Gabriel Roeder Smith & Company
Consultants & Actuaries

Nebraska Public Employees Retirement System

Proposal for Actuarial Services - RFP 5989 Z1

Technical Proposal - Original

Nebraska Public Employees Retirement System

Proposal for Actuarial Services
RFP 5989 Z1

TECHNICAL PROPOSAL – ORIGINAL

Submitted by Gabriel, Roeder, Smith & Company
One Towne Square, Suite 800
Southfield, MI 48076
www.grsconsulting.com

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Due: January 24, 2019 Prior to 2:00 P.M.

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Letter of Transmittal

January 22, 2019

Ms. Annette Walton
Ms. Nancy Storant
State Purchasing Bureau
1526 K Street, Suite 130
Lincoln, NE 68508

Re: Request for Proposal for Actuarial Services

Dear Ms. Walton and Ms. Storant:

Gabriel, Roeder, Smith & Company (GRS) is very pleased to have this opportunity to submit a Proposal to provide professional actuarial services to the Nebraska Public Employees Retirement System (NPERS). The attached Proposal sets forth our understanding of the work to be performed, the qualifications and capabilities of the consultants and resources of GRS, and specifically addresses the requirements set forth in your Request for Proposals dated December 14, 2018.

GRS offers the NPERS the opportunity to work with the nation's premier provider of actuarial consulting services to the public sector community and to partner with an actuarial team that excels in communicating complex items in terms that are understandable to all interested parties. GRS has a nationally renowned reputation, an excellent research center that specializes in public sector benefit programs and a clear understanding of the issues public retirement systems face across the nation. GRS is an employee-owned and operated company which brings with it a higher level of commitment to providing the best possible service and the most independent consulting advice possible.

We are the prominent provider of actuarial and consulting services to the public sector community in the country. As the public sector leader, we serve more than 1,000 public sector retirement systems and healthcare programs in nearly 50 states, including 36 statewide public pension retirement systems, 26 of which have 50,000 or more members. The location of our clients ranges from Rhode Island to Hawaii and from Minnesota to Texas.

GRS has an exceptional reputation for quality work and commitment to the public sector community. We also have a long-standing reputation for unbiased presentation of facts. Our role is to present impartial information and consulting advice so that governments and boards can make informed decisions.

We believe that GRS' proposed client service team is unmatched by any of our competitors. We have assembled a GRS team that is the perfect match for the NPERS. The consultants that we are proposing have extensive experience providing actuarial consulting to public sector retirement systems across the country which brings a national perspective to their consulting.

We believe there are four key qualification areas that you will want to look for in your actuarial firm. Our Proposal will demonstrate GRS' qualifications in each of these four areas:

Knowledge of the Issues and the Services – Our 80-year reputation for providing sound, technically proficient, independent advice is evidenced by the 1,000 public sector clients we serve, of which the majority have been clients for more than 25 years. GRS retains clients for long periods of time because we consistently demonstrate knowledge, expertise, timeliness, and capabilities that exceed those of our competitors.

Communication – Given the vast experience and expertise of our client service team, we believe strongly that we will be able to communicate effectively with NPERS staff, its Executive Director and the Board. Our work often requires us to speak in front of governing bodies, such as legislatures and city councils, as well as in front of labor and other employee groups. We communicate our results and recommendations in clear, jargon-free terms to maximize understanding by all parties.

Depth in the Issues – NPERS will want the benefit of knowing what other similar public retirement systems are doing and currently experiencing, not only in your region, but across the country, as well. In particular, we can provide NPERS with knowledge and consulting on the emerging financial and benefit related trends, and the ways in which NPERS can prepare and respond to these issues as they emerge. GRS is uniquely qualified to fill this role. We serve more public sector retirement systems than any other firm. As the nation's leading consultant to public sector retirement systems, GRS offers consulting expertise and technological capabilities that specifically focus on the needs of public sector employee benefit plans.

Sound and Integrated Approach – Our consulting team's depth of expertise in retirement benefit consulting results from strong actuarial science credentials, many years of experience with benefit related government finance issues, specific experience with public sector clients similar to NPERS, and access to GRS' state-of-the-art technology and research resources. We will work with NPERS to bring forward solutions that respect the interests of the members, the employers, and NPERS.

If we are awarded this engagement, we intend to negotiate in good faith with NPERS to reach an agreement on contract terms as expeditiously as possible. As the nation's largest provider of actuarial services to public entities, we have negotiated mutually acceptable contract terms with our other clients in support of similar opportunities. We expect to also successfully reach agreement with NPERS on acceptable contract terms for this opportunity. We note a sample contract is enclosed in the Appendix.

We attest that no activity related to this proposal contract will take place outside of the United States.

We believe that GRS' ongoing client service team is unmatched by any of our competitors. We know you will be pleased with our responsiveness and the quality of our work. Your consideration of GRS as your next actuarial firm is greatly appreciated and we hope to serve NPERS for many years to come.

Please contact Jim Anderson at (800) 521-0498 or email him at jim.anderson@grsconsulting.com if you have any questions or need any additional or clarifying information.

Judith A. Kermans, our President, is authorized to legally bind the firm.

Respectfully submitted,
Gabriel, Roeder, Smith & Company

James D. Anderson

James D. Anderson, FSA, EA, FCA, MAAA
Senior Consultant

Judith A. Kermans

Judith A. Kermans, EA, FCA, MAAA
President

SECTION I

REQUIRED FORMS

REQUEST FOR PROPOSAL FOR CONTRACTUAL SERVICES FORM

BIDDER MUST COMPLETE THE FOLLOWING

By signing this Request for Proposal for Contractual Services form, the bidder guarantees compliance with the procedures stated in this Request for Proposal, and agrees to the terms and conditions unless otherwise indicated in writing and certifies that bidder maintains a drug free work place.

Per Nebraska's Transparency in Government Procurement Act, Neb. Rev Stat § 73-603 DAS is required to collect statistical information regarding the number of contracts awarded to Nebraska Contractors. This information is for statistical purposes only and will not be considered for contract award purposes.

N/A NEBRASKA CONTRACTOR AFFIDAVIT: Bidder hereby attests that bidder is a Nebraska Contractor. "Nebraska Contractor" shall mean any bidder who has maintained a bona fide place of business and at least one employee within this state for at least the six (6) months immediately preceding the posting date of this RFP.

N/A I hereby certify that I am a Resident disabled veteran or business located in a designated enterprise zone in accordance with Neb. Rev. Stat. § 73-107 and wish to have preference, if applicable, considered in the award of this contract.

N/A I hereby certify that I am a blind person licensed by the Commission for the Blind & Visually Impaired in accordance with Neb. Rev. Stat. §71-8611 and wish to have preference considered in the award of this contract.

FORM MUST BE SIGNED USING AN INDELIBLE METHOD (NOT ELECTRONICALLY)

FIRM:	Gabriel, Roeder, Smith & Company
COMPLETE ADDRESS:	One Towne Square, Suite 800, Southfield, MI, 48076
TELEPHONE NUMBER:	800.521.0498
FAX NUMBER:	248.799.9020
DATE:	January 22, 2019
SIGNATURE:	Judith A. Kermans
TYPED NAME & TITLE OF SIGNER:	Judith A. Kermans, President

Form A
Bidder Contact Sheet
Request for Proposal Number 5989 Z1

Form A should be completed and submitted with each response to this RFP. This is intended to provide the State with information on the bidder's name and address, and the specific person(s) who are responsible for preparation of the bidder's response.

Preparation of Response Contact Information	
Bidder Name:	Gabriel, Roeder, Smith & Company
Bidder Address:	One Towne Square, Suite 800 Southfield, MI 48076
Contact Person & Title:	James D. Anderson, Senior Consultant
E-mail Address:	jim.anderson@grsconsulting.com
Telephone Number (Office):	800.521.0498
Telephone Number (Cellular):	616.250.5014
Fax Number:	248.799.9020

Each bidder should also designate a specific contact person who will be responsible for responding to the State if any clarifications of the bidder's response should become necessary. This will also be the person who the State contacts to set up a presentation/demonstration, if required.

Communication with the State Contact Information	
Bidder Name:	Gabriel, Roeder, Smith & Company
Bidder Address:	One Towne Square, Suite 800 Southfield, MI 48076
Contact Person & Title:	James D. Anderson, Senior Consultant
E-mail Address:	jim.anderson@grsconsulting.com
Telephone Number (Office):	800.521.0498
Telephone Number (Cellular):	616.250.5014
Fax Number:	248.799.9020

II. TERMS AND CONDITIONS

Bidders should complete Sections II through VI as part of their proposal. Bidder is expected to read the Terms and Conditions and should initial either accept, reject, or reject and provide alternative language for each clause. The bidder should also provide an explanation of why the bidder rejected the clause or rejected the clause and provided alternate language. By signing the RFP, bidder is agreeing to be legally bound by all the accepted terms and conditions, and any proposed alternative terms and conditions submitted with the proposal. The State reserves the right to negotiate rejected or proposed alternative language. If the State and bidder fail to agree on the final Terms and Conditions, the State reserves the right to reject the proposal. The State of Nebraska is soliciting proposals in response to this RFP. The State of Nebraska reserves the right to reject proposals that attempt to substitute the bidder's commercial contracts and/or documents for this RFP.

The bidders should submit with their proposal any license, user agreement, service level agreement, or similar documents that the bidder wants incorporated in the contract. The State will not consider incorporation of any document not submitted with the bidder's proposal as the document will not have been included in the evaluation process. These documents shall be subject to negotiation and will be incorporated as addendums if agreed to by the Parties.

If a conflict or ambiguity arises after the Addendum to Contract Award have been negotiated and agreed to, the Addendum to Contract Award shall be interpreted as follows:

1. If only one Party has a particular clause then that clause shall control;
2. If both Parties have a similar clause, but the clauses do not conflict, the clauses shall be read together;
3. If both Parties have a similar clause, but the clauses conflict, the State's clause shall control.

A. GENERAL

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JK			

The contract resulting from this RFP shall incorporate the following documents:

4. Request for Proposal and Addenda;
5. Amendments to the RFP;
6. Questions and Answers;
7. Contractor's proposal (RFP and properly submitted documents);
8. The executed Contract and Addendum One to Contract, if applicable ; and,
9. Amendments/Addendums to the Contract.

These documents constitute the entirety of the contract.

Unless otherwise specifically stated in a future contract amendment, in case of any conflict between the incorporated documents, the documents shall govern in the following order of preference with number one (1) receiving preference over all other documents and with each lower numbered document having preference over any higher numbered document: 1) Amendment to the executed Contract with the most recent dated amendment having the highest priority, 2) executed Contract and any attached Addenda, 3) Amendments to RFP and any Questions and Answers, 4) the original RFP document and any Addenda, and 5) the Contractor's submitted Proposal.

Any ambiguity or conflict in the contract discovered after its execution, not otherwise addressed herein, shall be resolved in accordance with the rules of contract interpretation as established in the State of Nebraska.

B. NOTIFICATION

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JK			

Contractor and State shall identify the contract manager who shall serve as the point of contact for the executed contract.

Communications regarding the executed contract shall be in writing and shall be deemed to have been given if delivered personally or mailed, by U.S. Mail, postage prepaid, return receipt requested, to the parties at their respective addresses set forth below, or at such other addresses as may be specified in writing by either of the parties. All notices, requests, or communications shall be deemed effective upon personal delivery or three (3) calendar days following deposit in the mail.

C. NOTICE (POC)

The State reserves the right to appoint a Buyer's Representative to manage [or assist the Buyer in managing] the contract on behalf of the State. The Buyer's Representative will be appointed in writing, and the appointment document will specify the extent of the Buyer's Representative authority and responsibilities. If a Buyer's Representative is appointed, the Contractor will be provided a copy of the appointment document, and is expected to cooperate accordingly with the Buyer's Representative. The Buyer's Representative has no authority to bind the State to a contract, amendment, addendum, or other change or addition to the contract.

D. GOVERNING LAW (Statutory)

Notwithstanding any other provision of this contract, or any amendment or addendum(s) entered into contemporaneously or at a later time, the parties understand and agree that, (1) the State of Nebraska is a sovereign state and its authority to contract is therefore subject to limitation by the State's Constitution, statutes, common law, and regulation; (2) this contract will be interpreted and enforced under the laws of the State of Nebraska; (3) any action to enforce the provisions of this agreement must be brought in the State of Nebraska per state law; (4) the person signing this contract on behalf of the State of Nebraska does not have the authority to waive the State's sovereign immunity, statutes, common law, or regulations; (5) the indemnity, limitation of liability, remedy, and other similar provisions of the final contract, if any, are entered into subject to the State's Constitution, statutes, common law, regulations, and sovereign immunity; and, (6) all terms and conditions of the final contract, including but not limited to the clauses concerning third party use, licenses, warranties, limitations of liability, governing law and venue, usage verification, indemnity, liability, remedy or other similar provisions of the final contract are entered into specifically subject to the State's Constitution, statutes, common law, regulations, and sovereign immunity.

The Parties must comply with all applicable local, state and federal laws, ordinances, rules, orders, and regulations.

E. BEGINNING OF WORK

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JK			

The bidder shall not commence any billable work until a valid contract has been fully executed by the State and the successful Contractor. The Contractor will be notified in writing when work may begin.

F. CHANGE ORDERS

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JK			

The State and the Contractor, upon the written agreement, may make changes to the contract within the general scope of the RFP. Changes may involve specifications, the quantity of work, or such other items as the State may find necessary or desirable. Corrections of any deliverable, service, or work required pursuant to the contract shall not be deemed a change. The Contractor may not claim forfeiture of the contract by reasons of such changes.

The Contractor shall prepare a written description of the work required due to the change and an itemized cost sheet for the change. Changes in work and the amount of compensation to be paid to the Contractor shall be determined in accordance with applicable unit prices if any, a pro-rated value, or through negotiations. The State shall not incur a price increase for changes that should have been included in the Contractor's proposal, were foreseeable, or result from difficulties with or failure of the Contractor's proposal or performance.

No change shall be implemented by the Contractor until approved by the State, and the Contract is amended to reflect the change and associated costs, if any. If there is a dispute regarding the cost, but both parties agree that immediate implementation is necessary, the change may be implemented, and cost negotiations may continue with both Parties retaining all remedies under the contract and law.

G. NOTICE OF POTENTIAL CONTRACTOR BREACH

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JK			

If Contractor breaches the contract or anticipates breaching the contract, the Contractor shall immediately give written notice to the State. The notice shall explain the breach or potential breach, a proposed cure, and may include a request for a waiver of the breach if so desired. The State may, in its discretion, temporarily or permanently waive the breach. By granting a waiver, the State does not forfeit any rights or remedies to which the State is entitled by law or equity, or pursuant to the provisions of the contract. Failure to give immediate notice, however, may be grounds for denial of any request for a waiver of a breach.

H. BREACH

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JK			

Either Party may terminate the contract, in whole or in part, if the other Party breaches its duty to perform its obligations under the contract in a timely and proper manner. Termination requires written notice of default and a thirty (30) calendar day (or longer at the non-breaching Party's discretion considering the gravity and nature of the default) cure period. Said notice shall be delivered by Certified Mail, Return Receipt Requested, or in person with proof of delivery. Allowing time to cure a failure or breach of contract does not waive the right to immediately terminate the contract for the same or different contract breach which may occur at a different time. In case of default of the Contractor, the State may contract the service from other sources and hold the Contractor responsible for any excess cost occasioned thereby.

The State's failure to make payment shall not be a breach, and the Contractor shall retain all available statutory remedies and protections.

I. NON-WAIVER OF BREACH

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:

The acceptance of late performance with or without objection or reservation by a Party shall not waive any rights of the Party nor constitute a waiver of the requirement of timely performance of any obligations remaining to be performed.

J. SEVERABILITY

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:

If any term or condition of the contract is declared by a court of competent jurisdiction to be illegal or in conflict with any law, the validity of the remaining terms and conditions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the contract did not contain the provision held to be invalid or illegal.

K. INDEMNIFICATION

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
			We ask that the State accept our standard indemnification language. Please see Sections G and H on pages 2 through 4 of our standard contract located in Appendix C of our proposal.

1. GENERAL

The Contractor agrees to defend, indemnify, and hold harmless the State and its employees, volunteers, agents, and its elected and appointed officials ("the indemnified parties") from and against any and all third party claims, liens, demands, damages, liability, actions, causes of action, losses, judgments, costs, and expenses of every nature, including investigation costs and expenses, settlement costs, and attorney fees and expenses ("the claims"), sustained or asserted against the State for personal injury, death, or property loss or damage, arising out of, resulting from, or attributable to the willful misconduct, negligence, error, or omission of the Contractor, its employees, subcontractors, consultants, representatives, and agents, resulting from this contract, except to the extent such Contractor liability is attenuated by any action of the State which directly and proximately contributed to the claims.

2. INTELLECTUAL PROPERTY

The Contractor agrees it will, at its sole cost and expense, defend, indemnify, and hold harmless the indemnified parties from and against any and all claims, to the extent such claims arise out of, result from, or are attributable to, the actual or alleged infringement or misappropriation of any patent, copyright, trade secret, trademark, or confidential information of any third party by the Contractor or its employees, subcontractors, consultants, representatives, and agents; provided, however, the State gives the Contractor prompt notice in writing of the claim. The Contractor may not settle any infringement claim that will affect the State's use of the Licensed Software without the State's prior written consent, which consent may be withheld for any reason.

If a judgment or settlement is obtained or reasonably anticipated against the State's use of any intellectual property for which the Contractor has indemnified the State, the Contractor shall, at the Contractor's sole cost and expense, promptly modify the item or items which were determined to be infringing, acquire a license or licenses on the State's behalf to provide the necessary rights to the State to eliminate the infringement, or provide the State with a non-infringing substitute that provides the State the same functionality. At the State's election, the actual or anticipated judgment may be treated as a breach of warranty by the Contractor, and the State may receive the remedies provided under this RFP.

3. **PERSONNEL**
The Contractor shall, at its expense, indemnify and hold harmless the indemnified parties from and against any claim with respect to withholding taxes, worker's compensation, employee benefits, or any other claim, demand, liability, damage, or loss of any nature relating to any of the personnel, including subcontractor's and their employees, provided by the Contractor.

4. **SELF-INSURANCE**
The State of Nebraska is self-insured for any loss and purchases excess insurance coverage pursuant to Neb. Rev. Stat. § 81-8,239.01 (Reissue 2008). If there is a presumed loss under the provisions of this agreement, Contractor may file a claim with the Office of Risk Management pursuant to Neb. Rev. Stat. §§ 81-8,829 – 81-8,306 for review by the State Claims Board. The State retains all rights and immunities under the State Miscellaneous (Section 81-8,294), Tort (Section 81-8,209), and Contract Claim Acts (Section 81-8,302), as outlined in Neb. Rev. Stat. § 81-8,209 et seq. and under any other provisions of law and accepts liability under this agreement to the extent provided by law.

