



O'Sullivan
Associates Inc.

Roofers Local No. 149 Pension Plan (Detroit)

Actuarial Valuation Report
as of 5/31/2018

O'Sullivan Associates
1236 Brace Road, Unit E
Cherry Hill, NJ 08034
(856) 795-7777

March 2019

Table of Contents

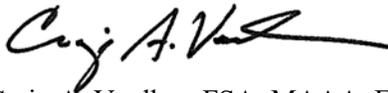
1.	Certification of Results	1
2.	Valuation Summary	3
3.	Summary of Funding Measures.....	4
4.	Plan Cost	5
	4.1 Annual Plan Cost and the Margin	5
	4.2 Margin Detail	6
	4.3 Reconciliation of Margin	7
	4.4 Development of Plan Asset Values.....	8
	4.4.1 Market Value of Assets	8
	4.4.2 Actuarial Value of Assets	8
	4.4.3 Actuarial Asset Gain/(Loss)	9
	4.4.4 Total Gain/(Loss).....	10
	4.5 Historical Information.....	11
	4.5.1 Gain/(Loss)	11
	4.5.2 Asset Information	12
	4.5.3 Employment.....	13
	4.5.4 Funded Percentage.....	14
	4.5.5 Actuarial Value of Assets Expressed as a Percent of Market Value	15
	4.6 Pension Projection Act: Rehabilitation Plan	16
5.	ASC No. 960 Disclosures.....	17
	5.1 Present Value of Accumulated Plan Benefits	17
	5.2 Reconciliation of Changes in Present Value of Accumulated Benefits.....	17
6.	Government Reporting	18
	6.1 Summary of Assumptions	18
	6.2 Summary of Plan Provisions.....	21
	6.3 Recent Plan Changes.....	24
	6.4 Contribution Rate History	25
	6.5 Funding Standard Account and Minimum Required Contributions	26
	6.6 Maximum Deductible Contribution	26
	6.7 Current Liability at Beginning of Plan Year	27
	6.8 Amortization Schedule for Minimum Required Contribution	28
	6.9 Equation of Balance	30
7.	Data Summary.....	31
	7.1 Historical Participation.....	31
	7.2 Flow of Lives	32
	7.3 Actives by Age and Service	33
	7.4 Distribution of Hours Worked by Actives (Plan Year ending 5/31/2018).....	34
	7.5 New Pensioners	35
	7.6 All Pensioners	35
	7.7 Distribution of Retired Participants	36
	7.8 Distribution of Inactive Vested Participants	37

1. Certification of Results

This report was prepared on behalf of the Detroit location of the Roofers Local No. 149 Pension Plan based on employee data, asset statements and Plan documents provided by the Plan Sponsor or its representatives. We relied upon the data as submitted, without formal audit. However, the data was tested for reasonableness, and we have no reason to believe that any other information which would have had a material effect on the results of this valuation was overlooked.

Therefore, to the best of our knowledge and belief, the information presented in this report is complete and accurate, and in our opinion, each assumption used represents our best estimate of anticipated experience under the Plan.

Certified by:



Craig A. Voelker, FSA, MAAA, EA
Enrolled Actuary No.: 17-05537

***** *This Page Intentionally Left Blank* *****

2. Valuation Summary

(A) Long-Term Funding

Projected annual contributions of \$9.78 million (\$11.50 per hour) exceed the total annual cost of benefits of \$7.57 million (\$8.90 per hour). This leaves a positive margin of \$2.21 million or \$2.60 per hour.

(B) Margin

The margin has increased \$0.30 from \$2.30 last year to \$2.60 this year. This increase is a result of experience gains, the passage of time, and an increase in the assumed hours worked. These effects were partially offset by changes in the mortality and expense assumptions. The Margin is explained in detail in Section 4.

(C) Pension Protection Act

The Pension Protection Act of 2006 (PPA) requires that multiemployer plans disclose the percentage level of funding using actuarial assumptions and assets in their participant notices. The Detroit Plan's current funding level is 82.8%.

As of 5/31/2018, the Plan was certified in the "Green" Zone (neither Endangered nor Critical Status) because the combined Plan is at least 80% funded, and the Credit Balance is not expected to fail this year or within the next six years.

(D) Minimum Funding Requirement

The Plan is not projected to fail the government's ERISA minimum funding standard minimum funding standard after applying the effect of the automatic extension of the amortization bases, assuming all experience emerges as expected, and there are no future changes in assumptions.

(E) Assumptions

We have made the following assumption changes this year:

- Reduced the mortality set forward from one year to zero.
- Increased our future employment units assumption from 800,000 per year to 850,000 per year
- Increased the expense assumption from \$600,000 to \$650,000 annually increasing 3.0% per year.

3. Summary of Funding Measures

1. Current	As of May 31	
	<u>2018</u>	<u>2017</u>
<u>Assets</u>		
a at Market	\$ 223,773,611	\$ 209,800,637
b at Actuarial	\$ 228,075,065	\$ 218,246,918
c Actuarial / Market (b/a)	101.9%	104.0%
<u>Present Values</u>		
d Vested Benefits	\$ 269,910,931	\$ 258,123,227
e Accrued Benefits (Accrued Liability)	\$ 275,386,161	\$ 265,790,026
<u>Funding Percentages</u>		
f Vested at market (a/d)	82.9%	81.3%
g Vested at actuarial (b/d)	84.5%	84.6%
h Accrued at market (a/e)	81.3%	78.9%
i Accrued at actuarial (b/e)	82.8%	82.1%
2. Prospective	For Plan Year Ending May 31	
	<u>2019</u>	<u>2018</u>
<u>Contributions</u>		
a Minimum Required	\$ -	\$ -
b Anticipated	\$ 9,775,000	\$ 9,200,000
c Actual	tbd	\$ 12,307,670
d Maximum Deductible	\$ 435,047,174	\$ 437,403,116
e Credit Balance	\$ 15,031,088	* \$ 23,718,726
f Minimum to preserve Credit Balance	\$ 18,177,571	* \$ 7,190,300
	* <i>Estimated</i>	
<u>Costs</u>		
g Cost of benefits earned in year	\$ 2,383,195	\$ 2,155,290
h Amortization of Unfunded Liability	<u>5,183,875</u>	<u>5,209,296</u>
i Total Cost (g+h)	\$ 7,567,070	\$ 7,364,586
j Margin (b-i)	\$ 2,207,930	\$ 1,835,414
3. Assumptions		
a Interest rate per annum	7.50%	7.50%
b Aggregate employment units per year	850,000	800,000

4. Plan Cost

4.1 Annual Plan Cost and the Margin

There are two component costs to funding a pension plan: the cost of benefits earned in the year, and the amortization of the unfunded liability. The sum of the two costs expressed in dollars per hour of covered work provides a useful way of expressing the Plan's cost.

In the context above, margin is the amount, in contributions per hour, by which the scheduled contributions differ from the Plan's projected monthly cost.

The costs below are calculated consistent with a funding policy of paying off the unfunded liability over 15 years assuming asset return of 7.50% annually. The margin, found on Line C below, indicates that the Plan's contributions are exceeding the funding policy by \$2.60 per hour.

There are many actuarial measures and statistics to measure the state of the Plan's funding. The margin is designed to provide a single simplified statistic for a Trustee to get a sense for the Plan's level of funding. As long as the margin is positive it is a strong indication that the current benefits are affordable on a long-term basis. If negative, it is an indication that the overall funding may need to be improved before benefits are affordable.

	<u>Per Year</u>	<u>Per Hour</u>	<u>As a % of Contributions</u>
A. Anticipated annual contributions	\$ 9,775,000	\$ 11.50	100.0%
B. Actuarial Costs			
1. Cost of benefits earned in the year	\$ 2,383,195	\$ 2.80	24.3%
2. Amortization of unfunded liability	<u>5,183,875</u>	<u>6.10</u>	<u>53.0%</u>
3. Total annual costs (1+2)	\$ 7,567,070	\$ 8.90	77.3%
C. Margin (A-B3)	\$ 2,207,930	\$ 2.60	22.7%

Note: The 15-year period for amortizing the Plan's unfunded liability is an ongoing one, in that it is reset at 15 years each time the annual actuarial valuation is completed.

