

AGREEMENT

WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD

and

BOLTON PARTNERS, INC.

THIS AGREEMENT (Agreement) made this 6th day of February 2019, is between the **WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD** (MPOB), Charleston, West Virginia, and **BOLTON PARTNERS, INC. (Bolton)**, 36 S. Charles Street, #1000, Baltimore, MD 21201.

WHEREAS, Pursuant to the provisions of *W.Va. Code* § 8-22-18A(b)(6), the MPOB is exempt from provisions of article three, chapter five-a of the Code for the purpose of contracting for actuarial services and pursuant to the provisions of *W.Va. Code* § 8-22-20(a), the MPOB shall contract with or employ a qualified actuary to annually prepare an actuarial valuation report on each pension and relief fund. The selection of contract vendors to provide actuarial services...shall be by competitive bid process but is specifically exempt from purchasing provisions of article three, chapter five-a of the Code; and

WHEREAS, on or about August 29, 2018, the MPOB issued Agency Request for Proposal (ARFP) MPO1900000001 seeking proposals from qualified actuarial consultants to provide certain actuarial valuations for each of the 53 municipal policemen's and firemen's pension and relief funds in West Virginia; prepare and deliver to the West Virginia Legislature's Joint Committee on Pensions and Retirement a consolidated actuarial report of the status of the 53 municipal policemen's and firemen's pension and relief funds on an annual basis; to assist the MPOB by reviewing any municipality's DROP (Deferred Retirement Option Plan) proposal received by the MPOB as required in *W.Va. Code* § 8-22-25(a); to provide consulting and complete special projects as required by both the MPOB and the Joint Standing Committee on Pensions and Retirement of the West Virginia Legislature; to provide Government Accounting Standards Board (GASB) reports 67 and 68 for each pension fund which impact a municipality's financial reporting; and

WHEREAS, in response to ARPF# MPO1900000001, Bolton submitted a proposal dated October 28, 2018, offering services as the primary provider of the services desired (Bolton Proposal); and

WHEREAS, the Bolton Proposal received the highest total point score in the evaluation of all proposals received by the MPOB as described in ARFP #MPO1900000001; and

WHEREAS, the parties now desire to formalize the terms and conditions of their agreement for such services.

NOW THEREFORE, THIS AGREEMENT, WITNESSETH:

That for and in consideration of the terms included herein, the parties do hereby covenant and agree as follows:

PART I – SPECIFIC CONTRACT TERMS

1-1. AGREEMENT:

- a. As reflected in the Purchase Order, the contract between the parties in its entirety consists of the following documents, in the order listed:
 - 1. This Agreement;
 - 2. ARFP #MPO190000001 and the Addendum issued September 28, 2018, by reference;
 - 3. Bolton Proposal, by reference; and
 - 4. Bolton Cost Sheet, Exhibit B.
- b. Any ambiguities or questions shall be resolved by reference to the documents in the order listed in this Section, unless otherwise specified in this Agreement.

1-2. SERVICES:

- a. Bolton agrees to provide the actuarial services required by the MPOB and described in ARFP #MPO190000001 (Services), reference to which is hereby made and incorporated herein.
- b. The MPOB reserves the right to alter, modify, eliminate, add, change, and amend the Services as mutually agreed between MPOB and Bolton to reflect the needs of the MPOB. The parties shall comply with all applicable federal and state laws, rules, regulations, and policies. The MPOB reserves the right to unilaterally accept, reject, cancel, prohibit or stop any, and all work performed under this Agreement without penalty with thirty (30) days written notice to Bolton.

1-3. VALUATION TIMELINE:

- a. Transition of Actuarial Services

Action	Timing	Responsible Party
Provide data and documentation requests to the MPOB and the prior actuary	Week 1	Bolton
Receive requested data and documentation	Weeks 2-4	MPOB and prior actuary
Complete initial programming of valuation model and send follow up request to prior actuary (if needed)	Weeks 4-5	Bolton
Receive follow up information regarding valuation match questions	Week 6	Prior actuary
Finalize valuation match and review discrepancies, if any, with the MPOB	Weeks 7-8	Bolton

- b. As stated in the ARFP #MPO1900000001, Bolton agrees to provide the actuarial services specified in Years 1, 2, 3, 4 and 5.
 - i. For year 1, data collection begins on the starting date of this contract for these services.
 - ii. Consolidated Report and Presentation to WV Legislature due November 1st.
 - iii. All individual pension valuations completed by September 30th.
 - iv. For years 2, 3, 4 or 5, data collection begins January 1st for preceding fiscal year end (June 30th).

1-4. **TERM:**

This Agreement will be effective upon award and shall extend for the period of five (5) years, at which time the contract may, upon mutual consent, be renewed. Such renewals are for a period of up to one (1) year, with a maximum of two (2) one-year renewals, or until such reasonable time thereafter as is necessary to obtain a new contract, not to exceed six months. During the "reasonable time" period, Bolton may terminate the contract for any reason upon giving the MPOB ninety (90) days written notice. Notice by Bolton of intent to terminate will not relieve Bolton of the obligation to continue providing services pursuant to the terms of the contract. This Agreement is subject to the general termination and extension rights reserved to the MPOB in this contract.

1-5. **COMPENSATION:**

Pursuant to the cost sheet and pricing schedule submitted by Bolton, Bolton shall be compensated for the services it provides as specified on the Cost Sheet, attached hereto and made a part hereof and included as Exhibit B to this Agreement. Bolton will invoice the MPOB on a monthly basis for the costs associated with providing the Hourly Services, specified in the ARFP, Addendum and any special projects/in person meetings requested by the MPOB. Prior approval from the MPOB is required for all projects billed on an Hourly Cost basis. Said invoice will be paid in arrears. Further, Bolton will invoice the MPOB in arrears for progress payments as each key phase of the valuation process is completed based upon the table below.

Bolton Fee Fixed Cost Schedule	
Prepare and send data request	5.0%
Update valuation software and report worksheets	10.0%
Update valuation reports	5.0%
Compile and reconcile data	15.0%
Gain loss analysis	7.5%
Generate liabilities and discount rate forecasts	7.5%
Prepare individual valuation reports	35.0%
Prepare consolidated report/presentation	10.0%
COLA Letters	5.0%
	100.0%

MPOB - 10/19/11

Special Projects/In Person Meetings:	Hourly Rate				
	Year 1	Year 2	Year 3	Year 4	Year 5
Senior Actuary	245.00	249.90	254.90	260.00	265.20
Actuary	245.00	249.90	254.90	260.00	265.20
Actuary Assistant	245.00	249.90	254.90	260.00	265.20
Clerical	245.00	249.90	254.90	260.00	265.20

Should any policemen’s or firemen’s municipal pension and relief fund decline to participate in the actuarial valuation process, Bolton will deduct the cost of performing that fund’s valuation from the progress payments invoice phase “Prepare individual valuation reports.”

The fee for the experience study completed in Year 1, and Year 4, shall be paid upon completion and acceptance by the MPOB.

The fees for the completion of GASB 67/68 reports may be billed in total or on a per unit cost each year. Year 1, unit cost is \$566.04; Year 2, unit cost is \$584.91; Year 3, unit cost is \$603.77; Year 4, unit cost is \$622.64 and Year 5, unit cost is \$641.51.

1-6. INSTITUTIONAL REQUIREMENTS:

- a. **Proof of Good Standing and Authorization to do Business:** Bolton agrees to remain in good standing with all regulatory and governmental entities and be authorized to do business in West Virginia. The MPOB reserves the right to request copies of all required business licenses, certificates, registrations, and declaration pages demonstrating applicable insurance coverage, including but not limited to, workers compensation, premises, professional liability, omissions and errors and general liability.
- b. **Insurance Requirements:** Bolton agrees that it will hold and maintain premises, professional/malpractice/errors and omissions and commercial general liability insurance policies in an amount not less than one million dollars (\$1,000,000). Additionally, Bolton agrees that it will hold and maintain cyber liability insurance in an amount not less than one million dollars (\$1,000,000) per occurrence. Such coverage shall remain in effect during the entire term of this Agreement unless otherwise advised in writing by the MPOB. Bolton agrees to provide copies of its insurance certificates to the MPOB prior to the execution of this Agreement.

1-7. SERVICE REQUIREMENTS:

- a. **Actuarial Valuation Reports:** Bolton agrees to prepare actuarial valuation reports for each of the 53 municipal policemen’s and firemen’s pension and relief funds in West Virginia as stated in Bolton’s response (pages 5-11) to ARFP #MPO1900000001 (to the extent the municipal policemen’s and firemen’s pension and relief funds provide the underlying required member and financial data and information directly to Bolton on a timely basis). Bolton is responsible for the collection of data from the individual municipalities and pension funds. These studies will be provided each year of the contract

as specified using the timeframes included in both ARFP #MPO1900000001 and Bolton's response to the ARFP. The individual actuarial valuations from Bolton are used by each municipality to determine a municipal policemen's or firemen's pension and relief fund's eligibility to receive state money and to provide supplemental benefits to its pensioners. Bolton also agrees, as stated in their response (page 9) to ARFP #MPO1900000001, to prepare and provide "COLA" letters to each of the municipal pension and relief funds annually.

- b. **Annual Consolidated Actuarial Report:** Bolton agrees to prepare a consolidated actuarial report to present to the Legislature's Joint Committee on Pensions and Retirement annually based on the results of the individual actuarial valuations as stated in Bolton's response (pages 12-13). The report will be completed by November 1st each year of the contract. Bolton may be asked to present the report in person or via teleconference to the Municipal Pensions Oversight Board at a board meeting and may also be asked to present the report in person to the WV Legislature's Joint Committee on Pensions and Retirement.
- c. **Promoting Actuarially Sound Funding Policies:** Bolton agrees to assist the MPOB in an educational effort to enable small pension plans to better understand their unfunded actuarial liabilities and how the management of fund assets can affect their liabilities. The educational effort will include forecasting of costs and components of solvency (currently provided as part of the discount rate setting for the annual valuation) as well as providing overall advice to the MPOB on ways to educate the members/trustees to ensure a quality pension fund as discussed in Bolton's response (pages 13-15).
- d. **Actuarial Assumptions:** Bolton agrees to perform an Experience Study in Year 1 (Spring/Summer 2019) and Year 4 (Spring/Summer 2022) of the contract to determine what the actuarial assumptions should be for the annual actuarial valuations using the MPOB's Standard Operating Procedures Experience Study Timing procedure. Bolton will perform the Experience Study as outlined in its response (pages 15-18) to ARFP #MPO1900000001.
- e. **Written Recommendations for Improving Pension Performance:** Bolton agrees to assist the MPOB by providing written recommendations as part of the annual valuation report which include methods for monitoring and improving the performance of pension and relief funds, methods for assuring prudent administration of the funds and providing strategies for monitoring investments and general management of the funds as stated in Bolton's response (pages 19) to ARFP #MPO1900000001.
- f. **Written Recommendations to Strengthen and Protect Pension Funds and Benefit Interests of Fund Members:** Bolton agrees to assist the MPOB by providing written recommendations as part of the annual valuation report that would both strengthen and protect the municipal pension funds and the benefit interests of the funds' members as stated in Bolton's response (pages 19-20) to ARFP #MPO1900000001.
- g. **Deferred Retirement Option Plan (DROP) Reviews and Reports:** Bolton agrees to assist the MPOB by reviewing any municipality's DROP (Deferred Retirement Option Plan) proposal received by the MPOB, as authorized in WV Code Chapter 8, Article 22, Section 25(a), and to provide a report on said plan to the MPOB as stated in Bolton's

response (pages 20-21) to ARFP #MPO1900000001. Bolton's review will include the elements of the DROP and the estimated actuarial impact of the DROP on the affected pension and relief fund. If such a DROP is adopted by a municipality, future actuarial studies will include a section on whether the plan continues to maintain the revenue neutrality required by the W.Va. Code. Further, Bolton will provide information to the MPOB regarding the experienced impact on an affected pension and relief fund. Review of DROP proposals and any associated actuarial analysis will be charged at Hourly Cost.

- h. Individual Sessions to Each Municipal Fund through Conference Calls and On-Site Meetings to Receive Specific Information on Fund Valuations:** Bolton agrees to assist the MPOB by providing education/information sessions to each municipal policemen's and firemen's pension and relief fund, on an as requested basis, through conference calls, on-site meetings in each municipality or on-site regional meetings where pension boards could meet with consultants to receive information specific to their own actuarial valuation as stated in Bolton's response (page 21) to ARFP #MPO1900000001. The time associated with these meetings and conference calls, including preparation time for any requested presentation materials, will be charged at Hourly Cost.
- i. Design of a New Retirement Formula that Does Not Diminish Current Benefits:** Bolton agrees to design a new retirement formula that does not diminish current benefits, but that is easier for participants to calculate retirements and disability retirements as stated in Bolton's response (pages 21-25) to ARFP #MPO1900000001. The MPOB will work with Bolton to establish a timeline with completion of this study and identify guiding principles for evaluating proposed plan designs. The time associated with providing these studies will be charged at Hourly Cost.
- j. Special Projects:** Bolton agrees to assist the MPOB by completing special projects as required of the MPOB by the Joint Standing Committee on Pensions and Retirement of the West Virginia Legislature regarding the plans being valued, such as costs of benefit formula changes, changes in actuarial assumptions, and cash flow and funding projections as stated in Bolton's response (pages 25-26) to ARFP #MPO1900000001. The time associated with providing these services will be charged at Hourly Cost.
- k. Government Accounting Standards Board (GASB) statements:** Bolton agrees to provide supplemental valuation report for each pension fund containing GASB statement number 67 and GASB statement number 68. This supplemental valuation report is to be provided each year of the fiscal years included in the contract as stated in Bolton's response (pages 26-27) to ARFP #MPO1900000001. Bolton will be available to respond to questions from the municipal treasurers/finance directors and their auditors regarding the supplemental GASB reports. The time associated with responding to such questions will be billed as an Hourly Cost.
- l. Additional GASB statements required reports:** Bolton agrees to provide any GASB reports required in the future through amendments to this contract as described in Bolton's proposal (page 27) to ARFP #MPO1900000001.

1-8. MANDATORY REQUIREMENTS:

- a. **Qualified Actuaries:** Bolton shall provide only "qualified actuaries" for this project. A "Qualified Actuary" means only an actuary who is a member of the Society of Actuaries or the American Academy of Actuaries. Bolton stated in its response (page 40) to ARFP #MPO190000001 that all the actuaries assigned to the engagement are "qualified actuaries".
- b. **Succession Plan:** Bolton agrees to follow the succession plan as outlined in its response (page 40-41) to ARFP #MPO190000001 for selecting another actuary should one of the assigned actuaries leave the company.

PART 2 – GENERAL CONTRACT TERMS AND CONDITIONS

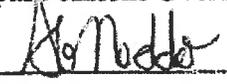
- a. **Mandatory Forms:** Bolton, its agents, employees and subcontractors, agree to be bound by the terms and conditions of all other applicable forms required by the MPOB and/or the State of West Virginia, including, but not limited to, the Purchasing Affidavit and the WV-1 Vendor Registration form.
- b. **General Terms and Conditions:** In addition to the mandatory forms, Bolton agrees to be bound by Section Three of ARFP #MPO190000001, attached hereto as Exhibit A, unless otherwise modified in this Agreement. Bolton agrees to allow (with the permission of the MPOB) WV municipalities with policemen's and or firemen's pension and relief funds to enter into contractual agreements using the same terms and conditions as this agreement including hourly fees for the purpose of additional actuarial engagements or additional GASB 67 and 68 statement engagements.

WITNESS THE FOLLOWING SIGNATURES:

Bolton Partners, Inc.

By: 
Title: Vice President
Date: 2/5/19

Municipal Pensions Oversight Board

By: 
Title: CHAIRMAN
Date: 2/6/19

Approved as to form this 13th day of February, 2019

By: , Deputy Attorney General

EXHIBIT A

ARFP# MPO1900000001, Section Three

EXHIBIT B

Bolton Cost Sheet from ARFP #MPO190000001

EXHIBIT B

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

CONSTRUCTION CONTRACTS: Under W. Va. Code § 5-22-1(i), the contracting public entity shall not award a construction contract to any bidder that is known to be in default on any monetary obligation owed to the state or a political subdivision of the state, including, but not limited to, obligations related to payroll taxes, property taxes, sales and use taxes, fire service fees, or other fines or fees.

ALL CONTRACTS: Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

EXCEPTION: The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (W. Va. Code §61-5-3) that: (1) for construction contracts, the vendor is not in default on any monetary obligation owed to the state or a political subdivision of the state, and (2) for all other contracts, that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: Bolton Partners, Inc.

Authorized Signature: [Handwritten Signature]

Date: 10/23/18

State of Maryland

County of Anne Arundel, to-wit:

Taken, subscribed, and sworn to before me this 23 day of October, 2018

My Commission expires Feb 20, 2019.



AFFIX SEAL HERE

NOTARY PUBLIC [Handwritten Signature]

CONTRACT CHANGE ORDER NO. 1 to MPO1900000001
WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD
and
BOLTON PARTNERS, INC.

THIS CHANGE ORDER NO. 1 made this 9th day of September, 2019, is between the **WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD (MPOB)**, Charleston, WV, and **BOLTON PARTNERS, (Bolton) INC.**, 36 S. Charles Street, #1000, Baltimore, MD 21201.

WHEREAS, Pursuant to the provisions of WV Code §8-22-18A(b)(6), the MPOB is exempt from provisions of article three, chapter five-a of the CODE for the purpose of contracting for actuarial services and pursuant to the provisions of WV Code §8-22-20(a), the MPOB shall contract with or employ a qualified actuary to annually prepare and actuarial valuation report on each pension and relief fund. The selection of contract vendors to provide actuarial services...shall be by competitive bid process, but is specifically exempt from purchasing provisions of article three, chapter five-a of the Code, and

NOW THEREFORE, THIS CHANGE ORDER, WITNESSETH:

That for and in consideration of the terms included herein, the parties do hereby covenant and agree to the following additions to the original contract pursuant to the findings of Bolton that some death benefits payable to spouses were not determined in accordance with W. Va. Code §8-22-26a. Bolton conducted a sampling to determine if the incorrect method was limited to a few municipal plans or if it was a systemic issue across most of the 53 municipal policemen's and municipal firemen's pension and relief funds. The sampling revealed the incorrect methodology is being applied by most if not all of the municipal plans. The incorrect methodology is causing spousal benefits and other beneficiaries benefits to be less than what is required by W.Va. Code for survivor supplemental benefits, i.e. cost-of-living adjustments (COLAs). The MPOB Board wants to correct these benefits to survivors and have the municipal plans pay any underpayments to the spouses and beneficiaries.

The project will be broken into two main phases. The first phase is detailed in this change order and broken into three main projects. The second phase will be covered in a separate change order document.

Phase I included three projects as outlined below.

- Project I will create an Excel Death Benefits Calculator that correctly applies the methodology stated in W. Va. Code §8-22-26a for new retiree deaths as well as correcting future payments to current survivor beneficiaries. The fee for Project I is \$9,800 and is payable upon completion of Project I.
- Project II will identify the number of beneficiaries whose benefits were determined incorrectly. Bolton will create a file of all current beneficiaries receiving survivor benefits. Bolton will collect specific data on each survivor from each pension plan and based on the data collected will recalculate the survivor benefit to determine if Bolton can match the survivor's benefits using the correct methodology or the known incorrect method. Bolton will also identify any survivors where the current survivor benefits cannot be determined using the correct methodology or the

known incorrect method. Bolton will create a report documenting the findings and recommendations for how to determine the amounts of under/over payments for Phase II. The fee for Project II is \$19,600 and is payable upon completion of Project II.

- For Project III, Bolton will conduct research on the history of the supplemental benefits (COLA) provision in the W.Va. Code to determine exactly how benefits should have been calculated. This project will include interviews with MPOB staff and MPOB Board members. Research to be performed includes reviewing the portions of the W.Va. Code which pertain to supplemental benefits from 1991 through the present and the WV Supreme Court decision on Fairmont Fire Pension v. City of Fairmont. The research will be used for benefit corrections under Phase II which will be detailed in a future Change Order. The fee for Project III is \$2,450 and is payable upon completion of Project III.

All other terms, conditions, prices and specifications remain in full effect.

WITNESS THE FOLLOWING SIGNATURES:

Bolton Partners, Inc.

By:

Title:

Date:

Municipal Pensions Oversight Board

By:

Title:

Date:

Approved as to form this 19th day of Sept, 2019.

By:

John S. Gray, Deputy Attorney General

STATE OF WEST VIRGINIA
Purchasing Division
PURCHASING AFFIDAVIT

CONSTRUCTION CONTRACTS: Under W. Va. Code § 5-22-1(i), the contracting public entity shall not award a construction contract to any bidder that is known to be in default on any monetary obligation owed to the state or a political subdivision of the state, including, but not limited to, obligations related to payroll taxes, property taxes, sales and use taxes, fire service fees, or other fines or fees.

ALL CONTRACTS: Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

EXCEPTION: The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (W. Va. Code §61-5-3) that: (1) for construction contracts, the vendor is not in default on any monetary obligation owed to the state or a political subdivision of the state, and (2) for all other contracts, that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: Bolton Partners Inc

Authorized Signature: [Signature] Date: 9/16/19

State of Maryland

County of Anne Arundel, to-wit:

Taken, subscribed, and sworn to before me this 10 day of September, 2019.

My Commission Expires February 20, 2023



My Commission Expires February 20, 2023 [Signature]
NOTARY PUBLIC



West Virginia

Municipal Pensions Oversight Board

PROPOSAL TO PROVIDE ACTUARIAL CONSULTING SERVICES

Requisition No: MP01900000001

COST PROPOSAL

October 24, 2018

Prepared by:

Ellen L. Kleinstuber, FSA, EA, FCA, MAAA, FSPA
Senior Consulting Actuary
ekleinstuber@boltonusa.com
(443) 573-3912

Thomas B. Lowman, FSA, EA, FCA, MAAA
Chief Actuary & President of Bolton Retirement
tlowman@boltonusa.com
(443) 573-3909

**MUNICIPAL PENSIONS OVERSIGHT BOARD
REQUEST FOR PROPOSAL
REQUISITION NO: MPO 1900000001
Attachment C
Cost Sheet**

- A Cost of Annual Valuation of 53 Plans and Consolidated Report
- B GASB 67/68 Reports
- C Experience Study
- D Cost Escalator Rate
- E Total Hourly Cost

Life of Contract					
Year 1	Year 2	Year 3	Year 4	Year 5	Total
\$200,000.00	\$204,000.00	\$208,000.00	\$212,000.00	\$216,000.00	\$1,040,000.00
\$30,000.00	\$31,000.00	\$32,000.00	\$33,000.00	\$34,000.00	\$160,000.00
\$30,000.00			\$32,000.00		\$62,000.00
	102.00%	102.00%	102.00%	102.00%	
\$98,000.00	\$99,960.00	\$101,959.20	\$103,998.38	\$106,078.35	\$509,995.93

Total Cost of Proposal **\$1,771,995.93**

- F Special Project/In person meetings:

Classification	Total Hours *	Hourly Rate	Total Hourly Cost
Senior Actuary	100	\$245.00	\$24,500.00
Actuary	100	\$245.00	\$24,500.00
Actuary Assistant	100	\$245.00	\$24,500.00
Clerical	100	\$245.00	\$24,500.00
Total Hourly Cost			\$98,000.00

Instructions: The gray shaded cells have been locked by the MPOB as they contain formulas. The blue shaded cells are unlocked and available for the vendor to provide cost information.

- A - List the cost of the Annual Valuation of all plans/Consolidated Report
- B - Total annual cost of individual GASB reports.
- C - Experience Study to be completed every third year.
- D - List the rate of increase of any price adjustments
- E - First year is equal to total cost for item F. Previous year multiplied by item D (cost escalator rate) for remaining years 2-5.
- F - Enter individual hourly rates to establish total hourly cost and base year.

* - Estimated hours for proposal purposes only.

Note 1:

Rates shall be inclusive of all expenses and costs associated with providing the services, including travel expenses. No travel will be reimbursed by the MPOB and will be the sole responsibility of the vendor.

Bolton Fee Estimate Pricing Schedule		
Prepare and send data request	5.0%	\$ 10,000.00
Update valuation software and report worksheets	10.0%	\$ 20,000.00
Update valuation reports	5.0%	\$ 10,000.00
Compile and reconcile data	15.0%	\$ 30,000.00
Gain loss analysis	7.5%	\$ 15,000.00
Generate liabilities and discount rate forecasts	7.5%	\$ 15,000.00
Prepare individual valuation reports	35.0%	\$ 70,000.00
Prepare consolidated report/presentation	10.0%	\$ 20,000.00
COLA letters	5.0%	\$ 10,000.00
	100.0%	\$ 200,000.00

Change order 2 was an administrative change.

CONTRACT CHANGE ORDER NO. 3 to MPO190000001
WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD
and
BOLTON PARTNERS, INC.

THIS CHANGE ORDER NO. 3 made this 25th day of April 2023, is between the WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD (MPOB), Charleston, WV, and BOLTON PARTNERS, (Bolton) INC., 36 S. Charles Street, #1000, Baltimore, MD 21201.

WHEREAS, Pursuant to the provisions of WV Code §8-22-18A(b)(6), the MPOB is exempt from provisions of article three, chapter five-a of the CODE for the purpose of contracting for actuarial services and pursuant to the provisions of WV Code §8-22-20(a), the MPOB shall contract with or employ a qualified actuary to annually prepare and actuarial valuation report on each pension and relief fund. The selection of contract vendors to provide actuarial services...shall be by competitive bid process, but is specifically exempt from purchasing provisions of article three, chapter five-a of the Code, and

NOW THEREFORE, THIS CHANGE ORDER, WITNESSETH:

That for and in consideration of the terms included herein, the parties do hereby covenant and agree to the following additions to the original contract pursuant to the findings of Bolton that some death benefits payable to spouses and other beneficiaries were not determined in accordance with W. Va. Code §8-22-26a. Bolton conducted a sampling to determine if the incorrect method was limited to a few municipal plans or if it was a systemic issue across most of the 53 municipal policemen's and municipal firemen's pension and relief funds. The sampling revealed the incorrect methodology is being applied by most if not all of the municipal plans. The incorrect methodology is causing spousal benefits and other beneficiaries benefits to be less than or more than what is required by W.Va. Code for survivor supplemental benefits, i.e., cost-of-living adjustments (COLAs). The MPOB Board wants to correct these benefits to survivors and have the municipal plans pay any underpayments to the spouses and beneficiaries and claw back any overpayments to the spouses and beneficiaries.

The second phase is to calculate the survivor benefits for deaths that occurred after the implementation of the Survivor Benefit Calculator, in May 2020, and for re-calculating survivor benefits paid to spouses and other beneficiaries that have been determined using a methodology that does not comply with WV Code §8-22-26a(b).

Phase II includes the following steps as outlined below.

- Bolton will correct the survivor benefits for an estimated 290 participants. Based on Bolton's preliminary review of the data from Phase I, Bolton will be able to correct the benefits for approximately 165 survivors. Bolton will request any updated data for approximately 125 of the 290 participants from municipalities and pension boards of trustees. Of the 125 participants where Bolton will request additional information, Bolton will be able to calculate and correct benefits for 65 participants based on certain reasonable assumptions if the municipalities cannot provide any additional data.

- For the remaining 60 participants, if the Municipalities do not provide any additional information, Bolton will not have enough information to calculate a corrected benefit. If this is the case, Bolton will work with MPOB staff to determine a plan of action for getting the information needed to check the accuracy of these benefits.
- Bolton will provide the MPOB with an updated Excel spreadsheet with the amounts paid, the corrected amount and the amounts of underpayments and overpayments to the participants by pension plan. Bolton will reflect the impact of the 2023 COLA.
- The scope of this project excludes South Charleston Policemen's Pension and South Charleston Firemen's Pension as the survivors and beneficiaries have already been corrected.

The fixed cost for Phase II is \$65,000 which represents an expected 250 hours to complete the work. Bolton will bill the MPOB progressively by month until the project is complete.

All other terms, conditions, prices, and specifications remain in full effect.

WITNESS THE FOLLOWING SIGNATURES:

Bolton Partners, Inc.

By: *James White*

Title: President of Bolton Retirement

Date: April 27, 2023

Municipal Pensions Oversight Board

By: *John M. Gray*

Title: Executive Director

Date: Apr 25, 2023

Approved as to form this 1st day of May, 2023

By: *John L. Gray*, Deputy Attorney General



West Virginia

Municipal Pensions Oversight Board

PROPOSAL TO PROVIDE ACTUARIAL CONSULTING SERVICES

Requisition No: MPO1900000001

TECHNICAL PROPOSAL

October 24, 2018

Prepared by:

Ellen L. Kleinstuber, FSA, EA, FCA, MAAA, FSPA
Senior Consulting Actuary
ekleinstuber@boltonusa.com
(443) 573-3912

Thomas B. Lowman, FSA, EA, FCA, MAAA
Chief Actuary & President of Bolton Retirement
tlowman@boltonusa.com
(443) 573-3909



October 23, 2018

LeAnne Neccuzi, Procurement Officer
Municipal Pensions Oversight Board
301 Eagle Mountain Road, Suite 251
Charleston, WV 25311

Re: Request for Proposal for Actuarial Services (Requisition No: MPO190000001)

Dear Ms. Neccuzi:

Bolton is pleased to present this response to the Request for Proposal for Actuarial Services issued by the West Virginia Municipal Pensions Oversight Board (the MPOB) on August 29, 2018. Our firm provides actuarial services nationally with a strong presence in the eastern portion of the country and is well-qualified to provide each level of actuarial services described in your RFP.

We understand that you require a firm capable of providing the valuation and consulting services outlined in the Scope of Consulting Services of the RFP. As you will see demonstrated in this proposal, Bolton has the experience and expertise necessary to provide the requested services in a timely manner with a commitment to the highest quality standards. Key advantages Bolton offers to the MPOB include:

- **Public sector expertise.** We have expertise in public sector pension and post-retirement medical valuations as a result of our extensive experience with providing these services. We also are familiar with the most current actuarial and accounting standards due to our involvement in national actuarial and accounting organizations. Our Chief Actuary and the proposed Principal Actuary for the MPOB, Tom Lowman, is currently the Chair of the American Academy of Actuaries' Public Pension Plans Committee and the Vice-chair of the Conference of Consulting Actuaries' Public Plans Community.
- **Accessible experts.** The MPOB will have direct access to a team that includes seven credentialed actuaries who specialize in public sector retirement consulting, two of whom are Fellows of the Society of Actuaries (FSA) and three of whom individually have over 25 years of actuarial consulting experience. Our consultants are accessible and knowledgeable about national trends in the public sector. This flexibility and availability allows us to quickly meet the needs of our clients.
- **Clear communication.** We work with our clients to ensure our communication is comprehensive, understandable, and meets their needs. This includes the use of framing, summary tables and graphs, and providing materials prior to meetings, so that our clients have time to review and provide any feedback or requests for additions or clarifications.
- **Familiarity with the needs of small plans.** We work with a wide variety of plan sponsors, including many small municipalities like the ones that are supported by the MPOB and sponsors of plans covering public safety workers. The consultants that will support the MPOB and the 31

municipalities whose uniformed policemen and firefighters are covered by the 53 pension plans engaging for actuarial services have worked with both very small, mid-sized and large plan sponsors. We are adept at tailoring our communication style to fit those of our audience. We are flexible in our work processes, while still maintaining an adherence to rigorous actuarial standards.

- **Excellent project management skills.** The team assigned to support the MPOB plans have worked with systems where there is a collection of smaller plans that add up to a much larger program, similar to the MPOB. One of the keys to being successful in such an engagement is employing strong project management practices, and we have operated in this regard with numerous client engagements. Our consultants have worked with retirement programs sponsored by the NFL and Department of Energy, where the much larger plan is essentially a collection of much smaller plans. Similarly, our post-retirement medical actuarial practice has many very small unrelated plans all of which require their GASB accounting results at the same time. It is imperative that we have project management practices in place to allow us to track the progress of each valuation, so we can ensure sufficient resources are budgeted to ensure all deadlines are met and the client is kept informed of our progress.

At Bolton, we embrace a “build it together” service delivery model focused on alignment to the highest standards, continuous improvement, empowerment and accountability, and teamwork and collaboration. The driving theme of our consulting practice is to focus on solutions and results for our clients. The firm’s culture is based on an obsession with serving the needs of our clients without the bureaucracy often found at large national firms. Our success over the last 37 years is based on our relationships with our clients, our technical knowledge, and our work product. Since our inception, Bolton has thrived in our industry and maintained our financial health and solvency.

As an independent firm, we work solely on behalf of our clients and always in their best interest. Bolton’s expertise is not limited by plan or employer size—our client base represents a broad spectrum, from small cities to large counties to states. Unlike our larger competitors, we are ideally suited to be more responsive and tailored to each and every client and understand the challenges that smaller plan sponsors face. Our record of service can be demonstrated by our client retention rate. We have not lost a major client in over seven years, except by merger or acquisition.

Bolton can provide the MPOB and the 53 West Virginia municipal pension and fire pension plans with the required valuation services and valuable consulting from experienced professionals. We look forward to working with the MPOB and developing into a trusted partner. Please let us know if you have any questions regarding this proposal. You may contact Tom Lowman at (443) 573-3909 or Ellen Kleinstuber at (443) 573-3912.

Sincerely,

Bolton



Thomas B. Lowman, FSA, EA, FCA, MAAA
Chief Actuary & President of Bolton Retirement
tlowman@boltonusa.com
P: (443) 573-3909
F: (410) 685-1924



Ellen L. Kleinstuber, FSA, EA, FCA, MAAA, FSPA
Senior Consulting Actuary
ekleinstuber@boltonusa.com
P: (443) 573-3912
F: (410) 685-1924

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ATTACHMENT A:

VENDOR RESPONSE SHEET

Section 4, Subsection 4.2.1.1. Goal 1:

Vendor Response:

Bolton has an outstanding reputation for thorough, accurate work. The quality and experience of our staff and the direct involvement in the daily processing of tasks by senior actuaries ensure that we deliver the highest quality of work. Bolton is committed to providing consistent, accurate results you can rely on through the implementation of quality control methods and procedures.

To ensure a successful partnership with the MPOB, we view our interactions as a collaborative effort in which both parties must work together to identify common goals and proper expectations. We would work with your team to set specific tasks, activities, and expectations for program management throughout the year.

Typically, we begin any client engagement with a stewardship and planning meeting. This allows us to set very specific short-term and long-term goals relative to support of your programs. We will come to this meeting with a preliminary work plan for how we propose to manage the completion of the all the deliverables involved in the annual valuation cycle. During our meeting we will ask for feedback on specific issues that typically arise during the annual valuation cycle and how they might affect our work plan for the year. We will share ideas on how we might manage those challenges, drawn from our experience working in different contexts with other small plans that may not have personnel well-versed in pension plans and working with actuaries or for whom providing the annual census and asset updates takes lower priority than other municipal functions.

The team assigned to support the MPOB plans have worked with systems where there is a collection of smaller plans that add up to a much larger program, similar to the MPOB. One of the keys to being successful in such an engagement is employing strong project management practices, and we have operated in this regard with numerous client engagements. Our consultants have worked with retirement programs sponsored by the NFL and Department of Energy, where the much larger plan is essentially a collection of much smaller plans. Similarly, our post-retirement medical actuarial practice has many very small unrelated plans, all of which require their GASB accounting results at the same time.

It is imperative that we have project management practices in place to allow us to track the progress of each valuation, so we can ensure sufficient resources are budgeted to ensure all deadlines are met and the client is kept informed of our progress.

- Following our initial planning meeting, we will finalize our customized work plan and share it with you, to ensure we are aligned on how the work will be accomplished and when and to establish a level of accountability as we proceed with our work. We will provide regular progress updates and work with the MPOB to make any adjustments during the year based on any developments that occur after the start of the year (such as significant delays in the receipt of census or asset

information, new legislative developments or reporting requirements, etc.)

As part of the annual valuation process, we will not only prepare calculations under each plan's selected actuarial funding policy but will also present results under any of the available alternative funding policies provided permitted by W. Va. §8-22-20. Those policies vary primarily in the amortization period (ranging from 13 to 31.5 years as of July 1, 2018) and pattern of recognition (either as a level dollar amount each year or as a level percentage of pay, which results in a steadily increasing annual payment) as well as a stated increase (i.e. 107%) of the prior year or on a pay-as-you-go basis with a separate accumulation account.

Quality Assurance

We have a rigorous quality control process with multiple levels of checking and review to ensure our work complies with the applicable legal and regulatory requirements, conforms to generally accepted actuarial practice, and meets the requirements of the Actuarial Standards of Practice and meets or exceeds the expectations of our clients. Our internal quality assurance procedures include:

- **Do/Check/Review Process** – All work is independently checked by a second analyst or actuary to reduce the likelihood of errors. This also provides our clients with multiple contacts who are familiar with their plans and projects. Results are always reviewed by the project manager and/or lead consultant for accuracy, consistency, and clarity.
- **Sample Review** – Actuarial software is like all other types of software – sometimes it isn't doing what you think it is. For all projects, we create independent models for sample participants that allow us to compare the results from the actuarial software with our expectations.
- **Project Management Checklists and Logs** – We maintain project management checklists and logs to track the status of projects and staff accountability. This ensures that we are meeting our do/check/review process and are not missing deadlines.
- **Peer Review** – Work products are independently reviewed by a senior consultant for compliance with actuarial standards and client's requirements, as well as the overall reasonableness of the results. Recommendations are also considered to ensure they reflect the firm's innovative thinking and best practices.

A basic outline of our approach to the requested work for the MPOB follows.

- Assign a dedicated team of personnel to work on the MPOB valuations, including a dedicated project manager, and assign tasks to employees whose abilities are suited to the complexity of the assignments.
- Develop a detailed project plan with responsibilities assigned to each member of the Bolton team, the individual municipalities, and the MPOB. We will share this plan with the MPOB during our initial planning meeting to ensure it meets with your expectations.
- Organize all case-related materials that apply system-wide with individual files for each of the individual municipal plans in the system, to allow us to easily identify and obtain any missing items that may be available.
- Establish a tracking system that allows us to easily evaluate our progress against the planned timeline and identify municipalities with whom follow up is needed to obtain the annual census data

and asset information updates that will facilitate timely completion of the valuation report.

- Create an efficient process for producing valuation reports that leverages the common features of each of the 53 plans, the capabilities of our valuation software and the flexibility of our reporting tools.
- Develop a customized version of our standard valuation report that addresses the issues unique to the plans under the MPOB oversight, such as the application of the alternative funding policies allowed by WV statute and the results of the funding projections that support selection of the annual valuation interest rate. We will share this with the MPOB prior to production of the valuation reports to ensure all requested information is addressed in a clear and understandable manner.
- Follow a comprehensive valuation standards checklist for each plan's funding and GASB valuation reporting, as well as preparation of the annual comprehensive valuation report provided to the MPOB. Each step in the valuation has an independent review.
- Ask for feedback from the MPOB once work is complete on each valuation cycle. We will incorporate your feedback into our processes and checklists and share your input with all staff members.

Pension Valuation Process

We maintain a checklist detailing each part of the valuation process which must be completed and initialed by the person responsible for that function. (A copy of our standard checklist is included in **Appendix 1**.) This creates a higher level of accountability for each of our employees. Each of the phases in our annual valuation work plan is described below.

Data Processing

Bolton will send a formal request for census and asset data that will be used for the actuarial valuation, participant statements (when requested), cost-of-living adjustment calculations, and other correspondence. Bolton uses Citrix ShareFile for secure file sharing to ensure our clients' data remains confidential.

ShareFile provides notification to users when files are uploaded or downloaded, and Bolton will have two dedicated team members monitoring the site for client activity. We will review the files as soon as we receive them and provide notification to each municipality when the data is accepted. All team members will receive notification of activity on the ShareFile site to ensure that staff is immediately aware of any data submissions.

We will also provide access to the MPOB staff to monitor progress and have the ability to set up folders for each entity, limiting each entity's access to their data only, while granting members of the MPOB staff access to all entities' data.

Before any reconciliation work is done, the prior year's files are reviewed for any special notes made in the prior year as part of the recordkeeping process. As soon as each plan submits their data, we will verify its completeness and begin processing and reconciling it with the prior year's data. As part of the processing, we will ask the local municipality to clarify any data discrepancies.