5. The Parties acknowledge that Attorney General for the State of Nebraska is required by statute to represent the legal interests of the State, and that any provision of this indemnity clause is subject to the statutory authority of the Attorney General.

L. ATTORNEY'S FEES

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
		JL	We ask that the language be modified to include "reasonable" attorney fees.

In the event of any litigation, appeal, or other legal action to enforce any provision of the contract, the Parties agree to pay all expenses of such action, as permitted by law and if order by the court, including attorney's fees and costs, if the other Party prevails.

M. CONTRACTING WITH OTHER NEBRASKA POLITICAL SUB-DIVISIONS

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JL			

The Contractor may, but shall not be required to, allow agencies, as defined in Neb. Rev. Stat. §81-145, to use this contract. The terms and conditions, including price, of the contract may not be amended. The State shall not be contractually obligated or liable for any contract entered into pursuant to this clause. A listing of Nebraska political subdivisions may be found at the website of the Nebraska Auditor of Public Accounts.

N. FORCE MAJEURE

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:

Neither Party shall be liable for any costs or damages, or for default resulting from its inability to perform any of its obligations under the contract due to a natural or manmade event outside the control and not the fault of the affected Party ("Force Majeure Event"). The Party so affected shall immediately make a written request for relief to the other Party, and shall have the burden of proof to justify the request. The other Party may grant the relief requested; relief may not be unreasonably withheld. Labor disputes with the impacted Party's own employees will not be considered a Force Majeure Event.

O. CONFIDENTIALITY

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:

All materials and information provided by the Parties or acquired by a Party on behalf of the other Party shall be regarded as confidential information. All materials and information provided or acquired shall be handled in accordance with federal and state law, and ethical standards. Should said confidentiality be breached by a Party, the Party shall notify the other Party immediately of said breach and take immediate corrective action.

It is incumbent upon the Parties to inform their officers and employees of the penalties for improper disclosure imposed by the Privacy Act of 1974, 5 U.S.C. 552a. Specifically, 5 U.S.C. 552a (i)(1), which is made applicable by 5 U.S.C. 552a (m)(1), provides that any officer or employee, who by virtue of his/her employment or official position has possession of or access to agency records which contain individually identifiable information, the disclosure of which is prohibited by the Privacy Act or regulations established thereunder, and who knowing that disclosure of the specific material is prohibited, willfully discloses the material in any manner to any person or agency not entitled to receive it, shall be guilty of a misdemeanor and fined not more than $5,000.

P. EARLY TERMINATION

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:

The contract may be terminated as follows:

1. The State and the Contractor, by mutual written agreement, may terminate the contract at any time.
2. The State, in its sole discretion, may terminate the contract for any reason upon thirty (30) calendar day's written notice to the Contractor. Such termination shall not relieve the Contractor of warranty or other service obligations incurred under the terms of the contract. In the event of termination the Contractor shall be entitled to payment, determined on a pro rata basis, for products or services satisfactorily performed or provided.
3. The State may terminate the contract immediately for the following reasons:
    a. if directed to do so by statute;
    b. Contractor has made an assignment for the benefit of creditors, has admitted in writing its inability to pay debts as they mature, or has ceased operating in the normal course of business;

c. a trustee or receiver of the Contractor or of any substantial part of the Contractor's assets has been appointed by a court;
d. fraud, misappropriation, embezzlement, malfeasance, misfeasance, or illegal conduct pertaining to performance under the contract by its Contractor, its employees, officers, directors, or shareholders;
e. an involuntary proceeding has been commenced by any Party against the Contractor under any one of the chapters of Title 11 of the United States Code and (i) the proceeding has been pending for at least sixty (60) calendar days; or (ii) the Contractor has consented, either expressly or by operation of law, to the entry of an order for relief; or (iii) the Contractor has been decreed or adjudged a debtor;
f. a voluntary petition has been filed by the Contractor under any of the chapters of Title 11 of the United States Code;
g. Contractor intentionally discloses confidential information;
h. Contractor has or announces it will discontinue support of the deliverable; and,
i. In the event funding is no longer available.

Q. CONTRACT CLOSEOUT

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
		JK	We request that partially completed deliverables be excluded from this section. In addition, we request that item 7 be stricken since it is not applicable to the services being provided or that the words "received from the State" be inserted before the phrase "in a mutually acceptable format and manner."

Upon contract closeout for any reason the Contractor shall within 30 business days, unless stated otherwise herein:

1. Transfer all completed or partially completed deliverables to the State;
2. Transfer ownership and title to all completed or partially completed deliverables to the State;
3. Return to the State all information and data, unless the Contractor is permitted to keep the information or data by contract or rule of law. Contractor may retain one copy of any information or data as required to comply with applicable work product documentation standards or as are automatically retained in the course of Contractor's routine back up procedures;
4. Cooperate with any successor Contactor, person or entity in the assumption of any or all of the obligations of this contract;
5. Cooperate with any successor Contactor, person or entity with the transfer of information or data related to this contract;
6. Return or vacate any state owned real or personal property; and,
7. Return all data in a mutually acceptable format and manner.

Nothing in this Section should be construed to require the Contractor to surrender intellectual property, real or personal property, or information or data owned by the Contractor for which the State has no legal claim.

III. CONTRACTOR DUTIES

A. INDEPENDENT CONTRACTOR / OBLIGATIONS

Accept (Initial)		Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JC				

It is agreed that the Contractor is an independent contractor and that nothing contained herein is intended or should be construed as creating or establishing a relationship of employment, agency, or a partnership.

The Contractor is solely responsible for fulfilling the contract. The Contractor or the Contractor's representative shall be the sole point of contact regarding all contractual matters.

The Contractor shall secure, at its own expense, all personnel required to perform the services under the contract. The personnel the Contractor uses to fulfill the contract shall have no contractual or other legal relationship with the State; they shall not be considered employees of the State and shall not be entitled to any compensation, rights or benefits from the State, including but not limited to, tenure rights, medical and hospital care, sick and vacation leave, severance pay, or retirement benefits.

By-name personnel commitments made in the Contractor's proposal shall not be changed without the prior written approval of the State. Replacement of these personnel, if approved by the State, shall be with personnel of equal or greater ability and qualifications.

All personnel assigned by the Contractor to the contract shall be employees of the Contractor or a subcontractor, and shall be fully qualified to perform the work required herein. Personnel employed by the Contractor or a subcontractor to fulfill the terms of the contract shall remain under the sole direction and control of the Contractor or the subcontractor respectively.

With respect to its employees, the Contractor agrees to be solely responsible for the following:

1. Any and all pay, benefits, and employment taxes and/or other payroll withholding;
2. Any and all vehicles used by the Contractor's employees, including all insurance required by state law;
3. Damages incurred by Contractor's employees within the scope of their duties under the contract;
4. Maintaining Workers' Compensation and health insurance that complies with state and federal law and submitting any reports on such insurance to the extent required by governing law.
5. Determining the hours to be worked and the duties to be performed by the Contractor's employees; and,
6. All claims on behalf of any person arising out of employment or alleged employment (including without limit claims of discrimination alleged against the Contractor, its officers, agents, or subcontractors or subcontractor's employees)

If the Contractor intends to utilize any subcontractor, the subcontractor's level of effort, tasks, and time allocation should be clearly defined in the bidder's proposal. The Contractor shall agree that it will not utilize any subcontractors not specifically included in its proposal in the performance of the contract without the prior written authorization of the State.

The State reserves the right to require the Contractor to reassign or remove from the project any Contractor or subcontractor employee.

Contractor shall insure that the terms and conditions contained in any contract with a subcontractor does not conflict with the terms and conditions of this contract.

The Contractor shall include a similar provision, for the protection of the State, in the contract with any subcontractor engaged to perform work on this contract.

B. EMPLOYEE WORK ELIGIBILITY STATUS

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JK			

The Contractor is required and hereby agrees to use a federal immigration verification system to determine the work eligibility status of employees physically performing services within the State of Nebraska. A federal immigration verification system means the electronic verification of the work authorization program authorized by the Illegal Immigration Reform and Immigrant Responsibility Act of 1996, 8 U.S.C. 1324a, known as the E-Verify Program, or an equivalent federal program designated by the United States Department of Homeland Security or other federal agency authorized to verify the work eligibility status of an employee.

If the Contractor is an individual or sole proprietorship, the following applies:

1. The Contractor must complete the United States Citizenship Attestation Form, available on the Department of Administrative Services website at http://das.nebraska.gov/materiel/purchasing.html

   The completed United States Attestation Form should be submitted with the RFP response.

2. If the Contractor indicates on such attestation form that he or she is a qualified alien, the Contractor agrees to provide the US Citizenship and Immigration Services documentation required to verify the Contractor's lawful presence in the United States using the Systematic Alien Verification for Entitlements (SAVE) Program.

3. The Contractor understands and agrees that lawful presence in the United States is required and the Contractor may be disqualified or the contract terminated if such lawful presence cannot be verified as required by Neb. Rev. Stat. §4-108.

C. COMPLIANCE WITH CIVIL RIGHTS LAWS AND EQUAL OPPORTUNITY EMPLOYMENT / NONDISCRIMINATION (Statutory)

The Contractor shall comply with all applicable local, state, and federal statutes and regulations regarding civil rights laws and equal opportunity employment. The Nebraska Fair Employment Practice Act prohibits Contractors of the State of Nebraska, and their subcontractors, from discriminating against any employee or applicant for employment, with respect to hire, tenure, terms, conditions, compensation, or privileges of employment because of race, color, religion, sex, disability, marital status, or national origin (Neb. Rev. Stat. §48-1101 to 48-1125). The Contractor guarantees compliance with the Nebraska Fair Employment Practice Act, and breach of this provision shall be regarded as a material breach of contract. The Contractor shall insert a similar provision in all subcontracts for services to be covered by any contract resulting from this RFP.

D. COOPERATION WITH OTHER CONTRACTORS

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JK			

Contractor may be required to work with or in close proximity to other contractors or individuals that may be working on same or different projects. The Contractor shall agree to cooperate with such other contractors or individuals, and shall not commit or permit any act which may interfere with the performance of work by any other contractor or individual. Contractor is not required to compromise Contractor's intellectual property or proprietary information unless expressly required to do so by this contract.

E. PERMITS, REGULATIONS, LAWS

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JK			

The contract price shall include the cost of all royalties, licenses, permits, and approvals, whether arising from patents, trademarks, copyrights or otherwise, that are in any way involved in the contract. The Contractor shall obtain and pay for all royalties, licenses, and permits, and approvals necessary for the execution of the contract. The Contractor must guarantee that it has the full legal right to the materials, supplies, equipment, software, and other items used to execute this contract.

F. OWNERSHIP OF INFORMATION AND DATA / DELIVERABLES

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JK			We request that this section exclude any of GRS proprietary information such as source code and internal work papers.

The State shall have the unlimited right to publish, duplicate, use, and disclose all information and data developed or obtained by the Contractor on behalf of the State pursuant to this contract.

The State shall own and hold exclusive title to any deliverable developed as a result of this contract. Contractor shall have no ownership interest or title, and shall not patent, license, or copyright, duplicate, transfer, sell, or exchange, the design, specifications, concept, or deliverable.

G. INSURANCE REQUIREMENTS

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
		JK	We request that the State accept our standard E/O coverage. Please see Appendix E for our professional liability statement.

The Contractor shall throughout the term of the contract maintain insurance as specified herein and provide the State a current Certificate of Insurance/Acord Form (COI) verifying the coverage. The Contractor shall not commence work on the contract until the insurance is in place. If Contractor subcontracts any portion of the contract the Contractor must, throughout the term of the contract, either:

1. Provide equivalent insurance for each subcontractor and provide a COI verifying the coverage for the subcontractor;
2. Require each subcontractor to have equivalent insurance and provide written notice to the State that the Contractor has verified that each subcontractor has the required coverage; or,
3. Provide the State with copies of each subcontractor's Certificate of Insurance evidencing the required coverage.

The Contractor shall not allow any subcontractor to commence work until the subcontractor has equivalent insurance. The failure of the State to require a COI, or the failure of the Contractor to provide a COI or require subcontractor insurance shall not limit, relieve, or decrease the liability of the Contractor hereunder.

In the event that any policy written on a claims-made basis terminates or is canceled during the term of the contract or within five (5) years of termination or expiration of the contract, the Contractor shall obtain an extended discovery or reporting period, or a new insurance policy, providing coverage required by this contract for the term of the contract and five (5) years following termination or expiration of the contract.

If by the terms of any insurance a mandatory deductible is required, or if the Contractor elects to increase the mandatory deductible amount, the Contractor shall be responsible for payment of the amount of the deductible in the event of a paid claim.

Notwithstanding any other clause in this contract, the State may recover up to the liability limits of the insurance policies required herein.

1. **WORKERS' COMPENSATION INSURANCE**
   The Contractor shall take out and maintain during the life of this contract the statutory Workers' Compensation and Employer's Liability Insurance for all of the contactors' employees to be engaged in work on the project under this contract and, in case any such work is sublet, the Contractor shall require the subcontractor similarly to provide Worker's Compensation and Employer's Liability Insurance for all of the subcontractor's employees to be engaged in such work. This policy shall be written to meet the statutory requirements for the state in which the work is to be performed, including Occupational Disease. **The policy shall include a waiver of subrogation in favor of the State. The COI shall contain the mandatory COI subrogation waiver language found hereinafter**. The amounts of such insurance shall not be less than the limits stated hereinafter. For employees working in the State of Nebraska, the policy must be written by an entity authorized by the State of Nebraska Department of Insurance to write Workers' Compensation and Employer's Liability Insurance for Nebraska employees.

2. **COMMERCIAL GENERAL LIABILITY INSURANCE AND COMMERCIAL AUTOMOBILE LIABILITY INSURANCE**
   The Contractor shall take out and maintain during the life of this contract such Commercial General Liability Insurance and Commercial Automobile Liability Insurance as shall protect Contractor and any subcontractor performing work covered by this contract from claims for damages for bodily injury, including death, as well as from claims for property damage, which may arise from operations under this contract, whether such operation be by the Contractor or by any subcontractor or by anyone directly or indirectly employed by either of them, and the amounts of such insurance shall not be less than limits stated hereinafter.

   The Commercial General Liability Insurance shall be written on an **occurrence basis**, and provide Premises/Operations, Products/Completed Operations, Independent Contractors, Personal Injury, and Contractual Liability coverage. **The policy shall include the State, and others as required by the contract documents, as Additional Insured(s). This policy shall be primary, and any insurance or self-insurance carried by the State shall be considered secondary and non-contributory**. **The COI shall contain the mandatory COI liability waiver language found hereinafter.** The Commercial Automobile Liability Insurance shall be written to cover all Owned, Non-owned, and Hired vehicles.

REQUIRED INSURANCE COVERAGE	
COMMERCIAL GENERAL LIABILITY	
General Aggregate	$2,000,000
Products/Completed Operations Aggregate	$2,000,000
Personal/Advertising Injury	$1,000,000 per occurrence
Bodily Injury/Property Damage	$1,000,000 per occurrence
Medical Payments	$10,000 any one person
Damage to Rented Premises (Fire)	$300,000 each occurrence
Contractual	Included
XCU Liability (Explosion, Collapse, and Underground Damage)	Included
Independent Contractors	Included
If higher limits are required, the Umbrella/Excess Liability limits are allowed to satisfy the higher limit.	
WORKER'S COMPENSATION	
Employers Liability Limits	$500K/$500K/$500K
Statutory Limits- All States	Statutory - State of Nebraska
Voluntary Compensation	Statutory
COMMERCIAL AUTOMOBILE LIABILITY	
Bodily Injury/Property Damage	$1,000,000 combined single limit
Include All Owned, Hired & Non-Owned Automobile liability	Included
Motor Carrier Act Endorsement	Where Applicable
UMBRELLA/EXCESS LIABILITY	
Over Primary Insurance	$5,000,000 per occurrence
PROFESSIONAL LIABILITY	
All Other Professional Liability (Errors & Omissions)	$10,000,000 Per Claim / Aggregate
COMMERCIAL CRIME	
Crime/Employee Dishonesty Including 3rd Party Fidelity	$1,000,000
CYBER LIABILITY	
Breach of Privacy, Security Breach, Denial of Service, Remediation, Fines and Penalties	$1,000,000
MANDATORY COI SUBROGATION WAIVER LANGUAGE	
"Workers' Compensation policy shall include a waiver of subrogation in favor of the State of Nebraska."	
MANDATORY COI LIABILITY WAIVER LANGUAGE	
"Commercial General Liability & Commercial Automobile Liability policies shall name the State of Nebraska as an Additional Insured and the policies shall be primary and any insurance or self-insurance carried by the State shall be considered secondary and non-contributory as additionally insured."	

If the mandatory COI subrogation waiver language or mandatory COI liability waiver language on the COI states that the waiver is subject to, condition upon, or otherwise limit by the insurance policy, a copy of the relevant sections of the policy must be submitted with the COI so the State can review the limitations imposed by the insurance policy.

3. EVIDENCE OF COVERAGE

The Contractor shall furnish the Contract Manager, with a certificate of insurance coverage complying with the above requirements prior to beginning work at:

Nebraska Retirement Systems
Attn: Controller
1526 K St. Ste. 400
Lincoln, NE 68508

These certificates or the cover sheet shall reference the RFP number, and the certificates shall include the name of the company, policy numbers, effective dates, dates of expiration, and amounts and types of coverage afforded. If the State is damaged by the failure of the Contractor to maintain such insurance, then the Contractor shall be responsible for all reasonable costs properly attributable thereto.

Reasonable notice of cancellation of any required insurance policy must be submitted to the contract manager as listed above when issued and a new coverage binder shall be submitted immediately to ensure no break in coverage.

4. DEVIATIONS

The insurance requirements are subject to limited negotiation. Negotiation typically includes, but is not necessarily limited to, the correct type of coverage, necessity for Workers' Compensation, and the type of automobile coverage carried by the Contractor.

H. ANTITRUST

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JA			

The Contractor hereby assigns to the State any and all claims for overcharges as to goods and/or services provided in connection with this contract resulting from antitrust violations which arise under antitrust laws of the United States and the antitrust laws of the State.

I. CONFLICT OF INTEREST

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JA			

By submitting a proposal, bidder certifies that there does not now exist a relationship between the bidder and any person or entity which is or gives the appearance of a conflict of interest related to this RFP or project.

The bidder certifies that it shall not take any action or acquire any interest, either directly or indirectly, which will conflict in any manner or degree with the performance of its services hereunder or which creates an actual or an appearance of conflict of interest.

The bidder certifies that it will not knowingly employ any individual known by bidder to have a conflict of interest.

The Parties shall not knowingly, for a period of two years after execution of the contract, recruit or employ any employee or agent of the other Party who has worked on the RFP or project, or who had any influence on decisions affecting the RFP or project.

