



## INDEPENDENT FISCAL OFFICE

**TO:** Governor Josh Shapiro  
All Members of the General Assembly

**FROM:** Matthew Knittel, Director  
Independent Fiscal Office

**DATE:** October 26, 2023

**RE:** Actuarial Note for Senate Bill 854, Printer's Number 1010

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The Independent Fiscal Office (IFO) submits an actuarial note for **Senate Bill 854, Printer's Number 1010** in accordance with section 615-B of the Administrative Code of 1929. Senate Bill 854 has nearly identical provisions to House Bill 1379, Printer's Number 1539 for which the IFO transmitted an analysis on August 3, 2023. Because the provisions are nearly identical, and any differences are technical in nature and would not have a material impact on the analysis, this note uses the same analysis from House Bill 1379. The note provided by the IFO's actuary along with a memo prepared by the Pennsylvania Municipal Retirement System (PMRS) are attached.

### Summary of Provisions

The bill would amend the act of December 14, 1988 (P.L. 1192, No. 147) known as the Special Ad Hoc Municipal Police and Firefighter Postretirement Adjustment Act to provide for ad hoc cost-of-living adjustments for qualified local police and firefighter annuitants. Major provisions of the bill include:

- Provisions would apply to all local municipal pension systems in the Commonwealth and would provide ad hoc cost-of-living adjustments beginning with the first annuity payment made after December 31, 2023.
- Cost-of-living adjustments would be based on length of retirement, not prior salary or current annuity value.
- Cost-of-living adjustments would be partially offset for any cost-of-living adjustment received by the annuitant after December 31, 2001 and before January 1, 2024.
- To qualify, annuitants must have received annuity payments prior to January 1, 2019.
- The Office of the Auditor General would provide partial reimbursement to local pension systems impacted by these cost-of-living adjustments using funds from the General Municipal Pension System State Aid Program.

### Review of Findings

Provisions of the bill provide guidelines by which municipal systems would provide ad hoc cost-of-living adjustments (COLA) for police and firefighter annuitants who received benefits prior to 2019. The COLA amount is based on the number of years retired and is displayed in the table below:

Years of Retirement as of Jan. 1, 2024	Monthly Annuity Increase	Annualized Value
5 Years to < 10 Years	\$75	\$900
10 Years to < 20 Years	\$150	\$1,800
20+ Years	\$300	\$3,600

The bill also provides two adjustments for special circumstances that may pertain to certain annuitants that could reduce costs:

1. If an annuitant is eligible to receive a COLA from more than one participating system, then the total COLA would be reduced so that the total of all COLAs paid does not exceed the amount stated in the legislation based on years of retirement.
2. If an annuitant received a COLA after December 31, 2001, then the COLA from this bill would be reduced by 65% of the COLA paid in the previous year.

To determine the actuarial impact of the bill, the IFO directed its contracted actuary (Foster & Foster) to run a simulation using data submitted by the Pennsylvania Office of the Auditor General. The analysis (attached to this note) found that:

- Total Increase in Unfunded Actuarial Accrued Liability (UAAL): \$342.2 million
- Annual Amortization Cost (10-Year)<sup>1</sup>: \$45.5 million
- Average Increase in Annual Benefit per Annuitant: \$1,604
- Average UAAL per Annuitant: \$13,050
- Average Annual Amortization Cost per Annuitant: \$1,737

Actual costs will vary by system based on experience, actuarial assumptions and populations served.

The projections from Foster & Foster are not adjusted for reduced benefit annuities (e.g., survivor beneficiaries). Based on conversations with the Auditor General, these individuals would receive the ad hoc COLA on a prorated basis consistent with their benefit proration rate (i.e., if a spouse of a deceased officer or firefighter received an annuity at 50% of the initial pension benefit, then the COLA would be 50% of the calculated rate). Based on annuitant data provided by the Auditor General, the IFO assumes that 35% of total recipients are benefit annuitants who receive 50% of the former pension benefit on average.

