Segal Consulting

University of California Retirement Plan (UCRP)

JULY 1, 2018 VALUATION PRESENTATION

Completed by Segal Consulting San Francisco

UCRS Advisory Board
November 30, 2018

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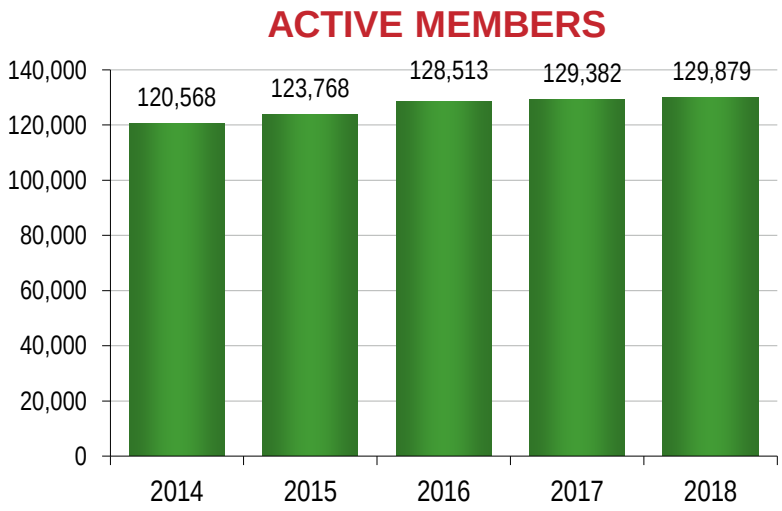
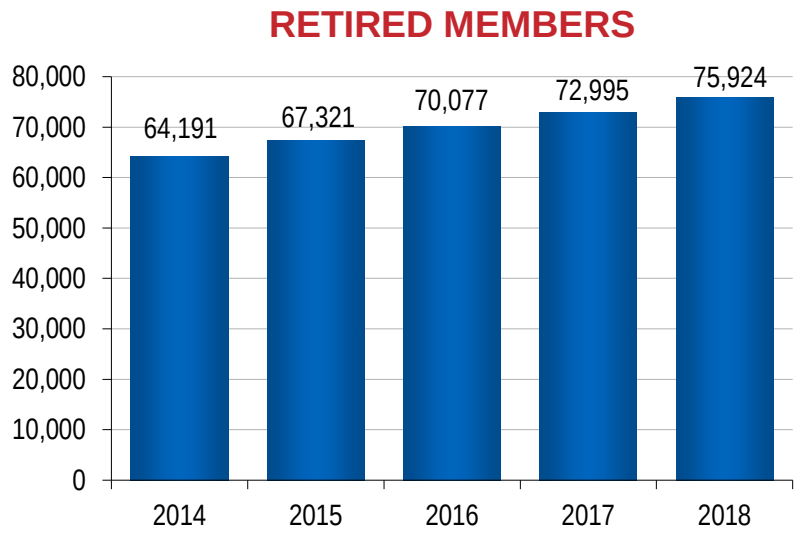
Highlights of 2018 Actuarial Valuation

- Approximately 7.8% market value return for 2017/18
  - Actuarial value return of 7.9% due to five-year smoothing of gains/losses
  - Market value of $66.8 billion exceeds actuarial value by $0.2 billion
- Increase in funded ratio (85% to 87%) and decrease in UAAL ($11.08 to $10.30 billion) and total funding policy contribution (27.0% to 26.3%) due to:
  - Contributions funding the total funding policy contributions
  - Investment gain on actuarial (smoothed) value of assets
- $169 million in State funding received during 2017/18
- $391.8 million STIP to UCRP transfer occurred during 2017/18
  - Transfer is reflected in the valuation results
  - Represents an amount that along with actual contributions results in full funding of the total funding policy contributions for 2017/18

UCRP Demographics



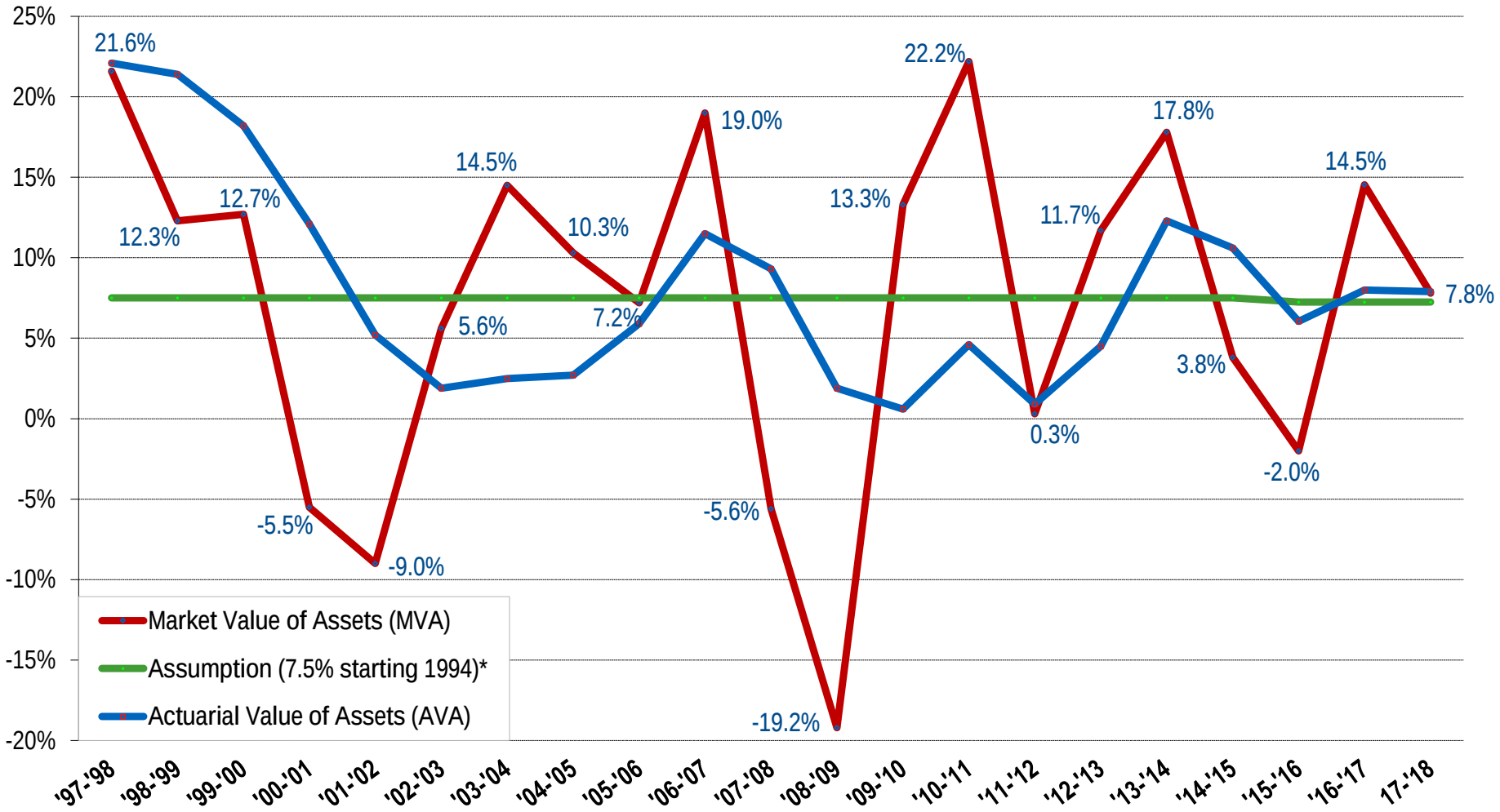
	2018	2017
Active Members	**129,879**	**129,382**
• Average Age	44.8	44.7
• Average Service	9.4	9.3
• Average Compensation	$99,707	$95,938



	2018	2017
Retired Members (in Pay Status)	**75,924**	**72,995**
• Average Age	71.7	71.5
• Average Annual Benefit	$42,890	$41,647