J. STATE PROPERTY

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JA			

The Contractor shall be responsible for the proper care and custody of any State-owned property which is furnished for the Contractor's use during the performance of the contract. The Contractor shall reimburse the State for any loss or damage of such property; normal wear and tear is expected.

K. SITE RULES AND REGULATIONS

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JL			

The Contractor shall use its best efforts to ensure that its employees, agents, and subcontractors comply with site rules and regulations while on State premises. If the Contractor must perform on-site work outside of the daily operational hours set forth by the State, it must make arrangements with the State to ensure access to the facility and the equipment has been arranged. No additional payment will be made by the State on the basis of lack of access, unless the State fails to provide access as agreed to in writing between the State and the Contractor.

L. ADVERTISING

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JL			

The Contractor agrees not to refer to the contract award in advertising in such a manner as to state or imply that the company or its services are endorsed or preferred by the State. Any publicity releases pertaining to the project shall not be issued without prior written approval from the State.

M. NEBRASKA TECHNOLOGY ACCESS STANDARDS (Statutory)

Contractor shall review the Nebraska Technology Access Standards, found at http://nitc.nebraska.gov/standards/2-201.html and ensure that products and/or services provided under the contract are in compliance or will comply with the applicable standards to the greatest degree possible. In the event such standards change during the Contractor's performance, the State may create an amendment to the contract to request the contract comply with the changed standard at a cost mutually acceptable to the parties.

N. DISASTER RECOVERY/BACK UP PLAN

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JL			

The Contractor shall have a disaster recovery and back-up plan, of which a copy should be provided upon request to the State, which includes, but is not limited to equipment, personnel, facilities, and transportation, in order to continue services as specified under the specifications in the contract in the event of a disaster.

O. DRUG POLICY

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JL			

Contractor certifies it maintains a drug free work place environment to ensure worker safety and workplace integrity. Contractor agrees to provide a copy of its drug free workplace policy at any time upon request by the State.

IV. PAYMENT

A. PROHIBITION AGAINST ADVANCE PAYMENT (Statutory)

Payments shall not be made until contractual deliverable(s) are received and accepted by the State.

B. TAXES (Statutory)

The State is not required to pay taxes and assumes no such liability as a result of this solicitation. Any property tax payable on the Contractor's equipment which may be installed in a state-owned facility is the responsibility of the Contractor.

C. INVOICES

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JF			

Invoices for payments must be submitted by the Contractor to the agency requesting the services with sufficient detail to support payment. Mail to Nebraska Retirement Systems, 1526 K Street Suite 400, Lincoln, NE 68508. The terms and conditions included in the Contractor's invoice shall be deemed to be solely for the convenience of the parties. No terms or conditions of any such invoice shall be binding upon the State, and no action by the State, including without limitation the payment of any such invoice in whole or in part, shall be construed as binding or estopping the State with respect to any such term or condition, unless the invoice term or condition has been previously agreed to by the State as an amendment to the contract.

D. INSPECTION AND APPROVAL

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JF			

Final inspection and approval of all work required under the contract shall be performed by the designated State officials.

E. PAYMENT

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JF			

State will render payment to Contractor when the terms and conditions of the contract and specifications have been satisfactorily completed on the part of the Contractor as solely determined by the State. (Neb. Rev. Stat. §73-506(1)) Payment will be made by the responsible agency in compliance with the State of Nebraska Prompt Payment Act (See Neb. Rev. Stat. §81-2401 through 81-2408). The State may require the Contractor to accept payment by electronic means such as ACH deposit. In no event shall the State be responsible or liable to pay for any services provided by the Contractor prior to the Effective Date of the contract, and the Contractor hereby waives any claim or cause of action for any such services.

F. LATE PAYMENT (Statutory)

The Contractor may charge the responsible agency interest for late payment in compliance with the State of Nebraska Prompt Payment Act (See Neb. Rev. Stat. §81-2401 through 81-2408).

G. SUBJECT TO FUNDING / FUNDING OUT CLAUSE FOR LOSS OF APPROPRIATIONS

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
JF			

The State's obligation to pay amounts due on the contract for a fiscal years following the current fiscal year is contingent upon legislative appropriation of funds. Should said funds not be appropriated, the State may terminate the contract with respect to those payments for the fiscal year(s) for which such funds are not appropriated. The State will give the Contractor written notice thirty (30) calendar days prior to the effective date of termination. All obligations of the State to make payments after the termination date will cease. The Contractor shall be entitled to receive just and equitable compensation for any authorized work which has been satisfactorily completed as of the termination date. In no event shall the Contractor be paid for a loss of anticipated profit.

H. RIGHT TO AUDIT (First Paragraph is Statutory)

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within RFP Response (Initial)	NOTES/COMMENTS:
		JF	We request that this section exclude any of GRS proprietary information such as source code and internal work papers.

The State shall have the right to audit the Contractor's performance of this contract upon a thirty (30) business days' written notice. Contractor shall utilize generally accepted accounting principles, and shall maintain the accounting records, and other records and information relevant to the contract (Information) to enable the State to audit the contract. The State may audit and the Contractor shall maintain, the Information during the term of the contract and for a period of five (5) years after the completion of this contract or until all issues or litigation are resolved, whichever is later. The Contractor shall make the Information available to the State at Contractor's place of business or a location acceptable to both Parties during normal business hours. If this is not practical or the Contractor so elects, the Contractor may provide electronic or paper copies of the Information. The State reserves the right to examine, make copies of, and take notes on any Information relevant to this contract, regardless of the form or the Information, how it is stored, or who possesses the Information. Under no circumstance will the Contractor be required to create or maintain documents not kept in the ordinary course of Contractor's business operations, nor will Contractor be required to disclose any information, including but not limited to product cost data, which is confidential or proprietary to Contractor.

The Parties shall pay their own costs of the audit unless the audit finds a previously undisclosed overpayment by the State. If a previously undisclosed overpayment exceeds one-half of one percent (.5%) of the total contract billings, or if fraud, material misrepresentations, or non-performance is discovered on the part of the Contractor, the Contractor shall reimburse the State for the total costs of the audit. Overpayments and audit costs owed to the State shall be paid within ninety (90) business days of written notice of the claim. The Contractor agrees to correct any material weaknesses or condition found as a result of the audit.

Section II
Corporate Overview

SECTION II

CORPORATE OVERVIEW

Corporate Overview

a. BIDDER IDENTIFICATION AND INFORMATION. The bidder should provide the full company or corporate name, address of the company's headquarters, entity organization (corporation, partnership, proprietorship), state in which the bidder is incorporated or otherwise organized to do business, year in which the bidder first organized to do business, and whether the name and form of organization has changed since first organized.

Gabriel, Roeder, Smith & Company was incorporated on October 2, 1962 from a merger of A. G. Gabriel & Company, a sole proprietorship that was established in 1938, and another younger sole proprietorship, Roeder & Company. In 1995, the company merged with Kruse, O'Connor & Ling, a Florida based consulting firm.

In 2015, the company formed a health & welfare consulting subsidiary, Gabriel, Roeder, Smith & Company Health and Welfare Consulting, LLC from its existing health and welfare practice. For administrative and operating efficiency, both Gabriel, Roeder, Smith & Company and Gabriel, Roeder, Smith & Company Health and Welfare Consulting, LLC are now wholly owned subsidiaries of Gabriel, Roeder, Smith & Company Holdings, Inc., a private Michigan corporation.

We are headquartered in Southfield, Michigan with additional offices in Rockford, Michigan; Colorado; Florida; Illinois; Minnesota and Texas.

Gabriel, Roeder, Smith & Company (Headquarters)
One Towne Square, Suite 800
Southfield, Michigan 48076
www.grsconsulting.com

b. FINANCIAL STATEMENTS. The bidder should provide financial statements applicable to the firm. If publicly held, the bidder should provide a copy of the corporation's most recently audited financial reports and statements, and the name, address, and telephone number of the fiscally responsible representative of the bidder's financial or banking organization.

If the bidder is not a publicly held corporation, either the reports and statements required of a publicly held corporation, or a description of the organization, including size, longevity, client base, areas of specialization and expertise, and any other pertinent information, should be submitted in such a manner that proposal evaluators may reasonably formulate a determination about the stability and financial strength of the organization.

The bidder must disclose any and all judgments, pending or expected litigation, or other real or potential financial reversals, which might materially affect the viability or stability of the organization, or state that no such condition is known to exist.

The State may elect to use a third party to conduct credit checks as part of the corporate overview evaluation.

Gabriel, Roeder, Smith & Company is a national actuarial and benefits consulting services leader that has served the public sector for 80 years. GRS practice areas include pension, OPEB, defined benefit plan administration, and client software; all of which comprise core competencies for GRS. Tables 1 and 2 below illustrate the services we provide.

Table 1: Actuarial and Benefits Consulting Services

Pension & OPEB Plans	
Actuarial Services	**Best Practice Benefit Design**
Valuations	Defined Benefit
Audits	DB/DC Hybrid
Risk Management	Cash Balance
Funding Policy	Adjustable Pension Plan
Experience Studies	Benefit Adequacy Studies
Asset/Liability Studies	Benefit Policy Development
Legislative & Regulatory	**Client Software**
Cost Impact Studies	MagVal™ Suite: Projection Software
GASB Standards Consulting	GRS Advantage™: Client Services Website
Research & Surveys	Exclusion Ratio Calculator
	415 Screening Tool

DB Plan Administration	
Core Services	**Client Software**
Benefit Calculations	Plan Sponsor Portal
Data Housing	Participant Benefit Estimator
Call Center	
Communications	

Table 2: Health & Welfare Services

Actuarial & Financial	**Benefit Strategy**
Cost Projections/Impact Analysis	Medical, Dental & Pharmacy
Budget Tracking	Ancillary Lines
Rate Setting	Strategic Planning
Rate Filing Reviews	Funding Vehicles
Utilization Analysis	Benchmarking & Satisfaction Surveys
Medicare Part D Attestations	Legislative & Regulatory Updates
Data Management & Analytics	**Vendor Procurement & Management**
Data Warehouse Development	RFP Development
Data Mining	Vendor Evaluation & Negotiation
Plan Monitoring & Reporting	Program Implementation
Trend Reports	Renewal Analysis & Negotiation
	Claims & Performance Audits

GRS has at least five advantages that are undisputable:

- GRS has the largest and most diverse public sector client base, both based on region and size
- GRS has the most actuaries dedicated to public sector retirement systems
- GRS has constantly invested significant resources in the public sector actuarial community
- GRS has a proven track record of a commitment to public sector advocacy through research, communication, and support for national organizations
- GRS has its own technology department and products, specially designed for public sector retirement systems

With 1,000 clients in nearly 50 states, we provide actuarial and benefits consulting services to more public sector clients than any other firm in the country. The following is representative of our client base:

- 400 pension clients
- 600 OPEB clients
- 36 state or statewide retirement systems covering a total of over 6 million participants and over $700 billion in assets
- 26 statewide retirement systems with 50,000 or more participants

We are an employee-owned corporation that is independent of banks, accounting firms, insurance companies, brokerage firms, and multinational corporations. This means GRS can provide NPERS with totally independent and unbiased advice and service. GRS has 140 employees, including 68 credentialed actuaries and consultants with decades of benefits experience. All of our employees are involved in serving public sector agencies, from consultants to administrative staff.

As an employee-owned firm, nearly everyone in the company from the CEO to an administrative assistant is an owner. Since everyone in the company has a stake in the success of the company, everyone strives to provide the best service possible to our clients.

GRS is headquartered in Southfield, Michigan with additional offices in Rockford, Michigan; Colorado; Florida; Illinois; Minnesota; and Texas.

We are unaware of any judgments, pending or expected litigation, or other real or potential financial reversals which might materially affect the viability or stability of GRS.

100% of our revenues derive from services to public sector benefits plans. As of the latest financial report dated December 31, 2017:

- GRS has nominal debt and substantial cash reserves on its balance sheet.
- GRS has access to a $2.6 million line of credit from JPMorgan Chase Bank, a bank with which GRS has had a more than 40-year relationship.

We are fully committed to serving the public sector for many years to come. With over 1,000 public sector clients served by seven offices, GRS is confident of its long-term viability.

GRS is not a publicly held corporation, however, we would be happy to provide you with our audited financial statements provided that they are kept confidential.

c. **CHANGE OF OWNERSHIP. If any change in ownership or control of the company is anticipated during the twelve (12) months following the proposal due date, the bidder should describe the circumstances of such change and indicate when the change will likely occur. Any change of ownership to an awarded vendor(s) will require notification to the State.**

No such changes are anticipated.

d. **OFFICE LOCATION. The bidder's office location responsible for performance pursuant to an award of a contract with the State of Nebraska should be identified.**

Services for the Nebraska Public Employees Retirement System will be provided from our Michigan offices at the addresses below.

Gabriel, Roeder, Smith & Company

One Towne Square, Suite 800 (Headquarters)	8 E. Bridge Street, Suite A-1
Southfield, Michigan 48076	Rockford, Michigan 49341

Phone: 800.521.0498
Fax: 248.799.9020
www.grsconsulting.com

e. **RELATIONSHIPS WITH THE STATE. The bidder should describe any dealings with the State over the previous ten (10) years. If the organization, its predecessor, or any Party named in the bidder's proposal response has contracted with the State, the bidder should identify the contract number(s) and/or any other information available to identify such contract(s). If no such contracts exist, so declare.**

No such contracts exist.

f. **BIDDER'S EMPLOYEE RELATIONS TO STATE. If any individual named in the bidder's proposal response is or was an employee of the State within the past twelve (12) months, identify the individual(s) by name, State agency with whom employed, job title or position held with the State, and separation date. If no such relationship exists or has existed, so declare.**

No such relationship has existed.

If any employee of any agency of the State of Nebraska is employed by the bidder or is a subcontractor to the bidder, as of the due date for proposal submission, identify all such individuals by name, position held with the bidder, and position held with the State (including job title and agency). Describe the responsibilities of such persons within the proposing organization. If, after review of this information by the State, it is determined that a conflict of interest exists or may exist, the bidder may be disqualified from further consideration in this proposal. If no such relationship exists, so declare.

No such relationship exists.

g. **CONTRACT PERFORMANCE. If the bidder or any proposed subcontractor has had a contract terminated for default during the past ten (10) years, all such instances must be described as required below. Termination for default is defined as a notice to stop performance delivery due to the bidder's non-performance or poor performance, and the issue was either not litigated due to inaction on the part of the bidder or litigated and such litigation determined the bidder to be in default.**

It is mandatory that the bidder submit full details of all termination for default experienced during the past ten (10) years, including the other Party's name, address, and telephone number. The response to this section must present the bidder's position on the matter. The State will evaluate the facts and will score the bidder's proposal accordingly. If no such termination for default has been experienced by the bidder in the past ten (10) years, so declare.

If at any time during the past ten (10) years, the bidder has had a contract terminated for convenience, non-performance, non-allocation of funds, or any other reason, describe fully all circumstances surrounding such termination, including the name and address of the other contracting Party.

None.

h. **SUMMARY OF BIDDER'S CORPORATE EXPERIENCE. The bidder should provide a summary matrix listing the bidder's previous projects similar to this RFP in size, scope, and complexity. The State will use no more than three (3) narrative project descriptions submitted by the bidder during its evaluation of the proposal. Please provide this information on Attachment B. Technical Approach.**

This information is provided in Attachment B, as requested, beginning on page 10.

i. SUMMARY OF BIDDER'S PROPOSED PERSONNEL/MANAGEMENT APPROACH. The bidder should present a detailed description of its proposed approach to the management of the project. Please provide your response on Attachment B Technical Approach.

This information is provided in Attachment B, as requested, beginning on page 10.

j. SUBCONTRACTORS. If the bidder intends to subcontract any part of its performance hereunder, the bidder should provide:

- **i. name, address, and telephone number of the subcontractor(s);**
- **i. specific tasks for each subcontractor(s);**
- **ii. percentage of performance hours intended for each subcontract; and**
- **iii. total percentage of subcontractor(s) performance hours**

We will not use a subcontractor on this project. We partner with firms only in cases when either Gabriel, Roeder, Smith & Company or the partner bring a specialized set of services or skills, not otherwise available at the firm. For public sector pension and OPEB work we do not use subcontractors.

In addition, GRS is an employee owned firm. Since virtually every employee has an ownership stake in the company, every employee has a stake in making the company successful by providing the best possible service to our clients.

- Our quality and peer review process are under our control. When our work is audited by other firms, those firms will not be engaged in providing services for this engagement.
- By not partnering with another firm, you can be assured that our advice is only our own and unbiased towards all stakeholders and is not in any way influenced by another firm.
- Our clients can be assured that GRS will only provide services that it is qualified to provide.
- We are a fee for service firm (we bill based on time and expense incurred). Even in cases where we partner with other firms, we do not accept commission revenue from those firms. Our clients can be assured that our advice is impartial since we do not receive any revenue other than for work completed and delivered to our client.
- By not partnering with another firm, our client is assured that Professional Standards and our internal Code of Ethics policies will be enforced.

SECTION III

TECHNICAL APPROACH

Attachment A

Mandatory Qualification Certification and Questionnaire

Request for Proposal Number 5989 Z1

All bidders are required to complete this attachment.

The bidder hereby certifies that it meets all of the following mandatory qualifications:

1. As of December 31, 2018, the bidder has a minimum of three (3) public pension fund clients.

_X_ Yes. ____ No.

2. The bidder has a minimum of five (5) years of experience in providing actuarial consulting services to a public pension fund. This means that the bidder as an organization has been providing actuarial consulting services to a public pension fund for at least five (5) years. This requirement is not satisfied simply because its employees have at least five (5) years' experience in providing actuarial consulting services to a public pension fund.

_X_ Yes. ____ No.

3. The bidder's lead consultant on the account must have a minimum of ten (10) years of experience in providing actuarial consulting service to public pension funds. This experience shall include general consulting, experience analysis, and valuation assignments for such funds. This person shall also have experience in testifying before legislative and administrative bodies in support of actuarial positions and the principles used in valuing a public retirement system or pricing legislation, and an ability to discuss in laymen's terms the following: actuarial theory; basis for assumptions; and other actuarial matters. The lead consultant must be a member of the American Academy of Actuaries.

_X_ Yes. ____ No.

4. Professional staff assigned to the account shall have a minimum of five (5) years of experience in the field of actuarial science and will include persons with appropriate professional credentials such as Fellow or Associate of Society of Actuaries, and/or Fellow of the Conference of Actuaries in Public Practice, and/or Member of the American Academy of Actuaries, and/or meet standards of a qualified actuary under the provisions of the Employee Retirement Income Security Act of 1974.

_X_ Yes. ____ No.

5. All services to be provided on behalf of the account shall be in accordance with generally accepted actuarial principles.

_X_ Yes. ____ No.

6. The actuarial firm must carry liability insurance as set forth in this RFP for the duration the contract. (Section III, G Insurance Requirements)

_X#_ Yes. ____ No.

