50	25.00
57	2.06	2.75	4.81	1.88	2.50	4.38	25.00
58	2.25	3.00	5.25	1.88	2.50	4.38	25.00
59	3.94	5.25	9.19	2.25	3.00	5.25	25.00
60	8.25	11.00	19.25	3.00	4.00	7.00	25.00
61	7.13	9.50	16.63	3.38	4.50	7.88	35.00
62	7.13	9.50	16.63	3.38	4.50	7.88	35.00
63	7.50	10.00	17.50	4.50	6.00	10.50	40.00
64	8.63	11.50	17.50	7.13	9.50	10.50	50.00
65	36.00	40.00	40.00	31.50	35.00	35.00	100.00
66	27.00	30.00	30.00	31.50	35.00	35.00	100.00
67	27.00	30.00	30.00	31.50	35.00	35.00	100.00
68	27.00	30.00	30.00	27.00	30.00	30.00	100.00
69	22.50	25.00	25.00	22.50	25.00	25.00	100.00
70	22.50	25.00	25.00	22.50	25.00	25.00	100.00
71	22.50	25.00	25.00	22.50	25.00	25.00	100.00
72	22.50	25.00	25.00	22.50	25.00	25.00	100.00
73	22.50	25.00	25.00	22.50	25.00	25.00	100.00
74	22.50	25.00	25.00	22.50	25.00	25.00	100.00
75	100.00	100.00	100.00	100.00	100.00	100.00	100.00
76	100.00	100.00	100.00	100.00	100.00	100.00	100.00
77	100.00	100.00	100.00	100.00	100.00	100.00	100.00
78	100.00	100.00	100.00	100.00	100.00	100.00	100.00
79	100.00	100.00	100.00	100.00	100.00	100.00	100.00
80 & Over	100.00	100.00	100.00	100.00	100.00	100.00	100.00

[1] Retirement rate assumptions for all tiers are set to zero until the next July 1 following the valuation date. In other words, we assume no retirements until the next July 1. Rates are rounded to two decimals for illustration only.

[2] These rates are first developed for members with 10 to 20 years of service. For ages under 65, 75% of the base rates are used for those with less than 10 years of service. For ages under 65, 175% of the base rates are used for those with 20 or more years of service, except the age 64 rate is set equal to age 63. For ages over 65, 90% of the base rates are used for those with less than 10 years of service.

Section 4: Actuarial Valuation Basis

Members with Tier Two Benefits:	Assumptions specific to the 1976 Tier are also applied to members with Tier Two Benefits.
Retirement Age for Deferred Vested Members:	Safety, 1976 Tier and Modified 2013 Tier: Age 60 2013 Tier and 2016 Tier: Age 63
Benefit for Inactive Non-Vested Members:	For current inactive non-vested members, 5-year certain only annuity of member contributions and CAP balance. For future inactive non-vested members, an immediate refund is valued.
Disability Income Cross Over Age:	Age 65.
Inactive COLA for Future Retirements:	For future retirements from active status, a 2.00% increase in 1976 Tier and Safety benefits is reflected.
Future Benefit Accruals:	1.0 year of service per year for the full-time employees. Part-time employees are assumed to earn full-time service for all future years.
Unknown Data for Members:	Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.
Definition of Active Members:	All members of UCRP who are not separated from active membership as of the valuation date or have not started receiving a monthly pension on or before the valuation date.
Percent with Eligible Survivors:	For all active and inactive members, 80% of male members and 60% of female members are assumed to have Eligible Survivors at time of pre-retirement death, retirement, or disability.
Eligible Survivor Gender and Age:	For all active and inactive members, male members are assumed to have a female Eligible Survivor who is three years younger than the member and female members are assumed to have a male Eligible Survivor who is two years older than the member.
Number of Survivors:	The assumed number of survivors per Active Member who is assumed to have a survivor is as follows:

Age	Male Member	Female Member
20	1.00	1.00
25	1.80	2.10
30	2.20	2.70
35	2.70	2.80
40	3.00	2.40
45	2.80	2.10
50	2.50	1.70
55	2.00	1.40
60	1.50	1.20
65	1.30	1.10

Section 4: Actuarial Valuation Basis

Sick Leave:	Only for purposes of determining projected benefits, service has been increased by 0.15% for Faculty, 1.50% for Staff, and 2.00% for Safety members to account for unused sick leave. This assumption applies only for members retiring from active membership and not electing a Lump Sum Cashout. For all other benefits there is assumed to be no conversion of unused sick leave to Service Credit.
Form of Payment:	It is assumed that a percentage of 1976 and Modified 2013 Tier future retirees will elect a Lump Sum Cashout (see Lump Sum Assumptions) and the remaining will elect an annuity benefit. 1976 Tier future retirees not electing a Lump Sum Cashout: • Life annuity for members without an Eligible Survivor; • 25% contingent annuity for 1976 Tier Members with Social Security who have an Eligible Survivor; • 50% contingent annuity for 1976 Tier Members without Social Security who have an Eligible Survivor; • 50% contingent annuity for members with Safety Benefits who have an Eligible Survivor. 2013 Tier and 2016 Tier future retirees are assumed to elect a life annuity. Modified 2013 Tier future retirees not electing a Lump Sum Cashout are assumed to elect a life annuity.
Lump Sum Assumptions:	*Conversion Basis* Discount Rate: 6.75% COLA: 2.00% Member Mortality: Pub-2010 Healthy Teacher Amount-Weighted Above-Median Mortality Table multiplied by 95% for males and 105% for females, projected 20 years (from 2010) with the two-dimensional mortality improvement scale MP-2018; weighted 40% male and 60% female. Beneficiary Mortality: Pub-2010 Contingent Survivor Amount-Weighted Above-Median Mortality Table multiplied by 100% for males and 90% for females, projected 20 years (from 2010) with the two-dimensional mortality improvement scale MP-2018; weighted 60% male and 40% female.

Lump Sum Assumptions (continued):

Take-Rate for Members Electing a Lump Sum Cashout:

Years of Service	Rate (%) Actives	Inactives	Disability Cross Overs
Less than 5	40.00	45.00	19.00
5 – 6	40.00	45.00	19.00
6 – 7	39.00	45.00	19.00
7 – 8	38.00	45.00	18.00
8 – 9	35.00	45.00	15.00
9 – 10	25.00	42.00	15.00
10 – 11	21.00	42.00	12.00
11 – 12	18.00	40.00	12.00
12 – 13	17.00	40.00	12.00
13 – 14	16.00	40.00	12.00
14 – 15	15.00	40.00	12.00
15 – 16	14.00	40.00	7.00
16 – 17	13.00	35.00	7.00
17 – 18	12.00	35.00	7.00
18 – 19	10.00	35.00	7.00
19 – 20	9.00	30.00	7.00
20 – 21	8.00	25.00	5.00
21 – 22	8.00	25.00	5.00
22 – 23	7.00	25.00	5.00
23 – 24	7.00	25.00	5.00
24 – 25	7.00	25.00	5.00
25 – 26	6.00	17.00	4.00
26 – 27	5.00	17.00	4.00
27 – 28	5.00	17.00	4.00
28 – 29	5.00	17.00	4.00
29 – 30	5.00	17.00	4.00
30 & Over	4.00	12.00	2.00

Changes in Actuarial Assumptions: There have been no changes in actuarial assumptions since the prior valuation.

Actuarial Funding Policy

Actuarial Cost Method: Entry Age Actuarial Cost Method. Entry Age is calculated as the age on the valuation date minus years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salaries as if the current benefit accrual rate has always been in effect (“replacement life within each tier”).

Actuarial Value of Assets:	The Market Value of Assets less unrecognized returns in each of the last five years. Unrecognized returns are equal to the difference between the actual market return and the expected return on the market value, and are recognized over a five-year period. The Actuarial Value of Assets allocated to the non-laboratory segment is approximated as the total UCRP actuarial value multiplied by the ratio of the market value of the non-laboratory segment allocated assets to the total UCRP market value.
Covered Payroll:	Covered compensation for a Plan Year is determined by annualizing actual payroll for the prior Plan Year increased by the total assumed salary increases. Covered payroll shown for the 2021-2022 Plan Year is based on the assumptions used in the projections for Scenario #1 in *Appendix A*, with the additional assumption that eligible future hires for LBNL will have an election rate of 45% Savings Choice and 55% Pension Choice (UCRP 2016 Tier). Covered payroll is covered compensation reduced to anticipate members who leave active status during the year.

Other Actuarial Methods

Internal Revenue Code Section 415:	Section 415 of the Internal Revenue Code (IRC) specifies the maximum benefits that may be paid to an individual from a defined benefit plan and the maximum amounts that may be allocated each year to an individual's account in a defined contribution plan. A qualified pension plan may not pay benefits in excess of the Section 415 limits. The ultimate penalty for non-compliance is disqualification: active participants could be taxed on their vested benefits and the IRS may seek to tax the income earned on the plan's assets. In particular, Section 415(b) of the IRC limits the maximum annual benefit payable at the Normal Retirement Age to a dollar limit of $160,000 indexed for inflation. That limit is $225,000 for 2019 and $230,000 for 2020. Normal Retirement Age for these purposes is age 62. These are the limits in simplified terms. They must be adjusted based on each participant's circumstances, for such things as age at retirement, form of benefits chosen and after tax contributions. The University pays benefits in excess of the limits through a 415(m) Restoration Plan. These costs are excluded in this valuation. Legal Counsel's review and interpretation of the law and regulations should be sought on any questions in this regard.

Segal valuation results are based on proprietary actuarial modeling software. The actuarial valuation models generate a comprehensive set of liability and cost calculations that are presented to meet regulatory, legislative and client requirements. Deterministic cost projections are based on a proprietary forecasting model. Our Actuarial Technology and Systems unit, comprised of both actuaries and programmers, is responsible for the initial development and maintenance of these models. The models have a modular structure that allows for a high degree of accuracy, flexibility and user control. The client team programs the assumptions and the plan provisions, validates the models, and reviews test lives and results, under the supervision of the responsible actuary.

