LIVINGSTON COUNTY FISCAL SERVICES
LIVINGSTON COUNTY, MICHIGAN
304 E. Grand River Ave., Suite 204 | Howell, MI 48843
Phone: 517.540.8740

RFP-LC-26-02
Pension Actuarial Audit and Actuarial Report

ADDENDUM #2

The purpose of this addendum is:

- Update Cover page:
  - '**Resulting Contract Term:** One (1) year contract' should be '**Resulting Contract Term:** One (1) year contract with four (4) optional 1-year renewals'
- to communicate questions received, and the answers to those questions

QUESTIONS	ANSWERS
Does the requested work cover the County's other post-employment benefits (OPEB) plan along with the pension plan, which would include calculation of the Total OPEB Liability, Fiduciary Net Position and Net OPEB Liability?	No.
Please confirm that a limited scope "Level 2" audit is being requested. Whereas a Level 3 audit utilizes no actuarial calculations and involves only a high-level review, including adherence to Actuarial Standards of Practice and a Level 1 audit is a full replication of all pertinent liability and asset values, along with recreating the Actuarial Determined Contribution, Net Pension Expense, etc. A Level 2 audit typically requires matching select test life calculations and obtaining limited data from the Plan's actuary to estimate that overall Total Pension Liability, Fiduciary Net Position values and resulting Net Pension Liability calculations are correct.	This is a level one audit.
When was the last actuarial audit performed for the County? Is a copy of the final report available for review by the bidders?	October 2025
What were the fees paid for the last actuarial audit?	Mers paid Cavmac $90,000 to perform the actuarial audit and paid its actuary

	GRS $52,000 to support the actuarial efforts required.
Are there any specific areas of the audit that the County would like the vendor to address in the proposal?	No.
Do all pension-eligible employees of Livingston County participate in MERS? If so, are you requesting an actuarial review of the MERS actuary's actuarial valuation of the pension benefits for Livingston County?	Yes. Yes.
In June 2025, the Michigan Department of Treasury issued Numbered Letter 2025-1 that stated all OPEB systems shall have a peer actuarial audit (or replace the plan actuary) at least every 8 years in order to comply with Section 4(1)(c-d) or PA202. Is it the intent of this RFP to satisfy the actuarial audit (in lieu of replacement of plan actuary) requirement of Section 4(1)(c-d) or PA202? If so, do you intend to include an actuarial audit of the Livingston County Retiree Health Care Plan with the scope of this RFP?	No.
Will we receive both the raw data and the final data used in the valuation?	They will get the final data used.
Who is the ongoing actuary?	GRS
What were the fees charged for the last 3 years for the Pension valuation and GASB 67/68 reporting?	2024 AAV (performed in 2025): $789,485 2023 AAV (performed in 2024): $762,180 2022 AAV (performed in 2023): $768,085
What were the fees charged for the most recent experience study?	MERS paid GRS $202,744 to complete the most recent experience study produced in February, 2025, covering the period of January 1, 2019 – December 31, 2023.
What were the fees charged for the last 3 years for the OPEB valuation and GASB 74/75 reporting?	This is for pensions and not OPEB.
When was the last time an actuarial audit was conducted?	October 2025
What were the fees charged for the most recent actuarial audit?	Mers paid Cavmac $90,000 to perform the actuarial audit and paid its actuary GRS $52,000 to support the actuarial efforts required.
How much is Livingston County budgeting for this project?	The board of Commissioners authorized the Request for Proposal but have not yet appropriated funds for the project. The

	budget will be determined when a vendor is presented to them for approval.
Our firm prefers to contract for actuarial services with a limit on liability for ordinary mistakes or errors (i.e., negligence). However, we can accept unlimited liability for direct damages for (i) willful, fraudulent, or criminal misconduct; (ii) bodily injury, including death, or damage to tangible personal or real property incurred while performing the services and to the extent caused by the negligent or willful acts or omissions of our personnel; or (iii) the infringement of the proprietary rights of a third party by use of the deliverables provided. Please confirm that Livingston County is willing to negotiate a mutually agreeable liability cap to cover the services being bid.	Livingston county legal counsel will work with the vendor to draft a satisfactory agreement.

The bid due date remains April 8, 2026 by 2:00 p.m. EST.

ACCEPTANCE/ACKNOWLEDGEMENT OF ADDENDUM #2

RFP-LC-26-02
Pension Actuarial Audit and Actuarial Report

To be signed and returned with proposal submission.

Company:	Date:
Authorized Signature:	
Printed:	

ACTUARIAL REVIEW REPORT

MUNICIPAL EMPLOYEES' RETIREMENT SYSTEM OF MICHIGAN

Prepared October 31, 2025

October 31, 2025

Retirement Board
Municipal Employees' Retirement System of Michigan
Lansing, MI

Dear Retirement Board:

Cavanaugh Macdonald Consulting, LLC (CavMac) has performed an independent review of the Municipal Employees' Retirement System of Michigan (MERS) December 31, 2024 actuarial valuations for the following employers:

- City of Charlotte
- Delta Charter Township
- City of Fraser
- Hunter Charter Township
- Village of Nashville
- Village of Sparta
- Sumpter Township

As an independent reviewing or auditing actuary, we have been asked to express an opinion regarding the reasonableness and accuracy of the actuarial assumptions, actuarial cost methods, and valuation results.

Our opinion on the valuation results was based on a replication valuation of seven employers December 31, 2024 actuarial valuations, along with a review of the Actuarial Experience Study for the period ending December 31, 2023. We would like to thank Gabriel, Roeder, Smith & Company (GRS), the retained actuary for the MERS, for their cooperation and assistance in providing the required information to us. ***We find the actuarial valuation results to be generally reasonable and accurate based on the methods and assumptions used. We have disclosed comments regarding some aspects of the assumptions and methods, along with a few comments on some report disclosures. The actuarial work was performed by qualified actuaries and was performed in accordance with the principles and practices prescribed by the Actuarial Standards Board.*** This report documents the detailed results of our review.

In order to prepare the results in this report, we have utilized actuarial models that were developed to measure liabilities and develop actuarial costs. These models include tools that we have produced and tested, along with commercially available valuation software that we have reviewed to confirm the appropriateness and accuracy of the output. In utilizing these models, we develop and use input parameters and assumptions about future contingent events along with recognized actuarial approaches to develop the needed results. The use of an independent actuary, including the use of an independent actuarial model to produce and compare valuation results is a positive for the system, as it helps ensure the accuracy and reliability of the retained actuary's results.

The undersigned are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report. We are happy to discuss any of this further.

Sincerely,

Brent A. Banister, PhD, FSA, EA, FCA, MAAA
Chief Actuary

Bryan K. Hoge, FSA, EA, FCA, MAAA
Principal and Consulting Actuary

Larry Langer, ASA, EA, FCA, MAAA
Principal and Consulting Actuary

Wendy T. Ludbrook, FSA, EA, FCA, MAAA
Consulting Actuary

TABLE OF CONTENTS

		Page
Section 1	Executive Summary	1
Section 2	Actuarial Assumptions	3
	Economic Assumptions	4
	Demographic Assumptions	7
Section 3	Actuarial Methods	10
	Actuarial Cost Method	12
	Asset Valuation Method	14
	Unfunded Actuarial Accrued Liability Amortization Method	18
	Other Actuarial Methods	25
Section 4	Data Review	27
Section 5	Actuarial Valuation Results Review	36
Section 6	Valuation Reports Review	39
Section 7	Summary of Recommendations	41

SECTION 1 – EXECUTIVE SUMMARY

As an independent auditing actuary, Cavanaugh Macdonald Consulting, LLC (CavMac) has been tasked to provide a general overview and express an opinion of the reasonableness and soundness of the work performed by Gabriel, Roeder, Smith & Company (GRS) for the Municipal Employees' Retirement System of Michigan (MERS). The work to be reviewed included:

- December 31, 2024 Actuarial Valuations for the following employers:
  - City of Charlotte
  - Delta Charter Township
  - City of Fraser
  - Hunter Charter Township
  - Village of Nashville
  - Village of Sparta
  - Sumpter Township
- December 31, 2024 Governmental Accounting Standards Board Statement No. 68 Valuations for the above employers
- Actuarial Experience Study for the Period ending December 31, 2023

We requested full participant and financial data of the pertinent employee groups from MERS along with reports, plan descriptions, and applicable statutes pertaining to the plans. We also requested from GRS the participant data as reconciled for the December 31, 2024 actuarial valuations along with the complete descriptions of assumptions, methods and valuation procedures.

It is our belief that an audit should not focus on finding differences between actuarial processes and procedures utilized by two different actuaries but rather to verify there are no material errors and to find improvements to the process and procedures utilized by the System's actuary. In performing this audit, we attempt to limit discussions concerning differing opinions and focus more on the accuracy of calculations, the completeness and reliability of reporting, and the compliance with generally acceptable actuarial practices and standards of practice in all the work reviewed.

CONCLUSIONS

As described in our report, we have determined that the actuarial methods, assumptions, processes, and reports are generally consistent with the applicable Actuarial Standards of Practice (ASOPs). Throughout the report, we have noted areas where there are opportunities for improvement and where methodologies or documentation could be reviewed and potentially updated. While we believe our suggested considerations would not have a material impact on the results of the December 31, 2024 valuations, the actuarial communication and details of the results could potentially be improved. Therefore, such suggestions and recommendations should be considered when the next experience study is performed or when the December 31, 2025 valuations are prepared.

SECTION 1 – EXECUTIVE SUMMARY

Additional details on our audit findings can be found in the remaining sections of this report.

- In Section 2 of our report, we discuss our review and observations of the Actuarial Experience Study. We find this experience study to be generally consistent with the applicable ASOPs and believe the proposed assumptions and methods to be appropriate for the actuarial work that GRS performs for the System. We offer some suggestions and ideas for consideration in enhancing future studies.

