



August 26, 2021

Ms. Bethany Rhodes, Director
Ohio Retirement Study Council
Rhodes State Office Tower
30 East Broad Street, 2nd Floor
Columbus, OH 43215

Dear Ms. Rhodes:

In accordance with Ohio Revised Code Section 5505.12(A), I am attaching the actuarial valuation of the Highway Patrol Retirement System as of December 31, 2020.

If you have any questions, please contact me.

Sincerely,

Carl Roark, Ph.D.
Executive Director
direct dial 614.430.3557
c.roark@ohprs.org

cc: The Honorable Mike DeWine, Governor
The Ohio Retirement Study Council
Director Kimberly Murnieks, Office of Budget and Management
The Honorable Bob Cupp, Speaker of the House
The Honorable Matt Huffman, Senate President
The Honorable Rick Carfagna, Chair, Ohio Retirement Study Council
The Honorable Susan Manchester, Chair, House Families, Aging & Human Services
The Honorable Frank Hoagland, Chair, Senate Veterans & Public Safety

OHIO STATE HIGHWAY PATROL RETIREMENT SYSTEM

ACTUARIAL VALUATION
AS OF DECEMBER 31, 2020



FOSTER & FOSTER
ACTUARIES AND CONSULTANTS

August 9, 2021

Board of Trustees
Ohio State Highway Patrol Retirement System
Columbus, Ohio

Dear Board:

We are pleased to present to the Board this report of the December 31, 2020 actuarial valuation of the Ohio State Highway Patrol Retirement System (OHPRS or the System).

The valuation was performed as of December 31, 2020 to determine the current funding status, funding period, the experience of the System over the past year, and provide information and trend data schedules for use in the Annual Financial Report. Use of the results for other purposes may not be applicable and produce significantly different results. Successive valuations will be performed every year.

This report does not include the related results for GASB Statements No. 67 and No. 68. Foster & Foster provided the disclosure information under Statements No. 67 and No. 68 in a separate report dated May 27, 2021. Foster & Foster prepares a separate valuation of OHPRS retiree health care benefits.

Data Sources

In preparing this report, we have relied on personnel, plan design and asset information supplied by OHPRS. In our opinion, the assumptions used in the valuation, as adopted by the Board of Trustees, represent reasonable expectations of anticipated fund experience. While we cannot verify the accuracy of all this information, the supplied information was reviewed for consistency and reasonableness. As a result of this review, we have no reason to doubt the substantial accuracy of the information and believe that it has produced appropriate results. This information, along with any adjustments or modifications, is summarized in various sections of this report.

Experience

The experience of the System over the last year is outlined in this report. The System experienced an actuarial gain of \$27.9 million, which consists of a \$23.6 million gain on the Fund's actuarial value of assets and a \$4.3 million gain on the System's actuarial accrued liability. Based on the actuarial value of assets, the Fund earned 10.30% compared to the assumed 7.25% return.

Changes Since Prior Report

At the June 2021 Board meeting, the Board of Trustees adopted a change to the following Plan provision in conjunction with the December 31, 2020 valuation:

- A one-time COLA in calendar year 2022 of 3% and none in future years.

The impact of the above change increased the actuarial accrued liability by \$10.9 million as of December 31, 2020.

Contribution Amounts

As established by Ohio Revised Code Section 5505.15, the Statutory Employer and Employee contribution rates are set as follows:

Annual Contributions to the Fund (as a % of Active Payroll)		
Employer	Employee	Totals
26.50%	10.00% to 14.00%	36.50% to 40.50%

The funding objective of the Fund is to comply with the amortization requirement of Section 5505.121 of the Revised Code, which requires the retirement board to set a policy with a period of not more than thirty years to amortize the system's unfunded actuarial accrued pension liabilities. If the funding period exceeds 30 years, a plan shall be prepared and submitted by the Board of Trustees to the Ohio retirement study commission (ORSC) to reduce the funding period to not more than 30 years. With the enactment of Senate Bill 345, the Board has the discretion to set the member contribution rate and the Cost of Living Allowance (COLA) percentage to comply with the amortization requirement of Section 5505.121 of the Revised Code.

The results presented in this report are based upon the Board decision from the June 2021 board meeting to adopt a member contribution rate of 14.0% and the COLA increases were assumed to be 0.0% for calendar year 2021 and a one-time COLA rate of 3.0% in calendar year 2022 and then 0.0% thereafter. The purpose of this report is to provide information on the results of the December 31, 2020 actuarial valuation based upon these decisions.

Based on the results of this valuation, the unfunded actuarial accrued liabilities of the pension program are expected to be amortized over a 22-year period, so no 30-year funding plan is required.

Schedules for Annual Financial Report

The report includes information and trend data schedules for use in the Annual Financial Report. The following information and exhibits are included in the body of the report and Supplementary Tables section:

- Present Value of Future Benefits
- Membership Note Data
- Participant Statistics
- History of Change in Unfunded Accrued Liability
- History of Annuitants and Survivors Added/Dropped from Rolls
- Summary of Annuitants and Survivors by Age
- Breakdown of Aggregate Accrued Liabilities
- Expected Development of Members contributing to the System

Actuarial Certification

The valuations have been conducted in accordance with generally accepted actuarial principles and practices, including the applicable Actuarial Standards of Practice as issued by the Actuarial Standards Board, and reflects laws and regulations issued to date pursuant to the provisions of Chapter 5505 of the Ohio Revised Code, as amended by Senate Bill No. 345., as well as applicable federal laws and regulations. The funding percentages and unfunded accrued liability as measured based on the actuarial value of assets will differ from similar measures based on the market value of assets. These measures, as provided, are appropriate for determining the adequacy of future contributions, but may not be appropriate for the purpose of settling a portion or all of its liabilities. Future actuarial measurements may differ significantly from the current measurements presented in this report for a variety of reasons including changes in applicable laws, changes in plan provisions, changes in assumptions, or plan experience differing from expectations. Due to the limited scope of the valuation, we did not perform an analysis of the potential range of such future measurements.

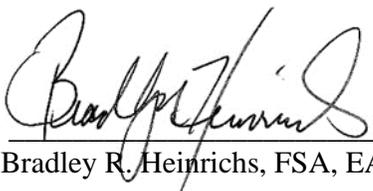
In our opinion, the following valuation results fairly present the financial condition of the Ohio State Highway Patrol Retirement System as of December 31, 2020.

The undersigned is familiar with the immediate and long-term aspects of pension valuations and meets the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinions contained herein. All the sections of this report are considered an integral part of the actuarial opinions.

To our knowledge, no associate of Foster & Foster, Inc. working on this report has any direct financial interest or indirect material interest in the Ohio State Highway Patrol Retirement System, nor does anyone at Foster & Foster, Inc. act as a member of the Board of Trustees of the Ohio State Highway Patrol Retirement System. Thus, there is no relationship existing that might affect our capacity to prepare and certify this actuarial report.

We look forward to discussing the results with you.

Regards,

By: 
Bradley R. Heinrichs, FSA, EA, MAAA

By: 
Jason L. Franken, FSA, EA, MAAA

Foster & Foster, Inc.

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SUMMARY OF RESULTS

The table below contains a summary of key valuation results compared to the prior year values.

	December 31, 2020	December 31, 2019
Membership Data		
Active Members (Includes DROP members)		
Number	1,542	1,614
Covered Payroll	117,996,230	118,370,595
Valuation Payroll	122,591,811	122,942,091
Retirees and Beneficiaries		
Number	1,730	1,699
Annual Allowances	\$ 71,554,792	\$ 69,831,187
Vested Former Members		
Number	26	18
Deferred Annual Allowances	\$ 896,382	\$569,612
Inactive Members eligible for Refunds only		
Number	567	574
Contributions Refund Due	\$ 2,637,082	\$ 2,979,402
Funded Status		
Total Actuarial Liability	\$ 1,203,886,606	\$ 1,173,155,313
Actuarial Value of Assets	<u>844,744,129</u>	<u>796,284,462</u>
Unfunded Actuarial Liability	\$ 359,142,477	\$ 376,870,851
Funded Ratio	70.2%	67.9%
Market Value of Assets	\$ 907,391,508	\$ 817,859,488
Unfunded Liability (MVA basis)	\$ 296,495,098	\$ 355,295,825
Funded Ratio (MVA basis)	75.4%	69.7%
Funding Period on AVA basis	22 Years	23 Years
Contribution Rates (as a Percentage of Payroll)		
Applicable Fiscal Year	2021	2020
Statutory Contribution Rates:		
Employer	26.50%	26.50%
Member	<u>14.00%</u>	<u>14.00%</u>
Totals	40.50%	40.50%
Allocation of Employer Contribution Rate:		
Pension Contribution Rate:		
Employer Normal Cost	6.35%	6.18%
Unfunded Actuarial Accrued Liabilities	<u>20.15%</u>	<u>20.32%</u>
Total Employer Pension Rate	26.50%	26.50%
Health Care Contribution Rate	<u>0.00%</u>	<u>0.00%</u>
Total Employer Contribution Rate	26.50%	26.50%

ACTUARIAL LIABILITY AND FUNDED RATIO

Below are details regarding the actuarial liability and funded ratio as of December 31, 2020.

1.	Present Value of Future Benefits	\$	1,386,681,512
2.	Active Members Actuarial Liability		
	Retirement	\$	437,086,677
	Termination		8,454,219
	Death & Disability		<u>7,168,803</u>
	Total	\$	452,709,699
3.	Members Receiving Benefits		
	Retirement Annuities	\$	637,376,632
	Disability Annuities		61,712,431
	Survivor Annuities/Children		<u>40,890,709</u>
	Total	\$	739,979,772
4.	Vested Former Members	\$	8,560,053
5.	Contributions Refund Due	\$	2,637,082
6.	Total Actuarial Liability	\$	1,203,886,606
7.	Actuarial Value of Assets	\$	844,744,129
8.	Unfunded Actuarial Liability	\$	359,142,477
9.	Funded Ratio		70.2%

EMPLOYER'S NORMAL COST

Below is a summary of the employer's share of the normal cost for the year beginning January 1, 2021.

Normal Cost	Normal Cost	Percent of Total Payroll
Retirement	\$ 17,545,771	14.31%
Termination	1,966,031	1.60%
Death & Disability	2,093,777	1.71%
Total Normal Cost as of beginning of year	\$ 21,605,579	17.62%
Total Normal Cost (with interest)	\$ 22,388,781	18.26%
Expected Member Contributions	\$ 17,162,854	14.00%
Employer's share of Normal Cost	\$ 5,225,927	4.26%
Expected Administrative Expenses (with interest)	\$ 1,636,887	1.34%
Purchase of Military Service	\$ 919,439	0.75%
Employer's share of Normal Cost, adjusted for expected administrative expenses and purchase of military service	\$ 7,782,253	6.35%
Unfunded Actuarial Accrued Liabilities Amortization Rate		20.15%
Pension Employer Contribution Rate		26.50%
Valuation Payroll	\$ 122,591,811	

UNFUNDED ACTUARIAL LIABILITY

1. Unfunded Actuarial Accrued Liability (UAAL) as of December 31, 2019	\$	376,870,851
2. Total Normal Cost, Developed as of December 31, 2019		23,052,454
3. Expected Interest (7.25%) on 1. and 2.		28,994,440
4. Contributions		50,961,802
5. Expected Interest (7.25%, mid-year) on 4.		1,815,043
6. Expected UAAL as of December 31, 2020 (1)+(2)+(3)-(4)-(5)		376,140,900
7. Change in UAAL due to actuarial (gain)/loss, by component		
Decrease in UAAL due to investment return higher than assumed		(23,558,102)
Decrease in UAAL due to salary increases lower than assumed		(504,174)
Decrease in UAAL due to decrement experience		(4,186,700)
Decrease in UAAL due to inactive mortality experience		(670,280)
Increase in UAAL due to other changes		<u>1,016,334</u>
Net decrease in UAAL due to actuarial experience		(27,902,922)
8. Change in UAAL due to assumption changes		-
9. Change in UAAL due to benefit changes		10,904,499
10. Unfunded Actuarial Accrued Liability as of December 31, 2020	\$	359,142,477

ANALYSIS OF PLAN EXPERIENCE

Below is the detailed analysis of Gains and Losses due to plan experience resulting in differences between Assumed and Actual Experience.

Type of Activity	(Gain) or Loss for Year Ended 12/31	
	2020	2019
Age & Service Retirements. If members retire at older ages or with lower final average pay than assumed, there is a gain. If younger ages or higher average pays, a loss.	(\$ 2,786,556)	(\$ 4,224,014)
Disability Retirements. If disability claims are less than assumed, there is a gain. If more claims, a loss.	594,394	241,386
Death-in-Service Benefits. If more liabilities are released by death-in-service claims than assumed, there is a gain. If smaller releases, a loss.	(26,935)	(188,451)
Withdrawal From Employment. If more liabilities are released by withdrawals than assumed, there is a gain. If smaller releases, a loss.	(1,967,603)	(3,148,393)
Salary Increases. If there are smaller pay increases than assumed, there is a gain. If greater increases, a loss.	(504,174)	1,711,714
Investment Return. If there is greater investment return on pension assets than assumed, there is a gain. If less return, a loss.	(23,558,102)	154,476
Inactive Mortality Experience. If more deaths occur than assumed, there is a gain. If fewer deaths than assumed, there is a loss.	(670,280)	5,696,925
Other Changes. Miscellaneous gains and losses resulting from data adjustments, timing of financial transactions, valuation methods, DROP account interest crediting, etc.	1,016,334	772,615
(Gain) or Loss During Year from Experience	(\$ 27,902,922)	\$ 1,016,258
Non-Recurring Items Effect of Assumption Changes/Method Changes/Benefit Changes ¹	10,904,499	(15,252,302)
Composite Gain (or Loss) During Year	(\$ 16,998,423)	(\$ 14,236,044)

1. Including Change in Actuary in 2019

CHANGE IN FUNDED RATIO

1. Funded ratio as of December 31, 2019	67.9%
2. Expected funded ratio as of December 31, 2020	68.6%
3. Change in funded ratio due to actuarial (gain)/loss, by component	
Increase in funded ratio due to investment return higher than assumed	2.0%
Increase in funded ratio due to salary increases lower than assumed	0.0%
Increase in funded ratio due to decrement experience	0.2%
Increase in funded ratio due to inactive mortality experience	0.1%
Decrease in funded ratio due to other changes	<u>-0.1%</u>
Net increase in funded ratio due to actuarial experience	2.2%
4. Change in UAAL due to assumption changes	0.0%
5. Change in UAAL due to the benefit changes	-0.6%
6. Funded Ratio as of December 31, 2020	70.2%

UNFUNDED ACTUARIAL ACCRUED LIABILITY

FUNDING PERIOD

Below is the schedule illustrating the Amortization of the Total Unfunded Actuarial Accrued Liability as of December 31, 2020.

