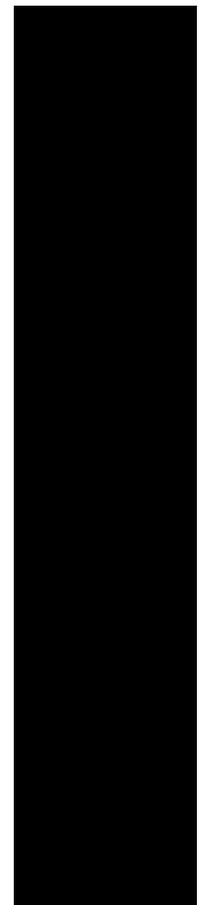
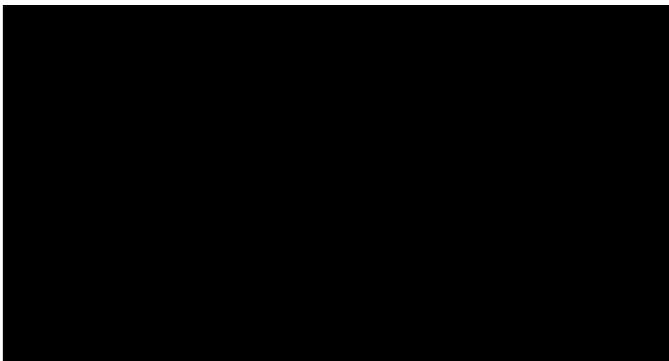


University Health

Pension Plan Actuarial  
Valuation Report - January  
2020

April 2021





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# Actuarial Certification

This report describes the results of an actuarial valuation of the University Health System Pension Plan. University Health retained Willis Towers Watson to perform this actuarial valuation for the purposes of determining (1) the funded status for the plan year January 1, 2020 through December 31, 2020 and the funding policy contribution amount for the plan year and fiscal year January 1, 2021 through December 31, 2021; and (2) financial statement disclosure and reporting information for the fiscal years ending December 31, 2020 and December 31, 2021.

The calculations were made as of January 1, 2020. In preparing the results presented in this report, we have relied upon information provided to us regarding plan provisions, plan participants, and plan assets as of January 1, 2020. We have reviewed this information for overall reasonableness and consistency, but have neither audited nor independently verified this information. Based on discussions with and concurrence by the plan sponsor, assumptions or estimates may have been made if data were not available. We are not aware of any errors or omissions in the data that would have a significant effect on the results of our calculations. The results presented in this report are directly dependent upon the accuracy and completeness of the underlying information. Any material inaccuracy in the data, assets, or plan provisions provided to us may have produced results that are not suitable for the purposes of this report and such inaccuracies, as corrected by University Health, may produce materially different results that could require that a revised report be issued.

The actuarial assumptions employed in this report have been selected by the plan sponsor, with the concurrence of Willis Towers Watson. This report does not determine liabilities on a plan termination basis, for which a separate extensive analysis would be required. The funding determination portion of this actuarial valuation has been conducted in accordance with principles of practice prescribed by the Actuarial Standards Board.

The financial statement disclosure portion of this actuarial valuation has been conducted according to our understanding of Statements No. 67 and 68 of the Governmental Accounting Standards Board. The Governmental Accounting Standards Board requires the use of reasonable assumptions. The actuarial assumptions used are identical to the assumptions used for the funding determination portion of the valuation.

The results shown in this report have been developed based on economic and demographic assumptions that are appropriate for the purpose of the measurement, take into account relevant historical and current data, reflect estimates of future experience and have no significant bias. Other actuarial assumptions could also be considered to be reasonable. Thus, reasonable results differing from those presented in this report could have been developed by selecting different, but still reasonable, assumptions.

The results shown in this report are estimates based on data that may be imperfect and on assumptions about future events that cannot be predicted with any certainty. The effects of certain plan provisions may be approximated, or determined to be insignificant and therefore not valued. Reasonable efforts were made in preparing this valuation to confirm that items that are significant in the context of the actuarial liabilities or costs are treated appropriately, and are not excluded or included inappropriately. The numbers shown in this report are not rounded, but this is for convenience only and should not imply precision, which is not a characteristic of actuarial calculations.

If overall future plan experience produces higher benefit payments or lower investment returns than assumed, the relative level of plan costs or contribution requirements reported in this valuation will likely increase in future valuations (and vice versa). Future actuarial measurements may differ

significantly from the current measurements presented in this report due to many factors, including plan experience differing from that anticipated by the economic or demographic assumptions and changes in plan provisions or applicable law. It is beyond the scope of this valuation to analyze the potential range of future pension contributions, but we can do so upon request.

The information contained in this report was prepared for the internal use of University Health and its auditors in connection with our actuarial valuation of the pension plan. It is neither intended nor necessarily suitable for other purposes, and we accept no responsibility or liability in this regard. University Health may also distribute this actuarial valuation report to the appropriate authorities who have the legal right to require University Health to provide them this report, in which case University Health will use best efforts to notify Willis Towers Watson in advance of this distribution. Further distribution to, or use by, other parties of all or part of this report is expressly prohibited without Willis Towers Watson's prior written consent. Willis Towers Watson accepts no responsibility for any consequences arising from any other party relying on this report or any advice relating to its contents.

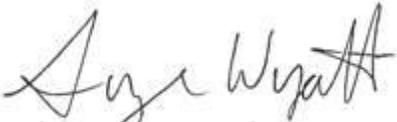
The undersigned consulting actuaries are members of the Society of Actuaries and meet the "Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States" relating to pension plans. Our objectivity is not impaired by any relationship between University Health and our employer, Willis Towers Watson US LLC.



Michael J. Bologna, FSA, EA, MAAA



David Fee, ASA



Suzanne Wyatt, FSA, EA

## I. Management Summary

### A. Key Results

The key results from the current valuation, along with comparable figures from the prior valuation, are as follows.

#### VALUATION RESULTS

Actuarial Valuation Date	January 1, 2020	January 1, 2019
Gross Service Cost	\$ 21,569,585	\$ 20,092,392
As a Percent of BOY Covered Payroll	5.25%	5.28%
Total Pension Liability (TPL)	\$ 586,845,566	\$ 546,953,449
Fiduciary Net Position (MVA)	\$ 436,563,397	\$ 359,774,304
Net Pension Liability (TPL – MVA)	\$ 150,282,169	\$ 187,179,145
Funded Ratio (MVA/TPL)	74.4%	65.8%
BOY Covered Employees' Payroll	\$ 410,769,235	\$ 380,744,589
Net Pension Liability as a percentage of covered payroll	36.6%	49.2%

#### FUNDING POLICY CONTRIBUTION DETERMINATION

	January 1, 2020 Projected to January 1, 2021	January 1, 2019 Projected to January 1, 2020
System's Service Cost (Net of Employee Contributions)		
FAP Service Cost	6,571,000	7,075,000
CB Service Cost	5,158,000	4,071,000
Total	\$ 11,729,000	\$ 11,146,000
As a Percent of EOY Covered Payroll	2.77%	2.84%
Total Pension Liability (TPL)	\$ 617,088,000	\$ 576,797,000
Actuarial Value of Assets (AVA)	\$ 452,867,000	\$ 402,433,000
Funded Ratio (AVA/TPL)	73.4%	70.0%
	2021 Fiscal Year Funding/Expense	2020 Fiscal Year Funding/Expense
Funding Policy Amount	\$ 21,734,000	\$ 21,502,000
As a Percent of EOY Covered Payroll	5.12%	5.47%
GASB 68 Annual Pension Expense	\$ 14,778,398	\$ 27,946,544
As a Percent of EOY Covered Payroll	3.48%	7.11%

The final average salary formula is closed to employees hired after June 30, 2012. Employees hired after that date are covered by a cash balance formula.