The data reconciliation process requires the following items to be checked:

- Basic member information (e.g., name, Social Security number, gender, date of birth, date of hire) is unchanged from the prior year
- No duplicate records
- Dates of birth and hire are reasonable
- Compensation is consistent with prior year; if not, can the change be justified
- Service credit is consistent with prior year; if not, can the change be justified
- Members reported in the prior year who are not reported in the current year are checked
- Active members reported for the first time in the current year with a date of hire more than one-year prior are checked

Following this initial review, we submit any questions on status changes or basic data to the municipality and incorporate their responses into the census data file. We attempt to submit questions as concisely as possible to minimize the number of times a municipality is asked to respond to our requests, however occasionally multiple rounds of questions may be required (particularly for the larger municipalities).

A full reconciliation of status changes is done to confirm no members were omitted, and this reconciliation is included in our valuation report. The summary statistics that will be included in the valuation as another check of the reasonableness of the final data set. A second actuarial analyst or plan administrator reviews the completed data file, using the same checklist, to ensure nothing was missed. If the reviewer makes any changes to the data, the file will go back to the original analyst/administrator who will review the changes.

An analyst or administrator also does the reconciliation of the plan assets, and the development of the actuarial value of assets, which is also checked and reviewed by another analyst or administrator. We also compare the benefit payments to retired, disabled and terminated participants as well as to spouses and beneficiaries of deceased participants to the participant census data to ensure consistency. This may result in additional data questions. In some cases, we may be able to make certain assumptions about missing data (to the extent that doing so is not expected to materially affect the results of the valuation) to facilitate moving forward if a timely response is not provided.

Valuation Processing

An actuarial analyst does the initial valuation software programming and a second analyst will check the programming update. An actuary will check the output of several sample members (some active, terminated with a deferred benefit and retired, referred to as “sample lives”). To facilitate our checking process, we create independent Microsoft® Excel model each year to replicate the individual valuation calculations and compare them to the sample life results from our valuation software, ProVal. While it takes time, this makes it much easier to spot problems.

In addition to checking individual sample life output, we also do an annual gain/loss analysis by participant to identify sources of significant experience that deviates from expectations and affects the measurement of plan liabilities. This allows us to review general plan experience with the plan sponsor on an annual basis and identify emerging trends in the data that may warrant a more comprehensive experience study.

Draft and Final Actuarial Valuation Report

Once the programming has been done and checked, an analyst assembles the valuation calculations and draft actuarial report. Our valuation system is flexible enough to allow us to prepare the projections that develop the funding metrics used to select the annual valuation discount rate and immediately feed liabilities determined at the resulting discount rate in to the remaining calculations for the current year. Completing both steps in the same program minimizes the number of separate steps in the process and reduces the potential for error.

The calculations and the draft report are checked by another analyst or actuary. An actuary completes a technical review of the calculations and draft report. Then, the signing actuary completes a review of the report, including any recommendations being made regarding changes in assumptions or methods and their impact on the results presented.

Finally, after the valuation is complete, reviewed and ready to provide to the client, a second actuary who has not worked on the case, provides a peer-review of the work to identify any possible areas for improvement in the valuation process, advice and report. Once all levels of review have been completed and signed off, we will submit the final valuation report to the municipality for their plan(s).

Timeline for Annual Valuation

The core annual work, including the valuation, will follow the schedule below (this timeline includes sub-steps not included in the process overview above). Due dates will be reviewed with the MPOB at an initial planning meeting to confirm that this schedule complies with our understanding of your timing requirements.

Activity	Date	Responsibility
Written request for valuation census data as of prior July 1	January 15	Bolton
Active and inactive census information for valuation provided	By April 15	Municipalities
COLA letters provided to pension secretaries	March	Bolton
Census questions given to Plan	3 – 6 weeks after receipt of data submission ¹	Bolton
Responses to census questions given to Bolton	3 weeks after questions sent	Municipalities

¹ Actual timing within the indicated window will depend upon the timing of receipt. If a large quantify of plans all submit at the same time, additional time may be needed to complete the initial processing of each submission and prepare data questions.

Activity	Date	Responsibility
Valuation processing: <ul style="list-style-type: none"> · Program and test valuation system · Prepare gain/loss analysis · Determine liabilities and costs using prior year assumptions · Finalize current year actuarial assumptions · Finalize liability and cost calculations 	March - July	Bolton
Asset information requested	August 1	Bolton
Asset information provided to Bolton	August – October	Municipalities
GASB 67/68 reports issued	6 weeks after receipt of asset data for each plan	Bolton
Issue actuarial valuation report for each plan	August – September	Bolton
Issue consolidated actuarial valuation report	November 1	Bolton
Presentation at the MPOB meeting	TBD	Bolton

The timing of events early in the year may be modified during the first year of our work with the MPOB to accommodate the transition of services from the prior actuary, as discussed below.

Transition of Actuarial Services

We know that the MPOB has been with its current actuary for many years. Naturally, this can create some anxiety about what the process of changing actuaries will involve, and what the time commitment will be for your staff and that of each of the individual municipalities. We endeavor to make this a painless process for you by providing a detailed list of the required documentation and data (much of which is already available on your website), establishing a timeline for completion of the transition process that identifies who is responsible for each step, and being as flexible as we can while still meeting our professional standards.

Our initial assessment of a new client begins with a complete review of plan documents, actuarial valuations, audits, experience studies, and other information necessary to gain a thorough understanding of the plans and to identify potential issues for discussion. Following this review, we will schedule an initial meeting with the MPOB to present what we have learned and to further identify any issues of interest. This meeting and follow-up discussions are part of our transition process and are included in our base fee.

Concurrent with this process, we will request participant data from the prior actuary that was used for valuation purposes, as well as any the assumption tables they used (to confirm they match the most recent experience study) and additional details on the valuation liabilities by benefit (retirement, termination, death, and disability) and sometimes by individual participant. We also request any historical participant data related to salary, service dates, and employment status that is included in their files. The valuation data is used to be sure we are starting in the same place as the prior actuary ends. The additional data may be needed to support other plan administration functions, such as benefit calculations and participant benefit

statements. We prefer to gather as much historical data as possible up front to avoid the time and expense of researching items in the future.

During our process of matching the prior pension plan valuations, we may have a few questions for the actuary. Sometimes this may include requests for the detailed calculation output for a small, select group of participants that will help us identify the specific components of the valuation calculations that we may be handling differently than the prior actuary. Again, we keep this to a minimum whenever possible and can often accomplish a match valuation based on the data and valuation reports provided.

There is generally no problem with professional cooperation, so we do not expect any time delays caused by any requests to the prior actuary. Members of the assigned service team for the MPOB have experience in transitioning work from the current actuarial firm, and we have audited retirement systems that are supported by that firm, which has allowed us to become familiar with their systems and anticipate where our valuation programming may differ slightly from theirs.

There are no specific thresholds for how closely we must match the prior actuary’s results that must be met before we can proceed as the new actuary. We are typically able to match the prior actuary’s results within 2% - 3%, and this is the standard that we apply as a target for our transition clients. In the unlikely event we cannot match the results we will review with the MPOB the reasons for the difference in results and determine an appropriate course of action.

The involvement of client staff in the transition process will be limited to providing background information and answering questions related to plan administration and historical practices.

Once notified of our selection as the MPOB’s actuary, we anticipate the following timeline for completion of key steps in the transition process. If the initial match of valuation results is very close, we may be able to shorten this timeline to as little as 6 weeks.

Action	Timing	Responsible Party
Provide data and documentation requests to the MPOB and the prior actuary	Week 1	Bolton
Receive requested data and documentation	Weeks 2 – 4	MPOB and prior actuary
Complete initial programming of valuation model and send follow up request to prior actuary (if needed)	Weeks 4 – 5	Bolton
Receive follow up information regarding valuation match questions	Week 6	Prior actuary
Finalize valuation match and review discrepancies, if any, with the MPOB	Weeks 7 – 8	Bolton

Delays on the part of the MPOB or its prior actuary in providing requested data and documentation within the timeframe indicated in our transition timeline may impair our ability to meet the due dates indicated for Bolton to complete the valuation match and prepare for the 2019 experience study and valuation. Where delays occur, we will endeavor to make up as much time as possible on our end and we will keep the MPOB apprised of our progress and any potential delay in the scheduled delivery dates for our services.

Section 4, Subsection 4.2.1.2. Goal 2:

Vendor Response:

The objective of the actuarial valuation report is to provide a picture of the financial status of the plan that can readily be used by the plan sponsor, plan administrator, and your auditors. To meet these goals, it is critical that the report be:

- **Clear** – We are the actuaries to approximately 175 public entity clients. Our clients have a wide range of plan designs and governance structures. We have extensive experience in communicating results to a variety of users so that they are easily understood and presented in a manner that complies with the applicable Actuarial Standards of Practice.
- **Comprehensive** – The report must provide the information needed by the various stakeholders who rely on our financial analysis. In addition to the information required to illustrate compliance with the regulatory requirements, we provide commentary on other plan costs, a summary of the plan’s reporting requirements, and a comparison of actual and expected plan experience. We will also point out the major risks to the plan if experience does not match the actuarial assumptions.
- **Accurate** – To ensure you can rely on the results presented in the valuation report, we have a rigorous quality control process. We also include several senior actuaries on each of our engagement teams and include all members of the team in regular internal planning meetings so that everyone is kept apprised of new information that may affect the work we do and assure it is reflected in the valuation, as appropriate.

As valuations for each of the 53 plans are completed, our system will log the results in a master database to allow us to compile the information needed to prepare the consolidated annual report to the MPOB. Concurrently, the master report document will be updated to reflect any known changes in the basic actuarial assumptions, plan provisions, funding methods, or other issues that will be addressed. Once all the individual valuations are completed, the numeric displays will be populated and the commentary and analysis of changes since the prior year are populated. The draft of the consolidated report follows the same rigorous checking and review process as each individual valuation and GASB accounting report.

Bolton’s team has extensive experience presenting valuation results and discussing issues of concern both with respect to the current valuation and those that may emerge in coming years. During our annual valuation results presentation, we will discuss current year results and contribution projections along with topics of importance to the various plans in general and the MPOB (for example, emerging practices, changes in actuarial standards or generally accepted actuarial practice, changes in federal or local laws that may affect plan administration, new developments in risk management for pensions, etc.).

Prior to formalizing the valuation report, results are summarized in a presentation that we use as a discussion tool when we meet with you to review the preliminary valuation results. Comparative results for the last several years are presented and are generally accompanied by a forecast of future years’ results to give a complete picture of the historical, current and projected future financial state of the plan.

A sample of our standard actuarial valuation report is provided in **Appendix 2**. As noted previously, these reports will serve as the starting point for developing the customized report format we will use for the individual plan valuations and the comprehensive report provided as part of our engagement with the

MPOB. For example, we will ensure that the report format we use for each of the 53 individual and the consolidated report meet the requirements in the W. Va. Statute (many of which are also required by the applicable Actuarial Standards of Practice), including:

- the financial objective of the fund, how the objective is to be attained and the progress being made toward realization of the financial objective;
- recent changes in the nature of the fund or the benefits provided;
- the frequency of actuarial valuation reports and the date of the most recent actuarial valuation report;
- the method used to value fund assets;
- the extent to which we relied on the data provided by the plan sponsor and whether the data was certified by the funds Auditor or examined by us to determine its reasonableness for use in the valuation;
- a description and explanation of the actuarial assumptions and methods, including any changes in the actuarial assumptions or methods since the most recent prior valuation; and
- an evaluation of each plan using the alternative funding method, to assess advantages of changing to other permissible funding methods.

We can incorporate additional displays that mirror those used by your current actuary and may recommend additional displays or variations on existing report content based on our initial discussions with you about what will best support the understanding of the local municipal pension sponsors.

Section 4, Subsection 4.2.1.3 Goal 3:

Vendor Response:

Bolton’s expertise is not limited by plan or employer size—our client base represents a broad spectrum, from small cities to large counties to states. Unlike our larger competitors, we are ideally suited to be more responsive and tailored to each client, especially small municipal pension plans. Our valuation software and reporting tools allow for flexibility in how we do our work, and our firmwide commitment to integrity and technical excellence ensures that any modifications to our standard procedures will conform to the highest standards.

Most of our clients are smaller and mid-sized plans, making us well-versed in the challenges faced by smaller municipal plans. Smaller plans face challenges in gaining economies of scale in managing their pension plans. Certain administrative costs, such as the required annual actuarial valuations, represent a much larger percentage of plan assets for smaller municipalities than for larger ones. Smaller plans may have difficulty accessing more favorable asset classes. When contributions and other costs become disproportionately large relative to the remainder of the municipal budget, taxpayers are asked to bear the cost either through higher taxes or reduced services.

We do also provide services to several very large retirement systems (such as the City of New York’s five retirement systems, the State of Maryland, the State of Texas, and CalPERS). Working with these large systems requires us to have best-in-class tools and procedures in place to support the work we do.

The following table shows a small but representative sample of our public sector pension clients.

Name	Pension Fund Size	Number of Pension Participants	Client Since
Anne Arundel County (MD) Fire*	\$548 million	1,450	2001
Anne Arundel County (MD) Police*	\$553 million	1,400	2001
Caroline County (MD) Government	\$23 million	300	2011
Carroll County (MD) Law Officers	\$12 million	115	2003
Cecil County (MD) Public Safety	\$51 million	450	2013
Charles County (MD) Sheriffs	\$239 million	710	1995
City of Takoma Park (MD)	\$16 million	70	2000
Delaware Transit Corporation	\$23 million	430	2008
Harford County (MD)	\$55 million	230	2009
Howard County (MD) Police & Fire*	\$546 million	1,300	2006
Prince William County (VA)	\$37 million	2,000	2005
St. Mary's County (MD)	\$68 million	350	2006
Town of Elkton (MD)	\$6 million	50	2010
Town of Riverdale Park (MD)	\$6 million	70	2012
Washington County (MD)*	\$104 million	1,200	2016

* Includes DROP provision.

Our actuaries are actively involved with the U.S. actuarial organizations that supporting consulting actuaries in the public sector, allowing us to remain abreast of the latest developments and trends.

Supporting Actuarially Sound Funding Policies

We understand that not all of your plans are actuarially sound. We are the actuary for one small closed plan for the City of Baltimore, which has no assets and is funded on a pay-as-you-go basis. We have helped clients find solutions for other poorly funded plans, including in the extreme case assisting with litigation.

Analysis of the dollar amounts of net assets available for benefits, actuarial accrued liability, and unfunded actuarial accrued liability in isolation can be misleading. Expressing the unfunded actuarial accrued liability as a percentage of annual covered payroll is one measure we use to adjust for the effects of inflation and aid in the analysis and understanding of the plan's progress in accumulating sufficient assets to pay benefits when due. Generally, the smaller this percentage, the stronger the Plan.

While the historical measures discussed above all provide useful information in understanding the plan's current financial health, and how that has trended over time, it is also important to understand where the plan's finances are heading in the future. Historical experience is not always a good predictor of future results. Accordingly, we prepare forward-looking forecasts of these measures taking into account recent forecasts of future economic trends to show how those metrics are expected to change in coming years based on a projection of anticipated future experience.

While the above focuses on measuring funded status and funding progress, the ultimate solvency of a plan is dependent on the ability and willingness of the plan sponsor to fund any unfunded liabilities and their ability to handle adverse risk. For severely underfunded plans that are funded essentially on a pay-as-you-go basis, the projected benefit payment stream is ultimately the true cost of the plan. Understanding how future benefit payments will grow and how they compare to the actual contributions being made to the plan is important to understanding the true "minimum" funding requirements, in addition to the actuarially determined contribution that is needed to move the plan toward improved financial health and sustainability.

Maintaining an actuarially sound plan also supports benefit security for the members of the plan and promotes an equitable sharing of costs among different generations of members and taxpayers. Tom Lowman, Bolton's Chief Actuary, was one of the principal authors of the Conference of Consulting Actuaries (CCA) 2014 whitepaper on Actuarial Funding Policies and Practices for Public Pension Plans. The CCA whitepaper is considered foundational literature in the development of actuarially sound funding policies.²

Section 4, Subsection 4.2.1.4 Goal 4:

Vendor Response:

We are very concerned that actuarial assumptions match expected experience as closely as possible. We typically recommend clients perform an actuarial experience study every three to five years. By adopting a standard procedure requiring an experience study every three years, the MPOB has committed to ensuring that the WV municipal police and fire plans are funded based on actuarial assumptions that reasonably reflect recent past experience and how that information informs future expectations. Bolton's philosophy on assumption selection and the evaluation of historical experience are consistent with the 2017 Experience Study Timing Standard Operating Procedures.

² The CCA whitepaper is available at the following link:
https://www.ccactuaries.org/Portals/0/pdf/CCA_PPC_White_Paper_on_Public_Pension_Funding_Policy.pdf

Assumption Selection Philosophy

Assumptions do not impact the true cost or the ultimate cost of the pension plan. Assumptions only impact the timing of when contributions are made to a pension fund or when costs are recognized for accounting purposes. The true or ultimate cost of a pension plan is represented by the following formula:

$$\text{Cost (i.e. Contributions)} = \text{Benefit Payments} + \text{Expenses} - \text{Actual Investment Return}$$

The benefit payments, expenses and actual investment returns will be the same regardless of what assumptions are used to value the liabilities of the pension plan. Actuarial assumptions are used to determine an annual contribution each year and make “educated guesses” as to what future benefit payments and investment returns will be.

The goal of setting actuarial assumptions is to calculate an actuarially determined contribution amount today that will be level (generally as a percentage of pay) over the long term. To the extent that the assumptions are too aggressive or optimistic, the plan will experience losses over time and the actuarially determined contribution will increase over time (as a percentage of pay). To the extent that the assumptions are conservative or pessimistic, the plan will experience gains over time and the actuarially determined contribution will decrease over time (as a percentage of pay). Therefore, the goal of setting assumptions is to be as accurate as possible in measuring the true cost in order to minimize fluctuations in the actuarially determined contribution over the long-term.

While we believe that past experience is often a reasonably good measure of demographic assumptions (such as retirement, employee termination, disability and the merit portion of salary improvement), economic assumptions (inflation, investment returns, the inflation portion of salary improvement) are often better based on current economic data and the expectation of future conditions implicit in that data.

Inflation Assumption

The inflation assumption is at the heart of the economic assumption set, as it is used as a starting point for all of the other economic assumptions, including Cost-of-Living Adjustments (COLAs), salary improvement and investment return assumptions. Thus, our analysis starts with the inflation assumption.

We analyze the inflation assumption from three perspectives:

- **Past experience** – based on the Consumer Price Index for all Urban Consumers (CPI-U) over the last 5, 10, 15, 20 and 25 years
- **Current expectations of future experience** – based on investment advisors’ analysis of future expected inflation
- **Current, market-based expectations of future inflation** – based on the difference between the treasury bond nominal yield curve and the Treasury Inflation Protected Securities (TIPS) yield curve. This curve is known as the Treasury Break-even Inflation yield curve (TBI).

Investment Return Assumption

The single assumption that has the largest effect on the determination of plan liabilities, funding levels and contributions is the investment return assumption. Our belief is that historic investment experience, while interesting, is of little value in accessing the validity of an investment return assumption. We also note that the only certainty about future investment returns is that any assumption is most likely wrong, both in the short-term and in the long-term.

While we typically suggest an investment return assumption based on the best estimate of the future investment return, reflecting investment advisors' investment return expectations and the plan's investment mix, we also recognize the value of choosing conservative investment return assumptions, trying not to assume the market meets expectations but to choose a return more likely to be exceeded than to not be met. Beyond getting information from the plan's investment advisors (when available), we also look at published data from other investment advisors and the NASRA surveys.

Because the 53 plans supported by the MPOB reflect a range of funding levels, with varying asset allocations and investment policies, it makes sense to continue using different valuation interest rates that are based on a formula taking into account current and projected funded status, liquidity metrics, and target asset allocation.

Salary Increase Assumption

In addition to inflation, we work with a plan sponsor to understand their current and expected future merit pay structure, including the effect of collective bargaining agreements, geographic location, and career progression. Selection of the merit increase component, more than any other economic assumption, is often informed by reviewing past experience and modifying it appropriately for any anticipated changes in the plan sponsor's workforce or compensation structure.

Other Economic Assumptions

We work with the plan sponsor to develop and agree upon other economic assumptions (such as cost of living increases) that appropriately model plan provisions and meet the consistency requirements of ASOP No. 27.

Demographic Experience Study Process

We have a proven process for preparing the experience metrics used to evaluate a plan's current actuarial assumptions against actual past experience. For smaller plans where there is not fully credible data, some assumptions may ultimately be set by reference to a standard, industry table. This is particularly true for the mortality assumption, which the MPOB has already committed to marking to the latest available data on mortality rates and projections of future improvement. For the 2019 study, this will include considering how to apply the recent Society of Actuaries Public Pension Plan Mortality Study. For the first time, public pension plan sponsors have published data specific to public safety workers (in addition to teachers and general service employees).

Our typical experience study process is described below.

1. **Compile historical data:** It is important to ensure the annual data for each valuation year is in a consistent format and fields are properly named to ensure accurate tracing of individual participant status and the progression of compensation amounts year over year.
2. **Review data on a standalone basis:** After appending the new data the next step will be to identify outliers, missing data, and data inconsistent within the database. This will first be done looking only at the current year's data, and eventually reviewing data in comparison with prior year's data:
3. **Adjust prior data to account for new information:** For example, if an employee was classified as a service retiree in the 2014 and 2015 data but is a disability retiree in the 2016 data, we will modify their status from a service retirement to a disability retirement.
4. **Documentation:** Documentation of the actions taken to adjust any historical data for consistency with the current year is critical to being able to trace the data from its source.
5. **Run queries to determine actual to expected ratios:** This will require the calculation of the number of exposures, the actual number of employees that decrement via retirement, turnover or other reasons, and the expected number of employees that decrement determined by multiplying the current assumption by the relevant exposure.
6. **Prepare summary tables:** We will prepare summary tables to allow for easy comparisons to prior experience studies, and to our recommendations.
7. **Make recommendations:** Based on the experience study we will make recommendations for revisions to the assumptions, as well as the expected impact on annual contributions and funding levels for each plan and in aggregate for all plans.
8. **Determine if change is necessary:** In recommending assumption changes the first question is whether to recommend a change or not. The following factors need to be considered:
 - Is the most recent experience consistent with the assumptions, and if not are the differences credible?
 - Is experience over a longer time period consistent with the assumptions, and if not are the differences credible?
 - What factors if any were unusual during the period in question?
 - Has the recent economic environment changed the experience, can these changes be expected to continue?
 - Have there been any changes to benefit provisions or administrative practices, such as in how disability programs are administered, that might affect future demographic experience?
9. **Determine impact:** Bolton will use its established valuation models for each group of employees to determine the impact of each recommendation on the system's funding and contribution requirements.

Section 4, Subsection 4.2.1.5 Goal 5: To find a consultant to assist the MPOB by providing written recommendations which include methods for monitoring pension and relief funds and methods for assuring prudent administration of the funds.

Vendor Response:

We believe that success with our clients is defined by them, not by us. Clients tell us that these characteristics are of value to them, and we work every day to make sure we meet and exceed these expectations:

- **Listen before we advise.** Each client and each company have their own set of issues and challenges that need to be solved. We listen to what clients need, seek to understand their culture and business, and work hard to imagine how an idea will work in their situation
- **Solve specific problems.** We will examine your data to understand your organization. This allows us to pinpoint problems and leverage the appropriate resources
- **Garner trust and openness.** These characteristics are driven by honest, transparent personal relationships. We look for and encourage straight talk and work to earn your trust
- **Be proactive.** We thoughtfully bring any reasonable idea and solution to the problems at hand and recognize that part of our value is to 'see the future' and lead with both innovative and proven solutions that will work
- **Ensure compliance.** We ensure that our clients are aware of all applicable compliance and legislative requirements

Monitoring good governance practices takes on many forms. **Appendix 3** contains an article written by Tom Lowman on model governance legislation with a focus on funding disclosure. Tom also provided comments to the Actuarial Standards Board on ASOP 51 regarding risk disclosures (this new standard will take effect in the coming year).

Our work on the five large New York City plans includes reviewing the plans' funding methods and making recommendations for changes. Similarly, we reviewed their administrative procedures to evaluate their processes for data collection to support the annual valuations, performing benefit calculations, maintaining data security, and methods of participant communications. These findings are public and posted on their website. We have included a copy of the administrative audit as **Appendix 4** to this proposal.

To prepare something the scope of the NYC administrative audit would require an additional fee. Monitoring funding and making recommendations in that area is part of the annual valuation and periodic experience studies. Funding monitoring includes potentially recommending changes in discount rates, tracking changes in the funding level and seeing how methods compare the CCA white paper on Actuarial Funding Policies and Practices for Public Pension Plans.

Section 4, Subsection 4.2.1.6 Goal 6:

Vendor Response:

When it comes to strengthening and protecting plan assets and the interests of plan members, our actuaries

have a breadth of experience working with plan sponsors in the public and private sectors, including tax exempt and for-profit employers and unions, facing challenges with improving the funding levels and solvency of their pension plans. In a 2014 Issue Brief the American Academy of Actuaries' Public Pension Plans Committee (currently chaired by Tom Lowman) notes "The policies used to establish funding for a public-pension plan should be formulated to maintain an appropriate balance among the competing objectives of benefit security, generational equity, and contribution stability."

Bolton's actuaries are thought leaders in this area, authoring papers on funding policies and governance structures that support the sustainability of public pension and Other Postretirement Benefit (OPEB) plans. **Appendix 2** includes an article by Tom Lowman published in the Society of Actuaries' Pension Forum on *Model Legislation for Better Public Pension Plan Governance (vs. Risk Disclosure)*.

Our extensive forensic experience with poorly funded and mismanaged pension plans in both the private and public sectors gives us insights into what has caused problems in the past and how to keep our clients out of those problems or help them recover from them if already incurred. We have provided assistance to groups involved in difficult decisions to amend plans to reduce benefits for current or future employees, assistance to the Pension Benefit Guaranty Corporation (which insures private sector defined benefit plans), and serving as consultants in litigation (e.g., Rhode Island, Baltimore City, the State of Alaska and New Orleans International Longshoremen's Association).

We have assisted a number of public sector clients in the process of de-risking in the recent past. We have experience analysing the trade-offs involved in de-risking pension plans as well as the mechanics of accomplishing the de-risking. In working with public sector plan sponsors we draw on the extensive experience of our private sector actuarial consultants, whose clients have been dealing with various forms of de-risking and risk transfer activities for many years, and our knowledge of the leading edge public sector de-risking steps taken by large retirement systems such as CalPERS, Contra Costa County and New York City.

For example, we recently completed an analysis of the best approaches to manage the risk of their pension plan as it becomes bigger relative to the size of the organization (often measured relative to active member count or total payroll of the plan sponsor). The final approach selected by the plan sponsor involved a long-term set of revisions to the assets mix of the plan, keying off future events (such as reaching certain target funding levels or completing other liability settlement activities) that reduced the potential contribution risk.

Section 4, Subsection 4.2.1.7 Goal 7:

Vendor Response:

Bolton has been at the forefront of consulting around the design, costing, and implementation of DROP programs. Our founder, Robert Bolton, co-authored a paper on DROP designs with Bolton's Chief Actuary Tom Lowman that is considered one of the primary actuarial reference materials on these programs. We are also familiar with the GFOA Advisory on DROPs and the recommendations made therein.

In 2010, Bolton was hired by the City Council of Philadelphia to conduct an actuarial audit of a report issued for the mayor by Boston College that assessed the cost of Philadelphia's Deferred Retirement Option Plan (DROP). After analyzing the original data, mastering multiple pension plans, and working with the original authors of the first report, Bolton discovered several important discrepancies in that report that led to

significantly different conclusions concerning the likely cost of the DROP program. Subsequently, Bolton advised the Council on ways to amend the existing DROP program to reduce its estimated cost to the City. The analysis reduced the estimated actual additional cost for the DROP from \$250 million to approximately \$100 million.

It is often difficult to quantify the true cost of a DROP program due to the interplay of offsetting short and long-term expenses such as eliminating the cost to replace a retiring employee offset by higher payroll and healthcare costs as long-career employees remain active employees during the DROP period. In addition to considering the hard dollar expense associated with a DROP, there is also the potential political risk that can be associated with what are often viewed as large lump sum payments from the plan for those in the DROP. Our deep knowledge of the workings of these programs and the broader cost implications allows us to provide clients with a comprehensive analysis of whether a DROP program meets their cost neutrality criteria.

Section 4, Subsection 4.2.1.8 Goal 8:

Vendor Response:

Your Bolton consultants will be available to provide individual sessions to each municipal policemen's and firemen's pension and relief fund through conference calls or on-site regional meetings. Bolton will attend all regional events in person whenever possible, or via Skype or other electronic venues with the plan administrator, retirement committees, or management when in-person attendance is not possible. Tom Lowman, Ellen Kleinstuber, Jim Ritchie, Jordan McClane, and Michael Spadaro will be available to attend these meetings to ensure there is adequate coverage in the event of vacation or other out of office time.

We are the actuaries for approximately 175 governmental entities under GASB 67/68 pension standards and GASB 74/75 OPEB standards, and numerous private sector and multiemployer pension and OPEB plans. These local governments and private employers have a variety of plan designs, funding arrangements, and governance structures. Hence, we have extensive experience in communicating results to a variety of users, under a wide variety of plans and funding policies—all in accordance with the Actuarial Standards of Practice and the qualification standards of the American Academy of Actuaries.

The three senior consultants assigned to the MPOB actuarial team (Tom Lowman, Jim Ritchie, and Ellen Kleinstuber) each have between 26 and 40 years of experience consulting to pension plan sponsors. We are frequent speakers on a variety of pension and retirement-related topics at actuarial meetings and other industry conferences, so we are accustomed to speaking to a variety of audiences, both in-person and via the phone or web. We have extensive experience presenting to retirement boards, government and corporate leaders, and boards of directors.

Section 4, Subsection 4.2.1.9 Goal 9:

Vendor Response:

We have extensive experience helping all types of organizations re-design their retirement programs from looking at the benefit formula, eligibility provisions, definition of compensation, service purchase provisions and DROPs. We have a proven process for designing retirement programs that start with understanding your specific goals and needs and developing a set of guiding principles that help us a design a program that is a

best fit for you. One factor that is frequently overlooked is ease of administration and simplicity. By identifying these two factors as key guiding principles, we can help you design a program that meets this goals as well as other goals such as adequacy of benefits and competitiveness in the market place.

Your concern that the terms “salary” or “compensation” can be detailed and confusing at the same time is a common problem for which there may not be a magic bullet. In the private sector this was often dealt with by using W-2 compensation which is well defined. In the public sector, concerns over the inclusion of overtime pay (a.k.a. spiking of pay near retirement) often makes this an untenable definition. It is not uncommon for a public sector employer to have 100 pay fields in their payroll system, ranging from clothing allowances to severance pay.

In addition, the MPOB plans have a lot of employers and probably numerous payroll systems that are not uniformly structured in how they track various pay fields. The result is usually a detailed document that is sent to the employer for them to pull out the correct elements of pay for pension purposes, yet errors are discovered after the fact in the covered payroll information that was sent for the valuation, benefit payments and contributions. We have helped clients with this before. It tends to be a laborious and detailed project.

In terms of simplifying formulas, we can help with identifying alternative ways of defining compensation for pension administration purposes that will make it easier for each municipality to determine which elements of pay to include or exclude. For example, using a simplified definition of compensation that excludes certain ancillary items of de minimis value while slightly increasing the benefit multiplier may result in future benefit accruals that are roughly equal in value to the current plan design. From the employee perspective, our Online Pension Portal (discussed in further detail below) often simplifies calculations and allows them to perform their own scenario modeling to improve understanding of how future pay increases, retiring early or working until they are eligible for full unreduced benefits affects the amount of their monthly pension payments.

The common trade off with simplifying formulas is the age-old issue of preserving legacy provisions to be sure few if any members get less and different perspectives on fairness in plan design. At Bolton, we work with our clients to look at all aspects of a retirement program to help clients develop a comprehensive program that balances competing objectives. We will work with you to design a program that more effectively manages costs while providing meaningful retirement income to your employees.

By working with us, you will receive the benefit of a plan design process that provides you with in depth analysis, not only on the cost of your program, but on the competitiveness and adequacy of the retirement program as well. We will also provide you with sensitivity on the cost impact to help you understand how much risk you have in your retirement program and what the range of possible outcomes could be. Our answer below provides more detail on our plan design process.

Over the past 10 years, we have worked with more than 250 public sector employers giving us access to a deep resource of benchmarking information. We have compiled benchmarking information on various topics including Police and Fire Plans and Deferred Retirement Option Programs (DROPs). We also utilize publicly available information like surveys published by the National Association of State Retirement Administrators (NASRA) and state oversight groups that collect retirement plan information. For example, Maryland and Florida both collect retirement plan data for county and/or local municipality retirement programs. This data can be used to evaluate current and proposed plan designs against other similarly sized plans.

We recently conducted plan design studies for Howard County and Montgomery County (both in MD). Our staff has recent experience conducting plan design studies for a corporate client with about \$150 million in pension assets, a large quasi-governmental financial organization with over \$1 billion in assets, a small environmental association, a large hospital with about \$100 million in assets and a religious organization. As you can see, we not only have experience helping municipal employers with plan design issues, but we also have significant experience helping a wide variety of organizations including corporate, quasi-governmental and not-for-profit organizations. This wide variety of experience adds tremendous value to the advice we give our municipal clients because we can tap into the 20+ years of experience we have helping these organizations transition from defined benefit to defined contribution plans or make other modifications to their defined benefit plan.

Plan Design Study Approach

Our customized and proven approach to plan design focuses on the cost, competitiveness and adequacy of your retirement program. You will receive the benefits of our experience helping municipalities balance budget and cost restraints with their employees' need for an efficient and adequate retirement program.

Your pension plan review and analysis will consist of three phases: Preparation, Analysis, and Decision. A fourth phase, Implementation, will apply if you decide to make material changes to your retirement program.

The **Preparation** phase consists of providing you with education on the current retirement landscape and discussing your specific issues with the goal of determining some specific plan designs to analyze in depth. The **Analysis** phase will be focused on a deep dive into three to five separate plan designs. You will receive details on the cost comparisons of each proposed design, the competitiveness of these designs and the impact on employees' retirement needs. The **Decision** phase will be focused on fine tuning the analysis for the final one or two proposed plan designs to present to relevant stakeholders and be used for justification for making a final decision. More detail on each phase follows.

Preparation Phase

Upfront preparation is key to finding a palatable solution to this very difficult challenge. During the preparation phase you will receive our perspective on the current retirement landscape in the U.S. with focus on public retirement systems across the country and in Georgia. You will be able to provide us with your specific challenges around competitiveness, budget constraints, employee feedback, ease of administration, simplicity and political pressures. You will receive our perspective on common practices as well as new innovative plan designs. Based on your initial discussions with us, we will work with you to develop your guiding principles with the focus on plan cost, competitiveness for talent, employee retirement adequacy, employee understanding, and overall program risk. The result of this initial phase is to determine the three to five plan designs that will be studied and to develop the guiding principles that will help determine the plan design that best meets your most important objectives.

Analysis Phase

While assumptions do not impact the long-term cost of a pension plan, they will have a significant impact on demonstrating the cost differences for a plan design study. The components of pension cost that can be reasonably estimated are the benefit payments and the expenses. The amount that is difficult to estimate is the actual investment return.

For the analysis phase, you will receive calculations showing the cost impact of the proposed plan designs compared to the current plan, the retirement adequacy (sometimes viewed as the replacement ratio) for a representative sample of employees, a graphic that shows a comparison of the proposed benefit to the current benefit for each employee to show how each employee's expected retirement income will be affected by the proposed change, a spend out analysis showing how long the benefit will last in retirement compared to inflated need for a representative sample of employees, and benchmarking to other municipal employers.

In order to make sure our clients have a complete understanding of the "true" cost of a plan design change, we provide our clients with sensitivity testing around key assumptions, especially the investment return assumption, over a multi-year projection period to give a full picture on the potential cost ramification of the plan design changes. The plan change being studied guides us in the selection of key assumptions for the analysis. We can be very sophisticated by providing percentile results under a stochastic projection or more simplistic by doing deterministic projections with two to four future economic scenarios.

You will receive the detailed results in a presentation and we will meet with you to discuss the results. We will also provide you with an analysis of the risk inherent in the proposed options and sensitivity on the projected costs.

Decision Phase

For the decision phase, we will review the final results of changes made from the analysis phase. You will receive final recommendations on the new plan design with justifications for the recommendations. Finally, you will receive our assistance with any final presentation to make to the Pension Board, representatives from State Legislature, and any other relevant stakeholders.

Online Pension Portal

In addition to our standard actuarial consulting services, Bolton hosts a secure online system that may be used by benefits staff and plan participants to estimate their retirement benefits and access benefit statements and summary plan descriptions. This offering is unique among our competitors, providing our clients with a powerful tool to help standardize benefit calculation procedures and improve the accuracy of calculations prepared for retiring members. Many clients have found the system to be particularly attractive to streamline the work of their internal human resources staff or to provide employees with tools to model potential retirement scenarios.

Benefits staff can access and update participant information, perform estimates of retirement benefits, and prepare final benefit calculations and retirement packages – all instantly. Plan participants can access information on their personal benefits as well as general information on the plan. This includes viewing benefit estimates at user-selected retirement ages and receiving illustrations of retirement income that include not only the plan benefits but also benefits provided by Social Security and any defined contribution plans or personal savings.

Features of the online system include:

- User-friendly design
- Anytime, anywhere access. No special software needed.

- Easily print or save retirement estimates, projections and illustrations.
- Reflects plan benefits and features, including surviving spouse benefits.

Our online system provides participants with more robust information while significantly reducing the time and assistance required from benefits staff. It also provides the ability to standardize the benefit calculations and administrative procedures across all the MPOB plans to ease the burden on the local municipalities – each of which would be able to access the system and continue to support the administration of their own plans – and ensure participants receive accurate information on their pension benefits.

The best way to understand the capabilities of our pension portal is to allow us to give you a demonstration.

Section 4, Subsection 4.2.1.10 Goal 10:

Vendor Response:

We have extensive experience providing fiscal analysis of proposed legislation. We provide clear, concise communication of the expected fiscal effect of any change and the potential risks to plan funding level and sponsor contribution requirements. This could be legislation that would affect a single plan (e.g. change in benefits or funding policy), or a change that would affect employers state-wide. For example, as the actuaries for the Maryland Department of Legislative Services, we provide the fiscal analysis for all proposed legislation related to the state's retirement systems. During the 2017 legislative session, there were a dozen proposed pieces of legislation that would have affected the retirement systems in various capacities.

We have the proven ability to provide accurate and timely analysis of the effects of proposed pension legislation. Our staff assigned to assist the MPOB have experience responding to legislative analysis requests and working with the Federal government in responding to their need for analysis of private sector pension plans, an environment that requires rapid, accurate responses, sometimes within a day and nearly always within the week. These responses to Federal government requests are frequently reviewed by both government actuaries and actuaries for the sponsors of these private sector plans, requiring not only accurate, rapid responses but clear documentation of what was done and why to allow the other actuaries to understand our analysis.

The quality and availability of staff assigned to assist the MPOB equip us to be able to respond to sudden workload increases. Our team of three senior actuaries (Lowman, Kleinstuber, and Ritchie) with nearly 100 years of combined experience with pension plans, supported by two skilled assistant actuaries (discussed in resumes in our response to question 4.3.1.3), provides a highly skilled team with extensive experience with public pension plans. While all of these actuaries will not be needed at all times, having three will allow us to quickly respond to any increases in the workload or requests for analysis that have a very short timeline for completion. In addition, over 70 of our employees are in the Baltimore/Washington area and could be called in to assist as needed. We provide more information on the quality and availability of our team in our response to question 4.3.1.3.

Our managers and staff are committed to delivering the projects on schedule.

Our work for the Pension Benefit Guaranty Corporation (PBGC) is an excellent example of our ability to meet

our clients' deadlines. Partly because of our PBGC contracts, we see a large number of new pension plans every year, which we quickly need to understand and interpret. Under one contract with the PBGC, we analyze the benefits provided in great detail, valuing the benefit for each individual and preparing a program to calculate each participant's benefit when they retire, in the future. We also produce benefit statements for about 40,000 participants.

Our work under another contract with PBGC includes the review of actuarial valuations and estimation of liabilities for large ongoing distressed plans. These range in size from 1,000 to over 100,000 participants. We review about 350 to 400 plans each year under this contract. We frequently have to complete these projects within a week (and sometimes within a day or two), and we are consistently able to meet our client's expectations. The PBGC rates the performance of all of its actuarial contractors on a quarterly basis. We consistently rank ahead of the other three PBGC actuarial contractors.