Year	Projected Unfunded Actuarial Accrued Liability at Beginning of the Year	Assumed Amortization Contribution Rate ¹	Assumed Payroll 3.00% Growth Rate	Mid-Year Amortization Contribution Amount	Projected Unfunded Actuarial Accrued Liability at End of the Year
1	\$ 359,142,477	20.15%	\$ 122,591,811	\$ 24,702,250	\$ 359,598,267
2	359,598,267	20.19%	126,269,565	25,493,825	359,267,334
3	359,267,334	20.24%	130,057,652	26,323,669	358,053,009
4	358,053,009	20.30%	133,959,382	27,193,755	355,849,571
5	355,849,571	20.36%	137,978,163	28,092,354	352,555,780
6	352,555,780	20.44%	142,117,508	29,048,819	348,032,659
7	348,032,659	20.48%	146,381,033	29,978,836	342,218,472
8	342,218,472	20.50%	150,772,464	30,908,355	335,020,132
9	335,020,132	20.52%	155,295,638	31,866,665	326,307,471
10	326,307,471	20.53%	159,954,507	32,838,660	315,956,529
11	315,956,529	20.54%	164,753,142	33,840,295	303,817,835
12	303,817,835	20.54%	169,695,736	34,855,504	289,747,719
13	289,747,719	20.55%	174,786,608	35,918,648	273,556,511
14	273,556,511	20.57%	180,030,206	37,032,213	255,038,215
15	255,038,215	20.59%	185,431,112	38,180,266	233,988,400
16	233,988,400	20.61%	190,994,045	39,363,873	210,186,712
17	210,186,712	20.61%	196,723,866	40,544,789	183,436,426
18	183,436,426	20.62%	202,625,582	41,781,395	153,466,096
19	153,466,096	20.61%	208,704,349	43,013,966	120,046,447
20	120,046,447	20.61%	214,965,479	44,304,385	82,867,495
21	82,867,495	20.59%	221,414,443	45,589,234	41,662,459
22	41,662,459	20.56%	228,056,876	43,146,299	0

Funding Period = 22 Years

1. The amortization contribution rate is the total statutory contribution rate, minus the total normal cost rate, minus the health care contribution rate. The statutory contribution rate is assumed to remain unchanged except for any legislated increases. The administrative expense is projected to increase at the assumed inflation rate of 2.50% per year. The impact of House Bill 362 and changes adopted by OHPRS that will impact new members will reduce the total normal cost rate over time, and, thus, increase the amortization contribution rate, as reflected above.

DEVELOPMENT OF ASSETS

Development of Investment Gain/(Loss)

Market Value of Assets, 12/31/2019	\$ 928,845,866
Contributions Less Benefit Payments & Admin Expenses	(40,184,641)
Expected Investment Earnings for 2020	<u>65,884,632</u>
Expected Market Value of Assets, 12/31/2020	\$ 954,545,857
Actual Net Investment Income/(Loss) for 2020	\$ 137,353,176
2020 Investment Gain/(Loss), (Actual less Expected)	\$ 71,468,544

Development of Actuarial Value of Assets

Plan Year Ending	Gain/(Loss)	Gains/(Losses) Not Yet Recognized by Valuation Year		
		2020	2021	2022
12/31/2017	49,993,408	0	0	0
12/31/2018	(110,794,174)	(27,698,543)	0	0
12/31/2019	89,868,756	44,934,378	22,467,189	0
12/31/2020	71,468,544	<u>53,601,408</u>	<u>35,734,272</u>	<u>17,867,136</u>
Total		70,837,243	58,201,461	17,867,136

Market Value of Assets, 12/31/2020	\$ 1,026,014,401
Less: Unrecognized Amounts as of 12/31/2020	<u>70,837,243</u>
Preliminary Actuarial Value of Assets, 12/31/2020	\$ 955,177,158
Corridor Percent	20%
Upper Corridor Limit	1,231,217,281
Lower Corridor Limit	820,811,521
Actuarial Value of Assets, 12/31/2020	\$ 955,177,158

Calculation of Rates of Return

Rates of return calculated below are based on a formula defined by the IRS. Therefore, the returns may differ from investment returns calculated for other purposes. The formula is defined as $(2 * I)$ divided by $(A + B - I)$ where A, B and I are as follows:

(A) 12/31/2019 Actuarial Assets:	\$ 904,343,034
(I) Net Investment Income:	
1. Interest, Dividends, & Realized/Unrealized Gain/Loss (net of investment expenses)	137,353,176
2. Change in Actuarial Value	<u>(46,334,411)</u>
Total	\$ 91,018,765
(B) 12/31/2020 Actuarial Assets:	\$ 955,177,158
Actuarial Asset Rate of Return = $2I/(A+B-I)$:	10.3%
Market Value of Assets Rate of Return:	15.1%
12/31/2020 Limited Actuarial Assets:	955,177,158

STATEMENT OF FIDUCIARY NET POSITION
 December 31, 2020

	MARKET VALUE		
	PENSION	HEALTH	TOTAL
<u>ASSETS</u>			
Cash and Cash Equivalents:			
Cash and Short Term Investments	32,645,585	4,346,579	36,992,164
Total Cash and Equivalents	32,645,585	4,346,579	36,992,164
Receivables:			
Employer Contributions Receivable	559,390	0	559,390
Member Contributions Receivable	1,669,891	0	1,669,891
Accrued Investment Income	1,052,128	140,085	1,192,213
Total Receivables	3,281,409	140,085	3,421,494
Investments:			
Domestic Equity	286,547,993	37,600,691	324,148,684
International Equity	177,452,115	23,253,096	200,705,211
Fixed Income	136,424,859	17,876,937	154,301,796
Real Estate	60,244,663	7,894,383	68,139,046
Private Equity	130,406,094	17,087,078	147,493,172
Hedge Funds	81,667,860	10,700,919	92,368,779
Direct Infrastructure	6,958,746	911,803	7,870,549
Total Investments	879,702,330	115,324,907	995,027,237
Other	72,436	0	72,436
Total Assets	<u>915,701,760</u>	<u>119,811,571</u>	<u>1,035,513,331</u>
Deferred Outflows of Resources	179,563	113,744	293,307
<u>LIABILITIES</u>			
Payables:			
Accounts Payable	460,999	61,379	522,378
Accrued Payroll Liabilities	218,059	29,033	247,092
Accrued Pension Liabilities	6,684,016	0	6,684,016
Accrued Health Care Liabilities	0	446,046	446,046
Net Pension Liability	808,021	0	808,021
Net OPEB Liability	0	667,427	667,427
Total Liabilities	<u>8,171,095</u>	<u>1,203,885</u>	<u>9,374,980</u>
Deferred Inflows of Resources	318,720	98,537	417,257
Net Assets:			
Active and Retired Members' Equity	907,391,508	118,622,893	1,026,014,401
Employees' Savings Fund			93,315,334
Employer Accumulation Fund			118,622,893
Pension Reserve Fund			814,076,174
Survivors Benefit Fund			0
Health Care Fund			118,622,893
Income Fund			(118,622,893)
Total Fund Balance			1,026,014,401
NET POSITION			1,026,014,401

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION
 FOR THE YEAR ENDED December 31, 2020
 Market Value Basis

	<u>PENSION</u>	<u>HEALTH</u>	<u>TOTAL</u>
<u>ADDITIONS</u>			
Contributions:			
Member Contribution	17,334,068	4,101,755	21,435,823
Employer Contributions	32,855,342	0	32,855,342
Medicare Part D Reimbursement		3,321,187	3,321,187
Transfers	772,392		772,392
Total Contributions	50,961,802	7,422,942	58,384,744
Net Investment Income ¹	121,212,655	16,140,521	137,353,176
Total Additions	172,174,457	23,563,463	195,737,920
<u>DEDUCTIONS</u>			
Distributions to Members:			
Benefit Payments	78,465,417	15,725,987	94,191,404
Refund of Member Contributions	2,552,672		2,552,672
Death Benefit	115,000		115,000
Total Distributions	81,133,089	15,725,987	96,859,076
Administrative Expenses	1,509,348	200,961	1,710,309
Total Deductions	82,642,437	15,926,948	98,569,385
Net Increase in Net Position	89,532,020	7,636,515	97,168,535
NET POSITION			
Beginning of the Year	817,859,488	110,986,378	928,845,866
End of the Year	907,391,508	118,622,893	1,026,014,401
Actuarial Value End of Year ²	844,744,129	110,433,029	955,177,158

¹ Investment related expenses include investment management, investment consulting, custodial and securities lending bank fees.

² Actuarial Value is allocated in proportion to the Market Value

PARTICIPANT DATA

Participant Information	December 31, 2020	December 31, 2019	Change
Number Total Active Members	1,542	1,614	-4.5%
Number Active DROP Members	162	167	-3.0%
Number Receiving Benefits			
Retirement Annuities	1,298	1,275	1.8%
Surviving Annuities	283	280	1.1%
Disability Annuities	149	144	3.5%
Number Inactive Members - Vested	26	18	44.4%
Total Members	3,298	3,331	-1.0%
Active Statistics – Total			
Number	1,542	1,614	-4.5%
Average Age	39.2	38.8	1.0%
Average Service	13.9	13.5	2.7%
Covered Payroll	\$ 117,996,230	\$ 118,370,595	-0.3%
Average Payroll	\$ 76,522	\$ 73,340	4.3%
Active Statistics – DROP Members			
Number	162	167	-3.0%
Average Age	52.6	52.4	0.4%
Average Service	27.2	27.1	0.2%
Average Age at DROP	49.9	49.8	0.2%
Average Service at DROP	24.4	24.6	-0.7%
Covered Payroll	\$ 14,792,545	\$ 14,840,214	-0.3%
Average Payroll	\$ 91,312	\$ 88,864	2.8%
Annual Benefit Payments for Members			
Receiving Benefits			
Retirement Annuities	\$ 60,917,257	\$ 59,695,768	2.0%
Surviving Annuities	\$ 5,196,447	\$ 4,909,832	5.8%
Disability Annuities	\$ 5,441,088	\$ 5,225,587	4.1%

Participant Reconciliation

	Active	Active DROP	Inactive Vested	Retiree	Survivors	Disabled	Total Count
<i>As of 12/31/2019</i>	1,447	167	18	1,275	280	144	3,331
DROPs In	(34)	34					0
Terminations							
Vested	(8)		8				0
Not Vested	(49)						(49)
Retirements	(13)	(39)	(2)	54			0
Disabled	(6)					6	0
Deaths							
w/o Beneficiary				(11)	(16)		(27)
w/ Beneficiary	(1)			(20)	23	(1)	1
New Member	41						41
Return to Work	3						3
Benefit Expired					(4)		(4)
Adjustments	<u>0</u>	<u>0</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>2</u>
Net Change	(67)	(5)	8	23	3	5	(33)
<i>As of 12/31/2020</i>	1,380	162	26	1,298	283	149	3,298

Active Member Statistics

DROP Status	Sex	Count	Avg Age	Avg Svc	Covered Payroll	
					Total	Average
Not Yet in DROP	M	1,256	37.7	12.4	94,268,118	75,054
	F	<u>124</u>	36.6	11.0	<u>8,935,567</u>	72,061
	Total	1,380	37.6	12.3	103,203,685	74,785
In DROP	M	149	52.5	27.2	13,670,344	91,747
	F	<u>13</u>	53.2	26.2	<u>1,122,201</u>	86,323
	Total	162	52.6	27.2	14,792,545	91,312
Total	M	1,405	39.3	14.0	107,938,462	76,825
	F	<u>137</u>	38.2	12.4	<u>10,057,768</u>	73,414
	Total	1,542	39.2	13.9	117,996,230	76,522

Active Age Service Grid - Total

Total Active Member Count and Covered Payroll by Age and Service

Age	Years of Service									Total
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	
<25	22 \$41,754	51 \$57,617								73 \$52,836
25-29	15 \$41,901	169 \$61,469	77 \$70,594							261 \$63,037
30-34	3 \$40,963	52 \$61,708	147 \$73,025	24 \$75,156						226 \$70,222
35-39	1 \$41,782	19 \$63,444	63 \$73,374	80 \$79,420	61 \$82,766					224 \$77,108
40-44		1 \$86,329	15 \$72,950	34 \$77,162	116 \$82,305	101 \$86,058	1 \$88,394			268 \$82,581
45-49		1 \$53,420	1 \$74,881	15 \$77,782	65 \$79,878	132 \$86,779	79 \$89,870	2 \$91,780		295 \$85,509
50-54				1 \$87,880	27 \$76,945	32 \$83,239	77 \$90,458	20 \$92,032	3 \$105,445	160 \$87,196
55-59					1 \$75,201	7 \$78,977	18 \$89,560	8 \$110,876	1 \$109,118	35 \$92,464
60-64										
65-69										
70+										
Total	41 \$41,751	293 \$61,027	303 \$72,482	154 \$78,152	270 \$81,262	272 \$85,894	175 \$90,088	30 \$97,040	4 \$106,363	1,542 \$76,522

Active Age Service Grid – DROP Members

Active DROP Member Count and Covered Payroll by Age and Service

Age	Years of Service								Total	
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-34		35+
<25										
25-29										
30-34										
35-39										
40-44										
45-49							29	1		30
							\$90,786	\$88,465		\$90,708
50-54						8	67	20	3	98
						\$85,039	\$90,641	\$92,032	\$105,445	\$90,921
55-59						7	18	8	1	34
						\$78,977	\$89,560	\$110,876	\$109,118	\$92,972
60-64										
65-69										
70+										
Total						15	114	29	4	162
						\$82,210	\$90,507	\$97,107	\$106,363	\$91,312

Annuitant Statistics

Retirement Annuities

Sex	Count	Avg Age	Total Annuity	Average Annuity
M	1,243	68.0	58,508,002	47,070
F	<u>55</u>	57.3	<u>2,409,255</u>	43,805
Total	1,298	67.5	60,917,257	46,932

Survivor Annuities

Sex	Count	Avg Age	Total Annuity	Average
M	9	29.5	28,851	3,206
F	<u>274</u>	74.1	<u>5,167,596</u>	18,860
Total	283	72.6	5,196,447	18,362

Disability Retirement Annuities

Sex	Count	Avg Age	Total Annuity	Average
M	127	56.9	4,645,183	36,576
F	<u>22</u>	52.3	<u>795,905</u>	36,178
Total	149	56.2	5,441,088	36,517

Deferred Annuities

Sex	Count	Avg Age	Total Annuity	Average
M	21	47.8	728,575	34,694
F	<u>5</u>	49.0	<u>167,807</u>	33,561
Total	26	48.0	896,382	34,476

Distribution of Retirement Annuities by Age

	Male			Female			Total		
	Count	Total Annuities	Average Annuities	Count	Total Annuities	Average Annuities	Count	Total Annuities	Average Annuities
x < 45	0	0	0	0	0	0	0	0	0
45 <= x < 50	18	835,021	46,390	4	177,992	44,498	22	1,013,013	46,046
50 <= x < 55	111	5,013,263	45,165	18	731,455	40,636	129	5,744,718	44,533
55 <= x < 60	174	7,910,377	45,462	20	951,641	47,582	194	8,862,018	45,681
60 <= x < 65	207	10,225,042	49,396	7	307,530	43,933	214	10,532,572	49,218
65 <= x < 70	179	9,301,052	51,961	4	163,985	40,996	183	9,465,037	51,722
70 <= x < 75	235	11,464,432	48,785	1	42,575	42,575	236	11,507,007	48,759
75 <= x < 80	189	8,593,123	45,466	1	34,077	34,077	190	8,627,200	45,406
80 <= x < 85	84	3,663,137	43,609	0	0	0	84	3,663,137	43,609
85 <= x < 90	26	881,685	33,911	0	0	0	26	881,685	33,911
90 <= x	20	620,870	31,044	0	0	0	20	620,870	31,044
Total	1,243	58,508,002	47,070	55	2,409,255	43,805	1,298	60,917,257	46,932

