

**WAYNE COUNTY AIRPORT AUTHORITY DIVISION OF
THE WAYNE COUNTY EMPLOYEES' RETIREMENT SYSTEM
ANNUAL ACTUARIAL VALUATION REPORT
SEPTEMBER 30, 2016**

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June 21, 2017

Retirement Commission (Board)
Wayne County Employees' Retirement System
Detroit, Michigan

Dear Commission Members:

The results of the Annual Actuarial Valuation of the assets, actuarial present values and contribution rates needed to fund benefits for the Wayne County Airport Authority (WCAA) division of the Wayne County Employees' Retirement System (except where otherwise noted) are presented in this report. The date of the valuation was September 30, 2016. The report was prepared at the request of the Board and is intended for use by the Retirement System and those designated or approved by the Board. This report may be provided to parties other than the Retirement System only in its entirety and only with the permission of the Board. Use of this report by a third party does not create a relationship between GRS and the party. GRS is not responsible for unauthorized use of this report. The valuation was based upon data, furnished by Retirement System staff, concerning financial operations and active members, vested former members, retirees, and beneficiaries. We checked the data for internal and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy of the data.

The purpose of the valuation is to measure the System's funding progress, and to determine WCAA contribution rates for the fiscal year beginning October 1, 2017. Information related to the Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68 is provided in a separate document. The results of the valuation are not applicable for other purposes.

Valuation results and comments are presented in Section A. The computed contributions shown on page A-2 may be considered a minimum contribution rate that complies with the Board's funding policy. Users of this report should be aware that contributions made at that rate do not guarantee benefit security. Given the importance of benefit security to any retirement system, we suggest that contributions to the System in excess of those presented in this report be considered.

The computed contributions shown in this report are determined using the actuarial assumptions and method disclosed in Section C of this report. This report includes risk metrics on page D-1 but does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment. We encourage a review and assessment of investment and other significant risks that may have a material effect on the plan's financial condition.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of the actuary's assignment, the actuary did not perform an analysis of the potential range of such future measurements.

This report was prepared by actuaries who have substantial experience valuing public employee retirement plans. To the best of our knowledge, this report is complete and accurate and the valuation was conducted in accordance with standards of practice prescribed by the Actuarial Standards Board.

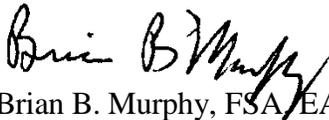
The signing actuaries are independent of the plan sponsor.

Judith A. Kermans and Brian B. Murphy are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,



Judith A. Kermans, EA, FCA, MAAA



Brian B. Murphy, FSA, EA, FCA, MAAA

JAK/BBM:sc

SECTION A

VALUATION RESULTS AND COMMENTS

FUNDING OBJECTIVE

The funding objective for the Retirement System is to establish and receive contributions which, when invested at the assumed rate of return, will accumulate assets over each member's working years that will be sufficient to pay expected retirement benefits.

CONTRIBUTION RATES

The Retirement System is supported by member contributions, employer contributions and investment income on Retirement System assets. Some members contribute percentages of their pay (by WCAA plan document or collective bargaining agreement) and the employer contributes the actuarially determined remainder needed to meet the funding objective.

Contributions are determined by the actuarial valuation and are sufficient to:

- (1) cover the actuarial costs allocated to the current year by the actuarial cost method (the normal cost); and
- (2) finance over a period of future years the actuarial costs not covered by present assets and anticipated future normal costs (unfunded actuarial accrued liability).

Contribution requirements for the fiscal year beginning October 1, 2017 are shown on page A-2.

**CONTRIBUTIONS AS A PERCENT OF PAYROLL
TO FINANCE THE WCAA'S DEFINED BENEFIT PLANS
OF THE RETIREMENT SYSTEM**

Defined Benefit Plans - Contributions for	Fiscal Year Ending September 30, 2018
Total Normal Cost	8.10 %
Less Portion Paid by Members*	1.16 %
Employer Defined Benefit Normal Cost	6.94 %
Unfunded Actuarial Accrued Liability [#]	17.69 %
Total Computed Employer Rate	24.63 %
Minimum Dollar Amounts	\$7,042,562

* Weighted average of the various contribution rates.

Base UAAL amortized as a level dollar amount over a period of 20 years (22 years in the prior valuation) and assumption changes reflected in the 2016 valuation are amortized over 10 years, in accordance with Actuarial Funding Policy.

The DB Plans are closed to most new hires, which is why a level dollar amortization method is being used. The rate shown above is computed based on estimated Fiscal Year 2018 payroll.

Historical contribution rates for prior fiscal years are shown on page A-3. The dollar amount shown above (\$7,042,562) is the minimum amount that should be deposited into the Retirement System during Fiscal Year 2018.

**HISTORICAL SCHEDULE OF NORMAL COST RATES
AND UNFUNDED ACTUARIAL ACCRUED LIABILITIES
CONTRIBUTION AMOUNTS FOR DEFINED BENEFIT PLANS**

Fiscal Year Ending	Valuation Date September 30 [@]	Contribution Rates		
		Employer Normal Cost	UAAL	Total
2009	2007	6.40 %	7.08 %	13.48 %
2010	2008	6.49 %	7.31 %	13.80 %
2011	2009	6.31 %	8.60 %	14.91 %
2012	2010	6.28 %	10.07 %	16.35 %
2013	2011 #	6.50 %	12.47 %	18.97 %
2014	2012 *	6.21 %	15.05 %	21.26 %
2015	2013	5.98 %	18.76 %	24.74 %
2016	2014	5.64 %	17.36 %	23.00 %
2017	2015	5.62 %	14.91 %	20.53 %
2018	2016 #	6.94 %	17.69 %	24.63 %

* After benefit changes.

@ Reflects transfers from Plan 4 to Plan 5 and/or Plan 5 to Plan 5A.

After assumption changes (adopted after Experience Study).

Note: Beginning with the September 30, 2014 valuation, the DB plans are closed to most new hires. The assumption changes reflected in the 2016 valuation are amortized over 10 years.

FUNDING PROGRESS INDICATORS

The funding progress and status of the defined benefit plans is measured by the following indicators:

- ***The ratio of the funding value of assets to accrued liabilities.*** The ratio is expected to hold steady or gradually move toward 100% in the absence of benefit changes, assumption changes or valuation method changes.
- ***The ratio of the unfunded actuarial accrued liability to member payroll.*** In a soundly financed retirement system, the amount of the unfunded actuarial accrued liabilities will be controlled and prevented from increasing in the absence of benefit improvements. The ratio is a relative indicator of the condition in an inflationary environment.

Valuation Date	Accrued Liability	Funding Value of Assets [@]	Funded Ratio	Defined Benefit Member Payroll	Unfunded Actuarial Accrued Liability Dollars	% of Payroll
September 30 [@]						
(\$ in thousands)						
2007	\$ 79,007	\$ 56,441	71%	\$ 22,771	\$ 22,566	99 %
2008	81,927	58,594	72%	23,402	23,333	100 %
2009	93,490	63,707	68%	20,208	29,783	147 %
2010	98,239	61,102	62%	21,909	37,137	170 %
2011#	111,124	60,539	54%	25,227	50,585	201 %
2012*	117,134	64,016	55%	22,297	53,118	238 %
2013	131,994	76,234	58%	26,412	55,760	211 %
2014	136,799	84,435	62%	27,204	52,364	192 %
2015	144,137	99,313	69%	28,300	44,824	158 %
2016#	161,201	112,006	69%	30,106	49,195	163 %

* After benefit changes.

@ Reflects transfers from Plan 4 to Plan 5 and/or Plan 5 to Plan 5A.

After changes in assumptions (adopted after Experience Study).

Note: Beginning with the September 30, 2014 valuation, The DB plans are closed to most new hires.

SHORT CONDITION TEST

If the contributions to the System are level in concept and soundly executed, the System will *pay all promised benefits when due – the ultimate test of financial soundness*. Testing for level contribution rates is *the long-term test*. A *short condition test* is one means of checking a system's progress under its funding program. In a short condition test, the plan's present assets (cash and investments) are compared with:

- 1) Active member contributions on deposit;
- 2) The liabilities for future benefits to present retired lives; and
- 3) The liabilities for service already rendered by active members.

The test is shown below. As of September 30, 2016, there were 100% of the assets needed to cover liabilities related to member contributions on deposit. Almost every system has assets at least equal to member contributions. Beyond that, there were 100% of the assets needed to cover retiree liabilities. While many systems have assets sufficient to cover 100% of retiree liabilities, particularly in the current economy, many also do not. Lack of assets allocated to funding active member liabilities does indicate a need for increased funding. It is very important that progress be made in funding active member liability at 100%.

Valuation Date	Aggregate Actuarial Accrued Liabilities For			Valuation Assets (Funding Value)	Portion of Accrued Liabilities Covered by Assets		
	(1)	(2)	(3)		(1)	(2)	(3)
	Member Contributions	Retirees and Beneficiaries	Members (Employer Financed Portion)				
	(... \$1,000s ...)						
9/30/2014	\$ 22,088	\$ 78,147	\$ 36,564	\$ 84,435	100%	80%	0%
9/30/2015	23,224	79,726	41,187	99,313	100%	95%	0%
9/30/2016	21,101	86,722	53,378	112,006	100%	100%	8%

**DERIVATION OF EXPERIENCE GAIN (LOSS)
YEAR ENDED SEPTEMBER 30, 2016**

Actual experience will never (except by coincidence) coincide exactly with assumed experience. Gains and losses often cancel each other over a period of years, but sizable year-to-year fluctuations are common. Detail on the derivation of the experience gain (loss) is shown below.

(1) UAAL* at start of year	\$ 44,824,451
(2) Normal cost from last valuation	1,691,937
(3) Employer contributions [#]	11,616,457
(4) Interest accrual $((1) + 1/2 ((2) - (3))) \times 7.75\%$	3,089,320
(5) Expected UAAL before changes: (1) + (2) - (3) + (4)	37,989,250
(6) Change from revised actuarial assumptions/methods	8,982,156
(7) Expected UAAL after changes: (5) + (6)	46,971,406
(8) Actual UAAL at end of year	49,194,790
(9) Gain (loss): (7) - (8)	\$ (2,223,384)
(10) Gain (loss) as percent of actuarial accrued liabilities at start of year	(1.5)%

* *Unfunded Actuarial Accrued Liability.*

Excludes transfers of \$4,400,000 to County but includes a restatement of assets (\$595,266).