January 22, 2019

Date

Gabriel, Roeder, Smith & Company

Name of firm

Judith A. Kermans, President

Name and title of individual signing for the firm.

Judith A. Kermans

Signature

GRS has access to additional insurance coverage beyond our standard amount.

c. Attachment B: Proposed Technical Approach

Attachment B is provided on the following pages.

Technical Approach

Bidders shall complete and submit a Technical Approach Document to provide Actuarial Services for the Nebraska Public Employees Retirement Systems (NPERS). Bidders are required to describe in detail how their proposed solution meets the specifications outlined within each Requirement.

The Technical Approach Document must indicate how the bidder intends to comply with the requirement and the effort required to achieve that compliance. It is not sufficient for the bidder to simply state that it intends to meet the requirements of the RFP. The State will consider any such response to the requirements in this RFP to be non-responsive. The narrative should provide the State with sufficient information to differentiate the bidder's solution from other bidders' solutions.

CORPORATE OVERVIEW
1. Qualification One: As of December 31, 2018, bidder has a minimum of three (3) public pension fund clients. Please submit a written description of how this qualification is satisfied, including, at a minimum, a list of at least three (3) public pension fund clients for whom the bidder currently provides actuarial consulting services. These descriptions should include: **a)** The time period of the project; **b)** The scheduled and actual completion dates; **c)** The Contractor's responsibilities; **d)** For reference purposes, a customer name (including the name of a contact person, a current telephone number, a facsimile number, and e-mail address); and, **e)** Each project description should identify whether the work was performed as the prime Contractor or as a subcontractor. If a bidder performed as the prime Contractor, the description should provide the originally scheduled completion date and budget, as well as the actual (or currently planned) completion date and actual (or currently planned) budget.
Bidder Response: With 1,000 clients in nearly 50 states, we provide actuarial and benefit consulting services to more public sector clients than any other firm in the county. GRS has worked for more than: • 400 pension clients • 36 state or statewide retirement systems covering a total of over 6 million participants and over $800 billion in assets • 26 statewide retirement systems with 50,000 or more participants Listed below are three pension fund clients similar in size and scope to NPERS for whom GRS performed as the Prime Contractor. In addition, sample statewide and public pension fund client lists are provided in Appendix B. **ARIZONA PUBLIC SAFETY PERSONNEL RETIREMENT SYSTEM (PSPRS)** Mr. Jared A. Smout Administrator ***Arizona Public Safety Personnel Retirement System*** 3010 East Camelback Road, Suite 200 Phoenix, Arizona 85016-4416 Phone: (602) 255-5575 E-mail: jsmout@psprs.com PSPRS was established to provide a uniform, consistent, and equitable statewide retirement program for

Arizona's public safety personnel. Separate plans exist for Arizona's elected officials (the Elected Officials' Retirement Plan or EORP) and corrections officers (the Corrections Officer Retirement Plan or CORP). All three plans are qualified governmental pension plans under Section 401(a) of the Internal Revenue Code. PSPRS and CORP are agent multiple-employer defined benefit plans. EORP is a cost-sharing, multiple-employer defined benefit plan. Retirement benefits are determined ("defined") using a formula based on salary and years of service. PSPRS also administers a defined contribution plan, where retirement benefits are determined ("defined") based on contributions and investment earnings on those contributions. PSPRS also administers the Public Safety Cancer Insurance Policy Program for members of PSPRS and CORP. PSPRS provides retirement benefits and programs to nearly 59,000 active members, 20,000 retired members and surviving beneficiaries, and to more than 250 employers groups (municipalities, agencies, and districts) throughout the State. PSPRS combined assets total nearly $10 billion.

GRS has served PSPRS since 2009 as the prime Contractor (with no subcontractors), preparing an actuarial valuation as of every June 30 with the results of the valuation generally presented at the Board meeting held in October or November. The valuation provides each individual employer group with their financial information, including the Statutory and actuarially recommended contribution rates for each employers group. Once the valuation is approved by the Board, GRS prepares an individual valuation summary for each of the 250+ employer groups to communicate the new contribution rate and the primary reasons for any changes.

Every five years GRS also performs an experience study that reviews all the economic and demographic assumptions used in the actuarial valuation. Since each employer group has their own contribution rate based on their plan provisions and actual demographics, it is vital that the most appropriate demographic assumptions are used. These results and recommendations are presented to the Board for their approval before being incorporated into the actuarial valuation.

GRS also provides PSPRS assistance with issues arising in connection with the operation and administration of the Retirement System. The spectrum of issues includes plan administration, data integrity, compliance with applicable IRS requirements, and GASB accounting.

Finally, GRS has assisted PSPRS with pension reform resulting in changes to each of the PSPRS, CORP, and EORP plans in the last 5 years that have put the plans on firmer financial footing.

WISCONSIN RETIREMENT SYSTEM (WRS)

Mr. Bob Conlin
Secretary
Wisconsin Retirement System
4822 Madison Yards Way
Madison, WI 53705-9100
Telephone: (608) 266-0301
Email: bob.conlin@etf.wi.gov

The WRS is a cost-sharing hybrid defined benefit plan containing elements of both a 401(k) or defined contribution plan and a defined benefit plan, covering 625,000 members, with assets of $100 billion. GRS has served WRS for over three (since 1976) decades as the prime Contractor (with no subcontractors), preparing an actuarial valuation as of every December 31 with the results of the valuation generally presented at Board meetings held in March and June. The valuation provides financial information, including the actuarially recommended contribution rates for three separate groups of employees – General, Protective with Social Security, and Protective without Social Security.

Each year's Active Lives valuation includes a detailed actuarial gain/loss section developed by GRS, which serves as the basis for the experience study performed once every three years. This persistent investigation of economic and demographic assumptions used in the actuarial valuation is very important in developing contribution rates that are applied to $14 billion payroll. These results and recommendations are usually presented in December to the Board for their approval before being incorporated into the actuarial valuation. In addition, the investigation of economic assumptions involves GRS interacting with the State of Wisconsin Investment Board every other year, to investigate the impact of various asset return scenarios on the Retirement System financial results.

Once the valuation results are finalized, we prepare a client specific version of the MagValPlus projection software for WRS Staff. This projection software allows WRS Staff to prepare cost projections and model plan provision changes for each individual city. GRS also assists WRS Division of Trust Finance Staff with GASB Accounting by providing detailed proportionate share calculations for the System's 1,500+ employers. This information is provided within weeks of receiving finalized asset information. Lastly, GRS participates in an annual Staff Retreat in Madison, Wisconsin.

ILLINOIS MUNICIPAL RETIREMENT FUND (IMRF)

Mr. Mark Nannini
Chief Financial Officer
Illinois Municipal Retirement Fund
2211 York Road, Suite 500
Oak Brook, Illinois 60523
Telephone: (630) 368-5345
Email: mnannini@imrf.org

IMRF is an agent multiple-employer defined benefit plan with almost 3,000 employers and has approximately $41 billion in assets. GRS has served IMRF since 1992 as the prime Contractor (with no subcontractors), preparing an actuarial valuation as of every December 31 with the results of the valuation generally presented at the Board meeting held in May. The valuation provides each individual employer group with their financial information, including the actuarially recommended contribution rates for each employer's group. Once the valuation is approved by the Board, GRS prepares an individual valuation summary for each of the 3,000 employers to communicate the new contribution rate and the primary reasons for any changes.

Every three years GRS also performs an experience study that reviews all the economic and demographic assumptions used in the actuarial valuation. Since each employer group has their own contribution rate based on their plan provisions and actual demographics, it is vital that the most appropriate demographic assumptions are used. These results and recommendations are presented to the Board for their approval before being incorporated into the actuarial valuation.

Accounting support is a challenge for 3,000 employers and 12 different fiscal year ends. Despite these obstacles, GRS produces over 3,000 employer GASB reports within six weeks of receiving final asset information.

2. Qualification Two:
The bidder has a minimum of five (5) years of experience in providing actuarial consulting services to a public pension fund. This means that the bidder as an organization has been providing actuarial consulting services to a public pension fund for at least five (5) years. This requirement is not satisfied simply because its employees have at least five (5) years' experience in providing actuarial consulting services to a public pension fund. Please submit a written description of how this qualification is satisfied, including, at a minimum, a list of the public pension fund clients for whom the actuarial consulting firm has provided actuarial consulting services for at least five (5) years.

Bidder Response:

Gabriel, Roeder, Smith & Company has been providing actuarial consulting services to the public sector for 80 years. We derive 100% of our revenue from actuarial and benefits consulting services. GRS practice areas include pension, OPEB, defined benefit plan administration, and client software.

GRS has worked in most of the 50 states, including Hawaii and Alaska. The majority of our client relationships span decades. We have been associated with more than half of our clients for at least 25 years, many for more than 50 years, and some for over 80 years. We believe that our clients' long association with our company results from our focus on technological innovation, research, and employee professional growth efforts solely attentive on managing the challenges faced by benefit plans. Since GRS has served clients in nearly every state, we have experience with virtually every benefit design used in the United States. We are confident that none of our competitors offer the same level of expertise and resources.

A sample list of our public pension fund clients is provided in Appendix B.

3. Qualification Three:
The bidder's lead consultant on the account must have a minimum of ten (10) years of experience in providing actuarial consulting service to public pension funds. This experience shall include general consulting, experience analysis, and valuation assignments for such funds. This person shall also have experience in testifying before legislative and administrative bodies in support of actuarial positions and the principles used in valuing a public retirement system or pricing legislation, and an ability to discuss in laymen's terms the following: actuarial theory; basis for assumptions; and other actuarial matters. The lead consultant must be a member of the American Academy of Actuaries. Please submit a written description of how this qualification is satisfied, including, at a minimum, a list of the lead consultant's experience in providing actuarial consulting services to public pension funds for at least ten (10) years, and showing past experience at testifying before legislative and administrative bodies.

Bidder Response:

James D. Anderson, FSA, EA, FCA, MAAA, the proposed lead consultant for NPERS, is a Senior Consultant in GRS' Grand Rapids (Rockford), Michigan office. He has provided actuarial and benefits consulting since 1988, and currently serves on the GRS Board of Directors. His areas of expertise include experience studies, plan design, funding, accounting, and administration and communication of defined benefit plans, defined contribution plans, and post-retirement medical plans. Jim currently provides general consulting, experience analysis and valuation assignments for the Arizona Public Safety Personnel Retirement System and Wisconsin Retirement System and is the Supervising Actuary for a replication audit of the Delaware Public Employees' Retirement System. He also works for a number of Michigan City and County retirement systems.

With regard to public testimony, GRS is distinguished from our competitors because of our unparalleled depth of experience addressing policy and legal issues related to public employee retirement systems across the nation. Jim has testified in Act 312 arbitration in Michigan and was deposed regarding actuarial results for a Statewide Public Employees Retirement System.

When it comes to discussing actuarial theory, basis for assumptions and other actuarial matters in layman's terms, your GRS Team is particularly experienced. GRS' motto when it comes to presentations and written communication is "education, not information." Our presentations will be concise, illustrative, and focused on "telling the story." We commonly find that our Boards continue to improve their understanding of the actuarial concepts with each presentation that we deliver, which indicates to us that we are fulfilling our role.

Resumes for Jim and the proposed team for NPERS are provided in Appendix A.

4. Qualification Four:
Professional staff assigned to the account shall have a minimum of five (5) years of experience in the field of actuarial science and will include persons with appropriate professional credentials such as Fellow or Associate of Society of Actuaries, and/or Fellow of the Conference of Actuaries in Public Practice, and/or Member of the American Academy of Actuaries, and/or meet standards of a qualified actuary under the provisions of the Employee Retirement Income Security Act of 1974. Please submit a written description of how this qualification is satisfied, including, at a minimum, a list of the professional staffs' experience in providing actuarial consulting services to public pension funds for at least five (5) years, and showing the professional staffs' credentials.

Bidder Response:

Mark Buis, FSA, EA, FCA, MAAA, will serve as the Secondary Actuary for NPERS. Mark is a senior consultant and team leader in GRS' Southfield, Michigan office. He has more than 29 years of pension consulting experience. His background encompasses all aspects of the actuarial valuation process, including preparation of project plans, budgets, and communication with the consulting team and the client. Mark's client responsibilities cover statewide and municipal plans located in Arizona, Michigan, Illinois, and Wisconsin. In particular, Mark currently provides actuarial and consulting services for the Arizona Public Safety Personnel Retirement System, Illinois Municipal Retirement Fund, Michigan Municipal Employees Retirement System and Wisconsin Retirement System.

Laura Frankowiak, ASA, MAAA, will serve as Project Manager for NPERS. Laura is a consultant is GRS' Southfield, Michigan office. She has 10 years of actuarial and benefits consulting experience. Laura's experience covers pension and retiree health care actuarial services. Her work includes funding valuations and GASB 67/68 and 74/75 reporting, experience studies, supplemental valuations, cost analyses of proposed plan changes, cash flow projections and sensitivity analysis, and calculation of per capita costs. She has worked with clients in Arizona, Florida, Illinois, Michigan, Virginia, and Wisconsin. In particular, Laura currently provides actuarial and consulting services for the Arizona Public Safety Personnel Retirement System, Illinois Municipal Retirement Fund, and Wisconsin Retirement System.

Resumes for Mark and Laura are provided in Appendix A.

TECHNICAL APPROACH

5. Describe bidder's understanding of the Scope of Work for this RFP.

Bidder response:

We understand the State of Nebraska (State), Department of Administrative Services (DAS), Materiel Division, State Purchasing Bureau (SPB), is issuing this Request for Proposal (RFP) Number 5989 Z1 for the purpose of selecting a qualified bidder to provide the following Actuarial Services for the Nebraska Public Employees Retirement Systems (NPERS):

1. Consulting Services
2. Valuation Services

3. Governmental Accounting Standards Board (GASB) Services
4. Projection Services
5. Actuarial Experience Study
6. Benefit Adequacy Study
7. Supplementary Services

GRS has been providing all of the requested services for over 80 years. Based on our experience with 36 statewide retirement systems and 350 local governments, we provide more year-end reporting for public sector clients than any other consulting firm in the country. Virtually all of the statewide systems we work on, as well as local municipalities, require timely and accurate information for the System's annual financial report. This information is typically needed within a month or two after the close of the fiscal year. This requires reconciling the valuation data, producing data schedules, reviewing financial information, computing actuarial liabilities and contribution requirements as well as providing the various disclosure requirements all in a short period of time. Since all of our valuation software and technology tools have been designed specifically for public sector clients, we have the capability of providing all of the necessary information for year-end reporting in a fast and efficient manner.

At some actuarial and benefits consulting firms, the provision of consulting services is secondary to completion of the annual actuarial valuation. In contrast, at GRS we consider the provision of retirement consulting services to be equally as important as the actuarial valuation itself. We focus on providing real value to our clients by integrating pension funding and accounting into their overall business and financial plans (as compared to merely "running the numbers"). We view the provision of consulting services as making our clients' lives easier and providing them with complete information such that they will be able to make informed decisions, and anticipate events that may impact this process.

In addition, the following attributes make GRS' consulting expertise invaluable to the public sector:

- Reputation for an unbiased presentation of facts. Our role is to present unbiased information and consulting advice so that Boards and governments can make decisions
- Experienced with providing testimony on benefit issues to state legislatures and commissions, county commissions and city councils
- Clear understanding that the plan operates towards the beneficial interest of the plan participants through the operation of the entire Board
- Sensitive to the considerations of the various stakeholders, management, labor management, private citizens, and Board members

6. Describe bidder's approach for providing Actuarial Consulting Services for public pension funds.

Bidder response:

Our continuing objective is to remain your trusted advisor and to continue to partner with you as risk managers and subject matter experts. As your partner, we view our relationship with NPERS as a dynamic process in which both GRS and NPERS take an active role.

GRS will emphasize accountability, transparency, education, risk management, and honesty. We are going to make sure decision makers do not just have a small subset of confusing numbers to base their decision on, or have to just blindly trust that their actuary is giving them sound advice. Instead, they will have a broad understanding of not only the top line numbers, but their limitations, their risks, what strategies have been implemented and how the System will react in adverse scenarios. We will also hold ourselves accountable to previous estimates and provide transparent discussions on either (1) how consistent the new information is, or (2) why the new information is different.

Our consulting philosophy rests on these fundamental principles. Our philosophy and approach brings NPERS a broad strategic perspective to your retirement needs and the highest quality actuarial services available in the industry.

Figure 1 below provides a schematic of the primary inputs involved in our consulting philosophy. Each of the inputs are designed to provide NPERS with clear, timely, and objective information which NPERS can use to make decisions and further direct its GRS team towards options it would like to explore to procure the best possible outcomes for the future of the retirement system.

Figure 1

Research Group

An important component to our overall strategic approach to actuarial consulting is research and education about successful plan sustainability approaches, workforce trends, and regulatory compliance. The research group continuously tracks legislative and regulatory developments and develops research publications for use by our clients and our consultants.

Chief Actuary

GRS' Chief Actuary, David Kausch, FSA, EA, FCA, MAAA, MSPA, PhD, monitors the firm's adherence to established actuarial standards, provides oversight and interpretations for the firm's actuarial methodologies, and serves as a GRS spokesperson for the company's perspectives and positions on actuarial issues. The work of our Chief Actuary focuses solely on public pension systems. As a result, our clients are further assured of receiving consulting advice that is sound and defensible.

Peer Review

In completing any client assignment, it is the goal of each employee to produce the highest quality work. This practice has been an integral component of our corporate culture throughout the entire history of the company. GRS' quality assurance procedures and guidelines require that consulting services be thoroughly reviewed by at least three consultants. We usually provide consulting services using a team of five to seven members. A core of actuarial analysts develop the initial work products, at least two senior analysts and a consultant reviews the analysts' work product for technical accuracy and consistency, a senior consultant reviews the work product and provides commentary on trends and conclusions, and the peer review senior consultant performs the final review from the client's perspective. For highly complex projects, such as the actuarial review of a statewide system, a second peer review senior consultant is typically used. The GRS Professionalism Committee developed our Peer Review guidelines, which they review and revise as appropriate. We use these quality assurance procedures and guidelines on all services provided to our clients. This attests to the strength of the quality controls we have built for providing actuarial services.

Consultant Practice Meetings

GRS has monthly Consultant Practice meetings, which include consultants from all GRS offices. The meetings provide a forum for consultants to share consulting issues and information related to the projects they are working on and for the Chief Actuary and Professionalism Committee to communicate guidance on current and emerging issues, such as those related to Actuarial Standards of Practice, GASB, and state and federal legislative and regulatory issues.

7. Describe bidder's approach for providing Actuarial Valuation Services for defined benefit and cash balance public pension funds. Give Examples.