Note that all results in this valuation report are related to only the "defined benefit" portion of the redesigned plan. The "match-savings" and CMA portion of the plan is excluded from all liability and contribution calculations, and plan asset figures have been reduced to exclude the value of the match-savings and CMA accounts. Total System contribution requirements to the plan are the amounts shown in this report, plus the contributions required to be made to the match-savings accounts and CMA accounts for the applicable period. Required employee contributions to the plan at the rate of 2% of pay for the final average salary formula and 3% of pay for the cash balance formula are also anticipated in addition to the above System requirements.

## B. Plan Experience and Changes since Last Valuation

The plan experienced an actuarial gain during 2019 of \$37,328,847 or 6.8% of Total Pension Liability.

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### ACTUARIAL (GAINS) AND LOSSES

#### Total Pension Liability

■ Actuarial experience different than assumed	\$ 3,276,589
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#### Fiduciary Net Position

■ Return (greater)/less than expected	<u>(40,605,436)</u>
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Total Actuarial (Gain)/Loss	\$ (37,328,847)
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The Total Pension Liability was higher than expected primarily due to new entrants and cash balance interest crediting rate higher than expected partially offset by a lack of service accruals for participants who did not work the expected 1,000 hours during the year. The investment return in 2019 was 17.8% as compared to the assumed rate of 7.0%. In accordance with GASB 68, investment gains/losses are recognized in pension expense over a five year period.

## II. Funding Determination

### A. Determination of Contribution Amounts and Funded Status

The current funding policy contribution has been determined based on the actuarial assumptions summarized in Appendix D and the actuarial cost method described in Appendix E.

The System's funding policy to reach the Health System's long-term strategic goal for financing the pension obligations at a 100 percent funded ratio in compliance with the requirements of Section 802.2011 of the Texas Government Code is to contribute, at a minimum, the Actuarially Determined Contribution (ADC) to the University Health System Pension Plan (Plan) annually. The Actuarially Determined Contribution is summarized in Section D and is determined based on the assumptions and methods described in this report.

The actuarial assumptions are used to predict the likelihood of various benefits becoming payable from the plan, the amounts of those benefits, and the estimated value today of those future benefits. Actual experience may deviate from these assumptions, resulting in actuarial gains and losses.

The actuarial cost method is a budgeting technique, used to allocate total estimated plan liabilities over past, current, and future years. Thus, the choice of the cost method does not affect the overall long-term plan costs, but only the incidence of when those costs are reflected. The cost method is designed to produce plan costs as a relatively level percentage of payroll if characteristics of the participant group do not change significantly.

An actuarial valuation is the process by which the actuarial assumptions and cost method are applied to actual plan provisions, assets, and participant data to develop a funding level sufficient to provide for future benefit payments, the actual ultimate value of which is not now known. The actuarial valuation also determines the current funded status of the plan, a comparison of current assets to the value of benefits accrued to date. As a governmental plan, the University Health System Pension Plan is not subject to the minimum and maximum funding levels prescribed by the Employee Retirement Income Security Act (ERISA) and the Internal Revenue Code.

### B. Changes since Last Valuation

None

## C. Basic Valuation Results

Valuation Date Measurement Date Fiscal Year End	January 1, 2020 December 31, 2020 December 31, 2021	January 1, 2019 December 31, 2019 December 31, 2020
1. Total Pension Liability	\$ 626,182,651	\$ 583,568,977
2. Fiduciary Net Position	\$ 513,920,307	\$ 436,563,397
3. Net Pension Liability: (1) – (2)	\$ 112,262,344	\$ 147,005,580
4. Gross Service Cost (Beginning of Measurement Period)	\$ 21,569,585	\$ 20,092,392
5. Covered Payroll (Beginning of Year)	\$ 410,769,235	\$ 380,744,589
6. Service Cost as a Percentage of Covered Payroll	5.25%	5.68%
7. Expected Benefit Payments:		
	2020 \$ 32,787,736	
	2021 \$ 31,267,127	
	2022 \$ 34,381,281	
	2023 \$ 36,380,951	
	2024 \$ 39,258,401	
	2025 \$ 41,851,090	
	2026 \$ 43,597,634	
	2027 \$ 45,621,976	
	2028 \$ 47,981,579	
	2029 \$ 50,671,819	

## D. Development of Funding Amount

Each actuarial valuation is used to determine the funding amount for the following fiscal year, to be paid as of the first day of that fiscal year. The funding policy amount at January 1, 2021 has been determined on a basis of a 24-year amortization of the unfunded actuarial accrued liability as a level percentage of payroll.

	<b>January 1, 2020 Projected to January 1, 2021 For 2021 Fiscal Year Funding</b>	<b>January 1, 2019 Projected to January 1, 2020 For 2020 Fiscal Year Funding</b>
1. Total Pension Liability	\$ 617,088,000	\$ 576,797,000
2. Actuarial Value of Plan Assets	\$ 452,867,000	\$ 402,433,000
3. Unfunded Actuarial Accrued Liability: (1) – (2)	\$ 164,221,000	\$ 174,364,000
4. Covered Payroll (Beginning of Year)	\$ 424,119,000	\$ 393,119,000
5. Employer Service Cost (Net of Employee Contributions		
a. FAP Service Cost	6,571,000	7,075,000
b. CB Service Cost	5,158,000	4,071,000
c. Total: (5a) + (5b)	\$ 11,729,000	\$ 11,146,000
d. Percent of Covered Payroll	2.77%	2.84%
6. Amortization of Unfunded Actuarial Accrued Liability		
a. Period	24 years	25 years
b. Amount	\$ 10,005,000	\$ 10,355,000
c. Percent of Covered Payroll	2.36%	2.63%
7. Funding Policy		
a. Amount: (5c) + (6b)	\$ 21,734,000	\$ 21,502,000
b. Percent of Covered Payroll: (7a) ÷ (4)	5.12%	5.47%
c. Date for contribution	January 1, 2021	January 1, 2020

### III. Information for Financial Statements

#### A. Disclosure of Pension Information

Actuarial calculations under Statement No. 67 of the Governmental Accounting Standards Board (GASB 67) are for purposes of providing the required supplementary information to the financial statement of the plan. Actuarial calculations under Statement No. 68 of the Governmental Accounting Standards Board (GASB 68) are for purposes of providing the required supplementary information and the notes to the financial statement of the System. The calculations and disclosures reported in this section have been made on a basis consistent with our understanding of GASB 67 and GASB 68.

Beginning with the plan year ending December 31, 2014, the Fund has elected to prepare the plan's financial statements in accordance with GASB 67, which supersedes GASB 25 for the plan's financial reporting. Effective with the fiscal year ending December 31, 2015, the System has elected to prepare financial statements in accordance with GASB 68, which supersedes GASB 27 for the employer's financial reporting.