Reconciliation of Gains (Losses)

(1) Total gain (loss)	\$ (2,223,384)
(2) Investment gain (loss)	790,308
(3) Non-investment gain (loss) [@] : (1) - (2)	(3,013,692)

[@] *Other gains (losses) include those created directly by member activity or compensation including, but not limited to, retired members living longer or not as long as expected and/or pay increases above or below expected levels.*

COMMENTS ON THE ACTUARIAL VALUATION

- 1. Experience (Total Plan):** The Market Value rate of return during fiscal year 2016 was 9.4%, and the total fund gained \$76.3 million in investment income. The fund was assumed to earn 7.75% or \$64.5 million in total. This year's asset gain on a Market Value basis was \$11.8 million. Under the asset valuation method, investment gains and losses are spread over a 4-year period. The net result of this year's Market Value gain, and carryover actuarial gains and losses from prior years, is a net recognized gain of \$5.2 million (see page B-8). As of September 30, 2016, the Funding Value of assets exceeds the Market Value by \$13.8 million. The WCAA receives a proportionate share of each year's Funding Value of Assets; see page B-9. An aggregate gain/(loss) analysis for the WCAA is shown on page A-6. Additional detail on gains and losses would require an additional study. However, we note that average pay increased by a little over 7% which may explain some of the loss that is shown.
- 2. Status:** Computed actuarial accrued liabilities exceed the Funding Value of assets by \$49.2 million (for the WCAA). Unfunded actuarial accrued liabilities (UAAL) for assumption changes are being amortized over 10 years and the remaining UAAL is currently being amortized over a 20-year period in accordance with the WCERS Funding Policy. The remaining amortization years (non-assumption changes) will decrease by 2 years each annual valuation cycle in accordance with the Funding Policy; therefore, in next year's valuation, there will be 18 years remaining in the schedule. The WCAA is 69% funded, based upon the Funding Value of Assets. Based on the Market Value of Assets, the WCAA is 68% funded.
- 3. Data for Measurement of Assumed Service:** WCAA active member data reflects the most recent date of hire (not the original date of hire) in some cases. We are working with WCERS staff to resolve this data issue by the next valuation.

COMMENTS ON THE ACTUARIAL VALUATION

4. ***GASB Reporting:*** Information regarding GASB Statements No. 67 and No. 68 are provided in a separate report.
5. ***Contribution Rates:*** This year (FY 2016) the WCAA made employer contributions of \$15.4 million: \$4.4 million of that amount was transferred to the WCERS in connection with funding of the combined pre-2002 retiree liabilities and approximately \$7.0 million was recommended by the actuary for FY 2016 based on the September 30, 2014 valuation.
6. ***Experience Study:*** The last comprehensive study of plan experience in WCERS was completed after the September 30, 2015 valuation. The changes in assumptions as a result of that study were first effective for the September 30, 2016 valuation. The updates to the assumptions decreased the funded ratio by approximately 4% and increased the calculated employer contribution by approximately \$1.6 million.
7. ***Combined Pre-2002 Retiree Liability:*** Effective with the September 30, 2007 actuarial valuation of the Wayne County Employees' Retirement System (WCERS), a separate employer contribution rate was computed each year for the Wayne County Airport Authority (WCAA). The original calculations were based on certain concepts that were agreed to by staff of the interested parties (County, WCAA and WCERS) at that time, one of which was that the Combined Pre-2002 Retiree liability would be funded and benefits paid by the County but would be tracked by the actuary each year so that adjustments could be made if, at some point in the future, the Combined Pre-2002 Retiree obligation became unfunded.

Retiree liability for WCERS retirees is approximately 60% funded. The WCAA committed to an accelerated payment schedule for the WCAA's theoretical share (10.25%) of the Combined Pre-2002 Retiree Liability based on assumptions and methods agreed to by the interested parties.

COMMENTS ON THE ACTUARIAL VALUATION

At the end of the 5-year period (September 30, 2020), the resulting UAAL, if any, would either be paid in a lump sum or amortized in a manner to be determined at that time. The actual UAAL as of September 30, 2020 will depend on actual accrued liability and actual assets, both of which will be impacted by experience that occurs each year. In addition, an Experience Study will be performed during this time, which will also ultimately impact the calculated liabilities.

A reconciliation of the WCAA's Theoretical Portion of the Combined Pre-2002 Retiree Liability through September 30, 2016 is shown below:

	Fiscal Year (September 30)						
	2015	2016	2017	2018	2019	2020	2021
(1) Assets BOY	\$15,278,397	\$15,302,135	\$16,222,390				
(2) One-time IEF Award Credit [#]	5,326,760	-	-				
(3) WCAA Payments*	-	4,400,000	4,400,000	4,400,000	4,400,000	4,400,000	Not Determined
(4) Benefits Paid to Retirees	5,363,501	4,895,385					
(5) Investment Return Rate (MV)	0.48%	9.40%					
(6) Investment Return Amount	60,479	1,415,640					
(7) Assets EOY: 1+2+3-4+6	\$15,302,135	\$16,222,390					
(8) Accrued Liability EOY	35,974,521	36,089,136					
(9) UAAL EOY: (8)-(7)	\$20,672,386	\$19,866,746					

* Actual payment received during Fiscal Year 2016; expected payments during the remaining fiscal years.

In 2015, the WCAA received credit for a portion (\$5,326,760) of the Inflation Equity Fund (IEF) award to be used to offset the payments towards the Combined Pre-2002 Retiree liability.

OTHER OBSERVATIONS

General Implications of Funding Policy on Future Expected Plan Contributions and Funded Status: Given the plan's Funding Policy, if all actuarial assumptions are met (including the assumption of the plan earning 7.25% on the actuarial value of assets), it is expected that:

- 1) The employer normal cost as a percentage of pay should remain relatively level as time passes since nearly all of the active population is comprised of Plan 5 and 5A members,
- 2) The unfunded actuarial accrued liabilities will be fully amortized when the amortization period ends, and
- 3) The funded status of the plan will increase gradually toward a 100% funded ratio.

Limitations of Funded Status Measurements: Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial (Funding) value of assets. Unless otherwise indicated, with regard to any funded status measurements in this report:

- 1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations; in other words, of transferring obligations to an unrelated third party in an arm's length market value type transaction.
- 2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the remaining active membership accruing an additional year of service credit).
- 3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.

Limitation of Project scope: Actuarial standards do not require the actuary to evaluate the ability of the plan sponsor or other contributing entity to make required contributions to the plan when due. Such an evaluation was not within the scope of this project and is not within the actuary's domain of expertise. Consequently, the actuary performed no such evaluation.

ACTUARIAL BALANCE SHEET - SEPTEMBER 30, 2016

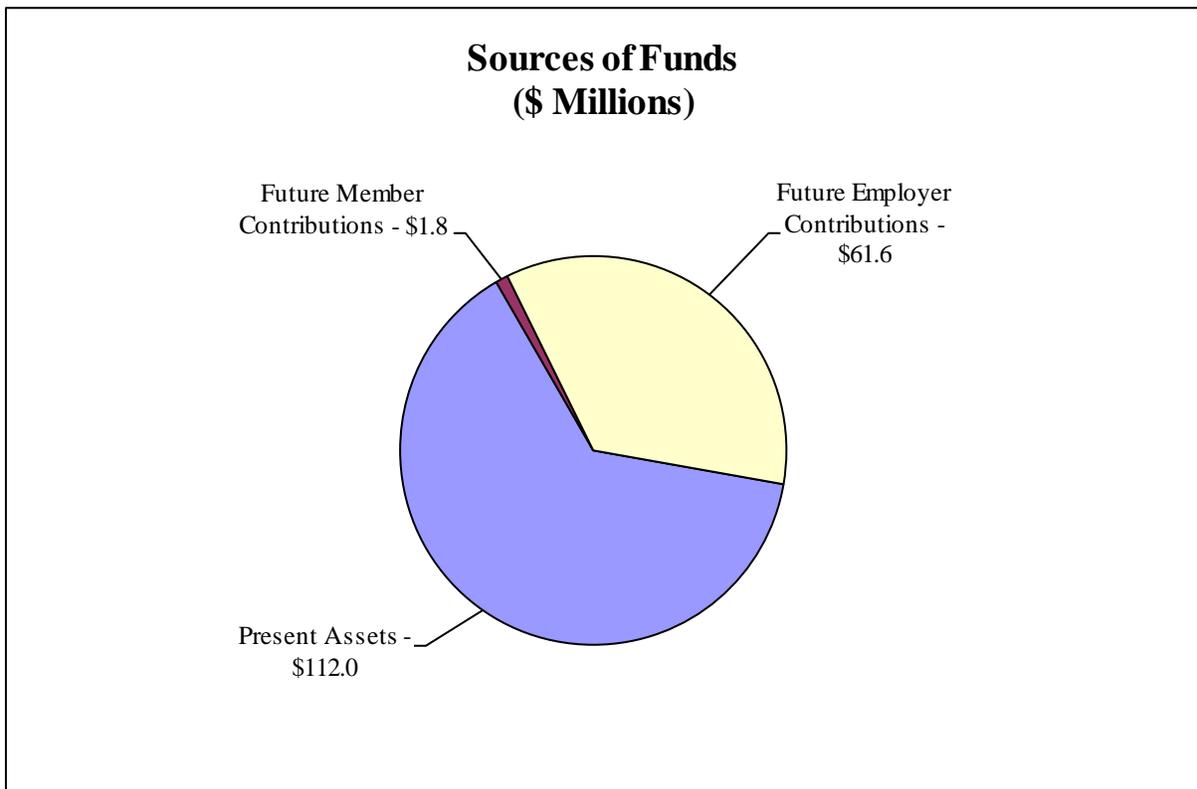
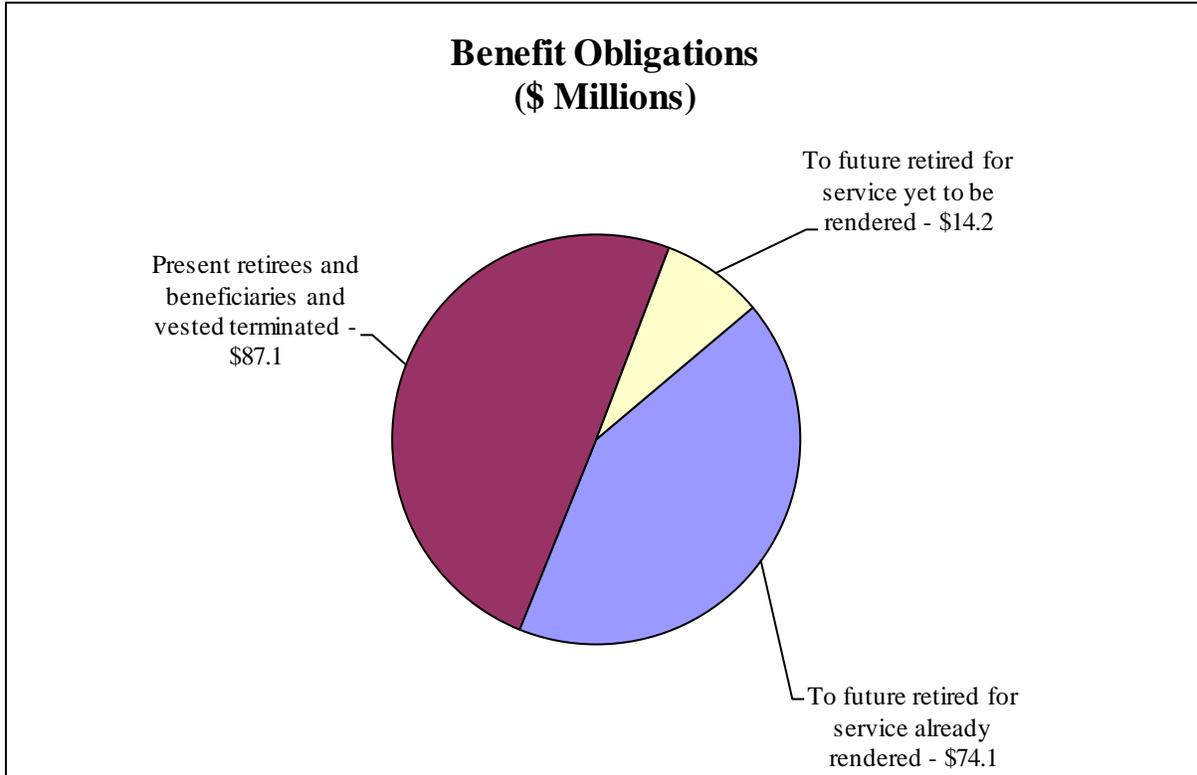
Present Resources and Expected Future Resources