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<sup>1</sup> A 10-year amortization schedule is required by statute.

Using these assumptions, **the IFO projects a net increase in total UAAL of \$282.3 million, and an annual amortization amount of \$37.6 million.** Data for COLAs administered at the discretion of the municipal systems were not available, therefore these projections represent an upward bound. Costs could be further reduced by an unknown amount equal to 65% of any prior municipal COLA.

The bill provides a mechanism to reimburse municipal pension systems for a portion of the amortized costs of the COLAs. Municipal pension systems would be eligible for reimbursement of these costs prorated by the amount of state aid as a share of municipal pension contributions. For example, if a municipality pays \$100 million in annual contributions, but \$20 million (20%) was aid received from the state, then it would be reimbursed 80% of the annual amortized costs. To project the amount and share of state reimbursement, the IFO requested data from the Auditor General. Results are shown in the table below.

<b>Projected State Reimbursement Share (SB 854)</b>						
<b>Municipal Contributions</b>	<b>State Pension Aid</b>	<b>State Share</b>	<b>State Reimb. Rate</b>	<b>Annual System Costs</b>	<b>Annual State Reimb. Cost</b>	<b>10-Year State Reimb. Costs</b>
\$1,388.7	\$334.7	24.1%	75.9%	\$37.6	\$28.5	\$285.2

Note: Dollars in millions.  
Sources: Pennsylvania Office of the Auditor General, Foster & Foster Actuaries and Consultants, calculations by the IFO.

The data from the Auditor General show that the state share of total municipal contributions is 24.1%. Therefore, municipal systems would receive reimbursement for 75.9% of their amortized costs over 10 years, a total nominal value of \$285.2 million. Note that the state share will vary across systems in a similar fashion to increases in system UAAL.

State reimbursements are provided through the General Municipal Pension System State Aid Program, which is administered by the Auditor General. The program is funded by tax revenues generated from the Insurance Premiums Tax via transfers from the General Fund. In 2022, the program delivered nearly \$335 million in aid to municipal pension systems. The funds needed to reimburse the amortized COLA costs would be assessed prior to normal distribution calculations. Using the table above, this implies that annual pension aid would be reduced by \$28.5 million (8.5% based on 2022 levels) for each of the 10 years that reimbursements would be paid, but would vary based on the annual state share of pension aid. The net change in state revenue would not be uniform across systems as COLA reimbursements would be paid to municipalities that have more police and fire annuitants (and thus higher costs), but general aid would be reduced for all parties based on current program guidelines. Certain municipal systems could experience funding gaps and may need to increase funding, likely through employer contributions, to fund the shortfall. Municipal system stress will depend on current funding levels and sources and the net change in state aid after taking into account COLA reimbursements.

October 26, 2023

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As part of its analysis, the IFO asked the Auditor General and PMRS to opine regarding any expected operational or actuarial impacts from the bill. Notes from those conversations follow, and a formal response from PMRS is attached to this note:

- The Auditor General confirmed an expected reduction in revenues available for the General Municipal Pension System State Aid Program.
- The Auditor General also noted that systems currently used for municipal pension oversight and aid delivery would not be able to identify annuitants who receive COLAs from more than one system. This would effectively eliminate the safeguard from annuitants “double dipping” on COLAs provided by the bill. The systems would need to be enhanced to provide that capability and coordinated with the Department of Community and Economic Development (DCED). No cost estimates or timeline for implementation were provided.
- PMRS noted that there would be negligible actuarial costs for its managed plans overall.

July 25, 2023

Mr. Mathieu Taylor, Fiscal Analyst II  
Independent Fiscal Office  
State of Pennsylvania

Re: *House Bill No. 1379 – Actuarial Analysis*

Dear Mathieu:

As you are aware, proposed House Bill No. 1379 would provide for a one-time cost-of-living adjustment (“Ad Hoc COLA”) to certain retired firefighters and police officers receiving pension benefits under municipal retirement systems in Pennsylvania. As requested, we have performed a special analysis to determine the potential actuarial impact. Below is a summary of the proposed provisions of the COLA.