Bidder response:

The proposed GRS team has experience meeting the valuation and reporting deadlines of large, complex retirement systems. A specific example of this relates to the valuation process for the Arizona Public Safety Personnel Retirement System (PSPRS). For PSPRS, funding valuations are performed for three large multiple-employer defined benefit plans. Each plan has three tiers. There are agent plans, cost-sharing plans, and cost-sharing plans within agent plans as well as OPEB plans associated with the defined benefit plans. The level of complexity is very high, the fiscal year ends June 30th, and actuarial reports are delivered by November.

Listed below is the basic approach we would use in performing actuarial valuation services for the NPERS defined benefit and cash balance plans. **A sample public pension valuation report is provided in Appendix D.**

1. **Hold Planning Meeting**. Each year's work starts with a planning meeting. We will have a meeting with NPERS soon after we receive notification that we have been selected to provide actuarial consulting services. We believe that meeting with you up front to clarify the deliverables is critical to developing a strong working relationship. We will discuss any special concerns that you may have including the effects of any recent benefit changes or special data needs. GRS will review with the Board/Staff the flow of events for the valuations and make note of important dates and issues to be addressed in the valuations. We will discuss the methods and assumptions used in the previous year's valuation and recommend any changes to NPERS, as needed. The result of the meeting is a work plan for the upcoming valuation process.

2. **Review Current Plan Provisions.** GRS will review State statutes, actuarial standards and request and review information such as, plan documents, summary plan descriptions, bargaining agreements, and other communications to active and retired members in order to evaluate the nature of the pension benefits of NPERS members.

3. **Perform Replication Valuations**. GRS will request census data files and assumption tables used in the previous year's valuation from the former actuary. We will perform a replication valuation of the previous year's valuation. We consider the replication valuation a standard practice and crucial to understanding the intricacies of NPERS. This parallel valuation also serves as an "audit" in that it replicates the work of the prior actuary and will highlight any exceptions in the valuation process that may merit discussion.

4. **Request Member Data.** GRS will request data files including records on each person who is actively participating in the plans as of the valuation date, receiving a benefit as of the valuation date, or who retains a right to future benefits. We request that the census information be provided electronically, in Access, Excel or some other format. GRS and the Board/Staff will discuss the method of data transmission – via email with password protected files, with a secure FTP site (file transfer portal), or by other means. **GRS has 1,000 public sector clients and has never had a breach of confidential information in its entire history, which dates back to 1938.**

5. **Prepare Data.** Once data has been received, it is checked for general reasonableness, and compared with the prior year. Selected individual cases are reviewed in detail to ensure that the data changed as expected from year to year. For example, we would confirm that active member test cases had an increase in service and that their reported pay amounts compare well between the two years. Retirees would be checked to confirm that they received the proper COLA, if applicable. A letter outlining any issues found in the reasonableness check along with comparative statistics is then sent to the client for their review and confirmation. Once NPERS staff has provided a reasonable check of the information provided, GRS will prepare the data for the valuations.

6. **Produce Valuation Results**. Once the data files are ready for use, they will be run through our valuation programs to produce initial results. The results will be thoroughly checked and costs and liabilities will be developed along with the contribution rate for the Defined Benefit Plan. The valuations will compare the actuarial assumptions and actual experience of the plan each year. Any unusual or unexpected results are discussed immediately with the Board/Staff. The gain/loss analysis is provided as part of the valuation process.

7. **Present Results**. We will then present the valuation to the Retirement Board, highlighting the most important results along with any trends emerging from the current and prior years' results. We will also inform the Retirement Board of the latest developments in the public sector benefits field as they apply to NPERS.

8. **Prepare Draft and Final Reports**. The valuation reports will then be drafted. The format is normally consistent from year to year for ease of use. At the initial planning meeting, we will discuss report content and format to ensure all the necessary information is provided. Our draft reports will typically be delivered approximately 8 weeks following the receipt of complete and usable data. **Please see our proposed detailed work plan in Table 3 on the following page. Dates to be filled in at planning meeting.**

Table 3: Proposed Pension Work Plan

	TASK DESCRIPTION	Responsibility GRS	Responsibility NPERS	Proposed Due Date
PLANNING MEETING	**1.0 Planning Meeting with Client and Team**			
	a.) Meeting with NPERS and team regarding scope of actuarial services	X	X	
TRANSITION	**2.0 Commence Parallel Valuation**			
	GRS requests the following information from the prior actuary			
	a.) Valuation-ready data	X	X	
	b.) Historical reports and documents	X	X	
	3.0 Replicate Valuation Results			
	a.) Write and test valuation programs	X		
	b.) Run parallel valuations and confirm discrepancies with prior actuary	X		
	c.) Submit and discuss replication results with NPERS	X		
DATA	**4.0 Census Data**			
	a.) Receipt of census data from NPERS		X	
	b.) Review and load data and email questions to NPERS	X		
	c.) Data answers received from NPERS		X	
	d.) Load data answers, finalize data and prepare schedule for NPERS	X		
	5.0 Financial Data			
	a.) Receipt of financial statements from NPERS		X	
	b.) Assets entered and reviewed	X		
VALUATION	**6.0 Calculations and Programs**			
	a.) Test Life program check	X		
	b.) Test Life program review	X		
	c.) Financing work papers input	X		
	d.) Financing work papers review	X		
	e.) Run gain/loss programs and analyze	X		
	f.) Review gain/loss by source	X		
	7.0 Report			
	a.) Draft valuation report	X		
	b.) Valuation report review	X		
	c.) Consultant final review of valuation report	X		
	8.0 Deliverable Schedule			
	a.) Draft report to NPERS	X		
	b.) Final Report to NPERS	X		
	c.) Budget results (if full report is not available by (Insert Date)	X		
	d.) Presentation of Report to Board	X		

8. Describe bidder's approach for providing GASB Services for single and multiple employer public pension funds. Give examples.

Bidder response:

Based on our experience providing individual valuation reports to the 3,000 cities that participate in the Illinois Municipal Retirement Fund, as well as allocating individual contribution rates to the cities, your proposed GRS consulting team has the infrastructure necessary develop the appropriate GASB disclosure information to the numerous employers participating in the County Plan and the School Plan.
Listed below is the basic approach we would use in performing the GASB actuarial valuations for the NPERS.

	Table 4: Proposed GASB Work Plan TASK DESCRIPTION	Responsibility		Proposed
		GRS	NPERS	Due Date
PLANNING MEETING	**1.0. Planning Meeting with Client and Team**			
	a) Meeting with NPERS and team regarding timing and deliverables	X	X	
TRANSITION	**2.0 Commence Parallel Valuation**			
	GRS requests the following information from the prior actuary			
	a) Valuation-ready data	X	X	
	b) Historical reports and documents	X	X	
	3.0 Replicate Valuation Results			
	a) Write and test valuation programs	X		
	b) Run parallel valuations and confirm discrepancies with prior actuary	X		
	c) Submit and discuss replication with NPERS	X	X	
DATA	**4.0 Data**			
	a) Receipt of provision data from NPERS		X	
	b) Review and email questions to NPERS	X		
	c) Receipt of financial statements from NPERS		X	
	d) Assets entered and reviewed	X		
	e) Receipt of component unit information from the NPERS		X	
	f) Review of component unit information from the NPERS	X		
VALUATION	**5.0 Calculations and Programs**			
	a) Test Life program and projection check	X		
	b) Test Life program and projection review	X		
	c) Financing work papers input	X		
	d) Financing work papers review	X		
	6.0 Report			
	a) Draft valuation report	X		
	b) Valuation report review	X		
	c) Consultant final review of valuation report	X		
	7.0 Deliverable Schedule			
	a) Draft report to the NPERS	X		
	b) Final report to the NPERS	X		

A sample GASB report is provided in Appendix D.

9. Describe bidder's approach for providing Projection Services for public pension funds. Give examples.

Bidder Response:

An example of our activities in this area follows:

State of Wisconsin Investment Board (SWIB)

GRS conducted Asset/Liability stochastic projection studies for SWIB and presented results at their Board retreats. One such study performed by Jim Anderson, Mark Buis and Brian Murphy was well received by SWIB staff as 'one of the best they have received'. The purposes of such studies included:

- Educating SWIB Board members on the long term relationship between Wisconsin Retirement System benefit obligations and SWIB investment activity.
- Demonstrating the effect of investment results on Wisconsin Retirement System contribution and dividend rates under a variety of market conditions.
- Showing the potential effect on contribution requirements if there were significant changes in the demographics of the Wisconsin Retirement System active population.
- Conducting Monte Carlo simulations demonstrating the potential range of future contribution and dividend ranges based upon volatility alternatives selected by the SWIB staff.
- Exploring the effect on dividends during difficult economic times and study alternative solutions.

GRS builds and customizes its own projection software. The Magnitude Valuation© line of projection software includes three different software applications. Each is tailored to the client's specific needs.

Our ***MagVal10*** projection application offers results for periods extending through 10 years into the future. GRS customizes this projection application for users by uploading the retirement system's most recent valuation results into the application. Users can create alternate scenarios by entering economic data and valuation result inputs. Alternate scenario inputs can include investment return, payroll and liability growth, contribution rates, amortization years, and asset corridors. The application returns results in both graphical and chart formats.

MagVal30, included in our fixed fees, offers NPERS longer term projections, enhanced economic scenario capabilities and interactive graphs. It provides information to help decision makers analyze the impact of a variety of potential economic pressures that could be faced by the plan. Decision makers can use the results to forecast budget requirements and develop strategies to manage risk. Users will find MagVal30 is flexible and easy-to- use:

- Results are delivered in easy-to-analyze graphs and charts.
- Users perform what-if scenario modeling using a simple, field based data input screen.

Benefits of MagVal30:

- This application enables clients to examine long-range funding progress and contribution adequacy quickly and efficiently. This application is specifically designed to model the adequacy of code-compliant contribution rates and can be customized to allow the system to study several key factors such as the impact of asset returns and funding policy decisions.
- MagVal30 provides a range of results based on the system's asset allocation and investment policy. This range of results is in the form of (1) investment return percentiles that are based on the investment return mean and standard deviation entered by the user and (2) user scenarios for which the user directly enters annual rates of investment return and inflation for each future year.

MagValPlus is useful in plan redesign projects and for risk modeling exercises. MagValPlus can value benefit and assumption changes. The effect of the changes can be broken out by retirees, active members (near or far from retirement), and future new hires. GRS can customize MagValPlus to best serve your needs.

10. Describe bidder's approach for providing Actuarial Experience Studies for public pension funds. Give examples.

Bidder Response:

The Wisconsin Retirement System provides a prime example of how GRS has developed efficient processes in the area of experience studies. Here we capitalize on performing detailed work during each valuation to provide annual gain/loss analyses which form the basis for the triennial experience study. This approach benefits both GRS and the client since experience is thoroughly investigated each and every year, leading to few surprises when aggregated over three years in the experience study.

Pension plans require a long-term financing program, but the future cannot be predicted with precision. Therefore, periodic adjustments to the financing program lead to better measurements as the demographic and financial environments inevitably change. Experience studies provide a basis for evaluating assumptions and revising them to better measure a plan's financial progress. We have helped clients refine these measurements to enhance the quality of funding recommendations, develop more level funding patterns, and ensure that inputs for benefit cost proposals are up-to-date.

GRS Approach

We perform experience studies including the review of demographic and economic assumptions for most of our clients on a regular basis. These studies are an important part of the actuarial services provided to our retirement system clients. Given our large public sector client base and our extensive experience, we offer a special advantage in this area.

In order to perform the valuation, assumptions must be made regarding the future experience of the System with regard to the following risk areas:

- Rates of withdrawal of active members
- Rates of disability among active members
- Patterns of salary increases to active members
- Rates of retirement among active members
- Rates of mortality among active members, retirees, and beneficiaries
- Long-term rates of investment return

In conducting experience studies, actuaries generally use data over a period of several years. This is necessary in order to gather enough data so that the results are statistically significant. In addition, if the study period is too short, the impact of the current economic conditions may lead to misleading results.

It is known, for example, that the health of the general economy can impact salary increase rates and withdrawal rates. Using results gathered during a short-term boom or bust will not be representative of the long-term trends in these assumptions.

Also, the adoption of legislation, such as plan improvements or changes in salary schedules, will sometimes cause a short-term distortion in the experience. For example, if an early retirement window was opened during the study period, we would typically see a short-term spike in the number of retirements followed by a dearth of retirements for the following two-to-four years. Using a longer period prevents giving too much weight to such short-term effects.

On the other hand, using a much longer period could water down real changes that may be occurring, such as mortality improvement or a change in the ages at which members retire.

Based upon actuarial audits we have performed on the work of other actuaries, we are convinced that the experience study we provide clients is one of the highest quality reports being done in the industry. Other studies we have seen by well-known actuaries display a much smaller amount of data and recommendations without providing the amount of foundation that we do.

11. Describe bidder's approach for providing Benefit Adequacy Studies for public pension funds.

Bidder Response:

In 2008, the severe decline in the financial markets and subsequent downturn in the global economy resulted in steep investment declines for public pension plans. This, in turn, affected the funded status of many public plans and has produced substantial increases in contributions. These events put additional budgetary pressures on state and local governments at a time when they also face fiscal stress from declining revenues. In response, public retirement systems and plan sponsors began to pursue various pension reform initiatives and are expected to continue to do so for the foreseeable future given the slow economic recovery. GRS has been very involved in helping its clients, nationwide, balance three priorities when considering the most appropriate route for reform: benefit adequacy, competitiveness, and cost.

COMPETITIVENESS

GRS has over 1,000 public pension actuarial clients, which include 36 statewide plans, some with hundreds of thousands of active plan participants. Therefore, we have access to the most comprehensive library of information available on State and municipal pension plans in our industry.

GRS gathers key information on public plans as part of the routine valuation process. This makes our survey results timely and relevant. Using our database, we can produce surveys that provide industry-wide information or customized information for a pre-defined peer group.

The results of surveys can include a variety of statistics (such as the mean, median, and mode) for fields that contain numeric values. The results can also indicate the range of practice in areas

ADEQUACY

When assessing the benefit adequacy of current benefit programs, and possible alternative approaches, it is important to understand the goals and priorities of the decision makers relative to benefit adequacy. Most decision makers want to reduce costs while, if possible, not materially impacting member benefits. Unfortunately, greater savings are generated from plan redesign as a result of deeper benefit cuts.

A balance between cost reduction and benefit adequacy is always needed when assessing the overall success of a retirement system, but it is generally difficult to accomplish both of these goals only through plan design.

12. Describe bidder's approach for providing Supplemental Services for public pension funds.
Bidder Response: GRS has over 80 years of experience working with large statewide retirement systems and municipal retirement systems. Most of our clients have multiple benefit structures and employer groups. Therefore, it is unlikely that there is any public sector benefit design or funding issue that GRS has not already helped another client manage or solve. Over the years, GRS' has made this accumulated wealth of knowledge available to all GRS consultants through internal communications and training provided by our internal subject matter experts. Our proposed consulting team is prepared to bring this experience to NPERS in the manner that is most beneficial to NPERS, even if this requires services outside of the anticipated Scope of Services.

13. Describe bidder's experience at providing Legislative Expertise for public pension funds.
Bidder Response: GRS serves 36 statewide retirement systems and we are an integral part of their legislative response team. We work with each of them not only in providing hundreds of impact statements during legislative sessions but also to help them prepare for each session in advance by providing our expert advice and consulting services. We routinely review and comment on legislation language and in some cases draft legislation for these systems. GRS can provide thoughtful and complete cost estimates for proposed legislative changes to NPERS by the requested delivery date. Our vast experience with the legislative processes for other retirement systems has taught us that response time to cost requests is of paramount importance in providing actuarial services to a public retirement system so as not to damage the system's standing with the legislature. On average we are able to provide our analysis within a week. In some cases, we have managed turnaround times of less than 24 hours. We are able to accomplish this type of timeline, while still providing thoughtful and accurate analyses as a result of our team-based approach and processes. For example, we always have multiple actuaries assigned to each client (all of whom are up-to-date on the client) so that a team member is always available to provide assistance. In addition, our processes are developed and implemented ahead of the beginning of the session so that programming and setup time are minimized. Very little, if any, legislation is introduced that we have not seen before. We are able to draw from these prior experiences to provide thorough analysis of any situation.

d. Deliverables, due dates and Cost Proposal

The Cost Proposal is provided under separate cover, as requested.

Appendix A
Proposed Team
Member Biographies

Appendix A

Proposed Team Member Biographies

James D. Anderson, FSA, EA, FCA, MAAA

Senior Consultant

jim.anderson@grsconsulting.com

Expertise

Jim Anderson is a Senior Consultant in GRS' Grand Rapids (Rockford), Michigan office. His actuarial and benefits consulting experience began in 1988 and includes working with major public employee retirement systems and private sector employers. Jim has served public sector clients located in Michigan, Arizona, Arkansas, Illinois, Maine, Minnesota, and Wisconsin. He also serves on the Board of Directors for GRS.

His areas of expertise include plan design, funding, accounting, and administration and communication of defined benefit plans, defined contribution plans, and post-retirement medical plans. In addition, Jim's background includes many plan design studies involving the impact on the plan costs as well as the impact on employee retention, administrative concerns, and applicable stakeholders. Jim also has significant experience analyzing demographic and economic assumptions through actuarial experience studies and helping plan sponsors understand historical patterns and anticipate future trends.

Jim is currently the Lead Consultant for the Arizona Public Safety Personnel Retirement System, and serves as Secondary Actuary for the Wisconsin Retirement System. He is the Supervising Actuary for a current full replication audit of the Delaware Public Employees' Retirement System. He also leads work for a number of Michigan City and County retirement systems.

Professional Designations

- Fellow, Society of Actuaries
- Enrolled Actuary
- Fellow, Conference of Consulting Actuaries
- Member, American Academy of Actuaries

Professional Affiliations

- Elected Member of Society of Actuaries Retirement Section Council

Presentations and Publications

Prior to their effective dates, Jim co-authored an article regarding GASB Statements 67 and 68 for the Michigan Association of Public Employees Retirement Systems (MAPERS). Jim also regularly presents material at national (Enrolled Actuaries, Washington D.C.) and local (MAPERS, GFOAz (Arizona)) conferences.

Education

Bachelor of Science, Actuarial Mathematics, University of Michigan

References

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Mark Buis, FSA, EA, FCA, MAAA
Senior Consultant & Team Leader
mark.buis@grsconsulting.com

Expertise

Mark Buis is a Senior Consultant and Team Leader in GRS' Southfield, Michigan office. He has more than 29 years of actuarial and benefits consulting experience, as well as management. His client responsibilities cover statewide and municipal plans located in Arizona, Michigan, Illinois, and Wisconsin.

As a manager of a 13-person pension team, Mark oversees project plans, budgets, and interaction between GRS and clients.

Mark's actuarial experience includes actuarial valuations, plan redesign analysis and implementation, long-range funding, and public pension risk management. Additionally, Mark has significant experience providing testimony at arbitration hearings, as well as client educational sessions.