A. Valuation assets	
1. Net assets at market value	\$ 110,277,974
2. Valuation adjustment	1,728,115
3. Valuation assets	112,006,089
B. Actuarial present value of expected future employer contributions	
1. For normal costs	12,396,774
2. For unfunded actuarial accrued liabilities	49,194,790
3. Total	61,591,564
C. Actuarial present value of expected future member contributions	1,824,042
D. Total Actuarial Present Value of Present and Expected Future Resources	\$175,421,695

Actuarial Present Value of Expected Future Benefit Payments and Reserves

A. To retired members and beneficiaries	\$86,722,309
B. To vested terminated members	382,391
C. To present active members	
1. Allocated to service rendered prior to valuation date	74,096,179
2. Allocated to service likely to be rendered after valuation date	14,220,816
3. Total	88,316,995
D. Total Actuarial Present Value of Expected Future Benefit Payments and Reserves	\$175,421,695

**FINANCING \$175.4 MILLION OF BENEFIT PROMISES
SEPTEMBER 30, 2016**



SECTION B

SUMMARY OF BENEFIT PROVISIONS AND
VALUATION DATA

BRIEF SUMMARY OF BENEFIT PROVISIONS AS OF SEPTEMBER 30, 2016

DEFINED BENEFIT PLAN 1

Availability:

Defined Benefit Plan 1 was closed to new hires on August 15, 1983 (or on the date in a negotiated agreement).

Normal Retirement (no reduction factor for age):

Eligibility - Police Command and Officers: 25 years of service.

Others: Age 50 with 25 years of service, age 60 with 5 years of service or any age with 30 years of service.

Pension Amount - Total service times 2.65% of average final compensation.

Maximum pension is 75% of AFC (less worker's compensation payments). Minimum monthly pension is \$5 times years of service.

Average Final Compensation (AFC) - Monthly average of covered compensations for best 4 years of credited service. Some lump sums, overtime & premium pay are included.

Vested Termination (deferred retirement):

Eligibility - 8 years of service. Pension begins at age 60.

Pension Amount - Computed as normal retirement but based upon service and AFC at time of termination.

Duty Disability Retirement:

Eligibility - No age or service requirements.

Pension Amount - Computed as normal retirement with additional service credit granted from date of retirement to age 60. Minimum pension is \$4,800 annually. Maximum pension is the lesser of 75% of AFC, and 100% of AFC less outside earnings and social security disability benefits. Worker's compensation payments, social security benefit payments, and outside earnings offset the maximum.

Non-Duty Disability Retirement:

Eligibility - 10 years of service.

Pension Amount - Computed as normal retirement but based on service and AFC at time of retirement.

BRIEF SUMMARY OF BENEFIT PROVISIONS AS OF SEPTEMBER 30, 2016

DEFINED BENEFIT PLAN 1

Duty Death Before Retirement:

Eligibility - No age or service requirements.

Pension Amount - Pension to the spouse is computed as a normal retirement but actuarially reduced in accordance with a 100% joint and survivor election. Additional service credit is granted from date of death to date the deceased member would have attained 60 years of age. If there is no eligible spouse, unmarried children under age 18 receive equal shares of 50% of normal retirement pension. Spouse's pension shall not be less than \$4,800. Worker's compensation payments and social security offset the maximum.

Non-Duty Death Before Retirement:

Eligibility - 10 years of service.

Pension Amount - Pension to the spouse is computed as a normal retirement but actuarially reduced in accordance with a 100% joint and survivor election. If there is no eligible spouse, unmarried children under age 18 receive equal shares of 50% of normal retirement pension.

Member Contributions:

Police Command and Officers: 5.00% of annual compensation.

Others:

<u>Credited Service</u>	<u>Contribution Rate*</u>
0 yrs. thru 8 yrs.	6.00% or 6.58% of compensation
9 yrs. thru 12 yrs.	4.00% or 4.58% of compensation
13 yrs. thru 16 yrs.	3.00% or 3.58% of compensation
17 yrs. or more	2.00% or 2.58% of compensation

* Contribution rate is determined by coverage group from Collective Bargaining Agreement (CBA).

BRIEF SUMMARY OF BENEFIT PROVISIONS AS OF SEPTEMBER 30, 2016

DEFINED BENEFIT PLAN 2

Availability - Defined Benefit Plan 2 was available to persons hired after August 15, 1983 and to DBP 1 and DBP 3 members who elected to be covered by DBP 2. **Eligibility to enter this Plan ceased as of October 1, 2001.**

Normal Retirement (no reduction factor for age):

Eligibility - Age 55 with 25 years of service or age 60 with 15 or 20 years of service; or, age 65 with 8 years of service. Airport Police Command may retire with 25 years of service regardless of age, POAM may retire with 30 years of service regardless of age.

Pension Amount - Average final compensation multiplied by the sum of a) 1% of credited service up to 20 years; and, b) 1.25% of credited service over 20 years. Maximum employer financed portion is 75% of AFC.

Average Final Compensation (AFC) - Monthly average of covered compensation for the best 5 years of credited service. Covered compensation includes overtime, premium and holiday pay, but not lump sums.

Vested Termination (deferred retirement):

Eligibility - 8 years of service. Pension begins at age 65.

Pension Amount - Computed as normal retirement based on service and AFC at time of termination.

Duty Disability Retirement:

Eligibility - No age or service requirements.

Pension Amount - Computed as normal retirement with additional service credit granted from date of retirement to age 60. Maximum pension is the lesser of 75% of AFC, and 100% of AFC less outside earnings and social security disability benefits. Worker's compensation payments, social security benefit payments, and outside earnings offset the maximum. Minimum pension for select unions is 75% of AFC.

Non-Duty Disability Retirement:

Eligibility - 10 years of service.

Pension Amount - Computed as normal retirement but based on service and AFC at time of termination. Social security benefit payments and outside earnings offset the maximum.

Death Before Retirement:

Eligibility - 10 years of service; or age 65 and 8 years of service (any amount of service if Duty related).

Pension Amount - Pension to the spouse is computed as a normal retirement but actuarially reduced in accordance with a 100% joint and survivor election. If there is no eligible spouse, unmarried children under 18 receive equal shares of 50% of normal retirement pension.

Member Contributions:

None.

BRIEF SUMMARY OF BENEFIT PROVISIONS AS OF SEPTEMBER 30, 2016

DEFINED BENEFIT PLAN 3

Availability - Plan 3 was available to persons last hired after August 15, 1983; and, to other persons if offered by collective bargaining agreement. **Eligibility to enter this Plan ceased as of March 31, 1986.**

Normal Retirement (no reduction factor for age):

Eligibility - Age 55 with 25 years of service; or age 60 with 15 or 20 years of service; age 65 with 5 years of service; or 30 years of service regardless of age. Airport Police Command may retire with 25 years of service regardless of age.

Pension Amount - Average final compensation multiplied by the sum of: a) 1.5% of credited service up to 20 years; and b) 2.0% of credited service between 20 and 25 years; and, c) 2.5% of credited service over 25 years.

Maximum employer financed portion is 75% of AFC (less worker's compensation payments).

Average Final Compensation (AFC) - Monthly average of covered compensation for the best 5 years of credited service. Covered compensation includes overtime, premium and holiday pay, up to 320 hours of lump sum payments for unused sick leave and up to 120 hours of lump sum payments for unused vacation time.

Vested Termination (deferred retirement):

Eligibility - 8 years of service. Pension begins at age 65.