- **Timing:** the COLA would be payable effective January 1, 2024.
- **Eligibility:** eligible recipients must have begun receiving a pension benefit prior to January 1, 2019.
- **Amount:** each eligible recipient would receive a one-time increase in benefits based on Years on Retirement as follows:
  - *5 to 10 years:* \$75 per month.
  - *10 to 20 years:* \$150 per month.
  - *20 or more years:* \$300 per month.

The amount would be further reduced by 65% of any Ad Hoc COLAs provided to the retiree after January 1, 2002, and before December 31, 2023, and paid in the immediately preceding year.

### **Methodology**

All methods and assumptions used in the analysis are the same as set forth in our June 7, 2022 analysis for proposed House Bill No. 2237 with associated amendment A04130, except that in this analysis, retirees at ages 55 to 59 are assumed to have been retired for 5 years. The average Years on Retirement for this group would otherwise be less than 5 years, resulting in no COLA considered in the analysis, when in reality some portion of this group would be eligible.

The cost of an Ad Hoc COLA is usually measured by identifying each person that is eligible for the COLA, calculating the increase that the person is entitled to, and then measuring the liability associated with that person’s increase.

However, the data available for this analysis consisted of data grouped in 5-year age “buckets” and did not include Years of Service or Years on Retirement information. Absent this data, we have formed what we believe to be reasonable assumptions for Years of Service and Years on Retirement for each group, as follows.

All retirees were assumed to have 22 Years of Service on average. This represents an assumed service requirement of 20 Years of Service, consistent with the provisions of the firefighters’ and police officers’ pension plans of the City of Pittsburgh, with an additional two-year load to reflect the fact that not all participants retire at first eligibility.

It was also necessary to estimate the number of Years on Retirement for each age bucket. We used retirement rates from the valuation reports of the firefighters’ and police officers’ pension plans of the City of Pittsburgh to develop what we believe are reasonable assumptions for the number of years each age group has been retired. The first step was to apply the retirement rates for fire and police respectively to a hypothetical group of 1,000 people to determine at which age each of these 1,000 people would retire under these assumptions.

**Retirement Age Distribution - Firefighters**

Age	Retirement Rate	Actives Remaining <sup>1</sup>	Expected Retirements <sup>1</sup>	Percentage of Retirees Who Retire at Each Age <sup>1</sup>
50	25%	1,000	250	25%
51	7%	750	53	5%
52	7%	698	49	5%
53	7%	649	45	5%
54	7%	603	42	4%
55	15%	561	84	8%
56	15%	477	72	7%
57	15%	405	61	6%
58	15%	345	52	5%
59	15%	293	44	4%
60	15%	249	37	4%
61	15%	212	32	3%
62	15%	180	27	3%
63	30%	153	46	5%
64	50%	107	54	5%
65	100%	54	54	5%
Total			1,000	100%

<sup>1</sup> Results shown are rounded but unrounded numbers used in analysis.

A similar profile was developed for police officers as follows.

**Retirement Age Distribution - Police Officers**

Age	Retirement Rate	Actives Remaining <sup>1</sup>	Expected Retirements <sup>1</sup>	Percentage of Retirees Who Retire at Each Age <sup>1</sup>
50	15%	1,000	150	15%
51	10%	850	85	9%
52	10%	765	77	8%
53	10%	689	69	7%
54	8%	620	50	5%
55	8%	570	46	5%
56	8%	524	42	4%
57	8%	483	39	4%
58	8%	444	36	4%
59	8%	408	33	3%
60	10%	376	38	4%
61	10%	338	34	3%
62	10%	304	30	3%
63	8%	274	22	2%
64	15%	252	38	4%
65	100%	214	214	21%
Total			1,000	100%

<sup>1</sup> Results shown are rounded but unrounded numbers used in analysis.