- In Section 3 of our report, we review the actuarial methods that are used to develop the actuarial contribution rate. In our opinion, these methods are generally reasonable and appropriate for systematically funding the benefits, however, we recommend a review of the Dedicated Gains Policy and its compliance with relevant ASOPs. We also recommend a review of the Amortization Extension policy.

- In Section 4 of our report, we compare the data provided by MERS with the data used by GRS. We find that the data is reasonably consistent and appropriate.

- In Section 5 of our report, we independently calculated the liabilities of MERS for the selected employer valuations. We reviewed the cost calculations and found them to be appropriate.

- In Section 6, we provide our analysis of the funding valuation reports including the GASB 68 disclosures, produced by GRS. We found them to be reasonable and substantially in compliance with the ASOPs.

- In Section 7, we provide a summary of all of our comments and suggestions for the convenience of GRS and MERS in assessing what changes might be appropriate going forward.

Because of the complexity of actuarial work, we would not expect to match GRS' results exactly, nor would we necessarily expect our opinions regarding the selection of assumptions and methods to be the same as the opinions of GRS. It is our intent to substantiate the reliability of the assessment of the funding progress of MERS and to offer ideas which could enhance the process. The remainder of this report provides the basis for our findings for each of the tasks, including our recommendations.

SECTION 2 – ACTUARIAL ASSUMPTIONS

BACKGROUND ON ACTUARIAL ASSUMPTIONS

The actuarial assumptions form the basis of any actuarial valuation or cost study. Since it is not possible to know in advance how each member's career will evolve in terms of salary growth, duration of service, or cause of employment ending, the actuary must develop assumptions in an attempt to estimate future patterns. These assumptions enable the actuary to value the amounts of benefits earned and to reasonably estimate when and how long these benefits will be paid. Similarly, the actuary must make an assumption about the future investment earnings of the trust fund. In developing all of these assumptions, the actuary examines the past experience and considers future expectations to make the best estimate of the anticipated experience under the plan.

There are two general types of actuarial assumptions:

- ***Economic assumptions:*** These include the valuation interest rate (expected return on plan assets), assumed rates of salary increase, price inflation, wage inflation, and increases in total payroll. The selection of economic assumptions should conform to ASOP No. 27 *"Selection of Assumptions for Measuring Pension Obligations".*

- ***Demographic assumptions:*** These include the assumed rates of retirement, mortality, termination, and disability. The selection of demographic assumptions should also conform to ASOP No. 27.

The December 31, 2024 valuations we are auditing used assumptions developed by GRS in the Experience Study Report for the 5-Year Period from January 1, 2019 - December 31, 2023. This study recommends assumptions and methods that were approved by the Board for use beginning with the December 31, 2024 actuarial valuations. We have reviewed the methods and conclusions of GRS' report and formed our opinion. We did not replicate the calculations in that report since that was beyond the scope of our assignment.

SECTION 2 – ACTUARIAL ASSUMPTIONS

ECONOMIC ASSUMPTIONS

Actuarial Standards of Practice (ASOPs) are issued by the Actuarial Standards Board to provide guidance to actuaries with respect to certain aspects of performing their work. As mentioned earlier, ASOP 27 is the actuarial standard that addresses the selection or recommendation regarding economic assumptions for measuring pension obligations (liabilities) under defined benefit plans. We discuss the assumptions used by GRS below:

Price Inflation: Price inflation is a factor in developing the assumptions for investment return, salary and payroll growth, and cost-of-living-adjustments (COLA). The underlying price inflation component in all of these should be consistent in accordance with the guidance provided in ASOP 27.

GRS considers a variety of sources, including the Congressional Budget Office the forecasts of investment advisors and Federal reserve branches, the Social Security Administration Trustees report, and the inflation estimate inherent in the bond market in arriving at their recommendation to keep the inflation assumption at 2.5%. We believe that GRS' methodology and sources in setting this assumption are reasonable. Many practitioners would also include some analysis of historical inflation, but that is not required. We note that despite the recent higher inflation to which GRS alludes, all of the sources used by GRS, ranging from 5 to 100 years, are less than 2.5%. Because inflation increased dramatically in 2021 following a number of years of being low, we understand that the decision to keep the long-term inflation assumption might seem surprising to some people. Despite what has been observed recently, the bond markets have consistently reflected an expectation that the low rates we have observed for the last 20-30 years will return before long. Consequently, our opinion is that GRS' recommendation is reasonable.

Investment Return Assumption: The investment return assumption should represent the long-term compound rate of return expected on the plan assets, considering the asset allocation, the real rate of return on each asset class, and the underlying inflation rate, all net of expenses paid from the trust.

The long-term relationship between price inflation and investment return has long been recognized by economists. The basic principle is that the investor demands a more or less level "real return" – the excess of actual investment return over price inflation. If inflation rates are expected to be high, investment return rates are also expected to be high, while low inflation rates will result in lower expected investment returns, at least in the long run.

The period considered for pension funding represents a long-time horizon. Frequently, asset advisors focus on no more than the next 5 to 10 years since they are most concerned with how to invest the funds currently to maximize returns. While actuaries are projecting benefits to be paid for the next 50 to 100 years, the short term is also relevant, especially for funds with

significantly negative cash flows. This difference in perspective can significantly influence how investment advisors and actuaries derive an investment return assumption.

GRS considers the capital market assumptions of the twelve investment consultants who they survey each year. They apply each these assumption sets to the MERS Board's Investment Policy and then adjust for inflation assumption differences and assumed administrative expenses. They also determine the median, 40th percentile, and 60th percentile returns and the probability of exceeding the current investment return of 6.93% for each assumption set. Most of the measures are then averaged across the twelve investment consultants and then in some cases across the assumption sets of the last three years.

Because the Dedicated Gains Policy is used to develop the discount rate, there is no recommended assumption made for the interest rate. GRS asserts that the "preferred range" that is used by the policy may still be used. The report does not indicate what the high and low ends of the preferred range represent but justifies its continued use because 2022 had low expectations and 2023 had high expectations and that this experience is "in conjunction" with the Dedicated Gains Policy. We believe there could be improved clarity as to what the range is intended to represent along with how the tabulated data supports the result. Because the resulting 6.93% interest rate, while never being identified as an assumption, is almost the median return under the various capital market assumption sets, we believe the use of this rate for valuation purposes is reasonable.

In the investment section of the report, GRS develops an assumption for administrative expenses by considering the last 20 years. We find this a reasonable approach. The investment return assumption for funding purposes is net of administrative expenses, which is a reasonable approach. For GASB (accounting) purposes, GRS uses 7.18% which adds the 0.25% expense load back in. This is appropriate since GASB calls for an explicit recognition of administrative expenses in the development of Pension Expense.

General Wage Increases: The general wage growth or wage inflation assumption consists of price inflation and real wage growth (also called productivity). As the prices of goods and services increase, we expect wages to increase as well. Productivity is a measure of how much wages increase across the whole labor pool in excess of the rate of price inflation. Both of these items tend to be a function of the general economy rather than system specific. GRS assumes a real wage growth of 0.50%. GRS bases their analysis by considering the change in the National Average Wage Index (not clearly identified as such) versus price inflation. Based on our experience with public employment, we find the assumption proposed by GRS to be reasonable.

Individual Salary Scale: There are two factors that generally affect salary increases and are typically reflected in the individual salary scale. The first is the wage inflation or the total wage growth assumption. The second component, frequently identified as the merit scale, reflects the portion of salary increases provided at the individual level, including promotion, increased skills,

longevity pay, and other similar items. The combination of these components is reflected in the total individual salary scale.

GRS has developed a merit scale based on years of service applicable to all employees. For the study, they considered the pay increases for those employees who were active in consecutive years, and the removed the increase in average pay for that year in order to isolate the merit portion. They determined that the observed merit increases were sufficiently consistent with the expected increases to leave the assumption in place. We find this approach to the analysis to be reasonable and do not see any evidence to suggest the assumption should be changed.

We have two comments on the nature of this assessment that we suggest be considered in the next experience study. First, we believe that having merit assumptions over a 40-year period is longer than most practitioners would typically use. This does not mean that it is inappropriate, but it might be reasonable to shorten the assumption to 30 years without losing any significant predictive ability. Second, we understand that GRS has reviewed this assumption separately for public safety and all other members and determined that a single assumption is appropriate. In our experience, there can be different pay increase patterns, especially since public safety members tend to have careers that are only 25 to 30 years long, and so we would encourage this review to be performed and noted in each experience study.

Related to the pay increase assumption are loads that reflect that final average compensation is often higher than might be expected from the valuation pay data. GRS develops this assumption separately for all employers (collectively) who use only base pay, and for each employer (individually) who uses total. There is a further adjustment made, when appropriate, for cases where sick leave is to be reflected. We find the approach described by GRS to develop this assumption to be reasonable.

Payroll Growth Assumption: The UAL is amortized as a level percentage of payroll over the amortization period. As a result, a payroll growth assumption is necessary to develop the UAL contribution rate. GRS assumes that payroll will grow at 3.00%. We do not find any direct consideration or disclosure of this assumption in the experience study report. While using wage inflation is a common approach, we would still suggest that explicit consideration of this assumption be made. As we note in our discussion on methods, this assumption is not generally appropriate for closed plans.

Miscellaneous Assumptions: GRS has additional assumptions for interest on member account balances, the growth of Internal Revenue Code limits on maximum benefits and compensation, and CPI-based COLAs. The rationale and recommended assumptions (all unchanged) for these items are appropriate in our opinion.

SECTION 2 – ACTUARIAL ASSUMPTIONS

DEMOGRAPHIC ASSUMPTIONS

The major demographic assumptions are the assumed rates of retirement, disability, and mortality (death before or after retirement). There are also various minor assumptions that sometimes are developed with a significant component of professional judgment since useful data is not always readily available.