Pension Amount - Computed as normal retirement but based upon service and AFC at time of termination.

Duty Disability Retirement:

Select Unions (Police Command) receive 75% of AFC. Worker's compensation, social security benefit payments, and outside earnings may offset pension.

Others: covered outside of Retirement System.

Non-Duty Disability Retirement:

Covered outside of Retirement System.

Death Before Retirement:

Eligibility - 10 years of service; or, age 65 with 5 years of service (any amount of service if Duty related).

Pension Amount - Pension to the spouse is computed as a normal retirement but actuarially reduced in accordance with a 100% joint and survivor election. If there is no eligible spouse, unmarried children under age 18 receive equal shares of 50% of normal retirement pension.

Member Contributions:

3% of covered compensation.

BRIEF SUMMARY OF BENEFIT PROVISIONS AS OF SEPTEMBER 30, 2016
DEFINED CONTRIBUTION PLAN 4

Defined Contribution Plan 4 is not included in this valuation.

From time to time, members in Plan 4 have been deemed eligible to roll account balances into Defined Benefit Plan 5 to receive a defined benefit during periods as specified in CBAs. This benefit would be based on the amount of service that can be purchased by the member's account balance.

BRIEF SUMMARY OF BENEFIT PROVISIONS AS OF SEPTEMBER 30, 2016

HYBRID PLANS 5 AND 5A

Availability - Hybrid Plan 5 was available for new employees hired after October 1, 2001; however, a defined contribution plan is obligatory for most new employees (with the exception of Fire members, who are eligible for Plan 5A). Members may transfer into Plan 5 or 5A when allowed by CBA.

DEFINED BENEFIT PROVISIONS

Normal Retirement (no reduction for age):

Eligibility - Age 55 with 25 years of service; or age 60 with 20 years of service; or age 65 with 8 years of service; or 30 years of service regardless of age (except at-will employees).

Pension Amount -

Plan 5 - Average final compensation multiplied by the sum of a) 1.25% of credited service up to 20 years; and b) 1.5% of credited service over 20 years. Maximum pension is 75% of AFC (less worker's compensation payments).

Plan 5A - Average final compensation multiplied by the sum of a) 1.50% of credited service up to 20 years; and b) 1.75% of credited service over 20 years. Maximum pension is 75% of AFC (less worker's compensation payments).

Average Final Compensation (AFC) - Monthly average of covered compensation for the last 5 years of credited service, with the exception of Police Command and Executives where AFC is for the best 5 years of credited service. Covered compensation includes overtime and premium pay, and also includes payout of sick and annual leave banks for select negotiated CBAs. For Plan 5A, compensation does not include payout of sick and annual leave banks.

Vested Termination (deferred retirement):

Eligibility - 8 years of service. Pension begins at age 65.

Pension Amount - Computed as normal retirement but based upon service and AFC at time of termination.

Duty Disability Retirement:

Eligibility - No age or service requirements.

Pension Amount - Computed as normal retirement with additional service credit granted from date of retirement to age 60. Worker's compensation payments, Social Security benefit payments and outside earnings offset the defined benefit portion of the pension.

Non-Duty Disability Retirement:

Eligibility - 10 years of service.

Pension Amount - Computed as normal retirement but based on service and AFC at time of termination. Social security benefit payments and outside earnings offset the maximum.

BRIEF SUMMARY OF BENEFIT PROVISIONS AS OF SEPTEMBER 30, 2016

HYBRID PLANS 5 AND 5A

Duty Death Before Retirement:

Eligibility - No age or service requirements.

Pension Amount - Pension to the spouse is computed as a normal retirement but actuarially reduced in accordance with a 100% joint and survivor election. Additional service credit is granted from date of death to date the deceased member would have attained 60 years of age. If there is no eligible spouse, unmarried children under age 18 receive equal shares of 50% of normal retirement pension. Worker's compensation payments offset the maximum.

Non-Duty Death Before Retirement:

Eligibility - 10 years of service, or age 65 with 8 years of service.

Pension Amount - Pension to the spouse is computed as a normal retirement but actuarially reduced in accordance with a 100% joint and survivor election. If there is no eligible spouse, unmarried children under age 18 receive equal shares of 50% of normal retirement pension.

Member Contributions:

Plan 5: 0% of covered compensation.

Plan 5A: 3% of covered compensation until the Airport funding ratio is 100%. If funding is 100%, contributions reduce to 2% of covered compensation until Airport funding ratio is less than 100%, at which point contributions increase to 3% of covered compensation.

DEFINED CONTRIBUTION PROVISIONS

Contributions:

6% of base compensation (3% member plus 3% employer). Contributions are invested by the members based on investment options established by the Retirement Commission. Contribution balances are credited with actual net market rates of return of the selected investments.

Vesting:

Member portion - 100% immediately.

Employer portion - 50% after 1 year of total service; 75% after 2 years; 100% after 3 years.

Distribution Options:

Terminating members may choose between:

- Lump sum distribution of vested account balance, or
- Rollover of vested account balance to a qualified plan, or

DEVELOPMENT OF FUNDING VALUE OF RETIREMENT SYSTEM ASSETS (ALL WCERS)

Year Ended September 30:	2014	2015	2016	2017	2018	2019
<i>Assumed Investment Return</i>	7.75%	7.75%	7.75%	7.25%	7.25%	7.25%
A. Funding Value Beginning of Year	\$751,584,281	\$768,265,277	\$839,508,097			
B. Market Value End of Year	814,619,598	819,072,539	881,038,959			
C. Market Value Beginning of Year	782,124,005	814,619,598	819,072,539			
D. Non-Investment Net Cash Flow	(44,692,639)	535,064	(14,336,300)			
E. Investment Income						
E1. Market Total: B - C - D	77,188,232	3,917,877	76,302,720			
E2. Amount for Immediate Recognition	56,515,942	59,561,293	64,506,346			
E3. Amount for Phased-In Recognition: E1-E2	20,672,290	(55,643,416)	11,796,374			
F. Phased-In Recognition of Investment Income						
F1. Current Year: 0.25 x E3	5,168,073	(13,910,854)	2,949,094			
F2. First Prior Year	10,960,860	5,168,073	(13,910,854)	\$ 2,949,094		
F3. Second Prior Year	8,928,381	10,960,860	5,168,073	(13,910,854)	\$2,949,094	
F4. Third Prior Year	(20,199,621)	8,928,384	10,960,860	5,168,071	(13,910,854)	\$2,949,092
F5. Total Recognized Investment Gain	4,857,693	11,146,463	5,167,173	(5,793,689)	(10,961,760)	2,949,092
G. Funding Value End of Year:						
G1. Preliminary: A + D + E2 + F5	768,265,277	839,508,097	894,845,316			
G2. Upper Corridor Limit: 120% x B	977,543,518	982,887,047	1,057,246,751			
G3. Lower Corridor Limit: 80% x B	651,695,678	655,258,031	704,831,167			
G4. Funding Value End of Year	\$768,265,277	\$839,508,097	\$894,845,316			
H. Difference between Market & Funding Value	46,354,321	(20,435,558)	(13,806,357)	(8,012,668)	2,949,092	0
I. Recognized Rate of Return	8.4%	9.2%	8.4%			
J. Market Value Rate of Return	10.16%	0.48%	9.40%			
K. Ratio of Funding Value to Market Value	94.3%	102.5%	101.6%			

The Funding Value of Assets recognizes assumed investment income (line E2) fully each year. Differences between actual and assumed investment income (line E3) are phased-in over a closed 4-year period. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than Market Value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than Market Value. The Funding Value of Assets is *unbiased* with respect to Market Value. At any time it may be either greater or less than Market Value. If assumed rates are exactly realized for 3 consecutive years, it will become equal to Market Value.

**INCOME STATEMENT
AND ALLOCATION OF FUNDING VALUE BY EMPLOYER**

	County	Airport Authority	Total
(1) Market Value Beginning of Year	\$ 722,177,189	\$ 96,895,350	\$ 819,072,539
(2) Audit Adjustment	4,447,673	595,266	5,042,939
(3) Employee Contributions	10,400,163	334,437	10,734,600
(4) Employer Contributions	86,584,524	15,421,191	102,005,715
(5) Benefit Payments & Refunds	129,888,576	7,901,621	137,790,197
(6) Bailiff & Pre-2002 Transfer	10,070,643	(4,400,000)	5,670,643
(7) Average Balance: (1) + 1/2 (2+3+4-5+6)	712,984,403	98,919,987	811,904,389
(8) Net Investment Income Allocation	66,969,369	9,333,351	76,302,720
(9) Market Value End of Year: (1)+(2)+(3)+(4)-(5)+(6)+(8)	\$ 770,760,985	\$ 110,277,974	\$ 881,038,959
(10) Market Value Rate of Return: (8)/(7)	9.4%	9.4%	9.4%
(11) Percentage of WCERS Market Value	87.48%	12.52%	100.00%
(12) Funding Value Allocation: (Total-IEF) x (11)	\$ 782,839,227	\$ 112,006,089	\$ 894,845,316

ASSET ALLOCATION

	2016
Assets:	
Cash and short-term investments	\$ 4,635,763
Receivables:	
Accrued interest and dividends	99,367
Accounts receivable	291
Investments, at fair value:	
U.S. Government Bonds	0
Corporate Bonds	63,229
Capital Assets	0
Asset-backed Securities	14,035
Mortgages	0
Foreign Debt	0
Stock Mutual Funds	16,947,998
Construction Loans	0
Structured Debt	1,257,392
Real Estate Investment Trusts	19,525,441
Investments in Partnerships/Private Equity	7,261,901
Stocks	41,897,286
Other	18,920,570
	105,887,852
Total Assets	\$ 110,623,273
Liabilities	
Payables	345,299
Net assets held in trust for pension benefits	\$ 110,277,974

RETIRED MEMBERS AND BENEFICIARIES ADDED AND REMOVED

Year Ended Sept. 30	Added		Removed		Net Increase		End of Year	
	No.	Annual Pensions	No.	Annual* Pensions	No.	Annual Pensions	No.	Annual Pensions
2014	3	\$137,462	2	\$ 139,300	1	\$ (1,838)	187	\$ 7,712,477
2015	9	277,419	0	54,889	9	222,530	196	7,935,007
2016	11	380,659	2	110,855	9	269,804	205	8,204,811

* Includes benefit adjustments, if any.