The preceding Retirement Age Distributions were used to calculate retirement age probabilities based on current age, and which were in turn used to assign probabilities to each possible number of Years on Retirement for every age group.

For example, consider a retired police officer who is currently age 51, which means that he or she began receiving benefits at age 50 or 51. According to the above assumptions, 235 out of every 1,000 police officers retire at ages 50 or 51, and 150 of these police officers retired at age 50. Therefore, the likelihood that the 51-year-old retired police officer originally retired at age 50 is 64% (150 / 235) and the probability that he or she retired at age 51 is 36% (85 / 235). This results in a 64% chance that a retired 51-year-old police officer has 1 Year on Retirement and a 36% chance that he or she has 0 Years on Retirement. A similar approach was used for all ages from age 50 to age 90 for fire and police, respectively.

An adjustment was made for the fact that the Ad Hoc COLA is reduced by 65% of the 2002 Ad Hoc COLA, which was based on Years of Service and Years on Retirement. A similar approach was used to estimate Years of Service and Years on Retirement as of July 1, 2002 in order to estimate the 2002 Ad Hoc COLA and associated reduction to the 2024 Ad Hoc COLA.

Our understanding is that survivor annuities may only be subject to 50% of the Ad Hoc COLA. No adjustment was made for this in absence of data identifying which benefits are for beneficiaries. Assumptions for investment return and mortality are consistent with the actuarial valuation reports for the firefighters' and police officers' pension plans of the City of Pittsburgh.

## Summary of Results

The results of our analysis are below:

Summary of Results (in \$millions)	
Approximate Increase in Unfunded Actuarial Accrued Liability (UAAL)	342.2
Amortization of Increase in UAAL Over 10 Years	45.5

The Approximate Increase in UAAL per retiree is \$13,050 and the Amortization of Increase in UAAL over 10 Years per retiree is \$1,737.

Additionally, below is a breakdown of results by age group and by employee group covered (fire or police).

Age	Employee Group	Headcount	Annual Increase in Benefits	Increase in Accrued Liability	Average Annual Increase in Benefits	Average Increase in Liability
< 60	Fire	796	360,900	4,496,232	453	5,649
60 to 64	Fire	645	580,500	6,766,682	900	10,491
65 to 69	Fire	856	1,540,800	16,423,434	1,800	19,186
70 to 74	Fire	1,223	2,201,400	20,785,097	1,800	16,995
75 to 79	Fire	879	3,087,504	24,782,590	3,513	28,194
80 to 84	Fire	604	2,048,982	13,342,784	3,392	22,091
85+	Fire	525	1,707,137	8,640,442	3,252	16,458
< 60	Police	4,713	2,025,900	24,951,785	430	5,294
60 to 64	Police	2,733	2,459,700	28,227,898	900	10,329
65 to 69	Police	3,272	2,944,800	30,741,311	900	9,395
70 to 74	Police	3,624	6,523,200	59,917,379	1,800	16,533
75 to 79	Police	2,885	4,970,067	38,485,992	1,723	13,340
80 to 84	Police	1,833	6,210,333	38,655,612	3,388	21,089
85+	Police	1,632	5,405,502	25,963,381	3,312	15,909
<b>Total</b>		<b>26,220</b>	<b>42,066,726</b>	<b>342,180,618</b>	<b>1,604</b>	<b>13,050</b>

As can be seen above, the average increase is greater at advanced ages because these retirees are assumed to have been retired for a longer period.

It should be noted that these results are based on available data which was incomplete; while we believe that reasonable assumptions were used in absence of complete data, the results would be different if actual data reflecting Years of Service and Years on Retirement were utilized.