#### B. Schedule of Funding Progress — GASB 68

<b>Valuation Date Measurement Date Fiscal Year End</b>	<b>January 1, 2020 December 31, 2020 December 31, 2021</b>	<b>January 1, 2019 December 31, 2019 December 31, 2020</b>
1. Total Pension Liability (TPL)	\$ 626,182,651	\$ 583,568,977
2. Fiduciary Net Position	\$ 513,920,307	\$ 436,563,397
3. Net Pension Liability (NPL): (1) – (2)	\$ 112,262,344	\$ 147,005,580
4. Funded Ratio: (2) ÷ (1)	82.1%	74.8%
5. Covered Payroll (Beginning of Year)	\$ 410,769,235	\$ 380,744,589
6. NPL as a Percentage of Covered Payroll: (3) ÷ (5)	27.3%	38.6%

## C. Schedule of Employer Contributions

	<b>Year Ended December 31, 2021</b>	<b>Year Ended December 31, 2020</b>
1. Actuarial Valuation Date	January 1, 2020 (Projected to January 1, 2021)	January 1, 2019 (Projected to January 1, 2020)
2. Funding Policy Contribution		
a. Employer's Service Cost (Net of Employee Contributions)	\$ 11,729,000	\$ 11,146,000
b. Employer's Service Cost (Percentage of Covered Payroll)	2.77%	2.84%
c. Net Pension Liability	\$ 164,221,000	\$ 174,364,000
d. Amortization of Net Pension Liability	\$ 10,005,000	\$ 10,355,000
e. Amortization of Net Pension Liability (Percentage of Covered Payroll)	2.36%	2.63%
f. Funding Policy Contribution (Percentage of Covered Payroll): (b) + (e)	5.12%	5.47%
g. Projected Payroll on following January 1 (at valuation assumption)	\$ 424,119,000	\$ 393,119,000
h. Funding Policy Contribution: (a) + (d)	\$ 21,734,000	\$ 21,502,000
3. Employer Contribution	\$ 21,734,000 <sup>1</sup>	\$ 21,502,000
4. Percentage Contributed: (3) ÷ (2)(h)	100%	100%
5. Excess Contribution/(Contribution Deficiency): (3) – (2)(h)	\$ 0	\$ 0

<sup>1</sup> Amount assumed to be contributed January 1, 2021.

## D. Change in Net Pension Liability

Valuation Date Measurement Date Fiscal Year End	January 1, 2020 December 31, 2020 December 31, 2021	January 1, 2019 December 31, 2019 December 31, 2020
1. Total Pension Liability – Beginning of Measurement Period:	\$ 583,568,977	\$ 526,503,867
a. Gross service cost	21,569,585	21,644,692
b. Interest	41,534,047	37,599,681
c. Plan amendments	0	0
d. Demographic (gains) / losses	3,505,950	(659,022)
e. Assumption changes	0	20,879,114
f. Benefit payments	<u>(23,995,908)</u>	<u>(22,399,355)</u>
g. Net change in Total Pension Liability	\$ <u>42,613,674</u>	\$ <u>57,065,110</u>
h. Total Pension Liability – End of Measurement Period	\$ 626,182,651	\$ 583,568,977
2. Fiduciary Net Position – Beginning of Measurement Period	\$ 436,563,397	\$ 359,774,304
a. Employer contributions	21,502,000	23,431,000
b. Employee contributions	9,750,999	8,795,716
c. Net investment income	70,099,819	66,961,732
d. Benefit payments	(23,995,908)	(22,399,355)
e. Net change in Fiduciary Net Position	<u>77,356,910</u>	<u>76,789,093</u>
f. Fiduciary Net Position – End of Measurement Period	513,920,307	436,563,397
3. Net Pension Liability:	112,262,344	147,005,580
4. Funded Ratio: (2)(f) / (1)(h)	82.1%	74.8%
5. Covered employees' payroll	\$ 410,769,235	\$ 380,744,589
6. Net Pension Liability (NPL) as a percentage of covered payroll: (3)/(5)	27.3%	38.6%
7. Sensitivity of NPL at Measurement Date		
a. 1% increase in Discount Rate	\$ 48,687,199	\$ 81,875,654
b. 1% decrease in Discount Rate	\$ 188,492,906	\$ 225,220,149

## E. Pension Expense and Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions

Expense components for the December 31, 2021 fiscal year are shown below.

Fiscal Year Ending	<u>December 31, 2021</u>	<u>December 31, 2020</u>
Gross service cost	\$ 21,569,585	\$ 21,644,692
Interest on the Total Pension Liability	41,534,047	37,599,681
Differences between expected and actual experience	(1,203,723)	(1,825,345)
Changes of assumptions	7,819,348	7,819,348
Employee contributions	(9,750,999)	(8,795,716)
Projected earnings on pension plan investments	(31,574,438)	(26,356,296)
Differences between projected and actual earnings on plan investments	<u>(13,615,422)</u>	<u>(2,139,820)</u>
Total pension expense	\$ <b>14,778,398</b>	\$ 27,946,544

At December 31, 2021, University Health will report deferred outflows of resources and deferred inflows of resources related to pensions. Amounts and balances are as follows:

	<u>Deferred Outflows of Resources</u>	<u>Deferred Inflows of Resources</u>
Differences between expected and actual experience	\$ 3,009,982	\$ 4,366,909
Changes of assumptions	19,719,797	0
Net difference between projected and actual earnings on plan investments	<u>17,156,976</u>	<u>61,487,247</u>
Total	\$ <b>39,886,755</b>	\$ <b>65,854,156</b>



## F. Notes to Required Schedules

	<b>Fiscal Year Ended December 31, 2021</b>	<b>Fiscal Year Ended December 31, 2020</b>
1. Actuarial Valuation Date	January 1, 2020	January 1, 2019
2. Actuarial Cost Method	Entry Age Normal	Entry Age Normal
3. Amortization Method	Level Percentage Closed	Level Percentage Closed
4. Remaining Amortization Period (Years)	24.0	25.0
5. Asset Valuation Method	5-year smoothed market	5-year smoothed market
6. Actuarial Assumptions:		
Investment Rate of Return	7.0%	7.0%
Projected Salary Increases*	4.3%	4.3%
*Includes Wage Inflation at	3.25%	3.25%
Cost-of-Living Adjustments	N/A	N/A
Payroll Growth Rate	3.25%	3.25%
7. Factors that significantly affect the identification of trends (changes in benefits, actuarial methods or assumptions, etc.)	None	Salary increase, mortality, termination, retirement and optional form assumptions were changed based on a recent experience study

# Appendix A – Summary of Plan Provisions

## A. Plan Provisions as of January 1, 2020

### Final Average Salary Formula

The final average salary formula is closed to employees hired after June 30, 2012. Employees hired after that date will be covered by the cash balance formula.

1. **Effective Dates:** January 1, 1974. Most recent restatement as of January 1, 2008
2. **Covered Employees:** All employees, excluding house staff
3. **Eligibility:** Age 21 and twelve months employment working at least 1,000 hours
4. **Participation Date:** January 1 or July 1 following eligibility
5. **Definitions:**
  - Participation Service: Prior to January 1, 1998, years of continuous participation since the most recent date of full-time employment. After January 1, 1998, one year of Participation Service for each Plan Year during which the Participant is credited with 1,000 Hours of Service
  - Rule of 85 Service: Prior to January 1, 1998, years of continuous employment since the most recent date of full-time employment. After January 1, 1998, one year of Participation Service for each Plan Year during which the Participant is credited with 1,000 Hours of Service
  - Vesting Service: One year for each Plan Year during which the Employee completed 1,000 Hours of Service
  - Compensation: Total remuneration paid by the System for personal services rendered during the year, including IRC Sections 457, 403(b) and 125 pretax contributions
  - Average Monthly Compensation: Compensation during the five (5) calendar years out of the last ten (10) completed calendar years of employment which produce the highest average.
  - Normal Retirement Date: The first day of the month on or next following attainment of age 65 and completion of five years of Vesting Service
  - Early Retirement Date: Prior to Normal Retirement Date, the first day of the month on or next following attainment of age 55 and completion of five years of Vesting Service