4.2 Margin Detail

A. As of	<u>5/31/2018</u>		
1. Actuarial liability	\$ 275,386,161		
2. Actuarial value of assets	<u>228,075,065</u>		
3. Unfunded actuarial liability (1-2)	\$ 47,311,096		
4. Normal cost	\$ 1,642,137		
5. Expenses	<u>650,000</u>		
6. Total cost of benefits (4+5)	\$ 2,292,137		
7. Amortization of unfunded liability	\$ 4,985,808		
B. Anticipated Contribution Income			
1. Projected hours	850,000		
2. Projected contribution rate	<u>\$ 11.50</u>	<u>\$/Hour</u>	<u>As a % of</u>
3. Anticipated annual contribution (1x2)	\$ 9,775,000	\$ 11.50	100.0%
C. Actuarial Costs			
1. Cost of benefits earned in the year	\$ 2,383,195	\$ 2.80	24.3%
2. Amortization of unfunded liability	<u>5,183,875</u>	<u>6.10</u>	<u>53.0%</u>
3. Total annual costs (1+2)	\$ 7,567,070	\$ 8.90	77.3%
D. Margin (B3-C3) (at actuarial)	\$ 2,207,930	\$ 2.60	22.7%
E. Spread Statistic	-1.9%		
F. Market value of assets	\$ 223,773,611		
G. Margin using assets at market	\$ 1,736,621	\$ 2.05	17.8%

4.3 Reconciliation of Margin

	<u>Dollars per Hour</u>
A. Margin as of 5/31/2017	\$ 2.30
B. Effect of:	
1. Contribution increase	\$ 0.00
2. Plan amendments	0.00
3. Passage of time	<u>0.95</u>
4. Subtotal	\$ 0.95
Actuarial Experience:	
5. Demographic experience	\$ (0.50)
6. Expense experience	0.00
7. Asset experience	<u>(0.19)</u>
8. Subtotal actuarial experience	\$ (0.69)
Methods and Assumptions:	
9. Change in employment assumption	\$ 0.95
10. Change in operational expense assumption	(0.06)
11. Other assumption change related	(0.85)
12. Method change	<u>0.00</u>
13. Subtotal methods and assumptions	<u>\$ 0.04</u>
C. Total change in margin	\$ 0.30
D. Margin as of 5/31/2018	\$ 2.60

4.4 Development of Plan Asset Values

4.4.1 Market Value of Assets

	<u>Total Fund</u>
A. Assets at 5/31/2017	\$ 209,800,637
B. Employer contributions	\$ 12,307,670
C. Investment income:	
1. Interest and dividends	\$ 5,529,291
2. Realized/unrealized gain/(loss)	14,549,400
3. Investment fees	<u>(1,112,761)</u>
4. Total investment income	\$ 18,965,930
D. Distributions:	
1. Benefit payments	\$ (16,643,604)
2. Administrative expenses	<u>(657,022)</u>
3. Total distributions	\$ (17,300,626)
E. Market value as of 5/31/2018	\$ 223,773,611
F. Average invested value (A+.5 x (B+D3))	\$ 207,304,159
G. Rate of return, C÷F	9.15%

4.4.2 Actuarial Value of Assets

A. Market value as of 5/31/2018	\$ 223,773,611
---------------------------------	----------------

Development of amount deferred

Year Ending <u>May 31</u>	Unexpected <u>Amount</u>	Percentage <u>Deferred</u>	Deferred <u>Amount</u>
1. 2015	\$ 147,322	20%	\$ 29,464
2. 2016	(20,812,593)	40%	(8,325,037)
3. 2017	2,099,374	60%	1,259,625
4. 2018	\$ 3,418,118	80%	<u>2,734,494</u>
B. Total deferred amount (Sum of 1-4)			\$ (4,301,454)
C. Preliminary actuarial value of assets (A-B)			228,075,065
D. 80% of market value			179,018,889
E. 120% of market value			268,528,333
F. Actuarial value as of 5/31/2018 (C not less than D or greater than E)			\$ 228,075,065

4.4.3 Actuarial Asset Gain/(Loss)

A. Actuarial Value of Assets as of 5/31/2017	\$ 218,246,918																								
B. Investment income:																									
1. Expected income (net of investment expenses)	\$ 15,547,812																								
	<u>Development of amount recognized</u>																								
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Year Ending <u>May 31</u></th> <th style="text-align: center;">Unexpected <u>Amount</u></th> <th style="text-align: center;">Percentage <u>Recognized</u></th> <th style="text-align: center;">Recognized <u>Amount</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2014</td> <td style="text-align: right;">\$ 11,514,235</td> <td style="text-align: center;">20%</td> <td style="text-align: right;">\$ 2,302,847</td> </tr> <tr> <td style="text-align: center;">2015</td> <td style="text-align: right;">147,322</td> <td style="text-align: center;">20%</td> <td style="text-align: right;">29,464</td> </tr> <tr> <td style="text-align: center;">2016</td> <td style="text-align: right;">(20,812,593)</td> <td style="text-align: center;">20%</td> <td style="text-align: right;">(4,162,519)</td> </tr> <tr> <td style="text-align: center;">2017</td> <td style="text-align: right;">2,099,374</td> <td style="text-align: center;">20%</td> <td style="text-align: right;">419,875</td> </tr> <tr> <td style="text-align: center;">2018</td> <td style="text-align: right;">\$ 3,418,118</td> <td style="text-align: center;">20%</td> <td style="text-align: right;"><u>683,624</u></td> </tr> </tbody> </table>	Year Ending <u>May 31</u>	Unexpected <u>Amount</u>	Percentage <u>Recognized</u>	Recognized <u>Amount</u>	2014	\$ 11,514,235	20%	\$ 2,302,847	2015	147,322	20%	29,464	2016	(20,812,593)	20%	(4,162,519)	2017	2,099,374	20%	419,875	2018	\$ 3,418,118	20%	<u>683,624</u>
Year Ending <u>May 31</u>	Unexpected <u>Amount</u>	Percentage <u>Recognized</u>	Recognized <u>Amount</u>																						
2014	\$ 11,514,235	20%	\$ 2,302,847																						
2015	147,322	20%	29,464																						
2016	(20,812,593)	20%	(4,162,519)																						
2017	2,099,374	20%	419,875																						
2018	\$ 3,418,118	20%	<u>683,624</u>																						
2. Total recognized amount	\$ (726,709)																								
3. Forced recognition (due to +/-20% corridor)	<u>0</u>																								
4. Total investment income (1+2+3)	\$ 14,821,103																								
C. Employer contributions	\$ 12,307,670																								
D. Distributions:																									
1. Benefit payments	\$ (16,643,604)																								
2. Administrative expenses	<u>(657,022)</u>																								
3. Total distributions	\$ (17,300,626)																								
E. Actuarial value as of 5/31/2018	\$ 228,075,065																								
F. Average invested value (A+.5 x (C+D3))	\$ 215,750,440																								
G. Rate of return (B4÷F)	6.87%																								
H. Assumed rate of return	7.50%																								
I. Expected income (H x F)	\$ 16,181,283																								
J. Asset gain/(loss) (B4-I)	\$ (1,360,180)																								

4.4.4 Total Gain/(Loss)

A.	Unfunded accrued liability (UAL) at 5/31/2017	\$ 47,543,108
B.	Annual cost of benefits and expenses at 5/31/2017	2,072,940
C.	Less contributions	(12,307,670)
D.	Interest on A, B, and C	<u>3,303,651</u>
E.	Expected unfunded accrued liability as of 5/31/2018 (A+B+C+D)	\$ 40,612,029
F.	Preliminary UAL before changes as of 5/31/2018	<u>43,124,761</u>
G.	Total gain/(loss), (E-F)	\$ (2,512,732)
H.	Change due to:	
	1. Assumption changes	\$ 4,186,335
	2. Plan amendments	0
	3. Method changes	<u>0</u>
	4. Subtotal changes	\$ 4,186,335
I.	Actual unfunded accrued liability as of 5/31/2018 (F+H4)	\$ 47,311,096
J.	Gain/(loss) due to:	
	1. Asset experience	\$ (1,360,180)
	2. Expenses	(31,634)
	3. Demographic experience	<u>(1,120,918)</u>
	4. Total gain/(loss)	\$ (2,512,732)

4.5 Historical Information

4.5.1 Gain/(Loss)

Plan Year Ending 5/31	Assets	Expenses	Demographic Assumptions	Total Gain/(Loss)
2006	\$ -	\$ -	\$ -	\$ 1,512,400
2007	1,705,000	-	(754,000)	\$ 951,000
2008	1,824,705	-	(607,605)	1,217,100
2009	(15,162,010)	-	(4,343,590)	(19,505,600)
2010	(2,860,551)	36,545	2,814,721	(9,285)
2011	(6,678,378)	421	(596,878)	(7,274,835)
2012	(11,326,727)	3,531	699,661	(10,623,535)
2013	(6,599,698)	(43,556)	(853,704)	(7,496,958)
2014	5,705,521	(2,469)	(437,230)	5,265,822
2015	5,511,733	11,221	(689,650)	4,833,304
2016	(2,160,680)	(52,209)	(3,370,661)	(5,583,550)
2017	1,384,786	(173,409)	4,695,184	5,906,561
2018	(1,360,180)	(31,634)	(1,120,918)	(2,512,732)
6-Year Average	\$ 413,580	\$ (48,676)	\$ (296,163)	\$ 68,741

Gain/(loss) analysis is one of the most important tools available to an actuary to ensure that his/her model of the Plan's funding is accurate. The exhibit above shows the total gain/(loss) broken down into three components: assets, administrative expense, and demographic assumptions.