## Actuarial Assumptions and Methods

Mortality Rates	PubS-2010 for Healthy Retirees (set forward one year for Police) projected generationally with Mortality Improvement Scale MP-2020. This is consistent with the rates used for healthy retirees in the January 1, 2021 actuarial valuation reports for the City of Pittsburgh Firemen's Relief and Pension Fund and the City of Pittsburgh Policemen's Relief and Pension Fund, as prepared by Korn Ferry, Inc.
Net Investment Return	7.00% per year compounded annually, net of investment-related expenses. This is consistent with the rate used in the January 1, 2021 actuarial valuation reports for the City of Pittsburgh Firemen's Relief and Pension Fund and the City of Pittsburgh Policemen's Relief and Pension Fund, as prepared by Korn Ferry, Inc.
Years of Service	22 Years of Service for all eligible participants. This reflects an assumed 20-year service requirement for benefit eligibility with consideration for those who do not retire at first eligibility.
Years On Retirement	<p>Tables of probabilities by age consistent with the Retirement Age Distributions set forth earlier in this analysis. For example, the likelihood that the 51-year-old retired police officer originally retired at age 50 is 64% (150 / 235) and the probability that he or she retired at age 51 is 36% (85 / 235), resulting in a 64% likelihood that this police officer has been retired for 1 year and 36% likelihood that they have been retired for 0 years, absent actual retirement duration data.</p> <p>Retirees at ages 55 to 59 were assumed to have 5 Years on Retirement. Otherwise, this group (average age 57.5) would have an average Years on Retirement of less than 5 years under the other assumptions used, resulting in no assumed COLA eligibility under the proposed amendment.</p>
Ages Within Buckets	For any 5-year age buckets, retirees were assumed to have ages equal to the middle of the age interval. For example, retirees between ages 60 to 65 were all assumed to be age 62.5. Retirees over age 84 were assumed to be age 87.5.
Gender	Assumed 80% male.
Marriage	Assumed 80% married with female spouses 2 years younger than husbands.


The undersigned is familiar with the immediate and long-term aspects of pension valuations, and meets the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinions contained herein.

In performing the analysis, we used third-party software to model (calculate) the underlying liabilities and costs. These results are reviewed in the aggregate and for individual sample lives. The output from the software is either used directly or input into internally developed models to generate the costs. All internally developed models are reviewed as part of the process. As a result of this review, we believe that the models have produced reasonable results. We do not believe there are any material inconsistencies among assumptions or unreasonable output produced due to the aggregation of assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report for a variety of reasons including: changes in applicable laws, changes in plan provisions, changes in assumptions, or plan experience differing from expectations. Due to the limited scope of the analysis, we did not perform an analysis of the potential range of such future measurements.

If you have any questions, please let me know.

Sincerely,

A handwritten signature in black ink, appearing to read "Bradley R. Heinrichs". The signature is fluid and cursive, with a large initial "B" and "H".

Bradley R. Heinrichs, FSA, EA, MAAA

A handwritten signature in black ink, appearing to read "Tyler A. Koftan". The signature is fluid and cursive, with a large initial "T" and "K".

Tyler A. Koftan, EA, MAAA

## FISCAL NOTE

July 13, 2023

Bill No: HB 1379

Printer's No: 1539

Sponsor: Malagari, et al.

### COST/(SAVINGS)

Fund (s)	2023-24	2024-25
Pennsylvania Municipal Retirement Fund	See Fiscal Impact	See Fiscal Impact

**SUMMARY:** HB 1379 would require that a municipal retirement system provide an ad hoc cost of living adjustment (COLA) during 2024 to any police officer or firefighter who retired on or before January 1, 2019. HB 1379 provides a formula as to what the COLA would be depending on how long the employee has been retired. Finally, HB 1379 provides that the ad hoc COLA is reduced by any other COLA provided by the municipality (if any). HB 1379 also provides that the cost of any ad hoc COLA would be reimbursed by the Commonwealth if the municipality adhered to certain conditions.