Exhibit II – Summary of Plan Provisions

This exhibit summarizes the major provisions of the Plan included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Effective Date:	April 24, 1954. Includes amendments through July 1, 2020.
Plan Year:	July 1 through June 30
Covered Employees:	Generally all employees who are not members of another retirement system to which the Regents contribute, and who: • Are appointed to work 50% time or more for one year or longer or • Have generally accumulated at least 1,000 hours in a 12-month period.
Membership Classification:	Members are divided into four classes: (1) Members with Coordinated Benefits (covered under Social Security); (2) Members with Non-Coordinated Benefits (not covered under Social Security); (3) Members with Tier Two Benefits; and (4) Members with Safety Benefits. The classes of Members with Coordinated Benefits and Members with Non-Coordinated Benefits have the following member tiers: the 1976 Tier, the 2013 Tier, the Modified 2013 Tier, and the 2016 Tier. Generally, members hired before July 1, 2013 accrue service under the 1976 Tier, members hired on or after July 1, 2013 and before July 1, 2016 accrue service under the 2013 Tier, and members hired on or after July 1, 2016 and elect to be covered under UCRP accrue service under the 2016 Tier. Members who are represented by the CNA, UPTE, and AFSCME bargaining units, who were generally hired (or rehired after a break in service) on or after July 1, 2013 accrue service under the Modified 2013 Tier. A member who has service credit in two or more tiers is referred to as a multi-tier member. Unless otherwise noted, the Plan provisions for Members with Tier Two Benefits are the same as those shown for 1976 Tier Members.
Highest Average Plan Compensation (HAPC):	Highest average monthly full-time-equivalent base compensation rate received during any period of 36 consecutive months.

Section 4: Actuarial Valuation Basis

Compensation Limit:

1976 Tier Service, 2013 Tier Service, Modified 2013 Tier Service & Safety Service

Annual compensation is limited based on Internal Revenue Code (IRC) Section 401(a)(17).

The limit for the Plan Year beginning July 1, 2020 is $285,000 for employees who became members on or after July 1, 1994. The limit is $425,000 for those active members who became employees before July 1, 1994. The compensation limit is indexed for inflation on an annual basis.

2016 Tier Service

Annual compensation is limited similar to the limit prescribed by the California Public Employees' Pension Reform Act of 2013 (PEPRA).

The limit for the Plan Year beginning July 1, 2020 is $126,291 ($151,549 for members with Non-Coordinated benefits). The PEPRA compensation limit is indexed for inflation on an annual basis.

Age Factor:

Percentage of HAPC per year of service credit (interpolated for fractional ages).

1976 Tier Service & Modified 2013 Tier Service

Age	Factor	Age	Factor
50	1.10%	56	1.94%
51	1.24%	57	2.08%
52	1.38%	58	2.22%
53	1.52%	59	2.36%
54	1.66%	60 & Over	2.50%
55	1.80%		

2013 Tier Service & 2016 Tier Service

Age	Factor	Age	Factor
55	1.10%	61	1.94%
56	1.24%	62	2.08%
57	1.38%	63	2.22%
58	1.52%	64	2.36%
59	1.66%	65 & Over	2.50%
60	1.80%		

Safety Service

3.0% at all ages 50 and above.

Tier Two Service

Equal to one-half of the Age Factor for 1976 Tier Service.

Benefit Percentage:

Age Factor multiplied by years of service credit.

Section 4: Actuarial Valuation Basis

Basic Retirement Income (BRI):	
1976 Tier Members with Social Security	Benefit Percentage x HAPC in excess of $133 per month.
All other Members, except Multi-Tier Members	Benefit Percentage x HAPC.
Multi-Tier Members	The applicable benefit percentages from the 1976 Tier, the 2013 Tier, the Modified 2013 Tier and the 2016 Tier are multiplied by HAPC or HAPC - $133, if applicable. These benefits are subject to a limit of 100% of HAPC or HAPC - $133, if applicable.
Service Retirement:	
Eligibility	Age 50 (age 55 for the 2013 Tier and the 2016 Tier) with 5 years of service credit, or Age 62 regardless of service credit if membership began on or before July 1, 1989, or Retirement on Normal Retirement Date.
Benefit	BRI.
Form of Payment	Single Life Annuity plus any Postretirement Survivor Continuance.
Optional Forms of Payment	Full continuance to contingent annuitant; two-thirds continuance to contingent annuitant; one-half continuance to contingent annuitant; one-half continuance (including Postretirement Survivor Continuance) to surviving spouse or domestic partner (for 1976 Tier Members with Social Security only).
Lump Sum Cashout	May be elected in lieu of non-2013 Tier and non-2016 Tier monthly retirement income.
Temporary Social Security Supplement:	
Eligibility	For 1976 Tier Members with Social Security and retirement must occur before age 65.
Benefit	Annuity in the amount of $133 per month multiplied by 1976 Tier Benefit Percentage.
Form of Payment	Temporary Single Life Annuity plus any Postretirement Survivor Continuance payable to age 65.
Optional Forms of Payment	None.
Disability Income:	
Eligibility	Disablement after five years of service credit. Safety members are eligible for duty disability without regard to years of service credit. Service credit continues to accrue during disabled period.

Section 4: Actuarial Valuation Basis

Disability Income (continued):	
Benefit	
1976 Tier Members without Social Security & Members with Safety Benefits (Non-duty)	The sum of: • 25% of final salary, plus • 5% of final salary per year of service credit greater than two, total not to exceed 40% of final salary, plus • 5% of final salary for each eligible child, total not to exceed 20% of final salary.
1976 Tier Members with Social Security	The sum of: • 15% of final salary, plus • 2.5% of final salary per year of service credit greater than two, total not to exceed 40% of final salary, less • $106.40 per month.
2013 Tier Members, Modified 2013 Tier Members & 2016 Tier Members	The sum of: • 13.1% of final salary, plus • 1.7% of final salary per year of service credit greater than five, total not to exceed 25% of final salary.
Multi-Tier Members	Benefit calculated for each tier is multiplied by the ratio of service credit accrued under that tier to total service. Not less than the result under the 1976 Tier benefit formula using 1976 Tier service only.
Members with Safety Benefits (Duty)	50% of HAPC, or non-duty disability benefit if greater.
Form of Payment	Single life annuity payable until end of disability income period or retirement date if earlier.
Disability Income Period	
Members disabled before November 5, 1990	The earliest of: • Date member is eligible to retire and retirement income equals or exceeds disability income, • Age 62 (age 67 for members without Social Security), or • Date member retires.
Members disabled on or after November 5, 1990	*If under age 65 at disablement:* • 1976 Tier Members with Social Security, 2013 Tier Members, Modified 2013 Tier Members and 2016 Tier Members: – The later of age 65 or five years. • 1976 Tier Members without Social Security and Safety Members: – The later of age 67 or five years. *If age 65 or older at disablement:* • The later of age 70 or 12 months. Disability income ends if member is no longer disabled.

Vested Termination:

Eligibility: Five years of service credit, or age 62 regardless of service credit if membership began on or before July 1, 1989.

Benefit: BRI beginning at age 50 or later, calculated using HAPC at termination date, adjusting for CPI changes (see Cost-of-Living Adjustment), and benefit formula in effect when benefits commence.

2013 Tier and 2016 Tier benefits cannot commence earlier than age 55.

HAPC for the 2013 Tier, the Modified 2013 Tier and the 2016 Tier benefit is not adjusted for CPI changes.

Form of Payment: Same as for service retirement.

Optional Forms of Payment: Same as for service retirement.

Refund Option: Member may elect a refund of contributions with interest, thereby forfeiting all other benefits.

Lump Sum Cashout: May be elected in lieu of non-2013 Tier and non-2016 Tier retirement income, available only if at least age 50 with five years of service credit at date of termination.

Preretirement Survivor Income:

Eligibility: Eligible survivor of deceased active or disabled member with two or more years of service credit; no service requirement for duty-related death of Safety Member.

Benefit

1976 Tier Members without Social Security & Members with Safety Benefits (Non-Duty Death): Percent of final salary as follows:

Eligible Survivors	Percent	Minimum Benefit
1	25%	$200
2	35%	$300
3	40%	$300 plus 5% of final salary
4	45%	$300 plus 10% of final salary
5 or More	50%	$300 plus 15% of final salary

1976 Tier Members with Social Security: 25% of final salary less $106.40 per month.

2013 Tier Members, Modified 2013 Tier Members & 2016 Tier Members: 15% of final salary.

Multi-Tier Members: Benefit calculated for each tier is multiplied by the ratio of service credit accrued under that tier to total service.

Preretirement Survivor Income (continued):

Benefit (continued)

Members with Safety Benefits (Duty Death)

Percentage of HAPC as follows, but not less than benefit for non-duty death:

Eligible Survivors	Percent of HAPC
1	50.0%
2	62.5%
3	70.0%
4 or More	75.0%

Death while eligible to retire

Eligibility

Surviving spouse or surviving domestic partner of active, disabled or inactive member who dies while eligible to retire.

Benefit

Greater of benefit described above or monthly benefit (including the Temporary Social Security Supplement) to eligible spouse or eligible domestic partner assuming member had retired on date of death and elected full continuance option with spouse or domestic partner as contingent annuitant.

Postretirement Survivor Continuance:

Eligibility

Eligible surviving spouse, eligible surviving domestic partner, eligible children or eligible dependent parent of deceased retired member. Not applicable for 2013 Tier, Modified 2013 Tier and 2016 Tier benefit for multi-tier members, 2013 Tier Members, Modified 2013 Tier Members, or 2016 Tier Members.

Benefit

1976 Tier Members without Social Security

50% of BRI including COLA.

1976 Tier Members with Social Security

25% of BRI including COLA, plus 25% of Temporary Social Security Supplement (ends when member would have reached age 65).