## Benefits

- **Accrued Benefit:** A benefit equal to 1.5% of Average Monthly Compensation times years of Participation Service
  - **Normal Retirement Benefit:** Accrued Benefit at Normal Retirement Date
  - **Early Retirement Benefit:** Accrued Benefit at actual retirement reduced at the rate of 1/15 for each of the first five years, and 1/30 for each of the next five years, by which the benefit commencement date precedes Normal Retirement Date. However, if Rule of 85 Service plus age equals 85 or more, the Accrued Benefit will not be reduced
  - **Termination Benefit:**
    - Prior to eligibility for retirement:
      - a. Refund of mandatory contributions plus interest at 4½% per annum computed from the date the participant commenced participation to the date of termination if participant terminates employment prior to completion of five years of Vesting Service
      - b. Accrued Benefit at termination date commencing at Normal Retirement Date if participant terminates employment after completion of five years of Vesting Service
  - **Death Benefit Before Retirement Eligibility:** Refund of mandatory contributions plus interest at 4½% per annum to January 1 coinciding with or preceding the date of distribution
  - **Death Benefits on or After Eligibility for Retirement:** A monthly benefit payable to the eligible beneficiary, actuarially equivalent to 50% of the present value of the member's Accrued Benefit otherwise payable on the date of his death
- 6. Forms of Payment:** Normal form is five years certain and life annuity for retirement benefits. Optional forms available at retirement on an actuarial equivalent basis. An automatic lump sum is paid at termination if the value of the vested portion of the Participant's benefit is less than \$1,000
- 7. Maximum Benefits:** Dollar limit based on Section 415 of the Internal Revenue Code as applied to governmental plans
- 8. Mandatory Employee Contributions:** Two percent (2%) of compensation
- 9. Defined Contribution Portion of Plan:** The plan contains defined contribution elements which are excluded from this actuarial valuation of the defined benefit portion of the plan. These defined contribution elements are the Match-Savings and the CMA Account applicable to CMA physicians

## Cash Balance Formula

The cash balance formula is open to employees hired after June 30, 2012. Employees hired prior to that date are covered by a final average pay formula (described in previous section).

1. **Effective Dates:** January 1, 2013
2. **Covered Employees:** All employees, excluding house staff
3. **Eligibility:** Age 21 and twelve months employment working at least 1,000 hours
4. **Participation Date:** January 1 or July 1 following eligibility
5. **Definitions:**
  - Participation Service: One year of Participation Service for each Plan Year during which the Participant is credited with 1,000 Hours of Service
  - Vesting Service: One year for each Plan Year during which the Employee completed 1,000 Hours of Service
  - Compensation: Base salary or base wages paid by the System for personal services including salary reduction contributions to any employee benefit plan
  - Normal Retirement Date: The first day of the month on or next following attainment of age 65 and completion of five years of Vesting Service

### **Benefits**

- Accrued Benefit: A hypothetical account balance based on contributions in the amount of 6% of Compensation, with interest credits applied quarterly based on the actual System investment returns on assets in the trust
- Normal Retirement Benefit: Accrued Benefit at Normal Retirement Date
- Termination Benefit: Prior to eligibility for retirement:
  - a. If participant terminates employment prior to completion of five years of Vesting Service, refund of mandatory contributions with interest credits based on the actual System investment returns on assets in the trust
  - b. If participant terminates employment after completion of five years of Vesting Service, cash balance at termination date commencing immediately
- Death Benefit Before Retirement Eligibility: Refund of mandatory contributions with interest credits based on the actual System investment returns on assets in the trust
- Death Benefits on or After Eligibility for Retirement: A monthly benefit payable to the eligible beneficiary, actuarially equivalent to 50% of the present value of the member's Accrued Benefit otherwise payable on the date of his death

- |   |  |
|---|--|
| <b>6. Forms of Payment:</b>                     | An automatic lump sum is paid at termination if the value of the vested portion of the Participant's benefit is less than \$1,000. Benefits are available as an optional lump sum prior to normal retirement. Annuity optional forms available at normal retirement on an actuarial equivalent basis |
| <b>7. Maximum Benefits:</b>                     | Dollar limit based on Section 415 of the Internal Revenue Code as applied to governmental plans  |
| <b>8. Mandatory Employee Contributions:</b>     | Three percent (3%) of compensation   |
| <b>9. Defined Contribution Portion of Plan:</b> | The plan contains defined contribution elements which are excluded from this actuarial valuation of the defined benefit portion of the plan. These defined contribution elements are the Match-Savings and the CMA Account applicable to CMA physicians  |

## B. Changes in Plan Provisions since Prior Actuarial Valuation

There have been no changes to the defined benefit portion of the plan since the prior valuation.

## Appendix B – Summary of Assets

### A. Source of Information

Willis Towers Watson used plan asset data provided by University Health. We have not been made aware of any significant non-benefit liabilities of the plan, such as outstanding expenses or fees payable from plan assets.

### B. Values

All figures are net of any payables indicated on the asset statements provided. All figures also exclude the value of the participant Match–Savings accounts and CMA accounts.

	<u>December 31, 2019</u>	<u>December 31, 2018</u>
1. Market Value of Plan Assets	\$ 436,563,397	\$ 359,774,304
2. Actuarial Value of Plan Assets	\$ 417,143,084	\$ 378,819,608

### C. Changes in Asset Values During 2019

Net figures exclude contributions to, payments from, and year-end value of the Match–Savings accounts and CMA accounts.

	<u>Total Market Value</u>	<u>Match Savings Accounts</u>	<u>CMA Accounts</u>	<u>Net Market Value</u>
1. Asset Value as of December 31, 2018	\$378,452,020	\$18,677,716	\$ 0	\$359,774,304
2. Contributions during 2019	34,077,478	1,850,762	0	32,226,716
3. Benefit Payments	23,878,692	1,479,337	0	22,399,355
4. Net Investment Return	<u>70,014,025</u>	<u>3,052,293</u>	<u>0</u>	<u>66,961,732</u>
5. Asset Value as of December 31, 2019: (1) + (2) – (3) + (4)	\$458,664,831	\$22,101,434	\$ 0	\$436,563,397
6. Approximate Rate of Investment Return, net of expenses	17.71%			17.79%

## D. Development of Actuarial Value of Plan Assets

### Actuarial Gain/(Loss) for the Year

1. Market value of plan assets, December 31, 2018	\$	359,774,304
2. Contributions	\$	32,226,716
3. Benefits paid	\$	22,399,355
4. Expected investment return at 7.0%	\$	26,356,296
5. Expected Market value of plan assets, December 31, 2019: (1) + (2) – (3) + (4)	\$	395,957,961
6. Actual Market value of plan assets, December 31, 2019	\$	436,563,397
7. Actuarial Gain/(Loss): (6) – (5)	\$	40,605,436

### Schedule of Actuarial Gains/(Losses)

Plan Year Ending	Initial Actuarial Gain/(Loss)	Five-Year Amortization	Unrecognized Gain/(Loss) as of January 1, 2020 <sup>1</sup>
December 31, 2016	\$ 320,330	\$ 64,066	\$ 64,066
December 31, 2017	\$ 31,518,404	\$ 6,303,681	\$ 12,607,362
December 31, 2018	\$ (42,892,440)	\$ (8,578,488)	\$ (25,735,464)
December 31, 2019	\$ 40,605,436	\$ 8,121,087	\$ 32,484,349
			\$ 19,420,313

### Actuarial Value of Assets

1. Market value of plan assets, December 31, 2019	\$	436,563,397
2. Actuarial (Gain)/Loss to be Recognized in Future Years	\$	(19,420,313)
3. Actuarial value of plan assets, December 31, 2019: (1) + (2)	\$	417,143,084

<sup>1</sup> Amounts deferred for recognition in future years.