Distribution of Survivor Annuities by Age

	Male			Female			Total		
	Count	Total Annuities	Average Annuities	Count	Total Annuities	Average Annuities	Count	Total Annuities	Average Annuities
x < 20	3	5,400	1,800	8	14,400	1,800	11	19,800	1,800
20 <= x < 25	3	7,502	2,501	3	6,652	2,217	6	14,154	2,359
25 <= x < 30	0	0	0	0	0	0	0	0	0
30 <= x < 35	0	0	0	2	36,662	18,331	2	36,662	18,331
35 <= x < 40	1	10,935	10,935	0	0	0	1	10,935	10,935
40 <= x < 45	0	0	0	5	52,830	10,566	5	52,830	10,566
45 <= x < 50	0	0	0	3	43,561	14,520	3	43,561	14,520
50 <= x < 55	0	0	0	8	136,534	17,067	8	136,534	17,067
55 <= x < 60	1	2,102	2,102	9	170,097	18,900	10	172,199	17,220
60 <= x < 65	1	2,912	2,912	10	200,592	20,059	11	203,504	18,500
65 <= x < 70	0	0	0	25	557,204	22,288	25	557,204	22,288
70 <= x < 75	0	0	0	45	1,001,948	22,266	45	1,001,948	22,266
75 <= x < 80	0	0	0	45	970,342	21,563	45	970,342	21,563
80 <= x < 85	0	0	0	37	715,520	19,338	37	715,520	19,338
85 <= x < 90	0	0	0	39	670,666	17,197	39	670,666	17,197
90 <= x	0	0	0	35	590,588	16,874	35	590,588	16,874
Total	9	28,851	3,206	274	5,167,596	18,860	283	5,196,447	18,362

Distribution of Disability Annuities by Age

	Male			Female			Total		
	Count	Total Annuities	Average Annuities	Count	Total Annuities	Average Annuities	Count	Total Annuities	Average Annuities
x < 20	0	0	0	0	0	0	0	0	0
20 <= x < 25	1	30,820	30,820	0	0	0	1	30,820	30,820
25 <= x < 30	1	30,735	30,735	0	0	0	1	30,735	30,735
30 <= x < 35	2	42,265	21,133	0	0	0	2	42,265	21,133
35 <= x < 40	2	58,152	29,076	1	40,950	40,950	3	99,102	33,034
40 <= x < 45	7	232,032	33,147	3	104,636	34,879	10	336,668	33,667
45 <= x < 50	26	943,108	36,273	3	102,527	34,176	29	1,045,635	36,056
50 <= x < 55	21	743,500	35,405	6	218,854	36,476	27	962,354	35,643
55 <= x < 60	16	677,656	42,354	6	243,731	40,622	22	921,387	41,881
60 <= x < 65	23	915,229	39,793	3	85,207	28,402	26	1,000,436	38,478
65 <= x < 70	11	429,207	39,019	0	0	0	11	429,207	39,019
70 <= x < 75	11	347,293	31,572	0	0	0	11	347,293	31,572
75 <= x < 80	4	129,569	32,392	0	0	0	4	129,569	32,392
80 <= x < 85	1	41,159	41,159	0	0	0	1	41,159	41,159
85 <= x < 90	0	0	0	0	0	0	0	0	0
90 <= x	1	24,458	24,458	0	0	0	1	24,458	24,458
Total	127	4,645,183	36,576	22	795,905	36,178	149	5,441,088	36,517

Distribution of Deferred Annuities by Age

	Male			Female			Total		
	Count	Total Annuities	Average Annuities	Count	Total Annuities	Average Annuities	Count	Total Annuities	Average Annuities
x < 40	1	19,164	19,164	0	0	0	1	19,164	19,164
40 <= x < 45	3	94,650	31,550	1	15,764	15,764	4	110,414	27,604
45 <= x < 50	13	509,182	39,168	2	98,015	49,008	15	607,197	40,480
50 <= x < 55	3	77,022	25,674	2	54,028	27,014	5	131,050	26,210
55 <= x < 60	0	0	0	0	0	0	0	0	0
60 <= x < 65	1	28,557	28,557	0	0	0	1	28,557	28,557
65 <= x < 70	0	0	0	0	0	0	0	0	0
70 <= x	0	0	0	0	0	0	0	0	0
Total	21	728,575	34,694	5	167,807	33,561	26	896,382	34,476

ACTUARIAL ASSUMPTIONS AND METHODS

Below is a summary of the actuarial assumptions for the December 31, 2020 valuation. An experience study was performed in May of 2020 based on data for the period December 31, 2013 through December 31, 2018. The assumptions below are based on the experience study and were adopted effective December 31, 2019.

Interest Rate	7.25% (net of investment-related expenses)
Mortality Rates	<i>Healthy Active Lives:</i> PubS-2010 (amount-weighted) employee tables. <i>Retiree and Vested Terminated Lives:</i> PubS-2010 (amount-weighted) healthy retiree tables adjusted by 94%. <i>Contingent Survivor Lives:</i> PubS-2010 (amount-weighted, above-median) contingent survivor tables adjusted by 105%. <i>Disabled Lives:</i> PubS-2010 (amount-weighted) disabled retiree tables. The mortality assumptions for all participants are sex distinct with mortality improvement projected five years beyond the valuation date using scale MP-2020 and a base year of 2010. We feel these assumptions sufficiently accommodate anticipated future mortality improvements.
Cost-of-Living Adjustment	0.00% for calendar year 2021; 3.00% for calendar year 2022 and then 0.00% thereafter. (Previously 0.00% for all future years)
Inflation	2.50%
Salary Increases	See Table 1 later in this section.
Retirement Rates	See Table 2 later in this section.
Termination Rates	See Table 3 later in this section.
Disability Rates	See Table 4 later in this section.
Percent Married	80%
Spousal Age Difference	Spouse of male member assumed to be 3 years younger than member; Spouse of female member assumed to be 3 years older than member.

Purchasing Military Service Load	0.75% of payroll is included in pension normal cost calculations.
Dependent Children	Members who receive a death-in-service benefit are assumed to have two children for whom benefits are paid for 10 years.
Contribution Rates	Members – 14.00% State – 26.50%
Actuarial Cost Method	Entry Age Normal, with costs allocated on basis of earnings. Actuarial gains and losses are reflected in the unfunded actuarial liability.
Actuarial Asset Method	Market value of assets adjusted by the unrecognized investment gains and losses for each of the four years prior to the valuation date. Gains and losses are recognized at a rate of 25% per year. Actuarial Assets shall not be less than 80% nor greater than 120% of Market Value of Assets.
Payroll Growth	3.00% for purposes of amortizing the Unfunded Actuarial Accrued Liability.
Administrative Expenses	\$ 1,579,626 annually, based on the average of actual expenses incurred in the prior two fiscal years and then increases based on 2.5% inflation rate annually.
DROP Duration	5 years.
DROP Election	15% of active members eligible for unreduced retirement/DROP do not enter the DROP or retire in any given year prior to age 60.
Source of Data	Data and audited financial information is provided by the Fund.
Valuation Date	December 31, 2020.

Changes in Funding Assumptions/Methods Since the Prior Valuation

There have been no changes of methods since the prior valuation.

The valuation reflects the following assumption change based on the Board's decision on June 2021 meeting:

- A one-time COLA of 3.00% in year 2022.

Table 1 – Salary Increase Rates

Service	Salary Increase Rate
0	13.50%
1	13.50%
2	9.50%
3	9.50%
4	8.00%
5	8.00%
6-11	5.00%
12+	3.80%

Table 2 – Retirement Rates

Age	Normal Retirement Rate	Early Retirement Rate
48	20%	5%
49-50	15%	5%
51	15%	10%
52	20%	
53	10%	
54	20%	
55	30%	
56-59	40%	
60+	100%	

Table 3 – Termination Rates

Service	Termination Rate
0	13.00%
1-2	6.50%
3-5	4.50%
6-9	2.50%
10-20	1.00%
21+	2.50%

Table 4 – Disability Rates (Sample Rates)

Age	Disability Rates
20	0.06%
25	0.06%
30	0.17%
35	0.32%
40	0.53%
45	0.64%
50	0.85%
55	1.00%
60	0.00%

55% of disabilities assumed to be service-incurred.

GLOSSARY

Actuarial Value of Assets is the asset value used in the valuation to determine contribution requirements. It represents the plan's Market Value of Assets (see below), with adjustments according to the plan's Actuarial Asset Method. These adjustments produce a "smoothed" value that is likely to be less volatile from year to year than the Market Value of Assets.

Covered Payroll is the annualized pensionable salary earned during the year ended on the valuation date.

Entry Age Normal Cost Method - Under this method, the normal cost is the sum of the individual normal costs for all active participants. For an active participant, the normal cost is the participant's normal cost accrual rate, multiplied by the participant's current compensation.

- (a) The normal cost accrual rate equals:
 - (i) the present value of future benefits for the participant, determined as of the participant's entry age, divided by
 - (ii) the present value of the compensation expected to be paid to the participant for each year of the participant's anticipated future service, determined as of the participant's entry age.
- (b) In calculating the present value of future compensation, the salary scale is applied both retrospectively and prospectively to estimate compensation in years prior to and subsequent to the valuation year based on the compensation used for the valuation.
- (c) The accrued liability is the sum of the individual accrued liabilities for all participants and beneficiaries. A participant's accrued liability equals the present value, at the participant's attained age, of future benefits less the present value at the participant's attained age of the individual normal costs payable in the future. A beneficiary's accrued liability equals the present value, at the beneficiary's attained age, of future benefits. The unfunded accrued liability equals the total accrued liability less the actuarial value of assets.
- (d) Under this method, the entry age used for each active participant is the participant's age at the time he or she would have commenced participation if the plan had always been in existence under current terms, or the age as of which he or she first earns service credits for purposes of benefit accrual under the current terms of the plan.

Market Value of Assets is the fair market value of plan assets as of the valuation date. This amount may be adjusted to produce an Actuarial Value of Assets for plan funding purposes.

Normal (Current Year's) Cost is the current year's cost for benefits yet to be funded. Under the Entry Age Normal cost method, it is determined for each participant as the present value of future benefits, determined as of the Member's entry age, amortized as a level percentage of compensation over the anticipated number of years of participation, determined as of the entry age.

Present Value of Benefits is the single sum value on the valuation date of all future benefits to be paid to current plan participants.

Unfunded Actuarial Accrued Liability (UAAL) is the difference between the actuarial accrued liability (described above) and the Actuarial Value of Assets. Under the Entry Age Normal Actuarial Cost Method, an actuarial gain or loss, based on actual versus expected UAAL, is determined in conjunction with each valuation of the plan.

Valuation Payroll is the projected annual pensionable salary starting on the valuation date of all active participants who are not subject to a 100% probability of retirement on the valuation date.

Actuarial Determined Contribution (ADC) is the level of employer contribution effort that would be required on a sustained, ongoing basis to:

- (a) fund the normal cost (cost associated with new service received) each year and
- (b) amortize the total unfunded actuarial accrued liability (or funding excess) attributed to past services over a funding period, which is no more than thirty years.

DISCUSSION OF RISK

ASOP No. 51, Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions, states that the actuary should identify risks that, in the actuary's professional judgment, may reasonably be anticipated to significantly affect the plan's future financial condition.

Throughout this report, actuarial results are determined under various assumption scenarios. These results are based on the premise that all future plan experience will align with the plan's actuarial assumptions; however, there is no guarantee that actual plan experience will align with the plan's assumptions. It is possible that actual plan experience will differ from anticipated experience in an unfavorable manner that will negatively impact the plan's funded position.

Below are examples of ways in which plan experience can deviate from assumptions and the potential impact of that deviation. Typically, this results in an actuarial gain or loss representing the current year financial impact on the plan's unfunded liability of the experience differing from assumptions; this gain or loss is amortized over a period of time determined by the plan's amortization method. When assumptions are selected that adequately reflect plan experience, gains and losses typically offset one another in the long term, resulting in a relatively low impact on the plan's amortization period. When assumptions are too optimistic, losses can accumulate over time and the plan's amortization period could potentially grow to an unmanageable level.

- **Investment Return:** When the rate of return on the Actuarial Value of Assets falls short of the assumption, this produces a loss representing assumed investment earnings that were not realized. Further, it is unlikely that the plan will experience a scenario that matches the assumed return in each year as capital markets can be volatile from year to year. Therefore, amortization periods can vary in the future.
- **Salary Increases:** When a plan participant experiences a salary increase that was greater than assumed, this produces a loss representing the cost of an increase in anticipated plan benefits for the participant as compared to the previous year. The total gain or loss associated with salary increases for the plan is the sum of salary gains and losses for all active participants.
- **Payroll Growth:** The plan's payroll growth assumption, if one is used, causes a predictable annual increase in the plan's amortization payment in order to produce an amortization payment that remains constant as a percentage of payroll if all assumptions are realized. If payroll does not increase according to the plan's payroll growth assumption, the plan's amortization period can increase significantly even if all assumptions other than the payroll growth assumption are realized since anticipated contribution rely upon membership payroll.
- **Demographic Assumptions:** Actuarial results take into account various potential events that could happen to a plan participant, such as retirement, termination, disability, and death. Each of these potential events is assigned a liability based on the likelihood of the event and the financial consequence of the event for the plan. Accordingly, actuarial liabilities reflect a blend of financial consequences associated with various possible outcomes (such as retirement at one of various possible ages). Once the outcome is known (e.g. the participant retires) the liability is adjusted to reflect the known outcome. This adjustment produces a gain or loss depending on whether the outcome was more or less favorable than other outcomes that could have occurred.

- **Amortization Period:** Risks associated with the items outlined above will inherently create varying liabilities and assets resulting in volatility in the amortization period. Actuarial losses on assets and liabilities will lead to longer amortization periods, while actuarial gains on assets and liabilities will lead to shorter amortization periods.
- **Contribution Risk:** This risk results from the potential that the total annual contributions, based on fixed-rates for the State and membership, may deviate from actuarially determined contributions. The actuarially determined contributions are adjusted in conjunction with each actuarial valuation to take into account the deviation in actual versus expected experience between valuation dates. Fixed-rate contribution structures include the risk that scheduled contributions do not reflect the actual cost of plan benefits, meaning that in order to maintain actuarially sound funding levels, contribution rate increases, or benefit reductions may be required.

Impact of Plan Maturity on Risk

For newer pension plans, most of the participants and associated liabilities are related to active members who have not yet reached retirement age. As pension plans continue in operation and active members reach retirement ages, liabilities begin to shift from being primarily related to active members to being shared amongst active and retired members. Plan maturity is a measure of the extent to which this shift has occurred. It is important to understand that plan maturity can have an impact on risk tolerance and the overall risk characteristics of the plan. For example, plans with a large amount of retired liability do not have as long of a time horizon to recover from losses (such as losses on investments due to lower than expected investment returns) as plans where the majority of the liability is attributable to active members. For this reason, less tolerance for investment risk may be warranted for highly mature plans with a substantial inactive liability. Similarly, mature plans paying substantial retirement benefits resulting in a small positive or net negative cash flow can be more sensitive to near term investment volatility, particularly if the size of the fund is shrinking, which can result in less assets being available for investment in the market.