Members with Safety Benefits

50% of BRI including COLA.

Section 4: Actuarial Valuation Basis

Lump Sum Death Benefit:	
Eligibility	Beneficiary of active, inactive, disabled, or retired member.
Basic Benefit	
Active member who became a member before October 1, 1990	Greater of: • $1,500 plus one month's final salary, or • $7,500.
All others	$7,500
Residual Benefit	Refund of member contributions plus interest, reduced by a portion of benefits received (100% of retirement income, 50% of preretirement survivor income or disability income) payable to beneficiary if no survivor, surviving spouse, domestic partner, or contingent annuitant.
Normal Retirement Age:	
Members with Safety Benefits	Attainment of age 50 with five years of service credit.
All Other Members	Attainment of age 60 (age 65 for the 2013 Tier and the 2016 Tier) with five years of service credit.
Eligible Survivor:	
Eligible Spouse or Domestic Partner	Spouse or domestic partner of deceased active or disabled member in relationship for at least one year before date of death and who is: • Responsible for care of eligible child, • Disabled, or • Age 60 (age 50 if spouse of member without Social Security and in Plan prior to October 19, 1973).
Eligible Child	Child that is either under age 18, under age 22 and a full-time student, or disabled, if disability occurred prior to age 18 or age 22 if a full-time student.
Eligible Dependent Parent	Parent of deceased active, disabled or retired member, supported by 50% or more by member for one year prior to earliest of death, disablement or retirement.
Inactive Member:	Former UCRP member who retains right to vested benefits.
Cost-of-Living Adjustment:	
Eligibility	Retired members, survivors, disabled members, and contingent annuitants receiving retirement income with benefits in pay status one or more years on July 1. For multi-tier members, separate dates apply to 1976 Tier, 2013 Tier and 2016 Tier benefits based on the dates those benefits start.
Basic	100% of annual Consumer Price Index (CPI) increase up to 2% per year.

Section 4: Actuarial Valuation Basis

Cost-of-Living Adjustment (continued):	
Supplemental	Generally 75% of annual CPI increase above 4%. The sum of the Basic and Supplemental COLA's cannot exceed 6% in a year.
1976 Tier and Members with Safety Benefits	HAPC (used to calculate retirement income) adjusted for COLA up to 2% per year from separation date to retirement date; retirement income adjusted using COLA formula.
Disabled members receiving disability income since before November 5, 1990	HAPC (used to calculate retirement income) adjusted for COLA up to COLA formula above for years from disablement to retirement date.
Capital Accumulation Provision (CAP):	
Eligibility	Various UCRP non-retired members have CAP balances from allocations made periodically in the past. These balances are all vested.
Interest Credit	Regents' approved interest rate; currently 8.50% per year for pre-2002 CAPs and the assumed rate of investment return used in the actuarial valuation (currently 6.75%) for 2002 and later CAPs (CAP II).
Payment	Lump sum payment upon termination, retirement or death.
University Contributions:	Each year the Regents will determine the actual total contributions and the split between Member Contributions and University Contributions based on the total funding policy contribution and various other factors, including the availability of funds, the impact of employee contributions on the competitiveness of UC's total remuneration package, and collective bargaining. In no event will the University Contributions be lower than the Member Contributions. The total funding policy contribution is based on the Regents' funding policy as described in *Section 4, Exhibit III*. The Regents approved an employer contribution rate of 14% of covered compensation for the non-laboratory segment of UCRP starting July 1, 2014. The Regents approved increases of 0.50% per year, for six years starting July 1, 2020, for an ultimate employer contribution rate of 17% of covered compensation. Contributions for the LBNL, LLNL and LANL segments are based on the University's contracts with the Department of Energy. As of July 1, 2020, the contribution rate for both the non-laboratory segment and the LBNL segment is 14.5%. For new employees hired on or after July 1, 2016 that elect the defined contribution plan option ("Savings Choice"), the Regents approved an employer contribution rate of 6.0% (on pay up to the IRC Section 401(a)(17) limit) that goes towards funding the non-laboratory segment of UCRP's UAAL. This contribution rate is scheduled to increase by 0.50% per year, for six years, starting July 1, 2020, for an ultimate contribution rate of 9.0%. There is a corresponding employer contribution for LBNL members who elect the defined contribution plan option that goes towards funding the LBNL segment UAAL. As of July 1, 2020 the contribution rate for both the non-laboratory segment and the LBNL segment is 6.5%.

Section 4: Actuarial Valuation Basis

Member Contributions:	
1976 Tier Members	9% of covered compensation for members represented by the CNA, UPTE, or AFSCME bargaining units. 8% of covered compensation for all other 1976 Tier Members.
2013 Tier or 2016 Tier Members	7% of covered compensation.
Modified 2013 Tier Members	9% of covered compensation.
Members with Safety Benefits	9% of covered compensation.
Tier Two Members	None.
Offset	All contributions for 1976 Tier Members and members with Safety benefits are reduced by $19 per month.
Interest Credit	Regents' approved interest rate; currently 6.00% per year.
Cessation	Members are exempt from contributing once the Benefit Percentage reaches 100%.
Changes in Plan Provisions:	Members who are represented by the EX and SX bargaining units that were in the 2016 Tier, will accrue future service under the Modified 2013 Tier after ratification of contracts in early 2020. This change in Plan Provisions had no material impact on the Actuarial Accrued Liability as of July 1, 2020.

Note: The summary of major plan provisions is designed to outline principal plan benefits as interpreted for purposes of the actuarial valuation. If the University of California should find the plan summary not in accordance with the actual provisions, the University of California should alert the actuary so they can both be sure the proper provisions are valued.

Exhibit III – UCRP Funding Policy

Effective with the July 1, 2008 valuation, a funding policy was adopted that determines total funding policy contributions based on the Plan's Normal Cost adjusted by an amortization of any surplus or underfunding. The funding policy was last amended in September 2015, effective with the July 1, 2015 actuarial valuation.

The UCRP funding policy has the following structure and parameters:

1. The funding policy is effective with the July 1, 2008 actuarial valuation and determines total funding policy contributions starting with the Plan Year beginning July 1, 2009.
2. Each year the funding policy contributions would be effective for the Plan Year starting one year after the date of the actuarial valuation.
3. Each year the Regents will determine the actual total contributions and the split between Member Contributions and University Contributions based on the total funding policy contributions and various other factors, including the availability of funds, the impact of employee contributions on the competitiveness of UC's total remuneration package, and collective bargaining. In no event shall the University Contributions be lower than the Member Contributions.
4. The funding policy determines total funding policy contribution rates based on an actuarial valuation of the non-laboratory segment of UCRP (i.e., campuses, medical centers and Hastings College of the Law). The Lawrence Berkeley National Laboratory contributes accordingly to the funding policy outlined in the terms of the University's contract with the Department of Energy. The Lawrence Livermore National Laboratory and Los Alamos National Laboratory Retained Segments in UCRP are subject to the funding policies outlined in the University's contracts with the Department of Energy. Throughout this funding policy, the term "UCRP" refers to the non-laboratory segment of UCRP.
5. The total funding policy contributions to UCRP consists of the Normal Cost plus an amortization charge for any Unfunded Actuarial Accrued Liability (UAAL) or minus an amortization credit for any surplus.
6. The Regents' Consulting Actuary conducts an annual actuarial valuation of UCRP. The Normal Cost and the Actuarial Accrued Liability (AAL) in each actuarial valuation is determined under the Entry Age Actuarial Cost Method, using actuarial assumptions adopted by the Regents.
7. The asset smoothing method used to determine the Actuarial Value of Assets is based on the Market Value of Assets adjusted for "unrecognized returns" in each of the last five years. Unrecognized return is the difference between actual and expected returns on a market value basis and is recognized over a five-year period.

8. As of the original effective date of this policy, any initial surplus as of that date is amortized as a level dollar amount over a period of three years.
   a. Any changes in surplus after the effective date due to actuarial gains and losses (including contribution gains and losses) is amortized as a level dollar amount over 15 years.
   b. Any change in surplus due to a change in actuarial assumptions, cost method or asset smoothing method is amortized as a level dollar amount over 15 years.
   c. Any change in surplus due to a Plan amendment is amortized as a level dollar amount over 15 years.
   d. In the first year after the effective date when UCRP has a UAAL all amortization bases are considered fully amortized and contributions would be determined under the remaining provisions of this policy.
9. For any year when UCRP has a UAAL, the calculation of the UAAL would be maintained by source (as listed below) and each new portion of or change in UAAL is amortized as a level dollar amount over a fixed amortization period. For any UAAL identified prior to the July 1, 2015 actuarial valuation, the following applies:
   a. Any initial UAAL (after a period of surplus) or change in UAAL due to actuarial gains and losses (including contribution gains and losses) is amortized over 30 years.
   b. Any change in UAAL due to a change in actuarial assumptions, cost method or asset smoothing method is amortized over 15 years.
   c. Any change in UAAL due to a Plan amendment is amortized over 15 years, unless a shorter period is adopted by the Regents reflecting the nature of the Plan amendment.
10. For any UAAL identified beginning with the July 1, 2015 actuarial valuation (including the 2014-15 actuarial gain or loss), the following applies:
    a. Any initial UAAL (after a period of surplus) or change in UAAL due to actuarial gains and losses (including contribution gains and losses) is amortized over 20 years.
    b. Any change in UAAL due to a change in actuarial assumptions, cost method or asset smoothing method is amortized over 20 years.
    c. Any change in UAAL due to a Plan amendment affecting active members is amortized over 15 years.
    d. Any change in UAAL due to a Plan amendment affecting non-active members is amortized over 10 years.
11. For any year in which UCRP has a surplus, such surplus would be amortized as a level dollar amount over 30 years, and all prior UAAL amortization bases would be considered fully amortized.
12. Effective July 1, 2010, all UAAL amortization bases as of July 1, 2010 were combined and the combined base is amortized as a level dollar amount over 30 years.
13. This funding policy supersedes any previous funding policies.