Professional Designations

- Fellow, Society of Actuaries
- Enrolled Actuary
- Fellow, Conference of Consulting Actuaries
- Member, American Academy of Actuaries

Presentations

Mark regularly provides client education sessions and materials designed specifically for a client's needs on topics related to public pension design and funding.

Education

Bachelor of Arts, Mathematics, Calvin College
Master of Science, Statistics, Michigan State University

References

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Phoenix, Arizona 85016-4416
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Laura Frankowiak, ASA, MAAA

Consultant

laura.frankowiak@grsconsulting.com

Expertise

Laura Frankowiak is a Consultant in GRS' Southfield, Michigan office. She has 10 years of actuarial and benefits consulting experience. Laura's experience covers local and statewide public employee retirement systems, retiree health care plans, and private sector benefit plans. She has worked with clients in Arizona, Florida, Illinois, Michigan, Virginia and Wisconsin.

Laura's experience covers pension and retiree health care actuarial services. Her work includes funding valuations and GASB 67/68 and 74/75 reporting, experience studies, supplemental valuations, cost analyses of proposed plan changes, cash flow projections and sensitivity analysis, and calculation of per capita costs. Laura also oversees work related to present value calculations, benefit calculations and the preparation of annual benefit statements for system members.

Professional Designation

- Associate, Society of Actuaries
- Member, American Academy of Actuaries

Education

Bachelor of Business Administration, Finance - Risk Management and Insurance, University of Memphis

References

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Appendix B
Sample Client Lists

APPENDIX B

SAMPLE CLIENT LISTS

Sample Statewide Client List

System	Plan Structure	Year Retained	Assets (in billions)	Actives	Retired
Arizona Public Safety Personnel Retirement System	Agent Multiple Employer	2009	6.0	18,700	11,900
Arizona State Retirement System	Cost Sharing Multiple Employer	2016	38.2	206,000	142,000
Arkansas Judicial Retirement System	Single Employer	1982	0.2	140	147
Arkansas Local Police and Fire Retirement System	Cost Sharing Multiple Employer	1981	2.1	13,700	8,000
Arkansas Public Employees Retirement System	Cost Sharing Multiple Employer	1962	8.0	48,000	36,000
Arkansas State Police Retirement System	Single Employer	1962	0.3	500	650
Arkansas Teacher Retirement System	Cost Sharing Multiple Employer	1956	16.0	72,000	45,000
Colorado Fire and Police Pension Association (FPPA)	Agent Multiple Employer	2004	2.4	8,000	1,200
Employees' Retirement System of Rhode Island	Cost Sharing Multiple Employer	2001	7.8	39,000	32,000
Illinois Municipal Retirement Fund	Agent Multiple Employer	1992	41.0	175,000	184,000
Illinois State Employees Retirement System	Single Employer	2001	17.0	61,000	70,000
Kentucky Retirement Systems	Cost Sharing Multiple Employer	2017	15.1	135,000	102,000
Maryland State Retirement and Pension Agency	Cost Sharing Multiple Employer	2008	49.0	194,000	156,000
Michigan Public School Employees	Cost Sharing Multiple Employer	2006	47.0	188,000	214,000
Michigan State Employee Retirement System	Single Employer	2006	12.0	10,000	60,000
Michigan State Police Retirement System	Single Employer	2006	1.3	2,000	3,000
Minnesota State Employees Retirement System	Cost Sharing Multiple Employer	2012	14.3	56,000	44,000
Missouri Dept. of Transportation and Highway Patrol Employees' Retirement System	Cost Sharing Multiple Employer	1999	2.1	7,500	8,800
Missouri Local Government Employees Retirement System	Agent Multiple Employer	1967	5.9	33,300	20,600

Sample Statewide Client List (Concluded)

System	Plan Structure	Year Retained	Assets (in billions)	Actives	Retired
Municipal Employees Retirement System of Michigan	Agent Multiple Employer	2017	8.5	35,000	39,000
New Hampshire Retirement System	Cost Sharing Multiple Employer	2006	8.0	48,000	36,000
New Mexico Educational Retirement Board	Cost Sharing Multiple Employer	2001	12.5	59,000	47,000
North Dakota Public Employees Retirement System	Cost Sharing Multiple Employer	2016	2.0	23,000	10,000
Ohio Public Employees Retirement System	Cost Sharing Multiple Employer	1954	87.0	331,000	217,000
Ohio State Highway Patrol Retirement System	Single Employer	1964	0.8	1,700	1,600
Oklahoma Teachers' Retirement System	Cost Sharing Multiple Employer	2001	15.5	88,000	62,000
Public Employees Retirement Association of Minnesota	Cost Sharing Multiple Employer	2012	$28.0	168,000	110,000
South Carolina Retirement System	Cost Sharing Multiple Employer	2011	24.9	224,000	142,000
State of Hawaii Employees' Retirement System	Cost Sharing Multiple Employer	2001	12.3	66,000	47,000
State Universities Retirement System of Illinois	Cost Sharing Multiple Employer	1996	18.0	64,000	65,000
Texas Employees Retirement System	Single Employer	2013	27.3	142,000	108,000
Texas Municipal Retirement System	Agent Multiple Employer	2008	28.6	110,000	63,000
Texas Teacher Retirement System	Cost Sharing Multiple Employer	2001	147	864,000	408,000
Utah Retirement System	Cost Sharing Multiple Employer	2001	21.3	102,000	52,000
Wisconsin Retirement System	Cost Sharing Multiple Employer	1976	88.5	255,000	192,000
Wyoming Retirement System	Cost Sharing Multiple Employer	2009	8.5	40,000	28,000

Sample Public Pension Client List

AK

Alaska Retirement Management Board (auditing actuary)

AL

Northeast Alabama Regional Medical Center

The Mobile Housing Board

AR

Arkansas Judicial Retirement System

Arkansas Local Police and Fire Retirement System

Arkansas Public Employees Retirement System

Arkansas State Highway Employees Retirement System

Arkansas State Police Retirement System

Arkansas Teacher Retirement System

City of Conway

Texarkana Public Employees Retirement System

AZ

Arizona Public Safety Personnel Retirement System

Arizona State Retirement System

City of Phoenix Employees Retirement System

Tucson Arizona Supplemental Retirement System

CA

Los Angeles Water & Power Employees' Association

San Luis Obispo County Pension Trust

CO

Adams County Retirement Board

Arapahoe County

Center Fire Protection District

City of Englewood

Colorado Fire and Police Pension Association (FPPA)

Craig Rural Fire Protection District

Denver Employees Retirement Plan

Denver Board of Water Commissioners

Fort Lupton Fire Protection District

Jefferson County School District No.R1 Retirement System

Longmont

Rapid Transit District of Denver

RTD/ATU Local 1001

FL

Alachua County School District

Atlantic Beach Florida General Employees' Retirement System

Atlantic Beach Police Officers' Retirement System

Bal Harbour Village General Employees' Pension Plan

Bay Medical Center

Boynton Beach Municipal Firefighters Retirement Fund

FL

Boynton Beach Municipal Police Officers' Retirement Fund

Boynton Beach Pension Plan for General Employees

Bradenton Police Officers' Retirement Plan

City of Arcadia

City of Fernandina Beach

City of Fort Walton

City of Lake Worth

City of Miami

City of Miami Parking Authority

City of Oldsmar

City of Tallahassee

Clearwater Employees Pension Fund

Cooper City General Employees Retirement Plan

Cooper City Officers Retirement Plan

Cooper City Police Retirement Plan

Coral Gables Retirement System

Coral Springs General Employees' Retirement System

Dania Beach General Employees' Retirement Plan

Dania Beach Police & Firefighters' Retirement System

Deerfield Beach Non-Uniformed Employees' Retirement Plan

DeLand General Employees' Retirement Plan

DeLand Municipal Police Officers' Retirement Plan

Delray Beach General Employees' Retirement Plan

Eustis Police Officers' Retirement System

Florida City Elected Officials Retirement Plan

Fort Lauderdale General Employees Retirement System

Fort Pierce Police Officers Retirement Fund

Fort Pierce Retirement and Benefit System

Hialeah Elected Officers Retirement System

Hialeah Gardens Police Pension Trust Fund

Hollywood Employees Retirement System

Homestead Elected Official Retirement System (Old Plan)

Homestead Firefighters' Retirement System

Homestead General Employees' Retirement System

Homestead New Elected Officials and Sr. Management Ret. System (New Plan)

Homestead Police Officers' Pension Plan

Jacksonville Police & Fire Pension Fund

Jacksonville Beach Firefighters' Retirement System

Jacksonville Beach General Employees' Retirement System

Jacksonville Beach Police Officers' Retirement System

Jupiter Island Retirement Plan

Sample Public Pension Client List

FL

Key Biscayne Police & Firefighters Retirement Plan
Key West Employees' Retirement Plan
Key West Housing Authority Employees' Retirement System
Key West Utility Board General Employees Retirement System
Kissimmee General Employees' Retirement Plan
Lake Mary Firefighters Pension Plan
Lake Worth Firefighters Retirement System
Lake Worth General Employees' Retirement System
Lake Worth Police Officers' Pension Systems
Lakeland Employees Retirement System
Lantana Firefighters' Pension Fund
Lantana Police Relief & Pension Fund
Largo Municipal Police Officers' & Firefighters' Retirement Plan
Lauderdale by Sea Volunteer Firefighters' Retirement Plan
Lauderhill General Employees Retirement System
Longboat Key
Marco Island Firefighters' Pension Plan
Martin County Sheriff
Miami Beach Fire & Police Retirement Planregi
Miami Beach Employees' Retirement Plan
Miami Parking Authority
Miami Shores Village General Employees' Pension Plan
Miami Shores Village Police Officers' Retirement System
Miami Springs Employees' Retirement System
Miami Springs Police & Firefighters' Retirement System
Miramar General Employees Retirement System
Miramar Management Retirement Plan
Mount Dora Firefighters' Pension and Retirement System
Mount Dora General Employees' Pension Plan
Mount Dora Police Officers' Pension & Retirement System
New Port Richey Police Officers' Retirement System
North Miami Clair T. Singerman Employees' Retirement System
North Miami Police Pension Plan
North Palm Beach General Employees' Retirement Fund
Office of Program Policy Analysis and Government Accountability
Okeechobee General Employees' Retirement Plan
Okeechobee Municipal Firefighters' Pension Fund
Okeechobee Municipal Police Officers' Retirement System
Okeechobee Utility Authority Retirement System
Orange Park General Employees' Pension Plan
Orlando General Employees' Pension Fund
Orlando Utilities Commission Pension Plan

FL

Palm Beach County Fire Employee Benefits Fund
Palm Beach County Firefighters' Retirement Insurance Fund
Palm Beach Gardens Police Officers' Pension Fund
Palm Springs Village Hazardous Employees Pension Plan
Pembroke Pines Fire & Police Pension Fund
Pinellas Park Police Officers' Pension Fund
Plantation General Employees Retirement System
Plantation Police Officers' Retirement Fund
Plantation Volunteers' Firefighters Retirement System
Riviera Beach General Employees' Retirement System
Riviera Beach Municipal Firefighters' Retirement System
Riviera Beach Police Pension Fund
Sarasota Firefighters' Health Insurance Trust Fund
Sarasota Firefighters' Pension Fund
Sarasota General Employees Pension Fund
Sarasota Police Officers Pension Fund
Sebring Police Officers' Retirement Fund
South Miami Pension Plan
St. Petersburg College
Starke Firefighters' Retirement System
Starke General Employees' Retirement System
Starke Police Officers' Retirement System
Sunrise General Employees' Retirement Plan
Sunrise Police Officers' Retirement Plan
Sweetwater Elected Officers
Sweetwater Police Officers Retirement Plan
Tallahassee Employees' Retirement System
Tamarac Police Pension Plan Trust Fund
Tavares Firefighters' Pension Board of Trustees
Tavares Police Officers' Pension Plan
Tequesta General Employees' Pension Trust Fund
Tequesta Public Safety Officers Pension Trust Fund
Town of Palm Beach Firefighters Retirement System
Town of Palm Beach General Employees Retirement System
Town of Palm Beach Police Officers Retirement System
Town of Surfside Employees' Retirement Plan
Volusia County Volunteer Firefighters' Pension System
West Palm Beach Firefighters Benefit Fund
West Palm Beach Police Pension Fund
West Palm Beach Restated Employees Defined Benef Retirement System
Wilton Manors Pension Plan for General Employees & Police
Wilton Manors Volunteer Firefighters' Retirement System
Winter Park Firefighters' Retirement System

Sample Public Pension Client List

FL

Winter Park Police Officers' Retirement System

Winter Springs Police and General Retirement System

HI

State of Hawaii Employees' Retirement System

IL

Chicago Firemens' Annuity & Benefit Fund

Chicago Laborers' & Retirement Board Emp.

Chicago Policemens' Annuity & Ben. Fund

Chicago Regional Transportation Authority

City of Joliet

East Peoria Police and Fire Pension Funds

General Assembly Retirement System of Illinois

Illinois Municipal Retirement Fund

Illinois State Employees Retirement System

Judges Retirement System of Illinois

Public School Teachers' Pension and Retirement Fund of Chicago

State Universities Retirement System of Illinois

KY

Kentucky Retirement Systems

LA

Louisiana Legislative Auditor

MD

Maryland State Retirement and Pension System

Montgomery County Employees' Retirement System

Montgomery County Public Schools

Prince George County

MI

Alpena Employees' Retirement System

Allen Park Retirement System

Battle Creek Police and Fire Retirement System-Act 345

Bay County Employees Retirement System

Benton Township Policemen and Firemen Retirement System

Berkley Public Safety Retirement System-Act 345

Berrien County Employees Retirement Plan

Bessemer Police & Fire Retirement System

Birmingham Employees Retirement System

Center Line Police and Fire Pension System

Central County Transportation Authority

Charter Township of Harrison

Charter Township of Meridian

Charter Township of West Bloomfield Employees Retirement Plan

City of Big Rapids Police & Fire Retirement System

MI

Cobo Hall Authority

Dearborn Chapter 21 Retirement System

Dearborn Chapter 22 Retirement System

Dearborn Chapter 23 Retirement System

Dearborn Heights Police & Fire Retirement System

Detroit General Retirement System

Detroit Police and Fire Retirement System

Ferndale Employee Retirement System

Ferndale Police and Fire Retirement System

Gibraltar Public Safety Officers Retirement System - Act 345

Gogebic County Employees Retirement System

Grand Rapids General Retirement System

Grand Rapids Police and Fire Retirement System

Harrison Township Firemen's Pension Fund

Harrison Township General Employees Retirement System

Huron Clinton Metro Authority

Iron Mountain Policemen and Firemen Retirement System

Ishpeming Policemen and Firemen Retirement System-Act 345

Jackson Act 345 Retirement System

Jackson County Employees Retirement System

Jackson Employees Retirement System

Jackson Policemen's and Firemen's Pension Fund

Kalamazoo County Employees' Retirement System

Kalamazoo Employees Retirement System

Kent County Employees Retirement Plan and Trust

Kent Library District Employees' Retirement Plan

Kingsford Policemen and Firemen Retirement System

Lincoln Park Police Officers and Firefighters Retirement System

Madison Heights Policemen and Firemen Retirement System

Marquette Policemen and Firemen Retirement System

Melvindale Policemen and Firemen Retirement System

Menominee Policemen and Firemen Retirement System

Michigan Public School Employees Retirement System

Michigan State Employee Retirement System

Michigan State Judges - Circuit and Recorders

Michigan State Legislative Retirement System

Michigan National Guard Retirement System

Midland - Police and Fire Retirement System

Midland County Employees Retirement System

Midland County Retirement System Act 345

Monroe Employees Retirement System

Mount Clemens Employees Retirement System

Mt. Pleasant Fire and Police Pension System

Sample Public Pension Client List

MI

Municipal Employee Retirement System of Michigan
Niles Township Police and Fire Department Retirement Plan
Oakland County Employees Retirement System
Owosso Employees Retirement System
Pontiac General Retirement System
Riverview Retirement System
Road Commission for Oakland County Retirement System
Royal Oak Retirement System
Sanilac County Employees Retirement System
Sault Ste. Marie Firemen and Policemen Retirement System
Southfield Employees Retirement System
Southfield Fire and Police Retirement System
Southgate Policemen and Firemen Retirement System
St. Clair Shores General Employees Retirement System
St. Clair Shores Police and Fire Retirement System
St. Joseph Employees Retirement Fund
Sterling Heights Employees Retirement System
Sturgis Employees Retirement System
Traverse City - Act 345 Police and Fire Retirement System
Trenton - Fire and Police Retirement System
Troy Employees Retirement System
Troy Incentive Plan for Volunteer Firefighters
Waterford Township General Employees Retirement System
Waterford Township Police and Fire Retirement System-Act 345
Wayne County Employees' Retirement System
Wayne County Employees' Retirement System-Circuit Court Commissioners Bailiffs Division -
Westland Policemen and Firemen Retirement System
Woodhaven Retirement Plan for Employees and Policemen
Wyandotte Employees Retirement System
Wyoming Employees Retirement System
Ypsilanti Fire and Police Retirement System

MN

Appleton Fire
Minnesota State Retirement System
Public Employees Retirement Association of MN
St. Paul Teachers' Retirement Fund Association
Virginia Minnesota Fire
White Bear Lake

MO

City of Joplin, Missouri Policemen's and Firemen's Pension Plan
Columbia Police and Firemen's Retirement Fund
Jefferson City Firemen's Retirement Fund

MO

Missouri Dept. of Transportation and Highway Patrol Employees' Retirement System
Missouri Local Government Employees Retirement System
Richmond Heights Policemen & Firemen Retirement Fund
St. Louis Fire

ND

North Dakota Public Employee Retirement System

NH

Manchester Employees' Contributory Retirement System
New Hampshire Local Government Center Defined Benefit Pension Plan
New Hampshire Retirement System

NM

New Mexico Educational Retirement Board

OH

Ohio Public Employees Retirement System
Ohio State Highway Patrol Retirement System

OK

Metropolitan Tulsa Transit Authority
Oklahoma City Employee Retirement System
Oklahoma Teachers' Retirement System
Tulsa Municipal Employees' Retirement Plan Board of Trustees

RI

Employees' Retirement System of Rhode Island
Warwick

SC

South Carolina Retirement Systems

SD

Sioux Falls Employee's Retirement System
Sioux Falls Firefighters' Pension Fund

TX

City of Arlington
City of Austin
City of Fort Worth Employees' Retirement Fund
City of Irving
City of Plano
Dallas / Fort Worth International Airport Board
Dallas County Utility and Reclamation District
Dallas Employee Retirement System

TX

Houston Municipal Employees' Pension System
Houston Police Officers' Pension System
Texas Employee Retirement System
Texas Municipal Retirement System
Texas Teacher Retirement System

Sample Public Pension Client List

UT

Utah Retirement System

VA

Fairfax Retirement Plan

Virginia Joint Audit & Review Commission

WA

Port of Seattle

WI

Milwaukee Public Schools Employee Retirement System

Wisconsin Retirement System

WV

City of Huntington

Morgantown Utilities Board

WY

Cheyenne Regional Medical Center

Wyoming Retirement System

Appendix C
GRS Standard Contract

APPENDIX C

GRS STANDARD CONTRACT

CONSULTING SERVICES AGREEMENT
BETWEEN THE
[NAME OF CLIENT]
AND
[NAME OF GRS ENTITY]

Section I
General Information

A. Purpose

[Name of Client] (Client) hereby enters into a contractual agreement with [Name of GRS Entity] (GRS) for actuarial and consulting services. The client in this matter shall be Client as represented by the Board of Trustees of Client. This Contract does not create any relationship between Consultant and any other related private, not for profit, or governmental entity, including, but not limited to, Client Plan Sponsor itself or participants in Client. Such entities may rely upon GRS work products only with the permission of both GRS and Client. GRS shall have no obligation to work for such entities; however, GRS may freely elect to work for such an entity with consent of Client.