We note that individual years are not shown in the data analyzed. Because the study data included the time when Covid was affecting the world, it could have been useful to show results by individual year. GRS indicated that they considered the presence of Covid in performing their analysis, but the details of this process are not readily discernible. We have found that the impact of Covid has varied significantly by retirement system, assumption, and even by year. This extra review would be especially valuable during a period in which behavior changes – some of which have since reverted back and some of which haven't – occurred rapidly.

In the following paragraphs, we make specific comments on the demographic assumptions.

Rates of Mortality: One of the most important demographic assumptions in the pension valuation is mortality because it projects how long benefit payments are expected to be made. The longer retirees live and receive benefits, the larger the liability of the system, thus increasing the contributions required to fund the system. In addition, if members live longer than expected based on the assumption, the true cost of future benefit obligations will be understated, and contributions will increase as the unfavorable experience unfolds.

Constructing mortality tables requires a significant amount of data, and so almost all retirement systems rely on mortality tables published by the Society of Actuaries (SOA). MERS has been using the Pub-2010 family of tables historically. Since these tables were developed using public plan retirement data, we are in full support of this. GRS has been using the general membership rates for both safety and non-safety members, with a 6% load to better fit the observed experience. While there could be a case made for using the SOA public safety table for the MERS public safety members, the observed mortality for safety and non-safety are reasonably similar to each other, so using a common assumption is reasonable.

GRS notes that the three years in which Covid was most pronounced had Actual-to-Expected ratios of over 100%, while the year before and the year after were under 100%. This makes sense since many retirement plans observed higher death rates during these same years. Because of the presence of Covid, GRS does not suggest any change to mortality rates, acknowledging there are still unknowns. We believe this choice is appropriate.

All of the analysis of mortality is shown in aggregate, split only by safety and non-safety. One risk of only considering the aggregate results is that the differences that might exist for males vs. females or between younger and older retirees are not necessarily apparent. It is possible that

GRS did some of this additional analysis, but there is no indication in the report that they did so. We would encourage that in the next study this additional analysis be performed and disclosed.

GRS assumes that mortality will increase in keeping with a mortality improvement scale. This has become the standard within the actuarial profession over the last several years. GRS recommends updating the mortality projection scale to MP-2021, the most recent version published by the Society of Actuaries at the time of the experience study. This was an update from the MP-2019 table adopted in the prior study. We believe this is appropriate.

Rates of Disability: In most retirement systems, disability retirements are relatively rare, making it often challenging to set rates. The rates for disability used by GRS are age-based, with a single table for all employees, whether safety or non-safety. GRS indicates that there were 143 disabilities during the study period, a number which they indicate is not fully credible. They do not indicate what the expected number of disabilities was, so there is no simple way to assess whether the current rates are about right, significantly high, or significantly low. We believe that the report should contain some indication of how the limited number of observations compares with the assumed pattern.

Because there are some provisions which treat duty-related disability differently from non-duty-related disability, GRS has developed an assumed proportion of duty-related disabilities that differs by safety and non-safety members. This assumption seems reasonable give the observed data and also is generally in line with what we see in many other systems.

Rates of Retirement: Because of the large variety of retirement eligibility provisions that employers may select, GRS has developed retirement rates that vary by a calculation designed to approximate the new replacement ratio of the benefit, with distinct rates for safety and non-safety embers. For the study, GRS determined the aggregate Actual-to-Expected Ratio for the two membership classifications and left the non-safety rates unchanged because the aggregate experience was fine. For the safety group, they show graphical and tabulated data that indicate the changes. In general, this structure makes sense given the large number of possible retirement criteria. We have some observations:

- The fact that the non-safety members had an A/E ratio close to 100% is not necessarily a sufficient condition to decide that no changes are needed. It could be that rates are high at one end and low at the other, leading to a decent average fit, but a poor model. GRS may have performed such an analysis, but they do not discuss it. For the safety group, GRS notes (and adjusts for) the fact that the fit is off in different directions at the two ends of the replacement index.
- The proposed changes for the safety rates have two places where retirement rates are not monotonic relative to the replacement index. Unless there is some known reason for this, we would prefer to maintain a steadily non-decreasing set of retirement rates as being the best model.

GRS also has rates for reduced retirement. This is a fairly minor occurrence, but we believe that the approach used model the occurrence is appropriate and reasonable.

Rates of Termination: The termination rates developed by GRS use service-based tables for safety and non-safety groups. We find the analysis and recommendations to be reasonable. We would suggest that GRS consider applying some smoothing to the developed rates, recognizing that the decision to terminate employment (on either the employer or employee end) is not likely to have any service-based discontinuities. We would also suggest assuming no terminations after 30 years of service for non-safety members and 25 years for safety members.

Because members usually have an option to take a refund of their contributions in lieu of future benefits, there needs to be an assumption regarding such an action. While not explicitly stated, GRS assumes that all members who are vested will receive a deferred annuity benefit. We believe it would be appropriate in the experience study to at least discuss why such an assumption is reasonable and then explicitly acknowledge this assumption.

Deferred Retirement Option Plan (DROP): One of the optional provisions available in MERS is a DROP feature which allows members to remain in employment but have their retirement benefit calculated and deferred until the end of employment at which time the deferred payments with interest and other possible adjustments are provided as a lump sum. Because of the complexities of MERS, GRS has determined that this feature is best valued as a load that is determined for each division that has adopted a DROP. We believe that this is a reasonable approach. We find the description of how this load is determined to be vague, but the disclosed loads are consistent with what we have seen with DROP plans.

Miscellaneous Assumptions: Valuations often require a number of minor assumptions, some of which can be estimated from system data and some of which may be based primarily on the actuary's professional judgment. GRS does a nice job and listing many of these, providing an explanation of the relevance of the assumption, and then explaining how the assumption is made. We find all of these assumptions to be reasonable for the purposes given.

SECTION 3 – ACTUARIAL METHODS

BACKGROUND ON ACTUARIAL METHODS

Actuarial methods are used to provide for systematic funding of a retirement plan. From the Second Edition of Actuarial Funding Policies and Practices for Public Pension Plans released August 2024 by the Conference of Consulting, there are five broad considerations when establishing a funding policy for a pension plan:

- ***Contribution Sufficiency***. The principal goal of a funding policy is to pre-fund the benefits so that future contributions together with current plan assets and future investment returns should be sufficient to provide for all benefits expected to be paid to members and their beneficiaries when due.
- ***Demographic Matching.*** The funding policy should seek a reasonable allocation of the cost of benefits and the associated funding to the years of service. This includes the goal that annual contributions should maintain a reasonably close relationship to both the expected cost of each year of service and to deviations from that expected cost.
- ***Volatility Management.*** The funding policy should seek to manage and control future contribution volatility to the extent reasonably possible, consistent with other policy goals.
- ***Transparency and Accountability.*** The funding policy should support the general public policy goals of transparency and accountability. While these terms can be difficult to define in general, here their meaning includes that each element of the funding policy should be clear both as to its intent and effect, and that each should allow an assessment of whether, how, and when the plan sponsor is expected to meet the funding requirements of the plan.
- ***Sound Governance.*** The funding policy should take into consideration the nature of public sector pension plans and their governance. These governance issues include (1) agency risk issues associated with the desire of interested parties (agents) to influence the contribution calculations in directions viewed as consistent with their particular interests, and (2) the need for a sustained budgeting commitment from plan sponsors.

Generally, a funding policy is composed of the following actuarial methods:

- Actuarial Cost Method
- Asset Valuation Method
- Unfunded Actuarial Accrued Liability Amortization Method
- Surplus management
- Output Smoothing Methods
- Contribution Lag Policy

SECTION 3 – ACTUARIAL METHODS

The last two methods on the list above have existed in practice for some years in the public sector actuarial universe but have been recently explicitly added to ASOP 4, the standard that guides actuaries in these matters. Note that not all of these elements are necessary for a complete funding policy. We will discuss each component of the actuarial methods for MERS.

We reviewed the Actuarial Methods in the following documents:

- The latest actuarial valuation reports
- Actuarial Policy document - https://assets.mersofmich.com/forms/ActuarialPolicy.pdf
- Appendix to the Annual Actuarial Valuation Report found at: https://www.mersofmich.com/Portals/0/Assets/Resources/AAV-Appendix/MERS-2024AnnualActuarialValuation-Appendix.pdf

For our review of actuarial methods we looked for consistency with the following:

- Actuarial Standards of Practice (ASOPs):
    - ASOP No. 4, Measuring Pension Obligations and Determining Pension Plan Costs or Contributions
    - ASOP No. 44, Selection and Use of Asset Valuation Methods for Pension Valuations.
- The Second Edition of Actuarial Funding Policies and Practices for Public Pension Plans released August 2024 by the Conference of Consulting Actuaries noted earlier (The CCA Funding Paper)
- Core Elements of a Funding Policy for Governmental Pension and OPEB Plans issued by the Government Finance Officers Association (the GFOA Funding Paper).

While the ASOPs are binding on the actuary's work, the CCA Funding Paper and the GFOA Funding Papers are not. However, these papers provide guidance in a more direct manner and can be helpful in reviewing the actuarial methods of a system.

SECTION 3 – ACTUARIAL METHODS

ACTUARIAL COST METHOD

For all pension plans, whether defined benefit or defined contribution, the basic retirement funding equation is:

$$C + I = B + E$$

where:

- C = employer and member contributions
- I = investment income
- B = benefits paid
- E = expenses paid from the fund, if any

As can be seen from the formula, for a given level of benefits and expenses, the greater "I" is, the smaller "C" will be. This is the underlying reason for advance funding a pension plan, and historically investment income pays for 70% to 75% of the benefit dollars received by plan members. In other words, for every dollar paid to a member only 25 to 30 cents come from contributions.