# Appendix C – Summary of Participant Data

## A. Participant Data as of January 1, 2020

The employee data provided to Willis Towers Watson by University Health was reviewed for reasonableness but no attempt was made to audit the data. All actuarial computations performed by Willis Towers Watson are directly dependent on the accuracy and completeness of the information provided.

Table C contains a summary of active participant data used in the current valuation. The active participant summary is based on age at last birthday, completed years of service as of January 1, 2020 and Reported Earnings during 2019. Reported Earnings is the figure provided by the System, and was identified as the 2019 base pay (total remuneration for employees covered by the final average pay formula) earned while a participant for personal services including salary reduction amounts pursuant to IRC Sections 125, 457, or 403(b). Valuation Earnings is calculated by adjusting Reported Earnings to the beginning of the year (January 1, 2020) using individual participant salary increase assumptions based on age and service. Covered Payroll is calculated by adjusting Reported Earnings to the beginning of the year (January 1, 2020) using the Payroll Growth assumption of 3.25%. Covered payroll as shown in the report uses total pay rather than pensionable earnings for cash balance participants.

Table D contains a summary of inactive participant data used in the current valuation. The inactive participant summary is based on age at last birthday and annual benefit as of January 1, 2020.

Table E shows a reconciliation of changes in participant data between January 1, 2019 and January 1, 2020.

## B. Comparison with Prior Year

A comparison of the participant data for the current and prior year is as follows:

	<u>January 1, 2020</u>	<u>January 1, 2019</u>
Active, Not Yet Participants	1,596	1,512
1. Active Participants - Final Average Pay		
a. number:		
i. vested	2,622	2,835
ii. nonvested	<u>21</u>	<u>27</u>
iii. total: (i)+(ii)	2,643	2,862
b. average age	50.5 years	49.9 years
c. average participation service	14.3 years	13.4 years
d. average vesting service	15.8 years	14.9 years
e. average Reported Earnings <sup>1</sup>	\$ 66,293	\$ 63,229
f. average increase for continuing actives	4.5%	3.2%
g. average Valuation Earnings <sup>2</sup>	\$ 69,011	\$ 66,356
2. Active Participants - Cash Balance		
a. number:		
i. vested	1,200	851
ii. nonvested	<u>2,929</u>	<u>2,729</u>
iii. total: (i)+(ii)	4,129	3,580
b. average age	39.2 years	39.0 years
c. average participation service	2.3 years	2.0 years
d. average vesting service	3.5 years	3.1 years
e. average Reported Earnings <sup>1</sup>	\$ 48,526	\$ 47,212
f. average increase for continuing actives	4.4%	4.6%
g. average Valuation Earnings <sup>2</sup>	\$ 50,851	\$ 50,050
3. Participants Pending Refund		
a. Number	1,646	1,468
b. Average balance	\$ 1,683	\$ 1,474
4. Participants Entitled to Deferred Benefits – Final Average Pay		
a. number	1,765	1,694
b. average annual benefit	\$ 5,587	\$ 5,387
5. Participants Entitled to Deferred Benefits – Cash Balance		
a. number	102	79
b. average benefit	\$ 11,812	\$ 11,002
6. Participants Currently Receiving Benefits		
a. number	1,262	1,193
b. average annual benefit	\$ 14,371	\$ 14,093

<sup>1</sup> See Part A of Appendix C for definition of Reported Earnings

<sup>2</sup> See Part A of Appendix C for definition of Valuation Earnings

C. Analysis of Participant Data as of January 1, 2020

**Active Participant Distribution by Age and Completed Years of Service, Including Valuation Earnings**

Age Nearest Birthday		Completed Years of Service								Total	
		0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	Over 34		
15 to 24	Count	242	0	0	0	0	0	0	0	0	242
	Total Earnings	8,019,555	0	0	0	0	0	0	0	0	8,019,555
	Average Earnings	33,139	0	0	0	0	0	0	0	0	33,139
25 to 29	Count	745	68	0	0	0	0	0	0	0	813
	Total Earnings	31,807,481	2,777,164	0	0	0	0	0	0	0	34,584,645
	Average Earnings	42,695	40,841	0	0	0	0	0	0	0	42,540
30 to 34	Count	650	215	31	0	0	0	0	0	0	896
	Total Earnings	31,367,409	11,090,933	1,467,268	0	0	0	0	0	0	43,925,610
	Average Earnings	48,258	51,586	47,331	0	0	0	0	0	0	49,024
35 to 39	Count	538	190	123	28	0	0	0	0	0	879
	Total Earnings	27,273,895	10,990,437	7,805,762	1,807,779	0	0	0	0	0	47,877,873
	Average Earnings	50,695	57,844	63,461	64,564	0	0	0	0	0	54,469
40 to 44	Count	422	188	145	103	15	0	0	0	0	873
	Total Earnings	23,776,689	10,781,425	9,781,679	7,185,493	1,274,503	0	0	0	0	52,799,789
	Average Earnings	56,343	57,348	67,460	69,762	84,967	0	0	0	0	60,481
45 to 49	Count	390	159	187	124	56	0	0	0	0	916
	Total Earnings	22,658,694	9,322,132	13,539,182	9,065,096	4,182,537	0	0	0	0	58,767,641
	Average Earnings	58,099	58,630	72,402	73,106	74,688	0	0	0	0	64,157
50 to 54	Count	250	152	129	132	89	29	0	0	0	781
	Total Earnings	15,256,777	9,083,320	9,212,248	9,623,941	6,479,570	1,991,798	0	0	0	51,647,654
	Average Earnings	61,027	59,759	71,413	72,909	72,804	68,683	0	0	0	66,130
55 to 59	Count	206	111	115	115	104	31	20	17	0	719
	Total Earnings	11,538,095	6,555,312	7,642,062	8,728,982	8,548,259	2,414,485	1,888,822	1,236,425	0	48,552,442
	Average Earnings	56,010	59,057	66,453	75,904	82,195	77,887	94,441	72,731	0	67,528
60 to 64	Count	115	79	90	70	68	14	8	16	0	460
	Total Earnings	6,766,001	5,127,625	5,928,499	5,554,612	5,801,813	1,035,759	635,192	1,095,932	0	31,945,433
	Average Earnings	58,835	64,907	65,872	79,352	85,321	73,983	79,399	68,496	0	69,447
65 to 69	Count	39	32	28	21	14	2	4	6	0	146
	Total Earnings	2,331,855	2,451,789	2,390,424	1,135,127	1,392,263	122,427	270,427	1,198,456	0	11,292,768
	Average Earnings	59,791	76,618	85,372	54,054	99,447	61,214	67,607	199,743	0	77,348
Over 69	Count	10	13	3	10	6	0	3	2	0	47
	Total Earnings	852,686	618,782	132,778	769,922	269,384	0	220,413	81,047	0	2,945,012
	Average Earnings	85,269	47,599	44,259	76,992	44,897	0	73,471	40,524	0	62,660
Total	Count	3,607	1,207	851	603	352	76	35	41	0	6,772
	Total Earnings	181,649,137	68,798,919	57,899,902	43,870,952	27,948,329	5,564,469	3,014,854	3,611,860	0	392,358,422
	Average Earnings	50,360	57,000	68,037	72,754	79,399	73,217	86,139	88,094	0	57,938