Section 4, Subsection 4.2.1.11 Goal 11:

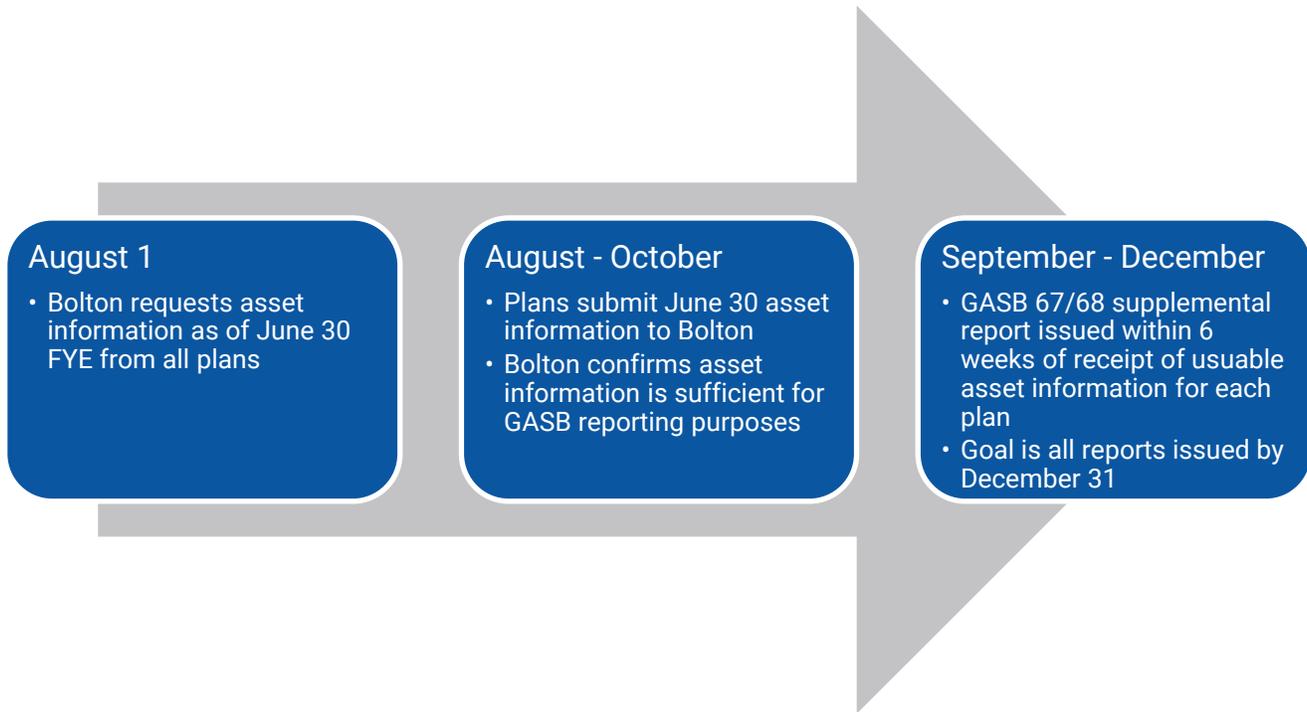
Vendor Response:

Bolton has provided actuarial valuations and special studies of pension and post-retirement medical benefits for government entities for over 20 years and has been providing our clients with GASB accounting valuation services since the applicable standards for pension and OPEB plans became effective. We complete GASB 67/68 valuations for 25 clients (several of which have multiple plans). We also perform GASB 74/75 valuations for over 100 local governments of all sizes from less than 100 participants to over 32,000 participants.

Tom Lowman has been a frequent speaker about GASB valuation requirements, giving presentations to members of various actuarial organizations, NCPERS, the GFOA, and ASBO on the GASB reporting requirements applicable to pension and OPEB plans. Kevin Binder, our OPEB actuarial practice leader, has authored numerous articles on GASB related topics in actuarial publications.

The timeline requested by the MPOB for completion of the supplemental GASB 67/68 disclosure reports is similar to the typical timeline we use for our existing pension clients and can be accommodated within our proposed work process. By completing the census data updates and valuation system testing during the first half of the calendar year, we are well prepared to begin preparing GASB reports once the asset information is received and reviewed. The GASB discount rate, which is a blend of the long-term rate of return for each plan and a 20-year municipal bond rate, can be determined in advance of receiving the asset information so that the liabilities that will be used in the report can be calculated and loaded into our reporting software even before asset information is received for some plans.

The timeline for preparing the GASB 67/68 reports will be as follows:



A sample of our standard GASB 67/68 annual report is included in **Appendix 5**.

Section 4, Subsection 4.2.1.12 Goal 12:

Vendor Response:

At Bolton we believe it is critically important for our senior actuaries to be actively engaged members of the actuarial profession. Our volunteer involved within the U.S. actuarial organizations allows us to stay “plugged in” to the latest developments and proposed changes in laws, regulations, actuarial practice standards and financial reporting standards applicable to public pension plans. We closely monitor the work of the GASB as it relates to pension and OPEB plan reporting so remain at the forefront of new developments. Our actuaries are frequently sought out as speakers on GASB reporting standards at actuarial conferences and other industry meetings due to our reputation as thought leaders in this area.

During the release of GASB Statements 67 and 68 (Pension Accounting Standards), we provided educational seminars to our clients and professional organizations. We also provided our clients with pro forma templates to help identify any questions or reporting information prior to the audit. We recently followed the same process for the implementation of GASB 74 and 75 (OPEB Accounting Standards). Our actuaries have provided educational sessions on GASB 74/75 at the state-wide annual conference for the Virginia GFOA in May 2017 and at a similar seminar to the Maryland GFOA in June 2016.

List project qualifications and experience contained in Section 4, Subsection 4.3:

Section 4, Subsection 4.3.1.1 Qualification and Experience 1:

Vendor Response:

About Us

Bolton is a full-service employee benefits, actuarial, and investment consulting firm with over 35 years of experience providing consulting services to clients in the public and corporate sectors, nonprofit organizations, as well as for the federal government. Bolton Partners, Inc. was founded in 1981 by Mr. Robert G. Bolton, FSA, MAAA, as an independent actuarial and employee benefits firm.

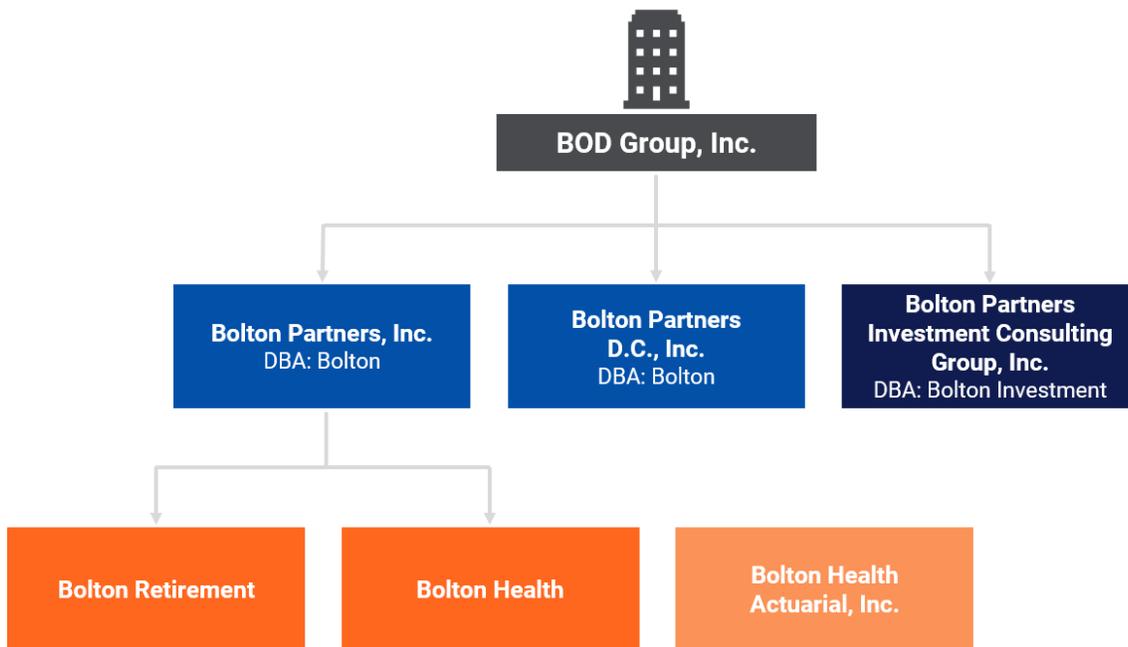
Since our founding, actuarial services and benefit plan consulting have been our primary focus. Bolton serves a national client base and has earned a reputation for integrity and the highest quality of work. We build long-term partnerships with our clients by delivering understandable, insightful, and impactful solutions to complex benefits issues so that they can best manage future financial risks and provide valuable benefits to their employees.

Our three consulting divisions provide Pension & Retirement, Health & Benefits, and Investment Consulting services for corporate, public sector, multi-employer plans, and nonprofit organizations. We have a national client base and a reputation for integrity and the highest quality of work.

- **Bolton Retirement.** We know workforce demographics, volatility of assets, new laws, regulations, and litigation add to the challenge of maintaining a successful retirement program. We use our experience and expertise to help you effectively navigate these challenges.
- **Bolton Health.** We help our clients design, implement, and manage cost-effective programs that align with the strategic goals and financial objectives of their organizations.
- **Bolton Investment.** We provide independent investment consulting and advisory services to corporate, public sector, and multi-employer defined contribution and defined benefit plans.

Headquartered in Baltimore, Maryland, we also maintain offices in Washington, D.C.; Mt. Laurel, NJ; Blue Bell (Philadelphia), PA; Atlanta, GA; Denver, CO; and Boca Raton, FL. Bolton's 100+ employees serve our clients throughout the United States, with an emphasis on the East Coast market.

We are a 100% employee-owned C corporation. The ownership structure of our firm is depicted on the following page. (While we are doing business as Bolton, our legal business name is Bolton Partners, Inc.)



We have a flat organizational structure, whereby even the most senior members of the firm are actively engaged in servicing clients. The firm’s culture is based on an obsession with serving the needs of our clients without the bureaucracy often found at large national firms. Our success over the last 37 years is based on our relationships with our clients, our technical knowledge, and our work product. Since our inception, Bolton has thrived in our industry and maintained our financial health and solvency.

Our annual revenues exceed \$25 million, with 75% derived from actuarial consulting services, 22% from health and welfare benefit consulting, and 3% from investment consulting.

Why Bolton?

Our strengths are impeccable client service, straightforward management style, and meticulous attention to detail all of which are critical to the success of our client relationships. Bolton has maintained its success for the last 37 years because of our industry-leading professional depth and expertise – which is not only a strong point of our firm but also a major asset to our clients.

The driving theme of our consulting practice is our focus on solutions and results for our clients. Our success in building and retaining a solid client base is attributed, in part, to principles that have served us well over time. Those principles include:

- **Knowing our clients.** We spend a great deal of time listening to and understanding our client. We want to understand the relationship and culture the client wants to construct with employees. We need to know our client’s perspective on overall costs, budget accountability, risk retention/transfer, competitive pressure on providing benefits, and anything else that impacts human resources.
- **Expectation setting.** This is particularly important for a successful client/consultant relationship. A clear understanding of your requirements and expectations is critical. We take the lead in accomplishing this understanding.

- **Value.** We offer excellent value to our clients - in that our prices are consistently lower than our equally qualified competitors, along with a finished product that exceeds expectations. In addition, most of our projects are on fixed fees, so that you have no exposure to cost overruns.
- **Feedback and measurement.** One of our responsibilities as your consultant is providing sufficient feedback on goals and milestones. We are in regular contact with our annual recurring services and any special projects requested, documented through timelines and work plans shared with you annually or at the start of a project. Any changes are discussed with and approved by our client.

Our clients tell us that the following key items distinguish us from our competition:

- Commitment and expertise in consulting to Public Sector clients
- References and experience with similar clients
- Subject matter experts to assist clients with special projects
- Access to the same resources as national firms at a significantly lower cost
- Passion to provide value to our clients and their employees at every opportunity

A key factor in our ability to deliver work timely is our low employee turnover. We strive to maintain an appealing place to work. Employees have a say in their work environment and are rewarded for producing timely, high-quality work. Also, because employees have often worked closely together on previous projects, we understand each other's strengths and weaknesses and can better choose which individuals do what parts of the assignment to maximize our ability to complete the work timely. Our team's depth of experience also ensures that should we lose any critical staff, there will be someone who can assume the role.

Public Sector Experience

We also have a breadth and depth of experience working with public sector employers, with government plans constituting about 75% of our revenue (across all our consulting services).

Working with public pension plan sponsors is a core competency of our firm. We have a broad base of experience dealing with issues unique to public pension and OPEB plans, including DROPs, litigation support, tax treatment of benefits, IRC Section 401(a)(9) minimum distribution rules, 415 limits, and benefits benchmarking. Additional services and expertise of interest to public sector pension and retiree health care clients is also addressed in our response to Question 8 in Section F.

Our actuaries are recognized as thought leaders in the actuarial profession, holding significant leadership roles within the actuarial profession both in the public-sector practice area and beyond (as demonstrated in the biographies of our team members). Through our industry involvement we have built connections with key people at NASRA, NCPERS, GFOA and other organizations that afford us insight into issues of importance to public plan sponsors.

A few non-actuarial areas of expertise that we believe distinguish us from our competitors include:

- **Our Online Pension Portal.** Bolton's online benefit calculation system, which also supports other plan administrative functions, is discussed in our response to Subsection 4.2.1.9, Goal 9.

- **Plan administration audits and consulting.** Our actuarial consultants have extensive experience supporting client's plan administration needs. As such, we are available as a resource to human resource personnel as they encounter situations that may present plan administration challenges. Some of our clients have engaged us to provide an independent "audit" review of their plan administration procedures to identify potential areas of inconsistency or weakness that could lead to future compliance issues.
- **Other services offered through teaming relationships.** Through our Bolton Health division, we are able to provide access to voluntary benefits, assistance with the design and implementation of onsite health clinics and provide audits of medical plan providers and dependents. Although these services do not directly support pension plan operations, we've found our clients value having access to a variety of resources to help them manage their other employee benefit plans and general human resource needs.

We understand that you have many small plans. Our smallest plan is a City of Baltimore closed police and fire plan covering just 12 retirees or beneficiaries (all former police as the last firefighter died a few years ago) as of July 2018 where the youngest is age 89. We have other small ongoing plans such as the City of Takoma Park Police plan which has about 40 employees and several retirees. We have some other small towns (Elkton and Riverdale Park) with under 100 members. Most of our clients are about equally split between those with 100-1,000 members and those with over 1,000 members. Our work on State plans often cover more than 100,000 members.

We do other work involving police and fire plans. Tom Lowman has helped with labor negotiations every four years for the San Jose police and fire plans. We are currently working as experts on litigation on the City of Baltimore Police and Fire plans and have worked on litigation involving police and fire for State plans in Rhode Island and Kentucky. We recently completed a review of the annual valuations for the police and fire plans for the City of Cocoa, Florida.

Our Professional Staff

This means that our senior actuaries and consultants work on fewer clients but are more focused and detailed on each.

Our staff, with its combined level of experience and expertise, is unique. We have a well-rounded team of professionals that have experience on the vendor side, employer side and the consulting side of the benefits area. This varied experience is key to understanding the needs of the client. More importantly, your client service team will include three senior actuaries who will be involved in the day-to-day work we do for the MPOB and each of the local municipalities in the West Virginia public safety workers retirement system.

We are proud of the fact that we have had little professional staff turnover (less than 5% over the last five years) which gives our clients the opportunity to have long-term relationships and continuity in their service with our consultants.

Our professional staff includes:

Title	Count
Credentialed Actuaries*	26
Actuarial Assistants	45
Benefit Consultants	17
Administrators	2
Other	25
Total	115

* Includes 9 Fellows and 13 Associates of the Society of Actuaries, 7 Fellows of the Conference of Consulting Actuaries, 14 Members of the American Academy of Actuaries, and 18 Enrolled Actuaries.

Bolton consultants are active participants in the actuarial and benefits community. We are members of the Society of Actuaries (SOA), the American Academy of Actuaries (AAA), the Conference of Consulting Actuaries (CCA), the International Foundation of Employee Benefit Plans (IFEBC), International Society of Certified Employee Benefit Specialists (ISCEBS), and Working in Employee Benefits (WEB). We take significant research and leadership roles with these organizations.

Section 4, Subsection 4.3.1.2 Qualification and Experience 2:

Vendor Response:

We are providing references for five clients that represent the range of our current clients whose demographic profile and/or scope of services are relevant to the work we proposed to do for the MPOB.

Prince William County, Virginia

Primary Contact: Michelle Attreed
Title: Director of Finance
Address: 1 County Complex Court, Woodbridge, VA 22192
Telephone Number: (703) 792-6700

City of Takoma Park

Primary Contact: Alexis B. Blackwell
Title: Human Resources Director
Address: 7500 Maple Avenue, Takoma Park, MD 20912
Telephone Number: (301) 891-7201
Email: alexisb@takomaparkmd.gov

Howard County Government and Schools

Primary Contact: Lonnie Robbins
Title: Deputy Chief Administrative Officer, Department of Finance
Address: 3430 Court House Drive, Ellicott City, MD 21043
Phone: (410) 313-2050
Email: lrobbins@howardcountymd.gov

Maryland Department of Legislative Services

Primary Contact: Michael Rubenstein
Title: Principal Analyst
Address: Legislative Services Building, 90 State Circle, Annapolis, MD 21401
Phone: (410) 946-5510
Email: michael.rubenstein@mlis.state.md.us

City of Cocoa

Primary Contact: John Titkanich
Title: City Manager
Address: 65 Stone Street, Cocoa, FL 32922
Phone: (321) 433-8737
Email: jtitkanich@cocoafll.org

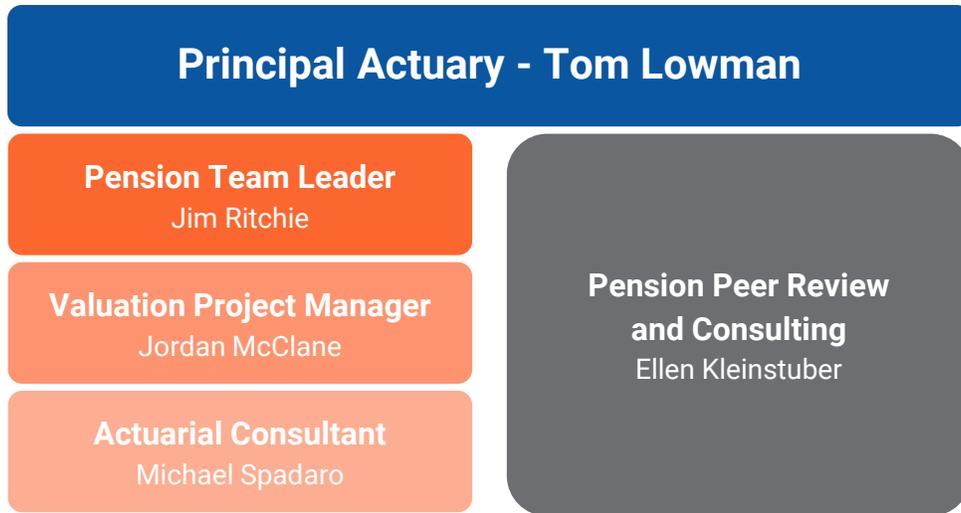
Section 4, Subsection 4.3.1.3 Qualification and Experience 3:

Tom Lowman will serve as the Principal Actuary for the MPOB. Tom will be responsible for the overall management of our relationship with the MPOB, timely delivery of all services, and coordination of our consulting advice to individual municipalities and the MPOB.

The pension valuation and consulting services will have a team of supporting actuaries and consultants assigned to work with Tom on the delivery of our services. The team will have a Senior Consulting Actuary assigned as the Actuarial Team Leader, with a second Senior Consulting Actuary dedicated to peer review and providing actuarial consulting support to the Team Leader and Principal Actuary. Working under the Team Leader will be a Valuation Project Manager, who will be primarily responsible for ensuring that our work remains on schedule and providing reporting to the MPOB about the status of the annual valuation process. The Principal Actuary, Actuarial Team Leader, and Actuarial Project manager are supported by a dedicated Actuarial Consultant/Analyst and a team of other actuarial analysts available to provide additional support as needed.

Although not specifically included as members of the proposed service team, Bolton has a team of consultants with a background and expertise in plan administration consulting who will work alongside the actuarial teams as additional support for annual census data updates and if issues related to the development of actuarial equivalence factors, 415 limit testing and excess benefit calculations, review of complex benefit calculations, and other plan administration needs arise.

The following chart illustrates the organization of our the MPOB team and the consultants assigned to each role.



Biographies for all named team members are provided below. Section 4.3 of the RFP requests “copies of any staff certifications or degrees applicable to this project”. A printout from the Society of Actuaries Actuarial Directory for each is included in **Appendix 6**.³ Copies of the actual credential certificates issued by the applicable actuarial organizations will be provided upon request.

Thomas B. Lowman, FSA, EA, MAAA, FCA Principal Actuary

Thomas B. Lowman is the Chief Actuary and President of Retirement at Bolton. Tom has forty years of pension actuarial experience and has been with Bolton since December 1996. Tom’s current responsibilities include leading our consulting engagement for several of the firm’s annual valuation clients, serving as the relationship manager for our work auditing the five New York City retirement plans, and being a general resource to our public-sector clients.

He is a Fellow of the Society of Actuaries (1982), an Enrolled Actuary (1981), a member of the American Academy of Actuaries (1982), and a Fellow of the Conference of Consulting Actuaries (2009). Tom is vice chair of the Conference of Consulting Actuaries (CCA) Public Plans Community and Chair of the American Academy of Actuaries Public Pension Plans Committee.

Tom is recognized as one of the top national experts on public sector plans and is sought out as a resource in this area by the professional actuarial societies, GASB, and national journalists. His work with national actuarial organizations is extensive. Tom served a three-year elected term on the Society of Actuaries’

³ Also available online at www.actuarialdirectory.org.

Pension Section Council and served as Chair of the Society of Actuaries' Pension Section Research Committee. Tom also served on the Pension Committee of the Actuarial Standards Board and the Society of Actuaries Enterprise Risk Management Task Force on Pensions.

Tom's clients include the federal government (PBGC and Treasury), and pension valuation clients in Maryland, Virginia, and Delaware. In the past, Tom has worked on large plans including the State of New York Retirement plan and the Federal Civil Service and FERS plans. Tom recently completed the audits of the State of Texas Employees Retirement System and the New York City plans.

Tom has served as an expert witness several dozen times in his career, focusing on a variety of issues, including incorrect application of Section 415 limits, arbitration and litigation over cost of proposed pension changes, loss in the value of lump sum distributions due to incorrect cash balance plan interest crediting, breach of contract for pension rights, calculation of due and unpaid employer contributions for large bankrupt employers, and a variety of other issues. In addition to his extensive work with governmental plan sponsors, his background working with private sector and multiemployer retirement plans makes him a well-rounded and sought out expert on a wide range of issues.

Tom helped draft the 2014 CCA White Paper on funding. He was interviewed by the SOA Blue Ribbon Panel on Public Plans and in April 2014 presented to the Actuarial Standards Board Pension Committee his thoughts on the difficulties of introducing the Panel's recommendations into actuarial standards of practice. Tom has been the Chair of several Society of Actuaries Project Oversight Groups. He was chair of the Pension Assumption and Method Project, studying how assumptions and methods vary depending on the type of plan/plan sponsor – ERISA single employer vs. state/local vs. Federal vs. Social Security. Tom wrote a paper on the issues with applying Financial Economic principals to public pension plans which he presented in 2009 and presented another paper to the 2010 Society of Actuaries' Retirement 2020 Symposium.

He has authored numerous papers for the Society of Actuaries that are considered primary actuarial reference documents.

- DROP designs, co-authored with Robert Bolton
- Public Sector Gain Sharing designs, co-authored with Colin England and Ann Sturmer
- Cash Balance Plans

Tom holds a Bachelor of Arts degree in Mathematics from the University of Delaware in 1977.

Jim Ritchie, ASA, EA, MAAA

Pension Actuarial Team Leader

Jim Ritchie is a Senior Consulting Actuary with Bolton. Jim has over 28 years of actuarial experience working with plan sponsors in both the public and private sectors. Jim joined Bolton in June 2018, following his previous service with two large actuarial consulting firms. Jim has quickly become involved in several of our ongoing engagements with city and county governments in Maryland, a couple actuarial audit projects (including one for the California State Auditor), and supporting new business development initiatives. His many years of experience working with a wide variety of plan sponsors allow Jim to be a general resource

for our staff and a mentor to some of our younger consultants.

Jim is an Associate in the Society of Actuaries (1994), a member of the Academy of Actuaries (1995), and an Enrolled Actuary (1996).

Jim has extensive experience on a variety of special projects including compliance and benefit calculation audits, retiree medical design alternatives, early retirement windows, plan redesign (including cash balance), plan mergers, spin-offs, and plan terminations. He also provides proactive strategic consulting such as pension de-risking opportunities, examining the use of debt to fund pension liabilities, projections, and evaluation of client's funding, financial, benefit and investment policies.

Prior to joining Bolton, Jim worked for Mercer and Aon Hewitt. While at Mercer, Jim worked with two large employer pension and retiree medical programs. Each program had over \$1 billion in liabilities. Jim also led an audit review of an \$8 billion pension program. While at Aon Hewitt, Jim worked on several complex large accounts including a high-profile sports league, the Department of Energy, which involved the oversight of over 70 contractor pension and retiree medical plans totaling more than \$45 billion in liabilities, and a pension program over \$1 billion in liabilities. Jim also served as the Local Practice Leader for the retirement practice in Baltimore.

Jim has experience with retiree medical plans, including:

- Accounting for Public Sector Plan OPEB Plans Under GASB 45
- Accounting for Private Sector OPEB Plans Under ASC 715-60
- Funding vehicles for retiree medical programs
- Demographic experience studies

Jim has been a speaker at Enrolled Actuaries meetings on a variety of retirement plan topics. Jim has also been frequently quoted by news media including the Wall Street Journal and Plan Sponsor magazine.

Jim graduated from the University of Texas at Austin in 1989 with a Bachelor of Business Administration in Actuarial Science.

Ellen L. Kleinstuber, FSA, FCA, FSPA, EA, MAAA Pension Peer Review and Actuarial Consulting

Ellen Kleinstuber is a Senior Consulting Actuary at Bolton with 26 years of actuarial experience. Ellen joined Bolton in September 2017. Prior to joining Bolton, Ellen was a Senior Vice President and Director of DB Plan Compliance with CBIZ Savitz for 8 years and a Vice President at Aon Consulting (now AonHewitt) for 17 years. At Bolton, Ellen's current responsibilities include consulting with private sector plan sponsors, providing research and consulting support to the actuarial practice clients in all areas, business development and practice management.

Ellen is a Fellow of the Society of Actuaries (2011), Fellow of the Conference of Consulting Actuaries (2005), Fellow of the ASPPA College of Pension Actuaries (2014), a Member of the American Academy of Actuaries (1998) and an Enrolled Actuary (1998).

She is a nationally recognized expert in ERISA and Internal Revenue Code compliance for single-employer plans, defined benefit plan funding, accounting and administration issues, retirement plan design and communications, nondiscrimination testing and defined benefit plan terminations. Ellen has worked with a wide variety of plan sponsors, ranging in size from 50 to 30,000 participants, including governmental entities, publicly traded and privately held companies, multinational corporations, and not-for-profit organizations, to deliver comprehensive employee benefit plan consulting, actuarial and plan administration services.

She is an active volunteer within the actuarial profession, currently holding several significant positions, including:

- Chairperson of the Pension Committee of the American Academy of Actuaries and a member of the Academy's Pension Practice Council
- Member of the Board of Directors and Chairperson of the Professionalism Committee for the Conference of Consulting Actuaries
- Chairperson of the Joint Program Committee for the annual Enrolled Actuaries Meeting
- Member of the committee that prepares the annual PBGC Blue Book Q&A (and previously the IRS/Treasury Gray Book Q&A)

Ellen also serves as a member of the Board of Actuaries for the Civil Service Retirement System and Federal Employees Retirement System, which is responsible for selecting the key actuarial assumptions used for the annual valuation of those programs based on experience studies prepared by the actuaries at the Office of Personnel Management.

In her roles prior to joining Bolton, Ellen provided internal compliance support to her firm's clients in addition to serving as a relationship manager and consulting actuarial on several large accounts. In this capacity, some of her recent consulting assignments and internal responsibilities included:

- Design and delivery of pension risk transfer programs.
- Developing internal practice standards for quality control and peer review of actuarial, consulting, and defined benefit administrative outsourcing services.
- Consulting on plan compliance correction procedures, including appropriate calculations methods, evaluation of alternatives for application of EPCRS requirements, development of participant communications, and coordination with outside vendors.
- Developing external client communications on recent statutory and regulatory developments and emerging trends in actuarial practice.

Ellen is a frequent speaker on pension-related topics; some recent and upcoming presentations include:

- Evolving Our Practice: Addressing Actuarial Professionalism Issues – April 2018 (Enrolled Actuaries Meeting)
- Pension Plan Administration and Practical Guide to EPCRS – October 2017 (CCA Annual Meeting)
- Q&N/As: *Things We Know We Don't Know* – April 2017 (Enrolled Actuaries Meeting)
- *Ethics* – December 2016 (CCA webcast)

- *Late Breaking Developments* – October 2016 (CCA Annual Meeting)
- Pension Risk Transfer from Different Perspectives – April 2016 (Enrolled Actuaries Meeting)
- Risk Transfer Issues for Pension Plans – October 2015 (SOA Annual Meeting)
- Model Notices and Disclosures for Pension Risk Transfers – May 2015 (ERISA Advisory Council testimony)
- *Fiduciary Responsibility* – April 2015 (Enrolled Actuaries Meeting)
- *Advanced Benefit Administration* – April 2015 (Enrolled Actuaries Meeting)
- Increasing Longevity: Impact on Pension Plan Sponsors and Participants – March 2014 (National Conference of Insurance Legislators)

She has been quoted by the New York Times, Reuters, CNBC, AARP and Pensions & Investments on a wide range of topics related to defined benefit plan management and administration.

Ellen was recognized in 2012 as an outstanding volunteer by the Society of Actuaries for her role as the former chairperson of the Pension Section's Continuing Education Committee and by the American Academy of Actuaries in 2015 for her work on pension risk transfer issues, when she represented the Academy testifying before the National Conference of Insurance Legislators and the ERISA Advisory Council.

Ellen graduated from Elizabethtown College with a Bachelor of Science in mathematics (magna cum laude) in 1992.

Jordan McClane, ASA, EA

Pension Valuation Project Manager

Jordan McClane is an Actuary with seven years of experience. He joined Bolton in January 2017. His role at Bolton primarily focuses on public sector pension plans. Jordan has developed models for analyzing sample lives and for projecting the impact on public employer contributions given changes in plan assumptions and provisions. He has also assisted in matching results from prior actuaries and in quantifying the potential effect of proposed legislation on a pension system. Thus far, he has been engaged for projects for New York City, the Pennsylvania State Education Association, the Maryland Department of Legislative Services, and numerous cities and counties in Maryland.

He is an Associate of the Society of Actuaries (2015) and an Enrolled Actuary (2017). Jordan has completed the last of his examinations to become a Fellow of the Society of Actuaries and is expected to obtain that credential in the near future.

Jordan's prior employment includes four years of experience as a member of the pension consulting group at Aon Hewitt in Baltimore. At Aon Hewitt, Jordan completed and reviewed numerous pension and OPEB valuations and played a crucial role in streamlining and promoting consistency throughout the valuation process. He also designed and implemented lump sum windows, developed plan termination feasibility studies, and performed pension asset-liability studies for both private and public sector employers. In addition to client-based projects, Jordan participated in leadership conferences and was a key contributor to

the training and development of new actuarial students.

Jordan's prior employment also includes over a year of experience at Towers Watson (now Willis Towers Watson) in New York City. Some of Jordan's responsibilities at Towers Watson included generating funding and accounting results for pension plans, evaluating liability gain/loss, preparing benefit calculations, and analyzing and programming pension data into valuation software.

Jordan holds a Bachelor of Science in Actuarial Science from the Smeal College of Business at the Pennsylvania State University.

Michael Spadaro, ASA

Pension Actuarial Consultant

Michael Spadaro is an actuarial consultant with Bolton. Michael has been an employee of Bolton since 2015, the year of his graduation from the Johns Hopkins University. Michael has been responsible for initiating and reviewing all aspects of the pension valuation process, including data reconciliation, actuarial software programming, plan document review, pension legislation review, drafting of valuation reports, client communication, and training junior analysts.

At Bolton, Michael is currently the lead analyst for 12 public sector clients, in addition to assisting with special projects. Michael provides a fresh perspective in reviewing the effectiveness of current procedures. Michael understands the importance of providing timely and accurate actuarial services by having to meet client requests on a regular basis.

Michael's experience includes:

- Performing and reviewing pension plan valuations
- Conducting experience analysis studies
- Studying the cost impact of proposed changes in plan benefits and funding methodology
- Preparing benefit calculations
- Responding to auditors' requests

Michael is an Associate of the Society of Actuaries (2017) and holds a Bachelor of Science in Applied Mathematics and Statistics from the Johns Hopkins University.

Additional Information (optional):

We are satisfied that the specific questions asked by the MPOB in this RFP have provided sufficient opportunity for us to fairly present our capabilities to provide the requested services and have no additional information to offer at this time.

ATTACHMENT B:

MANDATORY SPECIFICATION CHECKLIST

Provide a response regarding the mandatory requirements Section 4, Subsection 4.2.2. and Subsection 4.3.2.:

List mandatory requirements contained in Section 4, Subsection 4.2.2.:

Section 4, Subsection 4.2.2.1 Mandatory Requirement 1:

Vendor Response:

All of the actuaries who will be on the MPOB's team are Qualified Actuaries who have both the credentials as well as the in-depth experience and expertise to meet and exceed the MPOB's requirements. All named members of the client service team are members of the Society of Actuaries. Mr. Lowman, Mr. Ritchie and Ms. Kleinstuber are also members of the American Academy of Actuaries, and Mr. Lowman and Ms. Kleinstuber are Fellows of the Conference of Consulting Actuaries.

Section 4, Subsection 4.2.2.2 Mandatory Requirement 2:

Vendor Response:

Our teams are structured with the following qualities to effectively carry out project plans:

- **Accountability.** Your relationship manager will ensure that you, our client, are kept informed of important milestones and you will have direct access to them for any questions, issues, or concerns.
- **Redundancy.** To ensure that there is always continuity and accessibility, we have structured our teams to have redundancies at each level. In case of any absences, we will have the necessary backup leadership and support to continue to provide our services seamlessly. Additionally, your team includes three "generations" of actuaries, to ensure that we continue to provide the highest quality service throughout the length of this engagement.
- **Appropriate staffing.** Our staff is what makes our practice excellent. Our team members are experienced, knowledgeable, and devoted to providing the highest quality work to our clients.

The table on the following page shows the available resources should a member of the assigned team become unavailable.

Role	Assigned Personnel	Current Team Backup Personnel	Number of Other Available Bolton Personnel
Principal Actuary	Tom Lowman	Jim Ritchie, Ellen Kleinstuber	4
Pension Team Leader	Jim Ritchie	Ellen Kleinstuber	2
Pension Peer Review and Consulting	Ellen Kleinstuber	N/A	5
Valuation Project Manager	Jordan McClane	Michael Spadaro	6
Actuarial Consultant	Michael Spadaro	N/A	4

We have a team of eight (8) other actuarial analysts from whom we will select the small team of 2-3 analysts to assist with the census data updating, valuation system testing, report preparation, and other tasks that support the annual valuation process and periodic experience studies.

List mandatory qualification and experience requirements contained in Section 4, Subsection 4.3.2.:

Section 4, Subsection 4.3.2.1 Mandatory Requirement 1:

Vendor Response:

Bolton has been providing actuarial services to governmental defined benefit pension plans since we were founded 37 years ago.

APPENDICES

- Appendix 1:** Standard Actuarial Valuation Checklist
- Appendix 2:** Sample Standard Actuarial Valuation Report
- Appendix 3:** Model Legislation for Better Public Pension Plan Governance (vs. Risk Disclosure)
- Appendix 4:** New York City Plan Administration Audit Report
- Appendix 5:** Sample Standard GASB 67/68 Report
- Appendix 6:** Actuarial Directory Listings for Bolton Personnel
- Appendix 7:** Addendum Acknowledgement Form
- Appendix 8:** Certification and Signature Form
- Appendix 9:** Purchasing Affidavit Form
- Appendix 10:** RFP Form

APPENDIX 1

Standard Actuarial Valuation Checklist

CLIENT:
VAL DATE:
FREQUENCY:

Valuation Function	Sign off	Date	Notes
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Participant Data Request	Prepared by: Received:		
Asset Data Request	Prepared by:		
Confirm Plan Provision Changes	Prepared by: Reviewed by:		
Discuss Assumption Changes	Prepared by: Reviewed by:		
Participant Data Review & Edit	Prepared by: Checked by:		
Participant Flow (status changes)	Prepared by: Checked by:		
Valuation Program Update	Prepared by: Checked by:		
Check Sample Lives	Checked by: Reviewed by:		
Gain/Loss Analysis	Prepared by: Checked by:		
Valuation Worksheet/Calculations	Prepared by: Checked by:		
Valuation Report Draft	Prepared by: Checked by:		
Review of Final Valuation Report	Actuary:		
Peer Review of Final Val Report	Actuary:		
Valuation Report Sent	Sent by: Send to: Cc:		
GASB 67/68 Report Draft	Prepared by: Checked by:		
Review of Final GASB 67/68 Report	Actuary:		
Peer Review of Final GASB Report	Actuary:		
GASB 67/68 Report Sent	Sent by:		
GASB 67/68 Report Sent	Send to: Cc:		

APPENDIX 2

Sample Standard Actuarial Valuation Report



City Police Employees' Retirement Plan

Actuarial Valuation as of July 1, 2018 to
Determine the City's Contribution for the
Fiscal Year Ending June 30, 2020

Bolton

Submitted by:

John Smith, FSA, EA, MAAA

Senior Consulting Actuary

(443) 573-3000

info@boltonusa.com



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Employee Benefits, Actuarial & Investment Consulting

September 13, 2018

Ms. Mary Jones
City Manager
7500 Maple Avenue
City, MD 20000

Re: City Police Employees' Retirement Plan Valuation

Dear Mary:

The following sets forth the actuarial valuation of the City Police Employees' Retirement Plan as of July 1, 2018. Section 1 of the report provides a summary and an actuarial certification while Sections 2 through 6 contain the development of the City's contribution for the 2020 fiscal year along with a summary of the census and asset data, plan provisions, assumptions and actuarial methods. Section 7 provides a glossary of many of the terms used in this report. The appendices of the report provide information on plan funding as well as a 10-year projection of benefit payments.

We are available to answer any questions on the material in this report or to provide explanations or further details as appropriate. The undersigned credentialed actuaries meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report. We are not aware of any direct or material indirect financial interest or relationship, including investments or other services that could create a conflict of interest, which would impair the objectivity of our work.

Respectfully submitted,

John Smith, FSA, EA, MAAA



Section I. Executive Summary

Background

Bolton has prepared the following report that sets forth the actuarial valuation of the City Police Employees' Retirement Plan as of July 1, 2018.

Actuarially Determined Contributions (ADC)

The actuarially determined contribution (ADC) amount decreased this year as a nominal amount and as a percentage of participant payroll.

	FY2018	FY2019	FY2020
ADC	\$1,240,514	\$1,330,489	\$1,296,328
Percent of Total Payroll	44.67%	46.05%	42.85%

It is anticipated that the contribution will be paid in December 2019 and will equal 42.85% of the rate of pay for covered employees at that time. Details of the determination of the City's contribution for FY2020 are shown in Section 2 of this report.