Of course, the problem with the formula is that the amounts cannot be known with certainty until the last member is deceased. At that point, the benefits and expenses actually paid out and the investment income earned would be known and, using the equation above, the true cost could be determined. Since most plans are ongoing and do not expect to have a "last member", plan sponsors hire actuaries to estimate the cost of their plans and to create a budget for systematic contributions to meet that cost.

To determine the contributions needed, the actuary's first step is to estimate on a given date (the valuation date) the value of all benefits and expenses that will be paid to the existing active and retired membership over their remaining lifetimes based on the plan's current benefit structure. This estimation requires the use of assumptions regarding both future events (termination, disability, retirement, death, etc.) and future economic conditions (return on assets, inflation, salary growth, etc.). The MERS assumptions were covered in the previous section.

By combining the assumptions for future events and the salary growth assumption, the actuary generates an expected benefit payment stream. In other words, a string of annual payments expected to be made to the current active and retired members from the valuation date until all members are no longer living. Then the actuary applies the investment return assumption to discount each year's payments to the valuation date, creating the present value of all future benefits or the total liability of the plan.

The difference between the total liability and the current assets of the plan represents the present value of future contributions (PVFC) that must be made by either members or the employers. Usually, the members and employers cannot contribute the entire difference in one year but rather desire a relatively smooth contribution pattern over time that also meets any external constraints.

SECTION 3 – ACTUARIAL METHODS

To budget for the PVFC, the actuary applies an actuarial cost method. There are several acceptable cost methods, but it's important to recognize that they are nothing more than budgeting tools.

Different actuarial cost methods can provide for faster funding earlier in a plan's existence, more level funding over time, or more flexibility in funding. The choice of an actuarial cost method will determine the pattern or pace of the funding and, therefore, should be linked to the long-term financing objectives of the system and benefit security considerations.

The actuarial cost methods used by GRS in the MERS actuarial valuations are variants of the level percent of pay entry age normal method. This cost method determines the normal cost as a level percentage of pay which, if paid from entry into the plan through the last assumed retirement age, will accumulate to an amount sufficient to pay the expected benefits. The entry age normal cost method tends to result in reasonably stable contribution rates, a feature that has helped make it the most used cost method for public plans. The use of the entry age normal cost method satisfies the sufficiency and intergenerational equity components discussed above by developing contributions for taxpayers and members for workers' pensions while those workers are providing their services. In addition to the normal cost, there is also a cost determined by amortizing the unfunded actuarial accrued liability (discussed later in this section).

The variation of entry age normal used by GRS in the MERS actuarial valuations differs depending on the purpose of the calculation as follows.

- *For Accounting purposes,* the traditional entry age normal cost method is used. Under the traditional entry age normal method, 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. This variant is prescribed by GASB for Statements No. 67 and 68.
- *For plan funding and State reporting purposes,* the replacement life entry age normal cost method is used. The normal cost under replacement life will differ from that calculated under the traditional method only if the benefit structure for the member in an open tier is changed after some fixed date. Under the replacement life entry age normal cost method, the normal cost for each member is calculated based on the prospective benefit formula for that member, with entry based upon benefit service. Compared to the traditional normal cost, the replacement life normal cost has the advantage of producing a normal cost rate which is more consistent for all members with the same entry age in the tier, resulting in a more stable future normal cost rate.

In our opinion, the actuarial cost method employed by GRS for funding is appropriate and will systematically fund the prospective pension benefits on an actuarially sound basis if all actuarial assumptions are realized and the actuarial required contributions are made.

SECTION 3 – ACTUARIAL METHODS

The actuarial cost method employed by GRS for accounting purposes complies with GASB.

ASSET VALUATION METHOD

Since the purpose of actuarial funding is to build up an asset pool (remember the importance of "I" in "C + I = B + E"), actuaries need to value the current asset pool on each valuation date. The market value could be used, but it would tend to create too much volatility from valuation date to valuation date, and a single day's measurement is not necessarily indicative of the true underlying value of the investments held by the plan. Thus, most actuaries use an asset valuation method which smooths out these fluctuations in pursuit of achieving more stable funding measures and (when relevant) developing more level contributions. A good asset valuation method places values on a plan's assets which are related to current market value, but which will also produce a smooth pattern of costs. This is a question of balancing fit (measured against market value) and smoothness.

The goal of the actuarial asset valuation method is thus to smooth or reduce investment market fluctuations. This is particularly important during periods of volatile capital markets in which abrupt changes in asset values, when factored into the funding valuation, produce sudden unnecessary changes in contribution levels. In this case, "unnecessary" implies that the change in asset values is not necessarily a true revaluing of the assets involved but rather a fluctuation reflecting a current economic climate or a short-term reaction to specific news.

In our opinion, desirable characteristics of an actuarial asset valuation method include the following:

- The method should be simple to operate. It should be readily calculable from financial statements.
- The method should be easy to explain to all interested parties.
- The theoretical underpinnings should be solid and not produce a long-term lag to the fair value of assets. The value produced should account for market values.
- The method should smooth the effect of market fluctuations.
- The method is unbiased with respect to recognition of gains and losses; that is gains and losses should be recognized over the same period.
- Investment decisions should not be affected by the actuarial asset valuation method, and vice versa.
- The value produced should be realistic; the price tag placed on assets should be sensible and should not cause other variables to be adjusted to account for unrealistic asset values.

SECTION 3 – ACTUARIAL METHODS

The asset valuation method employed by MERS has two components, an asset smoothing method and the Dedicated Gains Policy. We discuss these separately below.

MERS Asset Smoothing Method: The asset smoothing method used by GRS in the valuation is commonly used by other public sector retirement systems. The method finds the difference between the actual net investment return on the market value of assets and the expected investment return on the actuarial value of assets. The differences are developed annually and then recognized evenly over a five-year period. A 20% corridor between the market and actuarial value is applied, meaning the actuarial value may never be 20% greater than, or less than, the market value.

The asset smoothing method calculation is contained in items 1 through 8 of the Derivation of Actuarial Value of Assets exhibit in the Appendix to the Annual Actuarial Valuation Report. We reviewed the calculations, and they are being applied according to the description in the report. The amount of the expected and actual returns is included by GRS in the development of the actuarial value.

Dedicated Gains Policy: The Dedicated Gains Policy automatically reduces the assumed rate of investment return for annual actuarial valuation purposes by immediately reflecting unrecognized investment gains. The decrease in UAL which results from reflecting the gains offsets the increase in the employer normal cost and UAL payment in the first year. This allows for lowering the assumed rate of return without an immediate cost impact. There is no immediate recognition of losses, but to the extent there are subsequent losses it is likely there are no gains to offset them.

The Dedicated Gains Policy calculation is contained in items 9 through 13 of the Derivation of Actuarial Value of Assets exhibit in the Appendix to the Annual Actuarial Valuation Report. We reviewed the calculations, and they are being applied according to the description in the report.

Compliance with ASOP 44: Actuarial Standard of Practice Number 44, "*Selection and Use of Asset Valuation Methods for Pension Valuations"*, provides guidance to the actuary when selecting an asset valuation method for purposes of a defined benefit pension plan actuarial valuation. When considering the use of an asset valuation method other than market value, ASOP 44 states the actuary should select an asset valuation method that is designed to produce actuarial values of assets that bear a reasonable relationship to the corresponding market values. Further guidance states that the asset valuation method must satisfy both of the following criteria:

- The asset values fall within a reasonable range around the corresponding market value.

  AND

- Any differences between the actuarial value of assets and the market value of assets are recognized within a reasonable period of time.

In lieu of satisfying both criteria above, an asset valuation method meets ASOP 44 requirements if, in the actuary's professional judgment, the asset valuation method either:

- Produces values within a sufficiently narrow range around market value, OR
- Recognizes differences from market value in a sufficiently short period.

Several of the terms in the criteria of ASOP 44 such as "reasonable" and "sufficiently narrow" are not well defined. As we consider the asset smoothing method used by MERS in light of ASOP 44, we believe it satisfies these requirements. While the asset smoothing method does include a corridor, which is allowed, but not required based on the method, under ASOP 44, as the five-year phase in of the difference between actual and expected returns is sufficiently short enough to not require a corridor. Use of a corridor can result in volatility in the unfunded actuarial accrued liability and resulting contributions and consideration can be given to eliminating the practice.

While in our professional opinion, the asset smoothing method component of the asset valuation method complies with ASOP 44 requirements, we believe the Dedicated Gains Policy component does not technically comply with ASOP 44.

Section 3.4.1 of ASOP 44 addresses bias in the asset valuation method:

> *If the asset valuation method has significant systematic bias, the actuary should disclose such bias in accordance with section 4.1. An asset valuation method has significant systematic bias if, in the actuary's professional judgment, the method's design is expected to produce a distribution of actuarial values that is significantly skewed toward understatement or overstatement relative to the corresponding market values.*

The Dedicated Gain Policy results in a skewing of the distribution of actuarial values *towards* an overstatement of the market value of assets by retaining all of the deferred losses over their scheduled five-year recognition while often accelerating recognition of the deferred gains. Item 13 of the Derivation of Actuarial Value of Assets exhibit illustrates this. We anticipate this trend will continue until the low end of the investment return range is achieved.

ASOP 44 does not preclude bias, but does require disclosure of the bias in section 4.1.4 of ASOP 44:

> *If, in the actuary's professional judgment, the asset valuation method has significant systematic bias toward understatement or overstatement relative to market value, as described in section 3.4.1, the actuary should disclose the direction of the bias.*

We recommend GRS consider disclosing the bias of the asset valuation method to comply with ASOP 44.

While ASOP 44 appears to allow bias as long as disclosed, The CCA Paper, page 17, is more direct with respect to bias.