Appendix A: Projections for Non-Laboratory Segment of UCRP

This appendix includes 20-year projections for the non-laboratory segment (i.e., campus and medical center segment) of UCRP under various scenarios. The results shown include employer contribution rates that have been approved by the Regents ("approved contributions"), the employer portion of the total funding policy contribution rates, Actuarial Accrued Liability (AAL), Actuarial Value of Assets (AVA) and funded ratios. A description of the actuarial assumptions and methods used in the projections is included at the end of this appendix.

Under each projection scenario shown we illustrate the impact of making the approved contributions versus the total funding policy contributions.

The approved contribution scenario includes the employer rate equal to 14.5% of covered compensation, increasing by 0.5% per year on each future July 1 to a maximum of 17%, and transfers from STIP of up to $600 million in 2020-2021, and $700 million in 2021-2022. For employees that elect the defined contribution plan ("Savings Choice") this scenario also includes the 6.5% of compensation (up to the IRC Section 401(a)(17) limit) contribution rate ("UAAL Surcharge") that goes towards paying down UCRP's Unfunded Actuarial Accrued Liability (UAAL). The UAAL Surcharge will also increase by 0.5% per year on each future July 1 to a maximum of 9%. All of these contributions have been approved by the Regents. The approved contributions do not include any future transfers from STIP or other sources except as noted above. In addition to these employer contributions, member contributions are also made to UCRP and are about 8% on average. The member contributions are also reflected in the projections, but are not displayed in the contribution rate graphs.

The total funding policy contribution scenario assumes that in addition to the above approved contributions, additional employer contributions (i.e., transfers from STIP, State Funding and/or other sources) will be made so that the total funding policy contribution will be contributed each year.

In general, funding for the laboratory segments of UCRP is governed by provisions of the contracts between UC and the DOE. Various funding projections for those segments are provided at least semi-annually to the DOE under separate cover in a specified format.

Scenario #1: 6.75% Market Value Return Per Year Beginning July 1, 2020 and 35% Savings Choice Election

The first (baseline) scenario shows results based on a 6.75% market value return per year beginning July 1, 2020 and a 35% Savings Choice election rate for eligible new hires on or after July 1, 2020.

Appendix A: Projections for Non-Laboratory Segment of UCRP

The first graph shows a comparison of the employer contribution rates. The red line is the approved employer contributions. As noted above, they include the STIP transfers and borrowing in the first two years and, after the phase-in of the employer contribution rate increase, are above the ultimate employer rate of 17% of compensation since the UAAL Surcharge is also included.

The blue line is the employer portion of the total funding policy contribution rate assuming that the total funding policy contribution is made each year. This rate declines for various reasons including the lower Normal Cost for future hires under the 2016 Tier, lower UAAL amortization rates when the level dollar payments are expressed as a percentage of an increasing amount of compensation, and lower dollar payments as UAAL amortization layers are paid off.

The green line is the employer portion of the total funding policy contribution rate assuming that only the approved contributions are made. The shortfall between the approved and total funding policy contributions is represented by the orange area in the graph. These shortfalls are recognized as actuarial losses under UCRP's funding policy and amortized over 20 years. Over time these losses lead to higher total funding policy contribution rates (green line) and increased contribution shortfalls represented by the yellow area.

The two graphs that follow show the projected AAL, AVA and funded ratios under the two different contribution levels. The projected results based on contributing the approved contributions are shown first followed by the projected results based on contributing the total funding policy contributions.

Based on contributing the approved contributions, the funded ratio (black line) increases gradually and is about 81% by 2039. The assets (AVA) increase at a slower pace than the AAL which results in an increase in the UAAL from about $18.7 billion in 2020 to about $33.4 billion in 2039.

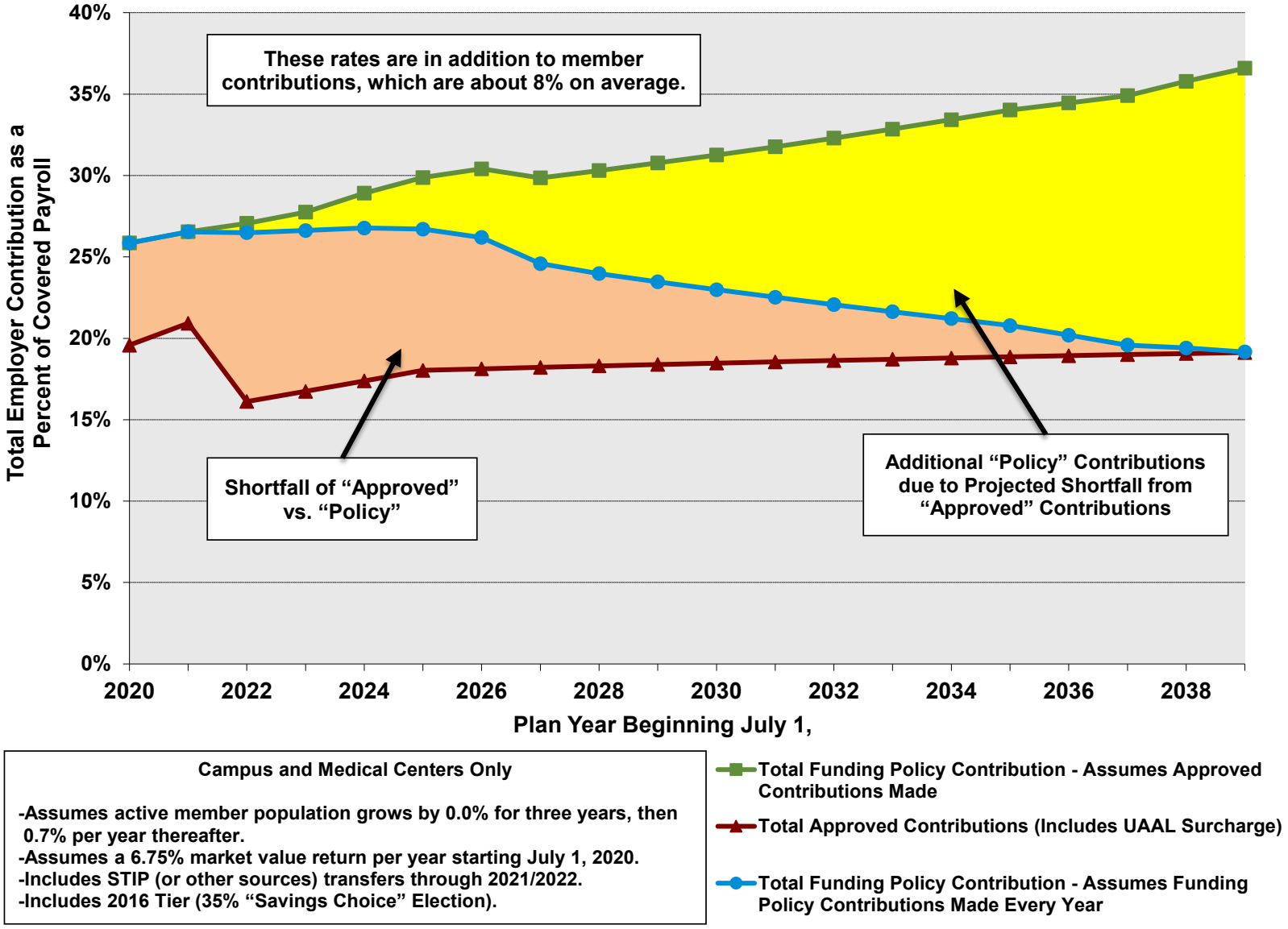
Based on contributing the total funding policy contributions, the funded ratio increases faster when compared to contributing the approved contributions and is nearly 100% by 2039 while the UAAL reduces to about $0.9 billion.

Our longer term projections indicate that the current assets combined with projected future approved contributions and investment earnings are expected to be sufficient to pay all future expected benefits for all plan members (both current and future).

Appendix A: Projections for Non-Laboratory Segment of UCRP

Scenario #1: 6.75% Market Value Return Per Year Beginning July 1, 2020 and 35% Savings Choice Election