Funding Measures

Funding Measures	7/1/2017	7/1/2018	Percent Change
1. Actuarial Accrued Liability			
a. Active	\$ 11,772,798	\$ 12,377,882	5.14%
b. Retired/Disabled	13,251,170	12,827,417	-3.20%
c. Term Vested	33,719	86,202	155.65%
d. Total	\$ 25,057,687	\$ 25,291,501	0.93%
2. Market Value of Assets	\$ 13,993,307	\$ 15,861,151	13.35%
3. Funded Ratio if Market Value of Assets was Used (2 / 1.d.)	55.84%	62.71%	
4. Actuarial Value of Assets	\$ 14,046,725	\$ 15,782,136	12.35%
5. Funded Ratio if Actuarial Value of Assets was Used (4 / 1.d.)	56.06%	62.40%	



Section I. Executive Summary

Risk Measures

The risks that a plan sponsor incurs from a defined benefit plan are primarily the risk of substantial increases in annual contributions. These increases occur most frequently due to variation in the investment returns. This valuation reflects the smoothing of asset returns, which reduces the risk of wide year-by-year contribution changes, but does not ultimately reduce the risk inherent in a defined benefit plan. The following table shows four commonly used measures of the relative riskiness of a pension plan, relative to the plan sponsor and the employee group covered by the plan. Additional information is shown in Appendix 3.

Risk Measure	FY2016	FY2017	FY2018	Conservative Measures
Retiree Liability as a Percent of Total Liability	56%	53%	51%	<50%
Assets to Payroll	4.5	4.9	5.2	<5
Liabilities to Payroll	8.2	8.7	8.4	<5
Benefit Payments to Contributions	0.5	0.6	0.5	1-3

Experience Analysis

The following factors affected the City's contribution as a percentage of payroll:

- Investment returns during 2018 were about \$0.2 million higher than expected. A portion of this gain is reflected in this valuation with the remaining portions to be reflected in future valuations. There is a total of \$0.1 million in net deferred investment gains as of July 1, 2018 that will be reflected in future valuations.
- The 2018 COLA of 2.11% was lower than the assumed annual increase of 3.00%.
- Pay for returning employees stayed level over the prior year; lower than what was expected.
- Total participant payroll increased by 4.7% over the prior year; more than the assumption of 4.0% per year during FY18.



Section I. Executive Summary

Changes in Method, Assumptions, and Plan Amendments

For amortization bases established July 1, 2018 and later, the payroll growth assumption has been changed from 4.00% compounded annually to 2.75% compounded annually.

There were no plan amendments adopted that affect benefits since the prior valuation.

Projection of Expected Benefit Payments

The projection of expected benefit payments for current participants is shown in Appendix 2.

Sources of Information

The July 1, 2018 participant data and market value of assets were provided by or at the direction of the City. While we have reviewed this data for consistency and completeness, we have not audited this data.

Actuarial Certification

This actuarial valuation sets forth our calculation of an estimate of the liabilities of the City Police Employees' Retirement Plan (the Plan), together with a comparison of these liabilities with the value of the plan assets, as submitted by City Government (the City). This calculation and comparison with assets is applicable for the valuation date only. The future is uncertain, and the plan may become better funded or more poorly funded in the future. This valuation does not provide any guarantee that the plan will be able to provide the promised benefits in the future.

This is a deterministic valuation in that it is based on a single set of assumptions. This set of assumptions is one possible basis for our calculations. Other assumptions may be equally valid. The future is uncertain and the plan's actual experience will differ from those assumptions; these differences may be significant or material because these results are very sensitive to the assumptions made and, in some cases, to the interaction between the assumptions. We may consider that some factors are not material to the valuation of the plan and may not provide a specific assumption for those factors. We may have used other assumptions in the past. We will likely consider changes in assumptions at a future date.



Section I. Executive Summary

Actuarial Certification

Different assumptions or scenarios within the range of possibilities may also be reasonable and results based on those assumptions would be different. As a result of the uncertainty inherent in a forward looking projection over a very long period of time, no one projection is uniquely “correct” and many alternative projections of the future could also be regarded as reasonable. Two different actuaries could, quite reasonably, arrive at different results based on the same data and different views of the future. A “sensitivity analysis” shows the degree to which results would be different if you substitute alternative assumptions within the range of possibilities for those utilized in this report. We have not been engaged to perform such a sensitivity analysis and thus the results of such an analysis are not included in this report. At the City’s request, Bolton is available to perform such a sensitivity analysis.

The City is responsible for selecting the plan’s funding policy, actuarial valuation methods, asset valuation methods, and assumptions. The policies, methods and assumptions used in this valuation are those that have been so prescribed and are described in this report. The City is solely responsible for communicating to Bolton any changes required thereto.

The City could reasonably ask how the valuation would change if we used a different assumption set or if plan experience exhibited variations from our assumptions. This report does not contain such an analysis. This type of analysis would be a separate assignment.

In addition, decisions regarding benefit improvements, benefit changes, the trust’s investment policy, and similar issues should not be based on this valuation. These are complex issues and other factors should be considered when making such decisions. These other factors might include the anticipated vitality of the local economy and future growth expectations, as well as other economic and financial factors.

The cost of this plan is determined by the benefits promised by the plan, the plan’s participant population, the investment experience of the plan and many other factors. An actuarial valuation is a budgeting tool for the City. It does not affect the cost of the plan. Different funding methods provide for different timing of contributions to the plan. As the experience of the plan evolves, it is normal for the level of contributions to the plan to change. If a contribution is not made for a particular year, either by deliberate choice or because of an error in a calculation, that contribution can be made in later years. We will not be responsible for contributions that are made at a future time rather than an earlier time. The plan sponsor is responsible for funding the cost of the plan.

We make every effort to ensure that our calculations are accurately performed. These calculations are complex. Despite our best efforts, we may make a mistake. We reserve the right to correct any potential errors by amending the results of this report or by including the corrections in a future valuation report.



Section I. Executive Summary

Actuarial Certification

Because modeling all aspects of a situation is not possible or practical, we may use summary information, estimates, or simplifications of calculations to facilitate the modeling of future events in an efficient and cost-effective manner. We may also exclude factors or data that are immaterial in our judgment. Use of such simplifying techniques does not, in our judgment, affect the reasonableness of valuation results for the plan.

This report is based on plan provisions, census data, and asset data submitted by the City. We have relied on this information for purposes of preparing this report, but have not performed an audit. The accuracy of the results presented in this report is dependent upon the accuracy and completeness of the underlying information. The plan sponsor is solely responsible for the validity and completeness of this information.

The City is solely responsible for selecting the plan's investment policies, asset allocations and individual investments. Bolton's actuaries have not provided any investment advice to the City.

The information in this report was prepared for the internal use of the City and its auditors in connection with our actuarial valuations of the pension plan. It is neither intended nor necessarily suitable for other purposes. Bolton is not responsible for the consequences of any other use or the reliance upon this report by any other party.

The purpose of this report is to provide the recommended employer contribution for the 2020 fiscal year. This report may not be used for any other purpose; Bolton is not responsible for the consequences of any unauthorized use. The GASB 67 and 68 reporting requirements will be the subject of a separate report. Additional analysis may be required to support the appropriateness of any proposed plan amendments or assumption changes.

The calculation of actuarial liabilities for valuation purposes is based on a current estimate of future benefit payments. The calculation includes a computation of the "present value" of those estimated future benefit payments using an assumed discount rate; the higher the discount rate assumption, the lower the estimated liability will be. For purposes of estimating the liabilities (future and accrued) in this report, you selected an assumption based on the expected long-term rate of return on plan investments. Using a lower discount rate assumption, such as a rate based on long-term bond yields, could substantially increase the estimated present value of future and accrued liabilities.

Because valuations are a snapshot in time and are based on estimates and assumptions that are not precise and will differ from actual experience, contribution calculations are inherently imprecise. There is no uniquely "correct" level of contributions for the coming plan year.



Section I. Executive Summary

Actuarial Certification

This report provides certain financial calculations for use by the auditor. These values have been computed in accordance with our understanding of generally accepted actuarial principles and practices and fairly reflect the actuarial position of the Plan. The various actuarial assumptions and methods which have been used are, in our opinion, appropriate for the purposes of this report.

The report is conditioned on the assumption of an ongoing plan and is not meant to present the actuarial position of the Plan in the case of Plan termination. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions, changes in economic or demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status), and changes in plan provisions or applicable law.

The City should notify Bolton promptly after receipt of this report if the City disagrees with anything contained in the report or is aware of any information that would affect the results of the report that has not been communicated to Bolton or incorporated therein. The report will be deemed final and acceptable to the City unless the City promptly provides such notice to Bolton.

The undersigned credentialed actuary meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. We are not aware of any direct or material indirect financial interest or relationship, including investments or other services, which could create a conflict of interest that would impair the objectivity of our work.

We are available to answer any questions on the material in this report to provide explanations or further details as appropriate.

Sincerely,

Bolton

John Smith, FSA, EA, MAAA



Section II. Determination of City Contributions

Derivation of Liabilities

Below is a summary of the actuarial accrued liability of the future benefits expected to be paid from the plan.

Unfunded Liability	7/1/2017	7/1/2018
1. Valuation Discount Rate	7.25%	7.25%
2. Number of Participants		
a. Active Participants	38	39
b. Retired Participants	26	25
c. Vested Terminated Participants	3	4
d. Total	<u>67</u>	<u>68</u>
3. Active Payroll	\$ 2,889,222	\$ 3,025,166
4. Actuarial Accrued Liability		
a. Active Participants	\$ 11,772,798	\$ 12,377,882
b. Retired Participants and Beneficiaries	6,128,397	6,142,031
c. Disabled Participants	7,122,773	6,685,386
d. Vested Terminated Participants	33,719	86,202
e. Total	<u>\$ 25,057,687</u>	<u>\$ 25,291,501</u>
5. Actuarial Value of Assets	<u>14,046,725</u>	<u>15,782,136</u>
6. Unfunded Actuarial Liability (4.e. - 5.)	\$ 11,010,962	\$ 9,509,364
7. Amortization of Unfunded Liability	782,714	713,661
8. Amortization of Unfunded as a Percentage of Payroll (7. / 3.)	27.09%	23.59%
9. Employer Normal Cost	547,775	582,667
10. Employer Normal Cost as a Percentage of Payroll (9. / 3.)	18.96%	19.26%
11. Total Employer Contribution (7. + 9.)	1,330,489	1,296,328
12. Total Employer Contribution as a Percentage of Payroll (11. / 3.)	46.05%	42.85%



Section II. Determination of City Contributions

Schedule of Amortization Bases

Below is a schedule of the amortization bases as of July 1, 2018.

Description	Date Established	Remaining Years	Amount to be Amortized	Payment / (Credit)
Original	7/1/2013	17	\$ 11,941,773	\$ 888,399
Actuarial Loss/(Gain)	7/1/2014	18	\$ (1,293,039)	\$ (92,132)
Actuarial Loss/(Gain)	7/1/2015	19	\$ (661,220)	\$ (45,260)
Actuarial Loss/(Gain)	7/1/2016	20	\$ (548,566)	\$ (36,169)
Assumption Change	7/1/2016	20	\$ 759,993	\$ 50,110
Actuarial Loss/(Gain)	7/1/2017	21	\$ (107,349)	\$ (6,834)
Assumption Change	7/1/2017	21	\$ 878,204	\$ 55,912
Actuarial Loss/(Gain)	7/1/2018	22	\$ (1,460,432)	\$ (100,365)
Totals			\$ 9,509,364	\$ 713,661

The July 1, 2018 amortization payment of \$713,661 is sufficient to cover the interest on the plan's unfunded liability.



Section III. Valuation of Assets

Reconciliation of Assets

Below is a reconciliation of assets (unaudited) from July 1, 2016 through June 30, 2018.

	FY2017	FY2018
1. Beginning of Year Assets	\$ 12,077,718	\$ 13,993,307
2. Additions		
a. Employer Contributions	\$ 1,189,854	\$ 1,325,199
b. Employee Contributions	189,057	196,589
c. Other Receipts	0	0
d. Investment Income & Dividends	327,370	405,198
e. Realized Gain/(Loss)	64,264	591,968
f. Unrealized Gain/(Loss)	1,059,884	224,878
g. Total Receipts	\$ 2,830,430	\$ 2,743,832
3. Deductions		
a. Benefit Payments	\$ 856,595	\$ 811,171
b. Administrative Expenses	58,246	64,817
c. Total Disbursements	\$ 914,841	\$ 875,987
4. Net Increase (2.g. – 3.c.)	\$ 1,915,589	\$ 1,867,844
5. Net Assets (1. + 4.)	\$ 13,993,307	\$ 15,861,151
6. Rate of Return Net of Investment Fees (2I / [A + B – I] Method)	11.8%	8.5%

Development of Actuarial Asset Value

The actuarial asset value as of July 1, 2018 is determined by spreading the asset gain or loss for each year over a five-year period. The asset gain or loss is the amount by which the actual asset return differs from the expected asset return.

					7/1/2018
1. Market Value of Assets					\$ 15,861,151
2. Spreading of Investment (Gain)/Loss					
BOY	EOY	(Gain)/Loss	% Deferred		Amount Deferred
2017	2018	\$ (184,119)	80%	\$	(147,295)
2016	2017	(528,287)	60%		(316,972)
2015	2016	783,992	40%		313,597
2014	2015	358,275	20%		71,655
a. Total Deferred					(79,015)
3. Actuarial Value of Assets (1 + 2.a.)					\$ 15,782,136



Section IV. Participant Information

Participant Summary

The following table summarizes the counts, ages and benefit information for plan participants used in this valuation.

	7/1/2017	7/1/2018
1. Actives		
a. Number	38	39
b. Average Age	39.7	40.2
c. Average Service	11.9	12.0
d. Average Salary	\$ 76,032	\$ 77,568
2. Service Retirements and Beneficiaries		
a. Number	26	25
b. Average Age	58.6	59.7
c. Total Annual Benefits	\$ 813,408	\$ 800,448
3. Vested Terminations		
a. Number	3	4
b. Average Age	30.8	32.4
c. Total Benefits	\$ 33,719	\$ 86,202



Section IV. Participant Information

Active Age/Service Distribution Including Compensation

Shown below is the distribution of active participants based on age and service. The compensation shown is the average expected earnings for the twelve months following the valuation date.

	Years of Service as of 07/01/2018										Total
	Under 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Up	
Under 25	1	1	-	-	-	-	-	-	-	-	2
	-	-	-	-	-	-	-	-	-	-	56,492
25 - 29	1	5	1	-	-	-	-	-	-	-	7
	-	-	-	-	-	-	-	-	-	-	61,071
30 - 34	-	1	2	1	-	-	-	-	-	-	4
	-	-	-	-	-	-	-	-	-	-	67,246
35 - 39	-	1	-	4	1	-	-	-	-	-	6
	-	-	-	-	-	-	-	-	-	-	73,415
40 - 44	-	-	-	2	1	-	-	-	-	-	3
	-	-	-	-	-	-	-	-	-	-	77,423
45 - 49	1	-	-	3	1	3	3	1	-	-	12
	-	-	-	-	-	-	-	-	-	-	92,547
50 - 54	-	-	2	-	1	-	-	1	-	-	4
	-	-	-	-	-	-	-	-	-	-	87,122
55 - 59	-	-	-	-	1	-	-	-	-	-	1
	-	-	-	-	-	-	-	-	-	-	83,894
60 - 64	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
65 - 69	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
70 & Up	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
Totals	3	8	5	10	5	3	3	2	-	-	39
	90,886	61,165	67,003	74,663	84,591	94,439	85,930	108,738	-	-	77,568

Averages	
Age	40.2
Service	12.0



Section IV. Participant Information

Participant Reconciliation

Shown below is the reconciliation of participants between the prior and current valuation date.

	Active Participants	Inactive Participants Retirees & Beneficiaries	Terminated Vested	Total
Participants in Last Valuation	38	26	3	67
New	4	0	0	4
Terminated Vested	0	0	0	0
Terminated (Owed Refunds)	(1)	0	1	0
Terminated (Paid Refunds)	(1)	0	(1)	(2)
Retired	0	0	0	0
Deceased	(1)	(1)	1	(1)
Beneficiaries	0	0	0	0
Data Adjustments	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Participants in This Valuation	39	25	4	68



Section IV. Participant Information

Inactive Participant Distribution

Shown below is the monthly benefits of retirees and beneficiaries by age.

Age as of July 1, 2018	Number	Average Annual Pension	Total Annual Pension
<55	7	42,437	297,060
55 - 59	4	30,414	121,656
60 - 64	7	29,269	204,876
65 - 69	4	22,470	89,880
70 - 74	3	28,992	86,976
75 - 79	4	26,512	106,048
80 - 84	0	0	0
85+	0	0	0
	29	31,258	906,496



Section V. Summary of Plan Provisions

Plan Year

July 1 – June 30.

Normal Retirement Date or Unreduced Early Retirement Date

25 years of service, or age 62 with 5 years of service, if earlier.

Normal Form of Benefit

Single Life Annuity with death benefit of undistributed employee contributions plus accumulated interest at retirement. Other forms are the actuarial equivalent.

Post Retirement Cost of Living Increases

CPI index, but no more than would cause the participant's benefit to exceed an amount equal to the original benefit compounded at 3% per year.

Average Compensation

Average of base pay for 36 highest consecutive months.

Service

Service includes:

1. Time as an active member contributing to the plan.
2. Unused sick leave (22 days = 1 month).
3. Service prior to July 1, 2001 under the State plan that was transferred to this plan at its inception.
4. For employees hired before July 1, 2001, up to five years of pre-employment military service if eligible under the State plan. If not eligible under the State plan, up to five years of pre-employment military service may be credited after 10 years of credited service with the plan.

Employee Contributions

7% of base pay.



Section V. Summary of Plan Provisions

Benefit Formula

2% of average compensation for each year of service earned. Total service is limited to 30 years.

The above amount will be increased by 2% of average compensation for each year of service attributable to unused sick leave (limited to 2 years.)

Note: prior to the latest plan amendment effective 7/1/2009, each year of service earned prior to 7/1/2000 was credited with 1.5% of average compensation. Total service was limited to 25 years.

Early Retirement Benefit

Age 55 with at least 15 years of service. Benefit is reduced actuarially from normal retirement date.

Termination Prior to Retirement

Return of employee contributions with 5% interest or if vested (after five years of service) an annuity beginning age 62 (or at the early retirement date, actuarially reduced).

Line of Duty Disability Benefit

Catastrophic Disability

The greater of:

- (a) the benefit due to employee contributions or
- (b) 66 2/3% of base pay.

Non-Catastrophic Disability

The greater of:

- (a) the benefit due to employee contributions or
- (b) 50% of base pay.

Note: prior to the latest plan amendment effective 7/1/2009, those hired before 7/1/2001 received the greater of (a) and 66 2/3% of base pay.



Section V. Summary of Plan Provisions

Ordinary Disability

5 Years of Service is required for this benefit.

The benefit is equal to the accrued benefit, without actuarial reduction.

If a participant is under age 62, or has earned less than 25 years of credited service as of the disability date, the years of credited service are projected. They include both the actual years of credited service, plus any credited service which would have otherwise been earned as of the earlier of the participant's 62nd birthday or the date the participant would have earned 25 years of credited service.

Line of Duty Pre-Retirement Death Benefit

If the participant is unmarried at his date of death, his beneficiary is entitled to receive a refund of the participant's contributions with interest, plus a single lump sum equal to the participant's compensation as of the date of death.

If the participant is married or has a registered domestic partner at the date of death and is eligible for normal or early retirement, his surviving spouse or partner may receive the benefit described above, or an annuity for the spouse's or partner's lifetime or earlier remarriage/re-registration, equal to a 66 2/3% of base pay. Upon the death or remarriage/re-registration of the surviving spouse or domestic partner, a benefit equal to 50% of base pay will be paid to the surviving children.

If the participant is not married and has designated one or more child as the primary beneficiary, the surviving children will receive an aggregate annuity equal to 50% of base pay. This benefit ceases upon the attainment of age 18, or 23 if a full-time student.

Ordinary Pre-Retirement Death Benefit

If the participant is unmarried at his date of death, his beneficiary is entitled to receive a refund of the participant's contributions with interest, plus a single lump sum equal to the participant's compensation as of the date of death.

If the participant is married or has a registered domestic partner at the date of death and is eligible for normal or early retirement, his surviving spouse or partner may receive the benefit described above, or an annuity for the spouse's or partner's lifetime, equal to the Joint and 100% Survivor benefit that would have been payable upon the participant's death.

Changes Since Prior Valuation

None.



Section VI. Actuarial Methods and Assumptions

Funding Method

Projected Unit Credit. Costs are determined as a percentage of payroll based on the assets and liabilities on the valuation date. The liability for disability benefits is fully accrued for participants hired before July 1, 2003. Disability attribution method for those hired on or after July 1, 2003 is linear to decrement.

The Unfunded Actuarial Accrued Liability as of July 1, 2013 was amortized as a level percent of payroll over a fixed period of 22 years (closed amortization). Actuarial gains or losses after June 30, 2013 are also amortized over a fixed period of 22 years.

Asset Method

Five year smoothed asset value. Investment returns above or below the assumed rate of return are recognized at a rate of 20% per year over five years.

Interest

7.25% net of investment related expenses, compounded annually. This assumption is based on the plan's investment policy and the long-term expectation of each investment class, based upon the recommendations of the plan's investment advisor. Details of the investment policy and long-term expectations are available in the plan's financial statements.

Payroll Growth

2.75% compounded annually. Amortization bases established prior to July 1, 2018 assume 4% compounded annually.

Post Retirement COLA Increases

3% compounded annually, no limit.

Mortality

RP-2014 Blue Collar adjusted to 2006 table with fully generational projection using scale MP-2015. For disabled participants, the table is set forward three years.

Projection to the year of the valuation is assumed to be current mortality experience. Generational projection beyond the valuation date is assumed to account for future mortality improvements.

Section VI. Actuarial Methods and Assumptions

Salary Increases

5.5% compounded annually.

Disability

Sample rates are:

Age	Rates
25	0.55%
35	1.02%
45	2.64%

Half the disability benefits are assumed to be line-of-duty. One-third of the line-of-duty disabilities are assumed to be catastrophic and two-thirds are considered non-catastrophic

Turnover

Sample rates are:

Age	Rates by Service		
	0 – 9	10 - 14	15 and over
25	6.179%	4.634%	1.236%
35	5.021%	3.766%	1.004%
45	3.180%	2.385%	0.636%

Rates are 75% of the initial rates between 10 and 15 years of service and 20% of the initial rates after 15 years. Employees that quit before age 50 are assumed to withdraw their contributions



Section VI. Actuarial Methods and Assumptions

Retirement

Probabilities of retirement are: 70% at 25 years, 10% at 26-29 years, and 100% at 30 years or age 62.

Sick Leave

Accrued benefit loaded 3.4% for unused sick leave credit.

Pay Limit

None.

Pre-Employment Military Service

Actual service credit as provided in census.

Marriage Assumption

80% of participants are assumed to be married. Husbands 3 years older.

Compensation

Compensation provided to us was assumed to be base pay for the 12 months ending on the valuation date.

Administrative Expenses

Employer normal cost includes assumed administrative expenses equal to the average of the actual expenses of the two fiscal years preceding the date of the valuation.

Changes Since Prior Valuation

For amortization bases established July 1, 2018 and later, the payroll growth assumption has been changed from 4.00% compounded annually to 2.75% compounded annually.

Section VII. Glossary

Actuarial Accrued Liability (AAL)

The difference between the Actuarial Present Value of Future Benefits and the Actuarial Present Value of Future Normal Costs or the portion of the present value of future benefits allocated to service before the valuation date in accordance with the actuarial cost method. Represents the present value of benefits expected to be paid from the plan in the future allocated to service prior to the date of the measurement.

Actuarial Asset Valuation Method

The method of determining the value of the assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets or a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the actuarially determined contribution (ADC).

Actuarial Cost Method

A procedure for allocating the Actuarial present Value of Future Benefits and the actuarial Present Value of Future Normal costs and the Actuarial Accrued Liability. Also known as the “funding method”. Examples of actuarial cost methods include Aggregate, Entry Age Normal, Projected Unit Credit, and Pay-as-you-go.

Actuarial Present Value of Future Benefits (APVFB)

The Actuarial Present Value of amounts which are expected to be paid at various future times to active members, retired members, beneficiaries receiving benefits, and inactive, non-retired members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.

Aggregate Cost Method

An actuarial cost method that spreads the cost of all future benefits in excess of plan assets as a level percentage of future salary or service. The actuarial accrued liability is set to the value of assets in this method.

Annual Determined Contributions of the Employer(s) (ADC)

The employer’s periodic determined contributions to a pension plan, calculated in accordance with the assumptions and methods used by the plan actuary. The ADC replaced the actuarially required contribution (ARC), with the replacement of GASB 27 with GASB 68.

Cost-of-Living Adjustment (COLA)

An annual increase in the amount of a retired participant’s benefit intended to adjust the benefit for inflation.

Covered Group

Plan members included in actuarial valuation.

Section VII. Glossary

Deferred Retirement Option Program (DROP)

A program allowing a participant eligible to retire to continue working for a fixed period of time, while accumulating the benefit payments he would have received if he had retired on his entry to DROP.

Demographic Assumption

Assumptions regarding the future population of pension participants, including retirement, termination, disability and mortality assumptions.

Economic Assumption

Assumptions regarding future economic factors, including COLA, salary improvement, change in average wages, changes in Social Security benefits and investment returns.

Employer's Contributions

Contributions made in relation to the actuarially determined contributions of the employer (ADC). An employer has made a contribution in relation to the ADC if the employer has (a) made payments of benefits directly to or on behalf of a retiree or beneficiary, (b) made premium payments to an insurer, or (c) irrevocably transferred assets to a trust, or an equivalent arrangement, in which plan assets are dedicated to providing benefits to retirees and their beneficiaries in accordance with the terms of the plan and are legally protected from creditors of the employer(s) or plan administrator.

Entry Age Normal (EAN) Cost Method

An actuarial cost method that spreads the cost for each individual's expected benefits over their career, either as a level percentage of pay or service. The actuarial accrued liability is the accumulated value of all past normal cost, and the unfunded accrued liability (surplus) is the excess of the AAL over the value of assets.

Expenses

Plan expenses paid by the plan are divided into administrative and investment related expenses.

Funded Ratio

The actuarial value of assets expressed as a percentage of the plan's actuarial accrued liability.

GASB

Government Accounting Standards Board.

GASB No. 67 and GASB No. 68

These are the government accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 77 sets the accounting rules for the retirement system while Statement No. 68 sets the rules for employers that sponsor or contribute to public retirement systems.



Section VII. Glossary

Investment Return Assumption or Investment Rate of Return (Discount Rate)

The rate used to adjust a series of future payments to reflect the time value of money.

Level Percentage of Projected Payroll Amortization Method

Amortization payments are calculated so that they are a constant percentage of the projected payroll of active plan members over a given number of years. The dollar amount of the payments generally will increase over time as payroll increases due to inflation; in dollars adjusted for inflation, the payments can be expected to remain level.

Normal Cost or Normal Actuarial Cost

That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.

Pay-as-you-go (PAYG)

A method of financing a benefits plan under which the contributions to the plan are generally made at about the same time and in about the same amount as benefit payments and expenses becoming due.

Payroll Growth Rate

An actuarial assumption with respect to future increases in total covered payroll attributable to inflation; used in applying the level percentage of projected payroll amortization method.

Plan Liabilities

Obligations payable by the plan at the reporting date, including, primarily, benefits and refunds due and payable to plan members and beneficiaries, and accrued investment and administrative expenses. Plan liabilities do not include actuarial accrued liabilities for benefits that are not due and payable at the reporting date.

Plan Members

The individuals covered by the terms of a Pension or OPEB plan. The plan membership generally includes employees in active service, terminated employees who have accumulated benefits but are not yet receiving them, and retired employees and beneficiaries currently receiving benefits.

Projected Unit Credit (PUC) Funding Method

An actuarial cost method that spreads the employee's benefit over their career, as a level percentage of service. The normal cost is the present value of the portion of the benefit assigned to the current year. The actuarial accrued liability is the accumulated value of all past normal cost, and the unfunded accrued liability (surplus) is the excess of the AAL over the value of assets.



Section VII. Glossary

Post-Employment

The period between termination of employment and retirement as well as the period after retirement.

Salary Improvement

An actuarial assumption regarding the increase in employees' salaries, reflecting cost-of-living, merit and longevity increases.

Select and Ultimate Rates

Actuarial assumptions that contemplate different rates for successive years. Instead of a single assumed rate with respect to, for example, the investment return assumption, the actuary may apply different rates for the early years of a projection and a single rate for all subsequent years. For example, if an actuary applies an assumed investment return of 8 percent for year 2000, 7.5 percent for 2001, and 7 percent for 2002 and thereafter, then 8 percent and 7.5 percent are select rates, and 7 percent is the ultimate rate.

Unfunded Actuarial Accrued Liabilities

The excess of the present value of prospective pension benefits, as of the date of a pension plan valuation, over the sum of (1) the actuarial value of the assets of the plan and (2) the present value of future normal costs determined by any of several actuarial cost methods. For plans that define an accrued liability, this amount equals the excess of the accrued liability over plan assets.

Vested Plan Benefits

All benefits to which current participants have a vested right based on pay and service through the valuation date. A participant has a vested right to a benefit if he/she would still be eligible to receive that benefit if employment terminated on the valuation date.



Appendix 1

Summary of Funding Progress

	(1)	(2)	(3)	(4)	(5)	(6)
Valuation Date	Actuarial Value of Assets	Actuarial Accrued Liability	Percentage Funded (1) / (2)	Unfunded Actuarial Accrued Liability (2) - (1)	Annual Covered Payroll	Unfunded Actuarial Accrued Liability as a Percentage of Covered Payroll (4) / (5)
7/1/2008	\$4,500,963	\$13,402,672	33.6%	\$8,901,709	\$2,383,190	373.5%
7/1/2009	\$4,035,510	\$14,355,855	28.1%	\$10,320,345	\$2,671,071	386.4%
7/1/2010	\$5,058,336	\$15,094,744	33.5%	\$10,036,408	\$2,713,518	369.9%
7/1/2011	\$6,795,093	\$16,397,138	41.4%	\$9,602,045	\$2,774,501	346.1%
7/1/2012	\$7,808,944	\$19,146,415	40.8%	\$11,337,471	\$2,673,827	424.0%
7/1/2013	\$8,700,353	\$20,508,708	42.4%	\$11,808,355	\$2,849,563	414.4%
7/1/2014	\$9,867,595	\$20,487,736	48.2%	\$10,620,141	\$2,570,207	413.2%
7/1/2015	\$11,141,355	\$21,161,355	52.6%	\$10,020,000	\$2,843,149	352.4%
7/1/2016	\$12,575,165	\$22,825,234	55.1%	\$10,250,069	\$2,777,426	369.0%
7/1/2017	\$14,046,725	\$25,057,687	56.1%	\$11,010,962	\$2,889,222	381.1%
7/1/2018	\$15,782,136	\$25,291,501	62.4%	\$9,509,364	\$3,025,166	314.3%

Analysis of the dollar amounts of net assets available for benefits, actuarial accrued liability, and unfunded actuarial accrued liability in isolation can be misleading. Expressing the net assets available for benefits as a percentage of the actuarial accrued liability provides one indication of funding status on a going-concern basis. Analysis of this percentage over time indicates whether the plan is becoming financially stronger or weaker. Generally, the greater this percentage, the stronger the plan.

Trends in unfunded actuarial accrued liability and annual covered payroll are both affected by inflation. Expressing the unfunded actuarial accrued liability as a percentage of annual covered payroll approximately adjusts for the effects of inflation and aids analysis of City's progress made in accumulating sufficient assets to pay benefits when due. Generally, the smaller this percentage, the stronger the plan.



Summary of Contributions

Year Ended June 30	Actuarially Determined Contribution	Percentage Contributed
2012	923,331	100.00%
2013	1,044,504	100.00%
2014	1,101,564	100.00%
2015	1,296,482	100.00%
2016	1,189,854	100.00%
2017	1,325,199	100.00%

The information presented in the required supplementary schedules was determined as part of the actuarial valuations at the dates indicated. Additional information as of the latest actuarial valuation follows.

Actuarial cost method	Projected unit credit
Amortization Method	Level percentage of payroll (closed)
Remaining amortization period	Remaining periods range from 17 to 22 years
Asset valuation method	5-year smoothed method
Actuarial assumptions:	
Investment rate of return	7.25%
Projected salary increase	5.50% compounded annually
Future payroll growth	2.75%
Post-retirement cost-of-living adjustments	3.00%



Appendix 2

Benefit Payment Projection

The following table shows the estimated benefit payments from July 1, 2018 through June 30, 2028 based on existing members of the plan.

Fiscal Year	Benefits
2019	1,055,000
2020	1,163,000
2021	1,266,000
2022	1,331,000
2023	1,432,000
2024	1,545,000
2025	1,683,000
2026	1,770,000
2027	1,905,000
2028	2,032,000



Appendix 3

Risk Metrics

The City contributions will vary over time based on the experience of the plan's investments and participants. As the value of the plan's assets and liabilities increase relative to the participant payroll, there is a greater risk of large changes to the City's contribution expressed as a percentage of participant payroll.

The Asset Volatility Ratio (AVR) is equal to the market value of assets (MVA) divided by payroll. A higher AVR implies that the plan is exposed to greater contribution volatility. The current AVR of 5.2 indicates that a 1% asset gain/loss can be related to about 5.2% of the annual payroll. The plan currently amortizes asset gains/losses over a period of 22 years. This would result in a change in the City's contribution of about 0.4% of payroll for each 1.0% change in market assets above or below the assumed valuation rate of return.

The Liability Volatility Ratio (LVR) is equal to the Actuarial Accrued Liability (AAL) divided by payroll. A higher LVR implies that the plan is exposed to greater contribution volatility due to changes in liability measurements. The current LVR of 8.4 indicates that a 1% liability gain/loss can be related to about 8.4% of the annual payroll. The plan currently amortizes liability gains/losses over a period of 22 years. This would result in a change in the City's contribution of about 0.6% of payroll for each 1.0% change in AAL less than or in excess of the changes anticipated by the plan's actuarial assumptions. As the plan approaches a 100% funded level, the AVR will converge to the LVR.

	2015	2016	2017	2018
AVR	3.9	4.5	4.9	5.2
LVR	7.4	8.2	8.7	8.4

APPENDIX 3

Model Legislation for Better Public Pension Plan Governance (vs. Risk Disclosure)

Model Legislation for Better Public Plan Governance (vs. Risk Disclosure)

By Thomas Lowman

The Society of Actuaries (SOA) has been looking at ways to communicate the financial health and risks associated with public pension plans. This might be done by requiring actuaries to disclose items such as the ratio of plan assets to member payroll (which is a good simple measure of risk to the plan sponsor that is repeated often in this paper). The SOA's goal of improving the funded status of these plans is a good one. More disclosure will cause change but often not material change and sometimes not the types of change that some stakeholders¹ will want to see. For example, plan members often believe that disclosing liabilities not tied to the funding assumptions is intended to scare politicians into cutting benefits. In any case, dealing with plan health and risk requires more than actuaries disclosing numbers, since the biggest risks relate to governance, even when the material facts are known. A better solution is creating model legislation for plans to follow that encourages better governance. The funding of public pension funds can be improved by the creation of model legislation covering plan governance (i.e., the decisions made by boards of trustees and elected officials). Such a model would include required disclosures. The drafters of model legislation may be too political in their objectives; but in the end, while adopted by politicians, model legislation can be (if properly done) one of the best ways to ensure appropriate public policy guidelines for plan governance.

It is unquestionable that actuaries are asked to explain to stakeholders the health of a pension plan, its risks and the funded status of the plan. To best perform their job, actuaries must disclose more than numbers. They must internalize and express the “biggest risks” to the plan, which, especially in the public sector, often relate to plan governance. Model legislation can go beyond what just the actuary can do for a sometimes reluctant client. The suggestions in this paper for the construction of model legislation cover a wide array of governance issues but are not intended to be an exhaustive list. Only a unified approach identifying all key “risks” to plans will help prevent unnecessary benefit reductions, volatile rate increases or precipitous plan changes. This also requires, among other things, an honest evaluation of the distinction between best practices and minimum actuarial standards and how this distinction factors into writing standards, as is explained later in this paper.

In this paper, the focus is on the need for and scope of model legislation and the related risks model legislation can address. This is done by using examples showing certain types of bad governance (by different parties) that we should try to avoid.

¹ Stakeholders would include taxpayers and plan members. They would not include actuaries (who are service providers) or boards of trustees (who are agents of the stakeholders).

Recent legal debates have focused on whether and to what extent pension benefits can be reduced when the employer has problems obtaining funds to contribute to the plans or would rather spend available funds elsewhere or avoid raising taxes. We need to move on from that debate and focus on how new laws can be used to prevent underfunding and, to a limited extent, guide others when determining what is affordable (separate from a best practices model). This paper is not a legal analysis or an attempt to define what is “reasonable and necessary” to break a contract. The attorneys can still argue over what benefits are and are not protected.

Following are six questions that need to be debated and are covered in this paper. Woven throughout the discussion of these six questions are comments on how model legislation can help.

1. How much should we narrow existing funding practices?
2. Who should determine the assumptions, methods and contribution needs?
3. Is there a difference between normal best practices and minimum acceptable standards? (Maybe minimum acceptable standards should be defined as “best practices in troubled times”?)
4. How much risk is acceptable under a best practices model?
5. Who gets access to information and neutral (balanced) service providers?
6. What are some of the other items to consider in model legislation?

How Much Should We Narrow Existing Funding Practices?

The Conference of Consulting Actuaries (CCA) published a 2014 white paper going over in detail principles behind the setting of funding methods. The types of choices (and balancing of choices) discussed in the white paper should serve as the guide to answering this question. The CCA may consider or assist in drafting model legislation. If so, the CCA may focus on the actuarial aspects of proposed model legislation, namely the funding methods (covered by the white paper) and assumptions used by plans (not covered by the white paper). But this limited focus is understandable because the role of the actuary is limited. While actuaries have specialized financial knowledge that can assist their clients, they are not the fiduciaries who ultimately decide on funding and plan design. However, here are two reasons why the CCA paper on funding policies is so important:

1. It represents the opinions of many senior public plan actuaries, which makes it more difficult for a plan sponsor who hires an actuary to recommend something outside of preferred practice to defend the unusual recommendation, particularly when the recommendation is identified as “unacceptable” in the CCA white paper (e.g., open negative amortization).

2. It provides a replacement option for the former Governmental Accounting Standards Board Statement No. 27 (GASB 27) annual required contribution (ARC)² concept.

For these reasons, the white paper is a good place to start when answering the question of how much to narrow funding practices. However, if the white paper is not integrated with governance rules and combined with good assumptions, the desired results will be limited. Assumptions and methods are often not chosen by actuaries. Many are prescribed by boards or, legislatively, by plan sponsors. While actuarial standards may require the actuary to opine on the appropriateness of assumptions, assumptions are most frequently set by a political process and therefore subject to governance risks, which model legislation can address.

Who Should Determine the Assumptions, Methods and Contribution Needs?

This is a key area where model legislation can help.

The SOA Blue Ribbon Panel on Public Pension Plan Funding and many others realized that the main problem we face is the failure of employers to fund the ARC. In the private sector world (referred to as the ERISA world in this paper), this is rare (generally only in a bankruptcy situation) because of IRS and Pension Benefit Guaranty Corporation (PBGC) enforcement powers to mandate funding. In the public sector, there is often no way to force proper funding at the state level, and often the states place few or no effective requirements on local governments. The failure to contribute the ARC might be as blatant as not contributing the ARC calculated by the actuary, or it may be more subtly due to manipulation of assumption or method changes. This applies in more than one direction. For example:

1. For years City A failed to lower its discount rate to the level recommended by the plan's actuary. When City A did lower the discount rate (to a rate below what was recommended by the actuary), it failed to contribute more because soon after the assumptions were changed, benefits were cut and valuations (and ARCs) were revised.
2. City B continues to refuse to adopt recommended assumption changes to avoid contribution increases or benefit cuts.
3. State X has rules for what are called fixed-rate plans within that state. The idea is that if the current employer contribution rate cannot cover the normal cost and a 30-year amortization of the unfunded liability, then benefit changes need to be considered. In 201X, the City C plan (within State X) had an amortization period of just under 30 years. However, to accomplish this, the plan had to eliminate mortality improvement projections used in the prior valuation.
4. State Y provided annual ad hoc cost-of-living adjustments (COLAs) and funded them over 15 years. This kept the plan systemically underfunded.

² The new GASB term is the actuarially determined contribution (ADC). I use the term ARC, since it is more recognizable.