Includes only members that retired from WCAA after September 2002.

RETIREED MEMBERS AND BENEFICIARIES COMPARATIVE SCHEDULE

Valuation Date Sept. 30	Pensions Being Paid					Active Member Ratio*	
	No.	Amount (\$ Thousands)	% of Member Payroll [#]	Annual % Increase			Average Pension
				No.	Amount		
2014	187	\$ 7,712	28.3%	0.5%	(0.0)%	\$ 41,243	3.1
2015	196	7,935	28.0%	4.8%	2.9%	40,485	3.0
2016	205	8,205	27.3%	4.6%	3.4%	40,023	3.2

* Number of active members (including defined contribution plan members) divided by number of retired members and beneficiaries.

Excludes Defined Contribution Plan payroll.

Includes only members that retired from WCAA after September 2002.

**RETIRED MEMBERS AND BENEFICIARIES SEPTEMBER 30, 2016
BY ATTAINED AGE GROUPS**

Attained Age Grouping	Number	Annual Pensions
40-44	1	\$ 29,542
45-49	3	71,075
50-54	14	350,455
55-59	29	1,387,478
60-64	54	2,116,730
65-69	57	2,483,110
70-74	33	1,210,698
75-79	11	350,327
80-84	1	59,672
85-89	2	145,724
Totals	205	\$8,204,811

Average age now: 64.9 yrs.
Average age at retirement: 56.9 yrs.
Average service at retirement: 25.7 yrs.

Includes only members that retired from WCAA after September 2002.

RETIRED MEMBERS AND BENEFICIARIES SEPTEMBER 30, 2016
BY TYPE OF RETIREMENT

Type of Pension Being Paid	Benefits Paid	Number
Age & Service Pensions		
S.S. Equated/Accelerated		
Straight Life	\$ 150,968	4
Option 1	134,447	4
Option 2	247,225	7
Option 3	378,453	11
Total	911,093	26
Not S.S. Equated/Accelerated		
Straight Life	\$ 2,268,641	53
Option 1	111,937	4
Option 2	2,183,435	54
Option 3	1,982,652	39
Total	6,546,665	150
Survivor Beneficiary of Deceased Retired Member	413,770	16
Total Age and Service Pensions	\$ 7,871,528	192
Casualty Pensions		
Duty Disability	\$ 237,677	9
Non-Duty Disability	84,495	3
Survivor Beneficiary of Deceased Retired Member	-	0
Duty Death	11,111	1
Non-Duty Death	-	0
Total Casualty Pensions	333,283	13
Total Pensions Being Paid	\$ 8,204,811	205

Includes only members that retired from WCAA after September 2002.

VESTED FORMER MEMBERS SEPTEMBER 30, 2016
TABULATED BY ATTAINED AGE GROUPS

Attained Ages	No.	Estimated Annual Allowances
45-49	2	\$ 15,235
50-54	3	34,989
55-59	1	22,455
Totals	6	\$ 72,679

A vested former member is a person who has left the employ of the Airport after acquiring credited service sufficient for a vested pension and has not withdrawn accumulated member contributions from the Reserve for Accumulated Member Contributions. A vested former member may retire upon satisfying the conditions for normal retirement.

ACTIVE MEMBERS SEPTEMBER 30, 2016

Plan	No.	Valuation Payroll	Average		
			Pay	Age	Service
				(in years)	
Defined Benefit Plan 1					
General	1	\$ 121,171	\$121,171	64.7	42.4
Public Safety	1	91,797	91,797	57.2	33.4
Total	2	212,968	106,484	61.0	37.9
Defined Benefit Plan 2					
General	2	121,472	60,736	41.6	18.2
Public Safety	2	149,548	74,774	43.8	15.3
Total	4	271,020	67,755	42.7	16.8
Defined Benefit Plan 3					
General	0	n/a	n/a	n/a	n/a
Public Safety	2	200,638	100,319	53.9	32.4
Total	2	200,638	100,319	53.9	32.4
Hybrid Plan 5 #					
General	207	18,109,615	87,486	50.0	15.6
Public Safety	133	11,311,394	85,048	45.2	18.1
Total	340	29,421,009	86,532	48.1	16.6
Defined Benefit Sub-total*	348	30,105,635	86,510	48.1	16.8
Defined Contribution Plan 4	304	24,261,739	79,808	46.0	11.2
Total	652	\$54,367,374	\$ 83,386	47.1	14.2

* Includes Plan 4 members that transferred into Plan 5 after the valuation date, if any.

Includes Plan 5A members.

DEFINED BENEFIT PLAN 1
ACTIVE MEMBERS SEPTEMBER 30, 2016
BY ATTAINED AGE AND YEARS OF SERVICE

Attained Age	Years of Service to Valuation Date*							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Salary
55-59							1	1	\$ 91,797
65							1	1	121,171
Totals							2	2	\$ 212,968

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 61.0 years
Service: 37.9 years
Annual Pay: \$106,484

* Includes purchased service, if any.

DEFINED BENEFIT PLAN 2
ACTIVE MEMBERS SEPTEMBER 30, 2016
BY ATTAINED AGE AND YEARS OF SERVICE

Attained Age	Years of Service to Valuation Date*							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Salary
35-39				1				1	\$ 69,882
40-44				1				1	73,891
45-49				2				2	127,247
Totals				4				4	\$ 271,020

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 42.7 years
Service: 16.8 years
Annual Pay: \$67,755

* Includes purchased service, if any.

DEFINED BENEFIT PLAN 3
ACTIVE MEMBERS SEPTEMBER 30, 2016
BY ATTAINED AGE AND YEARS OF SERVICE

Attained Age	Years of Service to Valuation Date*							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Salary
50-54							1	1	\$ 81,408
55-59							1	1	119,230
Totals							2	2	\$ 200,638

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 53.9 years
Service: 32.4 years
Annual Pay: \$100,319

* Includes purchased service, if any.

DEFINED CONTRIBUTION PLAN 4
ACTIVE MEMBERS SEPTEMBER 30, 2016
BY ATTAINED AGE AND YEARS OF SERVICE

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Salary
20-24	13							13	\$ 526,137
25-29	19							19	830,075
30-34	24							24	1,174,443
35-39	19	1		13				33	2,289,405
40-44	15	2	4	9	6			36	3,064,866
45-49	13	2	3	14	12	5		49	4,154,493
50-54	17	1	4	15	9	7	1	54	5,020,235
55-59	12	4	2	9	6	7	2	42	4,095,449
60				2	1		2	5	472,933
61	1			3	1	3	1	9	761,293
62	1	1		2	1			5	424,885
63				2		1		3	287,267
64		1						1	121,753
65	1	1		3			1	6	516,635
66					1	1		2	177,853
67		1			1			2	173,960
68	1							1	170,057
Totals	136	14	13	72	38	24	7	304	\$24,261,739

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 46.0 years
Service: 11.2 years
Annual Pay: \$79,808

**HYBRID PLAN 5 AND PLAN 5A
ACTIVE MEMBERS SEPTEMBER 30, 2016
BY ATTAINED AGE AND YEARS OF SERVICE**

Attained Age	Years of Service to Valuation Date*							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Salary
20-24	2							2	\$ 111,227
25-29	7	1						8	439,394
30-34	4	14	3					21	1,552,058
35-39	9	12	17	3				41	2,842,154
40-44	2	6	17	15	2			42	3,540,503
45-49	2	3	11	9	27	5		57	5,044,607
50-54		6	14	7	17	23	8	75	6,964,076
55-59	1	6	17	8	9	9	8	58	5,372,034
60			3	1	1	2	1	8	787,489
61		1	1	1	1	1	1	6	584,694
62			4		1	1	1	7	612,890
63		1	3			2		6	453,677
64		1				1	1	3	400,911
65		1			1			2	219,847
66			2		1			3	242,330
67				1				1	253,118
Totals	27	52	92	45	60	44	20	340	\$29,421,009

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 48.1 years
Service: 16.6 years
Annual Pay: \$86,532

* Includes purchased service, if any.

SECTION C
METHODS AND ASSUMPTIONS

BASIC FINANCIAL PRINCIPLES AND OPERATION OF THE RETIREMENT SYSTEM

Benefit Promises Made Which Must Be Paid For. A retirement program is an orderly means of handing out, keeping track of, and financing pension promises to a group of employees. As each member of the retirement program acquires a unit of service credit the member is, in effect, handed an “IOU” which reads: “The Retirement System promises to pay you one unit of retirement benefits, payments in cash commencing when you retire.”

The principal related financial question is: When shall the money required to cover the “IOU” be contributed? This year, when the benefit of the member’s service is received? Or, some future year when the “IOU” becomes a cash demand?

The Constitution of the State of Michigan is directed to the question:

“Financial benefits arising on account of service rendered in each fiscal year shall be funded during that year and such funding shall not be used for financing unfunded accrued liabilities.”

This Retirement System meets this requirement by having as its financial objective the establishment and receipt of contributions, expressed as percents of active member payroll, which will remain approximately level from year to year and will not have to be increased for future generations of taxpayers.

Translated into actuarial terminology, a level percent-of-payroll contribution objective means that the contribution rate must be at least:

Normal Cost (the present value of future benefits assigned to members’ service being rendered in the current year)

. . . plus . . .

Interest on the Unfunded Actuarial Accrued Liability (the difference between the actuarial accrued liability and current system assets).

The accumulation of invested assets is a by-product of level percent-of-payroll contributions, not the objective. Investment income becomes the third major contributor to the retirement program, and the amount is directly reacted to the amount of contributions and investment performance.

If contributions to the retirement program are less than the preceding amount, the difference, plus investment earnings not realized thereon, will have to be contributed at some later time, or, benefits will have to be reduced, to satisfy the fundamental fiscal equation under which all retirement programs must operate:

$$\mathbf{B = C + I - E}$$

The aggregate amount of **B**enefit payments to any group of members and their beneficiaries cannot exceed the sum of:

The aggregate amount of **C**ontributions received on behalf of the group

. . . plus . . .