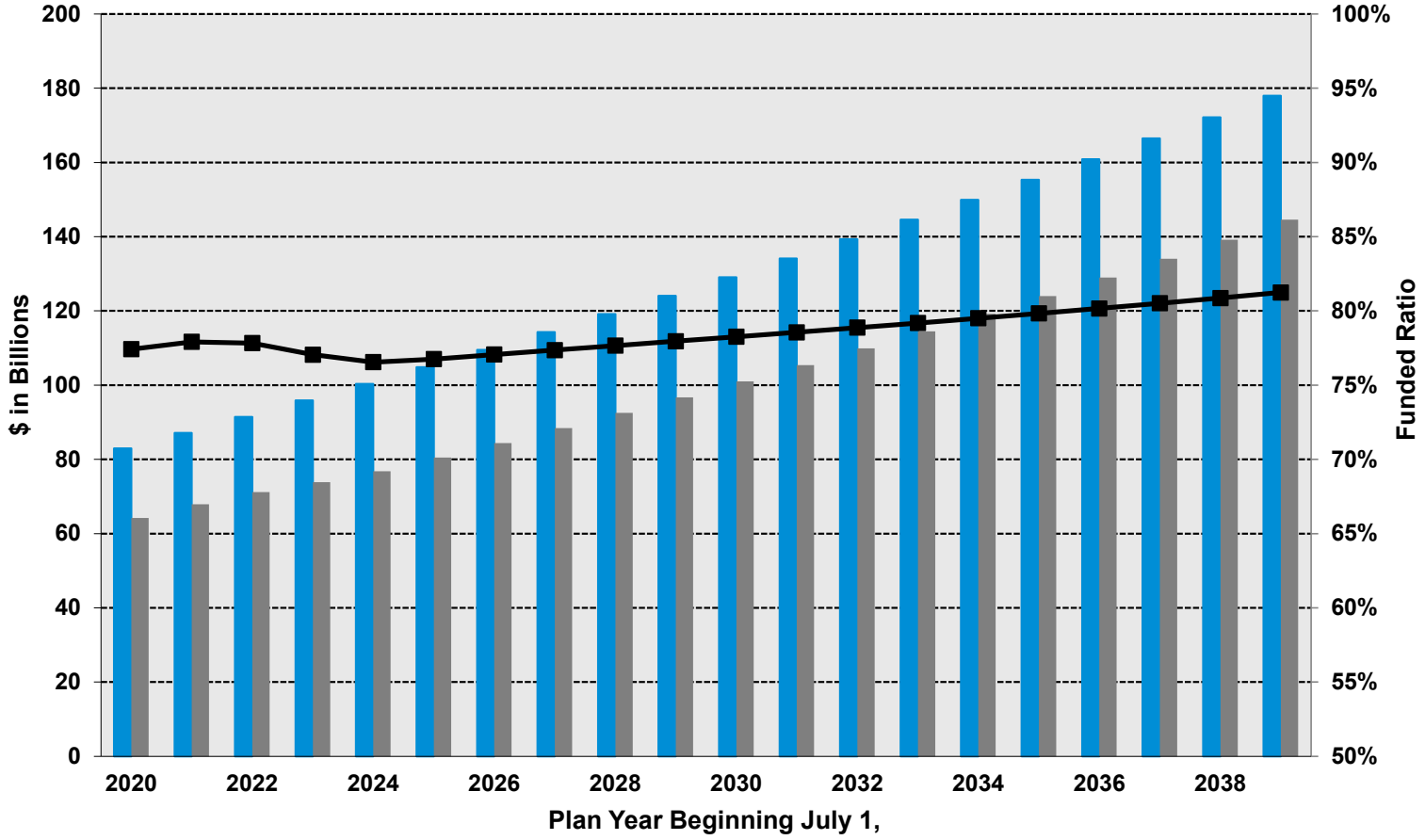
Projected UCRP Employer Contributions – Campus and Medical Center Segment Only



Appendix A: Projections for Non-Laboratory Segment of UCRP

Scenario #1: 6.75% Market Value Return Per Year Beginning July 1, 2020 and 35% Savings Choice Election

Projected UCRP Funded Ratio – Campus and Medical Center Segment Only
Approved Contribution Scenario



Campus and Medical Centers Only

-Assumes active member population grows by 0.0% for three years, then 0.7% per year thereafter.
-Assumes a 6.75% market value return per year starting July 1, 2020.
-Assumes approved contributions are paid each year.
-Includes STIP (or other sources) transfers through 2021/2022.
-Includes 2016 Tier (35% "Savings Choice" Election).

Actuarial Accrued Liability (AAL)

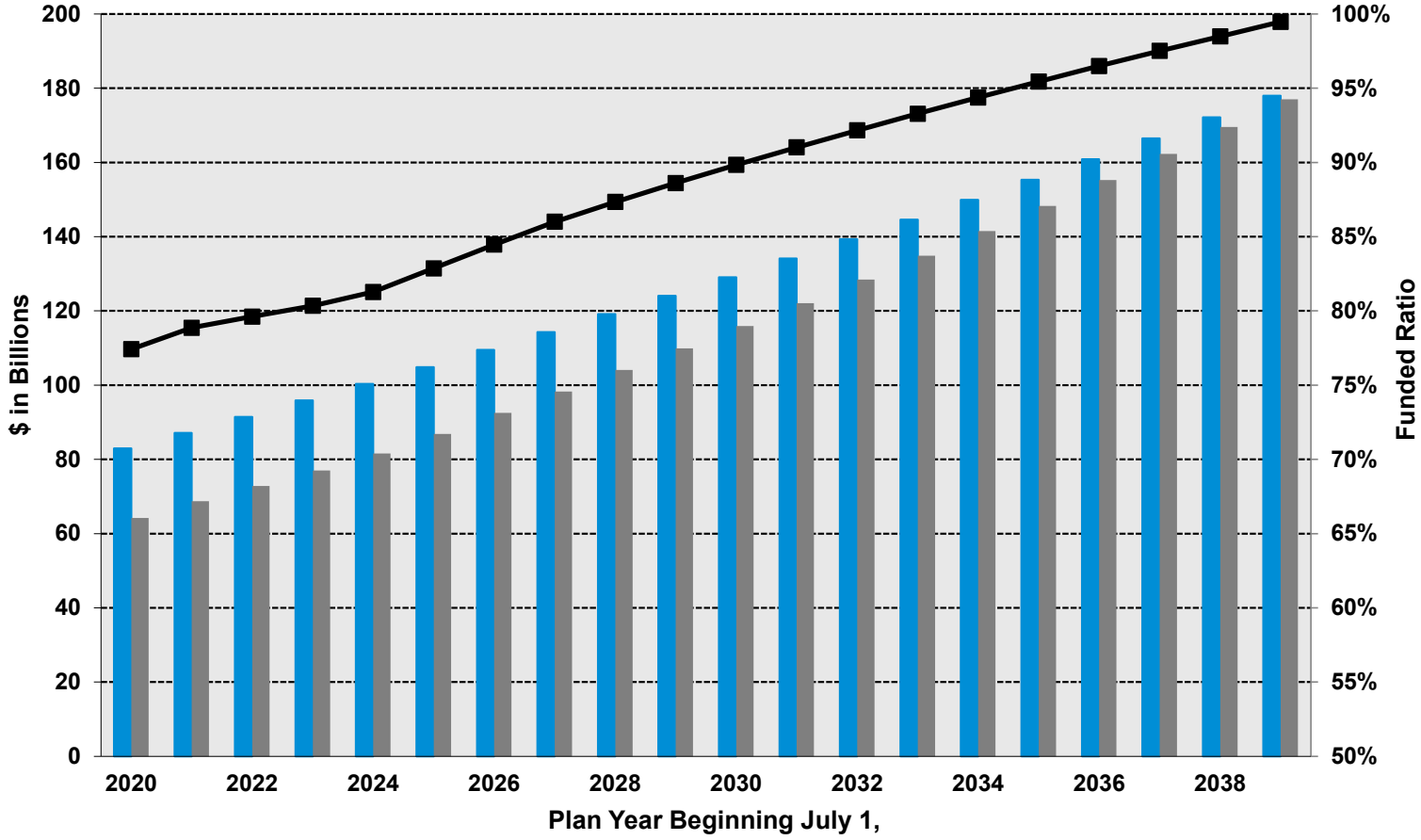
Actuarial Value of Assets (AVA)

Funded Ratio

Appendix A: Projections for Non-Laboratory Segment of UCRP

Scenario #1: 6.75% Market Value Return Per Year Beginning July 1, 2020 and 35% Savings Choice Election

Projected UCRP Funded Ratio – Campus and Medical Center Segment Only
Total Funding Policy Contribution Scenario



Campus and Medical Centers Only

-Assumes active member population grows by 0.0% for three years, then 0.7% per year thereafter.
-Assumes a 6.75% market value return per year starting July 1, 2020.
-Assumes total funding policy contributions are paid each year.
-Includes 2016 Tier (35% "Savings Choice" Election).

Actuarial Accrued Liability (AAL)

Actuarial Value of Assets (AVA)

Funded Ratio

Appendix A: Projections for Non-Laboratory Segment of UCRP

Scenario #2: 0% Actual Market Value Return During 2020-2021 and 35% Savings Choice Election

The second scenario is the same as the first, except that we assume a 0% market value return during 2020-2021. Returns of 6.75% per year are assumed thereafter. This projection illustrates the impact of one year of low investment returns.

The green line (total funding policy contribution rates based on contributing the approved contributions) shows an increase over the period and by 2039 is about 8% of compensation higher than in Scenario #1.

Based on contributing the approved contributions, the projected funded ratios decrease from 2020 to 2025 and then begins to slowly increase from 71.6% in 2025 to 73.6% in 2039, while the UAAL increases from $18.7 billion in 2020 to about $46.9 billion in 2039.