B. Entire Agreement and Order of Precedence

This Agreement, together with the Proposal issued by GRS to Client and dated [Month/Day/Year] collectively forms the complete and exclusive contract between the parties as it relates to this transaction. In the event of any conflict among these documents, the following order of precedence shall apply (in descending order of precedence):

1. This Agreement
2. GRS' Proposal for Actuarial and Consulting Services dated [Month/Day/Year]

The failure of a party to insist upon strict adherence to any term of the contract shall not be considered a waiver, or deprive the party of the right thereafter to insist upon strict adherence to that term, or any other term, of the contract. The contract may not be modified, amended, extended, or augmented, except by a writing executed by the parties, and any breach or default by a party shall not be waived or released other than in writing signed by the other party.

Each provision of the contract shall be deemed to be severable from all other provisions of the contract and, if one or more of the provisions of the contract shall be declared invalid, the remaining provisions of the contract shall remain in full force and effect. The contract shall in all respects be governed by, and construed in accordance with, the laws of the State of Michigan.

C. Term of Contract

The contract is for the 36-month period extending from January 1, 20XX, through December 31, 20XX. By mutual agreement of the parties, the contract may be renewed on a year-to-year basis, without re-bidding at the end of the contract term.

D. Contractor Responsibilities

GRS assumes responsibility for all contractual activities whether or not it performs them directly. GRS shall be the sole point of contact with regard to contractual matters, including payment of any and all charges resulting from the contract. Client reserves the right to interview the key personnel assigned by GRS to this project and to request reassignment of personnel deemed unsatisfactory by Client in its reasonable discretion.

If any part of the work is to be subcontracted, Client reserves the right to approve the subcontractors in advance, and to require that GRS replace any subcontractors found by Client to be unacceptable in its reasonable discretion. GRS shall be responsible for adherence by the subcontractor to all provisions of the contract.

E. Client Responsibilities

Client agrees to review information supplied by GRS for general reasonableness, and to ensure that GRS has properly understood the assignment. In the event that Client finds a GRS work product to be unreasonable or otherwise unsatisfactory, Client shall not distribute such work product or otherwise make use of it, or rely upon it, until a correction has been made, or GRS has explained matters to the satisfaction of Client. Client agrees that GRS is not responsible for the accuracy or completeness of any data provided to GRS by Client, and Client, to the extent permitted by state and federal law, will indemnify, defend and hold harmless GRS, its employees and agents from and against all losses, liabilities, penalties, fines, damages and claims, and all related costs and expenses (including reasonable attorneys' fees and disbursements and costs of investigation, litigation, settlement, judgments, interest and penalties) incurred by GRS in connection with any inaccuracy or incompleteness in such data. In the event of discovery of an error made by GRS in a calculation, Client agrees to take immediate and substantial steps to mitigate the effects of such error.

F. Accounting Records

GRS shall maintain all pertinent financial and accounting records and evidence pertaining to this contract in accordance with generally accepted accounting principles (GAAP).

G. Patent/Copyright Infringement and Employee Indemnification

GRS shall indemnify, defend and hold harmless Client and its employees and agents from and against all losses, liabilities, penalties, fines, damages and claims, and all related costs and expenses (including reasonable attorneys' fees and disbursements and costs of investigation, litigation, settlement, judgments, interest and penalties) incurred in connection with any action or proceeding threatened or brought against Client to the extent that such action or proceeding is based on a claim that any piece of equipment, software, commodity, or service supplied by GRS or its subcontractors, or the operation of such equipment, software, commodity, or service, or the use or reproduction of any documentation provided with such equipment, software, commodity, or service infringes any United States or foreign patent, copyright, trade secret or other proprietary right of any person or entity, which right is enforceable under the laws of the United States. In addition, should the equipment, software, commodity, or service, or the operation thereof, become, or in GRS' opinion be likely to become, the subject of a claim of infringement, GRS shall at its sole expense, (i) procure for Client the right to continue using the equipment, software, commodity, or service, or (ii) if such option is not reasonably available to GRS, replace or modify the same with equipment, software, commodity, or service of equivalent function and performance so that it becomes non-infringing, or (iii) if such options are not reasonably available to GRS, accept its return by Client with appropriate credits to Client against GRS' charges and reimburse Client for any losses or costs incurred as a consequence of Client ceasing to use and returning the equipment, software, commodity, or service. The foregoing indemnification is void to the extent that Client, its employees or agents modifies or misuses such equipment, software, commodity, or service.

GRS agrees to indemnify Client from claims made by GRS employees while working on Client premises on Client projects, provided that Client has complied with all relevant Federal and State Laws related to workplace safety, and human rights, including, but not limited to anti-discrimination and anti-harassment laws; however, GRS shall not be required to indemnify Client with respect to any claim that is based on Client's negligence or misconduct. In any and all claims against Client, or any of its agents or employees, by any employee of GRS or any of its subcontractors, the foregoing indemnification obligation shall not be limited in any way by the amount or type of damages, compensation, or benefits payable by or for GRS or any of its subcontractors under worker's disability compensation acts, disability benefit acts, or other employee benefit acts. This indemnification clause is intended to be comprehensive. Any overlap in subclauses, or the fact that greater specificity is provided as to some categories of risk, is not intended to limit the scope of indemnification under any other sub clauses.

The duty to indemnify will survive the expiration or early termination of the contract for a period of one year with respect to any claims based on facts or conditions which occurred prior to termination or expiration.

H. Liability Insurance and General Indemnity

GRS shall purchase and maintain such insurance as will protect it from claims which may arise out of or result from its performance under the contract, whether such performance be by GRS or by any subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. The insurance shall be written for not less than the greater of $1,000,000 and any limits required by law, and shall include contractual liability insurance as applicable to GRS' obligations under the indemnification clause of this contract.

GRS agrees to indemnify Client for the actual amount of all direct losses the client suffers due to gross negligence, error, or willful misconduct on the part of GRS in performing the services hereunder in an amount not to exceed five (5) times the fees paid under this contract during the year in which said gross negligence, error, or willful misconduct is alleged to have occurred, but in any event not to exceed (a) $250,000 in any consecutive 12-month period in which this Agreement is in effect, commencing as of the first day of the provision of services hereunder, or (b) $500,000 in the aggregate for all such damages. The indemnification provided by GRS for any single act of gross negligence, error, or willful misconduct shall not exceed $250,000. In the event of disputes, both parties to this contract agree to waive their right to a jury trial and that any claims or dispute arising out of this agreement, will be submitted to mandatory binding arbitration before an arbitrator in good standing with the American Arbitration Association. Client must notify GRS of any lawsuit, complaint, or other situation for which indemnification may be sought within six (6) months of the date Client is notified of the matter. Client agrees to indemnify, defend and hold harmless GRS for third party claims to the extent that such third party claims would cause the aggregate damages to exceed $500,000. Furthermore, Client shall indemnify GRS against third party derivative lawsuits, to the extent that such lawsuits result in a judgment payable to Client. In no event will GRS be liable to Client for any indirect, incidental, special, consequential, exemplary or reliance damages (including, without limitation, lost business opportunities or lost sales or profits) arising out of GRS' services to Client, regardless of whether GRS is advised of the likelihood of such damages.

I. Board Minutes

The Client shall routinely provide GRS with copies of Board Minutes for GRS' reference in connection with work to be performed pursuant to this contract. GRS is not obligated to provide corrections to the minutes. Silence on the part of GRS does not constitute agreement with the minutes, even with respect to meetings that a GRS employee attended or at which GRS was directly or indirectly quoted.

J. Cancellation

Client, with 30 days written notice to GRS, may cancel the contract. GRS may also cancel the contract with 30 days written notice to Client for any of the following reasons: 1) Client, the Client Plan Sponsor, or one or more plan participants or beneficiaries, or the State has filed a lawsuit against GRS in a matter related to Client, its participants, or its beneficiaries, 2) a member of Client's Board or Staff has been found guilty of criminal or civil breach of fiduciary responsibility or other severe wrongdoing with respect to Client or GRS, or 3) a member of Client's Board or Staff demands that GRS take actions deemed by GRS Management to be unethical or illegal. GRS may otherwise cancel the contract upon giving 90 days written notice to Client. If Client cancels the contract for any reason other than the failure of GRS to fulfill the obligations of the quotation or contract, Client shall pay GRS' reasonable final invoice for work performed under the contract, such final invoice, at the option of GRS, to include a penalty of not more than the greater of $50,000 or 50% of the amount paid under the contract for the most recently completed fiscal year. If Client cancels the contract for failure of GRS to fulfill all obligations under the contract, Client shall pay GRS' reasonable final invoice for work performed under the contract. In the event of the failure of GRS to fill its obligations under the contract, or in the event that GRS cancels this contract without sufficient notice as described above, Client may procure the services of other sources, and hold GRS liable for any excess costs occasioned thereby, up to the greater of $50,000 or 50% of the amount paid under the contract for the most recently completed fiscal year. Excess costs for this purpose, do not include the costs of preparing and issuing an RFP.

K. Delegation/Assignment

GRS shall not delegate any duties under this contract to a subcontractor unless Client has given prior written consent to the delegation. GRS may not assign the right to receive money due under the contract without the prior written consent of Client. In addition, Client reserves the right to approve subcontractors for this project and to require GRS to replace subcontractors who in Client' judgment are unacceptable. Notwithstanding the foregoing, however, GRS shall have the right to assign its rights and duties under this contract in connection with a sale of its business, whether by merger, consolidation, sale of stock, sale of assets or otherwise.

L. Non-Discrimination Clause

In performing the contract, GRS agrees not to discriminate against any employee or applicant for employment, with respect to their hire, tenure, terms, conditions or privileges of employment, or any matter directly or indirectly related to employment, because of race, color, religion, national origin, ancestry, age, sex, marital status, sexual orientation, physical or mental handicap or disability. GRS further agrees that every subcontract entered into for the performance of services hereunder will contain a provision requiring non-discrimination in employment, as herein specified, binding upon each subcontractor.

M. Fees

The fees set forth in this contract shall be firm for the duration of the contract. Other than routine fee updates for inflation, no fee changes will be permitted without prior written consent of Client. See Section III of this contract.

If GRS is required by governmental regulation, subpoena, or other legal process to produce records or any personnel as a witness with respect to the services provided to Client, Client will reimburse GRS for the costs of professional time and expenses, including, without limitation, reasonable attorneys' fees and expenses, incurred in responding to such requests, so long as GRS is not a party to the proceeding in which the information is sought.

N. Modification of Services

Client reserves the right to modify the service requirements during the course of the contract subject to GRS acceptance and potential changes in pricing. Modifications may include adding, deleting, or altering the work to be performed under the contract. Any changes in pricing (increases or decreases) proposed by GRS as a result of service modifications are subject to written acceptance by Client. In the event that price changes are not acceptable to Client, the contract may be canceled and subject to competitive bidding based upon the new specifications, in which case Client shall pay GRS' reasonable final invoice for work performed under the contract.

O. Confidentiality

GRS shall instruct its employees and the employees of any subcontractor to keep as confidential information concerning the business of Client, its financial affairs, its relations with its participating municipalities and courts, members, retirees and beneficiaries, and its employees, as well as any other information which may be specifically classified as confidential by Client. At Client' request, GRS or any subcontractor(s) and each of their employees may be required to sign confidentiality statements prior to beginning or continuing to work on the contract.

GRS will not print full Social Security numbers on documents used for communication with Client or its participants. In the event that Client directs GRS to make exceptions to this policy, Client agrees to indemnify, defend, and hold harmless GRS for any illegal use, misuse, security breaches or identity thefts related to such information by individuals other than GRS employees.

GRS reserves the right to destroy Client confidential information one year following receipt, unless it receives instructions to the contrary from Client, in which case GRS will deliver such confidential information to Client at Client's sole cost and expense, including, without limitation, GRS' internal costs to retrieve and collect such information. GRS will not reveal or disclose either information or findings concerning this contract with anyone who does not have a substantial need-to-know and who has not been expressly authorized in writing by Client to receive the information/findings. GRS shall ensure that commercially reasonable safeguards and procedures are implemented to protect confidential information.

P. Record Retention

GRS shall retain records of Client work appropriate to its business needs in accordance with its standard retention policy.

Q. Tax Advice, Legal Advice, and Investment Advice

Based upon its general background and research on Federal Income Tax, Legal Issues, and Investment Matters, GRS employees may from time to time provide general comments and information on same. However, no GRS work product shall be deemed to provide income tax advice, legal advice, or investment advice unless such work product contains one of the following phrases or substantially equivalent language.

- "This work product is intended to provide income tax advice."
- "This work product is intended to provide legal advice."
- "This work product is intended to provide investment advice."

No oral communication of any GRS employee shall be interpreted to provide income tax advice, legal advice, or investment advice. Further, no GRS work product shall be used for the purpose of (i) avoiding tax-related penalties under the Internal Revenue Code or (ii) marketing or recommending to another party any tax-related matter addressed within the work product.

R. Third Party Dealings

Except as may be required by law or legal process, GRS will not provide information related to Client to third parties except with the permission of, and under the specific direction of, Client. By giving such direction and permission, Client agrees to indemnify, defend, and hold harmless GRS, or to require such third party to indemnify GRS, with respect to any such third party's use of GRS work products. GRS shall not review any third party work product except under the specific written direction of Client to do so, and only for reasonable compensation. Such review if undertaken shall be limited to those areas in which GRS has expertise, and shall specifically exclude conclusions related to income tax, investment matters, and legal matters.

S. Communications

Client shall appoint an individual to serve as GRS' main contact throughout the term of this agreement. GRS shall presume, with no duty of inquiry that all assignments given by such main contact are given with the permission of Client's Board. GRS shall presume, with no duty of inquiry, that all communications and materials provided to such main contact will be transmitted to Client's Board. GRS shall not take direction from any other individual without explicit consent of such main contact.

T. Limitations

GRS shall act with due diligence in all matters in which it provides services under this contract. GRS acts only as the independent actuary for the Client and makes recommendations based upon Client funding policies. GRS does not provide legal or investment advice to the Client. GRS is not a fiduciary, within the meaning of any applicable state or federal law, or member of the board of trustees for the Client, and therefore, GRS does not vote on matters of governance and does not make decisions of any kind on behalf of the Client. GRS relies, as it must, on audited financial statements, demographic data, and member benefit information provided by the Client and/or the employer, and is not engaged to audit this data. GRS shall not be responsible under any circumstance for making employee or employer contributions to Client.

No provision of this contract shall be interpreted to require GRS to provide income tax advice, investment advice, or legal advice to Client. GRS has no responsibility for the performance or non performance of Client's assets, the structure of Client's portfolio, or the selection or termination of investment managers and consultants. GRS is not a registered municipal advisor with the SEC.

U. Warranty

GRS warrants that all work performed under the contract will be performed by individuals who are qualified under the requirements as are from time-to-time issued by various actuarial and other professional bodies. GRS warrants that the work product will be subject to an internal peer review procedure. Finally GRS warrants that GRS has no direct or indirect financial relationship to Client, other than the relationship described in this contract. Other than as expressly set forth herein, GRS makes no other express or implied warranties of any kind, including without limitation, any implied warranty of merchantability or fitness for a particular use.

V. Ownership

GRS has created, acquired or otherwise has rights in, and may, in connection with the performance of services hereunder, employ, provide, modify, create, acquire or otherwise obtain rights in, various concepts, ideas, methods, methodologies, procedures, processes, know-how, techniques, templates, software systems, user interfaces and screen designs, general purpose consulting and software tools, benefit administration systems, data, documentation, and other proprietary information and processes ("GRS Technology").

All GRS Technology is and will remain the sole property of GRS, and Client shall acquire no right or interest in such property. Client will honor GRS' copyrights, patents, trademarks and other intellectual property rights relating to the services provided hereunder and the GRS Technology and will not use GRS' name, copyrights, patents, trademarks or other intellectual property without GRS' prior written consent.

Nothing contained in this contract will prohibit GRS from using any of the GRS Technology, its general knowledge or knowledge acquired under this Agreement (excluding confidential information of Client to the extent protected by Section I, Item O) to perform services for others.

W. Force Majeure

GRS shall not be liable for any delays or non-performance hereunder resulting from circumstances or causes beyond its reasonable control, including, without limitation, acts or omissions of or the failure to cooperate by the Client (including, without limitation, entities or individuals under Client's control, or any of their respective officers, directors, employees, or other personnel or agents), acts or omissions of or the failure to cooperate by any third party, fire or other casualty, act of God, strike or labor dispute, war, terrorism or other violence, or any law, order or other requirement of any governmental agency or authority.

X. Independent Contractor

Client and GRS are independent entities, and neither Client nor GRS is, nor shall be considered to be, an agent, distributor, joint venturer, partner, fiduciary or representative of the other. Neither Client nor GRS shall act or represent itself, directly or by implication, in any such capacity in respect of the other or in any manner assume or create any obligation on behalf of, or in the name of, the other.

Section II
Work Statement

A. Duties

The regular and special services duties to be performed by GRS are set forth on pages X to Y of GRS' proposal for Actuarial and Consulting Services dated [Month/Day/Year]. GRS is not constrained from supplementing this list with additional items or elements deemed necessary to permit the development of alternative approaches or the application of proprietary analytical techniques, within the price schedule set forth in the proposal, unless agreed otherwise by the parties in writing.

B. Other Services

From time-to-time, Client may require services other than those described. GRS may be asked to provide communication services, applied technology services, defined contribution plan services, or other supplemental consulting services not described above. Fees for such services shall be based on the hourly rates as described in a separate Letter of Engagement.

If GRS is required by government regulation, subpoena, or other legal process to produce documents or any personnel as a witness with respect to the Services provided to Client, Client will reimburse GRS for the costs of professional time and expenses, including without limitation reasonable attorney's fees, incurred in responding to such requests, so long as GRS is not a party to the proceeding in which the information is sought.