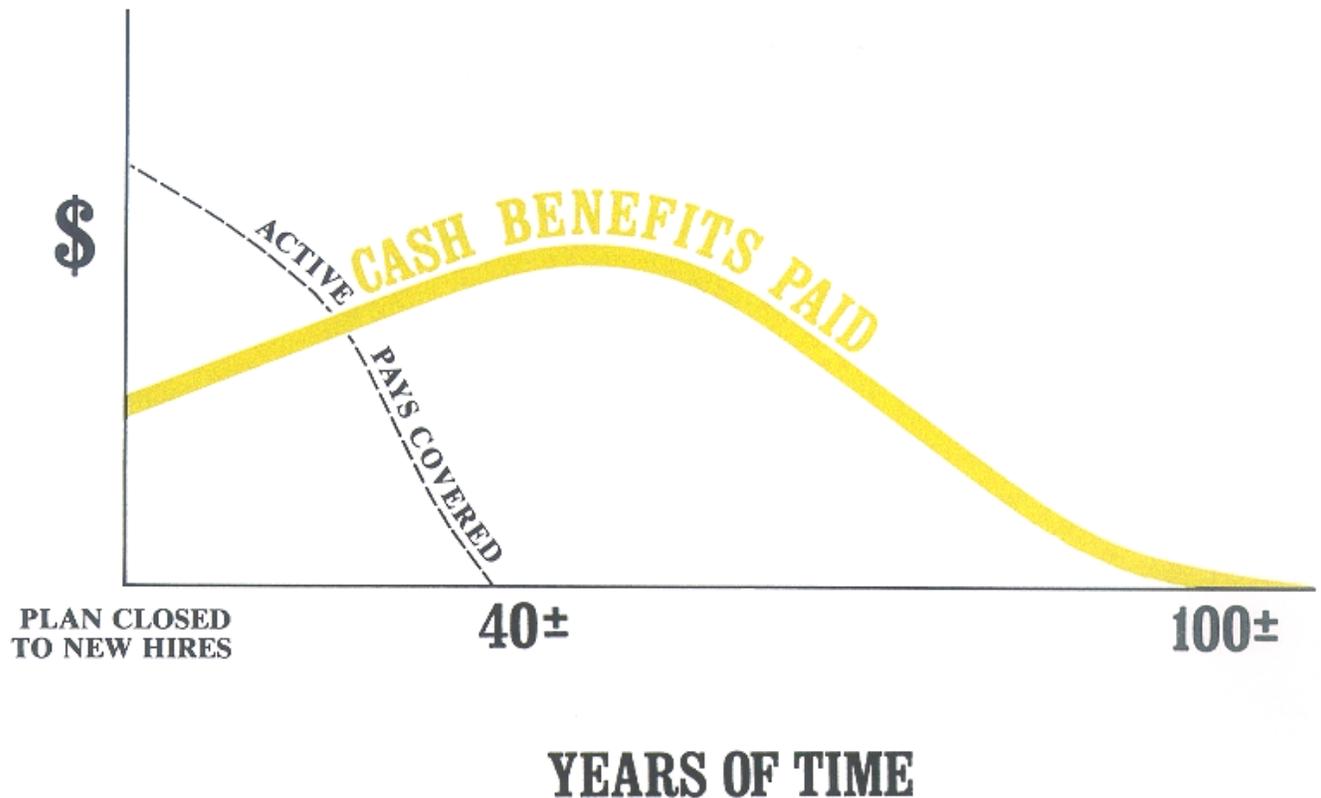
Investment earnings on contributions received and not required for immediate cash payments of benefits

. . . minus . . .

The **E**xpenses of operating the program.

Computed Contribution Rate Needed To Finance Benefits. From a given schedule of benefits and from the data furnished, the actuary calculates the contribution rate ***by means of an actuarial valuation*** - the technique of assigning monetary values to the risks assumed in operating a retirement program.

A CLOSED PENSION PLAN



A plan becomes closed when no new hires are admitted to active membership. The persons covered by the plan at the time of closing continue their normal activities and continue to be covered by the plan, until the last survivor dies.

CASH BENEFITS LINE. After a pension plan becomes closed, the usual pattern is for cash benefits to continue to increase for decades of time. Eventually the cash benefits will peak, and then gradually decrease over more decades of time, ultimately to zero. The last cash benefit is likely to occur a century after the time the plan is closed.

The precise amounts of cash benefits cannot be known now, and must be estimated by assumptions of future experiences in a variety of financial risk areas.

THE ACTUARIAL VALUATION PROCESS

The financing diagram on page C-3 shows the relationship between the two fundamentally different philosophies of paying for retirement benefits: the method where contributions match cash benefit payments (or barely exceed cash benefit payments, as in the Federal Social Security program) which is an *increasing contribution method*; and the *level contribution method* which equalizes contributions between the generations.

The actuarial valuation is the mathematical process by which the level contribution rate is determined, and the flow of activity constituting the valuation may be summarized as follows:

- A. ***Census Data***, furnished by plan administrator
 - Retired lives now receiving benefits
 - Former employees with vested benefits not yet payable
 - Active employees

- B. + ***Asset data*** (cash & investments), furnished by plan administrator

- C. + ***Assumptions concerning future experience in various risk areas***, which assumptions are established by the Retirement System after consulting with the actuary

- D. + ***The funding method*** (the long-term, planned pattern for employer contributions)

- E. + ***Mathematically combining the assumptions, the funding method, and the data***

- F. = Determination of:
 - Plan financial position; and/or
 - New Employer Contribution Rate

ACTUARIAL COST METHODS

Normal cost and the allocation of benefit values between service rendered before and after the valuation date was determined using the *individual entry-age actuarial cost method* having the following characteristics:

- the annual normal costs for each individual active member, payable from the date of employment to the date of retirement, are sufficient to accumulate the value of the member's benefit at the time of retirement; and
- each annual normal cost is a constant percentage of the member's year-by-year projected covered pay.

Asset Valuation Method. Last year's valuation assets are increased by contributions and reduced by refunds, benefit payments and expenses. An amount equal to the assumed investment return for the year is then added. Differences between actual return on a market value basis and an assumed return are phased-in over a four-year period. An 80%-120% market value corridor was incorporated in the September 30, 2014 valuation in accordance with WCERS Actuarial Funding Policy.

The portion of the actuarial present value allocated to the valuation year is called the normal cost. The portion of the actuarial present value not provided for by the actuarial present value of future normal costs is called the actuarial accrued liability. Deducting accrued assets from the actuarial accrued liability determines the unfunded actuarial accrued liability.

The base rate of increase in salaries used to calculate the actuarial liability was assumed to be 3.0%.

ACTUARIAL ASSUMPTIONS USED FOR THE VALUATION

Contribution requirements and actuarial present values are calculated by applying estimates of future experience (actuarial assumptions) to the benefit provisions and participant data of the System, using the actuarial cost methods described on page C-5.

The principal areas of activity which require experience estimates are:

- long-term rates of investment return to be generated by the assets of the System
- patterns of pay increases to members
- rates of mortality among members, retired members and beneficiaries
- rates of withdrawal of active members
- rates of disability among active members
- the age patterns of actual retirements

In an actuarial valuation, the monetary effect of each activity is calculated for as long as a present covered person survives - - - a period of time which can be as long as a century.

Actual experience of the System will not coincide exactly with the experience estimates. Each valuation provides a complete recalculation of estimated future experience and takes into account all past differences between estimated and actual experience. The result is a continual series of adjustments (usually small) to the computed contribution rate.

From time to time one or more of the estimates are modified to reflect experience trends but not random or temporary year-to-year fluctuations.

ACTUARIAL ASSUMPTIONS USED FOR THE VALUATION

The Rationale for the assumptions is an experience study covering the period October 1, 2010, through September 30, 2015, and dated November 22, 2016.

Investment Return (net of investment expenses).

7.25% per year, compounded annually. This rate consists of a real rate of return over wage inflation of **4.25%** per year plus a long-term rate of wage inflation of **3.00%** per year. The real rate of return over price inflation would be different.

No specific price inflation assumption is necessary for this valuation. However, the above assumptions would be consistent with a price inflation assumption in the 2.50% area.

This assumption is used to equate the value of payments due at different points in time and was first used following the September 30, 2016 valuation. Approximate rates of investment return, for the purpose of comparisons with assumed rates, are shown below.

	Year Ended September 30					5-Year Average
	2016	2015	2014	2013	2012	
Recognized Rate of Return (Funding Value)	8.4%	9.2%	8.4%	6.8%	2.1%	6.9%

The nominal rate of return was computed using the approximate formula $i = I$ divided by $1/2 (A + B - D)$, where I is recognized investment income net of expenses, A is the beginning of year asset value, and B is the end of year asset value.

Rates of salary increase were as follows:

Merit and Longevity Pay Increases			
Non-Public Safety		Public Safety	
Age	Increase	Service	Increase
20	4.35%	5	7.51%
25	3.75%	10	1.75%
30	2.40%	15	1.27%
35	1.70%	20	3.75%
40	1.55%	25	0.73%
45	1.20%	30	0.00%
50	1.05%	35	0.00%
55	0.88%	40 & Over	0.00%
60	0.44%		
65 & Over	0.00%		
Ref:	481	Ref:	704

These rates are used to project current salaries to those upon which pension amounts are likely to be based. The current rates were first used for the September 30, 2016 actuarial valuation.

Rates of separation from active membership were as follows:

% of Active Members Separating within the Next Year							
Non-Public Safety				Public Safety			
Age		Service		Age		Service	
20	9.50%	0 - 1	19%	20	4.14%	0 - 1	18%
21	9.50%	1 - 2	16%	21	4.14%	1 - 2	18%
22	9.50%	2 - 3	12%	22	4.14%	2 - 3	9%
23	9.45%	3 - 4	11%	23	4.10%	3 - 4	7%
24	9.40%	4 - 5	10%	24	4.07%	4 - 5	6%
25	9.35%			25	4.03%		
30	6.00%			30	2.96%		
35	6.00%			35	2.24%		
40	6.00%			40	2.15%		
45	3.79%			45	1.95%		
50	3.07%			50	1.56%		
55	2.59%			55	1.10%		
60 & Over	0.00%			60 & Over	0.00%		
Ref:	1398		759	Ref:	1230 x 92%		760

Rates for all divisions were first used for the September 30, 2016 valuation.