The gain/(loss) on assets is very unpredictable due to the unpredictable returns on the market value of assets. Moreover, the gain/(loss) on assets is greatly influenced by the smoothing method if used. The pattern of asset gains is discussed later in this report.

After itemizing the gain/(loss) on assets and expense, what remains is the gain/(loss) on all the other demographic assumptions including retirement, turnover, disability, and mortality rates. Over time, to remain confident in the future funding, it is important that the gains and losses on the demographic assumptions average zero, or at least a relatively small number.

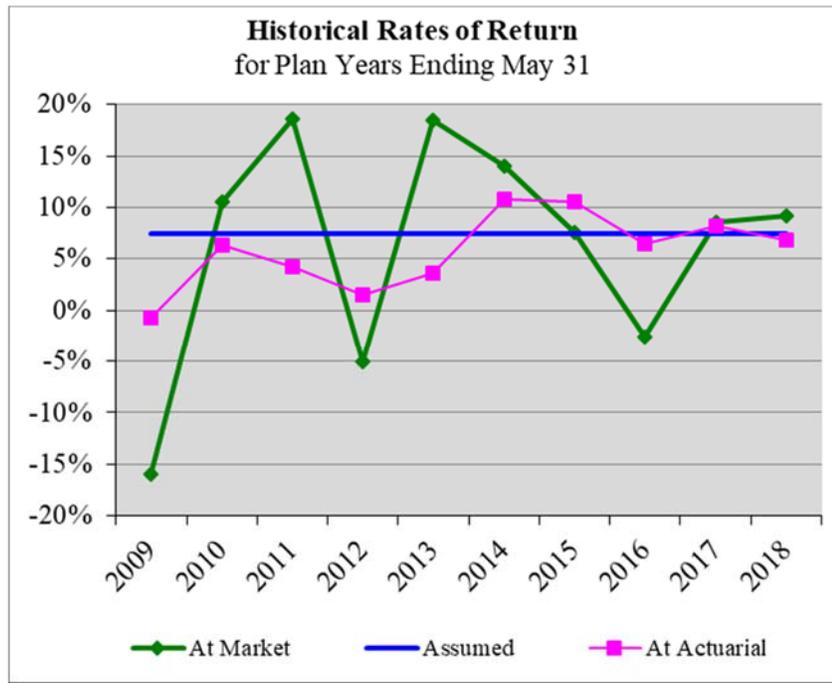
Experience prior to 2010 has been estimated from past actuarial reports. There was not enough detail for an accurate calculation and we suspect part of the large demographic loss in 2009 was actually investment loss.

For the last six years the Plan has averaged a modest loss on demographic assumptions and experienced both losses and gains. We have updated Plan mortality as shown in Section 6. We will continue to monitor this experience and recommend further assumption changes as necessary.

4.5.2 Asset Information

Plan Year Ending 5/31	<u>Rates of Return</u>						
	Contributions	Benefits	Expenses	Market	Market Value	At	At
				Investment Income	of Assets	Market	Actuarial
2009	\$ 5,111,964	\$ (8,749,338)	\$ (342,173)	\$ (27,701,019)	\$ 143,124,704	-16.0%	-0.7%
2010	4,670,996	(9,837,183)	(321,382)	14,751,231	152,388,366	10.5%	6.3%
2011	5,958,896	(11,168,252)	(334,574)	27,894,017	174,738,453	18.6%	4.2%
2012	6,803,596	(12,226,727)	(346,469)	(8,609,089)	160,359,764	-5.0%	1.6%
2013	5,942,032	(13,412,116)	(408,366)	28,902,778	181,384,092	18.5%	3.7%
2014	7,012,641	(14,046,686)	(419,394)	24,838,538	198,769,191	14.0%	10.9%
2015	9,229,512	(14,614,586)	(431,762)	14,836,880	207,789,235	7.6%	10.5%
2016	10,807,268	(15,165,745)	(521,250)	(5,411,390)	197,498,118	-2.6%	6.4%
2017	12,068,358	(15,868,524)	(642,450)	16,745,135	209,800,637	8.6%	8.2%
2018	12,307,670	(16,643,604)	(657,022)	18,965,930	\$ 223,773,611	9.1%	6.9%
Totals	\$ 79,912,933	\$ (131,732,761)	\$ (4,424,842)	\$ 105,213,011			

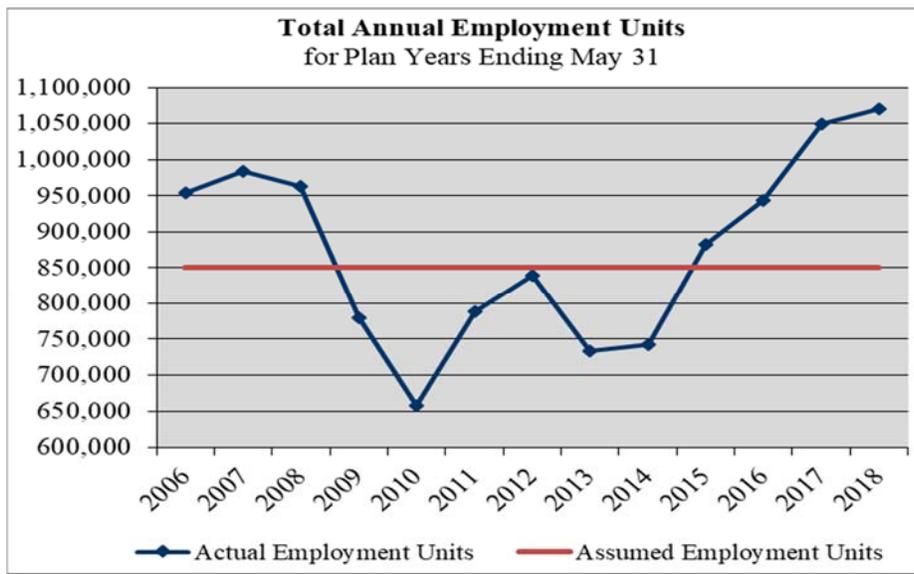
<u>Geometric Average</u>		
5-Year	7.2%	8.5%
10-Year	5.8%	5.7%



4.5.3 Employment

Plan Year Ending 5/31	Contribution Income	Hourly Contribution Rate	Weighted Avg CR	Employment Units
2006				953,799
2007				984,699
2008				962,847
2009				780,453
2010	\$ 4,670,996	\$7.60		657,887
2011	5,958,896	8.10	\$7.77	788,214
2012	6,803,596	8.10	8.10	839,950
2013	5,942,032	8.10	8.10	733,584
2014	7,012,641	9.45	9.45	742,078
2015	9,229,512	10.45	10.45	883,207
2016	10,807,268	11.45	11.45	943,866
2017	12,068,358	11.50	11.50	1,049,422
2018	\$12,307,670	\$11.50	\$11.50	1,070,232
			<u>Average</u>	
			2006 - 2008	967,115
			2009 - 2014	757,028
			2015 - present	986,682

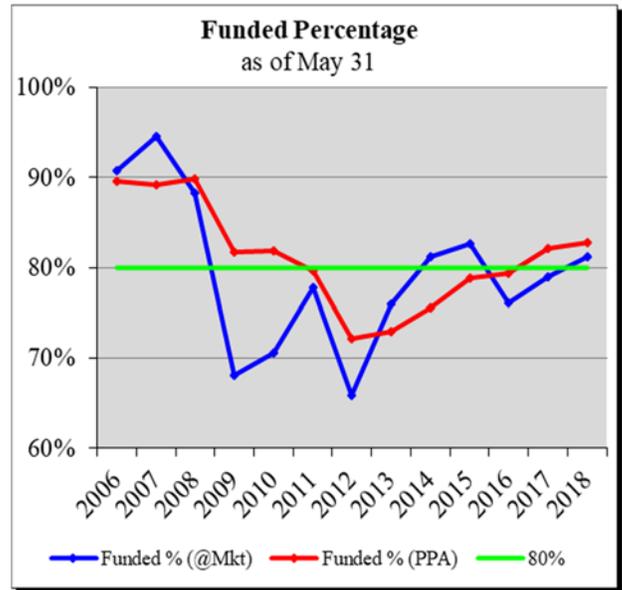
The employment assumption is 850,000 total units annually. Our assumption is set to resemble a long-term average. The employment units prior to 2009 are estimated based upon the prior actuary's valuation reports.