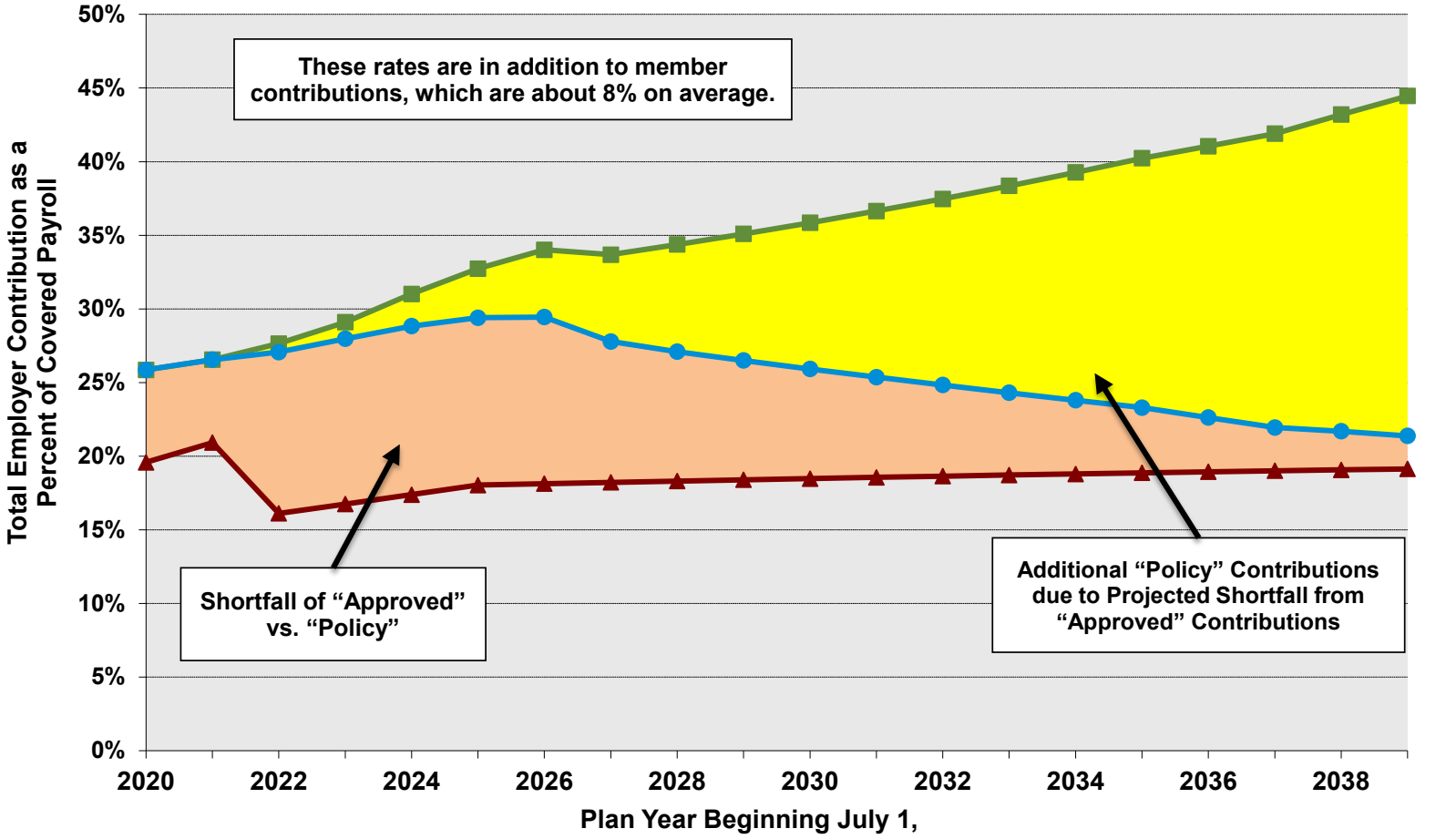
Based on contributing the total funding policy contributions, the funded ratio still increases over time as a result of the higher contributions being made which are about 2% higher in 2039 as compared to Scenario #1, while the UAAL is $1.5 billion higher. The funded ratio is expected to reach 100% in 2041, which is one year later than expected when contributing the total funding policy contributions under Scenario #1.

Our longer term projections indicate that, under Scenario #2, the current assets combined with projected future approved contributions and investment earnings are expected to be sufficient to pay future expected benefits for current plan members only. Payment of a portion of the benefits for future plan members is expected to require additional contributions to be made in the future.

Appendix A: Projections for Non-Laboratory Segment of UCRP

Scenario #2: 0% Actual Market Value Return During 2020-2021 and 35% Savings Choice Election

Projected UCRP Employer Contributions – Campus and Medical Center Segment Only



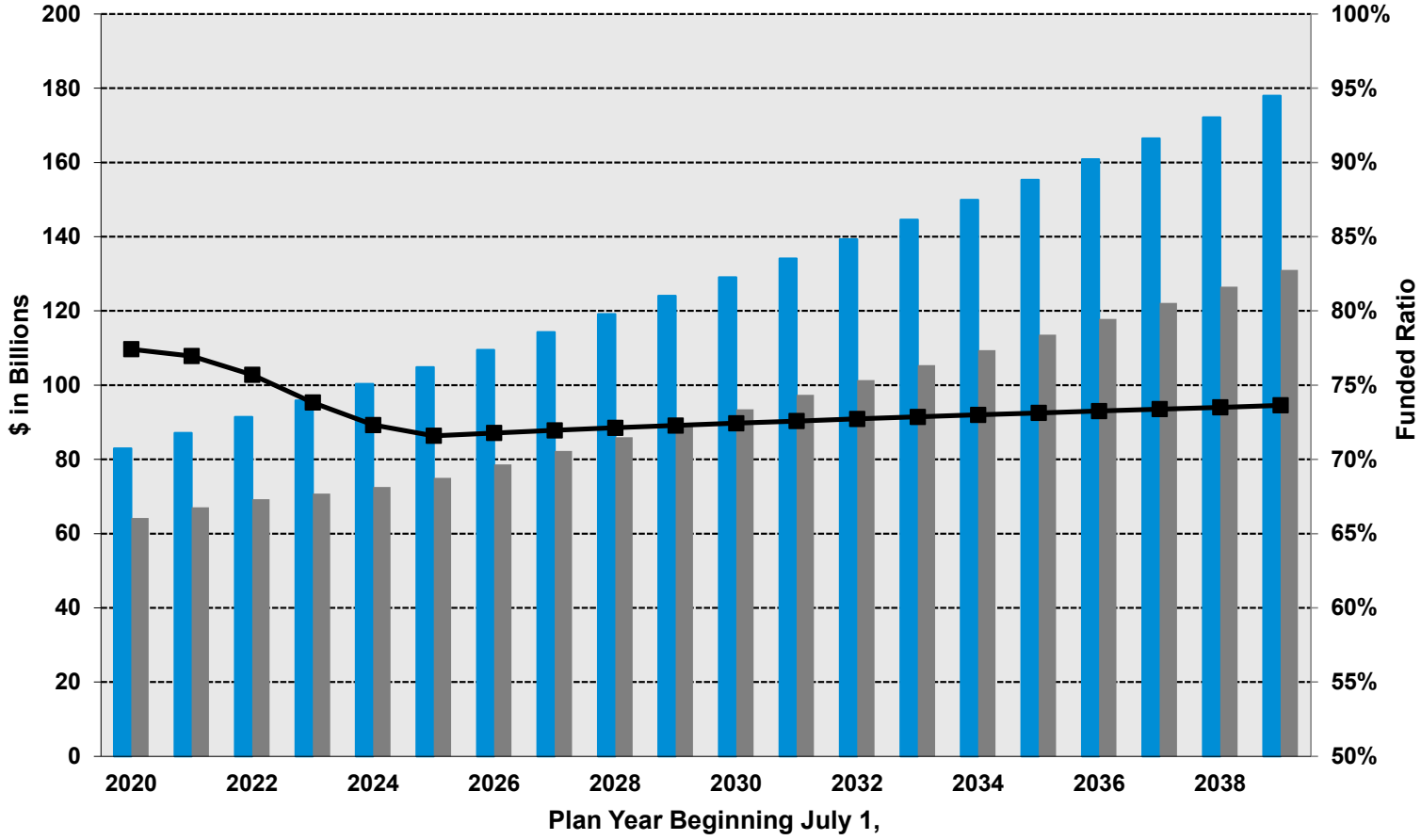
Campus and Medical Centers Only
- Assumes active member population grows by 0.0% for three years, then 0.7% per year thereafter.
- Assumes a 0% market value return for 2020/2021 and a 6.75% market value return per year starting July 1, 2021.
- Includes STIP (or other sources) transfers through 2021/2022.
- Includes 2016 Tier (35% "Savings Choice" Election).

- Total Funding Policy Contribution - Assumes Approved Contributions Made
- Total Approved Contributions (Includes UAAL Surcharge)
- Total Funding Policy Contribution - Assumes Funding Policy Contributions Made Every Year

Appendix A: Projections for Non-Laboratory Segment of UCRP

Scenario #2: 0% Actual Market Value Return During 2020-2021 and 35% Savings Choice Election

Projected UCRP Funded Ratio – Campus and Medical Center Segment Only
Approved Contribution Scenario



Campus and Medical Centers Only
- Assumes active member population grows by 0.0% for three years, then 0.7% per year thereafter.
- Assumes a 0% market value return for 2020/2021 and a 6.75% market value return per year starting July 1, 2021.
- Assumes approved contributions are paid each year.
- Includes STIP (or other sources) transfers through 2021/2022.
- Includes 2016 Tier (35% "Savings Choice" Election).

Actuarial Accrued Liability (AAL)

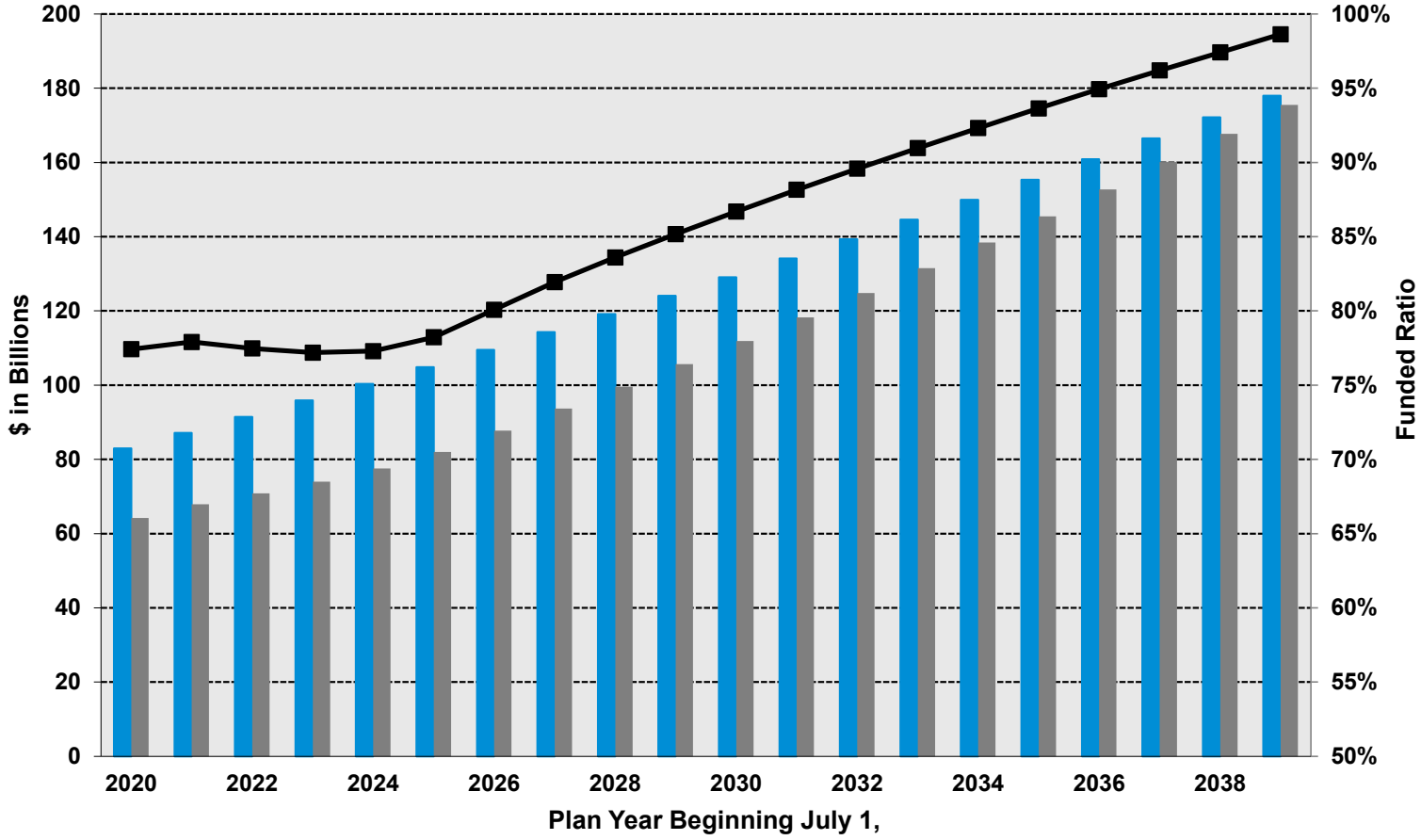
Actuarial Value of Assets (AVA)