We must have enforceable rules to prevent these situations. Currently, retirees, employees, trustees and unions may not be able to successfully sue an employer simply for failing to fund a plan properly and may have to wait until contractual benefits are cut before suing the employer. This situation may occur if the courts cannot tell the legislatures how to allocate their budgets due to constitutional separation of powers concepts. Said differently, there needs to be an enforceable law that requires employers to adequately fund public plans. Current taxpayers and labor unions both can be reluctant to push for additional pension funding, since (1) taxpayers want lower taxes, (2) employees may prefer pay increases (particularly younger employees), and (3) there is a sense that, since the employer is responsible for the obligation, it will make good on its promises at some future time from future taxpayers (which may or may not be true). However, someone needs to look out for the future, and model legislation can help.

How can we prevent these situations? Here are three ways model legislation can help:

1. The simple presence of basic guidelines would be an improvement over annually looking for creative ways to justify unsound practices. States should create rules that govern both themselves and their local government plans. While there may be some differences, the basic rules should apply at both the state and local levels. There should be some model state oversight of local plans. Some states already have a set of rules covering state and local plans, but there is no common framework. National guidelines may provide elected officials notice of inappropriate practices and encourage the elected officials to reconsider rules that deviate from model legislation.
2. Rules should place control over hiring actuaries, setting assumptions and methods, and determining the ARC with independent boards of trustees. These functions should be separated from the plan sponsor. Some jurisdictions already have this arrangement. There may be little we can do when an employer fails to fund the ARC. However, the trustees have a fiduciary role. Model legislation can provide pressure and guidance to boards to request proper funding (and, if needed, provide a basis for legal action against the boards or the employers). It would be naïve to assume that all boards are unbiased, but this is the best option.
3. State rules should require and enforce adequate (but not necessarily best practice) funding. This includes creating member rights to adequate funding that can be enforced in the courts.

Is There a Difference Between Normal Best Practices and Minimum Acceptable Standards?

Yes, there is a difference. Goals for model legislation should be primarily focused on eliminating the worst practices. There needs to be room to accommodate differences of opinion and allow some flexibility in contributions. Not everyone is likely to agree what the term “model funding practice” means, and it may be plan design dependent (e.g., for a variable annuity plan, entry age normal funding is not a model funding practice). The

most conservative practice is not always the best practice (e.g., one-year amortization of investment losses might be most conservative but is not practical). There also needs to be a clear statement that employers cannot choose to reduce their contractual benefit obligations simply to implement model funding practices.

Consider the following proposal allowing for one type of flexibility:

Have model legislation that allows a phase-in of the increase in the contribution resulting from assumption changes using one of two options: (1) a phase-in of the assumption itself or (2) directly phasing in the contribution increase. When the actuary for City D recommended a drop in the discount rate³ (investment return assumption), the board decided to phase in the change by slowly lowering the discount rate (option 1). Boards tend to favor this option, since they feel that they are asking the state or municipalities to fully fund the ARC. A better solution (option 2) would be to have governance models that allow the phasing in of the cost of assumption changes (i.e., paying less than the ARC). Option 2 (also referred to as direct rate smoothing) has the following virtues: (1) it reduces the incentive to delay needed changes, (2) it can avoid the creation of a fiscal emergency where none existed, and (3) it shows liabilities and costs based on the ultimate set of assumptions. Option 1 has only the first two advantages. Having either type of phase-in should be acceptable as long as the phase-in is disclosed. Neither option falls under the CCA's white paper model practice (which is to not phase in the increase), and this is an example where model legislation should not require model practice.

Here is another example where model or best practices might be the goal but should not be the minimum standard for model legislation. Consider the following differences in amortization approaches that have occurred:

Situation #1: City E had a 20-year level dollar amortization policy. Unfortunately, much of the true unfunded liability had not been recognized. Shortly after assumptions were made more conservative (to recognize the true cost of the plan), benefits were cut deeply to allow for the current contribution rate to be roughly maintained without adopting a new amortization policy. The unions asked for fewer benefit cuts and a 25- or 30-year amortization period with level percentage of pay amortization, but no amortization changes were made.

Situation #2: In City F, again shortly after major assumption changes were made, benefit cuts were made (do you see a theme?). The benefit cuts came with a resetting (lengthening) of the level percentage of pay amortization period to 25 years. The benefit cuts and amortization changes effectively “funded” the first year’s cost of assumption changes by reducing the ARC to the preassumption change level. Again the unions asked for 30-year amortization to avoid some of the cuts, but the resetting to 25 years was used.

³ This concept is not limited to discount rate assumption changes.

A question to ask is: Why should City E be allowed to cut contractual benefits⁴ rather than make the type of changes taken by City F or those proposed by the unions? Model legislation should provide amortization over 15–25 years but force employers to adopt 30-year closed amortization (and get state approval) before considering other actions. There could be a debate about what employer financial differences should be present to allow for differences in funding requirements, but this is not an actuarial issue and most likely has no clear answer.

Finally, there will always need to be some type of transition rule. Plans currently using 30-year closed amortization periods should not be required to immediately cut the amortization period of the existing unfunded liabilities.

How Much Risk Is Acceptable Under a Best Practices Model?

There is a reason a paper about model legislation that is focused on minimum standards must talk about best practices in the area of risk. It is not that model legislation should require best practices in this area but rather to realize that (1) some decisions on risk tolerance go beyond model legislation and (2) models and markets are still evolving. There is no universal answer to the level of risk all plan sponsors can accept or how it can be determined. A discussion of risk can include the following three areas, only the first of which should be part of model legislation:

1. What is the best way to measure and communicate pension risk?
2. How much risk can an employer afford?
3. What is an employer's risk appetite (understanding that, all other things being equal, employers tend to avoid risk)?

Truly understanding risk goes beyond simple disclosures and what we can expect simple model legislation to cover. Model legislation should focus on the best way to measure and communicate risk. One simple measure of risk noted in the beginning of this paper is the ratio of assets to payroll. As this ratio increases, the impact of a swing in market returns increases the volatility in the contribution as a percentage of payroll. Most plans are still maturing by this measure. This implies that simply keeping an existing asset mix (e.g., 70 percent equities and 30 percent bonds) increases a plan sponsor's risk over time, even if this is not how annual risk is most commonly communicated by the plan's investment adviser.

How should good governance factor in risk and future risk trends? Decisions on affordability⁵ should be based on (1) the current cost of the plan, (2) the projected best

⁴ This drifts into the area of what is "reasonable and necessary" to allow for benefit cuts. However, model legislation should not define this. What is needed is flexibility in contributions that does not simply turn into always contributing the smallest possible amount.

⁵ Decisions on affordability and the employer's ability to pay are not ones that actuaries or trustees should be making. However, there are pension cost risks that the actuary can quantify.

estimate of future cost and, to a lesser extent, (3) a stochastic type of projection of possible future outcomes. Many employers would like to derisk their plans. In the public sector, that means that defined benefit formulas are reduced and possibly replaced with defined contribution plans. State X decided to derisk by adopting a more conservative investment mix, lowering its discount rate and paying for this by lowering benefits. Is the sponsor obligated to consider these risks early enough to avoid reducing benefits? A transition rule may need to be considered if we deal with future risk more than is common current practice.

A related question about investment policy statements: Should these policies self-adjust (i.e., reduce annual investment risk) as the plan matures? The ideal answer is yes, which would also imply that this is something the actuary should take into account now under a best practices model. However, over the last 20 years we have seen increases in both plan maturity and investment risk. Some of this is driven by real rates of return on bonds declining to virtually zero, adding to a preference for other asset classes. This makes the ideal answer somewhat less ideal. It also makes it difficult to include this in model legislation while allowing flexibility to react to market conditions.

At a minimum, model legislation should include requiring historical metrics such as the ratio of plan assets to payroll, as is being considered by the Actuarial Standards Board (ASB). A second round of refinements to model legislation can go further. Such refinements can specify useful projections. However, some projections are useless. For example, one often-quoted projection is when a plan will run out of money if the employer stops making unfunded liability payments. It is no surprise that if unfunded liability payments are not made that a plan will run out of money, and therefore there is no need to ask when this would occur. What this calculation does is imply that the employer has no responsibility for unfunded liabilities and moves the focus away from funding the benefit promises.

Who Gets Access to Information and Neutral (Balanced) Service Providers?

Asymmetric availability of (actuarial) information on public pension plans should be unacceptable. Actuaries usually work for the retirement boards. It is common, understandable and proper for the plan actuary to be asked to provide contribution projections to the board or employer. Retirement board websites tend to provide access to more information compared to what is available in other areas of actuarial practice. However, some boards are controlled by labor members, and many others by management members. There have been instances where key information was withheld from board members by executive directors and service providers. In a political environment, this type of activity is often not punished. We should have code of conduct rules for board members, staff and service providers. Model legislation should reduce the chance of continuing to hear from those responsible for the hidden (unshared) sins of the past: “It is not important how we got where we are. We need to move forward and fix things now.”

Often there is one actuary who performs the valuation and is relied on by all parties. Sometimes there are three actuaries: one for the board, one for the sponsor and one for the unions. The board should have only one actuary (subject to audits), but rules of communication need to be established. Should all work done by the plan actuary for an interested party other than the board be shared with the board? After a healthy debate, model legislation should address this.

Boards do not always have independent attorneys. There is also the human nature that the attorneys selected by boards (like actuaries) might favor the positions of the majority of board members. Many ERISA multiemployer boards hire two attorneys. In these ERISA plans, one attorney often does all of the heavy lifting, but both labor and management get to pick their own attorney, who is paid out of plan assets. While not an actuarial issue, legal advice representing both sets of stakeholder representatives should be addressed in model legislation.

It is also important to have an independent competent auditor who is familiar with pension rules. This has been lacking in the past for many plans.

What Are Some of the Other Items to Consider in Model Legislation?

Model legislation should also include a requirement that, before any benefit change is adopted, an actuarial study regarding the costs and risks of the change be prepared. (Note: Many jurisdictions already have this requirement, and this falls in the category of low-hanging fruit when this rule does not exist.) This is much more than just a best practice; it should be a minimum standard for model legislation. These studies are often prepared by the plan actuary, particularly when judgments on assumption changes are needed as a result of the proposed change (e.g., retirement rate changes due to changes in retirement eligibility). However, using the plan actuary for this work (1) often leads to questions about whether the plan should pay for these settlor functions and (2) often draws the plan actuary into the employer's sphere of influence. These factors should be addressed in model legislation.

As noted previously, those drafting model legislation should consider both best practices and minimum standards, and we believe they should focus on enforcing minimum standards. This will certainly lead to a debate with questions such as: (1) Should we draft minimum funding rules and hope that employers contribute more than the minimum? and (2) How sure are we that the minimum funding level will be the only contribution level most employers are likely to fund, given competing demands for funds? These questions and others should be part of a healthy debate.

A review of the Government Finance Officers Association (GFOA) best practices should be part of any discussion of model legislation, including actuarial and data audits and experience studies. Like the SOA work and actuarial standards, GFOA also has

disclosure recommendations. Again, model legislation does not always need to follow best practices.

There could be a debate about *disclosing* the sponsor's ability to change or reduce benefits. The time to resolve this debate is not now. Commentators to the GASB standards asked the GASB to require the employer to disclose this information. However, the GASB felt it inappropriate to do so because this issue is beyond the expertise of the auditors, who cannot easily audit the meaning of legal provisions. The problem for the auditor is that it requires legal expertise, and the law seems to be changing. What we thought was protected, we are not so sure about anymore. This leads to the concerns of the unions. Unions probably would have more easily supported better disclosure of employers' ability to change or reduce benefits 20 years ago than they would now, since the fear is that now employers will use the model legislation process to reduce benefit promises. Model legislation should not be used as an excuse to cut benefits. The law is too much in flux in this area to make now the time to include this in any model legislation.

If benefits are reduced, how much documentation should be prepared regarding the historical situation that resulted in the need to reduce benefits? What is the penalty for those who breached their fiduciary duty in the past? This can all be debated.

Should every rule proposed for model legislation be "back-tested" to see if it would have solved key problems in a state before it is adopted?

Who should draft such model legislation? It needs to be a diverse group—e.g., the GFOA, the National Association of State Retirement Administrators (NASRA), the CCA—with both legal and actuarial input.

Finally, drafting model legislation will not be easy. It is much harder to ask someone to regulate themselves than to regulate someone else. No one is going to like all the results of such a group effort, and putting together a balanced group of drafters will not be easy. Like when the group of actuaries created the CCA white paper on funding, it must be realized that not all existing policies can be accommodated. Yet, if this turns into a process to help employers eliminate these plans or to try to make the plans funded as if they were insurance companies, it should not be supported. One test of any proposal is whether it will reduce the likelihood that the trustees or the plan actuary will be used by one stakeholder against another, while still allowing improvements in governance and some flexibility. Refusing to try to create model legislation should not be an option. Whether to adopt the final outcome of this process is its own debate, once we know what we are debating.

Thomas Lowman, FSA, EA, FCA, MAAA, is vice president and chief actuary at Bolton Partners Inc. in Baltimore.

Comments on

“Model Legislation for Better Public Plan Governance (vs. Risk Disclosure)”

By Evan Inglis

Thomas Lowman has written a thoughtful piece on the value that model legislation would have for public pension plans. Given the challenges of governing a large, long-term financial commitment within a political decision-making system, his advocacy for this kind of regulatory guidance seems like a very worthy ambition.

The paper appropriately identifies governance as the biggest issue that has resulted in the current challenging situation for public pensions. The paper does not deal with governance in the broad sense but is focused on funding strategies and how they could be better controlled. Actuarial methods and assumptions that result in contributions that are too low, contribution requirements and recommendations that are not met by plan sponsors, and a lack of risk analyses and an appropriate evolution of investment strategies are identified as key issues.

The paper contrasts best practices with minimum standards. It is suggested that the worst approaches to determining contributions should be addressed with minimum standards, rather than trying to define and implement best practices. On the other hand, the paper suggests that best practices for analyzing risk should be discussed and encouraged with model legislation.

More specifically, the paper includes the following recommendations for change:

- Use the standards from the white paper on public plan funding practices published by the Conference of Consulting Actuaries (CCA) to guide improvements in actuarial methods. The white paper identifies acceptable and model practices that would generally reduce deferral of current pension costs.
- Place control of hiring actuaries and defining how to determine contributions with independent boards of trustees, separate from the plan sponsor.
- Increase transparency so that all stakeholders have equal access to good information.
- Allow for transition from current practice, rather than ask for immediate reform.
- Disclose metrics such as the ratio of plan assets to payroll.
- Use stochastic analyses to better understand the range of potential outcomes.
- Evolve investment strategies toward lower-risk approaches as the plan population matures.
- Ensure that all stakeholders have access to the same good information.

- Require that an actuarial study be done to identify the costs and risks of any proposed benefit change. (Note from discussant: Can it be true that some plan sponsors make changes without such a study?)

In addition, the paper mentions several questions such as: “Who should draft model legislation?” and “Should different actuaries be hired to serve different stakeholders?”

The paper takes a practical approach rather than an idealistic one, and this perspective should be appreciated. It can be argued that it simply won’t be possible to do anything more than gradually eliminate the worst practices. At the same time, the current models for funding and investing seem very far from a desirable state. One wonders whether codifying something that simply eliminates today’s worst practices might result in a permanent state of practice that could be characterized as “barely acceptable.” The CCA work on funding standards defines a positive step forward but does not define a solid framework for ensuring that promised benefits ultimately get paid without the potential for undesirable sacrifices in other areas of state and city services.

Most important, there is too little understanding of the financial nature of the pension obligation and how to manage assets against that obligation by investment experts, actuaries and other public pension experts. The value of a pension obligation is sensitive to interest rates. Because this fundamental financial concept is not utilized in assessing the financial status of public pensions, risk management and risk taking will be less than fully effective. Investment teams don’t talk to actuaries enough, and actuaries don’t know enough about investment strategies. Thus really good asset-liability modeling and management is not encouraged or even possible. The model legislation concept described in the paper does not address these issues, except for the important suggestion that investment strategies be adapted to the maturity of the plan. It may be that the author does not view a better understanding of the obligation as important, or it may be seen as too challenging and controversial. It could well be that addressing this area directly would throw any model legislation initiative off course.

It would be useful for Lowman to work with others to take the ideas in his paper to the next level. His paper has the character of a first attempt to get thoughts and observations down on paper for the sake of further discussion. Defining a framework of ultimate objectives such as secure benefits or intergenerational equity would be useful—these are the ultimate goals that better funding is meant to achieve. The best practices for risk analysis and management could be defined in more detail. Ideas about transparency of information and different roles for different actuaries could also be clarified.

Just as significant, the next steps should include thinking about how to actually make this happen. The paper advocates a practical approach that does not try to force too much change too quickly, but there is no sense in just writing about a practical approach—let’s make it happen. Who will draft this kind of model legislation? How could the potential for adoption be increased? Are there states or cities willing to

participate in creating the model and advocating for it? What other influences can be brought to bear?

We need our profession to unite around ideas with open minds and a desire to make improvements. Too much time and energy is spent on “discussing” the right way to do things. Too much effort is put into defending the status quo. Both of these problems enable the status quo to continue.

One point that is made in the paper is that actuaries should not be blamed for the current state of public pension plan funding. This is true. The profession has limited influence at the individual plan level or at the broader policy level. Still, the profession and its methods must be viewed as a contributing factor to the existing situation, and certainly our profession’s expertise is needed to design and implement improvements. Lowman’s paper can be considered a worthwhile effort toward a better state of being for public pensions.

Evan Inglis, FSA, CFA, works in the Institutional Solutions group at Nuveen Asset Management.

APPENDIX 4

New York City Plan Administration Audit Report



New York City Retirement Systems

Administrative Review Report
March 12, 2018

BOLTON  PARTNERS

36 S. Charles Street, Suite 1000
Baltimore, MD 21201

Submitted by:

Erika B. Bode, CEBS

(443) 573-3907

ebode@boltonpartners.com

Kari Szabo, CEBS

(443) 573-3919

kszabo@boltonpartners.com

James J. McPhillips, FSA, EA

(484) 319-5283

jmcpPhillips@boltonpartners.com

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March 12, 2018

The Honorable Scott M. Stringer
New York City Comptroller
Office of the New York City Comptroller
One Centre Street
New York, NY 10007

Re: New York City Retirement Systems

Dear Comptroller Stringer:

Bolton Partners, Inc. is pleased to present this Administrative Review Report, which is a key deliverable under our first biennial engagement to serve as Independent Actuary under Section 96 of the New York City Charter.

This report summarizes the results of our review, which covered:

- Processes for gathering, validating, and transmitting data for the actuarial valuations;
- Processes for performing retirement calculations and having them certified;
- Methods for participant communications;
- Procedures for maintaining security of confidential member information; and
- Status of implementation of recommendations from prior Administrative Reviews.

Overall, we found that the Systems and the Office of the Actuary are very knowledgeable about their roles and responsibilities and take their work seriously. The Systems have robust data management systems and processes in place that, in our opinion, provide sufficient quality data to the Office of the Actuary for their valuations.

We are available to answer any questions on the material in this report or to provide explanations or further details as appropriate. We are not aware of any direct or material indirect financial interest or relationship, including investments or other services that could create a conflict of interest, which would impair the objectivity of our work.

Respectfully submitted,

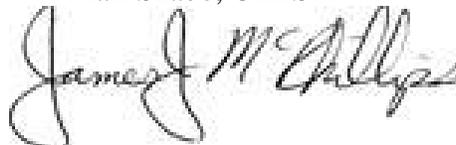
BOLTON PARTNERS, INC.



Erika B. Bode, CEBS



Kari Szabo, CEBS



James J. McPhillips, FSA, EA

Bolton Partners, Inc.

Section I. Background

Bolton Partners, Inc. was retained by the New York City Comptroller's Office to serve as Independent Actuary under Section 96 of the New York City Charter. The engagement relates to the five pension funds that collectively comprise the New York City Retirement Systems (NYCRS), which are:

- New York City Employees' Retirement System (NYCERS);
- Teachers' Retirement System of the City of New York (TRS);
- Board of Education Retirement System of the City of New York (BERS);
- New York City Police Pension Fund (POLICE);
- New York City Fire Pension Fund (FIRE).

This report summarizes our first Administrative Review. This review did not constitute a full-scale audit of plan administration, but was a broad review of administrative procedures and practices. For example, we did not check individual benefit calculations. The areas covered in the Administrative Review include:

- Processes for gathering, validating, and transmitting data for the actuarial valuations;
- Processes for performing retirement calculations and having them certified;
- Methods for participant communications;
- Procedures for maintaining security of confidential member information; and
- Status of implementation of recommendations from prior Administrative Reviews.

We received a great deal of assistance from the staffs at the Office of the Actuary (OA) and each of the Systems. We could not have completed our work without drawing upon their expertise. We are most appreciative of the time and effort spent by these staff members to explain their processes and procedures and answer our many questions. The names of those who assisted us are listed in the appendix.

Section II. Executive Summary

General Conclusions

Overall, we were very impressed by the knowledge and dedication of the Systems' staff. The Systems care deeply about their members and provide them the best possible service. Comprehensive data storage systems have been put in place to manage the tremendous amounts of member data and most of the Systems have recently or are currently upgrading their data systems for technology improvements.

We were also very impressed by the staff at the OA and the strong relationships they have with the Systems. All parties work well together, and given the low staff turnover on both sides, they have developed efficient, streamlined methods for data handling.

Summary of Key Issues

In this section, we summarize some areas for improvement or increased efficiency we discovered during our review. Additional details can be found in the Results section of this report.

NYCERS

1. Continue moving toward a new pension administration system. If possible, involve the OA in the development process, to ensure all data they require will be able to be fulfilled with the new system.
2. Utilize the secure FTP to transmit data to the OA. We understand this is not a capability of the current pension administration system, but should be included in any new system.
3. Supply ITHP and required member contribution data to OA. This is a prior recommendation that we understand is slated to be a part of the new system, but it is worth mentioning since it is valuable information for the OA.
4. Consider including the ability to flag static data changes in the development of the new system, to reduce data questions from the OA. Also, focus on automating, as the current system requires many manual edits or entries. Documentation of new system will be important and should be a major focus as the system is rolled out.
5. Compare the data the OA provides for the annual valuation to the data stored in the PROD system, and flag any discrepancies for the OA. This would be an extra layer of validation for the OA's data.

Section II. Executive Summary

(continued)

6. Consider performing periodic death audits for joint annuitants of living retirees who are receiving benefits in a joint and survivor form. If a beneficiary is found to be deceased, the valuation liability for the benefit becomes less since no survivor benefit will have to be provided. This would also make the processing of death benefits more efficient. We understand that this is not commonly done, but it may be worth consideration as it could impact the valuation.

TRS

1. Continue to work with CUNY (and whoever may have any authority over CUNY) to obtain better quality data for CUNY employees who participate in TRS. ASPEN has the functionality to receive data directly from the CUNY Human Resources system, but this data is not always accurate or timely. TRS has done significant outreach, but CUNY and the State payroll agency seem unwilling or unable to assist. TRS expressed frustration at not being able to provide the best possible service to CUNY members.
2. Consider renewing discussion with the OA about a “pre-certified” benefit calculator. This had been in discussion with OA in the past but discussions fell off. Having a pre-certified calculator for routine calculations would cut down on the work load for both TRS and OA.
3. Continue work toward updating the SPDs for Tiers 4 and 6. The versions on the TRS website were last updated in 2007. TRS says this is in progress but the completion target is not known. ERISA plans are required to update SPDs every five years if there have been changes during the five years; this is a good rule of thumb for how often TRS should update their SPDs.
4. Consider performing periodic death audits for joint annuitants of living retirees who are receiving benefits in a joint and survivor form. If a beneficiary is found to be deceased, the valuation liability for the benefit becomes less since no survivor benefit will have to be provided. This would also make the processing of death benefits more efficient. We understand that this is not commonly done, but it may be worth consideration as it could impact the valuation.

BERS

1. Prepare new, or modify existing, written documentation of internal processes to reflect the implementation of the new data management system.
2. Continue working to provide valuation data and benefit calculations to the OA via secure FTP, and consider giving the OA access to the data system to aid in the benefit certification process.

Section II. Executive Summary

(continued)

3. Enhance online member services, including the ability for members to run their own benefit estimates, and apply for loans and service purchases. This would reduce the amount of manual entry required by BERS staff thereby reducing human error in the data.
4. Work with Charter Schools to have them submit member data electronically.
5. Continue toward becoming a paperless office using the new data system to aid this process.
6. Renew discussion with the OA about a “pre-certified” benefit calculator, and consider allowing the OA access to the underlying data used in benefit calculations for their certification process. Having a pre-certified calculator for routine calculations would cut down on the work load for both BERS and OA.
7. Reach out earlier to members who have been terminated for five years, to initiate payment of benefits.
8. Increase focus on data and office security. Consider implementing a yearly internal training and certification process for employees. While the office entry is secure, and there is a private meeting area for members to receive retirement counseling, the office space is shared and not separately locked. It is important that staff be vigilant and member data be protected.
9. Consider creating communication materials in languages other than English. While we realize there may be a cost/benefit constraint on providing these materials, it would be beneficial to non-English speaking members.
10. Consider performing periodic death audits for joint annuitants of living retirees who are receiving benefits in a joint and survivor form. If a beneficiary is found to be deceased, the valuation liability for the benefit becomes less since no survivor benefit will have to be provided. This would also make the processing of death benefits more efficient. We understand that this is not commonly done, but it may be worth consideration as it could impact the valuation.

POLICE

1. Enhance online member services, including the ability for members to run their own benefit estimates, and apply for loans and service purchases. We understand that this is on the “wish list” for the new COPS2.0 system. This would reduce the amount of manual entry required by POLICE staff thereby reducing human error in the data.

Section II. Executive Summary

(continued)

2. Continue efforts to move toward becoming a paperless office aided by COPS2.0 features as developed.
3. Initiate discussion with the OA about a “pre-certified” benefit calculator, and consider allowing the OA access to the underlying data used in benefit calculations for their certification process. Having a pre-certified calculator for routine calculations would cut down on the work load for both POLICE and OA.
4. Consider a second level of death searches beyond Social Security. POLICE stated in our meeting that they are considering using LexisNexis for batch death searches; we think this, or something similar is a good idea.
5. Talk to building management about possible improvements to security for building access. When we came for our onsite meeting, we did not have to give our names or show identification. We told the guard with whom we were meeting, and then were shown to the elevator. POLICE has its own security measures in place on their floors of the building, but we believe requesting heightened security in the lobby would create an additional layer of safety for employees, and better protect sensitive data and all internal systems.
6. Include OA in development of project requirements for COPS2.0.
7. Consider performing periodic death audits for joint annuitants of living retirees who are receiving benefits in a joint and survivor form. If a beneficiary is found to be deceased, the valuation liability for the benefit becomes less since no survivor benefit will have to be provided. This would also make the processing of death benefits more efficient. We understand that this is not commonly done, but it may be worth consideration as it could impact the valuation.

FIRE

1. Hire additional staff. Now that corpus funding is in place, FIRE plans to hire eight to ten new staff members across several areas (IT, retirement counseling, and benefit processing).
2. Move toward becoming a paperless office. Each member currently has a paper file stored onsite; files are only sent to offsite storage upon the member’s retirement.
3. Continue working with the OA to send benefit calculations via FTP transfer, rather than via messenger. This project has been started; we believe it is important to see it through to completion to improve security and efficiency of the calculation and certification process.
4. Consider a second level of death searches beyond Social Security. FIRE stated in our meeting that they use LexisNexis as a verification of information found through the Social Security death search; we think this or a similar service should be used in tandem with the Social Security search.

Section II. Executive Summary

(continued)

5. Enhance online member services by extending portal access beyond fire station locations.
6. Initiate discussion with the OA about a “pre-certified” benefit calculator, and consider allowing the OA access to the underlying data used in benefit calculations for their certification process. Having a pre-certified calculator for routine calculations would cut down on the work load for both FIRE and OA.
7. Update computer systems to enhance security and decrease the use of manual edits and calculations.
8. Enhance e-UPS system to include capabilities to track terminated participants after 2012 and WTC disability elections and reclassifications for all members.
9. Create and expand training program. Due to the FIRE staff being so small for many years, training was mostly accomplished by shadowing a senior employee. Since the corpus funding was put into place, there are plans to increase the staff by 30-40%. The need for a more formal training program complete with documentation of processes will become more crucial to maintaining quality standards.
10. Consider performing periodic death audits for joint annuitants of living retirees who are receiving benefits in a joint and survivor form. If a beneficiary is found to be deceased, the valuation liability for the benefit becomes less since no survivor benefit will have to be provided. This would also make the processing of death benefits more efficient. We understand that this is not commonly done, but it may be worth consideration as it could impact the valuation.

OA

1. Work with Systems to get only data that is needed. IT is concerned that OA maintains data with Social Security numbers, which are not necessarily needed, and which are a security issue in case of a breach.
2. Explore possible precertification of the benefit calculation programs with each System.
3. Continue to work toward fully automated processes with the Systems. This will save paper, increase data security, and make inventory management much smoother in the upcoming years.

Section III. Administrative Review Process

We began work on the Administrative Review by gathering publicly-available documents containing plan provisions, so that we could familiarize ourselves with the complex workings of the plans. We utilized the website for each System to obtain Summary Plan Descriptions, CAFRs, and other member communication materials.

The Office of the Actuary provided copies of data request letters that were sent to the Systems, minutes from the “kick-off meetings” between the OA and each System at the beginning of the valuation process, and the latest valuation reports prepared for POLICE and FIRE.

The Systems provided any relevant documents they had available. These documents included meeting minutes, process manuals, internal memoranda describing policies, financial audit reports and management letters, and documentation of internal audits.

Further, we obtained copies of the last several Administrative Review Reports, and reviewed them, paying close attention to their conclusions and recommendations.

Once we were familiar with the plan provisions and processes, we prepared questionnaires that would serve as agendas for onsite meetings with the OA and each System. We sent the questionnaires in advance, so the staff could gather their thoughts and be prepared for our questions. We decided to meet first with the OA, to get an overview of their processes for all five Systems. We then met with each System separately.

Meeting with the OA

We met with the OA on June 6, 2017. The meeting began with discussion with the Valuation Services Division about valuation data collection for the Systems generally, followed by discussion of specific issues and differences among the Systems. We then met with the Certification Services Division to talk about their processes for certifying retirement calculations, and the methods by which the requests and results are transmitted between the OA and each System. Lastly, we spoke with Information Security about infrastructure in place to maintain data security, and staff training in that regard. The agenda for the four-hour meeting was as follows:

1. Data collection
 - a. Is there an annual kick-off meeting with the System? Who attends? What is the meeting agenda?
 - b. From where does the OA get member data?
 - c. How is member data transmitted to the OA?
 - d. What procedures are in place for verifying/validating data?

Section III. Administrative Review Process

(continued)

- e. How are member records tracked year over year?
 - f. What happens to any data that is suspect?
 - g. What is the target date for receipt of data?
 - h. Do you generally have a lot of questions about the data? How are the questions resolved? How long does the process generally take?
 - i. If you identify data issues that are eventually corrected, do you check in subsequent years that the corrections have been made and stored in the member database?
 - j. How is the OA informed of any plan changes for each system?
2. Benefit calculation process
- a. How are calculations transmitted to the OA for certification?
 - b. How many people at the OA are involved with a given benefit calculation? How long does the certification process generally take?
 - c. Does the OA have access to the same member data that the System uses in the calculations? Is the data compared to the valuation data? What data validation is done by the OA?
 - d. Are any calculations performed by OA rather than the System? In what kinds of cases? What are the processes for any such calculations?
 - e. If errors or inconsistencies are found in a calculation, how are they resolved?
 - f. How is the certification transmitted back to the System?
 - g. Does the validation process include election forms and other necessary paperwork required upon termination/retirement?
3. Internal security policies and procedures
- a. Has there been any movement toward a paperless office system? How far along is it and what is the process to complete it if it isn't already there?
 - b. Describe security procedures in terms of:
 - i. Employee office access
 - ii. Visitor office access
 - iii. After-hours office access
 - iv. Remote access
 - v. Cell phone use
 - vi. Locking of desk drawers/cabinets
 - vii. Clean desk
 - viii. Sending files to offsite storage
 - ix. Outside vendor – access to system
 - c. What are the processes for data backup and recovery? How often is data restoration tested? How often is disaster recovery tested?
 - d. Are system breach tests performed? How, and how frequently?

Section III. Administrative Review Process

(continued)

4. Data transmission to outside parties
 - a. What outside parties receive data from the OA? For what purpose?
 - b. How is data transmitted? What security protocols are in place?
 - c. How does the OA ensure that the vendor maintains the security of data?
5. Staff training
 - a. How are new staff members trained?
 - b. Are staff members cross-trained on other functions besides their primary function?
 - c. How are staff members trained on any changes (new security procedures, or law changes that would affect data and benefits)?
 - d. Do any staff members participate in outside continuing education programs? Are such programs supported by the OA?
6. Status of recommendations from prior administration reviews
7. Wish lists

Meetings with the Systems

After our meeting with the OA, we met with each System separately. (The order of the meetings was for no other reason than scheduling and availability of the staff necessary to address the topics on the agenda.) We met with FIRE on June 7, POLICE on June 15, BERS on June 16, TRS on June 22, and NYCERS on June 28. Each meeting lasted about three hours, and followed the same agenda:

1. Data collection, validation, and transmission to OA
 - a. Where does member data come from?
 - b. How frequently is member data updated?
 - c. How is data entered and stored in the System's databases?
 - d. What procedures are in place for verifying/validating data? Is data verified as received, or at some other interval?
 - e. What happens to any data that is suspect?
 - f. Are termination dates provided in the member data feeds? Does that trigger another process for benefit calculation or distribution?
 - g. How are transfers handled? How is data stored for terms and rehires?
 - h. How is data transmitted to OA? What is the target date for transmission? When data is requested, how difficult is it to compile the data to send to the OA?
 - i. What is the data reconciliation process with OA? Does OA generally have a lot of questions? How are the questions resolved? How long does the process generally take?

Section III. Administrative Review Process

(continued)

- j. If OA identifies data issues that are eventually corrected, how does the System ensure that the corrections are stored in the member database? How are corrections documented?
- 2. Retiree maintenance
 - a. Who is responsible for maintaining retiree data and processing payments?
 - b. How is information about new retirees transmitted to the party responsible for making the payments?
 - c. Are retiree death audits undertaken routinely? How are they done? What is the process for confirming a beneficiary's entitlement to survivor benefits and starting the payments?
 - d. Are there beneficiary death audits?
- 3. Benefit processing (retirement, disability, death discussed separately to extent processes are different)
 - a. What is the process for retirement, from the member's initial contact to the start of the payments? How long does that process generally take?
 - b. Is data from the member database used for the benefit calculation? What data sources are used for calculations (same as valuation data sources)?
 - c. Is any data supplied by the member? Do members supply data via paper, email, fax? Does the member have an opportunity to review the data and make any corrections?
 - d. How many people at the System are involved with a given benefit calculation?
 - e. Are any "special types" of calculations performed manually? How does the process differ for those?
 - f. Are any calculations performed by OA rather than the System? In what kinds of cases? What are the processes for any such calculations?
 - g. How is the completed calculation transmitted to OA? Does OA have access to all the data used by the System to do the calculation?
 - h. How is the certification transmitted back to the System? How long does it generally take?
 - i. Are signatures on election forms required to be notarized? Does the System have notaries on staff to assist?
 - j. How are terminated members handled? Is there a process to reach out to those who've reached retirement age? What paperwork is provided to members upon termination?

Section III. Administrative Review Process

(continued)

4. Contribution-related election processing (loans, withdrawals, ITHP, buy-backs)
 - a. How is a new loan initiated?
 - b. What is the process for members repaying loans and having their accounts properly credited?
 - c. What is the process/timing for a loan default?
 - d. Certain plans/tiers allow members to suspend contributions or make additional voluntary contributions. What is the process for this? How is this data maintained in the system?
 - e. What is the process by which members can buy back certain service credit?
5. Benefit statement processes
 - a. How are statements generated? Directly from the member database, or from a different system?
 - b. How are statements distributed?
 - c. What can members do if they find errors on the statement?
 - d. How are member errors corrected?
 - e. Are member statements or benefit modeling capabilities available online?
6. Internal security policies and procedures
 - a. Has there been any movement toward a paperless office system? How far along is it and what is the process to complete it if it isn't already there?
 - b. Describe security procedures in terms of:
 - i. Employee office access
 - ii. Visitor office access
 - iii. After-hours office access
 - iv. Remote access
 - v. Cell phone use
 - vi. Locking of desk drawers/cabinets
 - vii. Clean desk
 - viii. Sending files to offsite storage
 - ix. Outside vendor – access to system
 - c. What are the processes for data backup and recovery? How often is data restoration tested? How often is disaster recovery tested?
 - d. Are system breach tests performed? How, and how frequently?
7. Data transmission to outside vendors
 - a. What outside vendors receive data from the System? For what purpose?
 - b. How is data transmitted? What security protocols are in place?
 - c. How does the System ensure that the vendor maintains the security of data?

Section III. Administrative Review Process

(continued)

8. Staff training
 - a. How are new staff members trained?
 - b. Are staff members cross-trained on other functions besides their primary function?
 - c. How are staff members trained on any changes (new security procedures, or law changes that would affect data and benefits)?
 - d. Do any staff members participate in outside continuing education programs? Are such programs supported by the System?
9. Status of recommendations from prior administration reviews
10. Wish lists

Follow-Up

The staff members in attendance at the meetings were all extremely accommodating and helpful. As we expected, though, the time allotted for the meeting was not enough to cover all of our questions in detail. Therefore, we sent follow-up questions to the OA and to each System, to clarify any confusion we had or to probe deeper into particular topics. We sent these questions via email, and received prompt written responses from each party.

Section IV. Results - NYCERS

General

NYCERS is the largest of the five Systems. They currently use a pension administration system called PROD, but are in the procurement process for designing and building a new system. The PROD system is a 35-year-old COBOL-based system. The new system requirements are being developed and will include increased functionality, capabilities to provide online statements to members, and increased access for the OA. NYCERS has included the OA in the development of the discovery of requirements, in an effort to address any issues that the OA has with their data feeds. They have also reviewed the data questions received annually from the OA and are planning to address as many of them as possible in the development of the new system. Since the plans for the new system are still in the development phase, there has been no identifiable timeline or completion date set as of the date of our first meeting. We will continue to monitor the progress in our second engagement.

NYCERS is a very well organized and thorough organization. They take employee training and data security very seriously. Their internal processes are well documented and their data security and disaster recovery is state-of-the-art. The development and implementation of a new pension administration system will further enhance data quality and efficiency in the coming years.

Data Collection and Validation

NYCERS receives payroll feeds for each pay period from the Office of Payroll Administration (OPA) and several other employer payroll systems. These files are aggregated, if necessary, and uploaded into the PROD system each pay period. The files contain member ID number, Social Security number, and payroll information only. All member demographic data is entered into the system separately from these data feeds. Since there are multiple payroll systems reporting information to NYCERS, the payroll uploads are constantly occurring. While there are no validation checks done on individual records at the time of upload, a process is followed to ensure accuracy and a reconciliation of deduction amounts is performed with each upload to identify possible data issues that may need correction.

For the annual valuation, the OA sends NYCERS files containing data collected from OPA and seven other small employers' payroll feeds (whose employees are not paid through OPA). They also send a pensioner payment file. The OA requests that NYCERS update the file for status changes from the prior year, and add new members. NYCERS uses their production system to fill in the data the OA has requested, and sends it back in the format detailed by the OA in the data request. They also provide a file containing withdrawal, service, loan, WTC, and union leave information.

Section IV. Results - NYCERS

(continued)

Terminated non-vested members stay in the PROD system and on the active data feed provided to the OA for five years from termination date. This is because a terminated member's membership continues for five years in case they are rehired within the System. Once a membership expires, the contribution balance is payable to the member and they are removed from the file if not vested, or kept as vested. The active file also contains vested member information. The data is provided in component pieces to the OA, and the OA calculates their deferred benefit amount for valuation purposes in-house. NYCERS processes these members' calculations when they elect to begin receipt of their benefit.

Once the OA processes the data, they send a list of questions to NYCERS. These are generally questions to confirm changes in data and salary changes. NYCERS researches the questions individually and corrects any errors within PROD. There is currently no capability in PROD to allow tracking of any data changes that occur on a year-over-year basis to be flagged.

NYCERS transmits data to and from the OA via CD. The current system does not include capabilities to transfer data via FTP, so NYCERS has included a requirement in the design for the new pension administration system to allow for FTP transfer with the OA.