- *The asset smoothing method should be unbiased relative to market.*
  - *The same smoothing period should be used for gains and for losses.*
  - *Any market value corridor should be symmetrical around market value.*
- *The asset smoothing method should not be selectively reset at market value only when market value is greater than actuarial value.*
  - *Bases may be combined but solely to reduce future, non-level recognition of relatively small net unrecognized past gains and losses (i.e., when the smoothed and market values are already relatively close together).*

While the CCA Funding Paper is not binding on actuaries like the ASOPs, it does serve as a reference to Public Plan actuaries. In light of the bias of the Dedicated Gains Policy, we recommend that consideration be given to exploring other alternative methods for opportunistically lowering the assumed rate of return.

Other than the following recommendations, we find that the asset valuation method is reasonable and complies with relevant ASOPs and common practice in the public plan community.

- ***We recommend the bias in the asset valuation method caused by the Dedicated Gains Policy be reviewed in light of the CCA Funding Paper and documentation of the bias be considered.***
- ***We recommend that consideration be given to exploring other alternative methods for opportunistically lowering the assumed rate of return.***

SECTION 3 – ACTUARIAL METHODS

UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAL) AMORTIZATION METHOD

The UAL amortization method determines the length of time and the structure of the increase or decrease in contributions required to systematically fund the UAL. We discuss negative UAL, or Surplus, amortization later in this document. We reviewed the UAL calculations and confirmed they were consistent with the descriptions. There was one minor point we found during our review: Item 5b of the Derivation of Actuarial Value of Assets makes use of simple middle of year interest for crediting of contributions, while the amortization payment is based on continuous payment. We recommend that GRS disclose the rational for using different interest conventions for employer contributions for the development of the UAL payment and actuarial value of assets or harmonize the methodology by revising the calculations in the future to make them consistent.

A summary of the UAL amortization method is as follows:

Amortization period: Various amortization periods existed prior to the December 31, 2020 valuation. Effective with the December 31, 2020 actuarial valuation, a single layer is established each year regardless of source - gain/loss, assumption change or plan amendment. The period used for Closed Not Linked divisions is 10 years; for all other 15 years.

Closed or open amortization: Under a closed amortization the amortization period decreases by one each year and the associated UAL is "paid off"; under an open amortization, the UAL is amortized each year over the same amortization period and the associated UAL is paid down but not paid off. For underfunded divisions, a closed period is used for each base in MERS; for overfunded divisions, an open period is used.

Single base or amortization layers: Under a single base all UAL is amortized as one component; under amortization layers the UAL is broken down into several layers, with new layers added each valuation. An amortization layers policy is used for MERS for all divisions.

Level dollar or level percent of payroll: Under level dollar the payments are calculated so the payment is the same dollar amount in the future; under the level percent of payroll convention used by MERS, the payments are projected to increase each year at the assumed wage inflation of 3.00%.

Compliance with ASOP 4: Revised Actuarial Standard of Practice Number 4, "*Measuring Pension Obligations and Determining Pension Plan Costs or Contributions"*, which is first effective for the December 31, 2023 for MERS, provides guidance to the actuary when selecting an amortization policy in section 3.14:

- The actuary should select an amortization method for each amortization base that is expected to produce amortization payments that fully amortize the amortization base

within a reasonable time period or reduce the outstanding balance by a reasonable amount each year.

- For purposes of determining a reasonable period or a reasonable amount, the actuary should take into account factors including, but not limited to, the following, if applicable:
    - whether the amortization method is open or closed;
    - the source of the amortization base;
    - the anticipated pattern of the amortization payments, including the length of time until amortization payments exceed nominal interest on the outstanding balance;
    - whether the amortization base is positive or negative;
    - the duration of the actuarial accrued liability;
    - the average remaining service lifetime of active plan participants; and
    - the asset values fall within a reasonable range around the corresponding market value.

The UAL Amortization Method used by GRS for the MERS actuarial valuations appears to take this guidance into consideration; in particular, the choice of an amortization policy that fully amortizes the UAL.

Additional guidance on parameters can be found in the CCA Funding Paper. This guidance is not binding but is reflective of common public plan practices. We note Model Practices from the Actuarial Funding Policies and Practices for Public Pension Plans suggests different amortization periods depending on the source of the UAL:

- Active Plan Amendments: Lesser of active demographics, or 15 years
- Inactive Plan Amendments: Lesser of inactive demographics, or 10 years
- Experience Gain/Loss: 15 to 20 years
- Assumption or Method Changes: 15 to 25 years
- Early Retirement Incentives: 5 years or less
- Surplus: 30 years

Below we discuss each element of the amortization in light of ASOP 4, the CCA Funding paper and GFOA Funding Paper.

Amortization period: The period for Closed/Not Linked divisions of ten years is reasonable. While the CCA Funding Paper is silent on closed plans, ASOP 4 suggest that the active demographics should be considered, which suggests a shorter amortization period than open

divisions. Furthermore, the GFOA Funding Paper does suggest that shorter periods than those used for open divisions.

- *For closed plans with no remaining active members, the funding time horizon of the plan is generally shorter. Considerations include:*
  - *Special attention needs to be given to the mix of investments;*
  - *In comparison to open plans:*
    - *Asset smoothing periods should be shorter (typically no longer than three years),*
    - *Corridors, if used, should be narrower, and*
    - *Amortization periods should be shorter (typically no longer than 10 years for gains and losses).*
- *For closed plans that still have active members:*
  - *The continued use of level percent of member compensation amortization remains appropriate, but not for a long period (i.e., as the number of active members decreases); and*
  - *In comparison to open plans:*
    - *Asset smoothing periods should be shorter, and*
    - *For asset smoothing periods that exceed five years, a corridor (not to exceed 20 percent) should be used; and amortization periods should be shorter*.

Note that there are various considerations for asset valuation methods for closed plans noted above. Consideration could be given to these suggestions, but we believe these considerations are for stand-alone closed plans.

Amortization periods for benefit provisions are contained in the Actuarial Policy document and are reasonable. Based on conversations with GRS, the full cost of plan provisions are paid up front, negating the need for documenting the period in the valuation report,

SECTION 3 – ACTUARIAL METHODS

CavMac reviewed the Amortization Extension guidelines. Under the Amortization Extension, a division is allowed a one-time opportunity to extend the amortization period of its remaining UAL to provide contribution relief. The extension period is determined by GRS with approval by the CEO on a case-by-case basis. Future bases are established in accordance with the normal amortization policy.

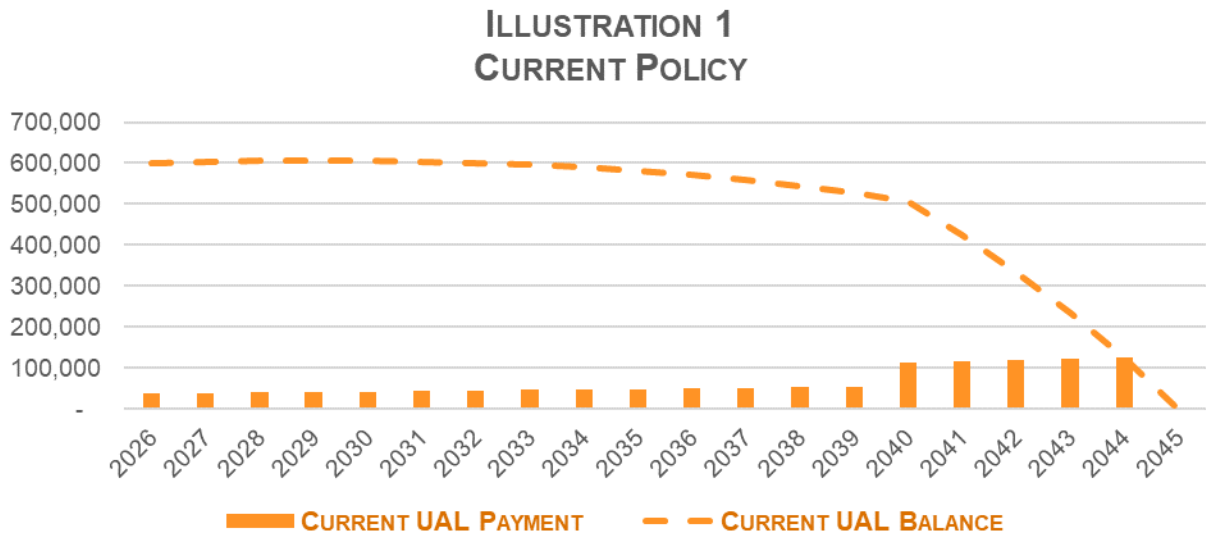
To demonstrate the impact of the Amortization Extension policy, we have developed the following illustrations:

- Illustration 1 – Subsequent Gains
  - Initial UAL of $1,000,000 as of 01/01/2026 with an extended amortization of 19 years
  - Subsequent UAL gains of $400,000 as of 01/01/2026 with an amortization period of 14 years
  - Total UAL of $600,000 as of 01/01/2026
- Illustration 2 – Subsequent Losses
  - Initial UAL of $1,000,000 as of 01/01/2026 with an extended amortization of 19 years
  - Cumulative UAL losses of $400,000 as of 01/01/2026 with an amortization period of 14 years
  - Total UAL of $1,400,000 as of 01/01/2026

The amortization schedule for the illustrations is as follows:

Illustration	Type of UAL	Amounts for Fiscal Year Beginning 1/1/2026 Outstanding UAL Balance	Remaining Amortization Period	Annual Amortization Payment
1 - Subsequent UAL Gains				
	Initial	$ 1,000,000	19	$ 74,655
	(Gain)/Loss	(400,000)	14	(37,261)
	Total	$ 600,000		$ 37,395
2 - Subsequent UAL Losses				
	Initial	$ 1,000,000	19	$ 74,655
	(Gain)/Loss	400,000	14	37,261
	Total	$ 1,400,000		$ 111,916

Below is a projection of the UAL and UAL payments under Illustration 1.