Funded Ratio

Appendix A: Projections for Non-Laboratory Segment of UCRP

Scenario #2: 0% Actual Market Value Return During 2020-2021 and 35% Savings Choice Election

Projected UCRP Funded Ratio – Campus and Medical Center Segment Only
Total Funding Policy Contribution Scenario



Campus and Medical Centers Only
- Assumes active member population grows by 0.0% for three years, then 0.7% per year thereafter.
- Assumes a 0% market value return for 2020/2021 and a 6.75% market value return per year starting July 1, 2021.
- Assumes total funding policy contributions are paid each year.
- Includes 2016 Tier (35% "Savings Choice" Election).

Actuarial Accrued Liability (AAL)

Actuarial Value of Assets (AVA)

Funded Ratio

Appendix A: Projections for Non-Laboratory Segment of UCRP

Scenario #3: 6.75% Market Value Return Per Year Beginning July 1, 2020 and 45% Savings Choice Election

The third scenario is the same as the first, except that we assume 45% of new hires on or after July 1, 2020 elect the Savings Choice plan. This projection illustrates the impact of a variation in the Savings Choice election rate.

Employer contribution rates show a slight increase due to contribution dollars, including the UAAL Surcharge, being expressed as a percent of the lower covered payroll of UCRP over the projection period as compared to Scenario #1.

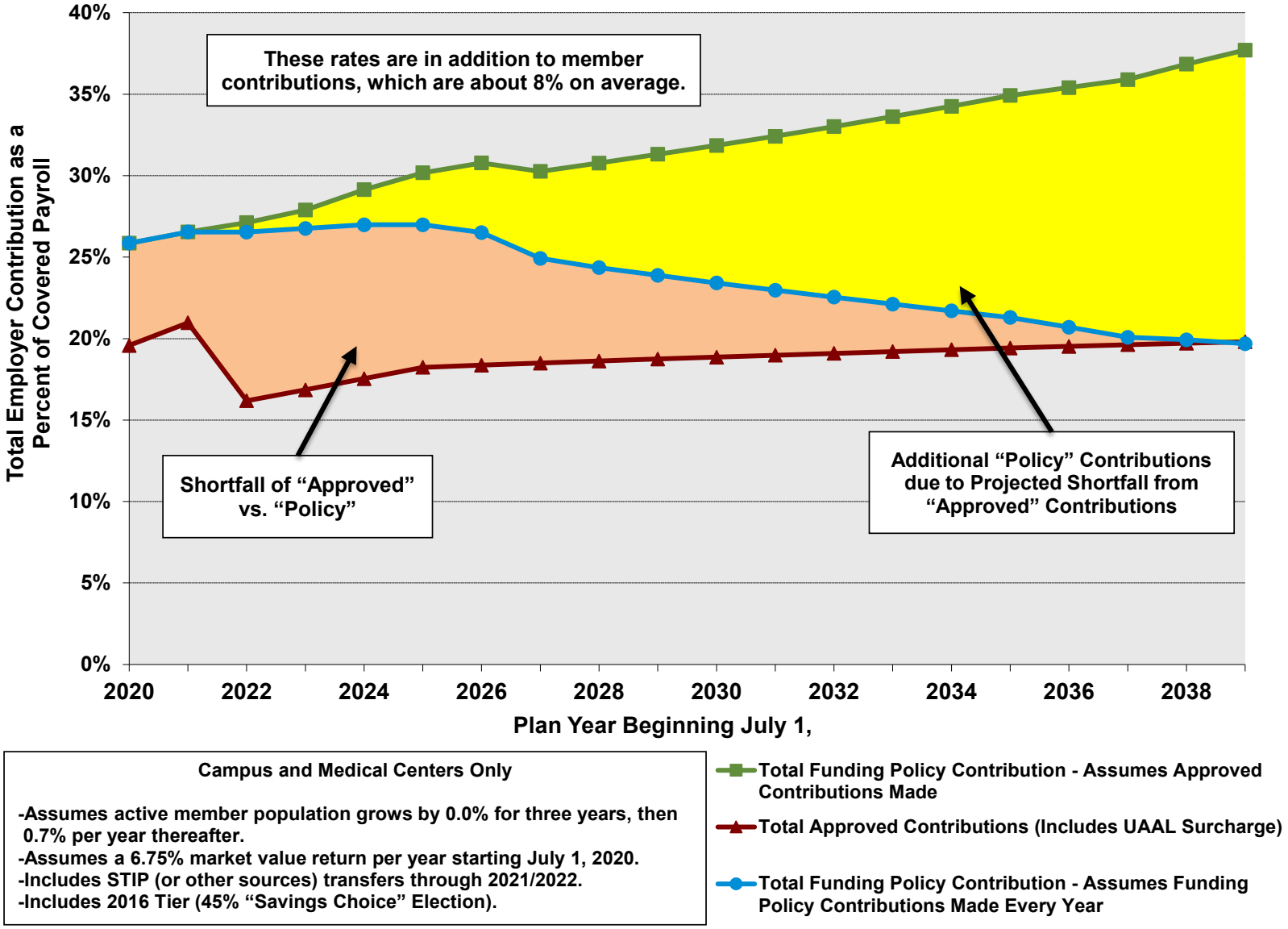
The projected funded ratios and the UAAL remain virtually unchanged regardless of the decrease in the UCRP covered payroll when compared to Scenario #1. This is because an increase in the number of actives who elect the Savings Choice plan decreases both the future AAL and assets for UCRP. As long as the UAAL Surcharge for new employees that elect Savings Choice is collected, then Savings Choice elections appear to have minimal impact on the long-term funding of UCRP.

Consistent with Scenario #1, our longer term projections show that under Scenario #3 the current assets combined with projected future approved contributions and investment earnings are expected to be sufficient to pay all future expected benefits for all plan members (both current and future).

Appendix A: Projections for Non-Laboratory Segment of UCRP

Scenario #3: 6.75% Market Value Return Per Year Beginning July 1, 2020 and 45% Savings Choice Election

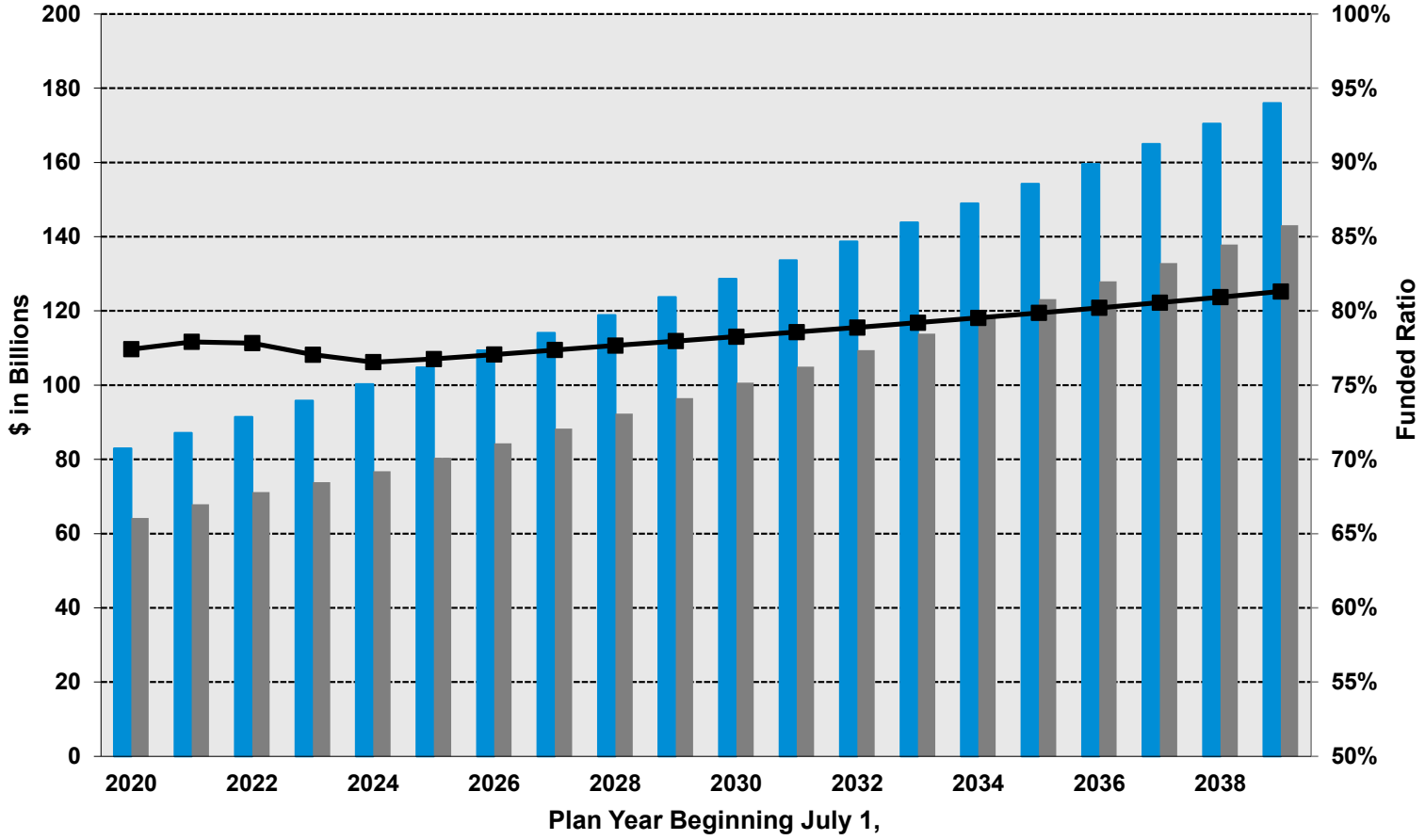
Projected UCRP Employer Contributions – Campus and Medical Center Segment Only