NYCERS uses an outside vendor Pension Benefit Information, Inc (PBI) to assist with death audits. PBI provides a death match with Social Security monthly, and also supplies death matches from State vital records departments as well as nation-wide obituaries. Affidavits are sent to retirees over age 85 and beneficiaries over age 87 on alternating years. For any deaths found, NYCERS proactively locates the beneficiary to start payment and/or takes the necessary actions to recoup any overpayments. A death certificate is required before any beneficiary payment is made.

Benefit Calculations

Members file an application in person or by mail to initiate the retirement process. NYCERS has a client services team with 13 counselors on staff who deal primarily with retirement processing. Members can meet with a counselor who provides information on retirement, benefit estimates, assistance with filling out forms, and explanation of benefit options.

Vested members are tracked in PROD, and contacted 90 days before their normal retirement date to apply for vested benefits. Members who cannot be located continue to be tracked in the PROD system until their address can be found. If a valid address cannot be obtained, the member file is marked that mail is being returned and no mail will be sent until a new address is provided.

Section IV. Results - NYCERS

(continued)

NYCERS Retirement Eligibility Unit (Operations Division) reviews and determines the eligibility of members who file for service retirement. The Vested Unit (Operations Division) and an independent Medical Unit (Client Services Division) determine the eligibility of vested and disability applicants, respectively.

Advance payment (AP) for service and vested retirees as well as for members who have been approved for disability retirement is then initiated. The member is paid a partial benefit amount as an advance payment while the benefit calculation is processed. The advance payment amount is predetermined, but hardship exceptions are made for members who contact NYCERS requesting an increase, if the situation is applicable. This would be processed manually using an Excel-based system.

The Service Processing Unit (Service and Disbursement Division) calculates the member's years of service, the Retirement Calculations Unit (Operations Division) reviews the earnings and calculates the compensation base, and the Active Accounts Review Unit (Service and Disbursement Division) reviews the required amount. The calculations, service, and required amount are then reviewed by the Edit and Annuity Unit (Operations Division) before being forwarded to the Data and Benefit Certification Unit (Operations Division) to calculate benefit options. Once the options are completed and reviewed, they are sent to the member to make their selection. Once their paperwork is returned, the system is updated and a Report of Benefit is generated. The case is then forwarded to the Pension Payroll Unit (Service and Disbursement Division) to adjust the pension benefit accordingly. Option selection usually occurs two to four months after the member's retirement date, depending on the volume of cases received in a specific month.

On average, benefit calculations take about four to six months to finalize. An exception report is generated monthly to identify members who remain on AP for six or more months. The Option Selection Unit reviews this report and sends out follow-up letters to those members to obtain the needed documentation/forms required to finalize their benefit.

Section IV. Results - NYCERS

(continued)

There is a Revision process that occurs 15 – 20 months after the retirement allowance is finalized where the calculation is reviewed again for accuracy and for any additional payments or checks received after the case is finalized. These payments include, but are not limited to, retroactive contractual increases in salaries, overtime payments, cancelled checks subsequent to the retirement process, changes in laws, procedures, and/or legal settlements. During this process, an overall review or update of the service, compensation base, annuity account balance, loan balance, refunds, and required contribution is completed. This information is provided by agencies before OA's review. The calculations and relevant updates are then forwarded electronically to the OA for certification. The OA is given access to the NYCERS system to perform their calculation review. Once completed, the OA returns the certified Report of Actuary (ROA) to NYCERS reflecting the revised benefit allowance.

An estimated 700 benefit calculations are performed monthly. A recent contract settlement has created a backlog of around 27,000 calculations that required adjustment. When we met with NYCERS in June 2017, NYCERS had processed over 50% of these recalculations.

In general, all benefit calculations are performed in-house, except Social Security offset calculations (for Tier 4 members with Tier 3 rights and Tier 3 22-year plan members), 415 limits, survivor benefit calculations, death gambles, and present value requests, which are forwarded to the OA for processing.

Data Security

Visitor access to the building requires that the visitor provide identification and pass through security. NYCERS offices require a security card to open the door, and the front desk requires visitors to sign in and provide identification. Member-facing teams reside on the mezzanine level, which has a separate entry to allow for visitor access. Offsite data centers require security card access where only specific IT personnel are allowed access.

Employees have building access from 7:00 am until 5:30 pm, Monday through Friday. Senior staff and IT staff have 24-hour access. After-hours access and remote network access is limited and must be approved. Network access is only allowed through a NYCERS-approved device; personal phones and devices cannot connect to the NYCERS network. NYCERS enforces a clean desk policy where all sensitive information must be secured when the employee is not at their desk. To enforce the policy, routine walkthroughs are done and violations are documented.

An internal recertification process occurs two times a year, during which all levels of employee access are reviewed, verified, and adjusted if necessary. Employee access to the PROD system is reviewed and adjusted, if necessary, every 90 days. Terminated employee access to network and systems is revoked within 24 hours.

Section IV. Results - NYCERS

(continued)

The network is routinely backed up. Disaster recovery tests are performed two times a year, and the outcome shows that crucial systems, such as call center, website, and production system, were up and running within one to four hours. Disaster simulations are performed, recently including finance information, to make sure pensioners' checks could be processed in the test. Vulnerability scans are performed by an outside "white hat" group of computer security specialists at least every two years. The Information Security unit runs scripts and vulnerability scans internally to test the system routinely and identify possible problems.

NYCERS has a document control area where scanning, indexing, and archiving takes place. All member applications are scanned into the system. All paper files go through a document destruction process after they are aged out (around nine months). The paper files are stored onsite at NYCERS or in a Long Island City facility.

Any data being shared with a vendor or within the City of New York requires the recipient of the data to ensure the data will be stored securely. The recipient must also disclose what the data will be used for. NYCERS has internal consultant policies which define access control, require confidentiality agreements, and detail contractual requirements to obtain access to the system.

Staff Training

NYCERS conducts a multi-phase onboarding process where new employees are taught agency policies and citywide rules and regulations, provided an employee handbook, and shown how to log onto the employee portal to review their basic information. Specific areas are highlighted to the employees on day one, especially as they pertain to office policies and the employee handbook. New employees also attend a seven-day new employee training where they learn the basics of the NYCERS plans, tiers, contributions, loans, etc. Other training is performed onsite through working with a senior level employee, shadowing (especially in the member facing teams), and in a classroom setting.

There are also mandatory annual training sessions, including, but not limited to Code of Conduct, EEO training, conflict of interest, safety, and right to know. Plan changes and legal issues are handled through emails to notify employees of law changes initially. Directives are created that outline the new policy based on the law; internal meetings are subsequently conducted to inform employees of new policies.

Staff members are also allowed to participate in up to 70 hours of outside training per year. These additional training opportunities require manager approval, and focus mainly on technical knowledge, management training, compliance, and requirements related to specific fields and designations.

Section IV. Results - NYCERS

(continued)

Other

The NYCERS website contains a wealth of information for members. Copies of Summary Plan Descriptions and other benefit summaries and instructional videos are available for easy reference.

There is also a secure member portal, on which members can view their estimated benefit, apply for loans, obtain information about service purchases, and view historical pension payment amounts. NYCERS provides two types of benefit statements annually: an estimated retirement benefit for members who are eligible for retirement, and employee contribution balances, beneficiary information, and loan information for all active members.

Status of Recommendations from Prior Administrative Reviews

1. Involve the OA in the development of the new pension administration system.

Response: NYCERS has included the OA in the development of the discovery of requirements in an effort to address any issues that the OA has with their data feeds. They have also reviewed the data questions received annually from the OA and are planning to address as many of them as possible in the development of the new system.

2. Reach out to TRS to learn about its employee security education program

Response: A Security Awareness Program to address physical security concerns has been incorporated into all NYCERS employee training programs. Employees also participate in Ethics Training provided by the Conflicts of Interest Board and Corruption Awareness Training sponsored by the Department of Investigation. Employees are reminded that they are part of the security solution at NYCERS. The phone number of the Security Directors and security desk are indicated on the rear of all Identification cards. Employees are encouraged to report any suspicious activity or unidentified people attempting to gain access to NYCERS. In our opinion, the security training at NYCERS is as strong, even if not exactly the same, as the training provided to employees at TRS.

Section IV. Results - NYCERS

(continued)

3. Work with the OA and data management to become the single source of data

Response: NYCERS reports data to the OA in the same manner as they have historically. NYCERS receives an active file from the OA containing data collected from OPA and seven other small employers' payroll feeds (that aren't paid through OPA). They also receive a pensioner payment file from the OA. NYCERS uses these files to fill in any missing data the OA has requested and sends it back in the format they detail in the data request. This process will remain unchanged until the pension administration system is implemented with the required functionalities to facilitate the annual valuation process.

4. Share service purchase information with the OA and work with the OA to determine if this information would be useful to the OA in the development of a service purchase assumption or estimation of potential service purchase liabilities.

Response: NYCERS provides service purchase information to the OA as a part of the annual valuation data collection process.

5. Supply the Increased Take-Home Pay (ITHP) and required employee contributions to the OA

Response: As of the date of our meeting, NYCERS is in the procurement process for a new pension administration system that will be able to provide this information to the OA.

Section V. Results - TRS

General

TRS has a full-time staff of about 370 employees. They currently use an administration system called UPS. TRS is undergoing a modernization process/total upgrade in which they are gradually migrating to a new system called ASPEN (created by SagiTech). The migration will have seven phases. Three have been completed; the remainder are expected to be complete by 2022. For now, anything done or processed in ASPEN bridges back to UPS, so all information in UPS is up to date. UPS is still being used to generate the data for OA.

TRS takes security and staff training very seriously. They proudly state that clear accountabilities and roles relative to information security management are established across TRS. The Information Security Manager leads the Information Security Program sponsored by the Deputy Executive Director. It is the responsibility of all associates to help maintain the highest possible degree of security. Information Security roles and responsibilities are documented in TRS' Enterprise Information Security Policy and communicated across TRS. Information security responsibilities are taken into account during each employee's performance evaluation. The TRS website for members is state-of-the-art, and their critical processes are very well documented. Data quality continues to improve, with fewer issues found by the OA each year.

Data Collection and Validation

TRS receives bi-weekly data feeds from the Department of Education (DOE) which contain demographic and service information. They also receive bi-weekly feeds from OPA with payroll information.

As of the date of our meeting with TRS, there are twelve Charter Schools with employees who participate in TRS. Data for those employees comes directly from each Charter School. The data is submitted electronically; the timing differs depending on the school (some submit bi-weekly, others submit monthly).

City University of New York (CUNY) employees are given the choice between participating in a TIAA defined contribution plan or in TRS. Those who do not affirmatively elect the TIAA plan within 30 days from appointment date default into TRS. Since CUNY senior college employees are paid by the State, the State's payroll agency is responsible for providing payroll data for those employees to TRS. However, despite repeated requests by TRS, the State is unable to provide all of the information TRS needs in a timely manner. Therefore, TRS relies on the payroll secretaries of each individual senior college to inform TRS of employees who are mandated into TRS following the period in which they can elect to join TIAA. This notification often does not occur in a timely manner, leaving TRS to rely on these members to proactively enroll in TRS by paper form, resulting in a delay of enrollment and missed required contributions that must be billed as contribution deficits directly to the member since the State's payroll agency will not support payroll deductions for contribution deficits.

Section V. Results - TRS

(continued)

If any data is missing on a feed, TRS deals directly with the member and gets their birth certificate or other verification of the missing information. TRS policy prevents members from accessing services (taking a loan, for example) without complete information on file. Some data comes into ASPEN and is updated there, but all data bridges back to UPS. UPS is updated for all data feeds once a month. TRS has a daily process to validate data, so they believe it is generally of very good quality before year-end. When the data is being compiled for OA, they have testers look at control totals and spot check data again.

TRS sends the following files to OA: Active members (includes members terminated with money left in the plan and members on leave of absence), deceased, new pensioner, withdrawal, and “exceptions” file (shows flags of notable data changes from prior year, as well as transfers and anything else unusual). These files show any transactions dated during the year. For example, if a member retired years ago but has a recalculation or revision to their benefit in the current year, that will show on the “new” pensioner file in the current year. Inactive members (terminated not vested, due a contribution refund) stay in UPS and on the file to the OA for seven years from termination date. This is because a terminated member’s membership continues for seven years in case they are rehired by the DOE. Once a membership expires, the contribution balance is distributed to the member and they are removed from the file if not vested, or kept as terminated vested.

Transfer contributors are members who change jobs within the City but elect to remain TRS members. Pay data for these members comes through on the OPA feed, but the service and demographic changes are provided manually from the new employer. This data is not always the most up-to-date. There are very few of these members.

Data is generally sent to OA at the end of August using secure FTP. Since most retirements occur in June, we wondered if this timing was problematic in making sure all retirements were captured. TRS does not have a concern in this regard, since they believe they are able to catch retirements daily and report actual status at June 30.

There are many ways by which TRS finds out about member deaths. Often, the beneficiary notifies TRS of the death. TRS uses an outside vendor, PBI, to assist with death audits. PBI provides a death match with Social Security monthly, looks for obituaries, and uses LexisNexis as well. Affidavits are sent to retirees who have moved overseas, once every two years. TRS is looking into outsourcing this to a vendor based on discussions with peer systems. For any deaths found, TRS proactively locates the beneficiary and starts payments. A death certificate is required before any beneficiary payment is made.

Section V. Results - TRS

(continued)

Benefit Calculations

When approaching retirement, members typically first go to their union for a pension consultation, and to get an estimate of their benefit. They then file a retirement application up to 90 days ahead of the retirement date. After receiving the application, TRS does an extensive review of service, and bills the member for any prior service or membership service deficits. Then the calculation is performed, including available options. Almost all calculations are done electronically in UPS. Seven staff members are trained to do years of service calculations; eight more are trained to do the retirement calculations. One staff member checks the routine calculations done in UPS before certification by the OA. Complex calculations involving multiple positions, breaks in service, and transfers are sometimes seen by four different TRS employees. UPS can do QDRO calculations, after the legal department reviews the QDRO and provides the benefit split.

All calculations are then sent to OA for certification. This is an automated process using Lotus Notes. A work list is automatically created, and the OA can certify electronically (including an e-signature). OA has access to all underlying data; this was automated in 2007.

Advance payments are made upon retirement, based on a conservative estimate (generally 85% of the finalized benefit). The process from application to benefit finalization averages three to four months. TRS will escalate the advance payment by 10% if the process is delayed beyond that timeframe. Administrative delay interest at a rate of 5% per annum is applied on retroactive payments. The retired member sees all the details of the calculation in a letter sent to them at finalization.

Data Security

TRS has documented information security policies that are based on the City's policies and best industry practices. The Risk Department leads the information security program, but takes joint responsibility with the IT Department for data security. The Risk Department was created based on recommendations from a prior audit.

Visitor access to the building requires that the visitor's name be on a list at the lobby desk. Visitors must show identification, and have a photo taken for a security badge. Visitors must also pass through a metal detector.

Section V. Results - TRS

(continued)

No TRS staff members work from home on a regular basis. Remote connections are available via virtual desktop for “disaster” scenarios. This is tested three times per year by allowing “critical” staff to access from home (“critical” is defined based on business impact analysis plan). To be given remote access (for example, if an employee is unable to come to the office for medical reasons for an extended period), employees can submit a request to IT with their unit manager approval. If approved by the unit manager, IT will provide the employee remote access, which includes an RSA key. Outside vendors do not access the network except when guided by IT.

Personal devices are not allowed to access the network. Guest wi-fi is separate from the local network. Remote email access through TRS-issued phones is allowed if the employee requests access. IT can remove access from devices if lost.

Incoming mail is opened, scanned, authenticated, and sent to Iron Mountain for storage. Boxes are sent to Iron Mountain at least weekly, or more frequently if necessary. Boxes are sometimes retrieved for cases like death calculations for members who retired long ago (generally, records were not scanned for members retired prior to 1985). To try to eliminate the need to retrieve those boxes, TRS sent out letters to approximately 36,000 retirees, asking them to confirm their beneficiaries. About 20,000 have responded, and the responses were scanned, so the paper files are generally no longer needed for them.

TRS maintains online data centers in New York and New Jersey. Backups are also done to tape nightly. Encrypted tape backups are stored at Recall. Once a year, IT goes to Recall and verifies the tapes are there. There is a regular need for restoring files (for example, accidentally deleted emails) so the recovery process is continually being tested. TRS is on an initiative to go paperless, however, they are being very careful to not destroy files unless they are sure they are no longer needed. Destruction of data in offsite storage follows a written retention policy.

Staff Training

New employees get mentored by another staff member and spend much time shadowing that staff member to learn their functions. New hire orientation provides an overview of the different departments and their functions. There is also City-wide diversity and equal employment opportunity training that is required every two years. DCAS (City-sponsored), AMA, Cornell, etc. are used for outside technical training or career development. Certain training may be brought in-house if enough staff needs training on a topic.

Section V. Results - TRS

(continued)

Critical processes are documented well. Documentation is being improved and updated as part of the modernization roadmap. There is/will be formal training for each new phase of the modernization as it is implemented, for staff that will be using it. A system called Policytech houses procedure and policy documents.

TRS doesn't have high staff turnover. They have done succession planning for critical staff nearing retirement. Cross-training is promoted, depending on department, to ensure backup on all functions. TRS has recently added staff at lower levels, to move people up for implementation of modernization.

New employees have security training within a week of hire, and must sign an agreement to comply with IT policies, before being certified to access the network. There is mandatory annual security training for all employees. Annual performance reviews cover information security, based on their role in TRS. TRS also uses creative methods to remind employees of security policies, like poster competitions, or "red cards" left on desks of employees violating the clean desk policy. There are stickers on printers to remind employees to shred personal information.

TRS maintains a data leakage prevention system. IT is notified if a staff member tries to email out something secure without the proper protection. The IT Service Desk can release such an email if a manager determines necessary or due to a false positive screening.

Other

The TRS website contains a wealth of information for members. Copies of Summary Plan Descriptions and other benefit summaries on a topical basis are available for easy reference. Although the benefit summaries are updated frequently, the SPDs have not been updated since 2007. TRS is currently in the process of updating the SPDs.

There is also a secure member portal, on which members can apply for loans, review and update beneficiary information, obtain information about service purchases, and view benefit statements. TRS provides two types of benefit statements: a quarterly statement of account balances, and an annual statement of estimated pension benefits. Starting in 2018, TRS plans to discontinue mailing of any paper statements and only print paper statements upon member request.

Section V. Results - TRS

(continued)

Status of Recommendations from Prior Administrative Reviews

1. Reach out to NYCERS to gather information on its paperless system/process

Response: TRS collaborates with the other City pension systems, as well as pension systems worldwide through CEM Pension Benchmarking. They feel that this keeps them abreast of new developments and best practices in the industry. A paperless initiative has been started at TRS, but will be fully implemented as part of the modernization roadmap.

2. Review process of storing boxes of information waiting for transportation to offsite facilities

Response: The previous administrative review found that boxes of sensitive information sometimes sit at TRS for two to three weeks before being sent to offsite storage. TRS now reports that boxes are sent at least weekly, or more frequently if needed.

3. Some active member data, such as from CUNY and Charter Schools, are entered into the TRS database manually. TRS should explore secure electronic methods of receiving this data and entering it into the TRS database.

Response: Charter Schools data is being received electronically, directly from each Charter School. CUNY data has been a continuing and well-documented struggle for TRS. TRS would like more buy-in from the State payroll agency and CUNY so that they can better serve the CUNY employees who participate in TRS.

Section VI. Results - BERS

General

The BERS Pension Fund employs a staff of approximately 90. Effective June 1, 2017, BERS went live with a new data management system called CPMS, which replaced a Prudential system that had been in place for decades. In addition to the new system, BERS has recently created a quality assurance department that is concerned with the data flow, origins of data, and filtering systems to identify and modify issues within the data.

Prior to going live with CPMS, an internal database scrub of data from 1990 forward was completed. The data was reviewed extensively to create a complete, accurate employment history for each member. During this process, checks were performed to ensure that the correct employee contributions are being withheld. Previously, due to the large number of part-time members who work multiple jobs and have separate payrolls for each position, employee information wasn't always consistent and the primary employer wasn't always easy to identify. DOE payroll is reported across 5 separate payroll feeds making payroll verification an important component of data management. The quality assurance team is tasked with creating documentation on how to load payroll feeds into CPMS.

The implementation of CPMS has been a tremendous step forward for BERS. BERS is keeping a "wish list" for future enhancement of CPMS as issues arise. BERS is considering connecting member forms to CPMS electronically, to reduce manual data entry and paper flow in the office. They are also working to create and fine-tune logical edits in the system with the hopes of reducing human error. The data historically provided by BERS was of lesser quality than what the other Systems provided, but we believe CPMS should provide data of much better quality to the OA going forward, thanks to the extensive clean-up of data and the new systems capabilities. We will be able to review this further in our next engagement.

Data Collection and Validation

For active members, payroll information is loaded into the system from an electronic feed from OPA and reconciled internally. The DOE provides service data including hours for part-time employees. Member breaks in service can be identified from the City's payroll system since payroll data is loaded on each pay date. There are 60 - 70 payroll sources from which information is loaded each month. The information is loaded into CPMS from three electronic and four manual sources.

Section VI. Results - BERS

(continued)

CPMS has the capability to identify DOE employees who can enter BERS and transfer in service. This allows BERS to proactively reach out to these employees to notify them of their eligibility. BERS is currently staffing an outreach program to conduct informational seminars to assist in enrolling eligible employees. There are about 11,000 - 12,000 employees who are eligible to join BERS but have not yet done so.

BERS and the OA have an annual kickoff meeting where they discuss plan changes, agree on deadlines, and review the data request, noting any changes. BERS has a good working relationship with the OA and feels the data requests are being fulfilled in a timely, efficient manner. However, due to the implementation of the new data system, the data was provided to the OA about six weeks later than usual this year.

An FTP connection has been established between the OA and BERS. A 2017 supplemental file was sent recently to the OA and confirmed received. BERS intends to use this FTP connection going forward to transmit data and benefit calculations to the OA.

The OA identifies any data issues and sends questions to BERS for confirmation or correction. Member demographic data is changed only when a proof document is shown, which is scanned and kept digitally. Any data issues are researched and resolved within CPMS.

Benefit Calculations

About 99% of members attend a personal counseling session prior to retiring. BERS has eight staff members who can conduct the counseling sessions. Approximately 300 individualized sessions are provided each month. If possible, benefit calculations are provided at the session, benefit options are discussed, and assistance is provided with completing paperwork. Proof documents are required in some circumstances (for example, beneficiary date of birth); all proof documents are scanned and stored electronically in CPMS. There are notaries onsite.

Members initiate retirement by completing an application. Once the application is processed, BERS aims for a six-week turnaround to have the member's retirement processed for payment. BERS performs 100 to 150 retirement calculations per month. Calculations are performed for members once actual retirement occurs. Employee data is stored in CPMS, but all Tier 1 and 2 benefit calculations are processed manually outside of CPMS. All other tiers' benefit calculations are performed within CPMS. Benefit estimates are done within CPMS. BERS has plans to write standard operating procedures for benefit calculations once the calculations can be processed in CPMS. There is a plan to assemble a library of training materials and process documents as CPMS continues to develop.

Section VI. Results - BERS

(continued)

The benefit calculation team of eight employs a enterer/verifier/approver process. Calculations are performed and reviewed on-site for accuracy. Once a calculation has been checked and reviewed, it is sent to the OA for certification. Currently, benefit calculations are sent via messenger to the OA for review. BERS upgraded the file transmission to a secure FTP transfer this year. When we met with BERS in June 2017, there was a backlog of about 400 calculations that needed processing, mostly due to the system upgrade. As of the date of this report, the calculation backlog has been resolved. If there is a dispute with a member about a benefit calculation, the member may provide proof documents, which are scanned and saved electronically in CPMS, to initiate a recalculation.

The OA performs the calculations for members who elect to annuitize their TDA balance at retirement. All other calculations are processed in-house by BERS. Calculations for Tier 1 and Tier 2 members are mostly automated but do include some manual edits.

The member is initially paid 80% of their calculated benefit amount until their benefit can be finalized. The temporary disposition is no longer in practice and BERS is back to 100% payment. BERS finalizes the calculation after the OA review. Once a union contract is adopted, members who are in receipt of benefit but may be affected by the new contract are identified and their benefits are verified again. There is no identifier of finalized vs. non-finalized benefits in CPMS.

Terminated members, when identified, are put into a suspended status until the status change can be verified. Terminated members can continue to appear on the payroll feeds for up to 18 months, appearing with \$0 earnings. However, \$0 earnings on the payroll feed can also identify part-time members and employees on leave without pay, so it cannot be relied upon to show that a member's employment has terminated.

Membership remains active for five years after employment has ceased, due to the fact that interest crediting continues for five years after termination. Non-vested members receive account balance statements for five years after employment ceases. When a "cease code" appears on the payroll data, the employee's termination can be verified. BERS reaches out to non-vested members after five years to initiate payment. BERS staff would like to be more proactive and reach out earlier to members who are coming up on five years for payment.

Deceased members are identified through a Social Security death match. LexisNexis is also used to provide death notifications. In certain situations, such as checks going uncashed for several months, the retiree is contacted and asked to provide proof of life.

Section VI. Results - BERS

(continued)

Data Security

BERS is focused on going paperless in the next few years. There is an imaging group on staff that digitizes member information; so far, close to nine million images have been scanned. The digital copy must be certified before the original paper copy can be destroyed. Paper copies of files already digitized are stored in a basement file room, with limited staff access. BERS has the goal of digitizing documents at the beginning of the process instead of the end.

A security guard is stationed in the building lobby. Visitors must be signed in and show photo identification to enter the building. Employees must show their department identification to enter the building, and need security cards to enter office space. Office access can be restricted on a person by person basis. BERS policy states that visitors may never be left unaccompanied in the office space. There is private space available in the office for members to meet with retirement counselors.

Remote computer access is allowed for a few select, authorized staff members, using VPN. DOE controls the VPN, which is monitored by the Department of Information, Technology and Telecommunications (DoITT). A few executives have BERS issued phones, but those with only personal phones may not use them to access the network. There are internal directives on securing sensitive data, and locked file storage, where access is allowed only for staff members in a specific group.

Data is backed up to tape daily. The tapes are sent to offsite storage at Iron Mountain once a week. Tapes are maintained at Iron Mountain for four years. Tapes are not generally retrieved to test whether the data is intact, but there was an instance recently where data needed to be restored from a tape and it was located and usable. DOE runs periodic system breach testing and controls system access.

Staff Training

There has been a fair amount of IT and leadership turnover in the past few years, necessitating staff training policies. Most training is done by having a new staff member partner with a senior staff member to learn and understand processes. The implementation of CPMS required online training sessions and manuals. For the retirement counselors, scripts are provided for training purposes and to ensure that all items are discussed and all relevant information is provided to the member. There is a focus to increase cross-training between teams, to increase staff knowledge and ability to shift roles when specific groups receive surges in requests.

Section VI. Results - BERS

(continued)

Other

The BERS website contains general plan information and documents such as SPDs and forms that can be downloaded and printed. The ability to apply for loans or view statements online does not currently exist.

Statements of account balances are mailed to members twice a year, as of June 30 and December 31. An estimated 10% are returned undeliverable. BERS attempts to resend the returned statements after trying to locate member's address through the payroll system. Currently, BERS is considering moving to electronic delivery method for statements. Thousands of members call in after the statements are issued, most with general questions or requests to change beneficiary information. If an error is identified, the member is asked to fill out a form to identify the error, and return it with the statement. The adjustment is made in the system and if necessary, a revised statement is issued.

Status of Recommendations from Prior Administrative Reviews

1. Develop a formal set of business rules to use in the data verification process.

Response: BERS has recently created a quality assurance department that is tasked with creating documentation concerning data loading and processing. The data verification process was also incorporated into the development of the new CPMS system.

2. Work with DOE to improve credited service reporting for the annual valuation.

Response: An internal database scrub of data from 1990 forward was completed. The data was reviewed extensively to create a complete, accurate employment history for each member. The new CPMS system has accrued service for all members but there are still many variables to be resolved as the system continues to be rolled out.

3. Involve the OA in the development of the new administration system.

Response: The OA was involved in the selection and implementation of the new system.

4. Share the Administrative Review Report with staff.

Response: Staff has indicated that the hard copy of the final Administrative Review Report is routinely made available to all staff interested in reviewing it.

Section VI. Results - BERS

(continued)

5. There is no specific documentation of BERS' process to provide active member data to the OA. BERS should document its active data process in writing.

Response: With the implementation of CPMS, BERS is reviewing, updating, and creating new documents covering all CPMS-related projects. We will follow up on the progress of this in our next engagement.

6. BERS does not supply full-time employees' service and part-time employees' hours to the OA for the valuation. The OA and BERS should work together to validate this data, and if valid, it should be provided to the OA.

Response: This data is now housed in CPMS, and will be provided to the OA. We will follow up on this in our next engagement.

7. The active valuation data process depends too heavily on the involvement of Prudential. BERS should complete the effort to replace the Prudential data system.

Response: This has been accomplished with the implementation of CPMS.

Section VII. Results - POLICE

General

POLICE employs approximately 150 staff members to administer the Police Pension Fund. They utilize a database management system called COPS (Comprehensive Officer Pension System) which houses all active member data, except for the three remaining active members in Tier 1. COPS was first developed in 2002, and was designed to handle only one tier of benefits. Since there are now multiple tiers, POLICE is currently in a procurement process to develop COPS2.0. It is expected that COPS2.0 will be able to handle multiple tiers of benefits, and will also have enhanced security and enable member self-service transactions. The development of COPS2.0 is expected to involve three or four rollouts and take up to four years to complete.

POLICE is at the forefront of data security and disaster recovery. They unfortunately dealt with a data breach several years ago, and with Hurricane Sandy more recently, which tested their processes and led them to improvements they may not have otherwise considered. Data quality continues to improve, with fewer questions from the OA each year. The implementation of COPS2.0 will be a major step forward for POLICE, by further enhancing data quality and allowing member self-service transactions.

Data Collection and Validation

COPS serves as the member data warehouse for POLICE. Data is entered into COPS in three different ways:

1. OPA provides an electronic data feed every other week. This feed includes demographic data, payroll figures, and amounts of any pension-related transactions such as loans, payroll deductions, contributions, account adjustments, and termination information. This data is uploaded into COPS every other week (in off-payroll weeks) through an automated process. The process is first run in a pre-production environment where any errors (for example, invalid dates) can be corrected before the data is actually fed into COPS for staff use.
2. The NYPD provides an electronic data feed daily, which is uploaded into COPS each night. This feed contains members' name, Social Security number, address, rank, and command. There is generally no review of changes that appear in these feeds; any changes are assumed to have been initiated by the member.
3. Certain transactions are initiated by the member and handled on paper forms, such as loans, buy-backs, and service purchases. This information is manually entered into COPS. There is a record-level audit trail within COPS where any manual entries or changes can be viewed.

COPS does not track or store member service. Instead, it creates an "equated date" equal to the appointment date, adjusted for leaves of absence, purchased service, etc.

Section VII. Results - POLICE

(continued)

Each year, the OA sends POLICE a “seed” file containing member data as of the prior valuation date, and asks POLICE to update the data to the current valuation date. Most of the data for the OA is produced in batch processing through COPS. There are a few members (Tier 1 members, reinstated members, and a few dozen managers) who require manual processing. The Financial Information Service Agency (FISA) sends retiree data to the OA, and OPA sends payroll data to the OA. All of the data is sent using secure FTP transmission.

Within a few days of their receipt of the data, the OA sends an initial list of questions to POLICE. These are generally questions regarding changes in static data. After two to three weeks, the OA sends a more comprehensive and detailed list of questions. Questions are researched in COPS, and if corrections are needed, the corrections are made in COPS so they will be maintained in future years.

POLICE believes that they are being asked fewer data questions every year. They attribute this to better internal documentation of the data process, better understanding among staff of the OA’s needs, and continuing improvement in data quality due to member feedback on the annual pension statements.

POLICE gets a Social Security Administration death feed once a month to compare payees to the death match index. There are additional safeguards in place to identify possibly deceased members, such as returned mail, uncashed checks, and rejected direct deposits. Also, often the family notifies the NYPD of the member’s death. Affidavits are sent to overseas and Puerto Rico retirees that require members to certify their status. POLICE currently uses LexisNexis as a cross-reference to verify deaths discovered in other ways. They are considering using LexisNexis on a bi-monthly basis as a second source to identify deceased members. Once it is determined that a member is deceased, beneficiary information is researched and confirmed. Beneficiaries are contacted via mail or phone.

Benefit Calculations

Active members planning to retire schedule an appointment to meet with a retirement counselor. There are eleven POLICE staff members who counsel members. At the counseling session, the member is given a benefit estimate (which may be prepared in advance or can be prepared on the spot in COPS). They discuss tax and direct deposit information, verify the data used in the estimate, discuss retirement benefit and health insurance options, and can sign necessary forms and have them notarized. The amounts of the benefit options are not provided at the counseling session, but the counselors do have some “rules of thumb” for estimating the reductions for the various options. Only about 8% of members elect an option other than the maximum, since they believe the reductions are too steep.

Section VII. Results - POLICE

(continued)

Vested members are tracked in COPS, and contacted only once approximately four to six months in advance of their normal retirement date. A locator service is used to find addresses for anyone whose address in COPS is no longer valid. Members who cannot be located continue to be tracked in COPS until they are located. Payments are made retroactive to the twenty-year anniversary if the member is late to apply for retirement.

Most benefit calculations are performed in the COPS system. COPS is currently unable to process calculations for Tier 3 members, so any calculations for those members are done manually. Since Tier 3 is relatively new, there are not many retirements in that tier. The OA also performs line of duty death benefit calculations and death gamble calculations as well as provides the benefit options for all retirement, disability, and death benefits. Current plans for COPS2.0 include the ability to calculate member benefit options.

The member initially receives monthly benefits equal to 90% of the estimated benefit until finalization occurs. Once the member selects their payment option and the benefit calculation is finalized, the member's benefit is increased to the full amount, and a back payment (with no interest adjustment) is processed within one month of finalization of the benefit. Finalization cannot occur until union contracts are settled, which sometimes takes years. As of the date of our meeting with POLICE in June 2017, there was a backlog of approximately 5,400 calculations due to a recent contract settlement.

Data Security

A security guard is always in the building lobby. Access to the POLICE offices is only available with swipe cards. Paper files are maintained onsite, in the 19th floor office space. POLICE is working toward going paperless. They support a clean desk policy, whereby all files are placed into locked storage at the end of the workday.

When counseling staff runs seminars offsite, a member of the IT department attends and brings laptop computers that connect back to COPS remotely. No POLICE staff members have remote access capability, except for a few senior staff and IT. Only a few senior staff have work-issued cell phones. There is no strict policy for personal cell phones, except that personal devices cannot be connected to POLICE computers. There is very limited internet access on workstations, only business-related sites are available. Access is very restricted and granted only on an as-needed basis.

Section VII. Results - POLICE

(continued)

POLICE maintains a data recovery site on Staten Island. The data recovery site has its own power source, cooling system, and security. Only a few select IT employees have access to that location. Data is backed up daily, and tapes are stored offsite at Iron Mountain. Tapes are regularly brought back to have certain files restored. System breach tests were performed in 2007 and 2009. A security consultant is being brought in for the COPS2.0 implementation to help perform intrusion and penetration tests. Breach tests may be performed annually going forward, depending on budget.

Other

The POLICE website contains general plan information, such as Summary Plan Descriptions, financial information, and member forms that can be downloaded, printed, and completed. There is no member portal, but this is on the POLICE wish list for COPS2.0.

Benefit statements are mailed to members annually. The statements have been a tool by which member data in COPS has been improved, when members contact POLICE to question or correct the data shown.

Status of Recommendations from Prior Administrative Reviews

1. Review NYCERS policies/program regarding a paperless office

Response: POLICE spoke to NYCERS, and to other retirement systems across the country, to learn more about what other systems are doing with regards to a paperless office. They have created a two-stage implementation process for going paperless. In COPS, paper flows through the office and ends up online by the end of the specific process. A goal with the COPS2.0 development is to have paper scanned at the beginning of the process or to have information received electronically.

2. Hire additional staff

Response: As of June 2017, POLICE had a backlog of about 5,400 calculations to be finalized, once union contracts have been settled. They have added two employees to assist with the backlog, but are mostly clearing the backlog through rededication of staff. Even with the staff enhancements, it is expected to be three years before all of the calculations will be finalized. POLICE is considering utilizing more of a batch approach to future finalizations to speed the process.

Section VII. Results - POLICE

(continued)

3. World Trade Center election data should reside in COPS and WTC data should include an indication of whether, and when, members reclassify their status to WTC accidental disability.

Response: This has been completed.

4. POLICE should continue to look for ways to streamline report creation by COPS.

Response: Both POLICE and the OA are happy with the quality of the data and the format in which it is provided.

Section VIII. Results - FIRE

General

FIRE employs approximately 25 staff members to administer the FIRE Pension Fund. They utilize an in-house system, Electronic Uniformed Pension System (e-UPS), which houses member data. Corpus funding has recently been established for the pension group. With the corpus funding, an additional eight to ten new employees may be added, with responsibilities ranging from information technology to benefits. Additionally, there may be an office move that will require a change to where systems, currently combined with the Fire Department systems, are housed.

FIRE does a good job of outreach to their members, by offering monthly retirement seminars and by placing portals in each station to allow members to review their own data and statements. They have a robust internal audit system in place in a continuing effort to improve data quality and processes. This has resulted in very good quality data being provided to the OA, with fewer questions each year. Now that corpus funding has been put in place, FIRE will build up additional resources to further improve their data quality and security.

Data Collection and Validation

The e-UPS serves as the member data warehouse for FIRE. Data is entered into e-UPS in three different ways:

1. OPA supplies the payroll data electronically to FIRE on a bi-weekly basis.
2. New members are added through the payroll department via a one-time manual entry that is sent to OPA after entries are reviewed.
3. There are also some supplementary payrolls that are uploaded separately and consolidated in-house. These are for members that miss a regular payroll.

Data is validated through the annual statements provided to members, OA data review for valuation calculations, and member feedback. A portal is provided in each fire station that allows members to verify data, perform estimates and real time calculations for retirement, apply for loans, and update beneficiary information.

Section VIII. Results - FIRE

(continued)

Each year, the OA sends FIRE a “seed” file containing member data as of the prior valuation date, and asks FIRE to update the data to the current valuation date. FIRE also provides files containing:

- Terminations
- New Entrants
- Withdrawals
- Employee Contributions and Service
- Military Service
- Transfers
- VSF Members

The data feeds are provided electronically to the OA through an encrypted FTP system.

The OA sends member data questions to FIRE. These are generally questions regarding changes in static data. FIRE experiences fewer data questions each year due to having a better understanding of what the OA is requesting and e-UPS system enhancements. Any data issues that are identified are researched and resolved. If a change to the system is required, it is made and noted in the member’s file. Data verification includes some research in paper files. Data for terminated members is stored in paper files as well as in e-UPS (for members terminated after 2012). Paper files are necessary for possible tier reinstatement and other issues that aren’t currently capable of being tracked in e-UPS. All members have paper files stored on-site.

Retiree data is validated through questionnaires mailed to all retirees annually, requiring the retiree to attest to benefits and notify FIRE of status changes in a timely manner or risk having their benefit payment stopped until the form is received. Death audits are performed bi-monthly through the NYC affirmative action division that provides a death match from Social Security. LexisNexis is also used as a backup system for death audits, and FIRE is considering services of a vendor for death searches. They are also working with banks to be able to reverse electronic payments upon notification a member is deceased.

Benefit Calculations

FIRE estimates that there are 700-900 retirements each year. Members are asked to go through the chain of command process for retirement. Most retirements are for disability, either recommended by the Commissioner, by self-application with doctor advice, or Board recommended if not in the line of duty.

Section VIII. Results - FIRE

(continued)

The benefit application process begins with members filling out their paperwork and returning it to the office. Members are strongly encouraged to come to a counseling session for paperwork processing so the benefits group can confirm data and provide retirement information or loan information. There are notaries on-site to assist with certifying election forms.

Typically within 60 days, an estimate is mailed to the member. The member then has 60 days to respond with their election; if no response is received the application goes to the board of trustees to request the maximum payment as the option.

Benefits are calculated in e-UPS. The e-UPS system is used to obtain data for the calculation, as well as any documents the member provides. Once the benefit has been calculated, checked and reviewed in-house, the calculation is sent to the OA for benefit certification. The turnaround time for the OA is usually two weeks, with the calculation sent to OA and returned via messenger. FIRE is working with the OA to set up secure FTP transfer for the calculations. We will review their progress in our next engagement.