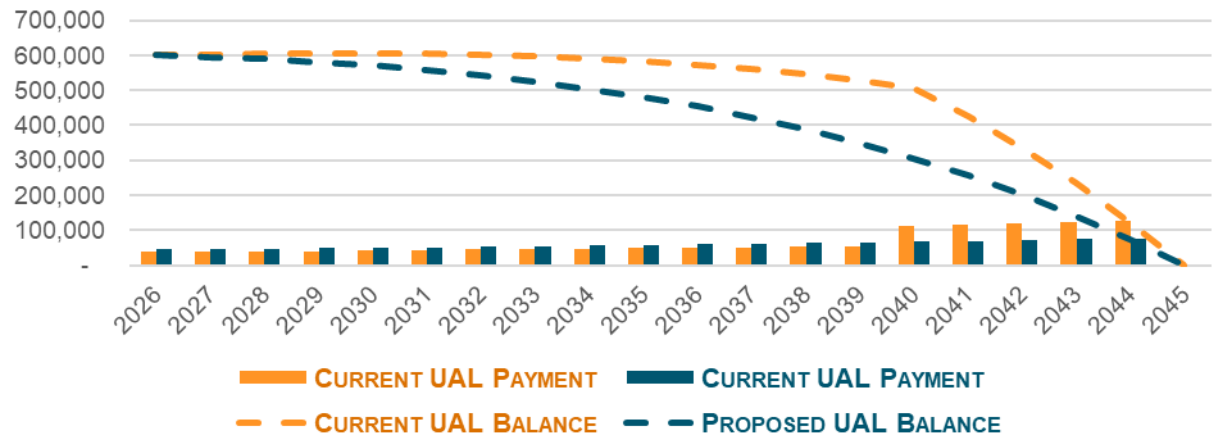


We offer the following observations on Illustration 1:

- Funding of the subsequent UAL gains over 14 years backloads the paydown of the UAL. The projected UAL as of January 1, 2040 is just over $500,000, a reduction just under $100,000 from the January 1, 2026 UAL balance of $600,000. The January 1, 2040 UAL balance of $500,000 is paid off by January 1, 2045.
- The current Amortization Extension policy introduces tail volatility. The UAL payments increase by 3% until FY 2040, when the payment increases by 106%. Increases thereafter are 3% until the initial UAL is projected to be paid off. In our experience, large increases like this are difficult to budget and contrary to the goal of contribution stability.
- The policy includes negative amortization. The term negative amortization is used to describe situations where UAL payments are not sufficient to pay down the UAL. Short periods of negative amortization – three to five years – are reasonable. The UAL payments under Illustration 1 are not sufficient to pay down the UAL below the initial balance of $600,000 until 2033, which is longer than three to five years.

We recommend GRS review the Amortization Extension guidelines to address the concerns above. CavMac proposes that the period used for the initial UAL – in this illustration 19 years – be applied to the total UAL. The following projection compares the impact of the current policy to our proposal.

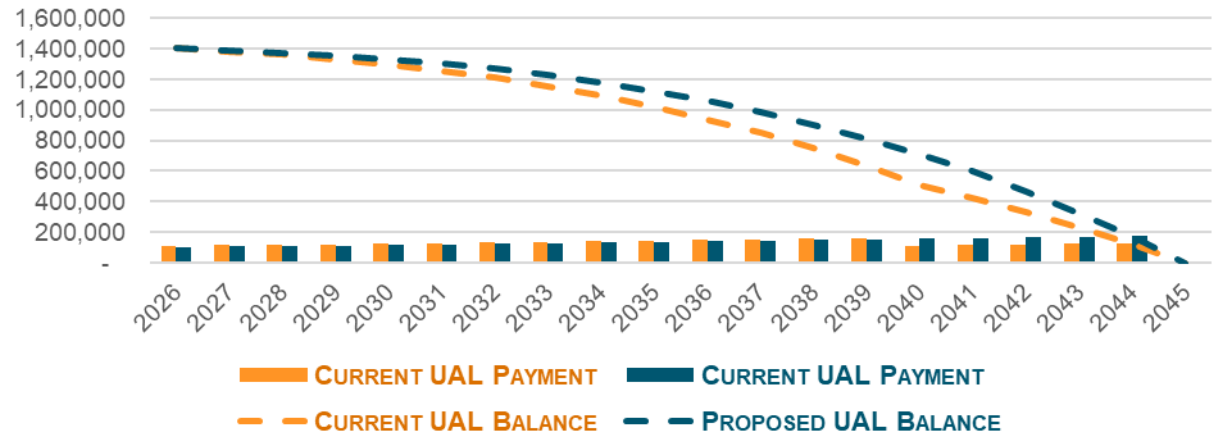
ILLUSTRATION 1
CURRENT POLICY VS PROPOSED POLICY



Our Proposed Amortization Extension policy adjustment addresses the concerns of backloading, large contribution increases and negative amortization.

Below we modelled the current and proposed Amortization Extension policies under Illustration 2 – Subsequent UAL Losses.

ILLUSTRATION 2
CURRENT POLICY VS PROPOSED POLICY



While there is no backloading or negative amortization under this Illustration, contribution volatility still exists with the contributions decreasing by 31% in 2040. Our proposed policy adjustment is reasonable under both Illustrations 1 and 2.

We recommend that GRS review the Amortization Extension policy to address backloading, contribution volatility and the potential for negative amortization.

Closed or open amortization: The closed period used for each base in MERS for underfunded divisions is appropriate. The open period used for overfunded divisions is reasonable.

Single base or amortization layers: The amortization layers policy used for MERS for all divisions since the December 31, 2016 actuarial valuation is appropriate. Consideration could be given to establishing a separate base for each source of layer – gain/loss, assumption changes and plan provision changes – to provide a history of the source.

Level dollar or level percent of payroll: UAL payments are projected to increase each year at the assumed wage inflation of 3.00%. For the Closed/Not Linked divisions, increasing UAL payments is incongruent with a declining underlying payroll and we recommend that the UAL payment be changed to level dollar. The 3.00% increase used by other divisions is reasonable and discussed more in the assumptions section.

Other than the following recommendations, we find that the amortization methods to be reasonable and comply with relevant ASOPs and common practice in the public plan community.

- ***We recommend that GRS disclose the rationale for using different interest conventions for employer contributions for the development of the UAL payment and actuarial value of assets or harmonize the methodology by revising the calculations in the future to make them internally consistent.***
- ***We recommend that the UAL payment for Closed/Not Linked divisions be changed to level dollar.***
- ***We recommend that GRS review the Amortization Extension policy and consider a policy which minimizes backloading, large future UAL payment increases and the potential for negative amortization.***

SECTION 3 – ACTUARIAL METHODS

OTHER ACTUARIAL METHODS

Surplus Management: When a division has assets in excess of actuarial accrued liability, the division can be said to be in surplus, or overfunded. Effective with the December 31, 2018 valuations, when a division switches from underfunded to overfunded on the valuation date, the division is required to make a minimum contribution equal to employer normal cost until the division's funded ratio reaches 120%. Effective with the December 31, 2024 valuations, the amortization switches from closed to open. This has the potential effect of reducing the division contribution to zero when the division becomes over 120% funded. This introduces the potential for contributions holidays which can cause budgetary challenges when the holiday ends. We find the minimum contribution of the employer normal cost up to 120% funded with the use of an open amortization of the surplus when the division is over 120% funded to be a reasonable method.

In addition to the surplus management policy, MERS employs surplus divisions where divisions can deposit additional contributions. The assets of these surplus divisions can be used to satisfy future division contribution requirements. We find this to be a prudent policy.

Output Smoothing Methods: The revised ASOP 4 provides guidance to the actuary when selecting an output smoothing method in section 3.16. Output smoothing methods can be used to reduce volatility of the employer contribution. Common output smoothing methods include:

- Phasing in the impact of assumption changes on contributions,
- Placing a corridor around changes in the dollar amount, contribution rate, or percentage change in contributions from year to year,
- Adjustments to the pattern of net deferred investment gains and losses in the determination of the actuarial value of assets, and
- Amortization base management where similar amortization bases are combined to reduce potential large changes in future employer contributions.

We recommend that consideration be given to a phase in of the impact of reductions in the assumed rate of return in lieu of the Dedicated Gains Policy.

Contribution Lag Policy: The revised ASOP 4 added guidance to the actuary when selecting a contribution lag policy in section 3.20:

> *When calculating an actuarially determined contribution, the actuary should consider reflecting the passage of time between the measurement date and the expected timing of actual contributions.*

The actuarially determined contribution does appear to reflect the passage of time. As noted in Table 10 for each division in the individual reports, the UAL is projected from the valuation date

to the beginning of the fiscal year for which the contributions are being determined and the applicable amortization is then applied to determine the amortization payment for each base. The employer normal cost appears to be adjusted for the passage of time as well.

We find that the Contribution Lag is reflected in a reasonable manner. We recommend that the Contribution Lag Policy should be documented in its entirety in the Actuarial Policy.

Administrative Expenses

Administrative expenses should be considered when determining the actuarially determined contribution rate. These can be reflected in one of two ways: (1) Implicitly, where the long-term assumed rate of return is reduced to reflect a return net of both investment and administrative expenses, or (2) Explicitly, where the actuarially determined contribution rate includes a component for normal cost rate, UAL rate, AND administrative expense rate. GRS reflects administrative expenses implicitly for MERS by reflecting a 0.25% for administrative expenses in the investment return assumption.

As noted in the assumptions section, GRS developed the administrative expense assumption on page 46 of the Experience Study Report for the 5-Year Period from January 1, 2019 - December 31, 2023. We find the development to be comprehensive and reasonable.

Overall, we find that the treatment of administrative expenses to be reasonable and comply with common practice in the public plan community.