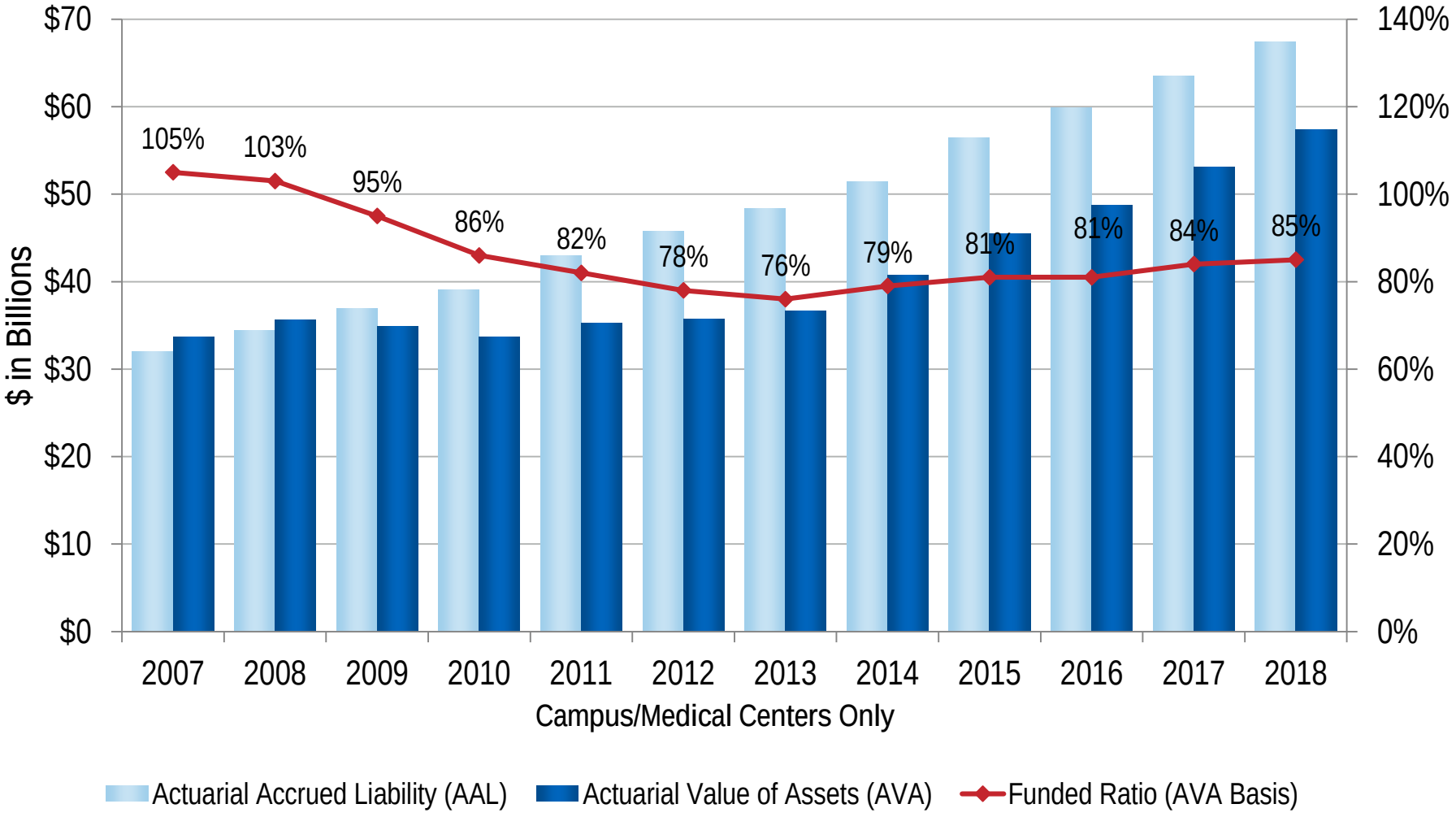
	2018	2017
Terminated Vested Members	**35,647**	**35,351**

UCRP Investment Rates of Return



***Investment rate of return assumption changed to 7.25% per annum starting July 1, 2015**

UCRP Historical Funded Status and Funded Ratio (5 year smoothing) as of July 1



UCRP Valuation Results ($ in billions)

	07/01/2018	07/01/2017
Market Value of Assets (MVA)	$66.8	$62.1
Actuarial Value of Assets (AVA)	$66.6	$61.9
Actuarial Accrued Liability (AAL)	$76.9	$73.0
Unfunded AAL – AVA Basis (AAL less AVA)	$10.3	$11.1
Unfunded AAL – MVA Basis (AAL less MVA)	$10.1	$10.9
Funded Percentage (AVA Basis)	87%	85%
Funded Percentage (MVA Basis)	87%	85%
Normal Cost (beginning of year)	$2.0	$1.9
Normal Cost (% of pay, middle of year)	17.90%	18.00%
Funding Policy Contributions (% of pay)*	26.33%	27.00%

* Campus and Medical Centers Segment only

Projection of UAAL Amortization Bases and Payments

- Two new graphs included in July 1, 2018 Actuarial Valuation Report
- Graphs illustrate how the UAAL amortization bases and payments progress over time
  - Assuming no future actuarial gains/losses, assumption changes or Plan changes
- Graphs should be viewed in conjunction with the table of amortization bases found in the valuation report
  - Shown on the next slide for reference
- Graphs show a steady decrease in net UAAL balance over time
  - Due to UAAL layers being paid down each year

UCRP July 1, 2018 Amortization Schedule

EXHIBIT H

Table of Amortization Bases as of July 1, 2018 (Non-Laboratory Segment of UCRP - $ in 000s)

Type	Date Established	Initial Years	Initial Amount	Annual Payment[1]	Years Remaining	Outstanding Balance
Restart Amortization[2]	07/01/2010	30	$5,389,886	$416,227	22	$4,837,066
Actuarial Loss	07/01/2011	30	905,208	69,867	23	826,915
Change in Assumptions	07/01/2011	15	1,513,127	157,872	8	1,001,322
Plan Amendment	07/01/2011	15	(59,179)	(6,174)	8	(39,162)
Actuarial Loss	07/01/2012	30	2,457,582	189,587	24	2,281,780
Actuarial Loss	07/01/2013	30	1,866,282	143,901	25	1,758,755
Actuarial Gain	07/01/2014	30	(886,657)	(68,334)	26	(847,055)
Actuarial Gain	07/01/2015	20	(1,440,456)	(129,251)	17	(1,330,273)
Change in Assumptions	07/01/2015	20	1,850,713	166,063	17	1,709,149
Actuarial Loss	07/01/2016	20	450,296	40,405	18	428,145
Actuarial Gain	07/01/2017	20	(452,535)	(40,606)	19	(441,794)
Actuarial Gain	07/01/2018	20	(208,223)	(18,684)	20	(208,223)
Total				$920,873		$9,976,625

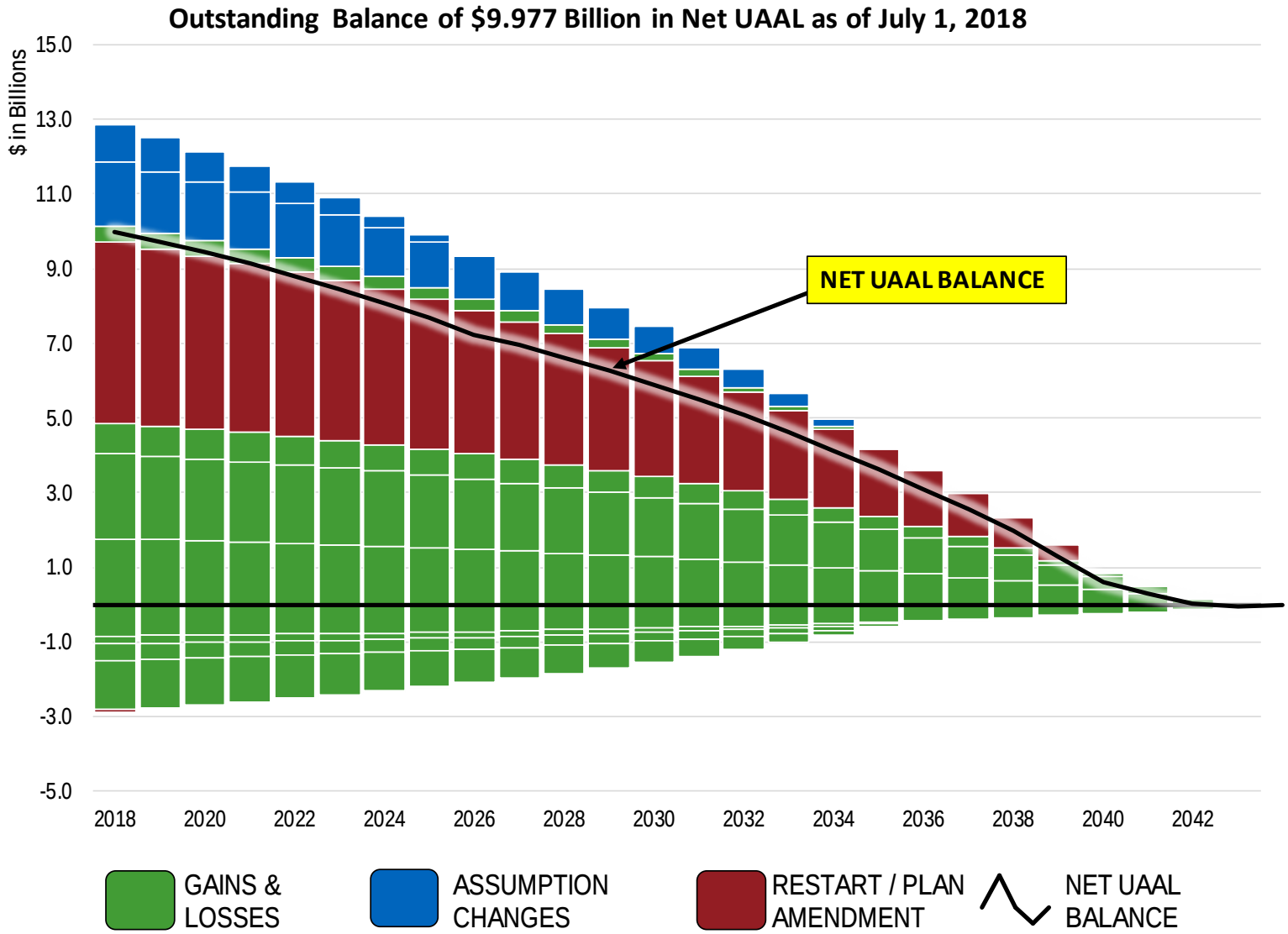
(1) *Level dollar amount. Payment shown is as of beginning of year. The amounts shown are based on results for the non-laboratory segment of UCRP (i.e., campuses, medical centers and Hastings College of Law). They are used in the determination of the total funding policy contribution shown in Section 2, Chart 11, page 10. For more details on the UCRP funding policy please see Section 4, Exhibit IV.*