The probabilities of retirement for members satisfying the age and service conditions for retirement are as follows:

Percent of Active Participants Retiring within Next Year		
Normal Retirement		
Age	Public Safety	Non-Public Safety
55	25%	25%
56	25%	25%
57	25%	25%
58	25%	25%
59	25%	25%
60	25%	25%
61	25%	25%
62	50%	50%
63	27%	27%
64	27%	27%
65	50%	50%
66	27%	27%
67	27%	27%
68	30%	30%
69	30%	30%
70	100%	100%
Ref:	2659	2659
anchor	55	55

Service	Regular Retirement	
	Non-Public Safety	Public Safety
30	30%	40%
31	20%	30%
32	15%	20%
33	30%	30%
34	30%	40%
35	40%	50%
36	30%	25%
37	30%	25%
38	30%	25%
39	20%	25%
40	100%	100%
Ref:	2120	2660
anchor	30	30

The rates were first used for the September 30, 2016 valuation.

Probabilities of retirement were increased to 45% for non-public safety and 40% for public safety once the member accrues the maximum benefit of 75% of Average Final Compensation.

Rates of disability are represented by the following table:

Sample Ages	Percent Becoming Disabled within Next Year	
	Non-Public Safety	Public Safety
20	0.08%	0.10%
25	0.08%	0.10%
30	0.05%	0.07%
35	0.09%	0.12%
40	0.21%	0.28%
45	0.38%	0.51%
50	0.61%	0.81%
55	0.85%	1.13%
60	1.08%	1.44%
Ref	8 x 75%	8 x 100%

For members not in public safety, two-thirds of disabilities are assumed to be non-duty related and the remaining one-third are assumed to be duty related. For public safety members, 60% are assumed to be non-duty related and the remaining 40% are assumed to be duty related.

The mortality table used to measure post-retirement mortality was the RP-2014 Healthy Annuitant Mortality table for males and females, adjusted for mortality improvement back to the base year of 2006. Mortality rates for a particular calendar year are determined by applying the MP-2016 Mortality Improvement scale to the above described tables. The corresponding Disabled and Employee tables were used for disability and pre-retirement mortality, respectively. This assumption was first used for the September 30, 2016 actuarial valuation.

Mortality rates are used to measure the probabilities of members dying before retirement and the probabilities of each pension payment being made after retirement. Sample post-retirement values are shown below:

Sample Attained Ages in 2016	Single Life Retirement Values					
	Present Value of \$1 Monthly for Life		Percent Dying Next Year		Future Life Expectancy (years)	
	Men	Women	Men	Women	Men	Women
45	\$153.22	\$156.50	0.2755%	0.2139%	39.30	42.01
50	147.62	151.75	0.4093%	0.2737%	34.37	36.99
55	140.68	145.45	0.5830%	0.3789%	29.63	32.07
60	132.11	137.47	0.8047%	0.5606%	25.09	27.32
65	121.58	127.48	1.1528%	0.8443%	20.78	22.77
70	108.75	115.05	1.7359%	1.3256%	16.71	18.44
75	93.54	100.16	2.7867%	2.1704%	12.94	14.41
80	76.65	83.33	4.6989%	3.6931%	9.58	10.80
Ref: Projection	2135 x 1.00 929	2136 x 1.00 930				

90% of pre-retirement deaths are assumed to be non-duty related and the remaining 10% are assumed to be duty related.

MISCELLANEOUS AND TECHNICAL ASSUMPTIONS

SEPTEMBER 30, 2016

Marriage Assumption:	100% of males and 100% of females are assumed to be married. Male spouses are assumed to be three years older than female spouses.
Pay Increase Timing:	Beginning of (Fiscal) year. This means that pay paid during the fiscal year before the valuation date is used.
Decrement Timing:	Decrements are assumed to occur mid-year.
Eligibility Testing:	Eligibility for benefits is determined using the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Decrement Relativity:	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
Decrement Operation:	Disability and withdrawal (separation) do not operate during retirement eligibility.
Normal Form of Benefit:	The assumed normal form of benefit is straight life.
Adjustments:	<p>Age and service benefits were increased by the following percentages to account for lump sum redemptions of unused sick leave, vacation time, and other items at retirement: Airport Plans One and Three, 5%. Airport Plans Two and Five, 2%.</p> <p>Straight Life amounts are provided for some retired members who elect the pop-up provision. Retiree liabilities were increased by 1% to account for the plan's pop-up provision.</p>
Incidence of Contributions:	Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made, subject to recommended dollar amounts shown on page A-2.
Benefit Service:	Exact fractional service is used to determine the amount of benefit payable.
Option Factors:	Option factors are based upon 7.25% interest and the RP-2014 Healthy Annuitant Mortality table projected to 2022 using MP-2016 with an 80% Unisex Blend.
Administrative Expenses:	A contribution of 1.15% of payroll was included for administrative expenses. This assumption was first used for the September 30, 2016 valuation.

SECTION D

RISK MEASURES AND FUNDING POLICY

**SUMMARY OF RISK MEASURES
BASED ON MARKET VALUE OF ASSETS**

Actuarial Valuation Date September 30	Funded Ratio	Annuitant Liabilities / AAL	UAAL / DB Plan Payroll	Market Value of Assets / DB Plan Payroll	Total AAL / DB Plan Payroll
2014	65.5 %	0.57	1.92	3.29	5.03
2015	67.2 %	0.55	1.58	3.42	5.09
2016	68.4 %	0.54	1.63	3.66	5.35

Short term fluctuations in the Risk Measures will occur due to experience, plan changes, and assumption and method changes. Long term expectations are described below.

Funded Ratio: The funded ratio is the most widely known measure of a plan’s financial strength, but the trend in the funded ratio is much more important than the absolute ratio. The funded ratio should trend to 100%; for WCAA, it is expected to trend toward 100% by September 30, 2028 under the current Funding Policy. As it approaches 100%, it is important to consider the level of investment risk in the portfolio and potentially to reevaluate the assumed rate of return.

Annuitant Liabilities / AAL: The ratio of annuitant (retiree) liabilities to total accrued liabilities gives an indication of the maturity of the system. As the ratio increases, cash flow needs increase, and liquidity needs of the portfolio change. A ratio on the order of 0.50 indicates a maturing system; a ratio approaching 1.00 indicates a closed system or another special situation.

UAAL / Payroll: The ratio of the unfunded actuarial accrued liability to payroll is expected to trend toward 0% by September 30, 2028 under the current Funding Policy.

Market Value of Assets / Payroll and Total AAL / Payroll: The ratios of liabilities and assets to payroll give an indication of both maturity and volatility. Many systems have ratios between 5 and 7. Ratios significantly above that range may indicate difficulty in supporting level percent of payroll financing, unless the assets are very conservatively invested. As the funded ratio increases, the Market Value of Assets / Payroll ratio is expected to converge to the ratio of Total AAL / Payroll.

CHAPTER 3 – ACTUARIAL FUNDING POLICY

SECTION 2:301 - INTRODUCTION.

(A) Purpose

(1) This document and the attached glossary of terms comprise the Actuarial Funding Policy for the Wayne County Employees' Retirement System (WCERS). The purpose of this Actuarial Funding Policy (Funding Policy) for the Defined Benefit Plan is to establish the funding objectives and policy set by the Retirement Commission for WCERS. The Retirement Commission establishes this Funding Policy to help ensure the systematic funding of future benefit payments for members of WCERS.

(B) Act 314

(1) Section 20m of the Public Employee Retirement System Investment Act, Public Act 314 of 1965, as amended ("Act 314") [MCL § 38.1140m], provides for the Retirement Commission's duties and responsibilities with respect to determining and certifying the annual required employer contribution to the Retirement System in relevant part as follows:

(a) The governing board vested with the general administration, management, and operation of a system or other decision-making body that is responsible for implementation and supervision of any system shall confirm in the annual actuarial valuation required under section 20h and the summary annual report required under section 13 that each system under this act provides for the payment of the required employer contribution as provided in this section and shall confirm in the summary annual report that the system has received the required employer contribution for the year covered in the summary annual report. The required employer contribution is the actuarially determined contribution amount. **An annual required employer contribution in a system under this act shall consist of a current service cost payment and a payment of at least the annual accrued amortized interest on any unfunded actuarial liability and the payment of the annual accrued amortized portion of the unfunded principal liability.** For fiscal years that begin before January 1, 2006, the required employer contribution shall not be determined using an amortization period greater than 40 years. **Except as otherwise provided in this section, for fiscal years that begin after December 31, 2005, the required employer contribution shall not be determined using an amortization period greater than 30 years. . . .** In a plan year, any current service cost payment may be offset by a credit for amortization of accrued assets, if any, in excess of actuarial accrued liability. A required employer contribution for a system administered under this act shall allocate the actuarial present value of future plan benefits between the current service costs to be paid in the future and the actuarial accrued liability. The governing board vested with the general administration, management, and operation of a system or other decision-making body that is responsible for implementation and supervision of a system shall act upon the recommendation of an actuary and the

CHAPTER 3 – ACTUARIAL FUNDING POLICY

board and the actuary shall take into account the standards of practice of the actuarial standards board of the American academy of actuaries in making the determination of the required employer contribution.

[Emphasis added].

(C) GASB

(1) In 2012, the Governmental Accounting Standards Board (GASB) approved two new financial reporting standards. GASB Statement No. 67, “Financial Reporting for Pension Plans” replaces the requirements of Statement No. 25. GASB Statement No. 68, “Accounting and Financial Reporting for Pensions” replaces the requirements of Statements No. 27 and No. 50. Prior to the changes, the Annual Required Contribution (ARC) rate was used as a basis for funding decisions. The new GASB statements separate accounting cost (expense) from funding cost (contributions), necessitating the creation of this Funding Policy.

SECTION 2:302 - FUNDING OBJECTIVES.