To assist with determining the maturity of the Fund, we have provided some relevant metrics in the table following titled “Fund Maturity Measures and Other Risk Metrics”. Highlights of this information are discussed below:

- The Support Ratio, determined as the ratio of active to inactive members, has decreased from 107.6% on December 31, 2010 to 87.8% as of December 31, 2020, indicating that the plan has been maturing during the period.
- The Accrued Liability Ratio, determined as the ratio of the Inactive Accrued Liability, which is the liability associated with members who are no longer employed but are due a benefit from the Fund, to the Total Accrued Liability, is 62.2%. With a plan of this maturity, losses due to lower than expected investment returns or demographic factors must be made up over a shorter time horizon than would be needed for a less mature plan.
- The Funded Ratio, determined as the ratio of the Actuarial Value of Assets to the Total Accrued Liability, has increased from 62.0% on December 31, 2010 to 70.2% on December 31, 2020.

- The Net Cash Flow Ratio, determined as the ratio of the Net Cash Flow (contributions minus benefit payments and administrative expenses) to the Market Value of Assets, is around -4.5% to -3.1%. A Net Cash Flow Ratio in this range indicates that contributions are not sufficient to cover the Fund's benefit payments and administrative expenses.

It is important to note that the actuary has identified the risks above as the most significant risks based on the characteristics of the Fund and the nature of the project, however, it is not an exhaustive list of potential risks that could be considered. Additional advanced modeling, as well as the identification of additional risks, can be provided at the request of the audience addressed in the cover letter of this report.

Fund Maturity Measures and Other Risk Metrics

	12/31/2020	12/31/2019	12/31/2015	12/31/2010
<u>Support Ratio</u>				
Total Actives	1,542	1,614	1,621	1,537
Total Inactives	1,756	1,717	1,558	1,428
Actives / Inactives	87.8%	94.0%	104.0%	107.6%
<u>Asset Volatility Ratio</u>				
Market Value of Assets (MVA)	907,391,508	817,859,488	704,225,033	647,094,901
Total Covered Payroll	117,996,230	118,370,595	99,983,224	94,767,852
MVA / Total Covered Payroll	769.0%	690.9%	704.3%	682.8%
<u>Accrued Liability (AL) Ratio</u>				
Inactive Accrued Liability	748,539,825	719,452,018	662,562,480	583,714,389
Total Accrued Liability	1,203,886,606	1,173,155,313	1,078,984,597	1,017,770,449
Inactive AL / Total AL	62.2%	61.3%	61.4%	57.4%
<u>Funded Ratio</u>				
Actuarial Value of Assets (AVA)	844,744,129	796,284,462	739,848,920	630,971,500
Total Accrued Liability	1,203,886,606	1,173,155,313	1,078,984,597	1,017,770,449
AVA / Total Accrued Liability	70.2%	67.9%	68.6%	62.0%
<u>Net Cash Flow Ratio</u>				
Net Cash Flow ¹	(32,453,027)	(28,058,421)	(31,573,506)	(19,787,180)
Market Value of Assets (MVA)	907,391,508	817,859,488	704,225,033	647,094,901
Ratio	-3.6%	-3.4%	-4.5%	-3.1%

¹ Determined as total contributions minus benefit payments and administrative expenses.

PLAN PROVISIONS

The following describe and reflect provisions in effect as described in Chapter 5505 of the Ohio Revised Code.

Membership Eligibility

All sworn officers and cadets in training at the academy are required to become members of the retirement system. The beginning date of membership in the system for sworn officers hired prior to June 30, 1991, is the commission date. All cadets entering the academy after that date become members of OHPRS upon entering the academy. Any persons hired prior to November 2, 1989, in the radio division are HPRS members. The beginning date of membership of the radio division member is the date of hire.

Highway Patrol Retirement System

The Plan is established and administered as prescribed by “Chapter 5505-Highway Patrol Retirement System” of the Ohio Revised Code.

Plan Administration

The Plan is administered by a Board of Trustees comprised of:

- a) The superintendent of the state highway patrol,
- b) Two retired Members who reside in Ohio,
- c) Five active Members,
- d) One member appointed by the treasurer of state, and
- e) Two investment expert members. One is appointed by the governor, and the other is jointly appointed by the speaker of the house of representatives and the president of the senate.

Credited Service

Total service credit is the total years of contributing service, or part thereof, purchased service credit and any additional service credit approved by the Board.

Normal Retirement

Eligibility

Age 52 and 20 years of Credited Service. or
Age 48 with 25 years of Credited Service if hired prior to January 1, 2020.

Benefit

Sum of:

- a) 2.5% of final average salary [average of salaries during highest 5 years (3 years prior to January 1, 2015)] times years of service not in excess of 20,
- b) 2.25% of final average salary times years of service in excess of 20 but not in excess of 25 and,
- c) 2% of final average salary times years of service in excess of 25. The maximum pension payable is 79.25% of the member’s final average salary.

A member must retire upon attainment of age 60 or completion of 20 years of service, whichever occurs later.

Form of Benefit

A member can elect one of the following options:

- a) A Single Life Annuity or,
- b) Actuarial equivalent Joint and Survivor Annuity with designating any percentage over 10% to the beneficiary or,
- c) Life Annuity Certain and Continuous between 5 to 20 years or,
- d) Partial Lump Sum if a member who is at least 52 with 20 years of total service; the partial lump sum benefit is not less than 6 times the monthly amount payable to the member as a single lifetime pension and not more than 60 times that amount

Early Retirement

Eligibility

Age 48 through 51 and has accumulated at least 20 years but less than 25 years of Credited Service. Or
 Age 48 through 51 and has accumulated at least 20 years of Credited Service if hired on or after January 1, 2020.

Benefit

Normal Retirement benefit, reduced as followed

Attained Age	Percent of normal retirement benefit
48	75%
49	80%
50	86%
51	93%

Form of Benefit

Same as Normal Retirement.

Disability Benefit

Eligibility

Total and permanent as determined by the Board of Trustees incapacitated for in the line of duty or five or more years of service for disability incurred off-duty.

Benefit Amount

- A maximum of:
- a) 61.25% of final average salary, and;
 - b) The normal retirement pension that the Member is entitled to receive if he or she retired immediately.

For off-duty disabilities, a benefit is the larger of:

- a) 30% of final average salary or
- b) normal retirement pension.

Cost-of-Living Adjustment

Retirees: A cost of living allowance (COLA) will be received after age 60 (age 53 for members retired or entered the DROP prior to 1/7/2013) or twelve months after they retire, whichever is later.

Disability members retired prior to 1/7/2013 are eligible for the increase after receiving benefits for sixty months or age 53 whichever occurs first.

The board establishes an annual COLA between 0% and 3% and must be based on compliance with the amortization period requirement of section 5505.121 of the Ohio Revised Code. The board's determination shall be based on the annual actuarial valuation required by section 5505.12 of the Ohio Revised Code. If the board determines that an increase may be made, the increase shall not exceed three percent (3%) of the eligible person's pension. The base pension used in the first calculation for the additional COLA amount shall remain as the COLA base for all future increases. The current COLA is 0.0 % in calendar year 2021, one-time 3.0% in calendar year 2022 and none in future years.

Survivor Benefit

Eligibility

A surviving spouse is considered to be the wife or husband as set forth in a statutory valid certificate of marriage or as recognized by judgment of a court. A surviving child is considered to be the child by birth or the legally adopted child of the member or retiree.

Benefit Amount

Surviving spouse and dependent children pension amounts are established by statute as follows:

- a) A surviving spouse is eligible to receive pension benefits for the remainder of his/her life.
 1. A surviving spouse of a member who retired or entered DROP before May 11, 2018, will receive an amount equal to 50% of the retiree's pension benefit or \$900.00/month, whichever is greater.
 2. A surviving spouse of a member who retired or entered DROP on or after May 11, 2018, will receive a set amount (\$900.00/month in 2018), but this amount increases annually by a COLA amount set by the board. The survivor benefit is in addition to any amount selected through a Joint and Survivor Annuity (JSA).
 3. A surviving spouse of an active member who is not eligible for retirement will receive a set amount (\$900.00/month in 2018), but this amount increases annually by a COLA amount set by the board.
 4. A surviving spouse of an active member who is eligible for retirement but has not elected to enter DROP or retire will receive a 50% JSA calculated on what the member's pension would have been had he/she retired the day after death. In addition, the surviving spouse will receive the established survivor benefit set for that year.

- b) A surviving child is considered to be the child by birth or the legally adopted child of the member or retiree.
1. A surviving child is eligible for benefits until attainment of age 18 or marriage; however, survivor benefits will continue until age 23 if such dependent child is a full-time student. Benefits are \$150 per month.
 2. A surviving child who is physically or mentally incompetent and who was totally dependent on the deceased member or retiree at the time of death is eligible for benefits until recovery or death. Benefits are \$150 per month.

Additionally, a \$5,000 lump sum benefit is payable upon the death of the retiree.

Vesting (Termination) Benefit:

Vesting Service Requirement	15 or more years of credit service.
Non-Vested Benefit	Refund of Member Contributions.
Vested Benefit	Payable upon reaching age 55 (or 48 with reduced benefit or 52 with unreduced benefit, if a member who has accumulated at least 20 years), provided contributions are not withdrawn, or a refund of member contributions. The termination benefit is 1.50% of average final salary times creditable service. If a member has completed 20 years of service and retires, they are eligible to receive a pension computed in the same manner as a retirement benefit.

Minimum Benefit:

All members who retired with a Retirement or Disability Benefit are eligible to receive a minimum benefit of \$1,050 per month.

Contributions

Member	Set by the retirement board annually. The percentage shall be not less than 10.0% and no more than 14.0% of a member's Salary.
Employer	The employer contribution rate is set by statute, currently set at 26.5%.

SUPPLEMENTARY TABLES

Table 1 – History of the Development of Unfunded Actuarial Accrued Liability

	Year Ending December 31				
	2020	2019	2018	2017	2016
1. Unfunded Actuarial Accrued Liability (UAAL), as of beginning of year	376,870,851	389,082,362	378,948,593	364,260,215	339,135,677
2. Total Normal Cost, as of beginning of year	23,052,454	23,248,328	22,033,532	21,901,786	20,149,707
3. Expected Interest on 1. and 2.	28,994,440	29,893,975	30,222,315	29,078,861	27,063,816
4. Contributions, with interest	52,776,845	51,117,770	42,241,099	42,685,668	41,385,236
6. Expected UAAL as of end of year (1)+(2)+(3)-(4)	376,140,900	391,106,895	388,963,341	372,555,193	344,963,965
7. Change in UAAL Due to Actuarial (Gain)/Loss, by component:					
Investment Return	(23,558,102)	154,476	31,264,298	9,943,102	4,839,839
Salary Increases	(504,174)	1,711,714	(459,716)	2,883,793	11,313,936
Decrement Experience	(4,186,700)	(7,319,472)	(1,453,717)	(1,065,239)	(2,636,439)
Inactive Mortality Experience	(670,280)	5,696,925			
Other Changes	1,016,334	772,615	2,351,765	(1,189,070)	5,778,914
Total change due to (Gain)/Loss	(27,902,922)	1,016,258	31,702,630	10,572,586	19,296,250
8. Change in UAAL Due to Assumption Changes/ Method Changes/Benefit Changes	10,904,499	(15,252,302)	(31,583,609)	(4,179,186)	-
9. Unfunded Actuarial Accrued Liability, as of end of year	359,142,477	376,870,851	389,082,362	378,948,593	364,260,215

Table 2 – History of Active Member Data

Actuarial Valuation Date	Active Members	Percent Increase	Annual Covered Payroll	Percent Increase	Average Covered Payroll	Percent Increase
12/31/2011	1,520		93,126,449		61,267	
12/31/2012	1,645	8.2%	98,117,403	5.4%	59,646	-2.6%
12/31/2013	1,613	-1.9%	98,519,844	0.4%	61,079	2.4%
12/31/2014	1,622	0.6%	99,211,756	0.7%	61,166	0.1%
12/31/2015	1,621	-0.1%	99,983,224	0.8%	61,680	0.8%
12/31/2016	1,670	3.0%	108,788,871	8.8%	65,143	5.6%
12/31/2017	1,650	-1.2%	112,705,188	3.6%	68,306	4.9%
12/31/2018	1,668	1.1%	116,009,622	2.9%	69,550	1.8%
12/31/2019	1,614	-3.2%	118,370,595	2.0%	73,340	5.4%
12/31/2020	1,542	-4.5%	117,996,230	-0.3%	76,522	4.3%
5-year Average Increase/ (Decrease)		-1.0%		3.4%		4.4%

Table 3 – History of Retiree and Survivor Annuitant Data

Actuarial Valuation Date	Number of Annuitant	Total Annuities (Annual)	Average Annuities (Annual)	Increase in Average Benefit
12/31/2011	1,465	51,249,684	34,983	
12/31/2012	1,497	53,646,504	35,836	2.44%
12/31/2013	1,523	56,007,360	36,774	2.62%
12/31/2014	1,558	58,292,436	37,415	1.74%
12/31/2015	1,548	59,723,304	38,581	3.12%
12/31/2016	1,580	62,458,476	39,531	2.46%
12/31/2017	1,637	65,661,636	40,111	1.47%
12/31/2018	1,671	67,722,984	40,528	1.04%
12/31/2019	1,699	69,831,187	41,101	1.41%
12/31/2020	1,730	71,554,792	41,361	0.63%

Table 4 – History of Employee Annuitants and Survivors Added to Payroll

Year of Retirement	Added		Removed		Total	
	Number	Annual Benefits ¹	Number	Annual Benefits	Number	Annual Benefits
2011	73	3,932,508	32	821,472	1,465	51,249,684
2012	79	3,380,304	47	983,484	1,497	53,646,504
2013	61	3,204,660	35	843,804	1,523	56,007,360
2014	66	3,008,568	31	723,492	1,558	58,292,436
2015	73	3,102,744	83 ²	1,671,876	1,548	59,723,304
2016	69	3,576,372	37	841,200	1,580	62,458,476
2017	83	3,878,244	26	675,084	1,637	65,661,636
2018	72	3,127,464	38	1,066,116	1,671	67,722,984
2019	63	2,881,148	35	772,944	1,699	69,831,187
2020	83	3,372,681	52	1,649,076	1,730	71,554,792

1. Includes added benefits due to COLA increases for continuing retirees and survivors.
2. Includes Alternate Payee records, which were combined with Participant records beginning with the December 31, 2015 valuation.