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

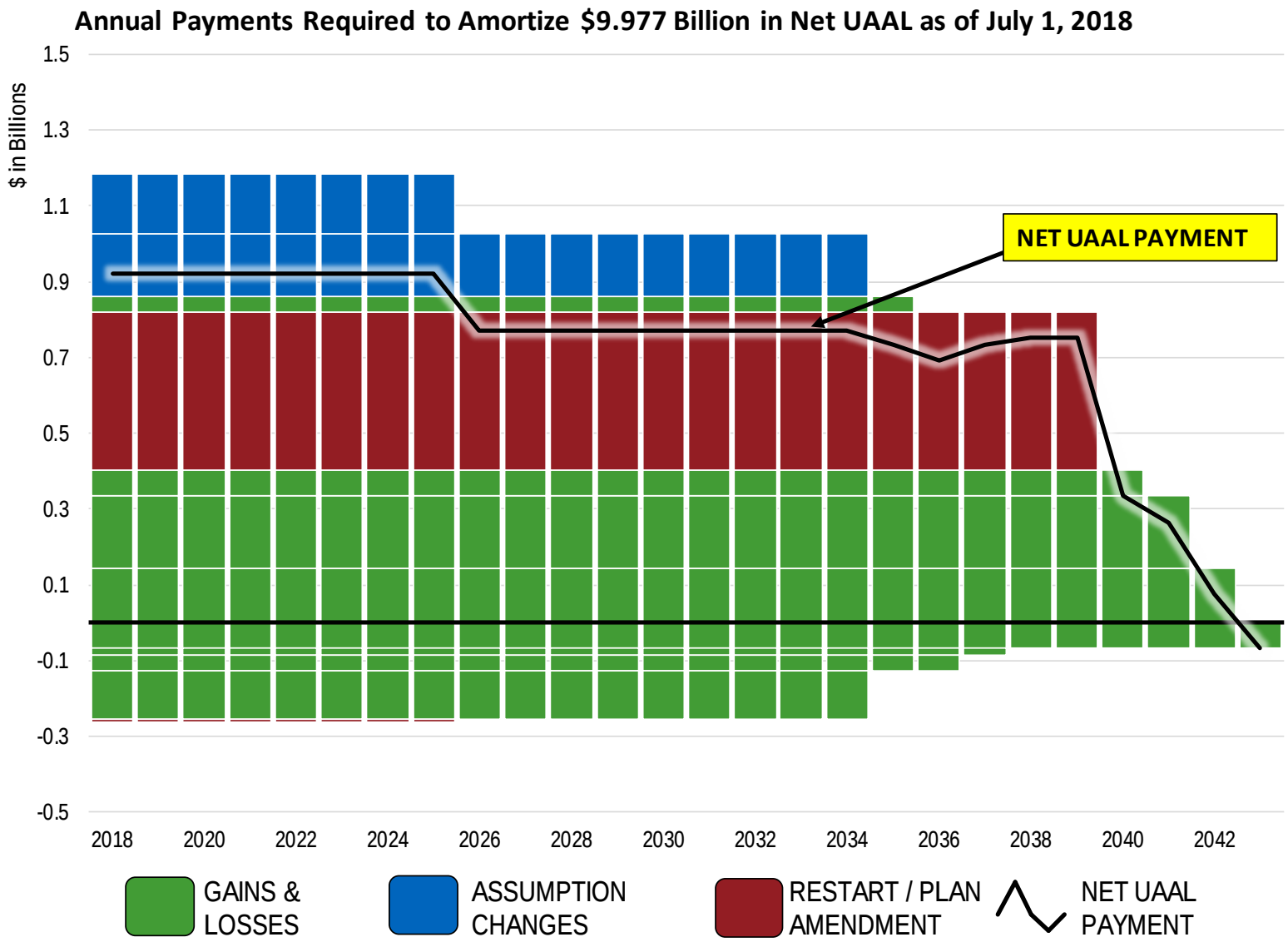
Note: Effective with the July 1, 2015 valuation the Regents approved a change to the amortization periods used for actuarial experience gains and changes in actuarial assumptions to be 20 years. The amortization periods for amortization bases established in prior valuations are not affected.

The average effective remaining amortization period as of July 1, 2018 was 18.83 years.

UCRP Layered UAAL Amortization Balances
as of July 1, 2018



UCRP Layered UAAL Amortization Payments
as of July 1, 2018



Future Expectations

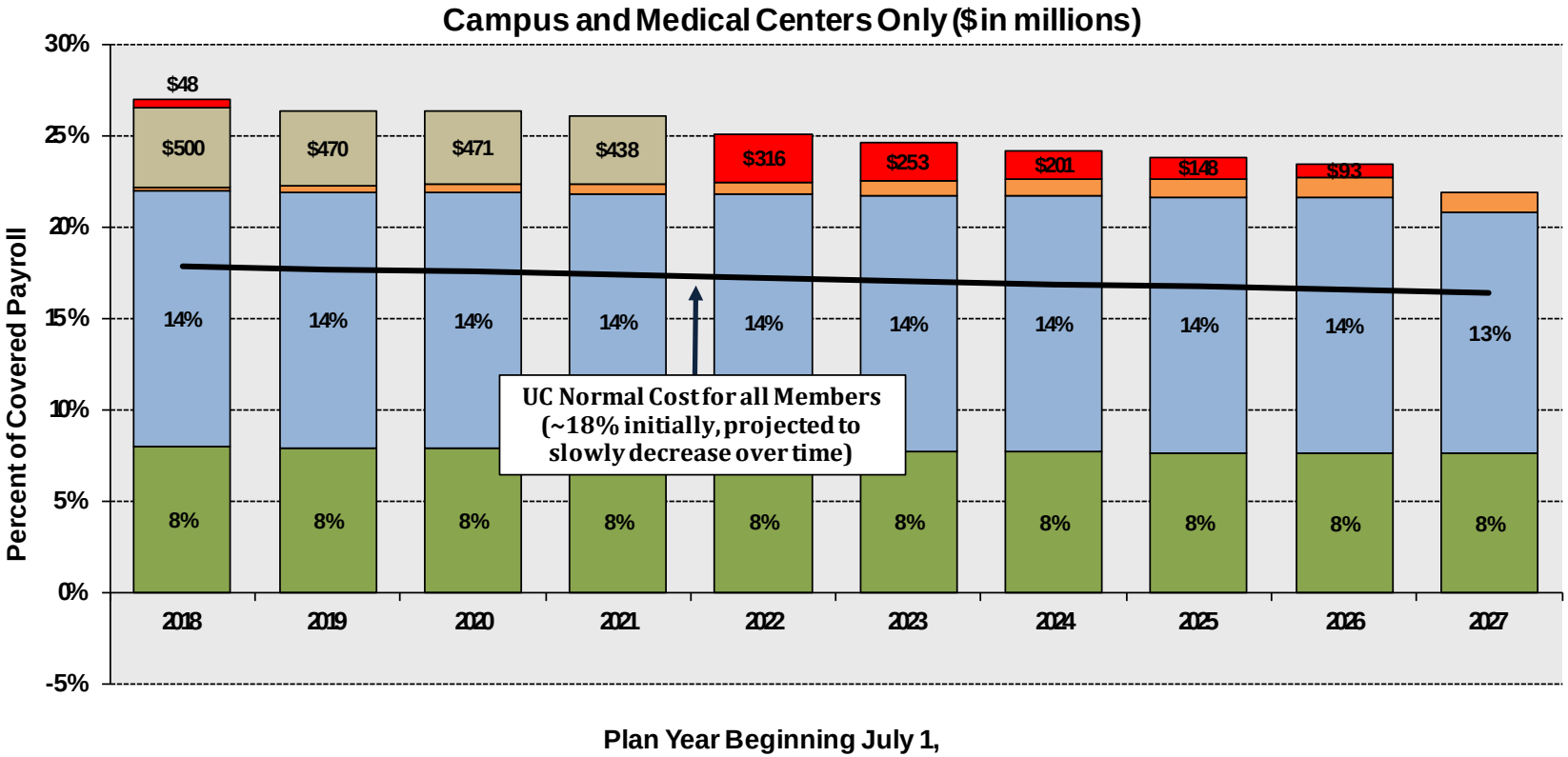
- Projections are included in valuation report (Appendix A)
  - Compares Approved and Total Funding Policy Contributions
  - Shows how current shortfall increases future Funding Policy Contributions
- Projected funded status
  - Assets, liabilities, funded ratio
  - Assuming only Approved Contributions are made
  - Assuming full Total Funding Policy Contributions are made
- Scenario #1
  - Illustrates what would happen if all assumptions are met
  - 7.25% market value return per year beginning July 1, 2018
  - 30% Savings Choice election rate