**Total employment units for the valuation is derived by dividing actual contributions by last year's projected contribution rate, and will not necessarily match reported hours by the Fund Office.*

4.5.4 Funded Percentage

Plan Year	Present Value		
Ending 5/31	Market Value of Assets	of Accrued Benefits	Funded Percentage
2006	\$ 157,000,000	\$ 173,000,000	90.8%
2007	175,000,000	185,000,000	94.6%
2008	174,805,270	198,000,000	88.3%
2009	143,124,704	210,000,000	68.2%
2010	152,388,366	215,938,339	70.6%
2011	174,738,453	224,469,464	77.8%
2012	160,359,764	243,368,205	65.9%
2013	181,384,092	238,625,199	76.0%
2014	198,769,191	244,754,779	81.2%
2015	207,789,235	251,369,112	82.7%
2016	197,498,118	259,418,048	76.1%
2017	209,800,637	265,790,026	78.9%
2018	\$ 223,773,611	\$ 275,386,161	81.3%



The Funded Percentage is a statistic commonly followed by Trustees. It provides an alternative measure of the Plan's current level of funding. The Funded Percentage compares the market value of assets to the value of benefits accrued as of the valuation date. Based on the market value of assets of \$223,773,611 and the total value of accumulated benefits of \$275,386,161, the Funded Percentage is 81.3% as of 5/31/2018.

The fact that the Funded Percentage is under 100% means that there are unfunded accumulated benefits when valuing the Plan on an ongoing basis. It does not necessarily imply that the Plan is underfunded on a long term basis because it makes no consideration of future contributions relative to future costs. The margin is the best single statistic to get a sense of how well funded the Plan is on a long term basis.

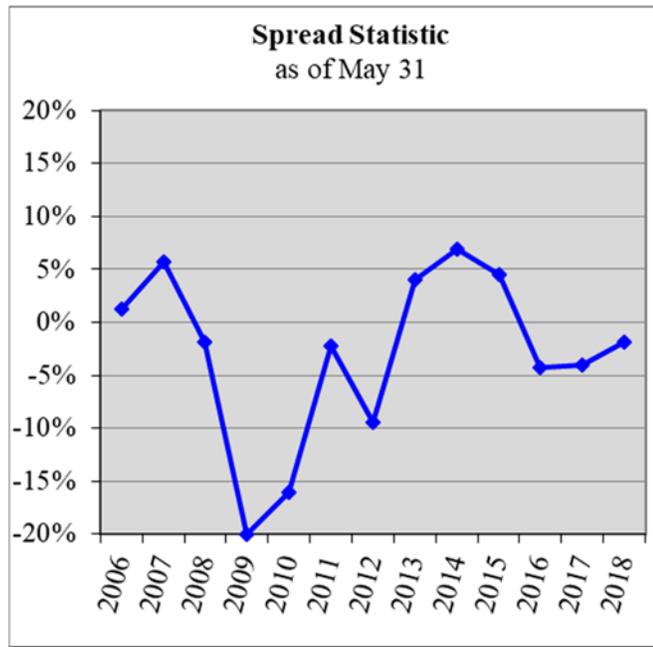
Moreover, the Funded Percentage is not a measure of funding on a plan termination basis. That would require a different interest assumption.

The Funded Percentage as per the Pension Protection Act, treating Detroit as if it was its own entity uses the actuarial value of assets and is 82.8% as of May 31, 2018.

* Prior to 2008 the market value of assets was estimated from prior actuary reports. Prior to 2010 the present value of accrued benefits was estimated. The present value of accrued benefits in 2010 and 2011 are the liabilities calculated using traditional unit credit as required by the PPA.

4.5.5 Actuarial Value of Assets Expressed as a Percent of Market Value

Plan Year Ending 5/31	Actuarial Value of Assets	Actuarial Assets as % of Market
2006	\$ 155,000,000	98.7%
2007	165,000,000	94.3%
2008	178,000,000	101.8%
2009	171,749,645	120.0%
2010	176,921,994	116.1%
2011	178,631,688	102.2%
2012	175,595,112	109.5%
2013	173,991,156	95.9%
2014	185,013,071	93.1%
2015	198,365,817	95.5%
2016	206,019,857	104.3%
2017	218,246,918	104.0%
2018	\$ 228,075,065	101.9%



The three primary measures that help an actuary assess how well funded a Trust is on a long-term basis are:

1. Margin,
2. Gain/loss analysis and an assessment of assumptions, and
3. Spread, defined as the difference between the market and actuarial value of assets expressed as a percentage of the market value of assets.

The margin and assumptions were covered in earlier sections.

The third factor is the Spread statistic. When positive it represents a cushion to help offset potential future unfavorable investment experience. Conversely, when the actuarial value is greater than the market value the Spread turns negative. When this is the case, future investment returns over and above the assumed return are necessary over time to restore the market value of assets equal to the actuarial value.

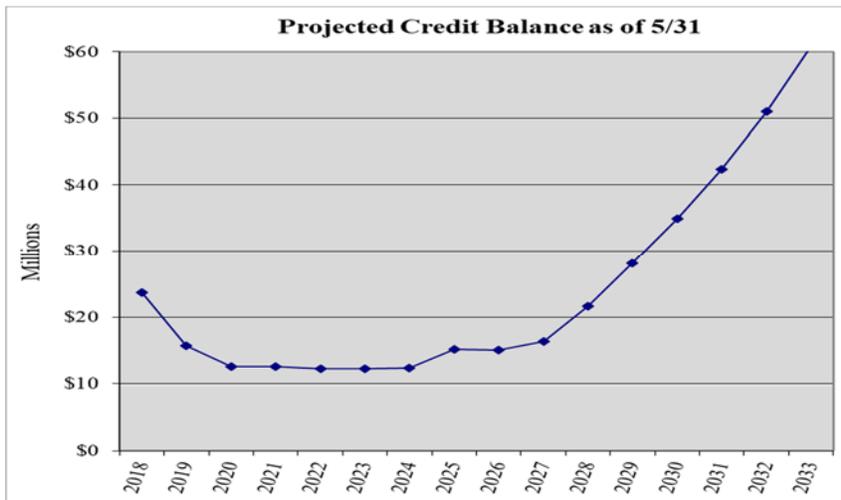
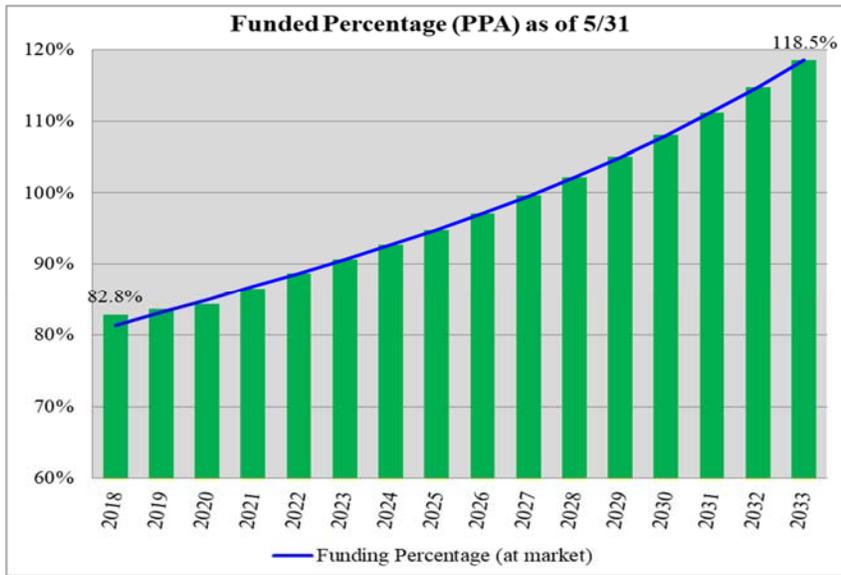
Currently the Spread is -1.9%.