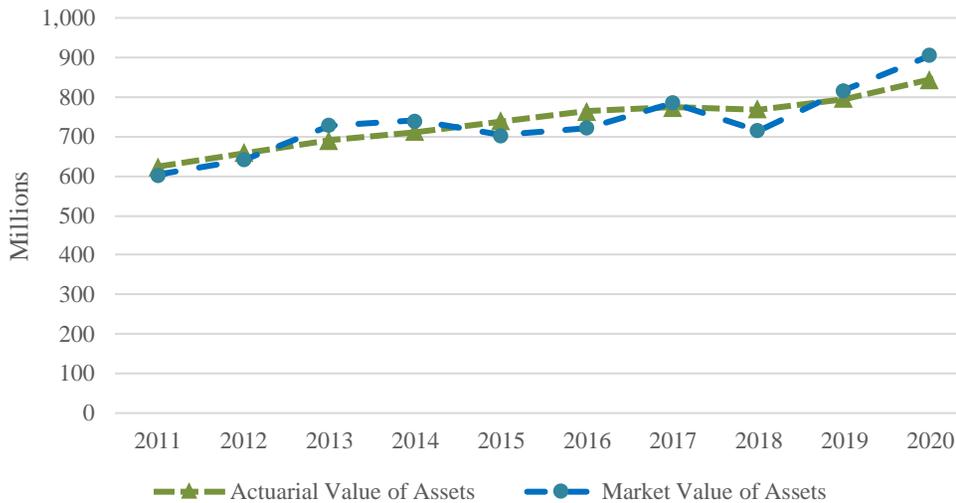
Table 5 – History of Annual Financial Report Asset Information

Year Ended	Pension Fund								Health Care Fund			
	Addition By Source				Deductions By Type				Addition By Source		Deductions By Type	
	Employer Contributions	Employee Contributions	Net Investment Income	Transfers from Other Systems	Administrative Expenses	Benefit Payments	Refunds	Transfers to Other Systems	Employer Contributions & Retiree Drug Subsidy and Prescription Drug Rebates	Net Investment Income	Benefits	Administrative Expenses
12/31/2011	22,966,338	9,278,533	(16,039,272)	608,366	948,319	57,288,210	451,682	1,797,986	2,418,411	(2,746,073)	11,092,515	159,271
12/31/2012	23,766,361	9,641,772	63,783,964	557,316	859,477	57,110,650	179,614	377,994	2,553,023	10,199,419	11,025,550	137,943
12/31/2013	22,908,182	10,037,246	115,874,530	1,353,520	909,929	61,528,826	943,433	467,462	4,718,651	17,893,377	12,140,996	140,676
12/31/2014	22,325,421	11,577,268	45,104,959	586,929	1,031,473	64,525,978	2,177,476	165,945	5,859,320	6,799,267	12,308,478	156,176
12/31/2015	22,895,242	13,686,292	(5,649,718)	947,265	1,084,161	66,213,253	857,626	160,888	5,637,420	(647,032)	11,362,048	157,150
12/31/2016	25,383,684	14,101,171	46,423,126	773,206	1,352,722	65,720,438	1,730,725	416,679	5,944,616	6,834,760	11,676,450	193,246
12/31/2017	26,109,836	14,504,919	101,482,224	619,110	1,437,267	75,392,803	1,074,973	140,562	6,777,825	14,467,179	11,571,393	204,198
12/31/2018	26,014,314	14,451,649	(37,810,306)	410,250	1,435,864	71,577,589	716,739	210,895	7,784,260	(5,852,119)	11,699,575	203,812
12/31/2019	33,107,047	15,618,020	129,802,232	781,873	1,649,904	73,577,433	1,556,151	147,156	2,983,659	18,006,553	11,602,364	229,044
12/31/2020	32,855,342	17,334,068	121,212,655	826,595	1,509,348	78,580,417	2,552,672	54,203	3,321,187	16,140,521	11,624,232	200,961

Table 6 – Funding Progress

Fiscal Year	Actuarial Accrued Liability	Actuarial Value of Assets	Fair Value of Net Assets	AVA / FVA	UAAL (AVA)	UAAL (FVA)	Funded Ratio (AVA)	Funded Ratio (FVA)	Covered Payroll	Funding Years
2011	1,047,699,686	623,360,121	603,422,669	103.30%	424,339,565	444,277,017	59.5%	57.6%	93,126,449	N/A
2012	966,310,485	658,428,914	642,644,347	102.46%	307,881,571	323,666,138	68.1%	66.5%	98,117,403	30
2013	989,101,470	690,605,582	728,968,175	94.74%	298,495,888	260,133,295	69.8%	73.7%	98,519,844	30
2014	1,012,752,337	712,285,604	740,661,880	96.17%	300,466,733	272,090,457	70.3%	73.1%	99,211,756	29
2015	1,078,984,597	739,848,920	704,225,033	105.06%	339,135,677	374,759,564	68.6%	65.3%	99,983,224	30
2016	1,127,927,927	763,667,712	721,685,656	105.82%	364,260,215	406,242,271	67.7%	64.0%	108,788,871	29
2017	1,153,619,256	774,670,663	786,356,140	98.51%	378,948,593	367,263,116	67.2%	68.2%	112,705,188	27
2018	1,158,179,566	769,097,204	715,480,960	107.49%	389,082,362	442,698,606	66.4%	61.8%	116,009,622	23
2019	1,173,155,313	796,284,462	817,859,488	97.36%	376,870,851	355,295,825	67.9%	69.7%	118,370,595	23
2020	1,203,886,606	844,744,129	907,391,508	93.10%	359,142,477	296,495,098	70.2%	75.4%	117,996,230	22

Comparison of AVA and MVA



Historical Rate of Returns

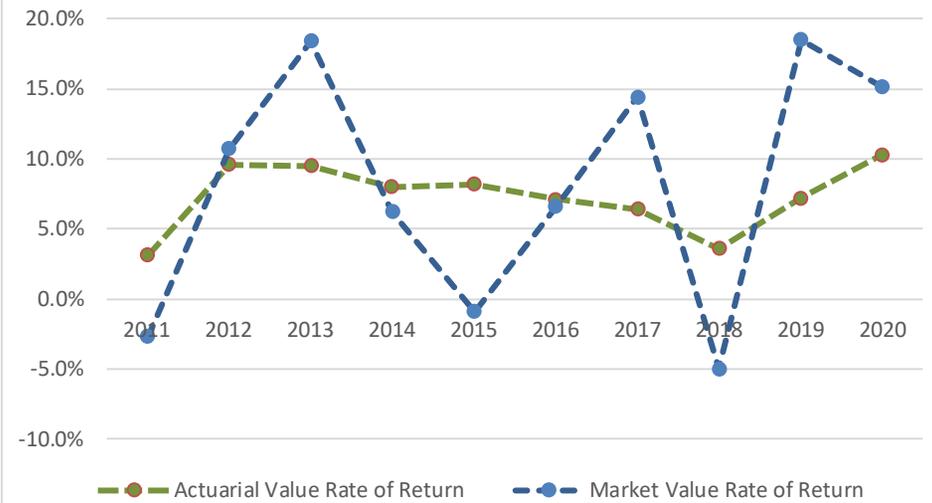


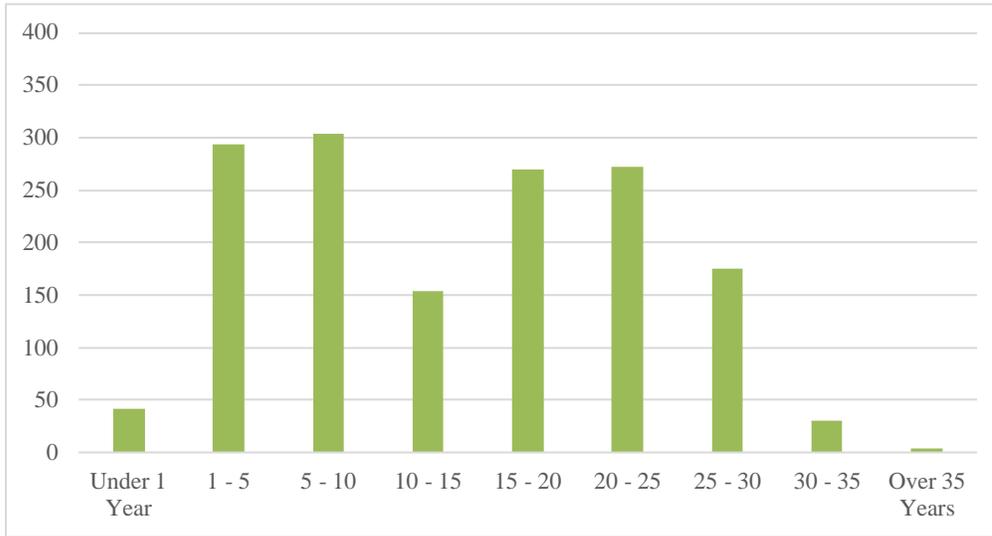
Table 7 – Solvency Test

Year Ended	Actuarial Accrued Liabilities			Actuarial Value of Assets	Portion of Liabilities Covered by Assets		
	(1) Active Member Contributions	(2) Retirees, Survivors and Vested Deferreds	(3) Active Members (ER Financed)		(1) Active Member Contributions	(2) Retirees, Survivors and Vested Deferreds	(3) Active Members (ER Financed)
12/31/2011	104,701,161	618,984,073	324,014,452	623,360,121	100%	84%	0%
12/31/2012	108,311,937	586,311,106	271,687,442	658,428,914	100%	94%	0%
12/31/2013	113,334,067	601,342,081	274,425,322	690,605,582	100%	96%	0%
12/31/2014	117,441,639	622,719,141	272,591,557	712,285,604	100%	96%	0%
12/31/2015	122,286,821	662,562,480	294,135,296	739,848,920	100%	93%	0%
12/31/2016	127,311,764	688,936,795	311,679,368	763,667,712	100%	92%	0%
12/31/2017	130,494,700	717,621,283	305,503,273	774,670,663	100%	90%	0%
12/31/2018	138,101,643	706,952,911	313,125,012	769,097,204	100%	89%	0%
12/31/2019	143,160,097	719,452,018	310,543,198	796,284,462	100%	91%	0%
12/31/2020	147,608,705	748,539,825	307,738,076	844,744,129	100%	93%	0%

Table 8 – Contribution History

Year Ended	Actuarially Determined Contribution for Fiscal Year End	Actual Contribution	Deficiency (Excess) in Annual Contribution	% of Actuarially Determined Contribution Contributed
12/31/2011	26,956,449	22,966,338	3,990,111	85%
12/31/2012	30,488,160	23,766,361	6,721,799	78%
12/31/2013	35,429,985	22,908,182	12,521,803	65%
12/31/2014	29,767,228	22,325,421	7,441,807	75%
12/31/2015	22,446,316	22,895,242	(448,926)	102%
12/31/2016	24,407,389	25,383,684	(976,295)	104%
12/31/2017	25,349,355	26,109,836	(760,481)	103%
12/31/2018	26,014,314	26,014,314	0	100%
12/31/2019	31,269,882	33,107,047	(1,837,165)	106%
12/31/2020	32,265,286	32,855,342	(590,056)	102%

Graph 9 – Distribution of Active Members by Service



Graph 10 – Distribution of Active Members by Age

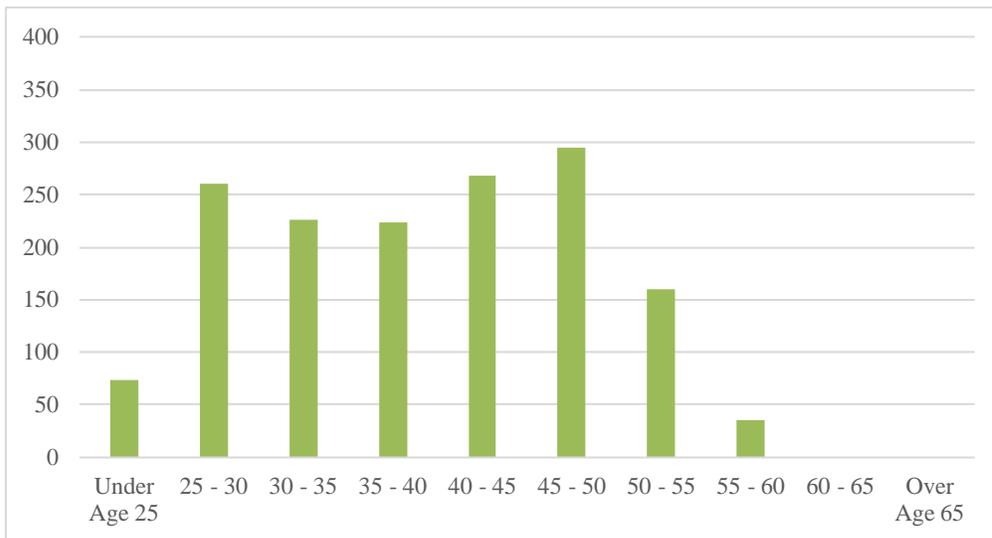
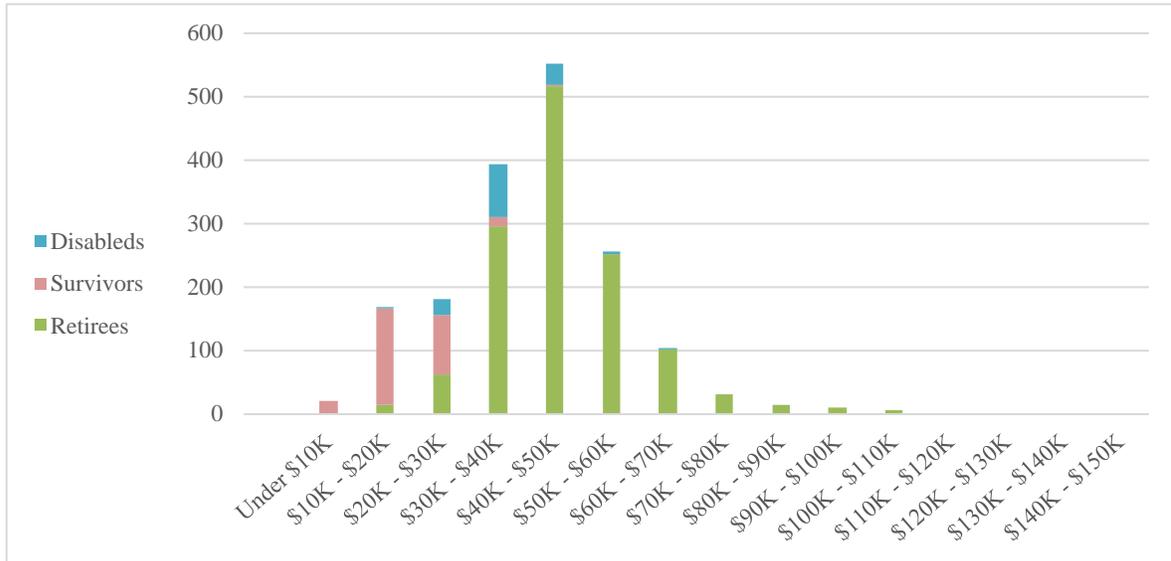
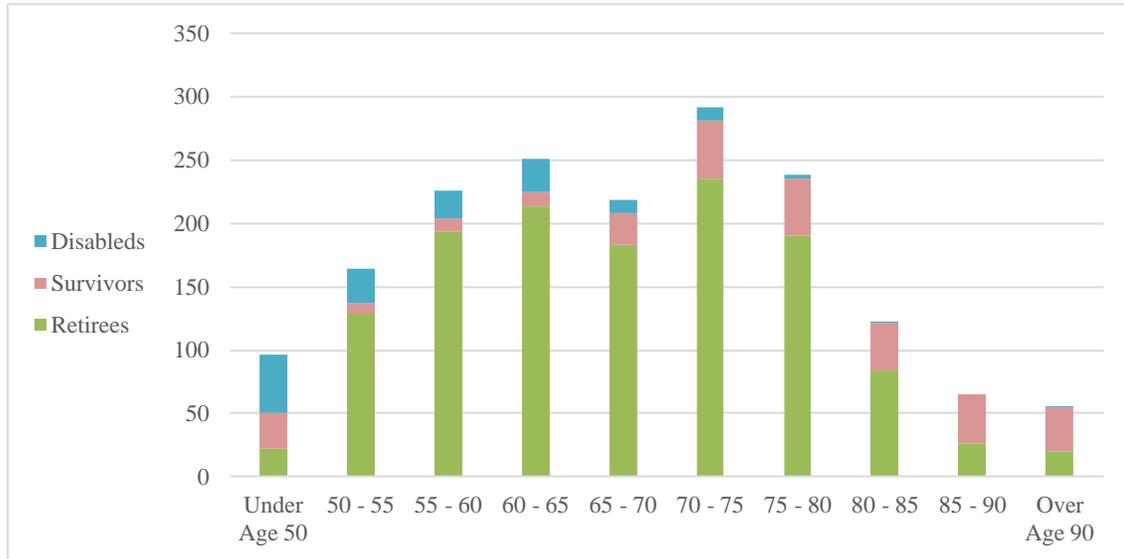