Future Expectations

- Scenario #2
  - Illustrates what would happen if market returns are unfavorable for one year
  - 0% market value return during 2018/2019
  - 30% Savings Choice election rate
- Scenario #3
  - Illustrates what would happen if more new hires elect Savings Choice
  - 7.25% market value return per year beginning July 1, 2018
  - 40% Savings Choice election rate

Projected Contribution Amounts
Campus and Medical Center Segment Only

Scenario #1: 7.25% Market Return Per Year Beginning July 1, 2018 and 30% Savings Choice Election

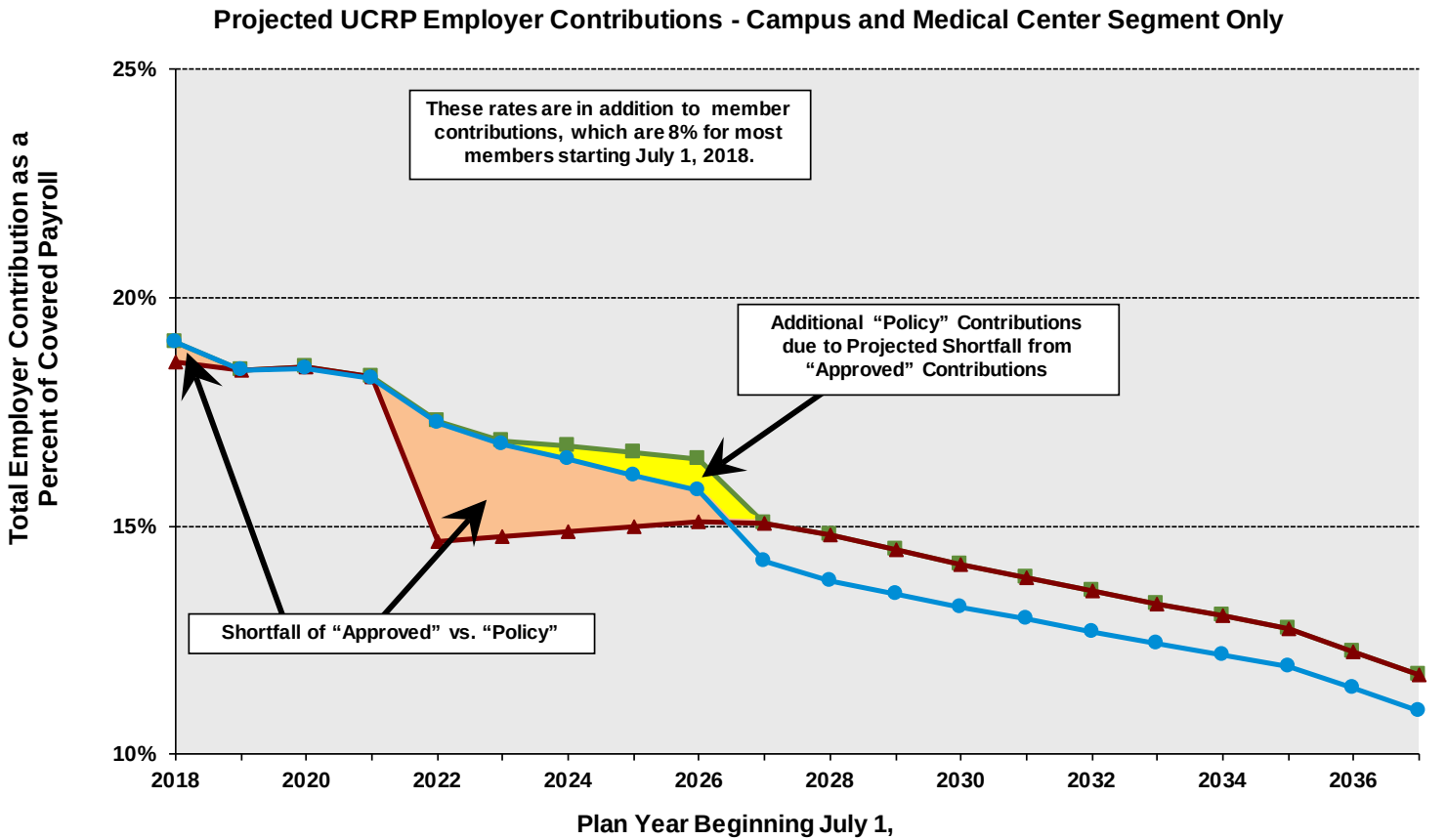


-Assumes total UCRP and Savings Choice active member population grows by 0.7% per year.
-Assumes market value return of 7.25% per year starting July 1, 2018.
-Assumes no future changes in actuarial assumptions.
-Includes STIP (or other sources) transfers through 2021/2022.
-Includes 2016 Tier and a 30% Savings Choice election rate.
-Assumes Total Funding Policy Contribution made each year starting July 1, 2022.
-Assumes any funding shortfall starting July 1, 2022 is paid by transfers, borrowing and/or State Funding.

- Funding Policy Shortfall
- STIP Transfers
- DC UAAL Surcharge (6%)
- Employer Contribution
- Average Member Contribution
- Normal Cost

Projected UCRP Employer Contributions Campus and Medical Center Segment Only

Scenario #1: 7.25% Market Return Per Year Beginning July 1, 2018 and 30% Savings Choice Election