**ANALYSIS:** HB 1379 mandates that all Pennsylvania municipalities provide an ad hoc COLA to public safety officers based on their date of retirement. This ad hoc COLA could be reimbursed by the Commonwealth.

**FISCAL IMPACT:** The fiscal impact on the Pennsylvania Municipal Retirement System as a whole is negligible. Moreover, because the costs are reimbursable by the Commonwealth, the fiscal impact to individual municipalities would likely be negligible as well.



## INDEPENDENT FISCAL OFFICE

### **Addendum to Actuarial Note for Senate Bill 854, Printer's Number 1010 February 27, 2024**

The letter that follows is an addendum to the October 26, 2023, actuarial note submitted for Senate Bill 854, P.N. 1010. The addendum responds to follow-up questions sent to the Independent Fiscal Office (IFO) from the House Local Government Committee on January 23, 2024 regarding House Bill 1379, P.N. 1539. House Bill 1379 has nearly identical provisions and outcomes as Senate Bill 854, and the IFO previously used the analysis for House Bill 1379 for the actuarial note submitted for Senate Bill 854. Due to the similarities between the two bills, the addendum submitted for House Bill 1379 also applies to Senate Bill 854. The primary issue addressed by the addendum is the use of Pittsburgh as a model system to determine retirement eligibility and cost and whether the Pennsylvania Municipal Retirement System (PMRS) would be a more representative model.

To examine these concerns, the IFO requested that its actuary, Foster & Foster, conduct a simulation using corresponding parameters from PMRS. The IFO instructed Foster & Foster to assume that PMRS parameters applied to 25% of annuitants. For the addendum, Foster & Foster estimates that using PMRS retirement assumptions instead of the Pittsburgh assumptions would increase the UAAL by \$17.7 million and the annual amortized costs by \$2.4 million. This outcome occurs because the value of the cost-of-living adjustment is based on length of retirement, and PMRS assumes that uniformed personnel retire at an earlier age than the Pittsburgh assumptions. (See attached.)

Additionally, as the IFO examined these issues and was in contact with the Auditor General's Office (Office), the IFO found that due to reporting/timing issues between local systems and the Office, the number of affected annuitants was understated by approximately 9.5% (nearly 2,500 annuitants). The IFO was not aware of the omission in the original analysis, and some omitted system values remain uncertified. For the addendum, Foster & Foster utilizes an adjusted total count of affected annuitants to gross up the original estimate. The 9.5% adjustment would increase the UAAL by \$32.5 million and annual amortization costs by \$4.4 million.

Please contact the IFO at (717) 230-8293 for any questions regarding the actuarial note or addendum.

February 22, 2024

Mr. Mathieu Taylor, Fiscal Analyst II  
Independent Fiscal Office  
State of Pennsylvania

Re: *House Bill No. 1379 – Actuarial Analysis - Addendum*

Dear Mathieu:

As requested, we are providing an addendum to our July 25, 2023 analysis to provide the following information:

1. **Impact of Updated Data:** Advise of approximate impact of updated data from the Auditor General, including an additional 2,493 annuitants (an increase of about 9.5% more annuitants than originally considered in the July 2023 analysis).
2. **Assumptions Scenario – 75-25 PMRS Blend:** An alternate scenario where 75% of annuitants are assumed to have retired according to the Pittsburgh retirement rates described in the July 2023 analysis, and 25% of annuitants are assumed to have retired according to the retirement rates for Uniform Members from the January 1, 2022 actuarial valuation report for the Pennsylvania Municipal Retirement System (PMRS).

### **Methodology**

All methods and assumptions used in the analysis are the same as set forth in our July 25, 2023 analysis unless otherwise noted.

As in that previous analysis, it should be noted that results disclosed in this letter are based on available data which was incomplete; while we believe that reasonable assumptions were used in absence of complete data, the results would be different if actual data reflecting Years of Service and Years on Retirement were utilized.