## D. Analysis of Participant Data as of January 1, 2020

***Inactive Participant Data by Age and Status***

Age Nearest Birthday	Terminated Vested Participants with Annual Benefits			Retired Participants and Beneficiaries		
	Number	Annual Benefits		Number	Annual Benefits	
		Total	Average		Total	Average
Under 35	85	275,039	3,236	2	11,611	0
35 – 39	186	777,703	4,181	2	32,517	0
40 – 44	268	1,143,839	4,268	3	25,410	1,101
45 – 49	315	1,855,914	5,892	2	13,617	0
50 – 54	307	1,981,634	6,455	0	0	0
55 – 59	257	1,855,837	7,221	63	1,004,771	15,949
60 – 64	169	1,106,474	6,547	200	3,353,814	16,892
65 – 69	118	647,248	5,485	391	6,532,555	16,875
70 – 74	41	174,741	4,262	301	4,427,277	14,997
75 – 79	17	38,211	2,248	138	1,505,098	10,889
Over 79	2	4,017	2,009	160	1,229,645	7,934
Total	1,765	9,860,657	5,587	1,262	18,136,316	14,371
Average Age		50.9 Years			70.6 Years	

## E. Analysis of Participant Data as of January 1, 2020

**Reconciliation of Participant Data**

	<i>Active-FAP</i>	<i>Active-CB</i>	<i>Deferred inactive</i>	<i>Currently receiving benefits</i>	<i>Total</i>
Included in January 1, 2019 valuation	2,862	3,580	3,241	1,193	10,876
Change due to:					
■ New hire and rehire	27	1,117	(45)	(2)	1,097
■ Nonvested termination					
– Contributions refunded	(2)	(163)	0	0	(165)
– Pending refund	(3)	(310)	313	0	0
■ Vested termination	(126)	(64)	190	0	0
■ Retirement	(83)	0	(7)	90	0
■ Death without beneficiary	0	(1)	0	(26)	(27)
■ Death with beneficiary	0	(1)	1	0	0
■ Cashout	(33)	(28)	(176)	0	(237)
■ Data Corrections	1	(1)	0	7	7
■ Net change	(219)	549	276	69	675
Included in January 1, 2020 valuation	2,643	4,129	3,517	1,262	11,551

# Appendix D – Summary of Actuarial Assumptions

## A. Funding Determination Actuarial Assumptions

### 1. Actuarial Assumptions

#### ■ Investment Return:

- Contribution Requirements: 7.00% per year, compounded annually
- Actuarial Present Value of Accumulated Benefits: 7.00% per year, compounded annually
- Determination of Employee-Purchased Benefit: 4.50% per year, compounded annually
- Interest crediting rate for Cash Balance participants: 7.00% per year, compounded annually

The return on assets shown above is net of investment expenses and administrative expenses assumed to be paid from the trust. Under GASB 67 and 68, the discount rate is based on the assumed long term expected return on assets to the extent that projected assets are sufficient to pay expected future benefits and a 20-year municipal bond rate is used to discount expected benefit payments where assets are projected to be insufficient. Based on our understanding of the funding policy of the plans, assets are projected to be sufficient to cover all expected future benefit payments. For purposes of projecting assets and benefit payments, the current funding policy is expected to continue for all future periods.

- Salary Increases: Annual rates based on age. See Sample Rates
- Payroll Growth: 3.25% per year, compounded annually (3.25% wage inflation composed of 2.75% price inflation plus 0.5% assumed productivity increase)
- Mortality:
  - Active Lives: PubG-2010 Sex Distinct Employee; projected with Generational Mortality (Scale MP-2018)
  - Retired Lives: PubG-2010 Sex Distinct Healthy Retiree; projected with Generational Mortality (Scale MP-2018)
  - Contingent Survivor Lives: PubG-2010 Sex Distinct Contingent Survivor; projected with Generational Mortality (Scale MP-2018)
- Disablement: None assumed
- Termination of Employment: Annual rates based on age and service. See Sample Rates

- Retirement: Annual rates based on age and age at satisfaction of Rule of 85 for participants that meet the Rule of 85 prior to age 65. See Sample Rates
- Credited Service: One year assumed earned in each future year employed
- Expenses: Investment return assumed net of expenses
- Spouse Age Difference: Wife assumed to be 3 years younger than husband.
- Missing Data: Reported data assumed to be complete
- Form of Payment:
 

Form of Payment	Rate
5-Year Certain & Life Annuity	25%
Life Only Annuity	25%
Lump Sum	25%
100% Joint & Survivor Annuity	25%
- Maximum Benefit and Pensionable Earnings: Benefits limited by Internal Revenue Code Sections 401(a)(17) and 415

**2. Sample Rates**

- Annual Rates of Mortality: *The rates shown reflect improvements to 2020*

Age	Males			Females		
	Employee	Healthy Retiree	Contingent Survivor	Employee	Healthy Retiree	Contingent Survivor
25	0.03%	N/A	N/A	0.01%	N/A	N/A
30	0.05%	N/A	N/A	0.02%	N/A	N/A
35	0.06%	N/A	N/A	0.03%	N/A	N/A
40	0.08%	N/A	N/A	0.04%	N/A	N/A
45	0.10%	N/A	0.53%	0.05%	N/A	0.25%
50	0.14%	0.27%	0.64%	0.08%	0.21%	0.31%
55	0.21%	0.42%	0.80%	0.13%	0.30%	0.47%
60	0.33%	0.64%	1.05%	0.20%	0.40%	0.66%

- Annual Rates of Termination:

Graded table by age and service – sample rates

Age	Service				
	1	2	3-4	5-8	9+
25	23.30%	21.20%	17.23%	12.78%	7.53%
30	22.13%	19.87%	15.93%	11.57%	6.73%
35	20.97%	18.53%	14.64%	10.36%	5.94%
40	19.80%	17.20%	13.35%	9.15%	5.15%
45	18.63%	15.87%	12.06%	7.94%	4.36%
50	17.47%	14.53%	10.77%	6.73%	3.57%
55	17.00%	14.00%	10.25%	6.25%	3.25%

■ Annual Salary Increase Rates:

Age	Rate
< 26	6.75%
26 – 36	5.25%
37 – 42	4.75%
43 – 53	4.25%
> 53	3.50%

■ Annual Rates of Retirement:

Annual rates based on age and eligibility for the Rule of 85

Age	Eligible for Rule of 85	Not Eligible for Rule of 85
55	24%	7%
56 – 57	10%	7%
58 – 61	13%	7%
62 – 64	22%	15%
65	40%	25%
66 – 69	25%	25%
> 69	100%	100%

**3. Assumptions Rationale**

- Discount Rate, Expected Return on Assets, Cash Balance Interest Crediting Rate  
 The expected return on assets assumption (net of administrative expenses) was based on an experience study conducted in 2019 combined with best estimates for future experience with consideration given to whether any conditions have changed that would be expected to produce different results in the future.
- Mortality:  
 Mortality rates were based on an experience study conducted in 2019 combined with best estimates for future experience with consideration given to whether any conditions have changed that would be expected to produce different results in the future.
- Disablement:  
 There is no separate assumption made for participants decrementing due to disability, as no disability benefit is offered under the plan.
- Termination of Employment:  
 Termination rates were based on an experience study conducted in 2019 combined with best estimates for future experience with consideration given to whether any conditions have changed that would be expected to produce different results in the future.

- Retirement: Retirement rates were based on an experience study conducted in 2019 combined with best estimates for future experience with consideration given to whether any conditions have changed that would be expected to produce different results in the future.
- Spouse Age Difference: The assumed age difference for spouses is based on general population statistics on the age difference for married individuals of retirement age.
- Form of Payment Form of payment elections were based on an experience study conducted in 2019 combined with best estimates for future experience with consideration given to whether any conditions have changed that would be expected to produce different results in the future.

**4. Benefits Not Valued**

All benefits of the Plan were valued except for Match–Savings and CMA Account portions of the Plan. These elements of the program are excluded from all liability calculations and current value of Match–Savings and CMA Accounts are excluded from assets.