* Estimated prior to 2009

4.6 Pension Projection Act: Rehabilitation Plan

Initial Critical Zone Certification:	June 1, 2012
Adoption Period:	08/29/2012 – 5/31/2014
Rehabilitation Period:	06/01/2014 – 5/31/2024
Emergence Date:	May 31, 2015
Initial Endangered Zone Certification:	June 1, 2015
Adoption Period:	08/29/2015 – 5/31/2017
Funding Improvement Period:	06/01/2017 – 5/31/2027
5/31/2027 Funding Benchmark:	86.1%
Initial non-Endangered (Green Zone) Certification:	6/1/2017

The charts below show our projected PPA Funding Percentage and credit balance. The projections assume there are no gains or losses on demographic assumptions and the market value of assets returns the assumed rate of 7.5%. Note the credit balance includes the effect of the automatic five-year amortization base extension.



5. ASC No. 960 Disclosures

5.1 Present Value of Accumulated Plan Benefits

As of 5/31/2018

A. Present Value of Vested Benefits:	
1. Participants currently receiving payments	\$ 183,080,144
2. Other vested benefits	<u>86,830,787</u>
3. Subtotal vested benefits	\$ 269,910,931
B. Present Value of Non-Vested Benefits	<u>5,475,230</u>
C. Present Value of Accumulated Benefits (A+B)	\$ 275,386,161

The ASC No. 960 values were computed using the same assumptions as those used for determining funding requirements.

5.2 Reconciliation of Changes in Present Value of Accumulated Benefits

A. Present Value of Accumulated Benefits at Prior Valuation Date	\$ 265,790,026
B. Changes During the Year Due to:	
1. Benefits accumulated and net gains	\$ 2,743,287
2. Benefits paid	(16,643,604)
3. Assumption changes	4,186,335
4. Method changes	0
5. Plan amendments	0
6. Passage of time	<u>19,310,117</u>
7. Total change	\$ 9,596,135
C. Present Value of Accumulated Benefits at Current Valuation Date	\$ 275,386,161

6. Government Reporting

6.1 Summary of Assumptions

These are the assumptions used for the ongoing valuation calculations, unless otherwise noted.

Mortality:	Pre-Decrement:	RP-2014 Blue Collar Employee
	Post-Decrement:	RP-2014 Blue Collar Annuitant
	Post-Disablement:	RP-2014 Disabled Annuitant

All tables use Scale MP-2016 generational mortality improvement.

Disability and Termination Rates	Disability		Termination Completed Years of Employment			
	Age	Male	Female	< 1	1 - 2	2+
	20	0.13%	0.15%	50%	25%	7%
	25	0.13	0.15	50	25	7
	30	0.13	0.15	50	20	6
	35	0.13	0.15	50	15	5
	40	0.26	0.45	50	10	5
	45	0.51	0.58	50	10	5
	50	0.96	0.89	50	6	1.5
	55	0.96	1.35	50	6	0
	60	1.74%	1.53%	0%	0%	0%

Retirement Rates

Active	Age	For those eligible for unreduced	For those not eligible for unreduced
		Early Retirement	Early Retirement
	<55	.60	N/A
	55-56	.60	.05
	57	.70	.10
	58	.80	.15
	59	.90	.20
	60	1.00	.33
	61	1.00	.50
	62	1.00	1.00

Inactive	Under 30 years of Credited Service	Immediately upon eligibility for an unreduced benefit
Vested	30 or more years of Credited Service	Age 55, or immediately if older

Future Employment: 850,000 total employment units

Unknown Data for Participants: Active participants with missing dates of birth are assumed to be age 40. Other missing information was assumed to be the same as those exhibited by participants with similar known characteristics. If not specified, participants are assumed to be male.

Definition of Active	500 hours of contributions, unless retired as of the valuation date.
Percent Married:	80% for males and 70% for females
Age of Spouse:	Females 3 years younger than males
Net Investment Return:	7.50%
Expenses:	\$650,000, annually increasing 3.0% per year
Actuarial Value of Assets:	The market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual market return and the expected return on the market value, and is recognized over a five-year period. The actuarial value is further adjusted, if necessary, to be within 20% of the market value.
Actuarial Cost Method	Unit Credit Actuarial Cost Method. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by service.

Current Liability Assumptions

Interest	3.00%
Mortality	Mortality prescribed under IRS Regulations 1.431(c)(6)-1 and 1.430(h)(3)-1

Assumption Changes

Mortality:	Changed the mortality set forwards from one year to zero.
Future Employment:	From 800,000 total employment units per year to 850,000 total employment units per year.
Expenses:	From \$600,000 to \$650,000 (annually increasing 3.0% per year)

Rationale for Assumptions

Demographic	The demographic rates utilized are standard tables that approximate recent historical demographic experience, and adjusted to reflect anticipated future experience and professional judgment. A comparison of actual vs. expected decrements, and aggregate liability gain/loss analysis were used to validate the demographic assumptions.
Administrative Expense and Employment	The Administrative Expense and Employment assumptions approximate recent historical experience, and adjusted to reflect anticipated future experience and professional judgment. When appropriate we

include the expectations of Trustees and co-professionals for these assumptions.

Investment
Return

The investment return assumption is a long-term estimate that is based on historical experience, future market expectations, and professional judgment. We have utilized the investment manager's capital market expectations, and have compared those expectations with a broader market survey.

6.2 Summary of Plan Provisions

The following summarizes the major provisions of the Plan. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Plan Year:	June 1 through May 31
Pension Credit Year	June 1 through May 31
Participation	Begins earliest June 1 or December 1 after earning 1 year of Credited Service
Year of Credited Service	One year of Credited Service for 500 hours of contributions or 1,000 hours of service.
Vesting Years	One Vesting Year for each Year of Credited Service.
Normal Retirement	

Eligibility **Benefit accrued prior to 6/1/2005**
 Age 60 & 5 years of covered employment

On and after 6/1/2005
 Age 65 & 5 years of covered employment

Amount Sum of the following:

<u>Accrual Period</u>	<u>Benefit</u>
Pre 6/1/1962	\$2.00 for each Year of Credited Service. Maximum 10 years
6/1/1962 – 5/31/2003	4.0% of contributions
6/1/2003 – 5/31/2006	\$0.1315 per hour worked
6/1/2006 – 5/31/2008	\$0.1340 per hour worked
6/1/2008 – 5/31/2009	Greater of: ➤ \$0.1340 per hour worked from 6/1/2008 to 9/30/2008 ➤ \$0.1285 per hour worked from 6/1/2008 to 5/31/2009
6/1/2009 – 6/30/2009	\$0.1285 per hour worked
7/1/2009 – 5/31/2013	\$0.01 per hour worked
On and after 6/1/2013	\$0.05 per hour worked

Normal Form If married: Reduced 50% J&S (Husband & Wife Form)
 If rejected, or if not married: Life

Early Retirement

Eligibility Age 55 with 10 years of Credited Service

Amount For Active Participants:

Normal retirement benefit, reduced 6% for each year of age less than 60,

For Inactive Participants:

Full actuarial reduction from Normal Retirement Age, with sample rates as follows:

Actual Retirement Age	Normal Retirement Age	
	60	65
55	59.1057%	33.1021%
58	80.5858%	45.1321%
60	100%	56.0050%

Early Enhanced

Eligibility

For Active Participants:

- Age 55 with 30 years of credited service, or
- Credited Service and age equal to or greater than 88 as of 5/31/2013

For Inactive Vested Participants:

- Age 55 with 30 years of credited service

Amount

For Active Participants: Unreduced

For Inactive Vested Participants: Reduced 6% from age 60

Disability:

None, effective 6/1/2013

Vesting:

Eligibility

5 years of Credited Service

Amount

Normal (or Early) benefit

Pre-Retirement Death Benefit

Eligibility

5 years of Credited Service

Amount

To spouse: 50% of the actuarially reduced benefit the participant would have received had he retired the day before he died and elected the 50% J&S option. If the participant died prior to eligibility for a Normal or Early Retirement pension, the spouse's benefit is deferred to the date participant would have been eligible for a Normal or Early Retirement pension.

Lump Sum

None, effective 9/28/2012, due to Critical Status

Post-Retirement Death Benefit As per the annuity form selected.