Table 11 – Distribution of Annuitants by Annual Benefit



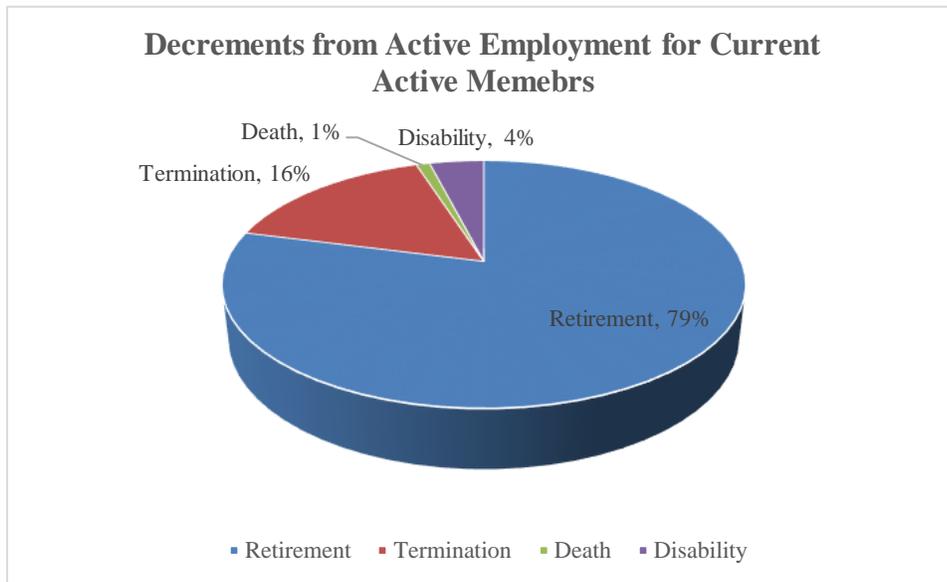
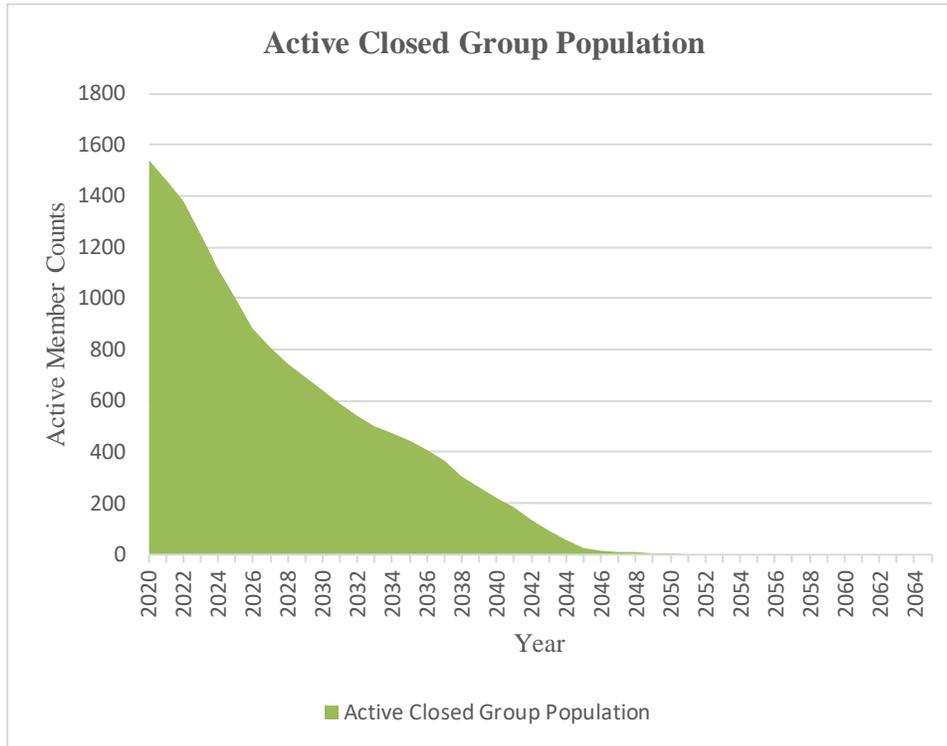
Annual Benefit	Retirees	Survivors	Disableds	Total
Under \$10K	0	20	0	20
\$10K - \$20K	14	152	1	167
\$20K - \$30K	61	94	25	180
\$30K - \$40K	296	15	83	394
\$40K - \$50K	516	2	35	553
\$50K - \$60K	252	0	3	255
\$60K - \$70K	101	0	2	103
\$70K - \$80K	30	0	0	30
\$80K - \$90K	14	0	0	14
\$90K - \$100K	9	0	0	9
\$100K - \$110K	5	0	0	5
	1298	283	149	1730

Table 12 – Distribution of Annuitants by Age



Age	Retirees	Survivors	Disableds	Total
Under Age 50	22	28	46	96
50 - 55	129	8	27	164
55 - 60	194	10	22	226
60 - 65	214	11	26	251
65 - 70	183	25	11	219
70 - 75	236	45	11	292
75 - 80	190	45	4	239
80 - 85	84	37	1	122
85 - 90	26	39	0	65
Over Age 90	20	35	1	56
Total	1,298	283	149	1,730

Graph 13-Projected Headcount of Present Population



The charts above show the expected future development of the present population in simplified terms. The Retirement System presently covers 1,542 active members. Eventually, 16% of the population is expected to terminate covered employment prior to retirement and forfeit eligibility for an employer provided benefit or separating from service without withdrawing contributions. 79% of the present population is expected to receive monthly retirement benefits by retiring directly from active service. 5% of the present population is expected to become eligible for death-in-service or disability benefits. Within 9 years, over half of the covered membership is expected to consist of new hires.

Table 14 – Active DROP Members as of December 31, 2020

Attained Ages	No.	Annual Benefit	DROP Account Balance
48	13	\$ 749,981	\$ 376,178
49	17	851,936	1,358,572
50	18	882,216	1,832,769
51	29	1,393,189	4,245,449
52	18	893,090	3,472,296
53	18	848,876	3,342,531
54	15	669,353	3,117,618
55	15	696,457	3,397,130
56	11	436,975	2,057,732
57	4	193,356	925,602
58	1	32,087	279,086
59	3	134,332	1,131,288
Total	162	\$ 7,781,848	\$25,536,251

OHIO STATE HIGHWAY PATROL RETIREMENT SYSTEM
OTHER POSTEMPLOYMENT BENEFITS PROGRAM

ACTUARIAL VALUATION
AS OF DECEMBER 31, 2020



FOSTER & FOSTER
ACTUARIES AND CONSULTANTS

August 12, 2021

Board of Trustees
Ohio State Highway Patrol Retirement System
1900 Polaris Parkway
Suite 201
Columbus, Ohio 43240-4037

Dear Board:

We are pleased to present to the Board this annual actuarial valuation of Ohio State Highway Patrol Retirement System's Other Postemployment Benefits (OPEB) Program. This valuation was performed to determine the current funded status of the Plan.

The valuation has been conducted in accordance with generally accepted actuarial principles and practices, including the applicable Actuarial Standards of Practice as issued by the Actuarial Standards Board, and reflects all applicable federal laws and regulations. In our opinion, the assumptions used in this valuation, as adopted by OHPRS, represent reasonable expectations of anticipated plan experience.

In conducting the valuation, we have relied on personnel and plan design information supplied by OHPRS personnel, and the actuarial assumptions and methods described in the Actuarial Assumptions section of this report. While we cannot verify the accuracy of all this information, the supplied information was reviewed for consistency and reasonableness. Because of this review, we have no reason to doubt the substantial accuracy of the information and believe that it has produced appropriate results. This information, along with any adjustments or modifications, is summarized in various sections of this report.

The measurements shown in this actuarial valuation may not be applicable for other purposes. Future actuarial measurements may differ significantly from the current measurements presented in this report due to factors such 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 (such as the end of an amortization period); and changes in plan provisions or applicable law. Due to the limited scope of this report, we did not provide an analysis of these potential differences.

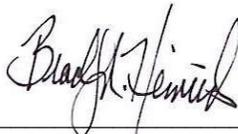
The undersigned are familiar with the immediate and long-term aspects of OPEB valuations and meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinions contained herein. All sections of this report are considered an integral part of the actuarial opinions.

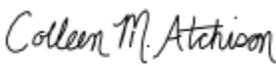
To our knowledge, no associate of Foster & Foster, Inc. working on valuations of the program has any direct financial interest or indirect material interest in OHPRS, nor does anyone at Foster & Foster, Inc. act as a member of the Board of Directors of OHPRS. Thus, there is no relationship existing that might affect our capacity to prepare and certify this actuarial report.

If there are any questions, concerns, or comments about any of the items contained in this report, please contact us at 239-433-5500.

Respectfully submitted,

Foster & Foster, Inc.

By: 
Bradley R. Heinrichs, FSA, EA, MAAA
Enrolled Actuary #20-6901

By: 
Colleen M. Atchison, FSA, MAAA

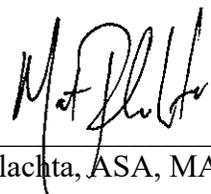
By: 
Matt Plachta, ASA, MAAA

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SUMMARY OF RESULTS

The annual actuarial valuation of OHPRS's Other Postemployment Benefits Program as of December 31, 2020, has been performed and the results are presented in this Report. For purposes of this valuation medical, prescription drugs, dental, and vision were taken into consideration. The results described herein are applicable to the plan year ending December 31, 2020.

The following table shows the results of the December 31, 2020 valuation of the Plan:

Valuation Date	12/31/2020
Actuarially Determined Contribution As a Percent of Covered Payroll	13.08%
Actuarial Accrued Liability (AAL)	
Actives	\$ 122,895,230
Retirees	162,432,699
Total	\$ 285,327,929
Normal Cost	\$ 5,195,885
Funded Status as of the Valuation Date	
Actuarial Accrued Liability (AAL)	\$ 285,327,929
Actuarial Value of Assets (AVA)	110,433,029
Unfunded Actuarial Accrued Liability (UAAL)	\$ 174,894,900
Funded Ratio	38.7%
Covered Payroll	\$ 117,996,230
Ratio of UAAL to Covered Payroll	148.2%

Changes since the Prior Valuation

The following changes have been made since the prior valuation:

- The census data reflects changes in status for the twelve (12) month period since December 31, 2019.
- The per capita claims cost has been updated to reflect the most recent 36-month Plan experience. Administrative fees, stop-loss premiums, and Medicare Advantage premium rates have also been updated to use rates effective January 1, 2021.
- The actuarial value of assets was updated and is based on the market value of assets as of December 31, 2020.
- Contribution rates paid by retirees and covered dependents have been updated to reflect the Plan's rates effective January 1, 2021.

There was a decrease in projected retiree health care costs as of December 31, 2020, which is largely due to a change in health care plan designs for 2021. In addition, we noted that there was a decrease in actual medical expenditures during calendar year 2020. This was likely due to the COVID-19 pandemic and its effect on health care usage during the year. As such, the medical expenditure experience during calendar year 2020 was not assumed to have credibility when projecting future costs. However, as prescription drug claims experience was minimally impacted by the pandemic, 2020 drug expenditure experience was relied on for projection development purposes.

The resulting effect of these changes is an overall decrease in the unfunded actuarial accrued liability of \$37,383,257. This represents a decrease of approximately 12% compared to the expected unfunded actuarial accrued liability, with the main driver being the lower projected health care costs.

This actuarial valuation involves estimates of the value of reported amounts and assumptions about the probability of events far into the future. Examples include assumptions about future employment, mortality, and the healthcare cost trend. Amounts determined regarding the funded status of the plan and the annual required contributions of the employer are subject to constant revision as actual experience is compared with past expectations and new estimates are made about the future.

Calculations are based upon the types of benefits provided under the terms of the substantive plan at the time of the valuation and on the pattern of sharing of costs between the employer and plan members to that point. Calculations reflect a long-term perspective, so methods and assumptions used include techniques that are designed to reduce short-term volatility in actuarial accrued liabilities and the actuarial value of assets.

UNFUNDED ACTUARIAL ACCRUED LIABILITY

1. Unfunded Actuarial Accrued Liability (UAAL) as of December 31, 2019	\$	195,268,480
2. Employer Normal Cost, Developed as of December 31, 2019		5,866,840
3. Expected Interest on 1 and 2 (at 7.25%)		14,582,311
4. Contributions		7,422,942
5. Expected Interest on 4, mid-year		264,374
6. Expected UAAL as of December 31, 2020 (1)+(2)+(3)-(4)-(5)	\$	208,030,315
7. Change in UAAL by component		
Decrease in UAAL due to investment experience	\$	(3,347,093)
Increase in UAAL due to demographic experience		3,731,301
Decrease in UAAL due to favorable claims experience		(37,950,584)
Increase in UAAL due to all other changes		183,119
Net decrease in UAAL		(37,383,257)
8. Unfunded Actuarial Accrued Liability as of December 31, 2020	\$	174,894,900

ANALYSIS OF PLAN EXPERIENCE

Below is the analysis of Gains and Losses due to plan experience resulting in differences between Assumed and Actual Experience.

Type of Activity	(Gain)/Loss
1. Premiums. Gains and losses resulting from actual premiums in valuation year versus that assumed from prior valuation.	\$ (37,950,584)
2. Investment Income. If there is a greater return on investments than assumed, there is a gain. If less return, a loss.	(3,347,093)
3. All Other Sources. Gains and losses resulting from demographic experience, data adjustments, timing of financial transactions, etc.	<u>3,914,420</u>
4. Composite (Gain)/Loss During the Year	\$ (37,383,257)

DEVELOPMENT OF ACTUARIALLY DETERMINED CONTRIBUTION

Valuation Date	12/31/2020
<i>Unfunded Actuarial Accrued Liability</i>	
Actuarial Accrued Liability	\$ 285,327,929
Actuarial Value of Assets	<u>110,433,029</u>
Unfunded Actuarial Accrued Liability	\$ 174,894,900
<i>Amortization Amount Component</i>	
Amortization Period	30
Amortization Method	Open
Discount Rate	7.25%
Payroll Growth Rate	3.00%
Total Amortization Amount	\$ 9,862,795
As of Percent of Covered Payroll	8.36%
<i>Normal Cost Component</i>	
Normal Cost	\$ 5,195,885
Interest on Normal Cost	<u>376,702</u>
Normal Cost Component	\$ 5,572,587
As of Percent of Covered Payroll	4.72%
<i>Development of Actuarially Determined Contribution</i>	
Normal Cost Component	\$ 5,572,587
As of Percent of Covered Payroll	4.72%
Amortization Component	\$ 9,862,795
As of Percent of Covered Payroll	8.36%
Actuarially Determined Contribution	\$ 15,435,382
As of Percent of Covered Payroll	13.08%
Covered Payroll	\$ 117,996,230

DEVELOPMENT OF ACTUARIALLY DETERMINED CONTRIBUTION

Determination of the Actuarially Determined Contribution for the Period July 1, 2021 to June 30, 2022	Contributions Expressed as a Percent of Payroll
Normal Cost	4.72%
UAAL Amortization	8.36%
Total Actuarially Determined Contribution	13.08%

The calculations above show the Employer’s Actuarially Determined Contribution for the year ended June 30, 2022. The Actuarially Determined Contribution for the year ended December 31, 2021 will be ½ of 14.62% of covered payroll and ½ of the 13.08% of covered payroll shown above.