Appendix A: Projections for Non-Laboratory Segment of UCRP

Scenario #3: 6.75% Market Value Return Per Year Beginning July 1, 2020 and 45% Savings Choice Election

Projected UCRP Funded Ratio – Campus and Medical Center Segment Only
Approved Contribution Scenario



Campus and Medical Centers Only

-Assumes active member population grows by 0.0% for three years, then 0.7% per year thereafter.
-Assumes a 6.75% market value return per year starting July 1, 2020.
-Assumes approved contributions are paid each year.
-Includes STIP (or other sources) transfers through 2021/2022.
-Includes 2016 Tier (45% "Savings Choice" Election).

Actuarial Accrued Liability (AAL)

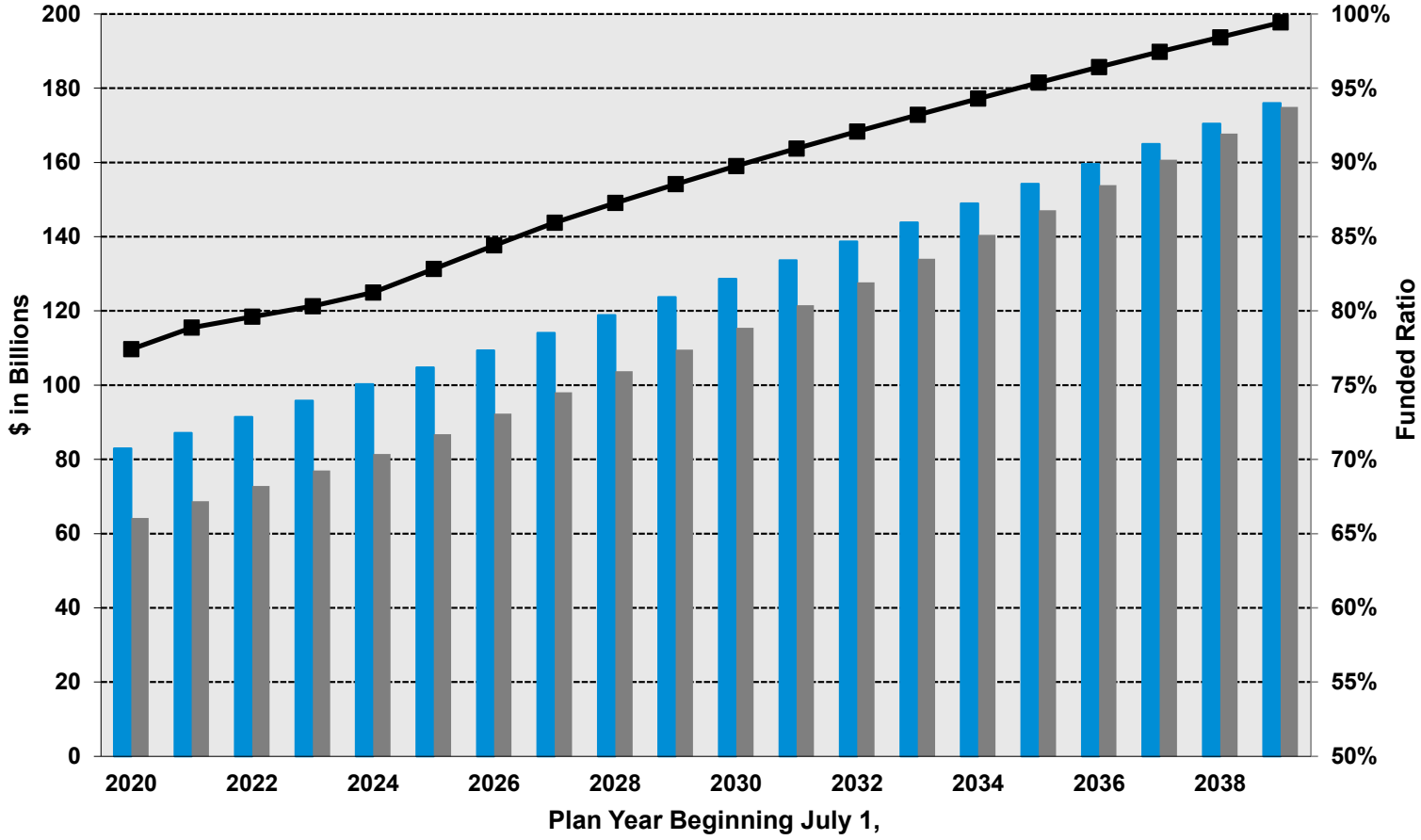
Actuarial Value of Assets (AVA)

Funded Ratio

Appendix A: Projections for Non-Laboratory Segment of UCRP

Scenario #3: 6.75% Market Value Return Per Year Beginning July 1, 2020 and 45% Savings Choice Election

Projected UCRP Funded Ratio – Campus and Medical Center Segment Only
Total Funding Policy Contribution Scenario



Campus and Medical Centers Only

-Assumes active member population grows by 0.0% for three years, then 0.7% per year thereafter.
-Assumes a 6.75% market value return per year starting July 1, 2020.
-Assumes total funding policy contributions are paid each year.
-Includes 2016 Tier (45% "Savings Choice" Election).

Actuarial Accrued Liability (AAL)

Actuarial Value of Assets (AVA)

Funded Ratio

Appendix A: Projections for Non-Laboratory Segment of UCRP

Actuarial Assumptions and Methods Used in Projections

The projections shown in Appendix A were made using generally accepted actuarial practices and are based on the July 1, 2020 actuarial valuation results. This includes the participant data and actuarial assumptions on which that valuation was based. We have used a forecast model that includes new hires and calculates Normal Costs, AAL and other results consistent with the UCRP actuarial valuation throughout the 20 year projection period, as if all the actuarial assumptions have been met. Here are some of the important assumptions used:

- Includes non-laboratory segment (i.e., campus and medical centers segment) only.
- For Scenario #1 and #3, assumes market value returns of 6.75% per year beginning July 1, 2020. Scenario #2 assumes a 0% market value return during 2020-2021 and returns of 6.75% per year thereafter.
- Reflects choice of either the UCRP 2016 Tier ("Pension Choice") or the defined contribution plan ("Savings Choice") for all new hires on or after July 1, 2020, with the exception of new hires under CNA, AFSCME, and UPTE who enter the Modified 2013 Tier. The UAAL Surcharge for employees that elect Savings Choice goes towards paying down UCRP's UAAL.
- For Scenario #1 and #2, an election rate of 35% Savings Choice and 65% Pension Choice (UCRP 2016 Tier) is assumed for new hires on or after July 1, 2020, with the exception of new hires under CNA, AFSCME, and UPTE who enter the Modified 2013 Tier. Scenario #3 assumes an election rate of 45% Savings Choice and 55% Pension Choice (UCRP 2016 Tier). All scenarios include a cost of initial and second choice of 0.6% of total new hire compensation added to UCRP's Normal Cost for new hires.
- Assumes a 0.0% per year growth in the total (UCRP and Savings Choice) active member population for three years, then 0.7% per year growth thereafter. This means that members that leave active employment are assumed to be replaced with an amount of new hires such that the active member population stays level for the first three years, and then increases by 0.7% per year throughout the projection.
- Employer contribution rate to UCRP is equal to 14.5% of compensation, increasing by 0.5% per year on each July 1 to a maximum of 17% of compensation. The UAAL Surcharge of 6.5% of compensation also increases by 0.5% per year on each July 1 to a maximum of 9% of compensation.
- Transfers from STIP of up to $600 million in 2020-2021, and $700 million in 2021-2022 are reflected in all scenarios.
- Total of employer and member contribution rates are assumed to be no greater than the total funding policy contribution rate for any year with the exception that the employer contribution rate can be no less than the member contribution rate.
- Demographics for future new entrants are assumed to be the same as those for members hired during the two years prior to July 1, 2020.

Projections, by their nature, are not a guarantee of future results. The modeling projections are intended to serve as illustrations of future financial outcomes that are based on the information available to us at the time the modeling is undertaken and completed, and the agreed-upon assumptions and methodologies described herein. Emerging results may differ significantly if the actual experience proves to be different from these assumptions or if alternative methodologies are used. Actual experience may differ due to such variables as demographic experience, the economy, stock market performance and the regulatory environment.