*Optional
Forms*

Optional form available in an actuarially equivalent amount:

- 50 % J&S (“**Husband & Wife Form**”) (for married participants only)
- 75% J&S (for married participants only)
- 100% J&S (for married participants only)
- *Lump Sum – Eliminated effective 9/28/2012, due to Critical Status*

*Sample
Option Form
Reductions*

Participant: Age 62, Spouse: Age 59

- 50% J&S: 90.6788%
- 75% J&S: 86.6408%
- 100% J&S: 82.9471%

6.3 Recent Plan Changes

<u>Effective</u>	<u>Plan Change</u>
2014	Terminated vested participants with 30 or more years of Credited Service may retire early with a reduction of 6% per year for each year prior to age 60.
2013	Benefits accrued after 5/31/2013 equal \$5.00 per 100 hours worked Disability benefits were eliminated Rule of 88 was eliminated for participants not already eligible for it as of 5/31/2013 Early retirement for Inactive Participants is subject to a full actuarial reduction from Normal Retirement Age All joint and survivor options are subject to a full actuarial reduction Lump sums were eliminated
2009	Benefits accrued after 6/30/2009 equal \$1.00 per 100 hours worked
2009	Benefits accrued after 5/31/2009 equal \$0.1285 per hour worked
2008	Benefits accrued after 5/31/2008 equal greater of: ➤ \$0.1340 per hour worked from 6/1/2008 to 9/30/2008 ➤ \$0.1285 per hour worked from 6/1/2008 to 5/31/2009
2006	Benefits accrued after 5/31/2006 equal \$0.1340 per hour worked
2003	Benefits accrued after 5/31/2003 equal \$0.1315 per hour worked

6.4 Contribution Rate History

Approx. Effective <u>Date</u>	Hourly Contribution <u>Rate</u>
6/1/2006	\$ 5.60
6/1/2007	6.10
6/1/2008	6.55
6/1/2009	7.10
6/1/2010	7.60
6/1/2011	8.10
6/1/2012	8.10
6/1/2013	9.45
6/1/2014	10.45
6/1/2015	11.45
6/1/2016	11.50
6/1/2017	11.50
6/1/2018	\$ 11.50

6.5 Funding Standard Account and Minimum Required Contributions

Rules for determining minimum required and maximum deductible contributions are set forth in IRC Sections 412 and 404, respectively. Since deductibility may be affected by factors not considered here, the deductibility and timing of contributions should be reviewed with tax counsel.

	Actual <u>2018</u>	Projected <u>2019</u>
For Plan Year ending May 31:		
Charges to the FSA:		
a. Normal cost	\$ 2,072,940	\$ 2,292,137
b. Amortization charges	13,887,706	24,605,111
c. Interest on a and b	<u>1,197,048</u>	<u>2,017,294</u>
d. Total charges	\$ 17,157,694	\$ 28,914,542
Credits to FSA:		
e. Credit Balance at beginning of year	\$ 18,427,743	\$ 23,718,726
f. Employer contributions	12,307,670	10,350,000
g. Amortization credits	7,759,418	7,759,415
h. Interest on above	<u>2,381,589</u>	<u>2,711,996</u>
i. Total credits	\$ 40,876,420	\$ 44,540,137
Credit Balance at end of Year	\$ 23,718,726	\$ 15,625,595
Minimum Required Contribution (d - (e + g) x (1.075))	\$ 0	\$ 0
Minimum Without Regard to the Credit Balance (d - g x (1.075))	\$ 8,816,320	\$ 20,573,171

A Plan's Credit Balance represents a cumulative measure of all prior contributions (since the initial ERISA effective date) against all prior minimum requirements. If cumulative contributions exceed cumulative minimums, then the Funding Standard Account will maintain a Credit Balance which can be used to offset any current year minimum requirements. As of May 31, 2018, the Plan has a Credit Balance of \$23,718,726. The minimum requirement for the year ending May 31, 2019 is \$0 after recognition of the Credit Balance.

6.6 Maximum Deductible Contribution

A. Traditional Maximum Deductible	\$ 8,657,859
B. 140% of Projected RPA Current Liability, less Projected Actuarial Value of Assets	435,047,174
C. Minimum Required Contribution	<u>0</u>
D. Greatest of A, B, and C	\$435,047,174

The maximum allowable deduction for the fiscal year ending May 31, 2019 is \$435,047,174. To be deductible for a given fiscal year, a contribution should be made by the time the tax return for that fiscal year is filed with the IRS (including extensions). Specific advice on the deductibility of contributions and timing should be reviewed with your tax counsel.

6.7 Current Liability at Beginning of Plan Year

Current liability is the present value of accrued benefits under the Plan using actuarial assumptions as prescribed by the Retirement Protection Act of 1994 (RPA '94). The liability is determined using the same assumptions used to determine the Plan's funding requirements, except for the interest rate and mortality table. These values are used for specific, prescribed purposes.

RPA '94 Current Liability:

A. Assumptions:			
1. Interest rate			3.00%
2. Mortality table		IRS Static Mortality Table per IRC §1.430(h)(3)-1	
B. RPA '94 Current Liability			
		<u>Vested Benefits</u>	<u>Total Benefits</u>
1. Retirees and beneficiaries receiving payments	\$ 273,177,392	\$ 273,177,392	\$ 273,177,392
2. Inactive vested participants	76,515,365	76,515,365	76,515,365
3. Actives	<u>106,593,664</u>	<u>106,593,664</u>	<u>120,994,075</u>
4. Total	\$ 456,286,421	\$ 456,286,421	\$ 470,686,832
C. Expected Increase in Liability			
			\$ 4,565,278
D. Expected Benefits to be paid During the Year			
			\$ 17,392,566

6.8 Amortization Schedule for Minimum Required Contribution

Amortization Charges as of June 1, 2018

Date Established	Base Type	Outstanding Balance	Years Remaining	Amortization Amount
1976	Original UAL	26,302	1	26,302
1977	Plan Amendment	153,354	1	153,354
1980	Plan Amendment	329,443	2	170,675
1984	Plan Amendment	185,718	1	185,718
1985	Plan Amendment	12,402	1	12,402
1986	Plan Amendment	240,154	1	240,154
1987	Plan Amendment	1,033,979	1	1,033,979
1989	Plan Amendment	1,170,557	1	1,170,557
1990	Plan Amendment	1,266,240	2	656,004
1991	Plan Amendment	252,075	3	90,170
1992	Plan Amendment	1,560,369	4	433,373
1993	Plan Amendment	854,820	5	196,541
1994	Plan Amendment	178,951	6	35,465
1995	Plan Amendment	517,611	7	90,907
1996	Plan Amendment	129,679	8	20,595
1996	Plan Amendment	622,742	8	98,901
1997	Plan Amendment	2,365,961	9	345,028
1997	Assumption Change	2,797,866	9	408,013
1998	Plan Amendment	7,454,287	10	1,010,218
1999	Plan Amendment	2,959,415	11	376,321
2000	Plan Amendment	3,988,949	12	479,705
2001	Plan Amendment	1,395,417	13	159,745
2002	Experience Loss	740,958	1	740,958
2002	Plan Amendment	3,013,915	14	330,262
2003	Plan Amendment	3,032,232	15	319,547
2003	Experience Loss	2,226,666	1	2,226,666
2004	Experience Loss	230,584	1	230,584
2004	Plan Amendment	962,776	16	97,971
2004	Assumption Change	2,626,064	16	267,226

Amortization Charges as of June 1, 2018, continued

Date Established	Base Type	Outstanding Balance	Years Remaining	Amortization Amount
2005	Experience Loss	2,634,329	2	1,364,773
2006	Plan Amendment	172,928	18	16,574
2007	Plan Amendment	1,888,734	19	176,418
2008	Plan Amendment	82,055	6	16,262
2008	Plan Amendment	138,144	5	31,762
2009	Experience Loss	16,165,169	6	3,203,634
2010	Experience Loss	6,832	7	1,200
2010	Change Funding Method	2,300,140	2	1,191,639
2011	Experience Loss	5,717,095	8	907,965
2011	Assumption Change	1,424,910	8	226,298
2012	Experience Loss	8,846,427	9	1,290,074
2012	Assumption Change	10,962,457	9	1,598,654
2013	Experience Loss	5,829,730	10	790,055
2014	Plan Amendment	677,600	11	86,164
2015	Assumption Change	969,157	12	116,549
2016	Experience Loss	5,139,959	13	588,414
2017	Assumption Change	6,254,522	14	685,364
2018	Experience Loss	<u>2,512,732</u>	15	<u>264,800</u>
	Totals	\$ 114,052,406		\$ 24,163,940