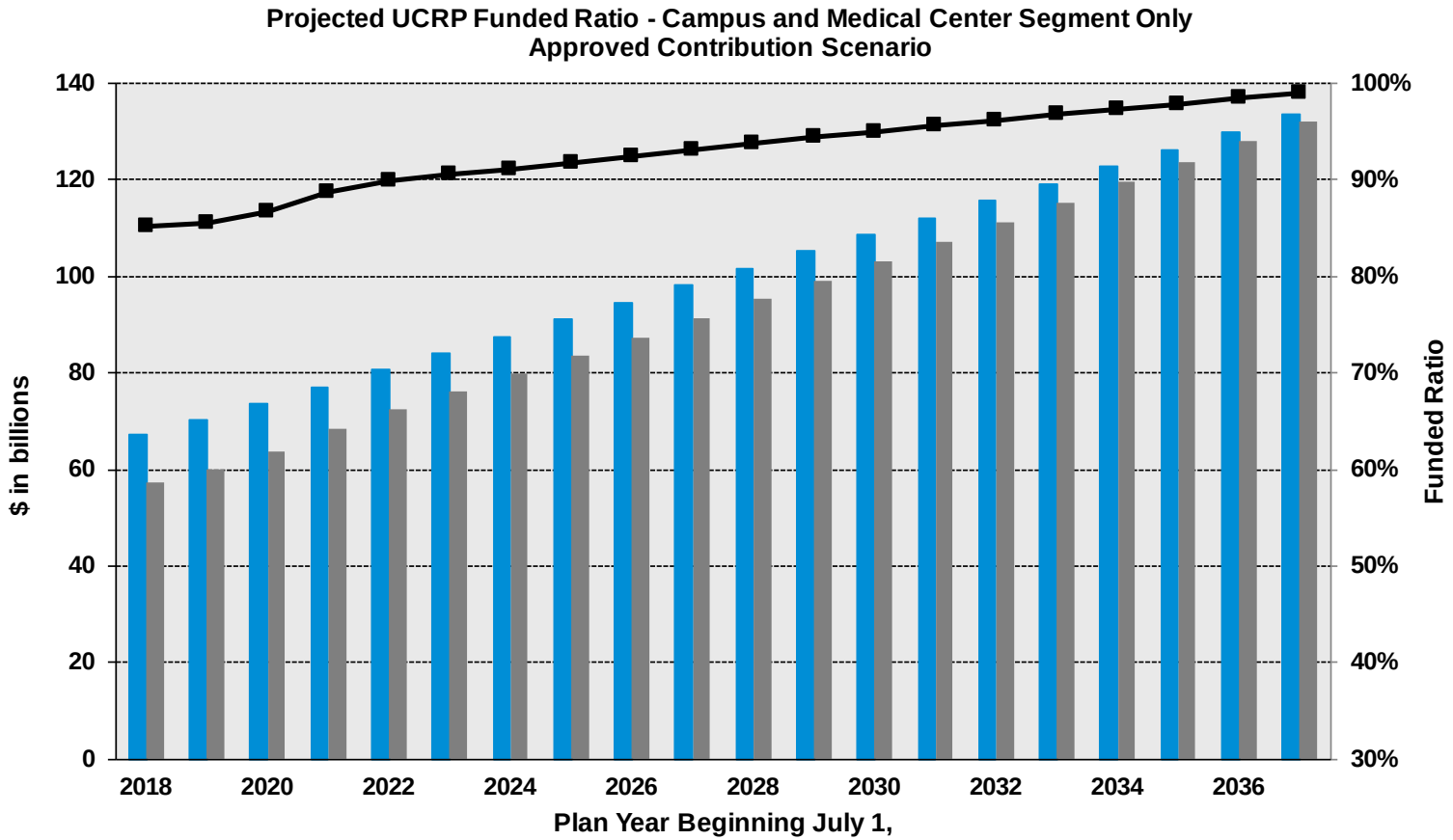
Campus and Medical Centers Only

- Assumes active member population grows by 0.7% per year.
- Assumes a 7.25% market value return per year starting July 1, 2018.
- Includes STIP (or other sources) transfers through 2021/2022.
- Includes 2016 Tier (30% "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

Projected UCRP Funded Status
Campus and Medical Center Segment Only

Scenario #1: 7.25% Market Return Per Year Beginning July 1, 2018 and 30% Savings Choice Election



Campus and Medical Centers Only

- -Assumes active member population grows by 0.7% per year.
- -Assumes a 7.25% market value return per year starting July 1, 2018.
- -Assumes approved contributions are paid each year.
- -Includes STIP (or other sources) transfers through 2021/2022.
- -Includes 2016 Tier (30% "Savings Choice" Election).

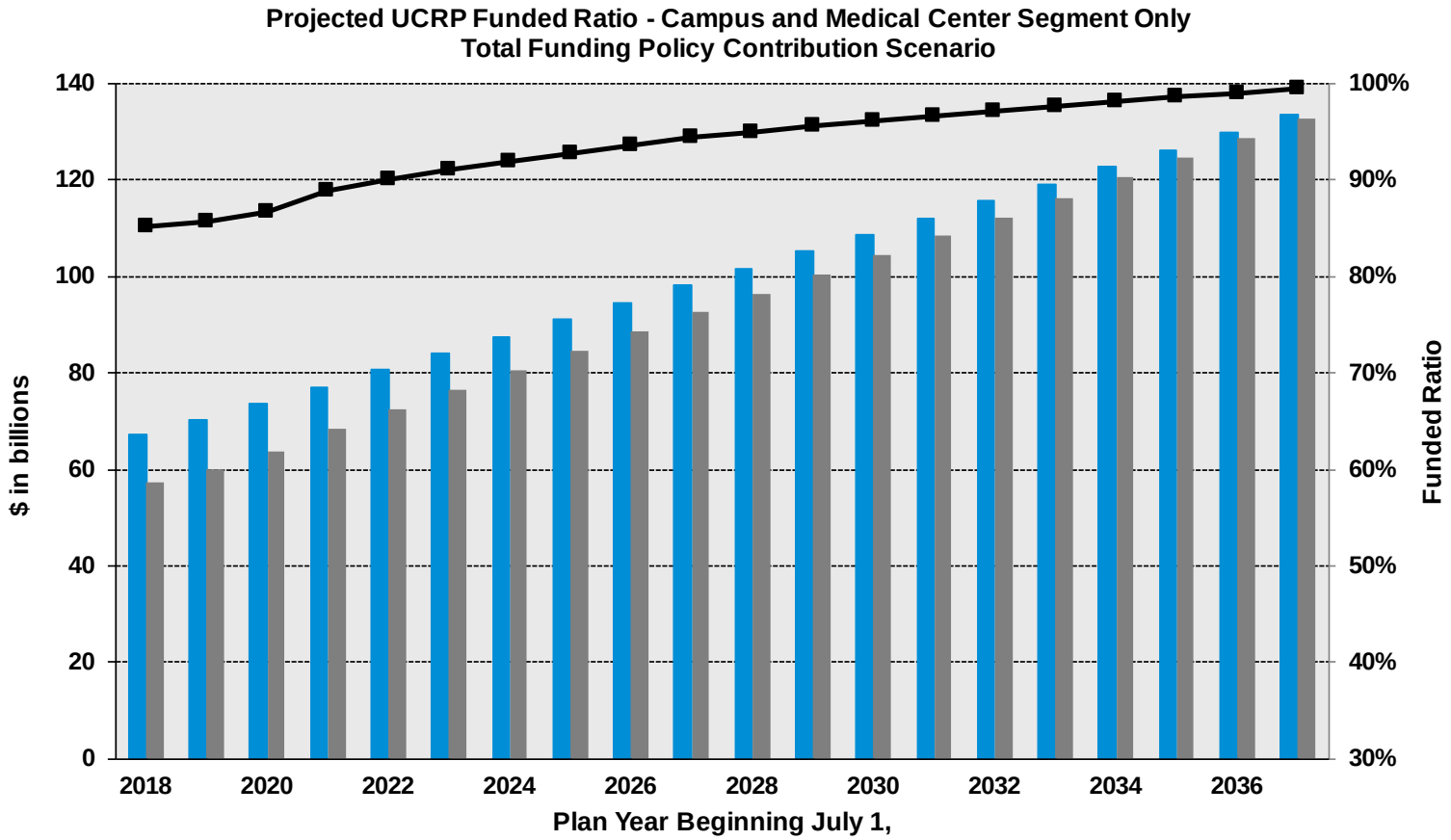
Actuarial Accrued Liability (AAL)

Actuarial Value of Assets (AVA)

Funded Ratio

Projected UCRP Funded Status
Campus and Medical Center Segment Only

Scenario #1: 7.25% Market Return Per Year Beginning July 1, 2018 and 30% Savings Choice Election



Campus and Medical Centers Only

-Assumes active member population grows by 0.7% per year.
-Assumes a 7.25% market value return per year starting July 1, 2018.
-Assumes total funding policy contributions are paid each year.
-Includes 2016 Tier (30% "Savings Choice" Election).