SECTION 4 – DATA REVIEW

DATA ANALYSIS

We requested and received the participant data files that MERS provided to GRS for the December 31, 2024 valuations. GRS also supplied us with their processed data file that was used for the December 31, 2024 valuations. Our review of the data was to ensure that the processing performed by GRS resulted in data sets that may be reasonably used for the intended calculations.

As is typical with most plans, the raw and processed data did not match exactly. There may be elements in the data administration system that need some sort of adjustment in order to be used in an actuarial context or other items that are needed for the valuation that are not available from the administration system. It is not uncommon to see adjustments made to the same records year after year because the information needed for the valuation is either not contained in the data administration system or is not in the format needed for the actuarial valuation.

We also considered the data elements provided by MERS to determine if the data contained sufficient detail to be able to adequately assess the liabilities of the System. We did not identify any issues that were of concern to us.

Please see the tables on the following pages that summarize the data comparison. Each table provides a comparison of the raw data provided by MERS with the data processed by GRS for the valuation.

Upon review of the data, we are comfortable with the processed data that is being used for the actuarial valuation.

TOTAL MERS

	(1) GRS Data	(2) MERS Data	(1)/(2)
Active Members			
Count	29,579	29,802	99.25%
Average Age	45.287	45.209	100.17%
Average Vesting Service	10.970	10.895	100.69%
Average Benefit Service	9.313	9.252	100.66%
Average Annualized Salary	$68,358.38	$67,850.11	100.75%
Inactive Members			
Count	79,381	80,444	98.68%
In Pay			
Count	47,559	47,594	99.93%
Average Age	70.873	70.878	99.99%
Retiree			
Count	39,239	39,271	99.92%
Average Age	70.918	70.923	99.99%
Disabled Retiree			
Count	1,586	1,588	99.87%
Average Age	65.573	65.585	99.98%
Beneficiary			
Count	6,734	6,735	99.99%
Average Age	71.862	71.863	100.00%

NASHVILLE 0807

	(1) GRS Data	(2) MERS Data	(1)/(2)
Active Members			
Count	8	9	88.89%
Average Age	45.435	43.252	105.05%
Average Vesting Service	6.531	5.806	112.50%
Average Benefit Service	6.531	5.806	112.50%
Average Annualized Salary	$53,144.75	$47,239.82	112.50%
Inactive Members			
Count	12	12	100.00%
Retiree			
Count	2	2	100.00%
Average Age	65.339	65.339	100.00%
Disabled Retiree			
Count	0	0	
Average Age	N/A	N/A	
Beneficiary			
Count	1	1	100.00%
Average Age	64.372	64.372	100.00%

CHARLOTTE 2301

	(1) GRS Data	(2) MERS Data	(1)/(2)
Active Members			
Count	50	50	100.00%
Average Age	41.007	41.007	100.00%
Average Vesting Service	10.752	10.752	100.00%
Average Benefit Service	8.477	8.477	100.00%
Average Annualized Salary	$72,017.76	$72,017.78	100.00%
Inactive Members			
Count	84	84	100.00%
Retiree			
Count	61	61	100.00%
Average Age	68.833	68.833	100.00%
Disabled Retiree			
Count	1	1	100.00%
Average Age	60.589	60.589	100.00%
Beneficiary			
Count	17	17	100.00%
Average Age	68.672	68.672	100.00%

DELTA CHARTER 2306

	(1) GRS Data	(2) MERS Data	(1)/(2)
Active Members			
Count	44	44	100.00%
Average Age	35.486	35.486	100.00%
Average Vesting Service	8.278	8.278	100.00%
Average Benefit Service	5.634	5.634	100.00%
Average Annualized Salary	$80,463.45	$80,463.47	100.00%
Inactive Members			
Count	60	60	100.00%
Retiree			
Count	24	24	100.00%
Average Age	63.525	63.525	100.00%
Disabled Retiree			
Count	1	1	100.00%
Average Age	56.814	56.814	100.00%
Beneficiary			
Count	6	6	100.00%
Average Age	64.713	64.713	100.00%

SPARTA 4107

	(1) GRS Data	(2) MERS Data	(1)/(2)
Active Members			
Count	4	4	100.00%
Average Age	51.677	51.677	100.00%
Average Vesting Service	23.083	23.083	100.00%
Average Benefit Service	23.083	23.083	100.00%
Average Annualized Salary	$78,289.00	$78,289.09	100.00%
Inactive Members			
Count	20	20	100.00%
Retiree			
Count	15	15	100.00%
Average Age	67.929	67.929	100.00%
Disabled Retiree			
Count	0	0	
Average Age	N/A	N/A	
Beneficiary			
Count	3	3	100.00%
Average Age	70.064	70.064	100.00%

FRASER 5003

	(1) GRS Data	(2) MERS Data	(1)/(2)
Active Members			
Count	56	56	100.00%
Average Age	37.143	37.143	100.00%
Average Vesting Service	9.958	9.958	100.00%
Average Benefit Service	9.448	9.448	100.00%
Average Annualized Salary	$87,204.25	$87,204.26	100.00%
Inactive Members			
Count	51	51	100.00%
Retiree			
Count	109	109	100.00%
Average Age	67.933	67.933	100.00%
Disabled Retiree			
Count	0	0	
Average Age	N/A	N/A	
Beneficiary			
Count	16	16	100.00%
Average Age	74.945	74.945	100.00%

HURON CHARTER 8224

	(1) GRS Data	(2) MERS Data	(1)/(2)
Active Members			
Count	57	57	100.00%
Average Age	41.368	41.368	100.00%
Average Vesting Service	9.190	9.190	100.00%
Average Benefit Service	4.202	4.202	100.00%
Average Annualized Salary	$77,083.51	$77,083.53	100.00%
Inactive Members			
Count	68	68	100.00%
Retiree			
Count	38	38	100.00%
Average Age	65.025	65.025	100.00%
Disabled Retiree			
Count	0	0	
Average Age	N/A	N/A	
Beneficiary			
Count	6	6	100.00%
Average Age	67.169	67.169	100.00%

SUMPTER 8226

	(1) GRS Data	(2) MERS Data	(1)/(2)
Active Members			
Count	30	30	100.00%
Average Age	46.324	46.324	100.00%
Average Vesting Service	9.817	9.817	100.00%
Average Benefit Service	8.472	8.472	100.00%
Average Annualized Salary	$78,106.67	$78,106.66	100.00%
Inactive Members			
Count	27	27	100.00%
Retiree			
Count	14	14	100.00%
Average Age	66.140	66.140	100.00%
Disabled Retiree			
Count	0	0	
Average Age	N/A	N/A	
Beneficiary			
Count	7	7	100.00%
Average Age	56.615	56.615	100.00%

SECTION 5 – ACTUARIAL VALUATION RESULTS REVIEW

REASONABLENESS OF THE ACTUARIAL VALUATION RESULTS

This section of our review discusses the reasonableness and accuracy of the valuation liabilities and costs.

Generally accepted actuarial practices provide actuaries with the basic mathematics and the framework for calculating the actuarial results. When it comes to applying those actuarial standards to complex calculations, differences may exist due to individual opinion on the best way to model the liabilities. Although these factors may lead to variance in the calculated results, the differences should not be material. Differences may also arise from the actuarial software used to make these calculations, not only in the actual pieces of the benefits being calculated, but also in the allocation of liabilities between past and future service for active members. Generally, differences in the present value of benefits of 1% to 2% or less and differences in the actuarial liabilities of 3% to 5% or less are considered reasonable. The normal cost rate should generally be within 5% to 7% as well, but it is also important that it be consistent with the relationship of the present value of benefits and the actuarial liability.

As part of the actuarial audit, CavMac used the data provided by GRS to reproduce the valuation liabilities used for the cost calculations. We have presented a summary of the results at the end of this section. Note that we looked at a finer level of detail than is displayed, examining results by status (in-pay, beneficiaries, actives, etc.) and decrement status (retirement, disability, etc.) within each subgroup. This allowed us to make sure that there were no situations in which there was a proportionately large difference that would not be detectable in total.

Most metrics in the following exhibits fell into the ranges listed above. However, because we were able to match very closely to the present value of benefits for all of the locations, differences in the way liabilities are allocated to past and future service do arise, as noted above, and in our opinion are not cause for alarm.

Based on the results of our review, overall, we find the actuarial liabilities and normal cost measures to be reasonable.

COMPARISON OF DECEMBER 31, 2024 LIABILITY MEASURES

Present Value of Future Benefits

Charlotte	GRS	CavMac	Difference
Active	9,409,200	9,470,749	0.65%
Retired	19,757,758	19,783,089	0.13%
Inactive	882,428	890,378	0.90%
	$30,049,386	$30,144,216	0.32%

Sparta	GRS	CavMac	Difference
Active	1,723,554	1,732,658	0.53%
Retired	4,974,203	4,937,169	-0.74%
Inactive	539,335	533,775	-1.03%
	$7,237,092	$7,203,601	-0.46%

Delta Charter	GRS	CavMac	Difference
Active	12,079,505	11,861,284	-1.81%
Retired	17,354,781	17,323,514	-0.18%
Inactive	1,118,487	1,096,217	-1.99%
	$30,552,773	$30,281,014	-0.89%

Nashville	GRS	CavMac	Difference
Active	890,112	896,456	0.71%
Retired	562,419	561,686	-0.13%
Inactive	22,884	23,098	0.94%
	$1,475,415	$1,481,240	0.39%

Huron Charter	GRS	CavMac	Difference
Active	14,490,506	14,355,826	-0.93%
Retired	26,876,537	26,808,640	-0.25%
Inactive	2,508,335	2,429,280	-3.15%
	$43,875,378	$43,593,746	-0.64%