Amortization Credits as of June 1, 2018

Date Established	Base Type	Outstanding Balance	Years Remaining	Amortization Amount
1989	Assumption Change	(186,666)	1	(186,666)
1991	Assumption Change	(914,142)	3	(326,997)
2001	Assumption Change	(475,495)	13	(54,434)
2005	Plan Amendment	(3,112,875)	17	(306,944)
2006	Experience Gain	(445,564)	3	(159,382)
2007	Experience Gain	(360,858)	4	(100,224)
2008	Experience Gain	(557,847)	5	(128,261)
2009	Assumption Change	(4,011,249)	6	(794,955)
2009	Plan Amendment	(14,649,350)	6.08	(2,872,724)
2012	Change Funding Method	(202,399)	4	(56,214)
2013	Plan Amendment	(8,012,575)	10	(1,085,879)
2014	Experience Gain	(4,364,018)	11	(554,930)
2015	Experience Gain	(4,235,466)	12	(509,351)
2017	Experience Gain	<u>(5,680,415)</u>	14	<u>(622,454)</u>
	Totals	\$ (47,208,919)		\$ (7,759,415)
	Net Charge/(Credit)	71,029,822		\$ 16,845,696

6.9 Equation of Balance

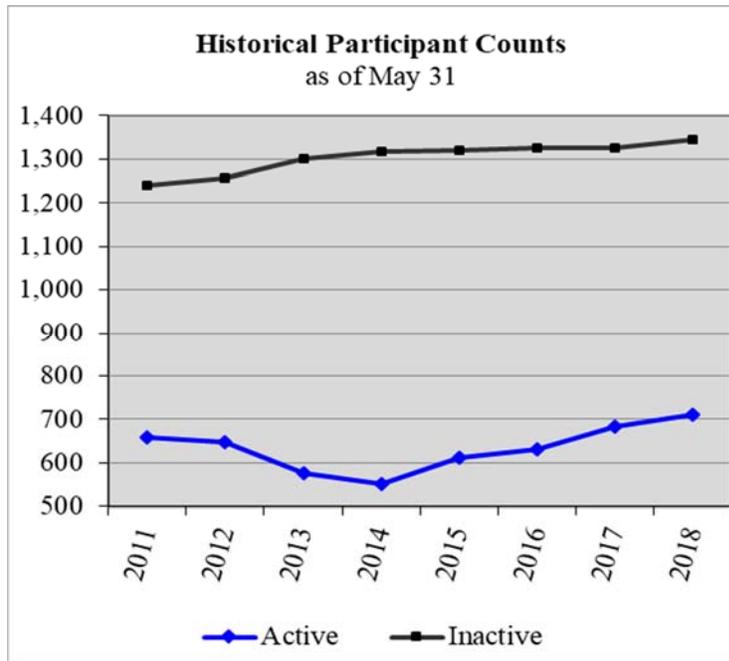
A. Net Outstanding Balance of Bases	\$ 71,029,822
B. Credit Balance	<u>23,718,726</u>
C. Unfunded Actuarial Accrued Liability (A-B)	\$ 47,311,096

7. Data Summary

7.1 Historical Participation

Plan Year Ending 5/31	Active	Inactive Vested	Retired	Total Inactive	Total	Ratio Inactive/Active
2007	802	1,473	487	1,960	2,762	2.44
2008	810	1,326	530	1,856	2,666	2.29
2009	822	1,154	545	1,699	2,521	2.07
2010	735	1,115	571	1,686	2,421	2.29
2011	658	630	611	1,241	1,899	1.89
2012	648	605	653	1,258	1,906	1.94
2013	576	618	682	1,300	1,876	2.26
2014	551	614	704	1,318	1,869	2.39
2015	612	592	729	1,321	1,933	2.16
2016	630	569	758	1,327	1,957	2.11
2017	683	540	786	1,326	2,009	1.94
2018	710	521	825	1,346	2,056	1.90

* From 2007 through 2010, included non-vested participants without a permanent break in service.



7.2 Flow of Lives

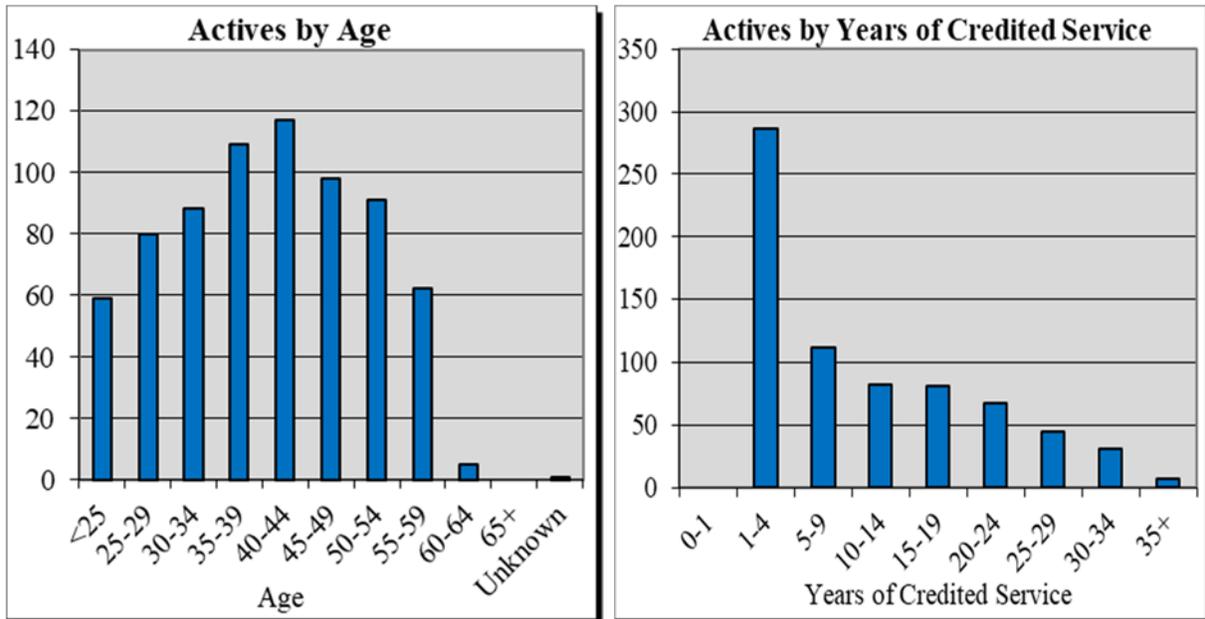
	Actives	Inactive Vested	Retired & Beneficiaries	Total
Beginning of year.....	683	540	786	2,009
To inactive vested.....	(19)	19	0	0
To inactive non-vested..	(68)	0	0	(68)
To retired.....	(32)	(22)	54	0
To disabled.....	0	0	0	0
Alternate Payee.....	0	0	2	2
Deaths.....	(1)	(2)	(26)	(29)
New Beneficiaries.....	0	0	9	9
Returned to work.....	13	(13)	0	0
New entrants.....	134	0	0	134
Data Corrections.....	0	(1)	0	(1)
End of year.....	710	521	825	2,056

7.3 Actives by Age and Service

Credited Service

Age	0-1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	Total
<25		56	3							59
25-29		54	22	4						80
30-34		44	23	17	4					88
35-39		48	23	21	14	3				109
40-44		37	22	17	21	15	5			117
45-49		19	8	12	19	27	11	2		98
50-54		13	7	6	11	12	15	22	5	91
55-59		12	4	5	12	10	12	5	2	62
60-64		2					1	2		5
65+										0
Unknown		1								1
Total	0	286	112	82	81	67	44	31	7	710