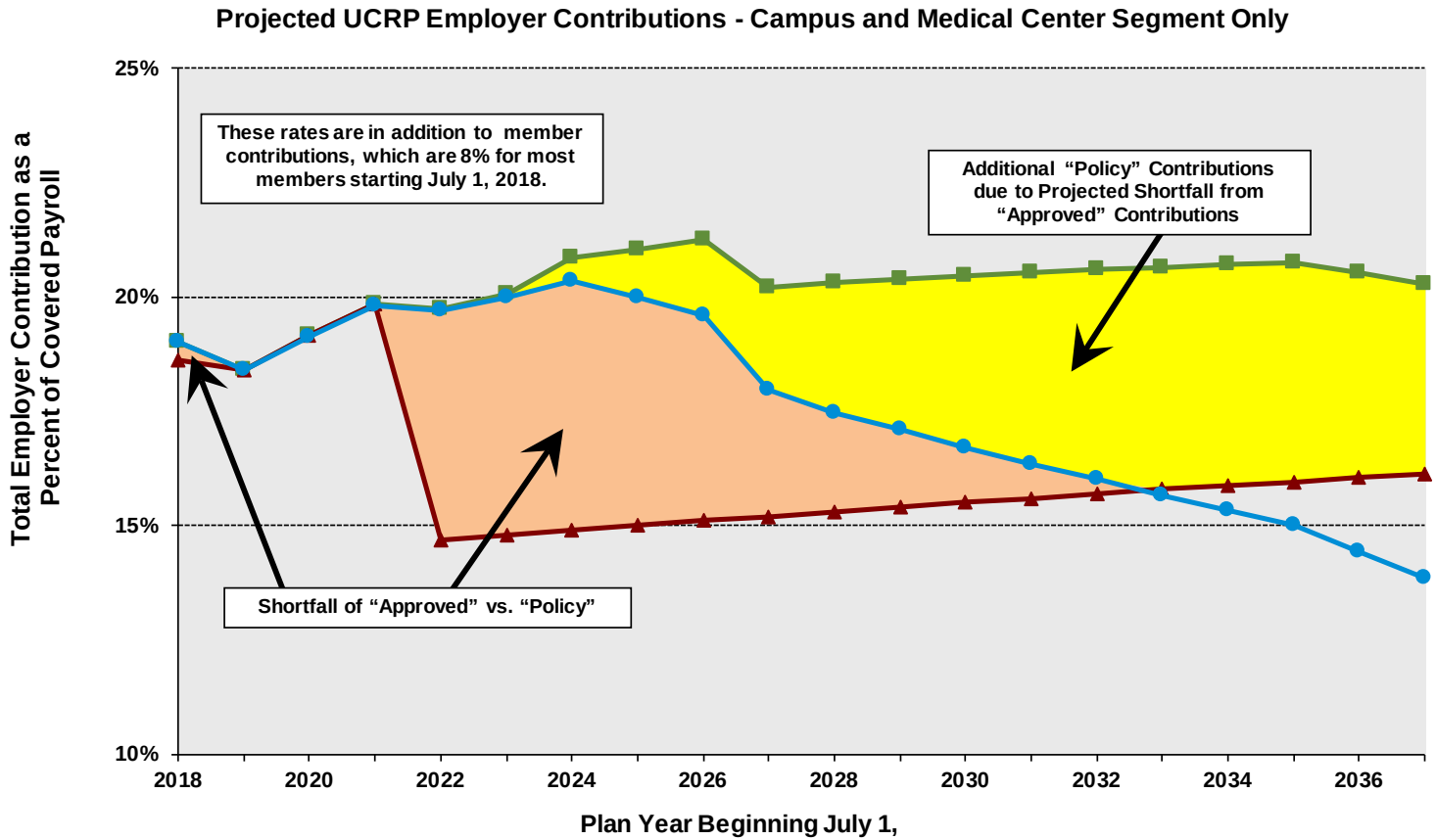
Actuarial Accrued Liability (AAL)

Actuarial Value of Assets (AVA)

Funded Ratio

Projected UCRP Employer Contributions Campus and Medical Center Segment Only

Scenario #2: 0% Actual Market Return for 2018/2019 and 30% Savings Choice Election



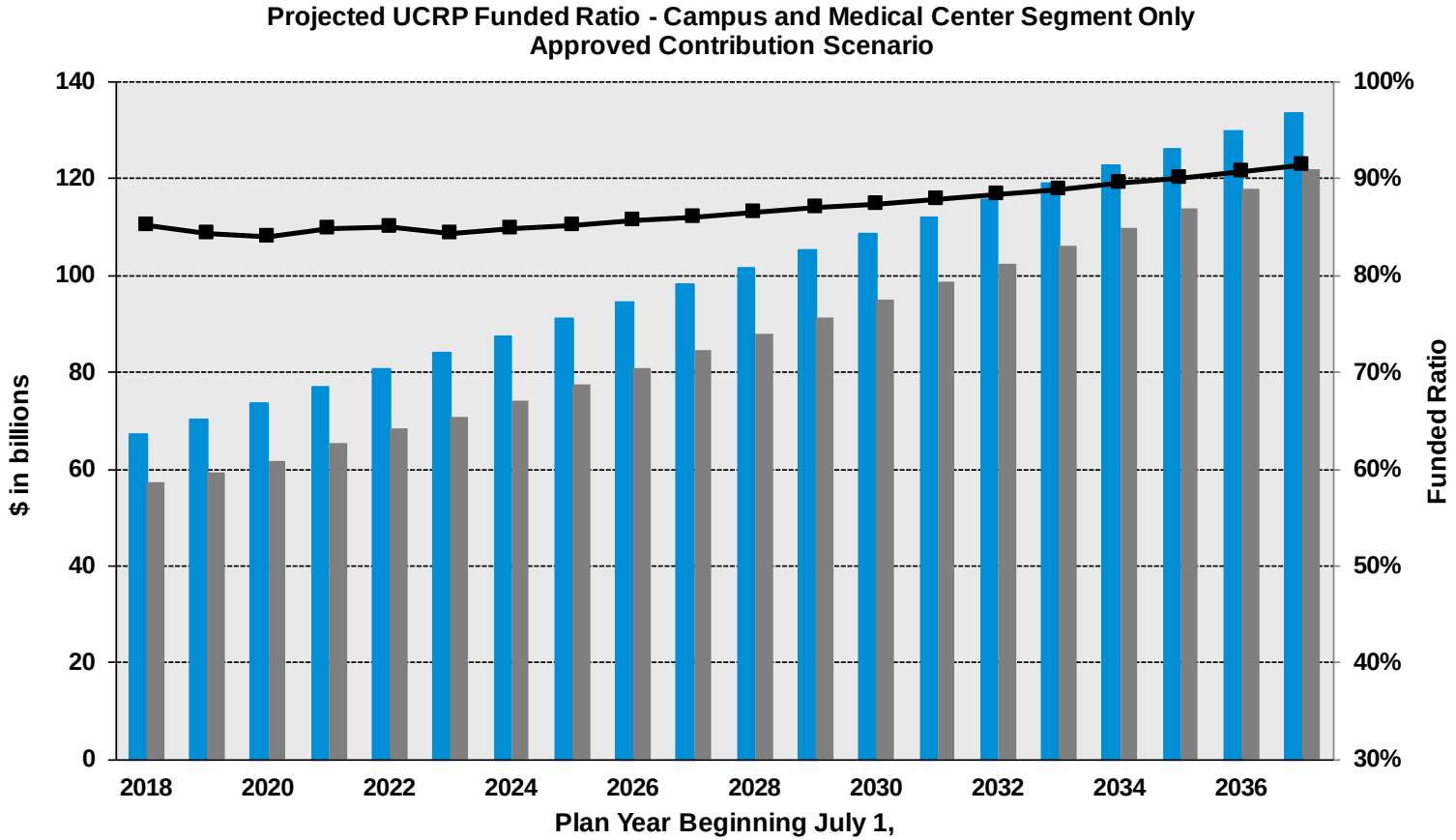
Campus and Medical Centers Only

- -Assumes active member population grows by 0.7% per year.
- -Assumes a 0% market value return in 2018/2019 and a 7.25% market value return per year starting July 1, 2019.
- -Includes STIP (or other sources) transfers through 2021/2022.
- -Includes 2016 Tier (30% "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

Projected UCRP Funded Status
Campus and Medical Center Segment Only

Scenario #2: 0% Actual Market Return for 2018/2019 and 30% Savings Choice Election



Campus and Medical Centers Only

- Assumes active member population grows by 0.7% per year.
- Assumes a 0% market value return in 2018/2019 and a 7.25% market value return per year starting July 1, 2019.
- Assumes approved contributions are paid each year.
- Includes STIP (or other sources) transfers through 2021/2022.
- Includes 2016 Tier (30% "Savings Choice" Election).

