

Actuarial Valuation Report

for

Lenawee County Board of Commissioners
Retirement Income Plan

as of

January 1, 2017

Contract Number: PF 473



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Actuarial Certification

I have reviewed the calculations performed for this report. They are based on the participant data provided by Lenawee County Board of Commissioners, the plan provisions summarized herein, and asset information provided by MassMutual. While I have not independently audited the participant data I have checked it for reasonableness and believe it is consistent and comparable with data used in prior valuations.

Each prescribed assumption was applied in accordance with applicable law and regulations. Each other actuarial assumption is reasonable, in my opinion, taking into account the experience of the plan and reasonable expectations. All calculations were performed using generally accepted actuarial principles and procedures. To the best of my knowledge, the results presented in this report are complete and accurate and are consistent with all applicable laws.

I am a member of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.



Kevin V. Osinski, ASA, EA
Enrolled Actuary No. 11-06368

June 30, 2017

Date

Executive Summary

This Actuarial Valuation Report is submitted in conjunction with the January 1, 2017 plan anniversary and reflects the funded position of the plan as of that point in time. This Executive Summary and the pages that follow provide details regarding the determination of your contribution requirement.

Analysis and Commentary

As of January 1, 2017 the Plan is 87% funded for benefits accrued to date, valued at an interest rate of 7.75%. The Employer's cost for the 2017 Plan Year is \$1,469,988, or about 30.81% of salaries of employees under normal retirement age. This recognizes the 10% employee contribution for all Groups. The cost for the 2016 Plan Year was \$1,516,950, or about 28.59% of salaries of employees under normal retirement age.

The interest rate to value the liabilities was changed from 7.90% (used for the 2016 valuation) to 7.75% for 2017. Similarly, the mortality table was changed from the RP 2014 mortality table with MP-14 generational projection scale to the RP 2014 mortality table with the MP-16 generational projection scale. As a result, the increase in liability due to the decrease in the interest rate was more than offset by the change in mortality table to produce a net decrease in liability of \$734,715 for changes in assumptions. The changes in assumptions were implemented to better reflect the expected rate of return on assets and latest Society of Actuaries mortality rates.

For 2016, the return on Market Value of Assets was approximately 7.48%. This valuation employs an asset smoothing method to determine an Actuarial Value of Assets used to calculate the annual funding amount. The return on an actuarial-value basis was approximately 5.51%. The expected return on assets is 7.9%. Since the Actuarial Value of assets did not achieve the 7.9% rate of return the Plan incurred an actuarial loss for 2016 (see page 9 of this report).

If you have any questions or would like any additional information, please do not hesitate to call.

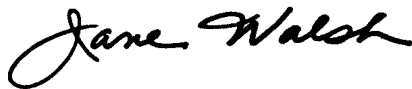
Respectfully submitted,



Kevin V. Osinski, ASA, EA
Consulting Actuary
1-(800)-349-8844, Ext. 42705

June 30, 2017

Date



Jane Walsh
Actuarial Analyst
1-(800)-349-8844, Ext. 43683

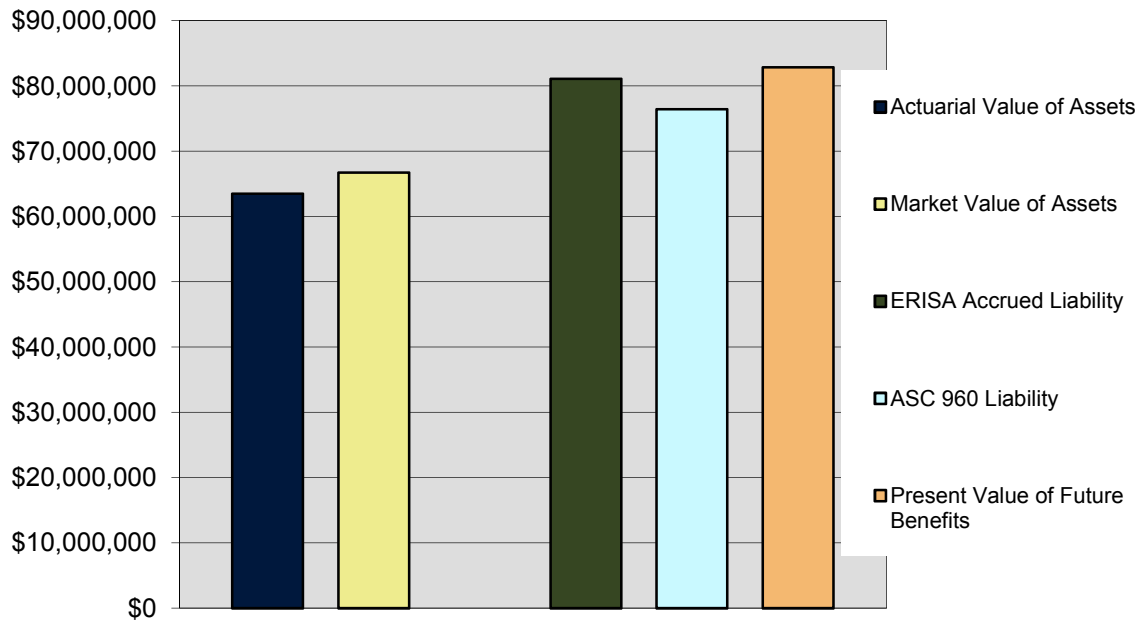
June 30, 2017

Date

Measures of Plan Liability and Assets

	Accrued Liabilities	Present Value of Accrued Benefits	Present Value of Future Benefits
Active	\$ 30,556,394	\$ 25,880,330	\$ 32,306,453
Terminated Vested	3,047,996	3,047,996	3,047,996
Retired	44,713,533	44,713,533	44,713,533
Disabled Receiving Benefits	665,753	665,753	665,753
Opt-Out Employees	2,124,652	2,124,652	2,124,652
Total	\$ 81,108,328	\$ 76,432,264	\$ 82,858,387

Actuarial Value of Assets:	\$ 63,502,854
Market Value of Assets:	\$ 66,725,800



Measures of Plan Liability and Assets

Liability Measurement

Before comparing and contrasting different measures of Plan liability, it is first necessary to briefly discuss how liability is measured. In order to measure any pension plan liability, assumptions must be made pertaining to what may happen in the future. Two important assumptions are the interest rate and the mortality assumptions.

The interest assumption determines the time-value of money. In other words, it determines how much is needed today to grow to a given amount at some time in the future. A pension plan's liability consists of promises to pay benefits at some time in the future, so a measure of that liability is how much money is needed today to provide for those promised benefits in the future.

The mortality assumption predicts how long a participant will live. Since retirement benefits are generally paid for the participant's life, the mortality assumption predicts how long retirement benefits will be paid.

For some purposes, the value of annuities that have been purchased for non-highly compensated employees must be included in the liability measurement.

Asset Measurement

Actuarial Value of Assets is the asset value used in the determination of the plan's contribution requirements, maximum tax-deductible limits and the plan's funded status. It is either equal to the Market Value of Assets or an average of market values. Please see the Funding Methods section of this Report for a description of the method used to determine the Actuarial Value of Assets.

Either value includes contributions that have been made after the valuation date for the prior Plan Year.

Present Value of Future Benefits

This is the liability associated with the promise to pay the benefits that participants will be entitled to assuming they work until retirement. Of the four measures of liability discussed here, this is typically the largest because it is based on projected benefits. In other words, it includes not only benefits that have been accrued to date, but also benefits that are expected to be earned in the future. The interest and mortality assumptions are chosen by the plan actuary. The interest assumption is a reasonable long-term expectation of future asset returns given how plan assets are invested, and the mortality assumption is based on a standard, current mortality table.

ERISA Accrued Liability

This measure of liability is closely related to the Value of Future Benefits. Briefly, it is the portion of the Value of Future Benefits that the Actuarial Cost Method attributes to past service. In other words, it is the portion of the Value of Future Benefits that is deemed to be accrued. The actuarial assumptions used here are the same as those used in the Present Value of Future Benefits. Of the four liability measurements discussed here, this is probably the most difficult to understand. It is common to compare it to saving money to buy a home in cash. How much cash you'll need is analogous to the Present Value of Future Benefits. How far along you are in your schedule to accumulate the necessary cash is analogous to the ERISA Accrued Liability.

Present Value of Accrued Benefits

This liability measure is based on accrued benefits. It does not take into account future salary and service increases. The interest assumption is generally the expected long-term return on the plan's assets.

Contribution History

The following contributions have been made since January 1, 2016

<u>Date</u>	<u>Amount</u>	<u>For Plan Year</u>	<u>Plan Year's Interest Credited</u> ⁽³⁾
01/06/16 ⁽¹⁾	\$ 370,843	2015	\$ 0
03/30/16 ⁽¹⁾	291,785	2016	17,494
07/11/16 ⁽¹⁾	395,028	2016	14,877
09/29/16 ⁽¹⁾	323,072	2016	6,573
01/04/17 ⁽¹⁾	373,151	2016	0
01/06/16 ⁽²⁾	191,863	2015	0
03/30/16 ⁽²⁾	160,896	2016	9,646
07/11/16 ⁽²⁾	183,108	2016	6,896
09/29/16 ⁽²⁾	161,376	2016	3,283
01/09/17 ⁽²⁾	182,663	2016	0
Total	<u>\$ 2,633,786</u>		<u>\$ 58,769</u>

⁽¹⁾ Employer Contribution

⁽²⁾ Employee Contribution

⁽³⁾ This is interest credited to the contribution(s) at the valuation interest rate. It is not the actual earnings on the contributions.

Determination of Actuarial (Gain) or Loss for the 2017 Plan Year

A. Expected Unfunded Actuarial Accrued Liability

1. Unfunded Actuarial Accrued Liability as of January 1, 2016	\$ 17,634,095
2. Normal Cost as of January 1, 2016	395,415
3. Interest at 7.9 %	1,424,331
4. 2016 contributions plus interest at 7.9 %	<u>2,129,849</u>
5. Expected Unfunded Actuarial Accrued Liability as of January 1, 2017 (1) + (2) + (3) - (4); but not less than zero	\$ 17,323,992

B. Actual Unfunded Actuarial Accrued Liability

1. Actuarial Accrued Liability as of January 1, 2017	\$ 81,108,328
2. Actuarial Value of Assets as of January 1, 2017	<u>63,502,854</u>
3. Actual Unfunded Actuarial Accrued Liability as of January 1, 2017 (1) - (2); but not less than zero	\$ 17,605,474

C. Changes in Unfunded Actuarial Accrued Liability

1. Increase/(Decrease) due to Plan Amendment(s)	\$ 0
2. Increase/(Decrease) due to Assumption Change(s)	(734,715)
3. Increase/(Decrease) due to Funding Method Change	<u>0</u>
4. Total Changes: (1) + (2) + (3)	\$ (734,715)

D. Actuarial (Gain) or Loss

B(3) - C(4) - A(5)	1,016,196
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Contribution Breakdown for the 2017 Plan Year

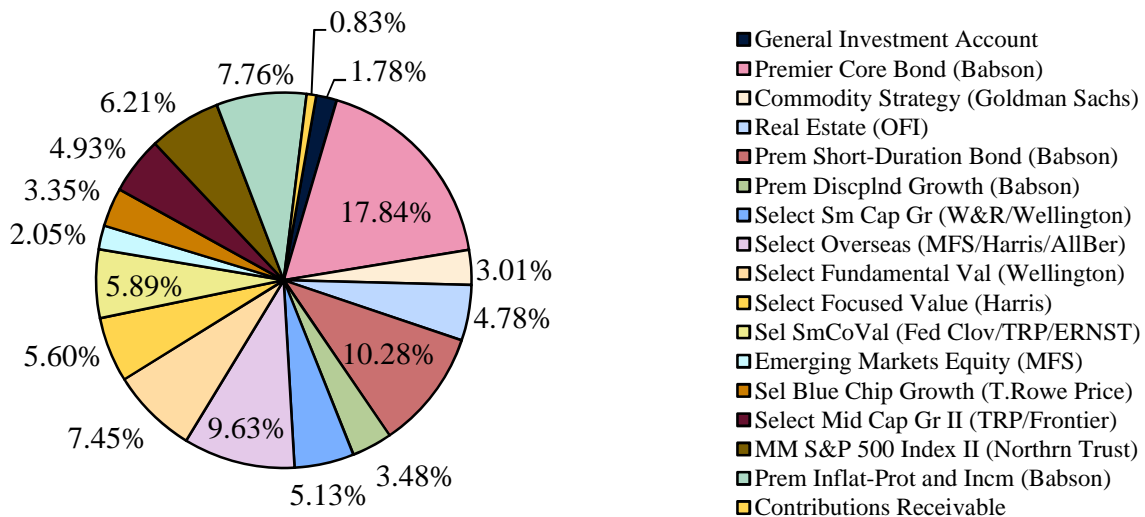
Below is a breakdown of the 2017 plan year contribution. To perform the breakdown, we first subtracted the actuarial accrued liability of the plan's inactive participants from the plan assets, and then allocated the remaining assets among the groups based on the actuarial accrued liability of the active participants. The unfunded actuarial accrued liability of each group was then amortized over a 20-year period. The resulting amortization payment was then added to the Normal Cost of each group to produce the recommended annual cost. Finally, the amount of anticipated employee contributions was subtracted from the total cost, to arrive at the annual contribution due from Lenawee County for each employee group.

	01 Sheriff- Command	02 Sheriff- Deputy	04 G.E.L.C. Union	05 County Non-Union	06 Steelworkers Union	61 Drain Commission	Total of All Groups
Active Employees	12	37	25	61	4	4	143
Average Age	48.04	49.09	52.07	55.54	58.55	54.91	52.7
Annual Salary (excluding employees over NRA)	\$743,807	\$1,748,844	\$687,328	\$1,338,994	\$82,939	\$169,966	\$4,771,878
Actuarial Accrued Liability (Active Employees)	\$3,560,030	\$8,248,939	\$4,115,846	\$13,588,805	\$417,246	\$625,528	\$30,556,394
Allocated Actuarial Value Plan Assets (Active Employees)	<u>1,508,871</u>	<u>3,496,203</u>	<u>1,744,446</u>	<u>5,759,434</u>	<u>176,844</u>	<u>265,122</u>	<u>12,950,920</u>
Unfunded Actuarial Accrued Liability (Active Employees)	2,051,159	4,752,736	2,371,400	7,829,371	240,402	360,406	17,605,474
Entry Age Normal Cost	47,751	130,877	38,774	74,312	7,657	14,461	313,832
Amortization Payment (20 yrs)	<u>190,296</u>	<u>440,934</u>	<u>220,006</u>	<u>726,368</u>	<u>22,303</u>	<u>33,437</u>	<u>1,633,344</u>
Total Annual Cost	\$238,047	\$571,811	\$258,780	\$800,680	\$29,960	\$47,898	\$1,947,176
Estimated Employee Contrib. (% salary)	74,381 (10.00%)	174,884 (10.00%)	68,733 (10.00%)	133,899 (10.00%)	8,294 (10.00%)	16,997 (10.00%)	477,188 (10.00%)
Employer Annual Cost (% salary)	\$163,666 (22.00%)	\$396,927 (22.70%)	\$190,047 (27.65%)	\$666,781 (49.80%)	\$21,666 (26.12%)	\$30,901 (18.18%)	\$1,469,988 (30.81%)

Plan Assets as of January 1, 2017

	<u>Market Value</u>
General Investment Account	\$ 1,188,596
Separate Investment Account E — Premier Core Bond (Babson)	11,906,481
Separate Investment Account JJ4 — Commodity Strategy (Goldman Sachs)	2,007,418
Separate Investment Account CB — Real Estate (OFI)	3,188,323
Separate Investment Account F — Prem Short-Duration Bond (Babson)	6,860,989
Separate Investment Account NU — Prem Disclnd Growth (Babson)	2,321,069
Separate Investment Account SC — Select Sm Cap Gr (W&R/Wellington)	3,419,808
Separate Investment Account SH — Select Overseas (MFS/Harris/AllBer)	6,425,473
Separate Investment Account SK — Select Fundamental Val (Wellington)	4,968,869
Separate Investment Account SV — Select Focused Value (Harris)	3,736,470
Separate Investment Account SY — Sel SmCoVal (Fed Clov/TRP/ERNST)	3,933,355
Separate Investment Account UA — Emerging Markets Equity (MFS)	1,368,314
Separate Investment Account W1 — Sel Blue Chip Growth (T.Rowe Price)	2,235,997
Separate Investment Account W9 — Select Mid Cap Gr II (TRP/Frontier)	3,286,378
Separate Investment Account X — MM S&P 500 Index II (Northrn Trust)	4,144,462
Separate Investment Account Y6 — Prem Inflat-Prot and Incm (Babson)	5,177,984
Subtotal	\$ 66,169,986
Contribution(s) Receivable	555,814
Total	\$ 66,725,800

Market Value of Assets



Asset Reconciliation

Asset Reconciliation	Actuarial Value	Market Value
	<hr/>	<hr/>
Assets as of January 1, 2016	\$ 62,759,863	\$ 64,104,582
Contributions	2,071,080	2,077,972
Investment Income	43,565	43,565
Appreciation/(Depreciation)	3,339,703	4,655,224
Gold Star Settlement Funds	39,149	39,149
Benefit Payments	(4,706,055)	(4,706,055)
Expenses	(44,450)	(44,450)
	<hr/>	<hr/>
Assets as of December 31, 2016	\$ 63,502,854	\$ 66,169,986 ⁽¹⁾
 Rate of Return ⁽²⁾	 5.51%	 7.48%

⁽¹⁾ Cash basis - does not include contribution(s) receivable.

⁽²⁾ Estimated assuming mid-year cash flows.

Participant Summary and Demographic Statistics

	<u>2016</u>	<u>2017</u>
Classification of Funded Participants as of January 1		
Actives Under Assumed Retirement Age	114	101
Actives Over Assumed Retirement Age	39	42
Terminated Vested	66	63
Retired	318	327
Disabled	6	5
Opt-out Active Employees	30	29
Total Participants	573	567
Total Monthly Benefits as of January 1		
Actives Under Assumed Retirement Age		
Accrued Benefits	\$ 184,957	\$ 172,062
Projected Benefits to Assumed Retirement	364,016	307,610
Actives Over Assumed Retirement Age	95,719	104,818
Terminated Vested	44,291	41,076
Retired	377,242	399,587
Disabled and Receiving Benefits	8,099	5,824
Opt-out Active Employees	28,597	28,205
Total Accrued	\$ 738,905	\$ 751,572
Total Projected	\$ 917,964	\$ 887,120
Demographic Statistics as of January 1		
Active Participants		
Average Age	52.11	52.70
Average Compensation	\$ 45,853	\$ 46,758
Terminated Vested Participants		
Average Age	55.10	55.20
Retired		
Average Age	71.70	72.14
Disabled Participants		
Average Age	55.50	51.00
Opt-out Active Employees		
Average Age	46.88	47.90

Participant Reconciliation

	<u>Active</u>	<u>Vested Term</u>	<u>In Pay Status</u>	<u>Opt-out Active</u>	<u>Total</u>
1. Number of Participants as of 1/1/2016	153	66	324	30	573
<hr/>					
2. Changes in status during the year:					
New Participants					0
Non-Vested Terminations					
Vested Terminations	(2)	2			0
Participants who Retired	(8)	(4)	13	(1)	0
Death without Beneficiary			(5)		(5)
Cashed Out					0
Rehired					0
Data Correction		(1)			(1)
<hr/>					
3. Number of Participants as of 1/1/2017	143	63	332	29	567

Actuarial Assumptions

Many of the factors affecting the funding cost and liability cost of the Plan are variables which cannot be predicted with certainty. The following actuarial assumptions have either been mandated by statute and regulation or selected to reasonably anticipate future experience with respect to these variables.

Interest:	7.75%
Preretirement Mortality:	RP-2014 Mortality Tables for Non-Annuitants, Fully Generational with Scale MP-2016
Postretirement Mortality:	RP-2014 Mortality Tables for Annuitants, Fully Generational with Scale MP-2016
Assumed Retirement:	Plan Normal Retirement Age
Termination:	Termination Table T-5 from the Actuary's Handbook with a 5-year setback for females
Incidence of Disability:	1952 Disability Table, Period 2, Benefit 5, with six month waiting period
Salary Scale:	3.0%
Marriage:	It is assumed that 80% of participants are married and that a male is 3 years older than his female spouse.
Expenses:	Interest rate is assumed to be net of plan expenses.
Optional Forms:	Liabilities include no load to account for the value of optional annuity forms.

Actuarial Cost and Asset Valuation Methods

Actuarial Cost Method

Individual Entry Age Normal

The Normal Cost is the level dollar premium necessary to fund the benefit projected to assumed retirement date over the working lifetime of each participants. The Accrued Liability is the excess of the present value as of the valuation date of the benefit projected to assumed retirement age over the present value of future Normal Costs. Or, equivalently, the accumulated value of all past Normal Costs. The benefit projected to assumed retirement date uses projected service, compensation if applicable, and any other components that would be used in the calculation of the benefit. The difference between the Accrued Liability and the Actuarial Value of Assets is the Unfunded Actuarial Accrued Liability. Each year the difference between the expected Unfunded Actuarial Accrued Liability (based on actuarial assumptions being realized exactly) and the actual Unfunded Actuarial Accrued Liability is the Actuarial Gain or Loss.

Asset Valuation Method

For assets held in the General Investment Account, Active Life Fund, or Experience Account, the Actuarial Value is assigned by the Insurance Company.

For assets held in the Separate Accounts listed below, the Actuarial Value is equal to the prior year's Actuarial Value plus the net deposit and investment income, minus withdrawals, plus (or minus) 50% of the unrecognized appreciation (or depreciation) during the year. The Actuarial Value is not greater than 120% of the Market Value, or less than 80% of the Market Value.

Separate Investment Accounts E, JJ4,CB, CE, NU, PSC, SH, SK, SV, SY, UA, W1, W9, X and Y6

For assets held outside of the Insurance Company, the Actuarial Value is equal to the reported value.

Separate Investment Account F

Summary of Plan Provisions

The provisions shown here are only summaries. In the interest of space and simplicity, many of them have been abbreviated, simplified, or paraphrased. In matters of Plan interpretation or application, the actual Plan Document should be consulted.

Plan: Lenawee County Board of Commissioners Retirement Income Plan

Employer Identification Number / Plan Number: 38-6005798 / 001

Effective Date: January 1, 1976

Plan Year: Calendar Year

Employer: Lenawee County Board of Commissioners

Employee: Any person who is employed by the Employer. An individual who performs services for the Employer pursuant to an agreement between the Employer and an employee leasing organization shall not be considered to be an Employee.

Participation: Each person employed by the County in a position normally requiring 1,000 hours or more per year is eligible to join the plan on date of hire. Except that Participation has been frozen for the following Groups:

Group 01: Sheriff Command (Police Officers Labor Council) - Employees hired after January 1, 2006

Group 02: Sheriff Deputy (Police Officers Association of Michigan) - Employees hired after September 1, 2005

Group 03: Nurses M.N.A. Union - Employees hired after January 31, 2002

Group 04: Government Employees' Labor Council - Employees hired after May 1, 2003, except that for District Court Employees, after March 1, 2004

Group 05: Lenawee County Employees (Non-union) - Employees hired after January 1, 2001

Group 06: Steelworkers Union - Employees hired after August 1, 2002

Group 61: Drain Commission - Employees hired after January 1, 2002

Group 08: Medical Care Facility (Non-union) - Employees hired after January 1, 2008

Service: The period of an Employee's employment with the Employer, as determined by the Employer from its personnel records.

Vesting Service: All years of Service with the Employer from Date of Employment

Benefit Service: All years of Service with the Employer from Date of Employment

Average Monthly Earnings:

Group 01: Sheriff Command and Group 02: Sheriff Deputy - The average of Monthly Earnings in the period of 48 consecutive months with respect to which such sum is the greatest

All Other Groups - The average of Monthly Earnings in the period of 60 consecutive months with respect to which such sum is the greatest

Summary of Plan Provisions

Normal Retirement Date:

Group 01: Sheriff Command and Group 02: Sheriff Deputy - First day of the month coincident with otherwise next following the earlier of 1) age 55 and 25 years of service, and 2) age 65 and 8 years of service

Group 04: Government Employees' Labor Council (GELC), Group 05: Lenawee County Employees (Non-union), Group 06: Steelworkers Union, Group 03: Nurses M.N.A. Union, and Group 61: Drain Commission Employees - the earlier of 1) date age and years of service equal 85, and 2) age 62 and 8 years of service

All other Groups - Age 65 and 8 years of service

Early Retirement Date: Any Participant who has attained age 55 and completed 10 years of Benefit Service may elect early retirement on the first day of any calendar month following the termination of Service.

Disability Retirement Date: Any Participant who has completed 10 years of Benefit Service may elect disability retirement on the first day of any calendar month following the determination of total and permanent disability.

Normal Retirement Benefit:

Group 01: Sheriff Command - 2.50% of average monthly earnings times all years of benefit service. The maximum monthly benefit is 80% of average monthly earnings.

Group 02: Sheriff Deputy - 2.50% of average monthly earnings times all years of benefit service. The maximum monthly benefit is 80% of average monthly earnings.

Group 03: Nurses M.N.A. Union - 2.00% of average monthly earnings times all years of benefit service.

Group 04: Government Employees' Labor Council - 2.00% of average monthly earnings times all years of benefit service.

Group 05: Lenawee County Employees (Non-union) - 2.00% of average monthly earnings times all years of benefit service.

Group 06: Steelworkers Union - 2.00% of average monthly earnings times all years of benefit service.

Group 61: Drain Commission - 2.00% of average monthly earnings times all years of benefit service.

Group 07: Medical Care Facility (Union) - 1.00% of average monthly earnings times all years of benefit service.

Group 08: Medical Care Facility (Non-union) - 2.50% of average monthly earnings times all years of benefit service.

Summary of Plan Provisions

Termination Benefit: A Participant who has at least eight years of Vesting Service has a nonforfeitable right to 100% of his or her Accrued Benefit. Benefit is payable at Normal Retirement

Early Retirement Benefit: The accrued benefit reduced 1/15 for the first five years, and 1/30 for the next five years for each year the Retirement Date precedes the Normal Retirement Date.

Disability Retirement Benefit: The accrued benefit reduced by any amounts payable under any worker's compensation or salary continuance program.

Normal Form: Single: Modified Cash Refund; Married: Qualified 50% Joint and Survivor Annuity

Optional Forms: Joint and Survivor Annuity, Life Annuity with 60 or 120 monthly payments

Death Benefits:

For all employees except Group 7: Medical Care Facility (Union)

Pre-retirement: If the Participant is not vested, no death benefits are payable. If the participant is vested, then the death benefit is 50% of the amount that would have been payable to the Participant under the 50% Joint and Survivor option.

Post-Retirement: None except as provided by the annuity form elected.

Employee Contributions: (picked up by the Employer under IRC §414(h)(2))

Group 01: Sheriff Command - 10.00% of pay

Group 02: Sheriff Deputy - 10.00% of pay

Group 03: Nurses M.N.A. Union - 10.00% of pay

Group 04: Government Employees' Labor Council (GELC) - 10.00% of pay

Group 05: Lenawee County Employees (Non-union) – 10.00% of pay

Group 06: Steelworkers Union - 10.00% of pay

Group 61: Drain Commission - 10.00% of pay

Spin-off of Medical Care Facility employees: Effective January 1, 2008, all non-retired employees of the Lenawee Medical Care Facility (Formerly Group 7 and Group 8 of this plan) were transferred to successor plans.

Opt-out Elections: Active participants in groups 03, 04, 05, 06, and 61 may elect to opt-out of participation in this plan for purposes of benefit accruals only. Vesting service and service for purposes of the Rule of 85 Retirement Age will continue to be credited. Each year the election period will run from November 15th to December 15th, and such election will take effect the following January 1st. At that time, the participant will commence participation in the County's Defined Contribution Plan.