**5. Changes in Actuarial Assumptions**

None

**Model Descriptions and Disclosures (in accordance with ASOP No. 56)**

**Quantify**

Quantify is the Willis Towers Watson centrally developed, tested and maintained Global actuarial valuation system. It is used to perform valuations of clients' benefit plans.

Quantify provides the ability to process data, calculate benefits and value benefit liabilities, develop results using applicable standards, and generate client reports.

Quantify parameters provide significant flexibility to model populations and plan designs. Various demographic, economic and benefit related assumptions exist for users to model multiple demographic and economic situations.

Plan liabilities are calculated based on standard actuarial techniques, developing actuarially reasonable results using the population and parameters entered. The calculation and presentation of liabilities in Quantify relies on the assumptions used and the reasonability of the assumptions selected.

Quantify incorporates standard liability methodologies that are intended to reasonably reflect a variety of economic or demographic conditions. The

model itself does not evaluate any assumptions entered for reasonableness, consistency or probability of occurrence.

Quantify is designed specifically for these purposes, and we know of no material limitations that would prevent the system from being suitable for these intended purposes. The actuaries signing this report have relied on the actuaries who develop, test and maintain this system, and have also performed a limited review of results to ensure that system parameters have been set appropriately and plan provisions coded correctly.

**Published Demographic Tables** Certain demographic tables described above are standard published tables or are based on standard published tables from models developed by organizations with the requisite expertise

## B. Pension Cost Determination Actuarial Assumptions

The actuarial assumptions outlined in the preceding subsection A for funding determination were also used for pension cost determination.

# Appendix E – Description of Actuarial Methods and Procedures

## A. Funding Determination Actuarial Cost Methods and Procedures

### 1. Calculation of Service Cost and Actuarial Accrued Liability

The method used to determine the Service Cost and Pension is the Entry Age Normal Cost Method, described below.

#### Entry Age Normal Cost Method

- The Projected Benefits at retirement or termination are determined for each individual included in the actuarial valuation. For each such individual, the individual Service Cost is the actuarial present value of projected benefits at entry age, divided by the actuarial present value of valuation earnings at entry age, multiplied by the individual's valuation earnings for the valuation year. The sum of all individual Service Costs is the Service Cost for the valuation year.
- The Total Pension Liability is the excess, on the valuation date, of the actuarial present value of projected benefits for all individuals included in the actuarial valuation over the sum of the actuarial present values of future individual normal costs. The Net Pension Liability is the excess of the Total Pension Liability over the Fiduciary Net Position.
- The actuarial gain (loss) is a measure of the difference between the Net Pension Liability based on actual experience and that expected based upon the actuarial assumptions between two actuarial valuation dates.
- Adjustments to the Net Pension Liability can result from changes in actuarial assumptions and plan provisions. Such adjustments are determined by calculating, as of the actuarial valuation date, the increase or decrease in the Net Pension Liability resulting from the change.

### 2. Calculation of Actuarial Value of Plan Assets

The actuarial value of plan assets is based on the market-related value of plan assets, with five-year smoothing of unexpected returns. The market-related value is equal to the value of the fair value of assets held in trust for pension benefits as of the valuation date, plus contributions receivable.

### 3. Other Actuarial Valuation Procedures

- No actuarial liability is accrued for nonvested terminated employees, even if a break in service had not occurred as of the actuarial valuation date. An actuarial liability is accrued for all other terminated employees, even if a claim for benefits has not been made.
- All benefits summarized in Appendix A were valued.

# Appendix F – Statement of funding-related risks of plan in accordance with ASOP No. 51

## Potentially Significant Risks Associated with the Plan

The following sections discuss certain risks associated with the plan. The specific risks discussed below do not represent a comprehensive list of all risks that could potentially affect the plan, its participants, the sponsor, or any other party. In our professional judgment, we believe these risks to be most relevant to the plan's future financial condition. Not all possible sources of risk were considered. We have not evaluated the ability or willingness of the plan sponsor to make contributions to the plan when due, nor have we assessed the likelihood or consequences of potential future changes in applicable law. Nothing contained in this report is intended to provide investment advice.

The results shown in this report rely on assumptions regarding future economic and demographic experience. Actual future experience will deviate from the actuarial assumptions, and thus future actuarial measurements and future contribution requirements will differ (perhaps significantly) from the current measurements and contribution requirements presented in this report. Following is a discussion of some of the risks that have the potential to significantly increase the future contributions needed to secure the benefits of participants. While the discussion below focuses on elements that can increase contributions, contributions may also significantly decline, although not below \$0, if these elements move in the opposite direction than discussed below. Note also that any assessment of the risk provided below is speculative and made by the actuary who may not have all the information necessary to evaluate the significance of the risk to the System or plan participants of changes in the plan's funded status; the plan sponsor and its advisors should consider the assessment and any reasons given, and other information, and come to their own conclusions as to the significance of the risk presented. A more complete understanding of these or other risks would require a separate analysis. Such analysis would provide information about the consequences of different plausible experience and about the severity of adverse experience that could be tolerated within a range of funding levels. We recommend that such an analysis be performed or considered.

We also note that the financial condition of a plan, as well as the contributions caused by this condition, tend to be highly leveraged amounts. When referring to a plan's financial condition below, we generally mean the difference between the plan's assets and its liabilities. As each of these numbers is typically much larger than their difference, even a small change in either one can cause a large percentage change in the financial condition and the resulting contributions.

## Financial Risks

### Asset Liability Mismatch Risk

There is generally a substantial risk to a plan's financial condition if the changes in asset values are not matched by changes in the value of liabilities. In this situation, this risk is somewhat mitigated because some of the plan's assets are invested in securities that expected to move in the same direction as the plan's liabilities.

We believe that a more detailed assessment would not be beneficial to understanding this risk because it is our understanding the detailed assessments have been made in prior years and circumstances have not significantly changed since then.

#### Effect of a 10% reduction in current assets without any offsetting reduction in liability

Measure <sup>1</sup> 2020 Plan Year	Before	After	Increase	
			\$ Amount	Percentage
Net Pension Liability (NPL) at January 1, 2020	150,282,169	193,938,509	43,656,340	29.05%
Actuarially Determined Contribution <sup>2</sup>	21,734,000	22,984,000	1,250,000	5.75%

1. The "after" NPL and actuarially determined contribution shown above are determined without regard to any assumption changes. The effect on the contribution reflects only the amortization of the increase in the Net Pension Liability.
2. January 1, 2020 Projected to January 1, 2021 for 2021 Fiscal Year Funding

The change in funding shortfall shown above does not take into account the smoothing of investment experience under the asset valuation method used by the plan. The effect of the asset smoothing method would be to delay a part of the increase in the contribution requirement that occurs when investment return is lower than the discount rate. The amortization of an investment loss (compared to the return implicitly expected by the expected return on assets) is fully reflected in the contribution determination five years after the valuation date at which it is first measured.

### Investment Risk

Some of the plan's assets are invested in return-seeking asset classes that can experience volatile returns. Several consecutive years of moderately poor returns or a single year of exceptionally poor returns may cause a significant increase in required contributions or in contributions required to reach desired funding targets (e.g., a percentage of Total Pension Liability). Failure to compensate for adverse

investment experience with increased contributions could result in further degradation of the funded status of the plan over time, even if investments return at expected rates thereafter.

Generally there is a substantial risk to a plan's financial condition if investment returns are lower than expected. In this situation the risk is present because some of the plan's assets are invested in equities that would not be expected to move in any predictable pattern relative to the plan liabilities.

We believe that a more detailed assessment would not be beneficial to understanding this risk because we understand that detailed assessments are made periodically and circumstances (e.g., the plan's funded status and investment mix) have not significantly changed since the most recent study.