DEVELOPMENT OF ASSETS

STATEMENT OF FIDUCIARY NET POSITION			
December 31, 2020			
	MARKET VALUE		
	PENSION	HEALTH	TOTAL
ASSETS			
Total Cash and Equivalents	32,645,585	4,346,579	36,992,164
Receivables:			
Employer Contributions Receivable	559,390	0	559,390
Member Contributions Receivable	1,669,891	0	1,669,891
Accrued Investment Income	1,052,128	140,085	1,192,213
Total Receivables	3,281,409	140,085	3,421,494
Investments:			
Domestic Equity	286,547,993	37,600,691	324,148,684
International Equity	177,452,115	23,253,096	200,705,211
Fixed Income	136,424,859	17,876,937	154,301,796
Real Estate	60,244,663	7,894,383	68,139,046
Private Equity	130,406,094	17,087,078	147,493,172
Hedge Funds	81,667,860	10,700,919	92,368,779
Direct Infrastructure	6,958,746	911,803	7,870,549
Total Investments	879,702,330	115,324,907	995,027,237
Other	72,436	0	72,436
Total Assets	915,701,760	119,811,571	1,035,513,331
Deferred Outflows of Resources	179,563	113,744	293,307
LIABILITIES			
Payables:			
Accounts Payable	460,999	61,379	522,378
Accrued Payroll Liabilities	218,059	29,033	247,092
Accrued Pension Liabilities	6,684,016	0	6,684,016
Accrued Health Care Liabilities	0	446,046	446,046
Net Pension Liability	808,021	0	808,021
Net OPEB Liability	0	667,427	667,427
Total Liabilities	8,171,095	1,203,885	9,374,980
Deferred Inflows of Resources	318,720	98,537	417,257
Net Assets:			
Active and Retired Members' Equity	907,391,508	118,622,893	1,026,014,401
Employees' Savings Fund			93,315,334
Employer Accumulation Fund			118,622,893
Pension Reserve Fund			814,076,174
Survivors Benefit Fund			0
Health Care Fund			118,622,893
Income Fund			(118,622,893)
Total Fund Balance			1,026,014,401
NET POSITION			1,026,014,401

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION FOR THE YEAR ENDED December 31, 2020 Market Value Basis			
	PENSION	HEALTH	TOTAL
ADDITIONS			
Contributions:			
Member Contribution	17,334,068	4,101,755	21,435,823
Employer Contributions	32,855,342	0	32,855,342
Medicare Part D Reimbursement		3,321,187	3,321,187
Transfers	772,392		772,392
Total Contributions	50,961,802	7,422,942	58,384,744
Net Investment Income ¹	121,212,655	16,140,521	137,353,176
Total Additions	172,174,457	23,563,463	195,737,920
DEDUCTIONS			
Distributions to Members:			
Benefit Payments	78,465,417	15,725,987	94,191,404
Refund of Member Contributions	2,552,672		2,552,672
Death Benefit	115,000		115,000
Total Distributions	81,133,089	15,725,987	96,859,076
Administrative Expenses	1,509,348	200,961	1,710,309
Total Deductions	82,642,437	15,926,948	98,569,385
Net Increase in Net Position	89,532,020	7,636,515	97,168,535
NET POSITION			
Beginning of the Year	817,859,488	110,986,378	928,845,866
End of the Year	907,391,508	118,622,893	1,026,014,401
Actuarial Value End of Year ²	844,744,129	110,433,029	955,177,158

¹ Investment related expenses include investment management, investment consulting, custodial and securities lending bank fees.

² Actuarial Value is allocated in proportion to the Market Value.

CASH FLOW PROJECTION

Cash Flow Projection Based on the December 31, 2020 Actuarial Valuation at 7.25%										
Calendar Year	Fund Balance BOY \$	Employer Contributions \$	Benefits \$	Net \$	Investment Return %	Investment Return \$	Fund Balance EOY		% of Payroll	
							Nominal \$	Real \$	Contrib.	Benefits
2021	\$ 110,433,029	\$ 0	\$ 9,516,378	\$(9,516,378)	7.25%	\$ 7,667,462	\$ 108,584,113	\$108,584,113	0.00%	7.80%
2022	108,584,113	0	11,415,423	(11,415,423)	7.25%	7,465,779	104,634,469	102,082,409	0.00%	9.10%
2023	104,634,469	0	12,322,667	(12,322,667)	7.25%	7,147,118	99,458,920	94,666,432	0.00%	9.70%
2024	99,458,920	0	13,331,773	(13,331,773)	7.25%	6,735,950	92,863,097	86,232,617	0.00%	10.17%
2025	92,863,097	0	14,363,411	(14,363,411)	7.25%	6,221,011	84,720,697	76,752,770	0.00%	10.31%
2026	84,720,697	0	15,780,395	(15,780,395)	7.25%	5,580,220	74,520,522	65,865,283	0.00%	10.86%
2027	74,520,522	0	17,234,375	(17,234,375)	7.25%	4,788,923	62,075,070	53,527,138	0.00%	11.35%
2028	62,075,070	0	18,686,346	(18,686,346)	7.25%	3,834,914	47,223,638	39,727,605	0.00%	11.75%
2029	47,223,638	0	20,189,345	(20,189,345)	7.25%	2,704,655	29,738,948	24,408,140	0.00%	12.11%
2030	29,738,948	0	21,634,672	(21,634,672)	7.25%	1,385,538	9,489,814	7,598,763	0.00%	12.44%
2031	9,489,814	0	23,415,820	(23,415,820)	7.25%	(145,961)	(14,071,967)	(10,992,998)	0.00%	12.90%

The above projection of the health care fund shows the fund will remain solvent until 2031. This is based on the following projection assumptions:

1. Actuarial assumptions and methods are as described in the Actuarial Assumptions and Funding Methods section of this report. All future demographic experience is assumed to be exactly realized.
2. Assume a 0% increase in the total active member population. All new future members are expected to enter the plan upon their date of hire, under applicable plan provisions.
3. Employer contribution rates and benefit provisions continue at their present levels.
4. All cash flows are assumed to occur mid-year.
5. Inflation rate is 2.50% annually.

SHORT-TERM HEALTHCARE SOLVENCY TEST

The funding progress exhibit below demonstrates the Trust’s solvency over time. In a short-term solvency test, assets available for benefits are compared to the actuarial accrued liability for future benefits payable to persons who have retired or terminated, and the actuarial accrued liability for future projected benefits payable to current active members.

Generally, if a system has been using level contribution rate financing, the portion fully funded in each category will increase over time.

Valuation Year	(1)	(2)	Healthcare Valuation Assets	Portion of Accrued Liabilities Covered by Reported Assets	
	Retirees, Beneficiaries & Deferreds	Active Members (Employer Financed Portion)		(1)	(2)
2019	\$ 168,752,009	\$ 134,575,043	\$ 108,058,572	64%	0%
2020	\$ 162,432,699	\$ 122,895,230	\$ 110,433,029	68%	0%

APPROXIMATE IRC SECTION 401(H) COMPUTATION

Year	(1)	(2)			(4)	(5)	(6)	(7)	(8)	(9)
	Covered Pay	Pension				Health Contribution	(4) + (5)	Sum of (5)	Sum of (6)	IRC Ratio (7) / (8)
		EAN NC %	PUC NC %	PUC NC \$						
1999	\$ 69,030	24.96%	26.08%	\$ 18,003.0	\$ 3,278.9	\$ 21,281.9	\$ 33,616.4	\$ 216,929.5	15.5%	
2000	68,505	24.96%	26.08%	17,866.1	3,254.0	21,120.1	36,870.4	238,049.6	15.5%	
2001	74,140	23.10%	23.63%	17,519.3	3,521.7	21,041.0	40,392.1	259,090.6	15.6%	
2002	79,594	23.14%	23.71%	18,871.7	3,780.7	22,652.4	44,172.8	281,743.0	15.7%	
2003	80,641	21.88%	22.72%	18,321.6	3,395.7	21,717.3	47,568.5	303,460.3	15.7%	
2004	81,931	21.91%	22.83%	18,704.8	2,867.6	21,572.4	50,436.1	325,032.7	15.5%	
2005	85,828	21.68%	22.59%	19,388.5	3,006.4	22,394.9	53,442.5	347,427.6	15.4%	
2006	87,563	20.99%	21.83%	19,115.0	3,384.8	22,499.8	56,827.3	369,927.4	15.4%	
2007	95,032	20.78%	21.92%	20,831.0	4,575.1	25,406.1	61,402.4	395,333.5	15.5%	
2008	93,029	20.81%	21.89%	20,364.0	4,668.0	25,032.0	66,070.4	420,365.5	15.7%	
2009	93,339	21.21%	22.92%	21,393.3	4,794.7	26,188.0	70,865.1	446,553.5	15.9%	
2010	92,226	21.23%	23.25%	21,445.7	3,699.8	25,145.5	74,564.9	471,699.0	15.8%	
2011	92,790	21.72%	24.03%	22,297.8	2,418.4	24,716.2	76,983.3	496,415.2	15.5%	
2012	96,022	21.80%	24.19%	23,227.8	2,553.0	25,780.8	79,536.3	522,196.0	15.2%	
2013	100,250	18.23%	20.37%	20,418.9	4,718.7	25,137.6	84,255.0	547,333.6	15.4%	
2014	100,569	18.13%	21.00%	21,117.3	5,859.3	26,976.6	90,114.3	574,310.2	15.7%	
2015	101,751	18.13%	21.01%	21,375.1	5,637.4	27,012.5	95,751.7	601,322.7	15.9%	
2016	112,811	19.70%	21.55%	24,305.2	5,944.6	30,249.8	101,696.3	631,572.5	16.1%	
2017	116,038	19.73%	21.18%	24,574.0	6,777.8	31,351.8	108,474.1	662,924.3	16.4%	
2018	115,613	19.10%	20.50%	23,700.0	7,784.3	31,484.3	116,258.4	694,408.6	16.7%	
2019	118,371	20.04%	22.86%	27,062.1	2,983.7	30,045.8	119,242.1	724,454.4	16.5%	
2020	117,996	20.18%	22.66%	26,734.9	3,321.2	30,056.1	122,563.2	754,510.4	16.2%	

As shown in the above table, the retiree health plan is subordinate to the pension plan in the trust based on the 25% threshold requirement for Column 9. Therefore, the calculations shown above indicate compliance with IRC Section 401(h).

PER CAPITA CLAIMS COSTS AND CONTRIBUTION AMOUNTS

Development of Health Care Rates

Medical and Prescription Drug Costs:

The per capita claims costs were developed based on the most recent 36-month Medical Mutual of Ohio and Express Scripts claims and enrollment experience. Additionally, the administrative and stop-loss fees charged by Medical Mutual of Ohio and the Aetna Medicare Advantage premium rates effective January 1, 2021 were used to establish the cost. Members and their spouses who are eligible for Medicare have a reduction to their cost due to retiree drug subsidies and prescription drug rebates.

The following rates were based on the retired life data as of the valuation date and are representative of the Plan's portion of the total care cost:

Member and Spouse Monthly Medical and Prescription Drug Cost		
Age	Male	Female
40	\$ 376.67	\$ 599.81
45	461.26	633.59
50	595.12	734.34
55	773.52	851.56
60	989.65	989.27
65	437.56	399.09
70	476.07	445.24
75	510.82	481.66
80	535.93	508.76
85	539.78	527.48
90	529.91	532.70
95	522.66	511.59

The dependent child per capita cost is \$277.28 per month for each child in calendar year 2021.

Dental Benefits:

Dental coverage under the Delta Dental PPO (Point-of-Service) plan is available to eligible retirees and their dependents. The premium rates shown below are effective January 1, 2021 through December 31, 2021. The rates represent the full cost of coverage as of the valuation date.

Delta Dental Monthly Premium Rates Calendar Year 2021	
Member Only	\$ 25.89
Member and Spouse	\$ 50.19
Member, Spouse, and Child	\$ 85.73
Member and Child	\$ 53.04

Vision Benefits:

Vision coverage under the Aetna Vision Preferred Plan – Under 65 and the Aetna Vision Preferred Plan – Over 65 is available to eligible retirees and their dependents and is based on whether they are ineligible or eligible for Medicare, respectively. The premium rates shown below are effective January 1, 2021 through December 31, 2021. The rates represent the full cost of coverage as of the valuation date.

Aetna Vision Preferred Plan Premium Rates Calendar Year 2021	
Over Age 65	
Member Only	\$ 5.27
Member and Spouse	\$ 10.50
Member, Spouse, and Child	\$ 14.61
Member and Child	\$ 9.20
Under Age 65	
Member Only	\$ 7.63
Member and Spouse	\$ 15.22
Member, Spouse, and Child	\$ 21.17
Member and Child	\$ 13.32

PARTICIPANT DATA

Summary of All Participants

Participant Group	Number
Retirees and surviving spouses who are currently receiving benefits	1,486
Retirees and surviving spouses who are not currently receiving benefits, but may enroll in coverage in the future	244
Inactive plan members who are entitled to, but not currently receiving benefits	9
Active members (including DROP participants)	<u>1,542</u>
Total	3,281

Summary of Current Inactive Participants

Summary of Current Inactives Health Plan Enrollment Election						
As of December 31 st	Inactives Currently Enrolled ³				Inactives That May Enroll in the Future	
	Medical	Vision	Dental	Total Number Enrolled	Vested Term	All Other Inactives
2019	1,329	1,455	1,449	1,479	11	219
2020	1,313	1,463	1,452	1,486	9	244

Number of Retired Lives Covered by Medical Mutual, AETNA, and Medicare Advantage			
December 31 st	Added to Rolls	Removed from Rolls	Totals
2016			1,395
2017	78	87	1,386
2018	42	77	1,351
2019	32	54	1,329
2020	48	64	1,313

³ The number of lives was compiled from data files provided by HPRS Staff. This is the number of retired members covered and will differ from the number of actual lives covered based on the type of coverage elected, as shown in the two exhibits that follow.