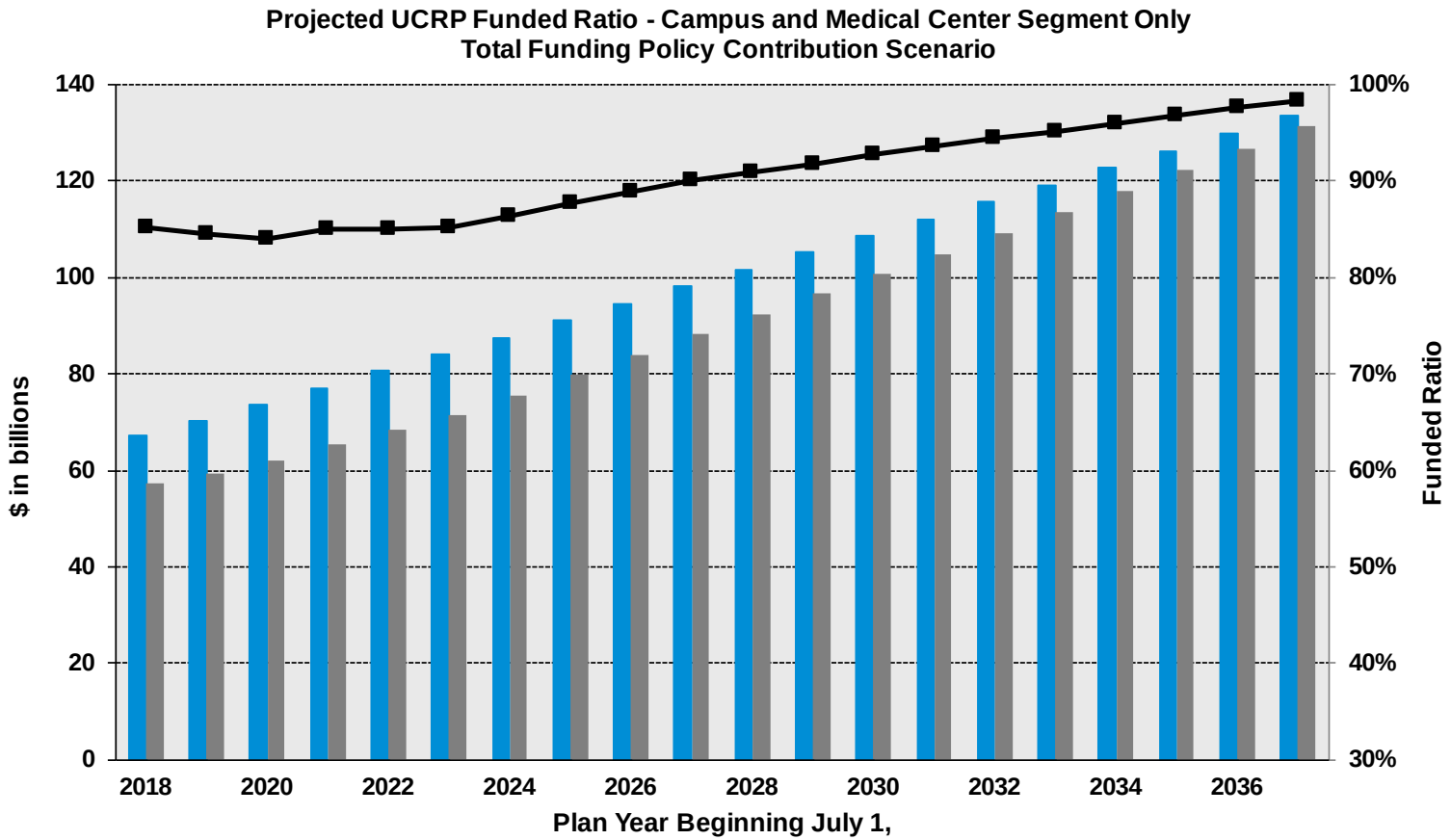
Actuarial Accrued Liability (AAL)

Actuarial Value of Assets (AVA)

Funded Ratio

Projected UCRP Funded Status
Campus and Medical Center Segment Only

Scenario #2: 0% Actual Market Return for 2018/2019 and 30% Savings Choice Election



Campus and Medical Centers Only

-Assumes active member population grows by 0.7% per year.
-Assumes a 0% market value return in 2018/2019 and a 7.25% market value return per year starting July 1, 2019.
-Assumes total funding policy contributions are paid each year.
-Includes 2016 Tier (30% "Savings Choice" Election).

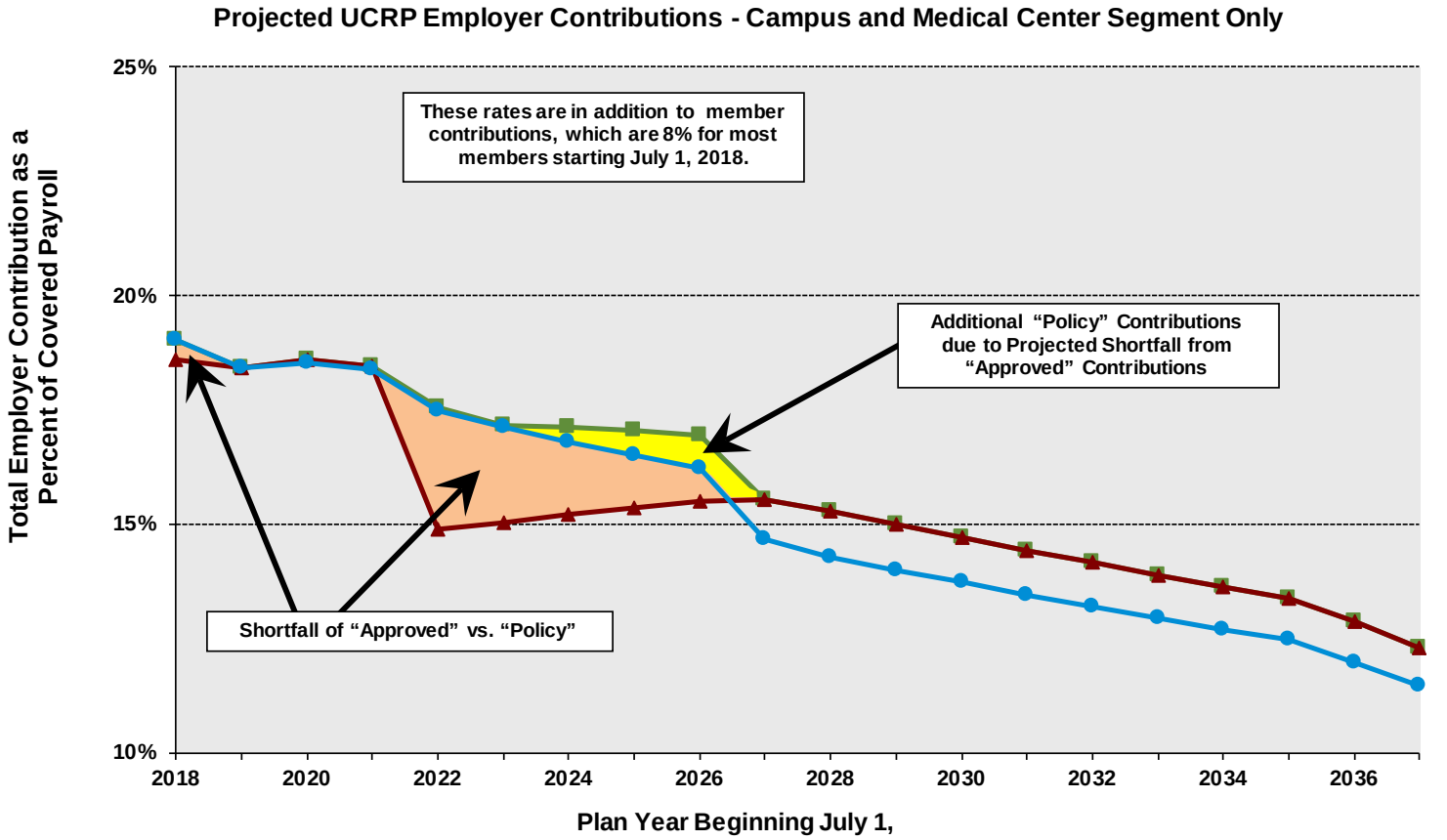
Actuarial Accrued Liability (AAL)

Actuarial Value of Assets (AVA)

Funded Ratio

Projected UCRP Employer Contributions Campus and Medical Center Segment Only

Scenario #3: 7.25% Market Return Per Year Beginning July 1, 2018 and 40% Savings Choice Election