While most calculations are automated, manual calculations are performed for WTC reclassifications, some death benefits, pre-2012 retirees (their information is not contained in the system), USERRA law changes about imputed overtime, some contract renegotiations, and member transfers. The OA does complete some calculations for FIRE, including transfers to other State plans.

The OA does not have access to the member data in FIRE's internal system. However, since the source data for the e-UPS system is the same as the source data obtained for valuation purposes by the OA, their data is most often consistent with each other.

Data Security

All visitors must go through security upon entering the building where ID is required. Visitors must pass through metal detectors and be accompanied by an employee to office space. Floors are locked individually, and some can be accessed only by fingerprint scan. Certain employees, depending on seniority level, can come in on weekends and can access only certain floors.

Section VIII. Results - FIRE

(continued)

Paper files are stored in a locked area which requires a key for entry. Files for retirees are stored offsite, and are destroyed after 56 years. Now that corpus funding is in place, FIRE would like to go paperless and create a document control system.

Employees do not have remote access except to view email. FIRE has a clean desk policy, such that any personal information must be locked when the employee is not at their desk.

Data is backed up to tape daily. These backup tapes are sent to offsite storage on a weekly basis. In addition to the FIRE security procedures, general New York City security procedures are managed by DoITT.

Staff Training

Staff members are trained in a classroom setting. There are in-house training sessions and small group discussions on how to handle changes in the law that affect benefits. New employees often train on the job with senior employees on procedures and calculations due to the complexity of the plan design. There is also a procedures manual for employees to reference during and after training.

Other

FIRE does not currently have its own website. Some information, such as plan summaries and CAFRs, is available on the website of the Comptroller's Office. Member-specific information is available through the secure portal accessible from each fire station.

Legally required benefit statements, usually ready by May 1, are sent electronically through the e-UPS employee portal on an annual basis. The portal provided in each fire station allows members to perform estimates and real time calculations for retirement, loan processing, and beneficiary updates. FIRE is not currently able to track how many members view their statement. Statements are not sent by mail. Some members call with corrections to information on their statement, but FIRE requires that written documentation be submitted.

Section VIII. Results - FIRE

(continued)

Status of Recommendations from Prior Administrative Reviews

1. Provide corpus funding for FIRE.

Response: This has occurred.

2. WTC election and buy-back service data reside in data files which are separate from FIRE's main database. These data items should reside in FIRE's main database. WTC data should include an indication of whether, and when, members reclassify their status to WTC accidental disability.

Response: The WTC reclassified disability and death data is still stored in a separate physical file. Buy-back service now resides in the main database.

3. The OA should be given access to actual member data for benefit certification purposes.

Response: The OA does not have access to the FIRE database for benefit certification purposes.

4. Data security can be improved.

Response: Data security is a major concern for FIRE. The recently approved corpus funding has provided extra funds to FIRE which will allow for them to hire their own IT staff instead of borrowing from other departments.

Section IX. Results - OA

General

The OA employs a staff of approximately forty, with about eighteen in the Valuation Services Division, twelve in the Certification Services Division, and ten in administrative and support roles. There are ten credentialed actuaries in the office. The office follows a “team” structure, whereby each plan has a team assigned to it. All of the members of the team attend the kickoff meeting with the System staff. There is some crossover on the teams to provide backup (for example, since the uniformed plans are very similar, there is natural backup between those teams). They did mention that they are working to have even more crossover among the teams, so that when special projects arise, there are more staffing options.

The OA states that they have excellent working relationships with the Systems. There is very little turnover on either side, so the relationships have become long-term and very solid.

Data Collection and Validation

Before the plan year begins, the OA sends data request letters to each of the Systems, as well as “seed” files with instructions for updating them. They also send letters directly to OPA and FISA to request salary data for active members and benefit information for retirees. In addition, they send letters directly to outside agencies whose employees are members of one of the Systems (e.g, Transit Authority). The letters are followed by kick-off meetings with each System. The meetings last about an hour, and are intended to ensure that all parties are aware of timing, deadlines, and data needs.

Once the OA receives the member data, they perform several “high-level” checks. Specifically, they look for changes in static data elements like birthdate and gender, invalid dates, and inconsistencies from the prior year (for example, service increasing more than one year). Once any issues from the high-level checks are addressed, more detailed data validation is performed. The OA states that they have very few data questions, and seemingly fewer every year. They attribute that to the Systems gaining better understanding of the OA’s needs, and the Systems having better processes in place to ensure better quality data. Some of the Systems go so far as to add comments and flags to the data files, to pre-empt questions from the OA.

All of the files received by the OA contain both member number and Social Security number. Most of the data reconciliation work uses member number, not Social Security number. However, it is sometimes useful for the OA to have the Social Security number, for example, to identify when retirements have been reclassified or when retirees with joint and survivor benefits have died.

Section IX. Results - OA

(continued)

There is no standardized data process office-wide, because the Systems and data they provide are so different that standardization is not viable.

Once the OA has completed the data reconciliation process, they send the data to the outside actuary (Conduent). Conduent does additional review of the data and sends any questions or inconsistencies back to the OA to resolve.

Based on inquiries from Unions, State Senators, outside consulting firms that work with Unions, and from the Systems themselves, the OA prepares fiscal notes to estimate the cost impact for all possible plan changes. They have had about 40-50 fiscal notes requested in the past year.

Benefit Calculations

The Certification Services Division certifies approximately 550 calculations each week. Each CSD staff member is trained on at least three Systems, so they can be moved depending on case load. Each case is done, checked, and reviewed before being certified. The process generally takes about two weeks, but no longer than a month. The certifications are done in Excel spreadsheets that contain some VBA programming.

NYCERS and TRS provide most, if not all, of their calculations electronically. The OA has the ability to access the underlying data used in the calculations.

BERS, POLICE, and FIRE provide their calculations on paper. The OA does not have access to the underlying data used in the calculations, so they are able only to check for reasonableness.

The OA performs, rather than just certifies, any non-standard calculations. Fifty to one hundred calculations per week are considered non-standard (for example, service transfers, death benefits).

The OA estimates that about 3% of cases have errors, although many are minor errors such as the misspelling of the member's name. The OA points out the error to the System, but does not get involved in the correction process if there is one.

Section IX. Results - OA

(continued)

There has been discussion over the years about whether the OA could give the Systems “pre-checked” calculation software, to be used for standard cases. This would greatly reduce the OA’s workload and improve the turnaround time for the non-standard calculations. This has not been implemented at any System, but all parties seem to be open to the idea. However, the OA did mention that this would be difficult to implement for NYCERS in particular, given the variety of plan provisions.

Data Security

All paper files are stored onsite. The OA is running out of filing space, since they have paper files that date back to 1920. They are moving toward becoming a paperless office. This is a City-wide initiative, and something that the Chief Actuary strongly supports. Any paper files that are no longer needed are shredded in-house after being scanned.

The OA does not currently have specific policies related to cell phones or clean desk. They believe that all employees understand the confidential nature of the information in their possession, and trust employees to treat the data with care.

No employees are permitted to tele-commute on a regular basis; only in special cases of inclement weather or special overtime. Only a few select staff members, senior staff and IT, have remote access. The remote access is done via VPN which is managed by DoITT.

A security guard is always onsite in the building lobby. Visitors must be signed in and must show identification before being allowed past the lobby. Employees have access cards that allow them into the building between 7:00 am and 7:00 pm.

Data is backed up to disk every night. Two weeks of backup disks are kept onsite. After two weeks, disks are boxed up and sent to offsite storage (under a City-wide contract). Boxes are kept in offsite storage for ten years. The boxes are rotated back to the OA so the oldest disks can be re-used. The boxes are all sealed closed with a unique zip-tie, so when the boxes are recovered the OA can be sure they were not opened or tampered with. They have never looked at the data on the returned tapes to see if it is intact or usable.

The OA has never run a data breach test internally, but the City does run such tests regularly. The OA is protected by two firewalls; their own and one through Citynet. All desktops and servers are mandated to run the City’s software for intrusion protection and virus protection.

Section IX. Results - OA

(continued)

Status of Recommendations from Prior Administrative Reviews

1. Perform all portions of the experience study internally

Response: The OA would not be opposed to doing the experience study in the future, but would need additional staff to take on that additional work. Given the project nature of this work, level staffing would be difficult. However, the OA believes that the City favors having an independent party perform the experience study and review the actuarial assumptions developed by the OA.

2. Prepare formal valuation reports for NYCERS, TRS, and BERS

Response: These valuation reports are currently in the works. The OA should have more of an update on their progress in our next review. However, they currently prepare contribution letters for NYCERS, TRS, and BERS, which they believe contain information which is very similar to what would be contained in a formal valuation report.

3. Work with BERS to obtain better credited service information

Response: BERS recently implemented a new data management system. During the implementation process, the data was reviewed and cleaned up significantly. We expect that going forward, the data provided by BERS to the OA will be much more accurate. We will look into this further in our next review.

4. Prepare for the contribution audit while performing the regular valuation

Response: The prior actuarial auditor, GRS, mentioned that receipt of sample lives from the OA was delayed, and recommended that the OA develop a representative list of sample lives to provide upon request. However, we did not encounter the issue GRS mentioned in this regard. We prefer to select sample lives rather than have a pre-selected set, and when we requested sample life output for our chosen sample, we received the information promptly. We also did not see the need to review as many sample lives, given the full replication nature of the audit.

Section IX. Results - OA

(continued)

5. CSD should explore whether using the FTP site will increase efficiency in processing benefit calculations

Response: The Systems that currently provide calculations on paper (BERS, POLICE, and FIRE) are all in the process of upgrading their data management systems. It is expected that electronic transmission of benefit calculations will be much more feasible once the new systems are in place. We will follow up on this in our next review.

6. CSD should reconsider batch processing of recalculations due to contract settlements

Response: There has been discussion over the years about whether the OA could give the Systems “pre-checked” calculation software, at least to be used for standard cases. This would greatly reduce the OA’s workload and improve the turnaround time for the non-standard calculations. This has not been implemented at any System, but all parties seem to be open to the idea. However, the OA did mention that this would be difficult to implement for NYCERS in particular, given the variety of plan provisions.

Appendix. Acknowledgements

We express our sincere thanks to the individuals listed below. We are grateful for their assistance and support during the course of the Administrative Review.

Office of the Actuary

Sherry Chan	Anderson Huynh	Rachel Lu	Vijay Kohli
Michael Samet	Ting Chen	Anna Vishnevetski	Frankie Chen
Paul Birnbaum	Bel Baptista		

NYCERS

Michael Goldson	Regina Kahney	Elizabeth Reyes	Julet Barnett
Hailey Vaughan	Badar Malik	Craig Thornton	Vilma Ebanks
Dominick Fallucci	Tenaye Wolde	Roy Holder	Ilyse Sisolak
Ellen Carton	John Hartman	Chun Gong	Greta John

TRS

Kate Chen	Kavita Kanwar	Ameer Chaudhury	Vladimir Liberman
Yuriy Khanutin	M. Ram	Madeline Peters	Carmela Crivelli
John Quadrino	James Sarker	George Guz	Tatiana Pezzoli
Andrew Bradford	Jamie Sutterlin	Igor Tsirkel	Pat Quinn
Jamaira Sanchez-Morales			

BERS

Michael Sohn	Steven Sebili	Ruby Chua	John Cahalin
J.D. Desmornes	Sanford Rich	Maria Cebin	

POLICE

John Flynn	Sunny Bavakutly	Jane Lee	Charles Mistretta
Bob Sens-Castet	Tara Braccia	John Como	William Dorney
Nelsi Rodriguez	Sal Locascio	Reynaldo Brigantty	Lisa Offner
Chris Johnson	Andrea Myrie	David Held	
Deborah Callender-Edwards			

FIRE

Yinyu (Winnie) Lin	Natalia Zorina	Albert Connolly	Michael O'Connor
Andrew Lai	Timica Wilson		

APPENDIX 5

Sample Standard GASB 67/68 Report



City Police Employees' Retirement Plan

GASB 67 & 68 Actuarial Information for
the Measurement Period Ending
June 30, 2018

Bolton

Submitted by:

John Smith, FSA, EA, MAAA

Senior Consulting Actuary

(443) 573-3000

info@boltonusa.com



September 13, 2018

Ms. Mary Jones
City Manager
7500 Maple Avenue
City, MD 20000

Re: City Police Employees' Retirement Plan – GASB 67 & 68 Actuarial Information for the Measurement Period Ending June 30, 2018

Dear Mary,

The following report contains the GASB 67 and GASB 68 actuarial information to be included with the City's financial statements for FY2018. The GASB 68 information has been provided as of the June 30, 2018 measurement date for FY18.

Methodology, Reliance and Certification

This report is prepared for the City. The report contains the actuarial information to be included with the City's financial statements for the year ending June 30, 2018 (the City's fiscal year end date) as required by GASB 68. This information has been prepared for use in the financial statements of the City. This information is not intended for, nor should it be used for, any additional purposes.

The total pension liability is based on the July 1, 2017 actuarial valuation rolled forward to June 30, 2018. The methods, assumptions, and participant data used are detailed in the July 1, 2017 actuarial valuation report with the exception of the actuarial cost method. These calculations are based on the Entry Age Normal cost method as required by GASB 67. The calculation of the Actuarially Determined Contribution for the fiscal year ended June 30, 2018 is contained in the July 1, 2016 actuarial valuation report.

The included calculations assume that the members and the City will continue to make all required actuarially determined contributions. Based on that assumption, the plan's fiduciary net position is expected to be available to make all future benefit payments of current plan members.

The long-term nominal expected rate of return on pension plan investments was determined using a building-block method where return expectations are established for each asset class. The building-block approach uses the current underlying fundamentals, not historical returns. For example, spread and the risk free rate are used for fixed income; and dividends, earnings growth and valuation are used for equity. These return expectations are weighted based on asset/target amounts.

These calculations and comparisons with assets are applicable for the valuation date only. The future is uncertain, and the plan may become better funded or more poorly funded in the future. This valuation does not provide any guarantee that the plan will be able to provide the promised benefits in the future.

Methodology, Reliance and Certification (cont.)

This is a deterministic valuation in that it is based on a single set of assumptions. This set of assumptions is one possible basis for our calculations. Other assumptions may be equally valid. The future is uncertain and the plan's actual experience will differ from those assumptions; these differences may be significant or material because these results are very sensitive to the assumptions made and, in some cases, to the interaction between the assumptions. We may consider that some factors are not material to the valuation of the plan and may not provide a specific assumption for those factors. We may have used other assumptions in the past. We will likely consider changes in assumptions at a future date.

The City is responsible for selecting the plan's funding policy, actuarial valuation methods, asset valuation methods, and assumptions. The policies, methods and assumptions used in this valuation are those that have been so prescribed and are described in this report. The City is solely responsible for communicating to Bolton any changes required thereto.

The City could reasonably ask how the valuation would change if we used a different assumption set or if plan experience exhibited variations from our assumptions. This report does not contain such an analysis. This type of analysis would be a separate assignment.

The cost of this plan is determined by the benefits promised by the plan, the plan's participant population, the investment experience of the plan and many other factors. An actuarial valuation is a budgeting tool for the City or in this case a measure of accounting expense. It does not affect the cost of the plan. As the experience of the plan evolves, it is normal for the level of contributions and expense of the plan to change. If a contribution is not made for a particular year, either by deliberate choice or because of an error in a calculation, that contribution can be made in later years. We will not be responsible for contributions that are made at a future time rather than an earlier time. The plan sponsor is responsible for funding the cost of the plan.

We make every effort to ensure that our calculations are accurately performed. These calculations are complex. Despite our best efforts, we may make a mistake. We reserve the right to correct any potential errors by amending the results of this report or by including the corrections in a future valuation report.

Because modeling all aspects of a situation is not possible or practical, we may use summary information, estimates, or simplifications of calculations to facilitate the modeling of future events in an efficient and cost-effective manner. We may also exclude factors or data that are immaterial in our judgment. Use of such simplifying techniques does not, in our judgment, affect the reasonableness of valuation results for the plan.

This report is based on plan provisions, census data, and asset data submitted by the City. We have relied on this information for purposes of preparing this report, but have not performed an audit. The accuracy of the results presented in this report is dependent upon the accuracy and completeness of the underlying information. The plan sponsor is solely responsible for the validity and completeness of this information.

The City is solely responsible for selecting the plan's investment policies, asset allocations and individual investments. Bolton Partners, Inc.'s actuaries have not provided any investment advice to the City.



Methodology, Reliance and Certification (cont.)

The information in this report was prepared for the internal use of the City, the plan and their auditors in connection with our actuarial valuations of the pension plan as required by GASB68. This report may not be used for any other purpose; Bolton Partners, Inc. is not responsible for the consequences of any unauthorized use or the reliance on this information by any other party.

The calculation of actuarial liabilities for valuation purposes is based on a current estimate of future benefit payments. The calculation includes a computation of the “present value” of those estimated future benefit payments using an assumed discount rate; the higher the discount rate assumption, the lower the estimated liability will be. For purposes of estimating the liabilities (future and accrued) in this report, you selected an assumption based on the expected long-term rate of return on plan investments. Using a lower discount rate assumption, such as a rate based on long-term bond yields, could substantially increase the estimated present value of future and accrued liabilities.

This report provides certain financial calculations for use by the auditor. These values have been computed in accordance with our understanding of generally accepted actuarial principles and practices and fairly reflect the actuarial position of the Plan. The various actuarial assumptions and methods which have been used are, in our opinion, appropriate for the purposes of this report.

The report is conditioned on the assumption of an ongoing plan and is not meant to present the actuarial position of the Plan in the case of Plan termination. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions, changes in economic or demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan’s funded status), and changes in plan provisions or applicable law.

The undersigned credentialed actuary meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. The July 1, 2017 actuarial valuation report contains information that is integral to the results contained herein and a copy may be provided upon request.

Sincerely,

Bolton

John Smith, FSA, EA, MAAA



City Police Employees' Retirement Plan

Actuarial Information to Include in the Financial Statements for the June 30, 2018 Measurement Date

Net Pension Liability of the City

The components of the net pension liability of the City at June 30, 2018, were as follows:

Total pension liability	\$ 26,186,659
Plan fiduciary net position	(15,861,151)
City's net pension liability	<u>\$ 10,325,508</u>
Plan fiduciary net position as a percentage of the total pension liability	60.57%

Actuarial assumptions. The total pension liability was determined by an actuarial valuation as of July 1, 2017 rolled forward to June 30, 2018 using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	3.0%
Salary increases	5.5 percent, including inflation
Investment rate of return	7.25 percent, net of pension plan investment expense, including inflation
Mortality	RP-2014 Healthy Blue Collar Tables with fully generational projection using scale MP-2015

The above is a summary of key actuarial assumptions. Full descriptions of the actuarial assumptions are available in the July 1, 2017 actuarial valuation report.

Sensitivity of the net pension liability to changes in the discount rate

	1% Decrease 6.25%	Current Discount Rate 7.25%	1% Increase 8.25%
City's net pension liability	\$ 14,209,230	\$ 10,325,508	\$ 7,180,789

City Police Employees' Retirement Plan
 Actuarial Information to Include in the Financial Statements
 for the June 30, 2018 Measurement Date

Changes in the Net Pension Liability

	Increase (Decrease)		
	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)
Balances at 6/30/17	\$ 23,718,631	\$ 13,993,307	\$ 9,725,324
Changes for the year:			
Service cost	839,314		839,314
Interest	1,690,196		1,690,196
Changes of benefit terms	-		-
Differences between expected and actual experience	(114,976)		(114,976)
Changes of assumptions	864,665		864,665
Contributions - employer		1,325,199	(1,325,199)
Contributions - member		196,589	(196,589)
Net investment income		1,222,043	(1,222,043)
Benefit payments, including refunds of member contributions	(811,171)	(811,171)	-
Administrative expense		(64,816)	64,816
Other		-	-
Net Changes	<u>2,468,028</u>	<u>1,867,844</u>	<u>600,184</u>
Balances at 6/30/18	<u>\$ 26,186,659</u>	<u>\$ 15,861,151</u>	<u>\$ 10,325,508</u>

City Police Employees' Retirement Plan

Actuarial Information to Include in the Financial Statements for the June 30, 2018 Measurement Date

Components of City's Pension Expense for the Fiscal Year Ended June 30, 2018

Note	Description	Amount
A	Service Cost	\$ 839,314
B	Interest on the total pension liability	1,690,196
A	Changes of benefit terms	-
C	Differences between expected and actual experience	(520,079)
C	Changes of assumptions	338,295
A	Employee contributions	(196,589)
D	Projected earnings on pension plan investments	(1,037,924)
C	Differences between expected and actual earnings on plan investments	85,972
A	Pension plan administrative expense	64,816
A	Other changes in fiduciary net position	-
Total Pension Expense		\$ 1,264,001

Notes:

- A Provided in the Changes in Net Pension Liability exhibit.
 B Based on the following calculation:

	Amount for Period (a)	Portion of Period (b)	Projected Rate of Return (c)	Projected Earnings (a) x (b) x (c)
Beginning total pension liability	\$ 23,718,631	100%	7.25%	\$ 1,719,601
Service Cost (End of Year)	839,314	0%	7.25%	-
Benefit payments, including refunds of employee contributions	(811,171)	50%	7.25%	(29,405)
Total interest on the total pension liability				\$ 1,690,196

- C Provided in the Schedules of Deferrals.
 D Based on the following calculation:

	Amount for Period (a)	Portion of Period (b)	Projected Rate of Return (c)	Projected Earnings (a) x (b) x (c)
Beginning plan fiduciary net position	\$ 13,993,307	100%	7.25%	\$ 1,014,515
Employer contributions	1,325,199	50%	7.25%	48,038
Employee contributions	196,589	50%	7.25%	7,126
Benefit payments, including refunds of employee contributions	(811,171)	50%	7.25%	(29,405)
Administrative expense and other	(64,816)	50%	7.25%	(2,350)
Total Projected Earnings				\$ 1,037,924

City Police Employees' Retirement Plan

Actuarial Information to Include in the Financial Statements for the June 30, 2018 Measurement Date

Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions

At June 30, 2018, the City reported deferred outflows of resources and deferred inflows of resources related to pensions from the following sources:

	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	\$ -	\$ 1,034,320
Changes of assumptions	1,187,817	-
Net difference between projected and actual earnings on pension plan investments	385,254	464,267
Total	\$ 1,573,071	\$ 1,498,587

Amounts reported as deferred outflows of resources and deferred inflows of resources related to pensions will be recognized in pension expense as follows:

Year ended June 30:	
2019	\$ (95,810)
2020	106,991
2021	(49,811)
2022	113,114
2023	-
Thereafter	-

City Police Employees' Retirement Plan

Actuarial Information to Include in the Financial Statements for the June 30, 2018 Measurement Date

Changes in the City's Net Pension Liability and Related Ratios
Last 10 Fiscal Years (Dollar amounts in thousands)

Total pension liability	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Service cost	\$ 839	\$ 809	\$ 790	\$ 543	\$ 796					
Interest	1,690	1,616	1,543	1,547	1,438					
Changes of benefit terms	-	-	-	-	-					
Differences between expected and actual experience	(115)	(645)	(562)	(1,372)	-					
Changes of assumptions	865	827	-	-	-					Information for FY2013 and earlier is not available
Benefit payments, including refunds of member contributions	(811)	(857)	(757)	(786)	(784)					
Net change in total pension liability	2,468	1,750	1,014	(67)	1,450					
Total pension liability - beginning	23,719	21,969	20,955	21,022	19,572					
Total pension liability - ending (a)	\$ 26,187	\$ 23,719	\$ 21,969	\$ 20,955	\$ 21,022					

Plan fiduciary net position	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Contributions - employer	\$ 1,325	\$ 1,190	\$ 1,296	\$ 1,102	\$ 1,045					
Contributions - member	197	189	194	178	184					
Net investment income	1,222	1,452	90	441	1,355					
Benefit payments, including refunds of member contributions	(811)	(857)	(757)	(786)	(784)					
Administrative expense	(65)	(58)	(57)	(60)	(55)					Information for FY2013 and earlier is not available
Other	-	-	-	-	-					
Net change in plan fiduciary net position	\$ 1,868	\$ 1,916	\$ 766	\$ 875	\$ 1,744					
Plan fiduciary net position - beginning	13,993	12,078	11,311	10,436	8,693					
Plan fiduciary net position - ending (b)	\$ 15,861	\$ 13,993	\$ 12,078	\$ 11,311	\$ 10,436					

City's net pension liability - ending (a)-(b)	<u>\$ 10,326</u>	<u>\$ 9,725</u>	<u>\$ 9,891</u>	<u>\$ 9,643</u>	<u>\$ 10,586</u>
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Plan fiduciary net position as a percentage of the total pension liability	60.57%	59.00%	54.98%	53.98%	49.64%
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Covered payroll	\$ 2,889	\$ 2,777	\$ 2,843	\$ 2,570	\$ 2,850
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City's net pension liability as a percentage of covered payroll	357.38%	350.16%	347.89%	375.20%	371.49%
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Expected average remaining service years of all participants	5	5	6	5	6
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Notes to Schedule:

Benefit changes: None.

Changes of assumptions: For FY18, the interest rate net of investment related expenses, compounded annually was changed from 7.50% to 7.25%.

City Police Employees' Retirement Plan

Actuarial Information to Include in the Financial Statements for the June 30, 2018 Measurement Date

Schedule of City Contributions

Last 10 Fiscal Years (Dollar amounts in thousands)

	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Actuarially determined contribution	\$ 1,325	\$ 1,190	\$ 1,296	\$ 1,102	\$ 1,045					
Contributions in relation to the actuarially determined contribution	1,325	1,190	1,296	1,102	1,045					
Contribution deficiency (excess)	<u>\$ -</u>									
Covered payroll	\$ 2,889	\$ 2,777	\$ 2,843	\$ 2,570	\$ 2,850					
Contributions as a percentage of covered employee payroll	45.87%	42.84%	45.60%	42.86%	36.65%					

Information for FY2013 and earlier is not available

Notes to Schedule

Valuation date:

Actuarially determined contribution amounts are calculated as of the beginning of the fiscal year (July 1) for the year immediately following the fiscal year. Actuarial valuations are performed every year.

Methods and assumptions used to determine contribution rates:

Actuarial cost method	Projected Unit Credit
Amortization method	Level Percentage of Payroll
Remaining amortization period	22 years (closed)
Asset valuation method	5-year smoothed market
Inflation	3.0%
Salary increases	5.5 percent, including inflation
Investment rate of return	7.25 percent, net of pension plan investment expense, including inflation
Retirement age	Rates vary by participant age and service
Mortality	RP-2014 Healthy Blue Collar Tables with fully generational projection using scale MP-2015

City Police Employees' Retirement Plan

Actuarial Information to Include in the Financial Statements
for the June 30, 2018 Measurement Date

Schedule of Differences between Projected and Actual Earnings on Pension Plan Investments

In conformity with paragraph 33b of Statement 68, the effects of differences between projected and actual earnings on pension plan investments are recognized in pension expense using a systematic and rational method over a closed five-year period, beginning in the current reporting period. The following table illustrates the application of this requirement.

Increase (Decrease) in Pension Expense Arising from the Recognition of Differences between Projected and Actual Earnings on Plan Investments											
Year	Differences between Projected and Actual Earnings on Pension Plan Investments	Recognition Period (Years)	2014	2015	2016	2017	2018	2019	2020	2021	2022
2014	\$ -	5	\$ -	-	-	-	-	-	-	-	-
2015	358,276	5		\$ 71,655	71,655	71,655	71,655	71,656			
2016	783,992	5			\$ 156,798	156,798	156,798	156,798	156,800		
2017	(528,286)	5				\$ (105,657)	(105,657)	(105,657)	(105,657)	(105,658)	
2018	(184,119)	5					\$ (36,824)	(36,824)	(36,824)	(36,824)	(36,823)
Net increase (decrease) in pension expense			\$ -	\$ 71,655	\$ 228,453	\$ 122,796	\$ 85,972	\$ 85,973	\$ 14,319	\$ (142,482)	\$ (36,823)

Deferred Outflows of Resources and Deferred Inflows of Resources Arising from Differences between Projected and Actual Earnings on Pension Plan Investments

Year	Investment Earnings Less than Projected (a)	Investment Earnings Greater Than Projected (b)	Amounts Recognized in Pension Expense Through June 30, 2018 (c)	Balances at June 30, 2018	
				Deferred Outflows of Resources (a) - (c)	Deferred Inflows of Resources (b) - (c)
2014	\$ -	\$ -	\$ -	\$ -	\$ -
2015	358,276	-	286,620	71,656	-
2016	783,992	-	470,394	313,598	-
2017	-	528,286	211,314	-	316,972
2018	-	184,119	36,824	-	147,295
				\$ 385,254	\$ 464,267

City Police Employees' Retirement Plan

Actuarial Information to Include in the Financial Statements
for the June 30, 2018 Measurement Date

Schedule of Differences between Expected and Actual Experience

In conformity with paragraph 33a of Statement 68, the effects of differences between expected and actual experience are recognized in pension expense, beginning in the current reporting period, using a systematic and rational method over a closed period equal to the average of the remaining service lives of all employees that are provided with pensions through the pension plan (active and inactive employees), determined as of the beginning of the measurement period. The following table illustrates the application of this requirement.

Increase (Decrease) in Pension Expense Arising from the Recognition of Differences between Expected and Actual Experience															
Year	Differences between Expected and Actual Experience	Recognition Period (Years)	Prior	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thereafter
Prior	\$ -		\$ -	-	-	-	-	-	-	-	-	-	-	-	-
2013	-	1		\$ -	-	-	-	-	-	-	-	-	-	-	-
2014	-	6			\$ -	-	-	-	-	-	-	-	-	-	-
2015	(1,372,279)	5				\$ (274,456)	(274,456)	(274,456)	(274,456)	(274,455)	-	-	-	-	-
2016	(561,940)	6					\$ (93,657)	(93,657)	(93,657)	(93,657)	(93,657)	(93,655)	-	-	-
2017	(644,857)	5						\$ (128,971)	(128,971)	(128,971)	(128,971)	(128,973)	-	-	-
2018	(114,976)	5							\$ (22,995)	(22,995)	(22,995)	(22,995)	(22,996)	-	-
Net increase (decrease) in pension expense			\$ -	\$ -	\$ -	\$ (274,456)	\$ (368,113)	\$ (497,084)	\$ (520,079)	\$ (520,078)	\$ (245,623)	\$ (245,623)	\$ (22,996)	\$ -	\$ -

Deferred Outflows of Resources and Deferred Inflows of Resources Arising from Differences between Expected and Actual Experience

Year	Experience Losses (a)	Experience Gains (b)	Amounts Recognized in Pension Expense Through June 30, 2018 (c)	Balances at June 30, 2018	
				Deferred Outflows of Resources (a) - (c)	Deferred Inflows of Resources (b) - (c)
Prior	\$ -	\$ -	\$ -	\$ -	\$ -
2013	-	-	-	-	-
2014	-	-	-	-	-
2015	-	1,372,279	1,097,824	-	274,455
2016	-	561,940	280,971	-	280,969
2017	-	644,857	257,942	-	386,915
2018	-	114,976	22,995	-	91,981
				\$ -	\$ 1,034,320

City Police Employees' Retirement Plan

Actuarial Information to Include in the Financial Statements
for the June 30, 2018 Measurement Date

Schedule of Changes of Assumptions

In conformity with paragraph 33a of Statement 68, the effects of the effects of changes of assumptions should be recognized in pension expense, beginning in the current reporting period, using a systematic and rational method over a closed period equal to the average of the remaining service lives of all employees that are provided with pensions through the pension plan (active and inactive employees), determined as of the beginning of the measurement period. The following table illustrates the application of this requirement.

Increase (Decrease) in Pension Expense Arising from the Effects of Changes of Assumptions															
Year	Changes of Assumptions	Recognition Period (Years)	Prior	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thereafter
Prior	\$ -		\$ -												
2013	-	1		\$ -											
2014	-	6			\$ -										
2015	-	5				\$ -									
2016	-	6					\$ -								
2017	826,809	5						\$ 165,362	165,362	165,362	165,362	165,361			
2018	864,665	5							\$ 172,933	172,933	172,933	172,933	172,933	172,933	
Net increase (decrease) in pension expense			\$ -	\$ -	\$ -	\$ -	\$ -	\$ 165,362	\$ 338,295	\$ 338,295	\$ 338,295	\$ 338,294	\$ 172,933	\$ -	\$ -

Deferred Outflows of Resources and Deferred Inflows of Resources Arising from Changes of Assumptions

Year	Increases in the Total Pension Liability (a)	Decreases in the Total Pension Liability (b)	Amounts Recognized in Pension Expense Through June 30, 2018 (c)	Balances at June 30, 2018	
				Deferred Outflows of Resources (a) - (c)	Deferred Inflows of Resources (b) - (c)
Prior	\$ -	\$ -	\$ -	\$ -	\$ -
2013	-	-	-	-	-
2014	-	-	-	-	-
2015	-	-	-	-	-
2016	-	-	-	-	-
2017	826,809	-	330,724	496,085	-
2018	864,665	-	172,933	691,732	-
				\$ 1,187,817	\$ -

APPENDIX 6

Actuarial Directory Listings for Bolton Personnel

The Actuarial Directory

Ellen L Kleinstuber

FSA MAAA EA FCA FSPA

Senior Consulting Actuary

Bolton Partners, Inc.

36 S Charles St Ste 1000

Baltimore

Maryland 21201-3105

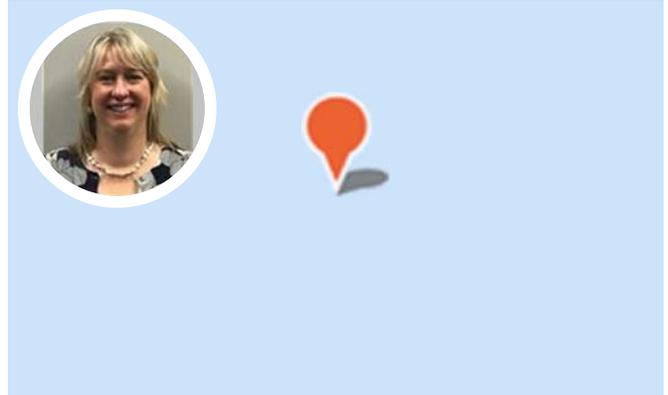
United States

Email EllenKActuary@gmail.com

Email ekleinstuber@boltonusa.com

Mobile +1(610)999-9567

Tel +1(443)573-3912



Designations

MAAA 1998

EA 1998

FCA 2005

FSA 2011

FSPA 2014

SOA CPD attestation status

Compliant(2016-2017)

Academic degrees

B.S.

Industry

Consulting

Primary area of practice

Retirement

Specializations

Other Post-Employment Benefits

Private Sector - Pension

Public Sector - Pension

Society of Actuaries Sections

Leadership & Development

Retirement

Social Insurance & Public Finance

Biography

Ellen has been practicing as a pension actuary since 1992. She has a broad base of expertise that includes funding and accounting for corporate and public-sector retirement program, plan design and administration, regulatory compliance, pension risk transfer transactions and plan termination. Ellen also provides research and consulting support to her firm's actuarial practices, leads business development efforts for the firm's single employer practice, and serves as a relationship manager for several of the firm's larger single employer clients. Ellen is a Fellow of the Society of Actuaries, the Conference of Consulting Actuaries and the ASPPA College of Pension Actuaries, an Enrolled Actuary and a Member of the American Academy of Actuaries. Ellen serves on the Board of Directors of the Conference of Consulting Actuaries, is the chairperson of the Pension Committee of the American Academy of Actuaries, and the vice-chairperson of the Joint Program Committee for the Enrolled Actuaries Meeting.

The Actuarial Directory

Thomas B Lowman

FSA EA MAAA FCA

Vice President & Chief Actuary

Bolton Partners Inc

36 S Charles St Ste 1000

Baltimore

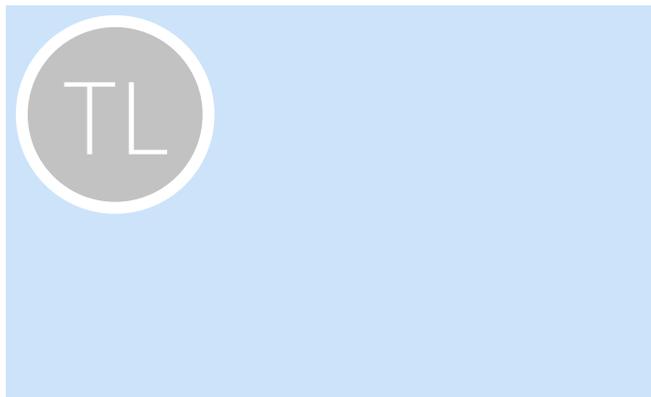
Maryland 21201-3020

United States

Email TLowman@boltonusa.com

Fax +1(410) 6851924

Tel +1(443)573-3909



Designations

EA 1981

MAAA 1982

FSA 1982

FCA 2009

SOA CPD attestation status

Compliant(2016-2017)

Industry

Consulting

Primary area of practice

Retirement

Society of Actuaries Sections

Retirement

The Actuarial Directory

James E Ritchie

ASA MAAA EA

Senior Consulting Actuary

Bolton

36 S Charles St Ste 1000

Baltimore

Maryland 21201-3105

United States

Email jritchie72@gmail.com

Email jritchie@boltonusa.com

Tel +1(410)935-5598



Designations

ASA 1994

MAAA 1995

EA 1996

SOA CPD attestation status

Compliant(2016-2017)

Academic degrees

B.B.A.

Industry

Consulting

Primary area of practice

Retirement

The Actuarial Directory

Jordan Michael McClane

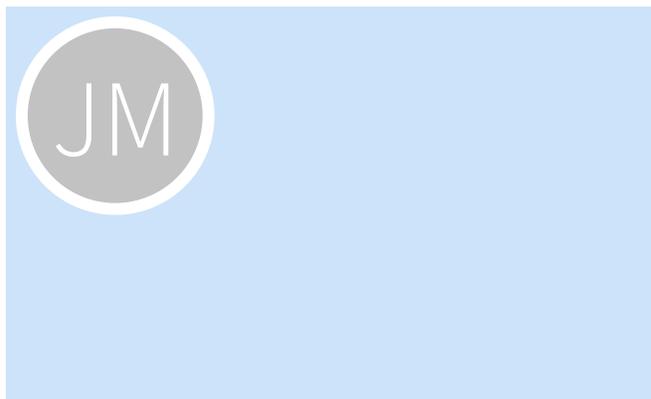
ASA EA

Bolton Partners Inc

36 S Charles St Ste 1000
Baltimore
Maryland 21201-3020
United States

Email jmccrane@boltonusa.com

Tel +1(484)947-9939



Designations

ASA 2015
EA 2017

SOA CPD attestation status

Compliant(2016-2017)

Academic degrees

B.S.

Industry

Consulting

Primary area of practice

Retirement

Specializations

Private Sector - Pension
Public Sector - Pension

The Actuarial Directory

Michael Joseph Spadaro Jr.

ASA



Designations

ASA 2017

SOA CPD attestation status

Compliant(2016-2017)

APPENDIX 7

Addendum Acknowledgement Form

REQUEST FOR PROPOSAL
Municipal Pensions Oversight Board
Requisition No: MPO1900000001

**ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.:**

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:

(Check the box next to each addendum received)

- Addendum No. 1 Addendum No. 6
- Addendum No. 2 Addendum No. 7
- Addendum No. 3 Addendum No. 8
- Addendum No. 4 Addendum No. 9
- Addendum No. 5 Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Bolton Partners, Inc.
Company


Authorized Signature

10/23/18
Date

NOTE: This addendum acknowledgment must be submitted with the bid by uploading the page into wvOASIS to expedite document processing.

APPENDIX 8

Certification and Signature Form

REQUEST FOR PROPOSAL
Municipal Pensions Oversight Board
Requisition No: MPO1900000001

CERTIFICATION AND SIGNATURE

By signing below and uploading this page as an attachment into wvOASIS, I certify that I have reviewed this Request for Proposal in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the Municipal Pensions Oversight Board that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that I am authorized by the vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

Bolton Partners, Inc.
(Company)

Thomas B. Lowman, Chief Actuary & President of Bolton Retirement
(Name) (Title)

 10/23/18
(Authorized Signature) (Date)

APPENDIX 9

Purchasing Affidavit Form

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

CONSTRUCTION CONTRACTS: Under W. Va. Code § 5-22-1(i), the contracting public entity shall not award a construction contract to any bidder that is known to be in default on any monetary obligation owed to the state or a political subdivision of the state, including, but not limited to, obligations related to payroll taxes, property taxes, sales and use taxes, fire service fees, or other fines or fees.