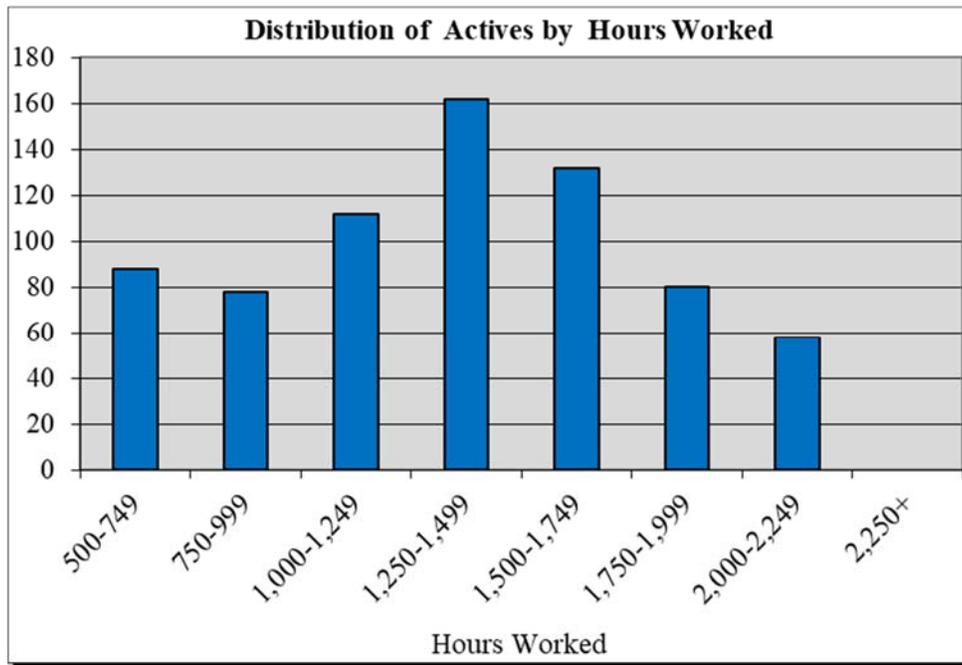
The average age of the active participants is 40.5, and the average Years of Credited Service is 10.6.



7.4 Distribution of Hours Worked by Actives (Plan Year ending 5/31/2018)

Hours Worked	
Between	Count
500-749	88
750-999	78
1,000-1,249	112
1,250-1,499	162
1,500-1,749	132
1,750-1,999	80
2,000-2,249	58
2,250+	0
Total	710

Average hours worked: 1,357



7.5 New Pensioners

Class	Number	Range of Monthly Pension			
		Average Age	Minimum	Average	Maximum
Normal	14	62.7	\$ 231	\$ 1,988	\$ 3,905
Unreduced Early	16	56.0	2,706	4,053	6,409
Reduced Early	<u>24</u>	<u>60.2</u>	<u>390</u>	<u>1,066</u>	<u>3,078</u>
Sub Total	54	59.6	\$ 231	\$ 2,190	\$ 6,409
Alternate Payee	2	54.2	\$ 980	\$ 1,311	\$ 1,642
Disabled	-	-	-	-	-
Survivor	<u>9</u>	<u>69.4</u>	<u>199</u>	<u>1,384</u>	<u>2,823</u>
Sub Total	11	66.6	\$ 199	\$ 1,370	\$ 2,823
Total	65	60.8	\$ 199	\$ 2,051	\$ 6,409

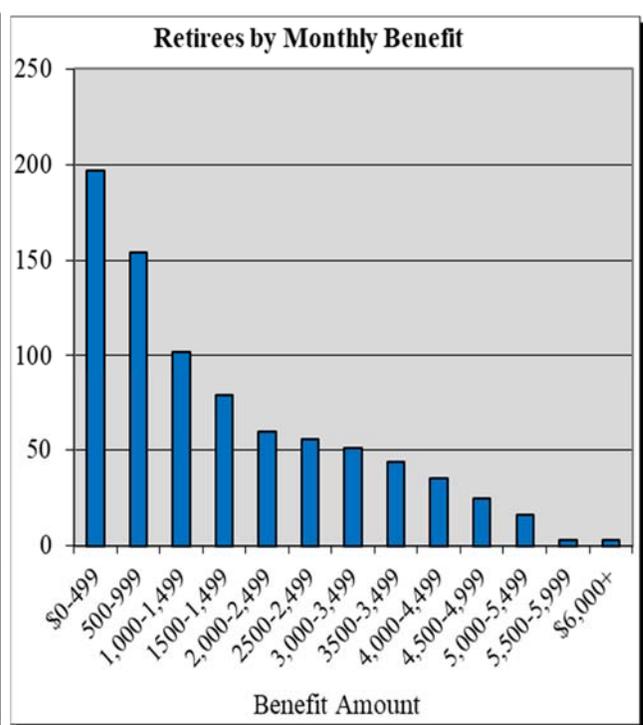
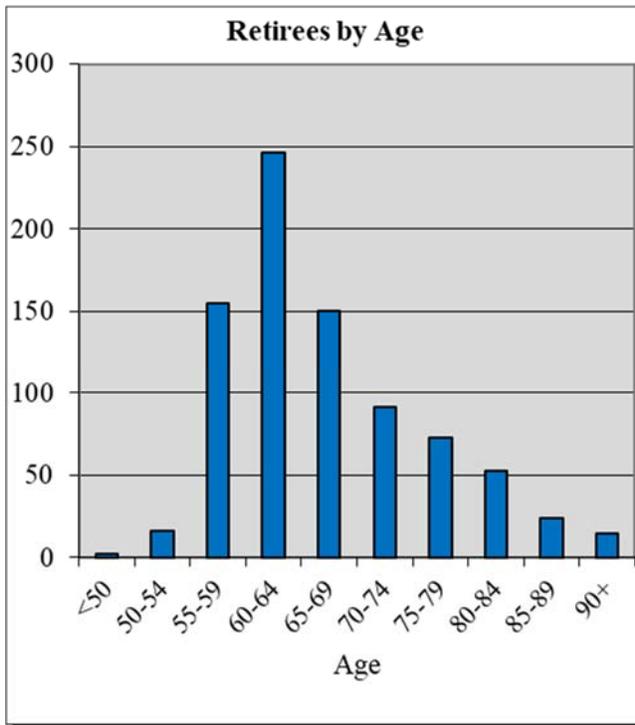
7.6 All Pensioners

Class	Number	Range of Monthly Pension			
		Average Age	Minimum	Average	Maximum
Normal	122	72.1	\$ 91	\$ 1,537	\$ 4,551
Unreduced Early	213	64.8	906	3,559	6,409
Reduced Early	<u>255</u>	<u>65.3</u>	<u>131</u>	<u>976</u>	<u>4,326</u>
Sub Total	590	66.5	\$ 91	\$ 2,025	\$ 6,409
Alternate Payee	40	62.8	\$ 147	\$ 766	\$ 2,707
Disabled	51	58.7	563	2,234	5,266
Survivor	<u>144</u>	<u>74.0</u>	<u>18</u>	<u>719</u>	<u>4,605</u>
Sub Total	235	68.8	\$ 18	\$ 1,056	\$ 5,266
Total	825	67.2	\$ 18	\$ 1,749	\$ 6,409

7.7 Distribution of Retired Participants

Monthly Pensions (from the Fund)

Age	\$0-499	500-999	1,000-1,499	1500-1,499	2,000-2,499	2500-2,499	3,000-3,499	3500-3,499	4,000-4,499	4,500-4,999	5,000-5,499	5,500-5,999	\$6,000+	Total
<50	1		1											2
50-54	3	3	1	4	2	1	2							16
55-59	18	23	16	15	8	17	14	17	12	5	7	1	2	155
60-64	36	52	32	30	19	10	15	14	16	14	6	2		246
65-69	36	31	13	11	11	15	14	6	5	4	3		1	150
70-74	33	16	11	8	4	6	4	7	1	1				91
75-79	22	14	12	5	10	6	2		1	1				73
80-84	27	7	10	4	4	1								53
85-89	13	3	4	2	2									24
90+	8	5	2											15
Unknown														0
Total	197	154	102	79	60	56	51	44	35	25	16	3	3	825



7.8 Distribution of Inactive Vested Participants

Accrued Benefit

Age	\$0-249	250-499	500-749	750-999	1,000-1,249	1,250-1,499	1,500-1,749	1,750-1,999	2,000-2,249	2,250-2,499	\$2,500+	Total
<25												0
25-29	2	2										4
30-34	5	5	4	4	2			1				21
35-39	1	15	10	5	7	4	1	3	1			47
40-44	3	9	8	13	11	6	3	3	3	1		60
45-49	4	9	23	13	14	5	5	7	1	2	2	85
50-54	3	14	33	21	20	12	8	7	2		9	129
55-59	1	21	19	30	17	10	5	2	1	2	12	120
60-64		13	13	7	4	1	3	1		1		43
65-69		3										3
70+	3	1	2	1								7
Unkown	2											2
Total	24	92	112	94	75	38	25	24	8	6	23	519

The average age of the inactive vested participants is 50.5, and the average monthly pension is \$996.