### Discount Rate Risk

The funding requirements use a measure of plan obligations based on the expected return on assets. If the expected return on assets changes, due to recent investment experience or other macro-economic factors, the pension liabilities and required contributions may increase significantly and the higher contribution rates may persist for a long period of time.

There is generally a substantial risk to a plan's financial condition due to changes in the discount rate because plan liabilities increase as discount rates decline. In this situation the risk is present because the some of the plan's assets are invested in securities that are not expected to react to changes in the expected return on assets in a manner that is correlated to the liability. We believe that a more detailed assessment would not be beneficial to understanding this risk because it is our understanding that the System regularly assesses its risk due to this phenomena.

#### Effect of a reduction of 1.0% in the discount rate used to determine liabilities

Measure 2020 Plan Year	Before	After	Increase	
			\$ Amount	Percentage
Total Pension Liability (TPL) at January 1, 2020	586,845,566	659,207,489	72,361,923	12.33%
Service Cost	21,569,585	24,489,110	2,919,525	13.54%
Actuarially Determined Contribution <sup>1</sup>	21,734,000	27,891,000	6,157,000	28.33%

1. January 1, 2020 Projected to January 1, 2021 for 2021 Fiscal Year Funding

### Contribution Risk

We believe there is risk to the plan's financial condition if actual future contributions are not made as expected. A more detailed assessment would not be beneficial to understanding this risk due to the very small chance that the System would not be making the recommended contribution. Note that we have not evaluated the System's willingness or ability to make the recommended contribution.

## Demographic Risks

The demographic risks discussed below are typically not as significant as the economic risks discussed above since both the degree of variation from assumptions and the effect on funded status tend to be smaller. However, situations do exist such as certain plan designs where the risks below may be more significant.

### Longevity Risk

Measurements of the plan obligations are based on the assumptions of participant longevity described in Appendix D. Expert opinions about future longevity vary widely. If lifespans of plan participants exceed those expected under the assumptions used in preparing the results presented in this report, future measures of the plan liability and future contribution requirements will gradually increase over time. Furthermore, an emerging pattern of longer lifespans or new research that increases the plausibility of longer lifespans may require a future adjustment in the mortality assumptions that results in a permanent significant increase in the plan liability measurements and contribution requirements.

We believe that a more detailed assessment would not be beneficial to understanding this risk because the System closed the Final Average Pay formula and the Cash Balance formula is not subject to this risk.

### Retirement Risk

The Final Average Pay formula includes valuable early retirement subsidies. As a result, plan costs will increase if participants retire at younger ages than assumed. This might occur, for example, if business conditions were to cause reductions in force. Currently, retirements are expected to occur at various ages, using the retirement rates summarized in Appendix D, producing an average expected retirement age of about 60 years for those FAP participants eligible for the Rule of 85. There is risk to the plan's financial condition if these participants retire earlier than currently assumed. Note that an experience study was recently performed, the assumed retirement rates are based on that study and plan sponsor expectations, and we are not aware of any economic conditions that would cause a change in such expectations.

We believe that a more detailed assessment would not be beneficial to understanding this risk because a detailed assessment was recently performed and circumstances have not changed significantly. Also, the System is scheduled to study experience next year and will fine tune this (and other assumptions) as necessary.

### Other Risks

Additional risks exist, including but not limited to deflation risk.

## Historical Information

The following information is provided to demonstrate how the fiduciary net position, total pension liability, and funded ratio have varied over time. Note that the asset and liability values shown below were affected by the levels of plan sponsor contributions and benefits accruing, respectively, in addition to interest rates, asset gains and losses, and other experience.

Measurement Date	Fiduciary Net Position	Total Pension Liability	Funded Ratio
December 31, 2019	436,563,397	583,568,977	74.8%
December 31, 2018	359,774,304	526,503,867	68.3%
December 31, 2017	363,779,588	491,923,670	74.0%
December 31, 2016	295,051,029	461,733,867	63.9%
December 31, 2015	267,492,612	407,490,138	65.6%

# Appendix G – Glossary

## A. Pension Terminology

The following terms are defined in accordance with standard pension terminology adopted by the actuarial profession.

### **Accumulated Plan Benefit**

The amount of an individual's benefit (whether or not vested) as of a specified date, determined in accordance with the terms of a pension plan and based on compensation (if applicable) and service to that date.

### **Actuarial Accrued Liability**

That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of pension plan benefits and expenses which is not provided for by future Service Costs.

### **Actuarial Assumptions**

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement, and retirement; changes in compensation and Social Security benefits; rates of investment earnings and asset appreciation or depreciation; and other relevant items.

### **Actuarial Cost Method**

A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an actuarially equivalent allocation of such value to time periods, in the form of a Service Cost and an Actuarial Accrued Liability.

### **Actuarial Gain (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, as determined in accordance with a particular Actuarial Cost Method.

### **Actuarial Present Value**

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.

**Actuarial Value of Plan Assets**

The value of cash, investments and other property belonging to a pension plan, as used by the actuary for the purpose of an Actuarial Valuation.

**Actuarial Valuation**

The determination, as of a valuation date, of the Service Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a pension plan.

**Actuarially Equivalent**

Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.

**Amortization Payment**

That portion of the pension plan contribution which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

**Service Cost**

That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.

**Projected Benefits**

Those pension plan benefit amounts which are 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 and past and anticipated future compensation and service credits.

**Unfunded Actuarial Accrued Liability**

The Excess of the Actuarial Accrued Liability over the Actuarial Value of Assets.

## **B. Accounting Terminology**

The following terms are defined in accordance with accounting profession terminology.

### **Annual Pension Cost**

A measure of the periodic cost of an employer's participation in a defined benefit pension plan.

### **Annual Required Contributions of the Employer (ARC)**

The employer's periodic required contributions to a defined benefit pension plan, calculated in accordance with the parameters.

### **Contribution Deficiencies (Excess Contributions)**

The difference between the annual required contributions of the employer (ARC) and the employer's actual contributions in relation to the ARC.

### **Investment Return Assumption (Discount Rate)**

The rate used to adjust a series of future payments to reflect the time value of money.

### **Level Dollar Amortization Method**

The amount to be amortized is divided into equal dollar amounts to be paid over a given number of years; part of each payment is interest and part is principal (similar to a mortgage payment on a building). Because payroll can be expected to increase as a result of inflation, level dollar payments generally represent a decreasing percentage of payroll; in dollars adjusted for inflation, the payments can be expected to decrease over time.

### **Market-Related Value of Plan Assets**

A term used with reference to the actuarial value of assets. A market-related value may be market value (or estimated market value) or a calculated value that recognizes changes in market value over a period of, for example, three to five years.

### **Measurement Date**

The date as of which plan assets and obligations are measured.

**Net Pension Obligation**

The cumulative difference since the effective date of the accounting statement between annual pension cost and the employer' contributions to the plan, including the pension liability (asset) at transition, and excluding (a) short-term differences and (b) unpaid contributions that have been converted to pension-related debt.

**Open Group/Closed Group**

Terms used to distinguish between two classes of Actuarial Cost Methods. Under an Open Group Actuarial Cost Method, Actuarial Present Values associated with expected future entrants are considered; under a Closed Group Actuarial Cost Method, Actuarial Present Values associated with future entrants are not considered.

**Parameters**

The set of requirements for calculating actuarially determined pension information included in financial reports.

**Prepaid Pension Cost**

Cumulative employer contributions in excess of accrued net pension cost.

**Unfunded Accrued Pension Cost**

Cumulative net pension cost accrued in excess of the employer's contributions.