Number of Retired Lives Covered by Medical Mutual, AETNA, and Medicare Advantage										
	Census Date									
	12/20	12/19	12/18	12/17	12/16	12/15	12/14	12/13	12/12	12/11
Recipients:										
w/o Medicare A	470	499	546	606	654	685	645	672	702	NA
Medicare A	919	894	874	841	821	780	753	717	669	NA
Spouses:										
w/o Medicare A	196	207	217	253	287	302	325	330	355	NA
Medicare A	452	451	434	402	386	372	360	338	305	NA
Dependent Children	94	98	104	208	251	261	273	302	279	NA
Orphans	0	0	0	0	0	0	0	0	0	NA
Totals	2,131	2,149	2,175	2,310	2,399	2,400	2,356	2,359	2,310	2,269

Summary of Recipients and Dependents Covered by Medical Mutual, AETNA, and Medicare Advantage				
December 31 st	AETNA	Advantage	Mutual	Totals
2011	197	891	1,181	2,269
2012	183	975	1,152	2,310
2013	162	1,056	1,141	2,359
2014	0	1,114	1,242	2,356
2015	0	1,152	1,248	2,400
2016	0	1,207	1,192	2,399
2017	0	1,244	1,066	2,310
2018	0	1,259	866	2,125
2019	0	1,290	803	2,093
2020	0	1,304	758	2,062

Summary of Current Active and DROP Participants

Actives & DROPs Combined Service										
Age	Total Past Service									Total
	< 1	1 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 -34	35 +	
<25	22	51	0	0	0	0	0	0	0	73
25 - 29	15	169	77	0	0	0	0	0	0	261
30 - 34	3	52	147	24	0	0	0	0	0	226
35 - 39	1	19	63	80	61	0	0	0	0	224
40 - 44	0	1	15	34	116	101	1	0	0	268
45 - 49	0	1	1	15	65	132	79	2	0	295
50 - 54	0	0	0	1	27	32	77	20	3	160
55 - 59	0	0	0	0	1	7	18	8	1	35
60 - 64	0	0	0	0	0	0	0	0	0	0
Total	41	293	303	154	270	272	175	30	4	1,542

Actives Service										
Age	Total Past Service									Total
	< 1	1 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 -34	35 +	
<25	22	51	0	0	0	0	0	0	0	73
25 - 29	15	169	77	0	0	0	0	0	0	261
30 - 34	3	52	147	24	0	0	0	0	0	226
35 - 39	1	19	63	80	61	0	0	0	0	224
40 - 44	0	1	15	34	116	101	1	0	0	268
45 - 49	0	1	1	15	65	132	50	1	0	265
50 - 54	0	0	0	1	27	24	10	0	0	62
55 - 59	0	0	0	0	1	0	0	0	0	1
60 - 64	0	0	0	0	0	0	0	0	0	0
Total	41	293	303	154	270	257	61	1	0	1,380

DROPs Service										
Age	Total Past Service									Total
	< 1	1 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 -34	35 +	
<25	0	0	0	0	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0	0	0	0	0
30 - 34	0	0	0	0	0	0	0	0	0	0
35 - 39	0	0	0	0	0	0	0	0	0	0
40 - 44	0	0	0	0	0	0	0	0	0	0
45 - 49	0	0	0	0	0	0	29	1	0	30
50 - 54	0	0	0	0	0	8	67	20	3	98
55 - 59	0	0	0	0	0	7	18	8	1	34
60 - 64	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	15	114	29	4	162

ACTUARIAL ASSUMPTIONS AND FUNDING METHODS

<u>Valuation Date</u>	December 31, 2020.
<u>Fiscal Year End</u>	December 31, 2020.
<u>Interest Rate</u>	7.25%
<u>Mortality Rates</u>	<p><i>Healthy Active Lives:</i> PubS-2010 (amount-weighted) employee tables.</p> <p><i>Retiree and Vested Terminated Lives:</i> PubS-2010 (amount-weighted) healthy retiree tables adjusted by 94%.</p> <p><i>Contingent Survivor Lives:</i> PubS-2010 (amount-weighted, above-median) contingent survivor tables adjusted by 105%.</p> <p><i>Disabled Lives:</i> PubS-2010 (amount-weighted) disabled retiree tables.</p> <p>The mortality assumptions for all participants are sex distinct with mortality improvement projected 5 years beyond the valuation date using scale MP-2020 and a base year of 2010. We feel these assumptions sufficiently accommodate anticipated future mortality improvements.</p>
<u>Inflation</u>	2.50%

Salary Increase Rates

Years of Service	Total Increase (Next Year)
0–1	13.50%
2–3	9.50%
4–5	8.00%
6–11	5.00%
12+	3.80%

Retirement Rates

Age	Retirement Rates	
	Normal	Reduced
48	20.00%	5.00%
49–50	15.00%	5.00%
51	15.00%	10.00%
52	20.00%	
53	10.00%	
54	20.00%	
55	30.00%	
56–59	40.00%	
60+	100.00%	

Termination Rates

Years of Service	Annual Rate of Withdrawal
0	13.00%
1–2	6.50%
3–5	4.50%
6–9	2.50%
10–20	1.00%
21+	2.50%

Disability Rates

Age	Annual Rate of Disability
20	0.06%
25	0.06%
30	0.17%
35	0.32%
40	0.53%
45	0.64%
50	0.85%
55	1.00%
60+	0.00%

Health Care Inflation

The assumed annual rates of increase in retiree expected health care claims costs and contribution during each period subsequent to the valuation date were adopted as of December 31, 2019.

Medical

Fiscal Year Beginning January 1	Pre-Medicare Medical and Prescription Drug Plan	Medicare Advantage Plan
2021	7.70%	5.70%
2022	7.65%	5.65%
2023	7.50%	5.60%
2024	7.25%	5.45%
2025	6.80%	5.25%
2026	6.25%	5.05%
2027	5.70%	4.90%
2028	5.25%	4.85%
2029	5.00%	4.80%
2030	4.85%	4.75%
2031	4.80%	4.75%
2032	4.75%	4.75%
2033+	4.75%	4.75%

Dental

4.00% for every year

Vision

3.25% for every year

Health Care Participation Rates

Future Retirees

See Table 1 (adopted December 31, 2019), on the following page, which contains annual health care coverage election rates based on member ages.

Current Retirees

Actual health care coverage elections for all current retirees and surviving spouses are used during the fiscal period that immediately follows the valuation date (initial year). After the initial year, current retirees and surviving spouses are assumed to elect health care coverages based on the annual rates provided in Table 1.

Future Spouses of Retirees

See Table 1 (adopted December 31, 2019), which contains annual health care coverage election rates based on member ages.

Current Spouses of Retirees

Actual health care coverage elections for all spouses of retirees are used during the fiscal period that immediately follows the initial year. After the initial year, spouses are assumed to elect health care coverages based on the annual rates provided in Table 1.

Dependent Children

Of Current Actives

Members who receive a death-in-service benefit are assumed to have two children for whom medical and prescription drug, dental, and vision coverage is maintained for a period of 10 years following the active employee's death. Otherwise, future retirees are not expected to enroll any children for coverage when they retire, withdraw, or become disabled.

Of Current Inactives

All current retirees who are enrolled in a member plus child(ren) or member plus family coverage tier are expected to cover one child to two children, respectively, for 10 years beginning on the member's date of retirement. Otherwise, current retirees are not expected to enroll any children during any future period.

Spousal Age Difference

Actual spouse age and gender is used where available, otherwise, spouse of male member is assumed to be 3 years younger than member; Spouse of female member assumed to be 3 years older than member. Members are assumed to be married to the opposite gender.

TABLE 1				
Member Attained Age	Medical / Rx Annual Member Election Rate	Medical / Rx Annual Spouse Coverage Rate	Dental / Vision Annual Member Election Rate	Dental / Vision Annual Spouse Coverage Rate
Under 48	0.600	0.000	0.600	0.000
48	0.550	0.450	0.700	0.450
49	0.500	0.450	0.650	0.500
50	0.500	0.450	0.600	0.550
51	0.525	0.450	0.600	0.550
52	0.650	0.450	0.700	0.550
53	0.675	0.400	0.725	0.500
54	0.700	0.350	0.750	0.400
55	0.725	0.400	0.775	0.475
56	0.775	0.425	0.825	0.525
57	0.800	0.450	0.850	0.550
58	0.825	0.500	0.875	0.575
59	0.850	0.550	0.900	0.600
60	0.850	0.575	0.900	0.600
61	0.850	0.575	0.900	0.625
62	0.875	0.575	0.925	0.650
63–64	0.900	0.575	0.950	0.650
65–66	0.900	0.625	0.975	0.650
67	0.950	0.625	0.975	0.650
68–69	0.950	0.650	0.975	0.675
70	0.950	0.675	0.975	0.700
71	0.950	0.700	0.975	0.725
72	0.975	0.725	0.975	0.750
73	0.975	0.750	0.975	0.775
74	0.975	0.725	0.975	0.750
75	0.975	0.700	0.975	0.700
76	0.950	0.675	0.950	0.650
77–79	0.925	0.675	0.925	0.650
80–81	0.925	0.725	0.925	0.700
82	0.900	0.700	0.900	0.650
83	0.900	0.650	0.900	0.600
84	0.875	0.600	0.875	0.550
85 +	0.800	0.550	0.850	0.450
Disabled Pre-65	0.750	0.400	0.750	0.400
Disabled Post-64	0.950	0.550	0.950	0.550

<u>Medicare Eligible Enrollment</u>	100% of current and future retirees and their dependents are assumed to be eligible for, and enroll in, Medicare when they reach age 65.
<u>Medical Aging (Morbidity) Factors</u>	Developed based on a study performed by Dale Yamamoto for the Society of Actuaries. Used to measure the annual increases in per capita claim costs for each age and relative cost by gender. See the SOA report titled “Health Care Costs – From Birth to Death” for more details.
<u>Medical and Prescription Drug Claims</u>	The per capita claims cost development reflects the most recent 36-month Plan claims and enrollment experience, as well as current administrative fees, stop-loss fees, and Medicare Advantage premium rates.
<u>Actuarial Cost Method</u>	Entry Age Normal (Level Percentage of Pay), with costs allocated on basis of earnings. Actuarial gains and losses are reflected in the unfunded actuarial liability.
<u>Actuarial Asset Method</u>	Market value of assets adjusted by the unrecognized investment gains and losses for each of the four years prior to the valuation date. Gains and losses are recognized at a rate of 25% per year. Actuarial Assets shall not be less than 80% nor greater than 120% of Market Value of Assets.
<u>Payroll Growth</u>	3.00% for purposes of amortizing the Unfunded Actuarial Accrued Liability.
<u>Administrative Expenses</u>	\$215,003 annually, based on the average of actual expenses incurred in the prior two fiscal years.
<u>DROP Duration</u>	5 years
<u>DROP Election</u>	15% of active member eligible for unreduced retirement/DROP do not enter DROP or retire in any given year prior to age 60. Previously, it was assumed that members eligible to DROP would either retire or “DROP in” at first eligibility for unreduced retirement.
<u>Source of Data</u>	Data and audited financial information is provided by the Fund.

Changes in Funding Assumptions/Methods Since the Prior Valuation

Method Changes

- None

Assumption Changes

The valuation reflects the following assumption changes to better reflect anticipated experience.

- The per capita claims cost has been updated to reflect the most recent 36-month Plan experience. Administrative fees, stop-loss premiums, and Medicare Advantage premium rates have also been updated to use rates effective January 1, 2021.
- Contribution rates paid by retirees and covered dependents have been updated to reflect the Plan's rates effective January 1, 2021.
- The mortality rates used were projected an additional year to maintain a five year projection from the valuation date.
- The mortality improvement projection scale was updated to MP-2020.

SUMMARY OF PLAN PROVISIONS

The following describe and reflect provisions in effect as described in Chapter 5505 of the Ohio Revised Code.

Membership Eligibility

All sworn officers and cadets in training at the academy are required to become members of the retirement system. The beginning date of membership in the system for sworn officers hired prior to June 30, 1991, is the commission date. All cadets entering the academy after that date become members of OHPRS upon entering the academy. Any person hired prior to November 2, 1989, in the radio division are HPRS members. The beginning date of membership of the radio division member is the date of hire.

Credited Service

Total years, or part thereof, employed with OHPRS, purchased service credit, and any additional service credit approved by the Board.

Eligibility for Pension

Normal Retirement

Age 52 and 20 years of Credited Service, or Age 48 with 25 years of Credited Service if hired prior to January 1, 2020.

Early Retirement

Age 48 through 51 and has accumulated at least 20 years but less than 25 years of Credited Service.

Disability Benefit

Total and permanent as determined by the Board of Trustees incapacitated for in the line of duty, or 5 or more years of service for disability incurred off-duty.

Survivor Benefit

A surviving spouse is considered to be the wife or husband as set forth in a statutory valid certificate of marriage or as recognized by judgment of a court. A surviving child is considered to be the child by birth or the legally adopted child of the member or retiree.

DROP

The DROP program was established in 2006 and affords eligible members a one-time election to “DROP in” upon attainment of unreduced retirement eligibility.

Vesting (Termination)

15 or more years of credit service.

Eligibility for OPEB

Eligibility is the same as the conditions set forth to be eligible for Pension benefits, but for Vesting (Terminated) employees, he/she must have 20 years of Credited Service.

Eligible retirees who elect to enroll in a coverage option or continue health care coverage under the Plan contribute a monthly amount based on the selected coverage tier during the enrollment process.

Monthly Contributions

The following tables provide the monthly health care contributions for retiree and dependent coverage options during the period January 1, 2021 through December 31, 2021:

Monthly Contribution Amounts for Medical / Prescription Drug Coverage				
	Retiree ⁴	Spouse	Surviving Spouse	Dependent Child
Medicare Ineligible				
Ages Under 52	\$ 760	\$ 820	\$ 760	\$ 152 per Child
Ages 52–55	\$ 484	\$ 545	\$ 484	\$ 152 per Child
Ages 56–59	\$ 248	\$ 309	\$ 248	\$ 152 per Child
Ages Over 59	\$ 175	\$ 235	\$ 175	\$ 152 per Child
Medicare Eligible	\$ 43	\$ 212	\$ 121	\$ 152 per Child

Monthly Contribution Amounts for Dental and Vision Coverage				
	Retiree	Spouse	Surviving Spouse	Dependent Child(ren)
Dental	\$ 5	\$ 20	\$ 5	\$ 20
Vision	\$ 5	\$ 5	\$ 5	\$ 5

Changes in Fund Provisions Since the Prior Valuation

- None

⁴ Disabled retirees who are receiving In-the-Line-of-Duty benefits contribute the age 60+ amount. Not-In-the-Line-of-Duty (Off-Duty) disabled retirees contribute amounts based on actual age.

GLOSSARY OF ACTUARIAL TERMS

Actuarial Present Value is the 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. For purposes of this standard, each such amount or series of amounts is:

1. adjusted for the probable financial effect of certain intervening events
2. multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination of employment, etc.) on which the payment is conditioned, and
3. discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Actuarial Cost Method is a procedure for determining the Present Value of plan benefits and expenses and for developing an actuarially equivalent allocation of such value to time periods, usually in the form of a Normal Cost and an Actuarial Liability.

Total Annual Payroll is the annual rate of pay for the fiscal year prior to the valuation date of all covered members.

Present Value of Benefits is the single sum value on the valuation date of all future benefits to be paid to current Members, Retirees, Beneficiaries, Disability Retirees and Vested Terminations.

Normal (Current Year's) Cost is the portion of the Actuarial Present Value of plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.

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

Unfunded Actuarial Accrued Liability (UAAL) is a liability which arises when a plan is initially established or improved and such establishment or improvement is applicable to all years of past service. Under the Entry Age Normal Actuarial Cost Method, there is also a new UAAL created each year equal to the actuarial gain or loss for that year.

Actuarially Determined Contribution (ADC) represents the level of employer contribution effort that would be required on a sustained, ongoing basis to:

1. fund the Normal Cost (cost associated with new services received) each year and
2. amortize the total unfunded actuarial liabilities (or funding excess) attributed to past services over a period of time (as determined by the plan sponsor, but typically no more than thirty years).

The ADC is a basis for the allocation of the employer's projected cost of providing Other Post-Employment Benefits (OPEB) over periods that approximate the periods in which the employer receives services from the covered employees. Accordingly, the ADC may be used as the foundation on which the measurement of the employer's annual funding can be based.