(A) General

- (1) Maintain a targeted funded ratio of 100%.
- (2) Maintain adequate assets so that current plan assets plus future contributions (Employer and Member) and investment earnings should be sufficient to fund all benefits expected to be paid to members and their beneficiaries.
- (3) Maintain stability of employer contribution rates, consistent with these funding objectives.
- (4) Maintain public policy goals of accountability and transparency. Each policy element is clear in intent and effect, and each should allow an assessment of whether, how and when the funding requirements of the plan will be met.
- (5) Monitor material risks to assist in any risk management strategies the Retirement Commission deems appropriate.
- (6) Promote intergenerational equity. Each generation of members and employers should incur the cost of benefits for the employees who provide services to them, rather than deferring those costs to future members and employers.
- (7) Provide a reasonable margin for adverse experience to help offset risks.
- (8) Review investment return assumption, potentially in conjunction with a periodic asset/liability study and in consideration of the Retirement Commission’s risk profile.
- (9) Continue progress of systematic reduction of the Unfunded Actuarial Accrued Liabilities (UAAL).

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SECTION 2:303 - ELEMENTS OF ACTUARIAL FUNDING POLICY.

(A) Actuarial Cost Method

(1) The Individual Entry Age Normal actuarial cost method of valuation shall be used in determining Actuarial Accrued Liability (AAL) and Normal Cost in accordance with Section 141-36 of the Retirement Ordinance. Differences in the past between assumed experience and actual experience (“actuarial gains and losses”) shall become part of the AAL. The Normal Cost shall be determined on an individual basis for each active member.

(B) Asset Smoothing Method

(1) The investment gains or losses of each valuation period, resulting from the difference between actual investment return and assumed investment return, shall be recognized annually in level amounts over a period not to exceed 4 years in calculating the Funding Value of Assets. Regardless of the results obtained from the smoothing method described above, the Funding Value of Assets shall not diverge from the Market Value of Assets by more than 20% (corridor). Based upon consultation with the Actuary, the Retirement Commission may combine bases (scheduled recognition of prior gains and losses) in order to reset the Funding Value of Assets to be equal to the Market Value of Assets when the difference between Market Value of Assets and Funding Value of Assets is 5% or less of Market Value of Assets.

(C) Amortization Method

- (1) A level percent of payroll amortization method shall be used to systematically pay off the UAAL over a closed amortization period not to exceed 30 years as required under Section 20m of Act 314 (MCL § 38.1140m).
- (2) The amortization period for unfunded accrued liabilities shall be set in a manner to ensure that the plan will be 100% funded as soon as reasonably possible. Starting in conjunction with the actuarial valuation dated September 30, 2014 (determines contribution for Fiscal Year 2016), the amortization period shall be decreased by two (2) years annually. In conjunction with the first valuation report employing a fifteen (15) year amortization period, the Retirement Commission may elect to create a new fifteen (15) year amortization schedule for unfunded liabilities arising during that valuation and subsequent valuations, and to continue the amortization of preexisting unfunded liabilities to their scheduled end date.
- (3) Unfunded liabilities associated with benefit changes or assumption changes shall be funded over a period not exceeding 10 years.
- (4) Unfunded liabilities arising from benefit increases provided to retirees or in conjunction with early retirement incentive programs offered by the employer shall be separately funded over a period not exceeding 5 future years.

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- (5) In order to stabilize contributions, the Retirement Commission may from time to time elect to combine separate amortization schedules arising under subparagraphs (3) and (4) into a single schedule over the average remaining amortization period being used.
- (6) In the event that the Plan's assets exceed the Plan's liabilities, all amortization schedules other than those related to benefit changes for retirees or early retirement incentive programs offered by the employer shall be considered completed and employer contributions will be set based upon the Normal Cost plus the completion of any remaining amortizations due to benefit changes for retirees or early retirement incentive programs offered by the employer, without regard to such overfunding.

(D) Risk Management

(1) Actuarial Assumption Changes

- (a) The actuarial assumptions used for funding shall be those last adopted by the Retirement Commission based on the most recent experience study and upon the advice and recommendation of the Actuary. The Retirement Commission shall direct the actuary to conduct an experience study at least every five years. The results of the study shall be the basis for the actuarial assumptions recommended to the Retirement Commission.
- (b) The actuarial assumptions can be updated during the five-year period between experience studies, as advised by the Actuary, if significant plan design changes or other significant events occur.

(2) Risk Control

- (a) The Retirement Commission shall carefully monitor the risk measures outlined below and shall consider steps to mitigate risk, with particular regard to funded ratio increases. Risk mitigation may involve a reduction in the assumed rate of investment return. Examples of risk mitigating techniques include, but are not limited to:
 - i. Review asset allocation with investment advisors and actuary with a goal of reducing the standard deviation of the portfolio return once WCERS becomes fully (100%) funded.
 - ii. Reduce asset-liability mismatching.
 - iii. Should such de-risking or future unfavorable experiences cause unfunded liabilities to arise again, such liabilities shall be funded over a closed period of 20 future years.

(3) Risk Measures

- (a) The following risk measures will be annually determined by the Retirement System's Actuary to provide quantifiable measurements of risk and its movement over time:

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- i. Funded ratio (assets / accrued liabilities)
 - ii. Average UAAL amortization period (years required to pay down the UAAL based on current funding schedule)
 - iii. Total UAAL / Total Defined Benefit Plan Active Member Payroll - Measures the risk associated with contribution decreases relative impact on the ability to fund the UAAL. A decrease in this measure indicates a decrease in contribution risk.
 - iv. Total Assets / Total Defined Benefit Plan Active Payroll - Measures the risk associated with the ability to respond to asset experience through adjustments in contributions. A decrease in this measure indicates a decrease in asset risk.
 - v. Total AAL / Total Defined Benefit Plan Active Payroll - Measures the risk associated with the ability to respond to liability experience through adjustments in contributions. A decrease in this measure indicates a decrease in experience risk. This also provides a long-term measure of the asset risk in situations where the WCERS has a funded ratio below 100%.
- (4) Closed Group Funding
- (a) Closed groups arise when new hires of a group participating in one of the Defined Benefit Plans of the WCERS are no longer allowed to participate in said defined benefit plan, or when active members of a group are transferred out of the WCERS, leaving only retirees and vested former members in the WCERS.
 - (b) The liabilities of employers sponsoring closed groups will only be considered discharged if the pension obligations (actuarial accrued liabilities) for the sub-group(s) (retirees, beneficiaries, active vested and non-vested and deferred vested members) leaving the WCERS are transferred to the employer/successor plan or, if such obligations remain with the WCERS, assets sufficient to fund the pension obligation (actuarial accrued liabilities) of any such sub-group(s) either remain and/or are deposited into the WCERS through a lump sum payment made by the employer associated with the closed group. Such transfers and payments will be based on amounts required by the Retirement Commission, based on consultation with the WCERS Actuary. Any such transfers and payments shall include a margin for adverse experience that may occur for the WCERS in the future, as follows:
 - i. **Closed Groups leaving liability with WCERS.** All calculations related to liabilities remaining with the WCERS shall be based on the Market Value of assets on deposit with the WCERS at the time of the transfer, and the Actuarial Accrued Liability calculated based on a risk-free rate of investment return and such other actuarial assumptions and methods as the Actuary and Retirement Commission deem appropriate for such purpose. Any sub-groups remaining in the WCERS will need to be 100% funded based on current assets and a risk-free rate of investment return but not

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less than 150% funded based on current assets and actuarial assumptions used in the regular valuation of WCERS. Current assets shall include any required transfers and payments from the employer/successor plan.

- ii. **Closed Groups transferring liability from WCERS.** All calculations with respect to liabilities being transferred to the employer or to a successor system or to any assets transferred from the WCERS in conjunction with a release of liability (transferred to the employer/successor plan) will be in an amount equal to 80% of the Funded Ratio of the Actuarial Accrued Liability to be transferred based on the actuarial assumptions used in the regular valuation of WCERS. Such 80%, however, shall not be permitted to result in a transfer of assets that exceeds the actuarial accrued liabilities being transferred.

W.C.E.R.S. Policy – Actuarial Funding Policy	
Category: Board Governance	
Date Adopted: 12/19/2014	Date(s) Amended:
Legal Review By: VanOverbeke, Michaud & Timmony, P.C.	Date(s) Reviewed: 4/21/2016

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APPENDIX A

GLOSSARY

1. **Actuarial Accrued Liability (AAL):** The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future Normal Cost. Sometimes referred to as “accrued liability” or “past service liability.”
2. **Actuarial Assumptions:** Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement actuarial assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic actuarial assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.
3. **Actuarial Cost Method:** A mathematical budgeting procedure for allocating the dollar amount of the “actuarial present value of future plan benefits” between the actuarial present value of future Normal Cost and the actuarial accrued liability. Sometimes referred to as the “actuarial funding method.”
4. **Actuarial Gain (Loss):** A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used. For example, if during a given year the assets earn more than the investment return assumption, the amount of earnings above the assumption will cause an unexpected reduction in UAAL, or “actuarial gain” as of the next valuation. These include contribution gains and losses that result from actual contributions made being greater or less than the level determined under the policy.
5. **Actuary:** A person who is trained in the application of probability and compound interest to solve problems in business and finance that involve payment of money in the future, contingent upon the occurrence of future events. Most actuaries in the United States are Members of the American Academy of Actuaries (MAAA). *For the purpose of this Funding Policy, Actuary shall only refer to the WCERS actuary.*
6. **Amortization:** Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.
7. **Entry Age Normal Actuarial Cost Method:** A funding method that calculates the Normal Cost as a level percentage of pay over the working lifetime of the plan’s members.
8. **Experience Study:** An actuarial investigation of demographic and economic experiences of the WCERS during the period studied. The investigation is made for the purpose of updating the actuarial assumptions used in valuing the actuarial liabilities.
9. **Funding Value of Assets:** The value of current plan assets recognized for valuation purposes. Generally based on a phased-in recognition of all or a portion of market related investment return. Sometimes referred to as Actuarial Value of Assets.
10. **Market Value of Assets:** The fair value of plan assets as reported in the plan’s audited financial statements.

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11. **Normal Cost (NC):** The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as “current service cost.” Any payment toward the unfunded actuarial accrued liability is not part of the Normal Cost.
12. **Unfunded Actuarial Accrued Liability (UAAL):** The positive difference, if any, between the actuarial accrued liability and valuation assets. Sometimes referred to as “unfunded accrued liability.”