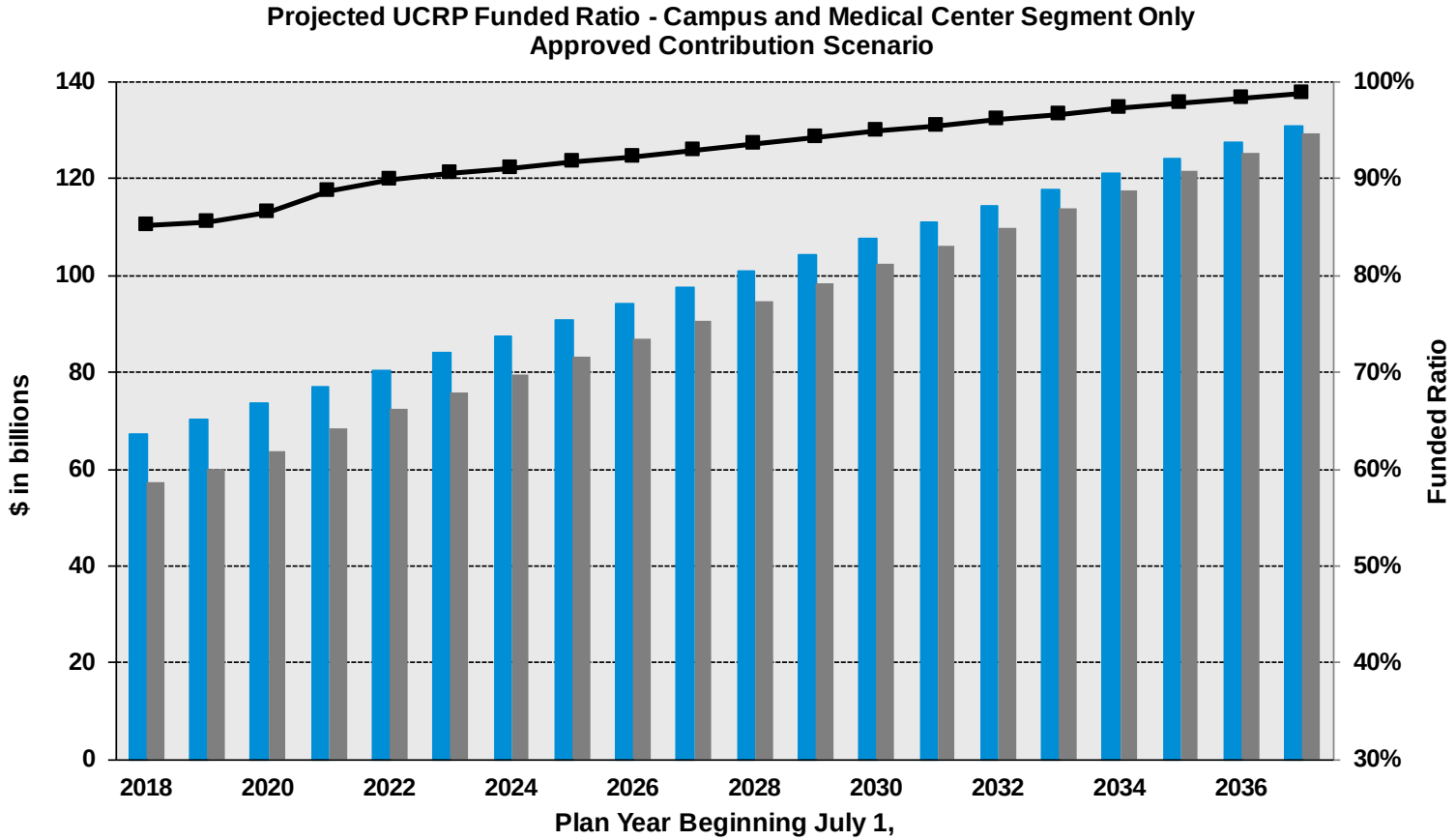
Campus and Medical Centers Only

- Assumes active member population grows by 0.7% per year.
- Assumes a 7.25% market value return per year starting July 1, 2018.
- Includes STIP (or other sources) transfers through 2021/2022.
- Includes 2016 Tier (40% "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

Projected UCRP Funded Status
Campus and Medical Center Segment Only

Scenario #3: 7.25% Market Return Per Year Beginning July 1, 2018 and 40% Savings Choice Election



Campus and Medical Centers Only

-Assumes active member population grows by 0.7% per year.
-Assumes a 7.25% market value return per year starting July 1, 2018.
-Assumes approved contributions are paid each year.
-Includes STIP (or other sources) transfers through 2021/2022.
-Includes 2016 Tier (40% "Savings Choice" Election).

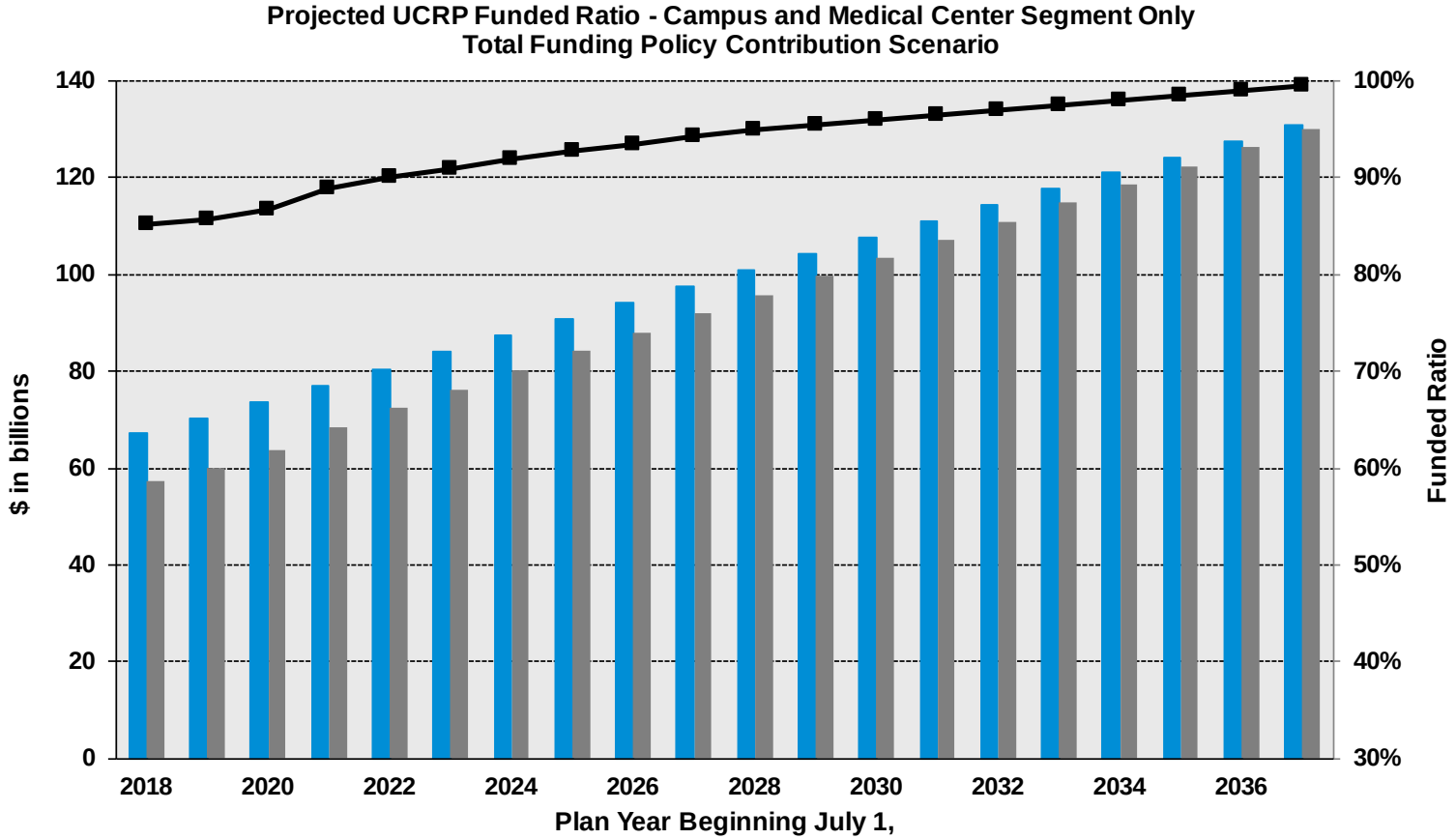
Actuarial Accrued Liability (AAL)

Actuarial Value of Assets (AVA)

Funded Ratio

Projected UCRP Funded Status
Campus and Medical Center Segment Only

Scenario #3: 7.25% Market Return Per Year Beginning July 1, 2018 and 40% Savings Choice Election



Campus and Medical Centers Only

-Assumes active member population grows by 0.7% per year.
-Assumes a 7.25% market value return per year starting July 1, 2018.
-Assumes total funding policy contributions are paid each year.
-Includes 2016 Tier (40% "Savings Choice" Election).

Actuarial Accrued Liability (AAL)

Actuarial Value of Assets (AVA)

Funded Ratio

Assumptions and Methods Used in Projections

- Unless otherwise noted, the cost calculations and projections were made using generally accepted actuarial practices and are based on July 1, 2018 actuarial valuation results. This includes the participant data and actuarial assumptions on which this valuation was based.
  Here are some of the important assumptions used:
  - Campus and medical center segment only.
  - Scenario #1 and #3 assumes market value returns of 7.25% per year beginning July 1, 2018. Scenario #2 assumes a 0% market value return during 2018/19 and returns of 7.25% per year thereafter.
  - Reflects choice of either UCRP 2016 Tier or defined contribution (Savings Choice) plan for all new hires on or after July 1, 2018. There is an employer contribution equal to 6% of compensation towards UCRP's UAAL on behalf of employees that elect the Savings Choice plan.
  - Scenario #1 and #2 assumes an election rate of 30% Savings Choice and 70% Pension Choice for new hires on or after July 1, 2018. Scenario #3 assumes an election rate of 40% Savings Choice and 60% Pension Choice for new hires on or after July 1, 2018. Cost of choice of 0.6% of payroll added to UCRP's Normal Cost for new hires in all Scenarios.
  - Assumes a 0.7% per year growth in total active member population.
  - Transfers from STIP of up to $500 million in 2018/19, $500 million in 2019/20, $600 million in 2020/21, and $700 million in 2021/22 are reflected in all Scenarios.

Assumptions and Methods Used in Projections

- Employer contribution rate to UCRP remains at 14% of compensation.
- Total of UCRP 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, 2018.

Other Information

- 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.
- All calculations were completed under the supervision of John Monroe, ASA, MAAA, Enrolled Actuary who is a member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein.