Appendix to The Annual Actuarial Valuation Report December 31, 2018

Summary of Plan Provisions, Actuarial Assumptions and Actuarial Funding Method as of December 31, 2018

Introduction

The MERS Defined Benefit Plan is an agent multiple-employer plan, meaning that assets are pooled for investment purposes but separate accounts are maintained for each individual employer. Each municipality is responsible for their own plan liabilities. MERS does not borrow from one municipality's account to pay for another.

An actuarial valuation is the mathematical model that estimates plan liabilities and employer contribution requirements for purposes of funding the individual employer plans within the Michigan Municipal Employees' Retirement System (MERS), for determining plan costs for Governmental Accounting Standards Board (GASB) accounting purposes, and for State Reporting. This model is updated annually to adjust the liabilities and contribution requirements for changes in member census and plan features, and to reflect actual plan experience in the process. The valuation reflects the present provisions of the MERS Plan Document (as revised February 28, 2019). The specific benefit provisions reflected in the valuation for each municipality are summarized in Table 2 in the municipality's actuarial report.

Each annual actuarial valuation uses current membership and financial data. In addition, an actuarial valuation requires the use of a series of assumptions regarding uncertain future events. The assumptions and methods used in the December 31, 2018 Actuarial Valuation are those adopted by the Retirement Board. The most recent study of plan experience covered the period from December 31, 2008 through December 31, 2013 and was completed in 2015 by the prior actuary. The December 31, 2018 Assumptions are based on the results of that experience study. Generally, an experience study is performed every 5 years.

All actuarial assumptions are estimates of future experience. The rationale for the assumptions is described in this Appendix as well as the most recent experiences study report. Although the actuarial assumptions are unchanged between the 2017 and 2018 annual actuarial valuations, there has been a change in actuarial software. Changes in actuarial software may result in differences in determination of plan costs even when based on the same data and assumptions. These differences, if any, are reflected in the developed normal cost and actuarial gain or loss amortization layer for each division without being separately identified.

We are relying on the prior actuary's assessment of the reasonableness of the demographic assumptions as described in the most recent experience study report. We reviewed the economic assumptions during 2018. Based on our analysis, the current economic assumptions are reasonable for the purposes of the December 31, 2018 annual actuarial valuation. **The Retirement Board has adopted a change in economic assumptions to be reflected in the next annual actuarial valuation as of December 31, 2019. The new assumptions adopted by the Retirement Board are an assumed rate of investment return of 7.35% per year, net of expenses, and an assumed rate of wage inflation of 3.00% per year.** The current assumptions are 7.75% and 3.75% respectively. In order to enhance communication regarding the new assumptions, the December 31, 2018 annual actuarial valuation includes a projection scenario under the new assumptions.

The next regularly scheduled experience study is expected to commence in the fall of 2019 covering the 5-year period from January 1, 2014 through December 31, 2018. This analysis will include a review of the demographic assumptions such as rates of mortality, retirement, turnover, disability, etc. The anticipated schedule for implementing new demographic assumptions, if any, is in conjunction with the December 31, 2020 annual actuarial valuation. The Retirement Board may review the economic assumptions in conjunction with the experience study and/or review them on a separate schedule.

There have been no changes in the funding method, adopted by the Retirement Board beginning with the December 31, 1993 valuations. The basic funding method is entry age normal and normal cost amounts are developed as a level percentage of projected payroll. For purposes of determining plan accounting costs under GASB, there has been a modification in actuarial cost method from the replacement life method to individual level percent method of the entry age normal cost method. The Retirement Board updated the Actuarial Policy on February 28, 2019. Most changes to the Actuarial Policy are prospective in nature. There is a minimum employer contribution requirement of normal cost for each division switching from an underfunded UAL to an overfunded UAL. This minimum employer contribution requirement shall continue until the division's funded ratio reaches 120%.

The actuarial valuation computations were made by or under the supervision of a Member of the American Academy of Actuaries (MAAA).

Details on MERS plan provisions, actuarial assumptions, and actuarial methodology follow this section.

Summary of Plan Provisions — Defined Benefit Plan[1]

The benefits summarized in this section are intended only as general information regarding the Municipal Employees' Retirement System of Michigan. They are not a substitute for PA 220 of 1996, and the MERS Plan Document (as revised). If any conflict occurs between the information in this summary and PA 220 of 1996 or the MERS Plan Document (as revised), the provisions of PA 220 and the MERS Plan Document govern.

Eligibility for Retirement (Unreduced Benefits)

MERS members are eligible to retire with unreduced benefits at the later of:

- Age T, where T is between ages 60 and 70, with enough credited service to be vested (see below), and
- Y years of credited service, where Y is a whole number between 5 and 10 years.

Optional Retirement Programs (Unreduced Benefits)

- FA(R), where A is an age from 50 to 54, and R is between 25 and 30 years of credited service.
- FA(R), where A is an age from 55 to 65, and R is between 15 and 30 years of credited service.
- FA(R), where A is any age, and R is 20, 21, 22, 23, 24, 25, 26, 27, 28, 29 or 30 years of credited service.
- S Points, where S is between 70 and 90, and S is the sum of the member or former member's attained age and years of credited service.

Eligibility for Retirement (Reduced Benefits)

MERS members are eligible to retire with reduced benefits at:

- Age T minus 5, with 15 or more years of credited service.
- Age T minus 10, with 25 or more years of credited service.

The retirement allowance is reduced for each complete month that the retirement date precedes T, up to a maximum reduction of 60%. The monthly reduction factors, as provided by MERS, for various ages T are shown in the following table:

Monthly Early Retirement Reduction Factor by Normal Retirement Age T										
60	61	62	63	64	65	66	67	68	69	70
0.50%	0.65%	0.66%	0.67%	0.68%	0.69%	0.70%	0.71%	0.72%	0.73%	0.74%

The reduction may be partially or fully waived by adopting the early retirement provisions outlined above.

Mandatory Retirement

None.

[1] Please see the description of the Hybrid Plan beginning on page 11.

Deferred Retirement (Vesting)

Retirement can be deferred if membership is terminated before age T other than by retirement or death, after becoming vested with Y years of credited service. Y is a whole number between 5 and 10 years of credited service. The retirement allowance begins when the application is filed with MERS and eligibility requirements for retirement are met. The deferred retirement allowance is computed in the same manner as a service retirement allowance, based on the benefit program in effect as of the date of termination of membership.

Rights to an allowance are forfeited if the member's accumulated contributions are refunded after termination of employment.

Final Average Compensation (FAC)

MERS Plan benefits are based on a member's FAC, subject to the dollar compensation limits under Section 401(a)(17) of the Internal Revenue Code, as applicable. For this purpose, FAC means one-fifth of the aggregate amount of compensation paid to a member and earned during the period of 5 consecutive years of the member's credited service in which the aggregate compensation paid is highest. The employer may optionally adopt a FAC averaged over N years, where N is a whole number of years not less than 3. Alternate rules apply for members with less than N years of credited service and for members with credited service in force with more than one participating municipality or court.

Service Retirement Allowance

Credited service at time of termination of membership is multiplied by one of the following options:

- 1.00% of FAC to 2.50% of FAC, in increments of 0.05% of FAC, the "lifetime multiplier" as adopted by the employer, with a maximum benefit of 80% of FAC.
- Supplemental Multiplier (in addition to the above lifetime multiplier): 0.05% of FAC to 1.50% of FAC, in increments of 0.05% of FAC, as adopted by the employer and payable only until attainment of the age at which unreduced Social Security benefits are available (currently age 66 for normal retirement, gradually increasing to age 67). When this age is reached, the benefit reverts to the above lifetime multiplier. The combined lifetime and supplemental multipliers may not exceed 2.5%, and the combined benefit may not exceed 80% of FAC.
- Bridged Benefit: For service prior to the Bridged Benefit date, one of the Benefit Program multiplier percentages of FAC (FAC may be frozen at the Bridged Benefit Date, or may be calculated at termination of membership). For service after the Bridged Benefit date, one of the Benefit Program multiplier percentages of FAC (at termination of membership).

  The combined benefit may not exceed the larger of:
  (i) the above benefit based on service prior to the Bridged Benefit date; and
  (ii) 80% of FAC at termination of employment.
- Frozen Benefit: For service prior to the Frozen Benefit Date, one of the Benefit Program Multiplier Percentages applies.

Maximum Benefit Payable by MERS

The maximum benefit that may be paid by MERS is governed by Section 415 of the Internal Revenue Code. Benefits in excess of the maximum benefit will be paid by the MERS Qualified Excess Benefit Arrangement.

Act 88 (Reciprocal Retirement Act, 1961 P.A. 88)

If the municipality has elected to come under the provision of Act 88 (see Table 2 in your municipality's actuarial report), service with former and future public employers in Michigan may be used to satisfy the service eligibility conditions of MERS. MERS maintains a statewide Act 88 adoption list: https://resources.mersofmich.com/SharepointFormsService/Default.aspx?FormName=form_77.pdf

Disability Retirement Allowance

Total and permanent disability while employed by a participating municipality and after meeting the vesting requirement of the benefit program. The service requirement is waived if the disability is duty-related, as set forth in Section 31(4) of the MERS Plan Document.

The allowance is computed in the same manner as a service retirement allowance, except that the reduction for retirement before age T is not applied.

If disability is duty-related, the amount of the retirement allowance shall not be less than 25% of the member's FAC.

Adoption of optional Benefit Program D-2 provides a retirement allowance for a duty-related disability that is the greater of:

(i) 25% of the member's FAC; or
(ii) A benefit based on 10 years of credited service in addition to the member's actual period of service, provided the total years of service do not exceed the greater of 30 years or the member's actual period of service.

Non-Duty Death Allowance

If a member or vested former member with the minimum years of service required to be vested dies before retirement, a monthly allowance may be payable to a beneficiary.

If the member is married at the time of death, the spouse is the automatic monthly pension beneficiary unless the spouse, in writing, waives the benefit in favor of another named beneficiary.

A monthly pension beneficiary (named in an Option II Contingent Beneficiary Designation form filed with MERS) will receive a retirement allowance computed in the same manner as a service retirement allowance, based on service and FAC at death, but reduced to reflect an Option II (100% joint and survivor) election. The reduction for retirement before age T is not applied. Payment of a retirement allowance to the monthly pension survivor beneficiary of a deceased member commences immediately. Payment of a retirement allowance to the monthly pension beneficiary of a deceased vested former member commences on the date the member would have first satisfied eligibility for retirement with an unreduced service retirement allowance.

If there is no named beneficiary and the member leaves a spouse, the spouse will receive an Option II survivor allowance. Payment of a retirement allowance to the surviving spouse of a deceased member commences immediately. Payment of a retirement allowance to the surviving spouse of a deceased vested former member commences on the date the member would have first satisfied eligibility for retirement for an unreduced service retirement allowance. The amount of a surviving spouse's retirement allowance shall be 85% of the deceased member's or deceased vested former member's accrued retirement allowance computed in the same manner as a service retirement allowance, based on service and FAC at time of death.

The amount of a surviving spouse's benefit is always the larger of:

(i) the benefit computed as a monthly pension beneficiary; and
(ii) the 85% of accrued retirement allowance benefit described above.

If there is no named beneficiary and no retirement allowance being paid to a surviving spouse, unmarried children under age 21 will be paid an equal share of 50% of the deceased member's or deceased vested former member's accrued retirement allowance. The reduction for retirement before age T is not applied.

If no retirement allowance becomes payable at death, the member's accumulated contributions, if any, are paid to the beneficiary or to the decedent's estate.

Duty-Connected Death Allowance

A duty death allowance, computed in the same manner as a non-duty death allowance, may be payable to a spouse or child(ren) if death occurs as the natural and proximate result of performance of duty with a participating municipality, as described in Section 34 of the MERS Plan Document. In such a case, the vesting requirement is waived, and the minimum benefit is 25% of the deceased member’s FAC.

Adoption of optional Benefit Program D-2 provides a retirement allowance for a duty-connected death that is the greater of:

(i) 25% of the member's FAC; or
(ii) A benefit based on 10 years of credited service in addition to the member's actual period of service, provided the total years of service do not exceed the greater of 30 years or the member's actual period of service.

Member Contributions

Each member contributes a percent of annual compensation, as selected by the municipality, on the member's annual compensation up to the compensation limit under Section 401(a)(17) of the Internal Revenue Code, as applicable. Any percentage from 0% to 10% (in 0.1% increments) may be selected. Interest is credited to accumulated member contributions each December 31 (and reflected in the Annual Member Statement provided to each member) at a rate determined by MERS, currently the one-year U.S. Treasury Bill rate determined as of each December 31.

If a member leaves the employ of the municipality or dies without a retirement allowance or other benefit payable on their account, the member's accumulated contributions plus interest (as described above) are refunded with spousal consent, to the member, if living, or to the member's surviving spouse, if any, or to a named beneficiary (after spousal consent, if applicable).

Note for MERS' Defined Contribution Plan: The Annual Actuarial Valuation addresses assets and liabilities for participation under the MERS Defined Benefit Plan and Hybrid Plan. The MERS Defined Contribution Plan, which first became available for adoption in late 1997, is not addressed in the valuation results as it is not a defined benefit plan.

Post-Retirement Adjustments

Employers may adopt post-retirement cost-of-living adjustments (COLA):

One-Time COLA for present retirees and beneficiaries. The amount of the increase is equal to the number of years since the later of retirement or the date specified in the adopting resolution times either:

(i) a fixed percentage of the present benefit; or
(ii) a fixed dollar amount.

This COLA may be readopted from time to time.

Annual COLA – provides automatic annual benefit increases. The COLA may apply to either:

(i) retirees (and their beneficiaries) retired before the effective date of the COLA; or
(ii) retirees (and their beneficiaries) retired on or after the effective date of the COLA.

The amount of the annual increase may be:

(i) a percentage of the original (base) retirement benefit (non-compounded COLA); or
(ii) a percentage of the present retirement benefit (compounded COLA); or
(iii) a fixed dollar amount.

Bridged COLA - A bridged COLA program prospectively terminates the COLA on service accrued on and after the COLA Bridge date.

Upon adoption of a COLA Bridge, the amount of annual increase may be:

(i) a percentage of the original (base) retirement benefit accrued through the COLA bridge date (non-compounded COLA); or
(ii) a percentage of the original (base) retirement benefit plus prior adjustments accrued through the COLA bridge date, (compounded COLA); or
(iii) a fixed dollar amount.

Death-After-Retirement Surviving Spouse Benefit

A retiring member electing the Straight Life (highest) form of retirement payment is normally paid a lifetime retirement allowance, with payments terminating at death. The retiring member could provide benefits to a surviving spouse or another named beneficiary by electing Option II (100% continuation to beneficiary) or Option II-A (75% continuation to beneficiary) or Option III (50% continuation to beneficiary). A surviving spouse is automatically the beneficiary to an Option II, IIA or III allowance unless the spouse, in writing, relinquishes the benefit to the member electing a Straight Life allowance or to another named beneficiary. Electing these alternate forms of payment would lower the retiring member's retirement allowance.

If Benefit Program RS50% is adopted, a member retiring on or after the effective date of Benefit RS50% may elect the Straight Life form of retirement payment and still provide a 50% survivor benefit to their spouse. To be eligible for a surviving spouse benefit, the retiring member and spouse must have been married to each other both at the time of death and during the full one-year period just before retirement.

Delayed Retirement Option Partial Lump Sum (DROP+)

Any member who is eligible to retire with full, immediate retirement benefits has the option to:

(i) Retire immediately and receive a monthly benefit payable immediately; or
(ii) Delay their retirement date and continue to work.

If the member is covered by DROP+ and they retire at least 12 months after first becoming eligible for unreduced benefits, at actual retirement the member has the option to receive a partial lump sum and a reduced monthly benefit:

(i) The member can elect a lump sum equal to 12, 24, 36, 48, or 60 times their monthly accrued benefit (if they have delayed retirement at least that many months).
(ii) For each 12 months included in the lump sum, the member's lifetime benefit is reduced by the DROP+ percentage adopted by the employer. The employer can adopt any of the following DROP+ reduction percentages: 6%, 7%, 8%, 9% or 10%.

DROP+ may not be adopted after June 30, 2013.

Annuity Withdrawal

An employer may adopt the Annuity Withdrawal Program (AWP). Under the AWP, a retiring member may elect to receive a refund of their accumulated member contributions with interest in a lump sum at retirement. The member's monthly pension would then be reduced by the actuarial equivalent of the lump sum payment. The employer has two options for the interest discount rate used to compute the actuarial equivalent reduction:

(i) The current investment return assumption used in the annual actuarial valuations (currently 7.75%); or
(ii) The most recent December 31 interest rate used for crediting interest on member contributions.

Deferred Retirement Option Program (DROP)

If a participant is covered by the Benefit Program DROP and is eligible for retirement, they have the option to elect a specified DROP period in which they will cease to accrue any additional retirement benefits, but remain employed by the participating municipality or court. The participant must elect a DROP end date at least six months after the beginning date, but no more than sixty months after the beginning date, in one-month increments.

Upon the participant's election of DROP and the receipt of an application to enroll in DROP, MERS will calculate the participant's service retirement and benefit payment as of the beginning date. The Retirement System also shall calculate any age differential between the participant and the participant's beneficiary as of the calendar year of the DROP exit date in accordance with Treas. Reg. § 1.401(a)(9)-6. Upon the beginning date of the DROP period, the participant shall be responsible to continue employee contributions, if any.

On the next available benefit payment date after processing is complete, and monthly thereafter, an amount equal to 100% of the monthly service retirement benefit payment the participant would have received if he or she had retired as of the DROP beginning date will be credited to a notional account for the benefit of the participant. Funds in the DROP account are credited with interest in the amount of 3% annually, or prorated in the event of a DROP period that is less than twelve months.

Upon the end date, the participant shall receive a lump-sum distribution of the participant's DROP account and on the first day of the calendar month following end date, the participant will begin receiving monthly service retirement benefit payments.

Frozen Benefit Provisions

If a division has a Frozen Defined Benefit plan as described on page 5 of this appendix, the provisions of the frozen defined benefit plan formula continue to apply for ancillary (non-retirement) benefits; alternatively, should the members of the Frozen Defined Benefit plan be enrolled in the Hybrid Plan, the terms of the defined benefit component of the Hybrid Plan shall apply.

Non-Standard Benefit Provisions

Some municipalities have collectively bargained benefit provisions that differ from the benefit provisions described in this section, and MERS has agreed to administer such provisions. Such benefit provisions, if any, are listed in Table 2 of a municipality's annual actuarial valuation report, or are reflected in the actuarial assumptions that are specific to a municipality and are listed individually in a municipality's annual actuarial valuation report.

Legacy Provisions

A number of plan provisions, primarily service retirement allowance programs and member contribution programs, have been sunset (are no longer available for adoption). A participating municipality or court may continue such benefit program. Such benefit provisions, if any, are listed in Table 2 of a municipality's annual actuarial valuation report.

Summary of Plan Provisions – Hybrid Plan[1]

The benefits summarized in this section are intended only as general information regarding the Municipal Employees' Retirement System of Michigan. They are not a substitute for PA 220 of 1996, and the MERS Plan Document. If any conflict occurs between the information in this summary and PA 220, or the MERS Plan Document, the provisions of PA 220 and the MERS Plan Document govern.

Hybrid Plan Part I — Defined Benefit Portion

Eligibility for Retirement

Members are eligible to retire at a Normal Retirement Age, between 60 and 70, as selected by the participating municipality, with 6 or more years of service.

Optional Retirement Programs (Unreduced Benefits)

An age between 55 and 65 as selected by the participating municipality, with credited service of 25 years.

Mandatory Retirement

None.

Deferred Retirement (Vesting)

Retirement can be deferred if membership is terminated before the applicable retirement age other than by retirement or death, after becoming vested (6 years of credited service is required for vesting). The retirement allowance begins when the application is filed with MERS and eligibility requirements for retirement are met. The deferred retirement allowance is computed in the same manner as a service retirement allowance, based on the final average compensation and years of service at termination of membership.

Final Average Compensation (FAC)

Benefits are based on a member's FAC, subject to the dollar compensation limits under Section 401(a)(17) of the Internal Revenue Code, as applicable. For this purpose, FAC means one-third of the aggregate amount of compensation paid to a member and earned during the period of 3 consecutive years of the member's credited service in which the aggregate compensation paid is highest.

Act 88 (Reciprocal Retirement Act, 1961 P.A. 88)

If the municipality has elected to come under the provision of Act 88 (see Table 2 in your municipality's actuarial report), service with former and future public employers in Michigan may be used to satisfy the service eligibility conditions of MERS. MERS maintains a statewide Act 88 adoption list: https://resources.mersofmich.com/SharepointFormsService/Default.aspx?FormName=form_77.pdf

[1] Please see the description of the Defined Benefit Plan beginning on page 4.

Service Retirement Allowance

Credited service at time of termination of membership is multiplied by one of the following options:

Hybrid 1.00%	1.00% of a member's FAC
Hybrid 1.25%	1.25% of a member's FAC
Hybrid 1.50%	1.50% of a member's FAC
Hybrid 1.75% [1]	1.75% of a member's FAC
Hybrid 2.00% [1]	2.00% of a member's FAC

[1] Available to those without social security coverage.

Maximum Benefit Payable by MERS

The maximum benefit that may be paid by MERS is governed by Section 415 of the Internal Revenue Code. Benefits in excess of the maximum benefit will be paid by the MERS Qualified Excess Benefit Arrangement.

Disability Retirement Allowance

Benefits are the same as under the Defined Benefit Plan, except that optional Benefit Program D-2 does not apply.

Non-Duty Death Allowance

Benefits are the same as under the Defined Benefit Plan.

Duty-Related Death Allowance

Benefits are the same as under the Defined Benefit Plan, except that optional Benefit Program D-2 does not apply.

Member Contributions

The Defined Benefit portion of the Hybrid plan only allows member contributions in the situation where the employer has a cap on their contributions. Each municipality's actuarial valuation reflects the member contribution provisions reported by MERS.

Post-Retirement Adjustments

Not available.

Death-After-Retirement Surviving Spouse Benefit

The same optional forms of payment are available as under the Defined Benefit Plan, except that the optional Benefit Program RS50% does not apply.

Annuity Withdrawal

Not available.

Deferred Retirement Option Program (DROP)

Not available.

Hybrid Plan Part II - Defined Contribution Portion

Employer Contributions and Vesting

The employer contribution amount is any amount allowed by federal law.

The vesting schedule for employer contributions is one of the following schedules, as adopted by the employer:

(i) Immediate vesting upon participation; or
(ii) 100% vesting after stated years (participant is 100% vested after not to exceed maximum 5 years of service ("cliff" vesting)); or
(iii) Graded vesting percentages per year of service, not to exceed maximum 6 years of service for 100% vesting, nor be less than certain stated minimums.

Member Contributions and Vesting

The member contribution amount is any amount allowed by federal law and subject to procedures established by the Retirement Board.

The vesting schedule for member contributions is 100% immediate vesting.

Note: The Annual Actuarial Valuation addresses assets and liabilities for participation under the MERS Defined Benefit Plan and the Defined Benefit portion of the Hybrid Plan. The Defined Contribution portion of the Hybrid Plan is not addressed in the valuation results.

Municipal Employees' Retirement System of Michigan
IRC Section 415(b)(1)(A) Benefit Dollar Limits — 2019

The limits are based on the retiree's age at normal retirement with at least 10 years of participation. The limit at ages 62-65 is indexed with inflation, in $5,000 increments. The limits at earlier ages are then increased proportionately. The limit applies to the retiree's or beneficiary's employer-financed straight life benefit, except in the case of an Option II, IIA, or III election with the retiree's spouse as named beneficiary, in which case the limit applies to the employer-financed portion of the reduced joint and survivor benefit.

Age at Retirement	General Employees	Police and Fire Members[1]
35	$42,440	$225,000
36	44,821	225,000
37	47,349	225,000
38	50,037	225,000
39	52,896	225,000
40	55,939	225,000
41	59,180	225,000
42	62,635	225,000
43	66,321	225,000
44	70,257	225,000
45	74,463	225,000
46	78,963	225,000
47	83,782	225,000
48	88,949	225,000
49	94,495	225,000
50	100,454	225,000
51	106,867	225,000
52	113,777	225,000
53	121,233	225,000
54	129,292	225,000
55	138,015	225,000
56	147,474	225,000
57	157,748	225,000
58	168,927	225,000
59	181,115	225,000
60	194,429	225,000
61	209,006	225,000
62	225,000	225,000
63	225,000	225,000
64	225,000	225,000
65 & older	225,000	225,000

[1] Requires that the member have at least 15 years of police, fire, and/or armed forces service as defined in IRC regulations. Otherwise use the limits for general members.

IRC Section 401(a)(17) Compensation Limit — 2019

For 2018, the IRC Section 401(a)(17) limit is $280,000. This limit is indexed with inflation in $5,000 increments.

Actuarial Assumptions

To calculate MERS contribution requirements, plan accounting costs, and reporting requirements, assumptions are made about future events that could affect the amount and timing of expected benefits to be paid and the assets to be accumulated. The economic and demographic assumptions include:

- An investment return assumption that is used to discount liabilities and project what plan assets will earn.
- A mortality table projecting the number of members who will die before retirement and the duration of benefit payments after retirement.
- Assumed retirement rates projecting when members will retire and commence receiving retirement benefits.
- A set of withdrawal and disability rates to estimate the number of members who will leave the work force before retirement.
- Assumed rates of pay increase to project member compensation in future years.

The primary actuarial assumptions used in connection with this December 31, 2018 Actuarial Valuation are unchanged from those used in the December 31, 2017 Actuarial Valuation performed by the prior actuary. The actuarial assumptions currently used are summarized below and on the following pages.

Interest Rate

Funding plan benefits involves the accumulation of assets to pay benefits in the future. These assets are invested and the net rate of investment earnings is a significant factor in determining the contributions required to support the ultimate cost of benefits. For the 2018 actuarial valuation, the long-term investment yield is assumed to be 7.75% annually, net of administrative and investment expenses. This assumption was first used for the December 31, 2015 actuarial valuations.

Please note that, given that the actuarial value of assets is currently 9% higher than the market value, meeting the actuarial assumption in the next few years will require average annual market returns that exceed the 7.75% investment return assumption.

Please see the Comments on Asset Smoothing in your municipality's Annual Actuarial Valuation Report.

Pay Increases

Because benefits are based on a member's final average compensation (FAC), it is necessary to make an assumption with respect to each member's estimated pay progression. The pay increase assumption used in the actuarial valuation projects annual pay increases of 3.75% in the long term plus a percentage based on an age-related scale to reflect merit, longevity and promotional pay increases.

The pay increase assumption for selected ages is shown below. The 3.75% long-term wage inflation assumption was first used for the December 31, 2015 actuarial valuations. The merit and longevity pay increase assumption was first used for the December 31, 2015 actuarial valuations.

Age	Base (Wage Inflation)	Merit and Longevity	Total Percentage Increase in Pay
20	3.75%	11.00%	14.75%
25	3.75	7.20	10.95
30	3.75	3.10	6.85
35	3.75	1.90	5.65
40	3.75	1.20	4.95
45	3.75	0.81	4.56
50	3.75	0.52	4.27
55	3.75	0.30	4.05
60	3.75	0.00	3.75

Inflation

Although no explicit price inflation assumption is used in this valuation, the long-term annual rate of price inflation implicit in the 3.75% base wage inflation is 2.5% annually.

Payroll Growth

For divisions that are open to new hires, the number of active members is projected to remain constant, and the total payroll is projected to increase 3.75% annually. This assumption was first used for the December 31, 2015 actuarial valuations.

Increase in Final Average Compensation (FAC Loads)

The 2009-2013 and two previous experience studies determined that for some retirees of some municipalities, the actual FAC at retirement was larger than would be expected based on reported annual pays and FAC's for the years just before retirement. Some possible sources for the differences are:

- Lump sum payments for unused paid time off. Unused sick leave payouts have been excluded from FAC since the mid-1970s. However, since that time it has become popular to combine sick and vacation time into paid time off, which is included in the FAC. Consequently, the lump sums that are includible in FAC have grown over the years.
- Extra overtime pay during the final year of employment. Our studies only reflect any increase in overtime during the final year, not any increase that occurs during the full 3 or more year averaging period.

Variation was analyzed among municipalities. The amount of unexpected FAC increase varies quite a bit between municipalities. Some municipalities show no sign of FAC loading, while other municipalities show increases above the average increase. This is presumably the result of different personnel policies among municipalities. Loading for this anticipated increase in FAC allows the employer to fund for the anticipated higher liabilities during the working lifetime of the employee, rather than paying for the increase in the form of a liability loss after the member retires.

The Retirement Board adopted new FAC load assumptions that were first used for the December 31, 2015 annual actuarial valuations. These assumptions reflect an FAC load of 0% to 12% for each municipality, based on the municipality's experience in the 2009-2013 and earlier experience studies (it is anticipated that these assumptions will be updated after every 5 year experience study). The FAC increase assumption(s) for your municipality are shown in your annual actuarial valuation report. Note that for divisions that adopted Sick Leave in FAC (SLIF), the assumption is developed individually for each division, based on the specific SLIF provision and/or past experience.

Withdrawal Rates

The withdrawal rates are used to estimate the number of employees at each age that are expected to terminate employment before qualifying for retirement benefits. The withdrawal rates do not apply to members eligible to retire, and do not include separation on account of death or disability. The assumed rates of withdrawal applied in the current valuation are based on years of service, and scaled up or down according to each employer's or division's experience.

Sample rates of withdrawal from active employment, before application of the scaling factor, are shown below. These rates were first used for the December 31, 2015 actuarial valuations.

Sample Years of Service	% of Active Members Withdrawing Within the Next Year
0	19.60%
1	16.30
2	13.30
3	10.50
4	8.60
5	6.90
10	4.60
15	3.40
20	2.60
25	2.20
30 and over	2.20

For the majority of the divisions in MERS, the base withdrawal rates from the table above are used. However, for larger employers (i.e., employers with 500 or more life years of exposure during the 5 year experience study period), the standard withdrawal rates are adjusted by the appropriate scaling factor based on that employer's actual withdrawal experience. A scaling factor of 100% means the municipality's experience is expected to be similar to the MERS-wide system experience. A scaling factor lower than 100% means the municipality's withdrawal experience is lower than the MERS-wide experience. A scaling factor higher than 100% means the municipality's withdrawal experience is higher than the MERS-wide experience.

The scaling factor for each division is shown in your actuarial valuation report.

Retirement Rates

A schedule of retirement rates is used to measure the probability of eligible members retiring during the next year. The retirement rates for Normal Retirement are determined by each member's replacement index at the time of retirement. The replacement index is defined as the approximate percentage of the member's pay (after reducing for their member contributions) that will be replaced by the member's benefit at retirement. The index is calculated as:

Replacement Index = 100 x Accrued Benefit divided by [Pay less Member Contributions]

The assumed retirement percentage is 100% at the later of age 70 or a member's age on the valuation date.

Retirement rates for Early (reduced) Retirement are determined by the member's age at early retirement.

The Normal Retirement rates below were first used for the December 31, 2015 actuarial valuations. The Early Retirement rates were first used for the December 31, 2015 actuarial valuations.

Normal Retirement – Unreduced Benefit (Exception Below)

Sample Replacement Index	Percent of Eligible Active Members Retiring Within the Next Year
5	8.0%
10	12.0
15	16.0
20	19.0
25	19.5
30	19.5
35	19.5
40	20.0
45	21.0
50	21.0
55	21.0
60	24.0
65	24.0
70	25.0
75	28.0
80	33.0
85	36.0
90	41.0
95	46.0
100+	50.0

Early Retirement – Reduced Benefit

Age	Percent of Eligible Active Members Retiring Within the Next Year
50	2.0%
51	2.0
52	3.3
53	3.8
54	5.6
55	4.3
56	4.2
57	4.1
58	5.0
59	6.2

Normal Retirement – Unreduced Benefit – Frozen Benefit – The retirement rates are equal to 20.0% at all ages, except age 70. At age 70 the retirement rate is equal to 100.0%.

Disability Rates

Disability rates are used in the valuation to estimate the incidence of member disability in future years.

The assumed rates of disablement at various ages are shown below. These rates were first used for the December 31, 2015 actuarial valuations.

Sample Ages	Percent Becoming Disabled Within the Next Year
20	0.02%
25	0.02
30	0.02
35	0.05
40	0.08
45	0.20
50	0.29
55	0.38
60	0.39
65	0.39

Eighty percent (80%) of the disabilities are assumed to be non-duty and 20% of the disabilities are assumed to be duty related. For those plans which have adopted disability provision D-2, 40% of the disabilities are assumed to be non-duty and 60% are assumed to be duty related.

Mortality Table

In estimating the amount of the reserves required at the time of retirement to pay a member's benefit for the remainder of their lifetime, it is necessary to make an assumption with respect to the probability of surviving to retirement and the life expectancy after retirement.

The mortality table used to project the mortality experience of non-disabled plan members is a 50% Male - 50% Female blend of the following tables:

1. The RP-2014 Healthy Annuitant Mortality Tables, with rates multiplied by 105%
2. The RP-2014 Employee Mortality Tables
3. The RP-2014 Juvenile Mortality Tables

For ages 0-17 we use the rates in Table 3; for ages 18-49 we use the rates in Table 2; for ages 70 and older we use the rates in Table 1; and for ages 50-69 we blend Table 2 and Table 1 as follows:

a. Age 50, use 60% of Table 2 and 40% of Table 1
b. Age 51, use 57% of Table 2 and 43% of Table 1
c. Etc. …
d. Age 69, use 3% of Table 2 and 97% of Table 1

The mortality table used to project the mortality experience of disabled plan members is a 50% Male - 50% Female blend of the RP-2014 Disabled Retiree Mortality Tables.

These mortality tables were first used for the December 31, 2015 actuarial valuations.

Ninety percent (90%) of active member deaths are assumed to be non-duty deaths and 10% of the deaths are assumed to be duty related.

Possible future mortality improvements are reflected in the mortality assumption. The mortality assumptions include a 10% margin for future mortality improvements, relative to the actual mortality experience seen in the 2009-2013 Experience Study. Mortality rates continue to improve for public sector employees.

The life expectancies and mortality rates projected for non-disabled members are shown below for selected ages:

Age	Expected Years of Life Remaining	Mortality Rates
20	63.06	0.03%
25	58.15	0.03
30	53.24	0.03
35	48.33	0.04
40	43.43	0.05
45	38.56	0.08
50	33.74	0.23
55	29.18	0.37
60	24.79	0.58
65	20.59	0.94
70	16.66	1.56
75	13.07	2.51
80	9.85	4.18

The life expectancies and mortality rates projected for disabled members are shown below for selected ages:

Age	Expected Years of Life Remaining	Mortality Rates
20	46.95	0.47%
25	43.14	0.54
30	39.24	0.55
35	35.33	0.65
40	31.52	0.82
45	27.98	1.30
50	24.87	1.62
55	21.91	1.89
60	18.97	2.18
65	16.04	2.63
70	13.19	3.43
75	10.54	4.77
80	8.18	6.88

State Reporting Assumptions

The Protecting Local Government Retirement and Benefits Act, Public Act 202 of 2017, was put into law effective December 20, 2017. One outcome of the law is the requirement for the local unit of government to provide select reporting discloures to the State. Sec. 5(1) of the Act provides the State treasurer with the authority to annually establish uniform actuarial assumptions for purposes of developing the requisite disclosures. Below you will find information which may be used to assist the local unit of government with required reporting.

Uniform Assumptions, as applicable to the measurement and the required disclosures under uniform assumptions are denoted below. Additional discussion of the PA 202 and uniform assumptions may be found on the State website in the uniform assumption memo dated September 25, 2018.

Uniform Assumption	Value
Investment Rate of Return	7.00%
Discount Rate	7.00%
Salary Increase	3.75%* + Merit and longevity
Mortality	A version of RP 2014* *(as described earlier in the Appendix, based upon an experience study dated July 6, 2015)
Amortization of the Unfunded Accrued Actuarial Liability:	
	Closed Non-Linked Divisions
Period	20 years
Method	Level Dollar
Type	Closed
	Open Divisions^
Period	20 years
Method	Level Percent
Type	Closed
	^Includes Closed Linked Divisions

Miscellaneous and Technical Assumptions

Loads - Vested Liabilities	- Vesting liabilities are increased by 2% to reflect the value of the potential survivor benefit payable in case of death during the benefit deferral period.
Marriage Assumptions	- Seventy percent (70%) of males and 70% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses. Adjustments for optional form of payment are based on the valuation assumptions.
Pay Increase Timing	- Beginning of valuation year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.
Decrement Timing	- Decrements of all types are assumed to occur mid-year.
Future Service	- Members are assumed to earn 1.0 years of service in each future year.
Eligibility Testing	- Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Benefit Service	- Exact fractional service is used to determine the amount of benefit payable. Benefit service is the service used in the benefit formula.
Eligibility Service	- The larger of reported Eligibility Service and reported Vesting Service was used as eligibility service in the valuation. Eligibility Service is the service used to meet the conditions for retirement, and is generally equal to or larger than benefit service.
Decrement Relativity	- Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
Decrement Operation	- Disability and withdrawal do not operate during retirement eligibility.
Normal Form of Payment	- Future retiring members are assumed to elect the Straight Life form of payment (see page 9 regarding death-after-retirement benefits).
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. New entrant normal cost contributions are applied to the funding of new entrant benefits.

Pension Obligation Bond Proceeds

- Proceeds from pension obligation bonds contributed to the fund are first applied to the outstanding Initial UAL amortization layer. Any remainder is applied to the most recent gain/loss amortization layer.

Maximum Compensation

- The dollar compensation limits under Section 401(a)(17) of the Internal Revenue Code are projected to increase 3.75% annually. No member or employer contributions are projected to be made on the portion of any member's annual compensation in excess of the IRC Section 401(a)(17) limit for the year.

Maximum Benefit

- The dollar benefit limitations under Section 415 of the Internal Revenue Code are projected to increase 3.75% annually. Employee divisions 02, 20-29 (Police), 05 and 50-59 (Fire) are presumed eligible for the public safety benefit limits. No benefits in excess of the IRC 415 limits are projected to be paid out of the Qualified Benefit Plan.

Member Contribution Interest

- The interest rate credited on member contributions is the one-year Treasury Bill rate as of December 31, determined annually. The long-term rate assumed in the valuation is 3% annually, which is consistent with the 2.5% price inflation assumption.

DROP+ Assumptions

- Each eligible member is assumed to make the DROP+ election with the most valuable combination of lump sum and reduced monthly benefit.

  The retirement probabilities shown earlier are used for members who are not covered by Benefit Program DROP+. For those covered by Benefit Program DROP+, it is assumed that retirement will be delayed long enough to become eligible for at least 4 years' worth of DROP+ lump sum.

Traditional DROP

- Active liability and present value of future benefits are loaded for potential future DROP election. The DROP load is estimated for an affected division by assuming each eligible member was assumed to enter the DROP when first eligible and stay in the DROP program for 3 years.

  At the end of the 3-year period, the member was assumed to receive their DROP account balance with interest and the monthly benefit. No load is applied to the normal cost to reflect the fact that employer contributions stop but member contributions continue at DROP entry.

  Members in the DROP are treated as having retired immediately. No adjustment has been made for interest accruing during the DROP period or continued member contributions.

  Reported DROP balances that are included in the assets are added to the liability. No adjustment has been made for future DROP interest credits.

Data Adjustments	- The gender was not reported for a small number of active members. These active members were assumed to be male. Active members with frozen benefits had vesting and eligibility service incremented from the date of termination to the date of the valuation. Certain retirees were reported without a beneficiary date of birth. In the event this data was necessary to value a retired liability, a 3-year age difference was assumed. Retired records reported with a recipient type of MEMB, optional form involving a joint and survivor, and beneficiary count of 0, were assumed to have the surviving beneficiary predecease the retiree. These records were valued as straight life.
Non-vested Former Members Active in a DC Plan	- Liabilities in excess of accumulated member contributions are not included in the valuation until the former member earns total vesting service to become vested in the defined benefit plan. We did not receive sufficient data on these individuals to calculate the liability in excess of accumulated contributions; however, we believe this amount, if any, is likely to be immaterial to the calculation.
Non-vested Former Members Active in Another DB or Hybrid Plan	- Members of this type were assumed to become vested through continued employment with another MERS employer. Liabilities for these former members were included in the valuation. Benefits were assumed to commence based upon service in effect at the valuation date.
Non-vested Former Members Terminated from all Plans	- Liability is equal to the accumulated member contribution balance.
Eligible Domestic Relations Orders (EDROs)	- Participants and alternate payees under EDROs are reported individually. In the event the Participant is active and the Alternate Payee has commenced benefits, the liability associated with the Alternate Payee has been netted from the Participant's gross liability.
Nonstandard Amortization Policies	- Certain exceptions to the MERS Actuarial Policy were reported in the valuation data and have been applied in the determination of the minimum required employer contributions valuation.

Projection Assumptions

- Open and closed (linked) divisions are assumed to be stable populations. Total payroll of the link set, open division and the associated closed (linked) divisions, is projected to grow with wage inflation division in future years of projections. Payroll projections for closed (linked and not linked) divisions are projected based on the closed group demographic and pay increase assumptions. In the event the open (linked) division does not have any active members, the normal cost for emerging new entrants is projected under the benefit structure of the existing closed (linked) division(s).

  The accumulated member contribution balance as of the valuation date for non-vested former members terminated from all plans is assumed to be paid out mid-year.

  Future projection years are not adjusted from the provisions of employer contribution cap arrangements or other non-standard amortization policies.

  Divisions becoming overfunded in 2018 and later were assumed to contribute an employer contribution equal to normal cost. This minimum contribution was assumed to continue regardless of funded status.

Actuarial Funding Method

The Retirement Board has adopted funding policies for the Retirement System to achieve the following major objectives:

- Develop level required contribution rates as a percentage of payroll (for divisions that are open to new hires);
- Finance benefits earned by present employees on a current basis;
- Accumulate assets to enhance members' benefit security;
- Produce investment earnings on accumulated assets to help meet future benefit costs;
- Make it possible to estimate the long-term actuarial cost of proposed amendments to System provisions; and
- Assist in maintaining the Retirement System's long-term financial viability.

The basic funding objective is a level pattern of cost as a percentage of pay throughout each member's working lifetime.

The funding method used in this actuarial valuation – the entry age normal cost method – was first used for the December 31, 1993 actuarial valuations and is intended to:

(i) Meet this funding objective; and
(ii) Result in a relatively level long-term contribution requirement as a percentage of pay.

Under the entry age normal cost method, the total actuarially-determined contribution requirement is equal to the sum of the normal cost plus the payment required to fund the unfunded actuarial accrued liability over a period of years. Funding or amortizing the unfunded actuarial accrued liability includes a payment toward the liability (principal) plus a payment to reflect the time value of money (interest).

Normal Cost

In general terms, the normal cost is the cost of benefit rights accruing on the basis of current service. Technically, the normal cost rate is the level percentage-of-pay contribution required each year, with respect to each member, to accumulate over their projected working lifetime the reserves needed to meet the cost of earned benefits. The normal cost represents the ultimate cost of the Retirement System, if the unfunded liability is paid up and the actual experience of the System conforms to the assumptions.

For purposes of Plan funding and State reporting, the normal cost for each member is calculated based on the prospective benefit formula for that member (referred to as the replacement life method). For accounting purposes, the normal cost for each member is calculated as the level contribution over the member's entire career which is anticipated to accumulate to the value of benefits at the end of the career.

Actuarial Accrued Liability

The total actuarial present value of future benefits is computed using the valuation's actuarial assumptions. Subtracting the present value of future normal costs results in the actuarial accrued liability.

The total actuarial accrued liability essentially represents the amount that would have been accumulated as of a given valuation date, if:

i. Contributions sufficient to meet the normal costs of the Retirement System had been made each year in the past;
ii. Benefit provisions had always been the same as current benefit provisions; and
iii. Actual past experience had always conformed to current actuarial assumptions.

If assets equaled the total accrued liability, there would be no unfunded liability and future contribution requirements would consist solely of the calculated normal cost rates.

Amortization of Unfunded Actuarial Accrued Liability

The unfunded accrued liability (UAL) as of December 31, 2018 (see Table 10 of your municipality's annual actuarial valuation report) is projected to the beginning of the fiscal year for which employer contributions are being calculated (fiscal year beginning in 2020). This allows the 2018 valuation to take into account the expected future contributions that are based on past valuations. This projection process will result in more stable computed contribution rates, and was first used for the December 31, 2004 actuarial valuations.

For valuation years through 2015, the projected total unfunded accrued liability was then amortized over the appropriate period for each division to determine the amortization payment. For divisions that will have no new hires this was the dollar amortization payment. For divisions that are open to new hires this payment was divided by the projected fiscal year payroll to determine the amortization payment as a percentage of active member payroll. The resulting amortization contributions were displayed in Table 1 for each division. For purposes of determining the amortization payment, payments are projected to increase 3.75% a year.

Beginning with the December 31, 2016 Annual Valuation, the various types of UAL are amortized over different amortization periods. Dollar and percentage contributions are determined as above for each piece (layer) of UAL.

The MERS funding policy uses a level-percent-of-payroll amortization method. This means that the annual amortization payment dollars will increase each year at the assumed wage inflation of 3.75%. One result of the level percent of pay amortization method is that the outstanding balance of the UAL will increase in nominal dollars each year for amortization periods longer than around 18 years (although it will decline in real, inflation-adjusted terms). This is called negative amortization. This phenomenon ceases once the amortization periods become shorter than 18 years.

The different types of UAL are defined below in the table below:

Type of UAL	Definition
Initial UAL	UAL as of December 31, 2015 UAL, or the valuation date the municipality joined MERS
Gain/Loss	UAL attributable to differences between the actuarial assumptions and the experience of the plan for the twelve months prior to the valuation date
Plan Amendment	UAL arising from adoption of a benefit change
Assumption Change	UAL arising from a change in actuarial assumptions
Method Change	UAL arising from a change in methods (i.e., funding method or asset method)
Early Retirement Incentive	UAL arising from adoption of an Early Retirement Incentive program
Merged Division Balance	Aggregate UAL resulting when divisions merge

Beginning in the December 31, 2016 annual actuarial valuation, the different sources of UAL are amortized over separate closed amortization periods as shown in the table that follows, unless the remaining period on the Initial UAL is longer in which case the longer period is used.

If in a valuation the total Unfunded Liability switches from positive to negative or negative to positive, all existing layers are eliminated and a new layer is established.

Amortization Periods for Sources of Unfunded Accrued Liability (UAL)

(First Applicable to the December 31, 2016 Annual Actuarial Valuation)

Source of UAL	Amortization Period [1]	
	Open Divisions	Closed Divisions
Initial UAL	20 years[2]	Accelerated or Non-Accelerated Option
Future Active and Inactive Plan Amendments	10 years [3]	5 years [3]
Future Liability and Asset Gain or Loss	15 years	10 years
Future Assumption or Method Changes	15 years	10 years
Future Early Retirement Incentives	5 years [3]	5 years [3]

[1] A shorter amortization period may be suggested for poorly funded divisions (subject to MERS CEO and actuary discussion).

[2] 25 years in the year a municipality first joins MERS, 10 years open if overfunded, subject to CEO and actuary discussion.

[3] Only applies to divisions that are over 100% funded before and after the benefit provision change.

Amortization periods that are shorter than the above standard periods may be elected by a municipality.

The minimum contribution requirement is equal to the excess of three years of projected annual retiree benefit payments over the projected market value of assets. For open divisions this minimum first applied beginning with the December 31, 2015 annual valuations.

Prior to December 31, 2018, the standard amortization period for negative Initial UAL is 10 years, with the 10 year period re-established with each annual valuation. Beginning with the December 31, 2018 valuations, there is a minimum employer contribution requirement of normal cost for each division switching from an underfunded UAL to an overfunded UAL. This minimum employer contribution requirement shall continue until the division's funded ratio reaches 120%.