ALL CONTRACTS: Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

EXCEPTION: The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (W. Va. Code §61-5-3) that: (1) for construction contracts, the vendor is not in default on any monetary obligation owed to the state or a political subdivision of the state, and (2) for all other contracts, that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: Bolton Partners, Inc.

Authorized Signature: [Handwritten Signature]

Date: 10/23/18

State of Maryland

County of Anne Arundel, to-wit:

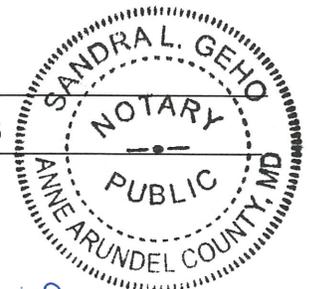
Taken, subscribed, and sworn to before me this 23 day of October, 2018

My Commission expires Feb 20, 2019.

AFFIX SEAL HERE

NOTARY PUBLIC

[Handwritten Signature]



APPENDIX 10

RFP Form



**State of West Virginia
Request For Proposal
Service - Prof**

Procurement Folder : 489180

Document Description : Actuarial Services

Procurement Type : Agency Master Agreement

Date Issued	Solicitation Closes	Solicitation No	Version	Phase
2018-09-28	2018-10-24 15:00:00	ARFP 0946 MPO1900000001	2	Final

SUBMIT RESPONSES TO:	VENDOR
<p>ALL BIDS MUST BE SUBMITTED ELECTRONICALLY wvOASIS Vendor Self Service (VSS) Register and bid online at: www.wvOASIS.gov US</p> <p align="right">WV 00000</p>	<p>Vendor Name, Address and Telephone</p> <p>Bolton Partners, Inc. 36 S Charles St Suite 1000 Baltimore, MD 21201 410-547-0500</p>

FOR INFORMATION CONTACT THE BUYER
 Karen LeAnne Neccuzi
 (304) 356-2422
 leanne.k.neccuzi@wv.gov

Signature X  **FEIN #** 52-1231144 **DATE** 10/23/18

ADDITIONAL INFORMATION:

****Addendum #1****

To provide responses to questions received by the September 19, 2018 deadline regarding ARFP MPO1900000001. (See attached) Please note the last page of the addendum regarding Attachment C: Cost Sheet.

The MPOB is soliciting proposals pursuant to West Virginia Code Section 8-22-20 and 8-22-20a to procure services of a qualified actuarial firm to perform actuarial services for the MPOB. WV Code Section 8-22-18a(b)(6) states in part ".....The oversight board is exempt from the provisions of article three, chapter five-a of this code for the purpose of contracting for actuarial services." In addition, WV Code Section 8-22-20 (c) states that the "selection of contract vendors to provide actuarial services, shall be by the competitive bid process but is specifically exempt from purchasing provisions of article three, chapter five-a of this code."

The goals and objectives of the may be found in the ARFP in Section 4: Project Specifications.

SCHEDULE OF EVENTS

<u>Line</u>	<u>Event</u>	<u>Event Date</u>
1	RFP Released to Public	2018-08-29
2	10:00 a.m. EST, Mandatory On-site Pre-bid Conference	2018-09-12
3	3:00 p.m. EST, Vendors Written Questions Submission Deadline	2018-09-19
4	3:00 p.m. EST, Addendum Issued	2018-09-28
5	3:00 p.m. EST, Proposal Submission Date	2018-10-24
7	Contract Award Made	2019-01-02



West Virginia

Municipal Pensions Oversight Board

PROPOSAL TO PROVIDE ACTUARIAL CONSULTING SERVICES

Requisition No: MPO1900000001

COST PROPOSAL

October 24, 2018

Prepared by:

Ellen L. Kleinstuber, FSA, EA, FCA, MAAA, FSPA
Senior Consulting Actuary
ekleinstuber@boltonusa.com
(443) 573-3912

Thomas B. Lowman, FSA, EA, FCA, MAAA
Chief Actuary & President of Bolton Retirement
tlowman@boltonusa.com
(443) 573-3909

**MUNICIPAL PENSIONS OVERSIGHT BOARD
REQUEST FOR PROPOSAL
REQUISITION NO: MPO 1900000001
Attachment C
Cost Sheet**

- A Cost of Annual Valuation of 53 Plans and Consolidated Report
- B GASB 67/68 Reports
- C Experience Study
- D Cost Escalator Rate
- E Total Hourly Cost

Life of Contract					
Year 1	Year 2	Year 3	Year 4	Year 5	Total
\$200,000.00	\$204,000.00	\$208,000.00	\$212,000.00	\$216,000.00	\$1,040,000.00
\$30,000.00	\$31,000.00	\$32,000.00	\$33,000.00	\$34,000.00	\$160,000.00
\$30,000.00			\$32,000.00		\$62,000.00
	102.00%	102.00%	102.00%	102.00%	
\$98,000.00	\$99,960.00	\$101,959.20	\$103,998.38	\$106,078.35	\$509,995.93

Total Cost of Proposal

\$1,771,995.93

- F Special Project/In person meetings:

Classification	Total Hours *	Hourly Rate	Total Hourly Cost
Senior Actuary	100	\$245.00	\$24,500.00
Actuary	100	\$245.00	\$24,500.00
Actuary Assistant	100	\$245.00	\$24,500.00
Clerical	100	\$245.00	\$24,500.00
Total Hourly Cost			\$98,000.00

Instructions: The gray shaded cells have been locked by the MPOB as as they contain formulas. The blue shaded cells are unlocked and available for the vendor to provide cost information.

- A - List the cost of the Annual Valuation of all plans/Consolidated Report
- B - Total annual cost of individual GASB reports.
- C - Experience Study to be completed every third year.
- D - List the rate of increase of any price adjustments
- E - First year is equal to total cost for item F. Previous year multiplied by item D (cost escalator rate) for remaining years 2-5.
- F - Enter individual hourly rates to establish total hourly cost and base year.

* - Estimated hours for proposal purposes only.

Note 1:

Rates shall be inclusive of all expenses and costs associated with providing the services, including travel expenses. No travel will be reimbursed by the MPOB and will be the sole responsibility of the vendor.

Bolton Fee Estimate Pricing Schedule

Prepare and send data request	5.0%	\$ 10,000.00
Update valuation software and report worksheets	10.0%	\$ 20,000.00
Update valuation reports	5.0%	\$ 10,000.00
Compile and reconcile data	15.0%	\$ 30,000.00
Gain loss analysis	7.5%	\$ 15,000.00
Generate liabilities and discount rate forecasts	7.5%	\$ 15,000.00
Prepare individual valuation reports	35.0%	\$ 70,000.00
Prepare consolidated report/presentation	10.0%	\$ 20,000.00
COLA letters	5.0%	\$ 10,000.00
	100.0%	\$ 200,000.00

CONTRACT CHANGE ORDER NO. 2 to MPO1900000001
WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD

and

BOLTON PARTNERS, INC.

THIS CHANGE ORDER NO. 2 made this 16th day of March 2023, is between the WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD (MPOB), Charleston, WV, and BOLTON PARTNERS, (Bolton) INC., 36 S. Charles Street, #1000, Baltimore, MD 21201.

WHEREAS, Pursuant to the provisions of WV Code §8-22-18A(b)(6), the MPOB is exempt from provisions of article three, chapter five-a of the CODE for the purpose of contracting for actuarial services and pursuant to the provisions of WV Code §8-22-20(a), the MPOB shall contract with or employ a qualified actuary to annually prepare and actuarial valuation report on each pension and relief fund. The selection of contract vendors to provide actuarial services...shall be by competitive bid process, but is specifically exempt from purchasing provisions of article three, chapter five-a of the Code, and

NOW THEREFORE, THIS CHANGE ORDER, WITNESSETH:

That for and in consideration of the terms included herein, the parties do hereby covenant and agree to the following additions to the original contract pursuant to the findings of Bolton that some death benefits payable to spouses and other beneficiaries were not determined in accordance with W. Va. Code §8-22-26a. Bolton conducted a sampling to determine if the incorrect method was limited to a few municipal plans or if it was a systemic issue across most of the 53 municipal policemen's and municipal firemen's pension and relief funds. The sampling revealed the incorrect methodology is being applied by most if not all of the municipal plans. The incorrect methodology is causing spousal benefits and other beneficiaries benefits to be less than or more than what is required by W.Va. Code for survivor supplemental benefits, i.e., cost-of-living adjustments (COLAs). The MPOB Board wants to correct these benefits to survivors and have the municipal plans pay any underpayments to the spouses and beneficiaries and claw back any overpayments to the spouses and beneficiaries.

The second phase is to calculate the survivor benefits for deaths that occurred after the implementation of the Survivor Benefit Calculator, in May 2020, and for re-calculating survivor benefits paid to spouses and other beneficiaries that have been determined using a methodology that does not comply with WV Code §8-22-26a(b).

Phase II includes the following steps as outlined below.

- Bolton will correct the survivor benefits for an estimated 290 participants. Based on Bolton's preliminary review of the data from Phase I, Bolton will be able to correct the benefits for approximately 165 survivors. Bolton will request any updated data for approximately 125 of the 290 participants from municipalities and pension boards of trustees. Of the 125 participants where Bolton will request additional information, Bolton will be able to calculate and correct benefits for 65 participants based on certain reasonable assumptions if the municipalities cannot provide any additional data.

- For the remaining 60 participants, if the Municipalities do not provide any additional information, Bolton will not have enough information to calculate a corrected benefit. If this is the case, Bolton will work with MPOB staff to determine a plan of action for getting the information needed to check the accuracy of these benefits.
- Bolton will provide the MPOB with an updated Excel spreadsheet with the amounts paid, the corrected amount and the amounts of underpayments and overpayments to the participants by pension plan. Bolton will reflect the impact of the 2023 COLA.
- The scope of this project excludes South Charleston Policemen's Pension and South Charleston Firemen's Pension as the survivors and beneficiaries have already been corrected.

The fixed cost for Phase II is \$65,000 which represents an expected 250 hours to complete the work. Bolton will bill the MPOB progressively by month until the project is complete.

All other terms, conditions, prices, and specifications remain in full effect.

WITNESS THE FOLLOWING SIGNATURES:

Bolton Partners, Inc.

Municipal Pensions Oversight Board

By: 

By: 

Title: President Bolton Retirement

Title: Executive Director

Date: 3/16/23

Date: March 16, 2023

Approved as to form this 21st day of April, 2023.

By: , Deputy Attorney General

CONTRACT CHANGE ORDER NO. 3 to MPO1900000001
WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD
and
BOLTON PARTNERS, INC.

THIS CHANGE ORDER NO. 3 made this 25th day of April 2023, is between the WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD (MPOB), Charleston, WV, and BOLTON PARTNERS, (Bolton) INC., 36 S. Charles Street, #1000, Baltimore, MD 21201.

WHEREAS, Pursuant to the provisions of WV Code §8-22-18A(b)(6), the MPOB is exempt from provisions of article three, chapter five-a of the CODE for the purpose of contracting for actuarial services and pursuant to the provisions of WV Code §8-22-20(a), the MPOB shall contract with or employ a qualified actuary to annually prepare and actuarial valuation report on each pension and relief fund. The selection of contract vendors to provide actuarial services...shall be by competitive bid process, but is specifically exempt from purchasing provisions of article three, chapter five-a of the Code, and

NOW THEREFORE, THIS CHANGE ORDER, WITNESSETH:

That for and in consideration of the terms included herein, the parties do hereby covenant and agree to the following additions to the original contract pursuant to the findings of Bolton that some death benefits payable to spouses and other beneficiaries were not determined in accordance with W. Va. Code §8-22-26a. Bolton conducted a sampling to determine if the incorrect method was limited to a few municipal plans or if it was a systemic issue across most of the 53 municipal policemen's and municipal firemen's pension and relief funds. The sampling revealed the incorrect methodology is being applied by most if not all of the municipal plans. The incorrect methodology is causing spousal benefits and other beneficiaries benefits to be less than or more than what is required by W.Va. Code for survivor supplemental benefits, i.e., cost-of-living adjustments (COLAs). The MPOB Board wants to correct these benefits to survivors and have the municipal plans pay any underpayments to the spouses and beneficiaries and claw back any overpayments to the spouses and beneficiaries.

The second phase is to calculate the survivor benefits for deaths that occurred after the implementation of the Survivor Benefit Calculator, in May 2020, and for re-calculating survivor benefits paid to spouses and other beneficiaries that have been determined using a methodology that does not comply with WV Code §8-22-26a(b).

Phase II includes the following steps as outlined below.

- Bolton will correct the survivor benefits for an estimated 290 participants. Based on Bolton's preliminary review of the data from Phase I, Bolton will be able to correct the benefits for approximately 165 survivors. Bolton will request any updated data for approximately 125 of the 290 participants from municipalities and pension boards of trustees. Of the 125 participants where Bolton will request additional information, Bolton will be able to calculate and correct benefits for 65 participants based on certain reasonable assumptions if the municipalities cannot provide any additional data.

- For the remaining 60 participants, if the Municipalities do not provide any additional information, Bolton will not have enough information to calculate a corrected benefit. If this is the case, Bolton will work with MPOB staff to determine a plan of action for getting the information needed to check the accuracy of these benefits.
- Bolton will provide the MPOB with an updated Excel spreadsheet with the amounts paid, the corrected amount and the amounts of underpayments and overpayments to the participants by pension plan. Bolton will reflect the impact of the 2023 COLA.
- The scope of this project excludes South Charleston Policemen's Pension and South Charleston Firemen's Pension as the survivors and beneficiaries have already been corrected.

The fixed cost for Phase II is \$65,000 which represents an expected 250 hours to complete the work. Bolton will bill the MPOB progressively by month until the project is complete.

All other terms, conditions, prices, and specifications remain in full effect.

WITNESS THE FOLLOWING SIGNATURES:

Bolton Partners, Inc.

Municipal Pensions Oversight Board

By: *James White*

By: *John M. [Signature]*

Title: *President Bolton Retirement*

Title: *Executive Director*

Date: *April 27, 2023*

Date: *Apr 25, 2023*

Approved as to form this ____ day of _____, 2023

By: _____, Deputy Attorney General

Change order 4 was an internal change order for an address change only.

CONTRACT CHANGE ORDER NO. 5 to MPO1900000001
WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD
and
BOLTON PARTNERS, INC.

THIS CHANGE ORDER NO. 5 made this 23rd day of January 2024, is between the WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD (MPOB), Charleston, WV, and BOLTON PARTNERS, (Bolton) INC., 1 W. Pennsylvania Avenue, Suite 600, Townson, MD 21204.

WHEREAS, Pursuant to the provisions of *WV Code §8-22-18A(b)(6)*, the MPOB is exempt from provisions of article three, chapter five-a of the CODE for the purpose of contracting for actuarial services and pursuant to the provisions of *WV Code §8-22-20(a)*, the MPOB shall contract with or employ a qualified actuary to annually prepare and actuarial valuation report on each policemen's and firemen's pension and relief fund. The selection of contract vendors to provide actuarial services...shall be by competitive bid process, but is specifically exempt from purchasing provisions of article three, chapter five-a of the Code, and

WHEREAS, Pursuant to the original agreement dated the 6th day of February 2019, between the **WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD** and **BOLTON PARTNERS** which included section 1-4. **TERM** which extended the period of the agreement for a period of five (5) years, at which point the contract may, upon mutual consent, be renewed. Such renewals are for a period of up to one (1) year, with a maximum of two (2) one-year renewals, or until such reasonable time thereafter as is necessary to obtain a new contract, not to exceed six months. During the "reasonable time" period, Bolton may terminate the contract for any reason upon giving the MPOB ninety (90) days written notice. Notice by Bolton of intent to terminate will not relieve Bolton of the obligation to continue providing services pursuant to the terms of the contract. This Agreement is subject to the general termination and extension rights reserved to the MPOB in this contract.

WHEREAS, Pursuant to the original agreement dated the 6th day of February 2019, between the **WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD** and **BOLTON PARTNERS** which included section 1-5. **COMPENSATION** which outlines monthly invoices for the costs of hourly services as well as progress payments for each phase of the actuarial valuation process.

NOW THEREFORE, THIS CHANGE ORDER, WITNESSETH:

That for and in consideration of the terms included herein, the parties do hereby covenant and agree to the following additions to the original contract.

1. Term Extension:

The term of the Agreement shall be extended for the period February 6, 2024, through February 5, 2025.

2. Year 6 Contract Fixed Cost Project Payment Schedule and Special Projects/In Person Meetings Hourly Rates. All work performed shall be billed in arrears.

BOLTON
Year 6 Contract Cost Schedule

Annual Actuarial Funding Valuation of 53 plans	Progress Payments	Services to be performed Between February 6, 2024, and February 5, 2025 \$220,000.00
Prepare and send data request	5.0%	\$11,000.00
Update valuation software and report worksheets	10.0%	\$22,000.00
Update Valuation Reports	5.0%	\$11,000.00
Compile and reconcile data	15.0%	\$33,000.00
Gain loss analysis	7.5%	\$16,500.00
Generate liabilities and discount rate forecasts	7.5%	\$16,500.00
Prepare individual valuation reports	35.0%	\$77,000.00
Prepare Consolidated report presentations	10.0%	\$22,000.00
Prepare COLA Letters	5.0%	\$11,000.00
	100%	
Special Projects/In person meetings:	Rate: Year 6	
Senior Actuary	\$270.50	
Actuary	\$270.50	
Actuary Assistant	\$270.50	
Clerical	\$270.50	

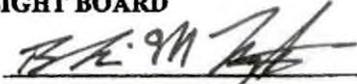
Should any policemen's or firemen's municipal pension and relief fund decline to participate in the actuarial valuation process, Bolton will deduct the cost of performing that fund's valuation from the progress payments invoice phase "Prepare individual valuation reports."

The fees for completion of GASB 67/68 reports may be billed in total, \$35,000.14 or on a per unit cost each year. The unit cost is \$660.38 for Year 6.

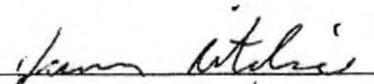
All other terms, conditions, prices, and specifications remain in full effect.

IN WITNESS WHEREOF, Municipal Pensions Oversight Board and Bolton Partners have entered this Change Order No. 5 as of the date of last signature below.

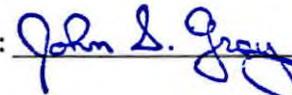
**MUNICIPAL PENSIONS
OVERSIGHT BOARD**

By: 
Name: Blais M Taylor
Its: Executive Director
Date: 1-23-2024

BOLTON PARTNERS

By: 
Name: James Ritchie
Its: President of Bolton Retirement
Date: 1/23/2024

Approved as to form this 29th day of January, 2024

By: , Deputy Attorney General

CONTRACT CHANGE ORDER NO. 6 to MPO190000001
WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD
and
BOLTON PARTNERS, INC.

THIS CHANGE ORDER NO. 6 made this 17th day of January 2025, is between the WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD (MPOB), Charleston, WV, and BOLTON PARTNERS, (Bolton) INC., 1 W. Pennsylvania Avenue, Suite 600, Townson, MD 21204.

WHEREAS, Pursuant to the provisions of *WV Code §8-22-18A(b)(6)*, the MPOB is exempt from provisions of article three, chapter five-a of the CODE for the purpose of contracting for actuarial services and pursuant to the provisions of *WV Code §8-22-20(a)*, the MPOB shall contract with or employ a qualified actuary to annually prepare and actuarial valuation report on each policemen's and firemen's pension and relief fund. The selection of contract vendors to provide actuarial services...shall be by competitive bid process. but is specifically exempt from purchasing provisions of article three, chapter five-a of the Code, and

WHEREAS, Pursuant to the original agreement dated the 6th day of February 2019, between the **WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD and BOLTON PARTNERS** which included section 1-4. **TERM** which extended the period of the agreement for a period of five (5) years, at which point the contract may, upon mutual consent, be renewed. Such renewals are for a period of up to one (1) year, with a maximum of two (2) one-year renewals, or until such reasonable time thereafter as is necessary to obtain a new contract, not to exceed six months. During the "reasonable time" period, Bolton may terminate the contract for any reason upon giving the MPOB ninety (90) days written notice. Notice by Bolton of intent to terminate will not relieve Bolton of the obligation to continue providing services pursuant to the terms of the contract. This Agreement is subject to the general termination and extension rights reserved to the MPOB in this contract.

WHEREAS, Pursuant to the original agreement dated the 6th day of February 2019, between the **WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD and BOLTON PARTNERS** which included section 1-5. **COMPENSATION** which outlines monthly invoices for the costs of hourly services as well as progress payments for each phase of the actuarial valuation process.

NOW THEREFORE, THIS CHANGE ORDER, WITNESSETH:

That for and in consideration of the terms included herein, the parties do hereby covenant and agree to the following additions to the original contract.

1. Term Extension:

The term of the Agreement shall be extended for the period February 6, 2025, through February 5, 2026.

2. Year 7 Contract Fixed Cost Project Payment Schedule and Special Projects/1n Person Meetings Hourly Rates. All work performed shall be billed in arrears.

BOLTON
Year 7 Contract Cost Schedule

Annual Actuarial Funding Valuation of 53 plans	Progress Payments	Services to be performed Between February 6, 2025, and February 5, 2026 \$224,000.00
Prepare and send data request	5.0%	\$11,200.00
Update valuation software and report worksheets	10.0%	\$22,400.00
Update Valuation Reports	5.0%	\$11,200.00
Compile and reconcile data	15.0%	\$33,600.00
Gain loss analysis	7.5%	\$16,800.00
Generate liabilities and discount rate forecasts	7.5%	\$16,800.00
Prepare individual valuation reports	35.0%	\$78,400.00
Prepare Consolidated report presentations	10.0%	\$22,400.00
Prepare COLA Letters	5.0%	\$11,200.00
	100%	
Special Projects/In person meetings:	Rate: Year 7	
Senior Actuary	\$275.91	
Actuary	\$275.91	
Actuary Assistant	\$275.91	
Clerical	\$275.91	

Should any policemen's or firemen's municipal pension and relief fund decline to participate in the actuarial valuation process, Bolton will deduct the cost of performing that fund's valuation from the progress payments invoice phase "Prepare individual valuation reports."

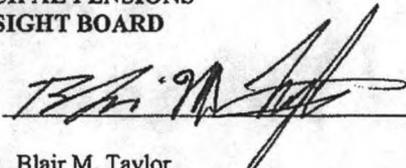
The fees for completion of GASB 67/68 reports may be billed in total, \$36,000.25 or on a per unit cost each year. The unit cost is \$679.25 for Year 7.

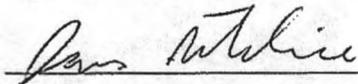
All other terms, conditions, prices, and specifications remain in full effect.

IN WITNESS WHEREOF, Municipal Pensions Oversight Board and Bolton Partners have entered this Change Order No. 6 as of the date of last signature below.

**MUNICIPAL PENSIONS
OVERSIGHT BOARD**

BOLTON PARTNERS, INC.

By: 

By: 

Name: Blair M. Taylor

Name: James Ritchie

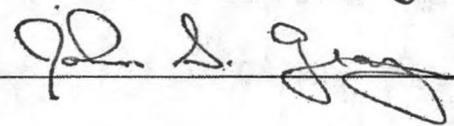
Its: Executive Director

Its: President of Bolton Retirement

Date: January 17, 2025

Date: 1/17/25

Approved to as form this 22nd day of Jan, 2025

By: , Deputy Attorney General

CONTRACT CHANGE ORDER NO. 2 to MPO1900000001
WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD

and

BOLTON PARTNERS, INC.

THIS CHANGE ORDER NO. 2 made this 16th day of March 2023, is between the WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD (MPOB), Charleston, WV, and BOLTON PARTNERS, (Bolton) INC., 36 S. Charles Street, #1000, Baltimore, MD 21201.

WHEREAS, Pursuant to the provisions of WV Code §8-22-18A(b)(6), the MPOB is exempt from provisions of article three, chapter five-a of the CODE for the purpose of contracting for actuarial services and pursuant to the provisions of WV Code §8-22-20(a), the MPOB shall contract with or employ a qualified actuary to annually prepare and actuarial valuation report on each pension and relief fund. The selection of contract vendors to provide actuarial services...shall be by competitive bid process, but is specifically exempt from purchasing provisions of article three, chapter five-a of the Code, and

NOW THEREFORE, THIS CHANGE ORDER, WITNESSETH:

That for and in consideration of the terms included herein, the parties do hereby covenant and agree to the following additions to the original contract pursuant to the findings of Bolton that some death benefits payable to spouses and other beneficiaries were not determined in accordance with W. Va. Code §8-22-26a. Bolton conducted a sampling to determine if the incorrect method was limited to a few municipal plans or if it was a systemic issue across most of the 53 municipal policemen's and municipal firemen's pension and relief funds. The sampling revealed the incorrect methodology is being applied by most if not all of the municipal plans. The incorrect methodology is causing spousal benefits and other beneficiaries benefits to be less than or more than what is required by W.Va. Code for survivor supplemental benefits, i.e., cost-of-living adjustments (COLAs). The MPOB Board wants to correct these benefits to survivors and have the municipal plans pay any underpayments to the spouses and beneficiaries and claw back any overpayments to the spouses and beneficiaries.

The second phase is to calculate the survivor benefits for deaths that occurred after the implementation of the Survivor Benefit Calculator, in May 2020, and for re-calculating survivor benefits paid to spouses and other beneficiaries that have been determined using a methodology that does not comply with WV Code §8-22-26a(b).

Phase II includes the following steps as outlined below.

- Bolton will correct the survivor benefits for an estimated 290 participants. Based on Bolton's preliminary review of the data from Phase I, Bolton will be able to correct the benefits for approximately 165 survivors. Bolton will request any updated data for approximately 125 of the 290 participants from municipalities and pension boards of trustees. Of the 125 participants where Bolton will request additional information, Bolton will be able to calculate and correct benefits for 65 participants based on certain reasonable assumptions if the municipalities cannot provide any additional data.

- For the remaining 60 participants, if the Municipalities do not provide any additional information, Bolton will not have enough information to calculate a corrected benefit. If this is the case, Bolton will work with MPOB staff to determine a plan of action for getting the information needed to check the accuracy of these benefits.
- Bolton will provide the MPOB with an updated Excel spreadsheet with the amounts paid, the corrected amount and the amounts of underpayments and overpayments to the participants by pension plan. Bolton will reflect the impact of the 2023 COLA.
- The scope of this project excludes South Charleston Policemen's Pension and South Charleston Firemen's Pension as the survivors and beneficiaries have already been corrected.

The fixed cost for Phase II is \$65,000 which represents an expected 250 hours to complete the work. Bolton will bill the MPOB progressively by month until the project is complete.

All other terms, conditions, prices, and specifications remain in full effect.

WITNESS THE FOLLOWING SIGNATURES:

Bolton Partners, Inc.

Municipal Pensions Oversight Board

By: 

By: 

Title: President Bolton Retirement

Title: Executive Director

Date: 3/16/23

Date: March 16, 2023

Approved as to form this 21st day of April, 2023.

By: , Deputy Attorney General

CONTRACT CHANGE ORDER NO. 3 to MPO1900000001
WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD
and
BOLTON PARTNERS, INC.

THIS CHANGE ORDER NO. 3 made this 25th day of April 2023, is between the WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD (MPOB), Charleston, WV, and BOLTON PARTNERS, (Bolton) INC., 36 S. Charles Street, #1000, Baltimore, MD 21201.

WHEREAS, Pursuant to the provisions of WV Code §8-22-18A(b)(6), the MPOB is exempt from provisions of article three, chapter five-a of the CODE for the purpose of contracting for actuarial services and pursuant to the provisions of WV Code §8-22-20(a), the MPOB shall contract with or employ a qualified actuary to annually prepare and actuarial valuation report on each pension and relief fund. The selection of contract vendors to provide actuarial services...shall be by competitive bid process, but is specifically exempt from purchasing provisions of article three, chapter five-a of the Code, and

NOW THEREFORE, THIS CHANGE ORDER, WITNESSETH:

That for and in consideration of the terms included herein, the parties do hereby covenant and agree to the following additions to the original contract pursuant to the findings of Bolton that some death benefits payable to spouses and other beneficiaries were not determined in accordance with W. Va. Code §8-22-26a. Bolton conducted a sampling to determine if the incorrect method was limited to a few municipal plans or if it was a systemic issue across most of the 53 municipal policemen's and municipal firemen's pension and relief funds. The sampling revealed the incorrect methodology is being applied by most if not all of the municipal plans. The incorrect methodology is causing spousal benefits and other beneficiaries benefits to be less than or more than what is required by W.Va. Code for survivor supplemental benefits, i.e., cost-of-living adjustments (COLAs). The MPOB Board wants to correct these benefits to survivors and have the municipal plans pay any underpayments to the spouses and beneficiaries and claw back any overpayments to the spouses and beneficiaries.

The second phase is to calculate the survivor benefits for deaths that occurred after the implementation of the Survivor Benefit Calculator, in May 2020, and for re-calculating survivor benefits paid to spouses and other beneficiaries that have been determined using a methodology that does not comply with WV Code §8-22-26a(b).

Phase II includes the following steps as outlined below.

- Bolton will correct the survivor benefits for an estimated 290 participants. Based on Bolton's preliminary review of the data from Phase I, Bolton will be able to correct the benefits for approximately 165 survivors. Bolton will request any updated data for approximately 125 of the 290 participants from municipalities and pension boards of trustees. Of the 125 participants where Bolton will request additional information, Bolton will be able to calculate and correct benefits for 65 participants based on certain reasonable assumptions if the municipalities cannot provide any additional data.

- For the remaining 60 participants, if the Municipalities do not provide any additional information, Bolton will not have enough information to calculate a corrected benefit. If this is the case, Bolton will work with MPOB staff to determine a plan of action for getting the information needed to check the accuracy of these benefits.
- Bolton will provide the MPOB with an updated Excel spreadsheet with the amounts paid, the corrected amount and the amounts of underpayments and overpayments to the participants by pension plan. Bolton will reflect the impact of the 2023 COLA.
- The scope of this project excludes South Charleston Policemen's Pension and South Charleston Firemen's Pension as the survivors and beneficiaries have already been corrected.

The fixed cost for Phase II is \$65,000 which represents an expected 250 hours to complete the work. Bolton will bill the MPOB progressively by month until the project is complete.

All other terms, conditions, prices, and specifications remain in full effect.

WITNESS THE FOLLOWING SIGNATURES:

Bolton Partners, Inc.

Municipal Pensions Oversight Board

By: *James White*

By: *John M. [Signature]*

Title: *President Bolton Retirement*

Title: *Executive Director*

Date: *April 27, 2023*

Date: *Apr 25, 2023*

Approved as to form this ____ day of _____, 2023

By: _____, Deputy Attorney General

Change order 4 was an internal change order for an address change only.

CONTRACT CHANGE ORDER NO. 5 to MPO1900000001
WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD
and
BOLTON PARTNERS, INC.

THIS CHANGE ORDER NO. 5 made this 23rd day of January 2024, is between the WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD (MPOB), Charleston, WV, and BOLTON PARTNERS, (Bolton) INC., 1 W. Pennsylvania Avenue, Suite 600, Townson, MD 21204.

WHEREAS, Pursuant to the provisions of *WV Code §8-22-18A(b)(6)*, the MPOB is exempt from provisions of article three, chapter five-a of the CODE for the purpose of contracting for actuarial services and pursuant to the provisions of *WV Code §8-22-20(a)*, the MPOB shall contract with or employ a qualified actuary to annually prepare and actuarial valuation report on each policemen's and firemen's pension and relief fund. The selection of contract vendors to provide actuarial services...shall be by competitive bid process, but is specifically exempt from purchasing provisions of article three, chapter five-a of the Code, and

WHEREAS, Pursuant to the original agreement dated the 6th day of February 2019, between the **WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD** and **BOLTON PARTNERS** which included section 1-4. **TERM** which extended the period of the agreement for a period of five (5) years, at which point the contract may, upon mutual consent, be renewed. Such renewals are for a period of up to one (1) year, with a maximum of two (2) one-year renewals, or until such reasonable time thereafter as is necessary to obtain a new contract, not to exceed six months. During the "reasonable time" period, Bolton may terminate the contract for any reason upon giving the MPOB ninety (90) days written notice. Notice by Bolton of intent to terminate will not relieve Bolton of the obligation to continue providing services pursuant to the terms of the contract. This Agreement is subject to the general termination and extension rights reserved to the MPOB in this contract.

WHEREAS, Pursuant to the original agreement dated the 6th day of February 2019, between the **WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD** and **BOLTON PARTNERS** which included section 1-5. **COMPENSATION** which outlines monthly invoices for the costs of hourly services as well as progress payments for each phase of the actuarial valuation process.

NOW THEREFORE, THIS CHANGE ORDER, WITNESSETH:

That for and in consideration of the terms included herein, the parties do hereby covenant and agree to the following additions to the original contract.

1. Term Extension:

The term of the Agreement shall be extended for the period February 6, 2024, through February 5, 2025.

2. Year 6 Contract Fixed Cost Project Payment Schedule and Special Projects/In Person Meetings Hourly Rates. All work performed shall be billed in arrears.

BOLTON
Year 6 Contract Cost Schedule

Annual Actuarial Funding Valuation of 53 plans	Progress Payments	Services to be performed Between February 6, 2024, and February 5, 2025 \$220,000.00
Prepare and send data request	5.0%	\$11,000.00
Update valuation software and report worksheets	10.0%	\$22,000.00
Update Valuation Reports	5.0%	\$11,000.00
Compile and reconcile data	15.0%	\$33,000.00
Gain loss analysis	7.5%	\$16,500.00
Generate liabilities and discount rate forecasts	7.5%	\$16,500.00
Prepare individual valuation reports	35.0%	\$77,000.00
Prepare Consolidated report presentations	10.0%	\$22,000.00
Prepare COLA Letters	5.0%	\$11,000.00
	100%	
Special Projects/In person meetings:	Rate: Year 6	
Senior Actuary	\$270.50	
Actuary	\$270.50	
Actuary Assistant	\$270.50	
Clerical	\$270.50	

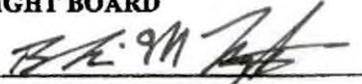
Should any policemen's or firemen's municipal pension and relief fund decline to participate in the actuarial valuation process, Bolton will deduct the cost of performing that fund's valuation from the progress payments invoice phase "Prepare individual valuation reports."

The fees for completion of GASB 67/68 reports may be billed in total, \$35,000.14 or on a per unit cost each year. The unit cost is \$660.38 for Year 6.

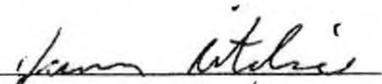
All other terms, conditions, prices, and specifications remain in full effect.

IN WITNESS WHEREOF, Municipal Pensions Oversight Board and Bolton Partners have entered this Change Order No. 5 as of the date of last signature below.

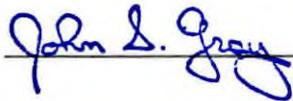
**MUNICIPAL PENSIONS
OVERSIGHT BOARD**

By: 
Name: Blais M Taylor
Its: Executive Director
Date: 1-23-2024

BOLTON PARTNERS

By: 
Name: James Ritchie
Its: President of Bolton Retirement
Date: 1/23/2024

Approved as to form this 29th day of January, 2024

By: , Deputy Attorney General

CONTRACT CHANGE ORDER NO. 6 to MPO190000001
WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD
and
BOLTON PARTNERS, INC.

THIS CHANGE ORDER NO. 6 made this 17th day of January 2025, is between the WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD (MPOB), Charleston, WV, and BOLTON PARTNERS, (Bolton) INC., 1 W. Pennsylvania Avenue, Suite 600, Townson, MD 21204.

WHEREAS, Pursuant to the provisions of *WV Code §8-22-18A(b)(6)*, the MPOB is exempt from provisions of article three, chapter five-a of the CODE for the purpose of contracting for actuarial services and pursuant to the provisions of *WV Code §8-22-20(a)*, the MPOB shall contract with or employ a qualified actuary to annually prepare and actuarial valuation report on each policemen's and firemen's pension and relief fund. The selection of contract vendors to provide actuarial services...shall be by competitive bid process. but is specifically exempt from purchasing provisions of article three, chapter five-a of the Code, and

WHEREAS, Pursuant to the original agreement dated the 6th day of February 2019, between the **WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD and BOLTON PARTNERS** which included section 1-4. **TERM** which extended the period of the agreement for a period of five (5) years, at which point the contract may, upon mutual consent, be renewed. Such renewals are for a period of up to one (1) year, with a maximum of two (2) one-year renewals, or until such reasonable time thereafter as is necessary to obtain a new contract, not to exceed six months. During the "reasonable time" period, Bolton may terminate the contract for any reason upon giving the MPOB ninety (90) days written notice. Notice by Bolton of intent to terminate will not relieve Bolton of the obligation to continue providing services pursuant to the terms of the contract. This Agreement is subject to the general termination and extension rights reserved to the MPOB in this contract.

WHEREAS, Pursuant to the original agreement dated the 6th day of February 2019, between the **WEST VIRGINIA MUNICIPAL PENSIONS OVERSIGHT BOARD and BOLTON PARTNERS** which included section 1-5. **COMPENSATION** which outlines monthly invoices for the costs of hourly services as well as progress payments for each phase of the actuarial valuation process.

NOW THEREFORE, THIS CHANGE ORDER, WITNESSETH:

That for and in consideration of the terms included herein, the parties do hereby covenant and agree to the following additions to the original contract.

1. Term Extension:

The term of the Agreement shall be extended for the period February 6, 2025, through February 5, 2026.

2. Year 7 Contract Fixed Cost Project Payment Schedule and Special Projects/1n Person Meetings Hourly Rates. All work performed shall be billed in arrears.

BOLTON
Year 7 Contract Cost Schedule

Annual Actuarial Funding Valuation of 53 plans	Progress Payments	Services to be performed Between February 6, 2025, and February 5, 2026 \$224,000.00
Prepare and send data request	5.0%	\$11,200.00
Update valuation software and report worksheets	10.0%	\$22,400.00
Update Valuation Reports	5.0%	\$11,200.00
Compile and reconcile data	15.0%	\$33,600.00
Gain loss analysis	7.5%	\$16,800.00
Generate liabilities and discount rate forecasts	7.5%	\$16,800.00
Prepare individual valuation reports	35.0%	\$78,400.00
Prepare Consolidated report presentations	10.0%	\$22,400.00
Prepare COLA Letters	5.0%	\$11,200.00
	100%	
Special Projects/In person meetings:	Rate: Year 7	
Senior Actuary	\$275.91	
Actuary	\$275.91	
Actuary Assistant	\$275.91	
Clerical	\$275.91	

Should any policemen's or firemen's municipal pension and relief fund decline to participate in the actuarial valuation process, Bolton will deduct the cost of performing that fund's valuation from the progress payments invoice phase "Prepare individual valuation reports."

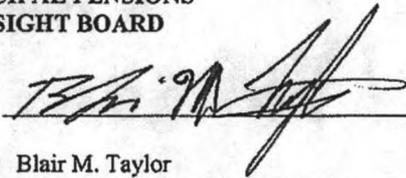
The fees for completion of GASB 67/68 reports may be billed in total, \$36,000.25 or on a per unit cost each year. The unit cost is \$679.25 for Year 7.

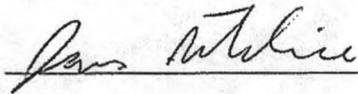
All other terms, conditions, prices, and specifications remain in full effect.

IN WITNESS WHEREOF, Municipal Pensions Oversight Board and Bolton Partners have entered this Change Order No. 6 as of the date of last signature below.

**MUNICIPAL PENSIONS
OVERSIGHT BOARD**

BOLTON PARTNERS, INC.

By: 
Name: Blair M. Taylor

By: 
Name: James Ritchie

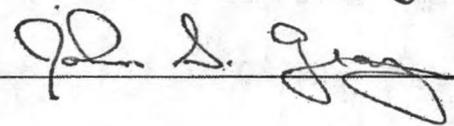
Its: Executive Director

Its: President of Bolton Retirement

Date: January 17, 2025

Date: 1/17/25

Approved to as form this 22nd day of Jan, 2025

By: , Deputy Attorney General