### **Impact of Updated Data**

You indicated that the Auditor General has provided an updated version of the data used in the July 25, 2023 analysis, and that the updated data includes an additional 2,493 annuitants (a 9.5% increase in number of annuitants).

Absent demographic information of the new annuitants such as age information and distribution between Fire and Police groups, our best estimate of the impact of including the new annuitants is to increase the original Approximate Increase in Unfunded Actuarial Accrued Liability (UAAL) by 9.5%.

### **Impact of Updated Data (Cont.)**

After including the 9.5% load mentioned in the previous paragraph, the Summary of Results is as follows:

<i>Summary of Results (in \$millions)</i>	<i>Total</i>
Approximate Increase in Unfunded Actuarial Accrued Liability (UAAL)	374.7
Amortization of Increase in UAAL	49.9

The 9.5% load is not included in other scenarios shown, so that results in this letter can be compared to the original July 25, 2023 analysis.

### **Assumptions Scenario – 75-25 PMRS Blend**

The retirement rates from the January 1, 2022 actuarial valuation report for PMRS and resulting assumed retirement age profile is as follows.

Age	Retirement Rate	Actives Remaining	Expected Retirements	Percentage of Retirees Who Retire at Each Age
50	25%	1,000	250	25%
51	10%	750	75	8%
52	10%	675	68	7%
53	10%	608	61	6%
54	15%	547	82	8%
55	15%	465	70	7%
56	17%	395	67	7%
57	17%	328	56	6%
58	17%	272	46	5%
59	15%	226	34	3%
60	15%	192	29	3%
61	20%	163	33	3%
62	28%	131	37	4%
63	22%	94	21	2%
64	25%	73	18	2%
65	35%	55	19	2%
66	30%	36	11	1%
67	100%	25	25	3%
Total			1,000	100%

These retirement rates result in generally earlier assumed retirement ages; for example, 25% are assumed to retire at age 50 (previously 15%).

As a result, the impact of House Bill No. 1379 would be greater under this assumption because annuitants are assumed to generally have retired at earlier ages, and would therefore be assumed to have more Years on Retirement than in the previous analysis.

**Assumptions Scenario – 75-25 PMRS Blend (Cont.)**

Below is the estimated impact of House Bill No. 1379 if 75% of annuitants are assumed to have retired according to the Pittsburgh retirement rates described in the July 2023 analysis, and 25% of annuitants are assumed to have retired according to the retirement rates for Uniform Members from the January 1, 2022 actuarial valuation report for the Pennsylvania Municipal Retirement System (PMRS).

<i>Summary of Results (in \$millions)</i>	<i>Total</i>
Approximate Increase in UAAL - 100% Pittsburgh Rates	342.2
Approximate Increase in UAAL - 100% PMRS Rates	413.1
Approximate Increase in UAAL (75-25 Blend, Pittsburgh and PMRS)	359.9
Amortization of Increase in UAAL (75-25 Blend, Pittsburgh and PMRS)	47.9

The undersigned are familiar with the immediate and long-term aspects of pension valuations, and meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinions contained herein.

In performing the analysis, we used third-party software to model (calculate) the underlying liabilities and costs. These results are reviewed in the aggregate and for individual sample lives. The output from the software is either used directly or input into internally developed models to generate the costs. All internally developed models are reviewed as part of the process. As a result of this review, we believe that the models have produced reasonable results. We do not believe there are any material inconsistencies among assumptions or unreasonable output produced due to the aggregation of assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report for a variety of reasons including: changes in applicable laws, changes in plan provisions, changes in assumptions, or plan experience differing from expectations. Due to the limited scope of the analysis, we did not perform an analysis of the potential range of such future measurements.

If you have any questions, please let me know.

Sincerely,



Bradley R. Heinrichs, FSA, EA, MAAA



Tyler A. Koftan, EA, MAAA