Prior to December 31, 2016, various amortization policies have been in place. In many instances, the amortization policy already in effect for a division's 12/31/2015 UAL is maintained for the Remaining 12/31/2015 UAL. The table below shows the different types of amortization policies that are still being used in the annual valuations for these cases:

Type of Amortization	Description
Non-accelerated amortization (can apply to both open and closed divisions)	Amortization period declines by 1 each year until the UAL is paid off
Accelerated to 5-Year amortization (applies to closed-not-linked divisions only and cannot be adopted after 2016)	Declines by 2 years each year until it reaches 6 or 5 years, than declines by 1 each year until UAL is paid off
Accelerated to 15-Year amortization (applies to closed-not-linked divisions only and cannot be adopted after 2016)	Declines by 2 years each year until it reaches 16 or 15 years, than declines by 1 each year until UAL is paid off
Extended amortization (applies to the initial UAL only)	Declines by 1 year each year until UAL is paid off.
Custom amortization (can apply to both open and closed divisions)	Various amortization schedules adopted by employers that do not fit the descriptions of the other schedules listed above

Open Divisions and Closed Divisions

Open divisions will include the future new hires within an employee classification (bargaining unit). Rehired members will also become members of the open division. Members transferred to the employee classification will also become members of the open division, unless the Alternate Transfer Provision is adopted by the municipality. In the latter case, each transferring member is given a choice of entering the open division or a closed division within the employee classification (if there are still active members in the closed division, and the closed division is of the same type - defined benefit, hybrid, or defined contribution - as the division from which the member transferred).

There may also be one or more divisions within the employee classification that no longer accept new hires. These are generally referred to as closed divisions, but in some situations are linked to the open division with the new hires (for actuarial valuation purposes - see Linked Divisions below). Note that a division is also treated like a closed division if the division has no active members reported as of the valuation date.

Linked Divisions

If new hires, transfers and rehires in a division are covered by a new tier of benefits in the MERS Defined Benefit Plan (including the defined benefit portion of the MERS Hybrid Plan), there can be a sharing of employer assets between the defined benefit division with no new hires (with the old benefit structure) and the defined benefit or hybrid division covering the new hires within the same employee classification. (Note that assets cannot be shared if the new tier of benefits is a defined contribution plan.) This allows multiple divisions to be "linked" and financed as if they were one division.

If a division with no new hires is "linked" to an open MERS Defined Benefit Plan or MERS Hybrid Plan division, this is indicated in Table 2 of your municipality's annual actuarial valuation report. Both of the linked divisions will use the standard open division funding policy.

Asset Valuation Method

The actuarial value of assets is determined on the basis of a method that calculates expected investment income at the valuation rate of return and adds a portion of the difference between the expected investment income and actual investment income earned on a market value basis. For the December 31, 2017 valuation the difference in investment income between expected return and market return is recognized over a 5-year period at the rate of 20% per year. This asset valuation method was first adopted for the December 31, 2016 valuation, and is applied as follows:

Actuarial Value equals:

(i) Actuarial value of assets from the previous actuarial valuation; plus
(ii) Aggregate employer and member contributions since the last valuation; minus
(iii) Benefit payments and refunds of member contributions since the last valuation; plus
(iv) Estimated investment income at the 7.75% valuation interest rate; plus
(v) Portion of gain (loss) recognized in the current valuation.

For the above purpose, gain (loss) is defined as the excess during the period of the investment return on the market value of assets over the expected investment income. The portion recognized in the valuation is 20% of the current year's gain (loss) plus 20% of the gain (loss) from each of the 4 preceding years. This is a change from the 2015 and prior valuations where a 10 year smoothing period was used. For purposes of transitioning from the 10 year to the 5 year method, the entirety of prior unrecognized gains and losses at December 31, 2016 is combined into a single item and will be recognized over the next four years.

During 2018, the approximate net investment return on average total assets at actuarial value (determined as the actuarial value of investment income divided by the average actuarial value of assets during the year) was 3.80%. The corresponding amounts for 2017, 2016, 2015, and 2014 were 6.08%, 5.14%, 5.21%, and 5.90%, respectively.

For the December 31, 2018 valuation, the actuarial value of assets is equal to 109.34% of market value (compared to 101.13%, 107.71%, 113.54%, and 105.99%, in 2017, 2016, 2015, and 2014 respectively). This percentage is applied to each division's reported market value of assets to estimate the actuarial value of assets for the division. The tables on the following pages provide the details of the derivation of the actuarial value of assets for the retirement system in the aggregate.

Note that, given that the actuarial value of assets is currently 9% higher than the market value, meeting the actuarial assumption in the next few years will require average annual market returns that exceed the 7.75% investment return assumption.

Please see the Comments on Asset Smoothing in your municipality's annual actuarial valuation report.

Municipal Employees' Retirement System of Michigan

Derivation of Actuarial Value of Assets

Valuation Date December 31	2016	2017	2018	2019	2020	2021	2022	2023	2024
1. Beginning of Year Assets									
a) Market Value	$7,886,133,448	$8,490,200,180	$9,438,790,673						
b) Valuation Assets	8,953,772,507	9,144,749,435	9,545,649,179						
2. End of Year Market Value of Assets	8,490,200,180	9,438,790,673	8,956,119,550						
3. Net Additions to Market Value									
a) Net Contributions	654,676,753	698,797,543	796,389,263						
b) Benefit Payments	(917,084,153)	(849,733,843)	(892,535,236)						
c) Net Cash Flow = (3a) - (3b)	(262,407,400)	(150,936,300)	(96,145,973)						
d) As a percent of market value of assets = (3c) / (1a)	(3.33%)	(1.78%)	(1.02%)						
4. Average Valuation Assets = (1b) + 0.5 x [(3a) + (3b)]	8,822,568,807	9,069,281,285	9,497,576,193						
5. Determination of Annual Gain/(Loss)									
a) Valuation Rate	7.75%	7.75%	7.75%						
b) Expected Income at Valuation Rate = (4) x (5a)	683,749,083	702,869,300	736,062,155						
c) Actual Net Investment Income = (2) - (3c) - (1a)	866,474,132	1,099,526,793	(386,525,150)						
d) Gain (Loss) = (5c) -(5b)	182,725,049	396,657,493	(1,122,587,305)						
6. Phased-In Recognition of Investment Return									
a) Current Year = 0.2 x (5d)	36,545,010	79,331,499	(224,517,461)						
b) First Prior Year	(266,909,765)	36,545,010	79,331,499	(224,517,461)					
c) Second Prior year		(266,909,765)	36,545,010	79,331,499	(224,517,461)				
d) Third Prior Year			(266,909,765)	36,545,010	79,331,499	(224,517,461)			
e) Fourth Prior Year				(266,909,764)	36,545,009	79,331,497	(224,517,461)		
f) Total Recognized Investment Gain (Loss)	(230,364,755)	(151,033,256)	(375,550,717)	(375,550,716)	(108,640,953)	(145,185,964)	(224,517,461)		
7. Change In Valuation Assets = (3a) + (3b) + (5b) + (6f)	190,976,928	400,899,744	264,365,465						
8. End of Year Assets									
a) Market Value = (2)	8,490,200,180	9,438,790,673	8,956,119,550						
b) Valuation Assets = (1b) + (7)	9,144,749,435	9,545,649,179	9,810,014,644						
c) Difference Between Market & Valuation Assets	(654,549,255)	(106,858,506)	(853,895,094)						
9. Recognized Rate of Return = [(5b) + (6f)] / (4)	5.14%	6.08%	3.80%						
10. Market Rate of Return	11.17%	13.07%	(4.12%)						
11. Valuation Asset Adjustment Factor = (8b) / (8a)	1.077095	1.011321	1.095342						