Sumpter	GRS	CavMac	Difference
Active	8,502,743	8,398,901	-1.22%
Retired	10,871,425	10,873,306	0.02%
Inactive	289,986	288,919	-0.37%
	$19,664,154	$19,561,126	-0.52%

Fraser	GRS	CavMac	Difference
Active	20,885,063	20,765,470	-0.57%
Retired	55,503,792	55,384,941	-0.21%
Inactive	3,436,765	3,482,962	1.34%
	$79,825,620	$79,633,373	-0.24%

COMPARISON OF DECEMBER 31, 2024 LIABILITY MEASURES

Actuarial Accrued Liability

Charlotte	GRS	CavMac	Difference
Active	6,649,489	6,661,707	0.18%
Retired	19,757,758	19,783,089	0.13%
Inactive	882,428	890,378	0.90%
	$27,289,675	$27,335,175	0.17%

Sparta	GRS	CavMac	Difference
Active	1,491,921	1,487,721	-0.28%
Retired	4,974,203	4,937,169	-0.74%
Inactive	539,335	533,775	-1.03%
	$7,005,459	$6,958,664	-0.67%

Delta Charter	GRS	CavMac	Difference
Active	7,520,363	7,001,343	-6.90%
Retired	17,354,781	17,323,514	-0.18%
Inactive	1,118,487	1,096,217	-1.99%
	$25,993,631	$25,421,074	-2.20%

Nashville	GRS	CavMac	Difference
Active	476,737	515,069	8.04%
Retired	562,419	561,686	-0.13%
Inactive	22,884	23,098	0.94%
	$1,062,040	$1,099,854	3.56%

Huron Charter	GRS	CavMac	Difference
Active	8,448,047	7,756,202	-8.19%
Retired	26,876,537	26,808,640	-0.25%
Inactive	2,508,335	2,429,280	-3.15%
	$37,832,919	$36,994,122	-2.22%

Sumpter	GRS	CavMac	Difference
Active	5,009,743	4,999,402	-0.21%
Retired	10,871,425	10,873,306	0.02%
Inactive	289,986	288,919	-0.37%
	$16,171,154	$16,161,627	-0.06%

Fraser	GRS	CavMac	Difference
Active	15,115,597	14,924,946	-1.26%
Retired	55,503,792	55,384,941	-0.21%
Inactive	3,436,765	3,482,962	1.34%
	$74,056,154	$73,792,848	-0.36%

Total Normal Cost Rate

Charlotte	GRS	CavMac	Difference
	9.25%	9.00%	-2.77%

Sparta	GRS	CavMac	Difference
	11.86%	12.93%	8.99%

Delta Charter	GRS	CavMac	Difference
	13.69%	14.27%	4.22%

Nashville	GRS	CavMac	Difference
	12.44%	11.28%	-9.32%

Huron Charter	GRS	CavMac	Difference
	15.72%	16.07%	2.23%

Sumpter	GRS	CavMac	Difference
	17.08%	16.37%	-4.16%

Fraser	GRS	CavMac	Difference
	13.78%	13.43%	-2.51%

SECTION 6 – VALUATION REPORTS REVIEW

ACTUARIAL FUNDING REPORTS

The American Academy of Actuaries has issued Actuarial Standards of Practice which deal with measuring pension obligations and communicating the results (ASOP No. 4, 23, 27, 41, 44, 51, and 56). Those standards list specific elements to be included, either directly or by reference to other documents, in pension actuarial communications. Some of the elements would not be pertinent in all communications, but since an actuarial valuation report is the most complete picture of the actuarial status of the plan, all of the elements listed should be covered in the report, even if only briefly.

The December 31, 2024 Actuarial Valuation Reports for MERS generally provide sufficient information for another actuary to understand what was done and to assess the reasonableness of the results. We compared the contents of the reports to over 40 specific items detailed for pension actuarial work in ASOPs 4, 41, 51, and 56.

ASOP 4 states that "*When issuing an actuarial report to which this standard applies…actuarial communication should contain the following disclosures when relevant and material…These disclosures include:*

- Section 4.1.bb "*if applicable, the results of the gain and loss analysis performed in accordance with section 3.22, separating the total gain or loss into investment gain or loss and other gain or loss."* While an actuary may be able to determine the gain or loss on investments and liabilities through some calculations, we believe in order to comply with the ASOP, the calculation of the gains or losses should be included in the report along with some qualitative discussion. We recommend GRS review ASOP 4.1.bb and determine if their current report complies with the ASOP.

Aside from the aforementioned item, i*n our review of the reports, we found them to be in compliance with the applicable ASOPs.*

SECTION 6 – VALUATION REPORTS REVIEW

GASB REPORTS

In each individual employer report, there is a section for Governmental Accounting Standards Board (GASB) Number 68. This section contains very limited information compared to a standard GASB 68 report, but does include a count of covered employees, the Total Pension Liability (TPL), service cost, change in TPL due to benefit changes, differences between expected and actual experience and changes in assumptions, average expected remaining service lives, covered employee payroll and the change in Net Pension Liability for a 1% increase/decrease in discount rate. It appears that each individual employer would be performing their own GASB 68 calculations, and GRS is only providing the necessary information for those calculations to be completed.

The December 31, 2024 actuarial valuation is the basis for the TPL as of either December 31, 2024, or December 31, 2025, depending on the individual employer. For most employer reports, but not all, calculations at both measurement dates are provided. When calculating the TPL, a discount rate of 7.18% is used for GASB purposes. A discount rate of 6.93% is used for funding calculations, however, there is an implicit assumption of a 0.25% reduction to the investment return assumption to account for administrative expenses. GASB requires administrative expenses to be accounted for separately, so we believe this approach is appropriate.

According to GASB 67 and 68, when attributing the actuarial present value of projected benefit payments in a plan with a Deferred Retirement Option Plan (DROP), "*the date of entry into the DROP should be considered to be the plan member's retirement date*." Based on the retained actuary's experience study, there is a statement, "For each individual, this means the assumed rates of DROP exit are the assumed rates of retirement under the current plan provisions, and implicitly assumes an individual enters DROP up to three years earlier than retiring in a no DROP scenario." Later it is mentioned that "Since there is no explicit DROP entry assumption, there is no explicit adjustment for attribution to DROP under GASB." Whether the DROP assumption is implicit or explicit, it appears for funding purposes, funding is calculated through DROP exit. For GASB purposes, no adjustment is made to account for when the member is assumed to enter DROP, three years earlier. We recommend the retained actuary review their GASB TPL calculations for employers with a DROP provision that is being valued.

While there was not enough information available to match all calculations shown exactly, we were able to assess their reasonableness using provided sensitivity analysis and other disclosed results in the funding report.

Overall, we believe the disclosed GASB 68 numbers are reasonable.

SECTION 7 – SUMMARY OF RECOMMENDATIONS

For your convenience we have provided a summary of the recommendations made throughout the report:

SECTION 2 – ACTUARIAL ASSUMPTIONS:

- ***Investment Return Assumption:*** recommend disclosing the basis for determining the end points for the Dedicated Gains Policy's preferred interest rate range. (Page 4)
- ***Individual Salary Scale:*** it might be reasonable to shorten the merit assumption to 30 years without losing any significant predictive ability. Also, we would encourage analyzing the assumption separately for public safety and all other members. (Page 5)
- ***Payroll Growth Assumption:*** recommend performing and/or documenting any analysis done to set this assumption in the experience study report. (Page 6)
- ***Mortality:*** recommend performing and/or documenting any mortality analysis done on a deeper level than just safety/non-safety (such as gender or age). (Page 7)
- ***Disability:*** recommend disclosing how the actual number of disabilities compares to the assumed number. (Page 8)
- ***Retirement:*** recommend performing and/or disclosing further analysis in the Safety category to confirm the A/E ratio close to 100% is not skewed on the ends. (Page 8)
- ***Termination:*** recommend that GRS consider applying some smoothing to the developed rates, recognizing that the decision to terminate employment (on either the employer or employee end) is not likely to have any service-based discontinuities. We would also recommend assuming no terminations after 30 years of service for non-safety members and 25 years for safety members. (Page 9)
- ***Refund of Contributions:*** recommend adding a discussion in the experience study to discuss why the assumption of no refund of contributions is reasonable and explicitly acknowledge this assumption. (Page 9)

SECTION 3 – ACTUARIAL METHODS:

- **Dedicated Gains Policy:** recommend the bias in the asset valuation method caused by the Dedicated Gains Policy be reviewed in light of the CCA Funding Paper and documentation of the bias be considered; recommend that consideration be given to exploring other alternative methods for opportunistically lowering the assumed rate of return. (Page 15)
- **Interest Conventions:** recommend disclosing the rational for using different interest conventions for employer contributions for the development of the UAL payment and actuarial value of assets or harmonize the methodology by revising the calculations in the future to make them consistent. (Page 18)
- **Amortization Extension policy:** recommend that GRS review the Amortization Extension policy and consider a policy which minimizes backloading, large future UAL payment increases and the potential for negative amortization. (page 21)

SECTION 7 – SUMMARY OF RECOMMENDATIONS

- **UAL Payment Increases:** recommend that the UAL payment for Closed/Not Linked divisions be changed to level dollar. (Page 24)
- **Output Smoothing Methods:** recommend that consideration be given to exploring other alternative output smoothing methods for opportunistically lowering the assumed rate of return such as a phase-in of the impact. (Page 25)
- **Contribution Lag Policy:** recommend that the Contribution Lag Policy be documented in its entirety in the Actuarial Policy. (Page 25)

SECTION 6: VALUATION REPORTS:

- **Funding:**
  - ***Gain/Loss Analysis:*** recommend reviewing ASOP 4.1.bb to determine if the gain/loss information in the current report complies with the ASOP. (Page 39)

- **GASB:**
  - ***DROP Attribution:*** recommend reviewing the GASB TPL calculations to verify the DROP calculations are being handled in accordance with GASB standards. (Page 40)