C. Transition

If another vendor succeeds GRS as Client's actuary; GRS shall cooperate in the transition of responsibilities by providing the successor firm the most recent year's actuarial valuation data in the format provided by the Client, and without improvement, and a full set of actuarial assumptions. GRS is not required to provide anything else to such successor actuary. Items that GRS will not provide include, without limitation:

- Internal work papers, including financing spreadsheets.
- Historical reports, correspondence, prior benefit calculations, or any other items that have already been delivered to [client/plan name] or that came from [client/plan name].
- Valuation program output of any type. In particular, we will not supply test life information from our valuation system.
- Source code for or changes to any software, including spreadsheets.
- Any type of certification that the replacement actuary's work is correct.
- Access to GRS offices or computers.
- Any type of actuarial consulting work following [the end date of the contract], including PA728 work, special studies, EDROs, and any other work that the new actuary committed to providing in conjunction with the RFP process, etc.

Such transition cooperation is contingent upon Client's agreement to pay GRS' reasonable final invoice for work performed under this contract. GRS may, at its option and with agreement of Client, provide additional transition assistance to such other vendor. GRS shall charge fees for the first five (5) hours of such additional transition assistance in accordance with the standard rates described herein. For hours in excess of five (5), the fees shall be based upon 150% of the otherwise applicable rates. GRS' obligation to assist the replacement vendor in the transition shall cease upon the 6 month anniversary of the contract termination.

D. Audit

In the event that an Audit of GRS' work for Client is performed during the term of this contract, GRS shall cooperate with the audit to the extent required by actuarial standards and within the limits of GRS corporate policies provided that Client agrees to pay GRS' reasonable fees associated with such cooperation. GRS internal work papers, proprietary information, source code and software are property of GRS and considered confidential and will not be made available to the auditing firm. In the event of an audit subsequent to the termination of this contract, client agrees that GRS shall have no specific duty of cooperation.

Section III
Price and Payment Schedule

A. Price for Actuarial Consulting Services

GRS' fees for Actuarial Consulting Services are set forth on Pages X and Y of the Proposal for Actuarial Consulting Services dated [Month/Day/Year]. Prices specified on Page X are for the first year services outlined in this proposal. Prices for future contract years are updated for inflation, and changes, if any, in the scope of services requested.

B. Fees for Additional Meetings and Other Services

Hourly rates applicable to these items are set forth on Page X of the Proposal for Actuarial and Consulting Services. These fees are adjusted annually, and do not include direct expenses, such as travel and lodging.

C. Fees and Payment of Invoices

Properly submitted invoices upon which payment is not received within thirty (30) days of the invoice date shall accrue a late charge of 1.5%. Without limiting its right to remedies, GRS shall have the right to halt or terminate the Actuarial Consulting Services entirely if payment is not received within thirty (30) days of the invoice date. Client shall indemnify GRS for the costs of collection of overdue payments.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed effective the 1st day of January, 20XX.

For GRS:

____

Authorized Signer per policy
[Name of GRS Entity]
_________________________, 20XX

For Client:

____

Client Authorized Representative
Client
_________________________, 20XX

Appendix D

Sample Valuation Reports

APPENDIX D

SAMPLE VALUATION REPORTS

Sample Public Employees Retirement System

Actuarial Valuation and Experience Gain/Loss Analysis

June 30, 2017

Outline of Contents

Outline of Contents

GRS Retirement Consulting

800.521.0498 | P: 248.799.9000 | F: 248.799.9020 | www.grsconsulting.com

November 8, 2017

Board of Trustees
Sample Public Employees Retirement System
City, State

Ladies and Gentlemen:

The results of the ***June 30, 2017 actuarial valuation*** of the Sample Public Employees Retirement System together with ***the annual gain and loss analysis*** for the year ended June 30, 2017 are presented in this report. The purpose of the valuation and gain/loss analysis is to measure funding progress in relation to the actuarial cost method and to determine employer contribution rates for the fiscal year beginning July 1, 2018.

Calculations required for compliance with the Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68 have been issued in separate reports.

This report should not be relied on for any other purpose than those described above. It was prepared at the request of the Board and is intended for use by the Retirement System and those designated or approved by the Board. This report may be provided to parties other than the System only in its entirety and only with permission of the Board. Gabriel, Roeder, Smith & Company is not responsible for the unauthorized use of this report.

The findings in this report are based on data and other information through June 30, 2017. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as: plan experience differing from that anticipated by the economic and 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. Due to the limited scope of the actuary's assignment, the actuary did not perform an analysis of the potential range of such future measurements.

The actuarial methods and assumptions used in the actuarial valuation are summarized in Section E of this report. The assumptions are established by the Board after consulting with the actuary. The actuarial assumptions used for the valuation produce results which, individually and in the aggregate, are reasonable.

The cooperation of the Executive Director and the staff in furnishing the materials required for these valuations is acknowledged with appreciation.

This report has been prepared by individuals who have substantial experience valuing public employee retirement systems. To the best of our knowledge, this report is complete and accurate and was made in accordance with standards of practice promulgated by the Actuarial Standards Board and in conformance with State Code.

Consultant A and Consultant B are Members of the American Academy of Actuaries (MAAA), and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

The signing individuals are independent of the plan sponsor.

Respectfully submitted,

Consultant A, ASA, FCA, MAAA

Consultant B, ASA, FCA, MAAA

SECTION A

VALUATION RESULTS

Comments

General Financial Objective.

The general financial objective of each public employee retirement plan shall be to establish and receive contributions that, expressed as percentages of active member payroll, will remain approximately level from generation to generation of citizens. More specifically, contributions received each year shall be sufficient both:

(1) To fully cover the costs of benefit commitments being made to members for their service being rendered in that year; and

(2)(A) To make a level payment that, if paid annually over a reasonable period of future years, will fully cover the unfunded costs of benefit commitments for service previously rendered.

(B) Alternatively, if the costs of benefit commitments for service previously rendered are overfunded, the plan may deduct a level payment that, if deducted annually over a reasonable period of future years, will fully liquidate the overfunded portion of such costs.

Benefit Changes. The most recent benefit changes were reflected in the June 30, 2009 valuation. No benefit changes have been adopted for consideration in the June 30, 2017 valuation.

Assumption Changes. The June 30, 2017 valuation reflects a change in the investment return assumption from 7.50% to 7.15%. An experience study is scheduled to be performed prior to the June 30, 2018 valuation.

Method Changes. In conjunction with the adoption of the 7.15% investment return assumption, the amortization period was updated for the June 30, 2017 valuation to a 30-year period. There have been no other changes in methods since the June 30, 2016 valuation.

Status. Based upon the results of the June 30, 2017 actuarial valuation, ***SPERS continues to satisfy the general financial objective*** of level contribution financing.

Reserve Strength. As a by-product of achieving level contribution financing, actuarial accrued liabilities usually become more and more funded over a period of years. On a funding value of assets basis, the System has a 78% funded ratio. On a market value of assets basis, the System has a 76% funded ratio.

Employer Contribution Rates. Based upon experience through June 30, 2017, the State and Local Government contribution rate will be 15.32% of covered payroll for the fiscal year beginning July 1, 2018.

District Judges. Results for the District Judges are presented in Section D. These results are not included in any of the numbers presented in Sections A, B and C.

Recommendations

Reserve Transfers. Each year reserve transfers are recommended so that there will be a balance between assets and actuarial accrued liabilities in the Retirement Reserve Account and the Deferred Annuity Account.

- The Retirement Reserve Account is responsible for future annuity payments to present retired lives.
- The Deferred Annuity Account is responsible for future annuity payments to present inactive members.

This year's recommended transfer amounts are as follows:

Employer Accum. Account Before Transfers	Transfers as of July 1, 2017 (from) to: Retirement Reserve Account	Deferred Annuity Account	Employer Accum. Account After Transfers
$2,273,419,083	$768,006,551	$65,687,729	$1,439,724,803

For the purposes of this valuation it was assumed that these transfers would be made.

Other Observations

General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status.

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 7.15% on the actuarial value of assets), it is expected that:

(1) The employer normal cost as a percentage of pay will decrease to approximately 7.4% (the employer normal cost for the new contribution plans) as non-contributory members leave employment;

(2) The unfunded actuarial accrued liabilities will be fully amortized after 30 years; and

(3) The funded status of the plan will increase gradually towards a 100% funded ratio.

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

(1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.

(2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).

(3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.

Employer Contribution Rates Computed for Fiscal Year Beginning July 1, 2018

Contribution for	Contributions Expressed as %'s of Active Payroll
	State and Local and General Assembly
Normal Cost:	
Age and service annuities (including DROP and reduced retirement)	8.47%
Separation benefits	1.88%
Disability benefits	0.65%
Death-in-service annuities	0.23%
Administrative expenses	0.40%
Total	11.63%
Member contributions	3.47%
Employer Normal Cost	8.16%
Unfunded Actuarial Accrued Liabilities	7.16% *
Total Employer Contribution	**15.32%**

* *Unfunded actuarial accrued liabilities were amortized over a 30-year period.*
Note: State and Local payroll includes payroll for DROP participants and retired members returned to work.

Summary Statement of System Resources and Obligations
Year Ended June 30, 2017

Present Resources and Expected Future Resources

A.	Present Valuation Assets:	
	1. Net assets from System financial statements	$ 7,998,520,598
	2. Market value adjustment	158,517,063
	3. Valuation assets	8,157,037,661
B.	Actuarial present value of expected future employer contributions:	
	1. For normal costs	1,063,085,814
	2. For unfunded actuarial accrued liability	2,353,142,658
	3. Total	3,416,228,472
C.	Actuarial present value of expected future member contributions	515,719,301
D.	Total Present and Expected Future Resources	$ 12,088,985,434

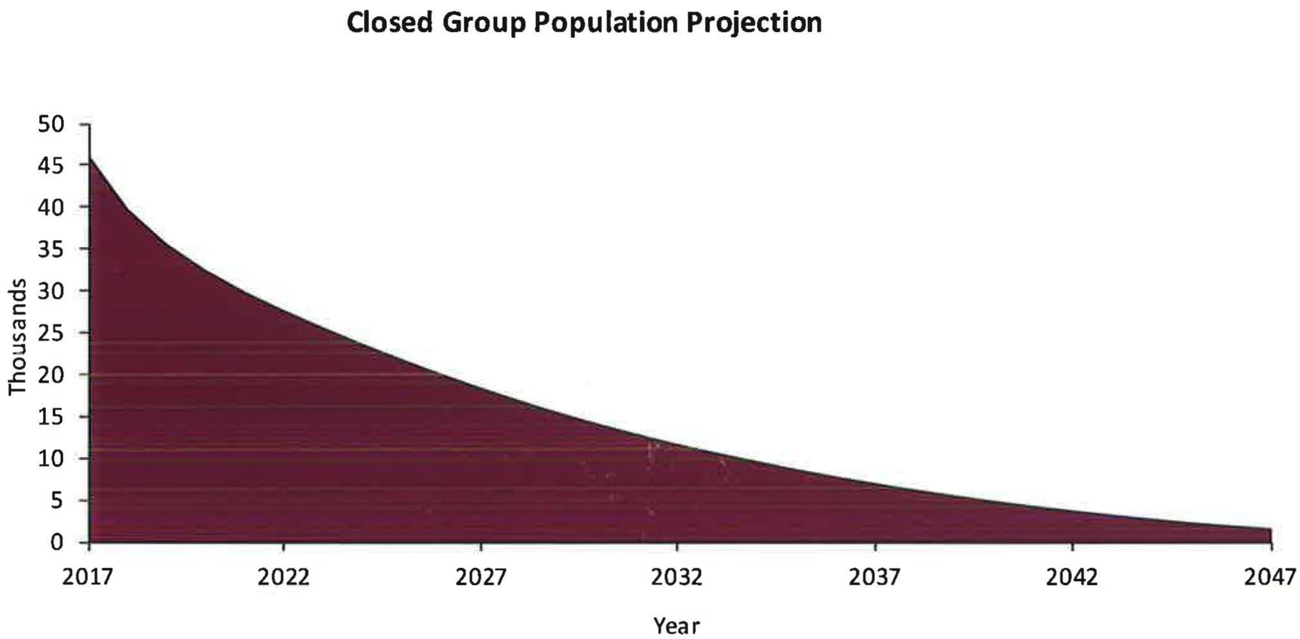
Actuarial Present Value of Expected Future Benefit Payments

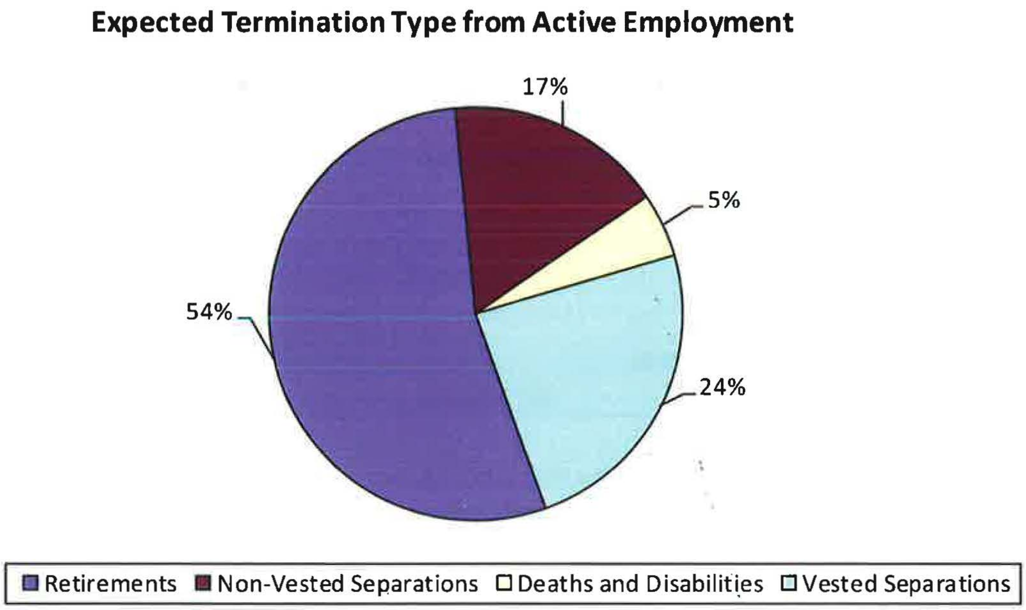
A.	To retirees and beneficiaries:	
	1. Annual pensions	$ 5,547,312,143
	2. DROP participants: future payments	607,518,123
	3. DROP Reserve: accrued balances	98,416,745
	4. Total	6,253,247,011
B.	To vested terminated members	528,546,993
C.	To present active members:	
	1. Allocated to service rendered prior to valuation date - actuarial accrued liability	3,728,386,315
	2. Allocated to service likely to be rendered after valuation date	1,578,805,115
	3. Total	5,307,191,430
D.	Total Actuarial Present Value of Expected Future Benefit Payments	$ 12,088,985,434

Computed Actuarial Liabilities and Allocation Using Entry Age Actuarial Cost Method as of June 30, 2017

Actuarial Present Value of	Total Present Value	Portion Covered By Future Normal Cost Contributions	Actuarial Accrued Liabilities (1) - (2)
Benefits to be paid to current retirees, beneficiaries, and future beneficiaries of current retirees	$5,547,312,143	$ 0	$5,547,312,143
Age and service allowances based on total service likely to be rendered by present active members	4,675,658,425	1,190,781,775	3,484,876,650
DROP paricipant benefits likely to be paid to present active members and current DROP participants	705,934,868	0	705,934,868
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active and inactive members	875,111,486	264,305,754	610,805,732
Disability benefits likely to be paid to present active members	194,425,301	91,382,308	103,042,993
Death-in-service benefits likely to be paid on behalf of present active members	90,543,211	32,335,278	58,207,933
Total	$12,088,985,434	$1,578,805,115	$ 10,510,180,319
Applicable assets (funding value)	8,157,037,661	0	8,157,037,661
Liabilities to be covered by future contributions	$ 3,931,947,773	$1,578,805,115	$ 2,353,142,658

Expected Development of Present Population
June 30, 2017





The charts show the expected future development of the present population in simplified terms. The Retirement System presently covers 46,094 active members. Eventually, 17% of the population is expected to terminate covered employment prior to retirement and forfeit eligibility for an employer provided benefit. About 78% of the present population is expected to receive monthly retirement benefits either by retiring directly from active service, retiring from DROP, or retiring from vested deferred status. About 5% of the present population is expected to become eligible for death-in-service or disability benefits. Within 9 years, over half of the covered membership is expected to consist of new hires.

Valuatic.. Results
Comparative Statement
($ Millions)

Valuation Date June 30,	Actuarial Accrued Liabilities & Reserves	Valuation Assets	% Funded	Unfunded Actuarial Accrued Liabilities & Reserves			Contribution Rate Computed Percents	
				Dollars	Amortiz. Period *	% of Payroll	General Assembly	State & Local**
2001 @	$4,111	$ 4,342	105.6 %	$(231)	50	(22) %	148.78 %	10.00 %
2002 #	4,398	4,404	100.1	(6)	6	(1)	150.95	10.00
2003 #	4,674	4,416	94.5	258	30	22	222.80	11.09
2004	5,005	4,438	88.7	567	30	48	201.39	12.54
2005 @#	5,619	4,584	81.6	1,035	22	85	459.47	12.54
2006	5,936	4,949	83.4	987	19	78	464.67	12.54
2007 @	6,174	5,498	89.1	676	18	52	410.58	11.01
2008 #	6,543	5,866	89.7	677	14	49	408.06	11.00
2009 @	6,938	5,413	78.0	1,525	30	106	521.36	12.46
2010	7,304	5,409	74.1	1,895	30	124	518.69	13.47
2011 #	7,734	5,467	70.7	2,267	30	147	939.81	14.24
2012	8,163	5,625	68.9	2,538	30	151		14.88
2013 #	8,284	6,159	74.3	2,125	25	126		14.76
2014 #	8,864	6,895	77.8	1,969	23	113		14.50
2015 #	9,295	7,352	79.1	1,943	25	111		14.50
2016	9,663	7,769	80.4	1,894	21	106		14.75
2017	**10,101**	**8,157**	**80.8**	**1,944**	**20**	**109**		**14.94**
2017 #	**10,510**	**8,157**	**77.6**	**2,353**	**30**	**132**		**15.32**

* *Amortization period is for State division prior to 2001, State and Local division for 2001 and later and may be rounded above. General Assembly unfunded actuarial accrued liabilities are amortized over an 18-year period as of June 30, 2008.*

** *Local Government rate was 6.00% for the 1998 valuation, 7.00% for the 1999 valuation, and 8.00% for the 2000 valuation. Beginning with the June 30, 2012 valuation, results include General Assembly.*

@ *After legislated changes in benefit provisions.*

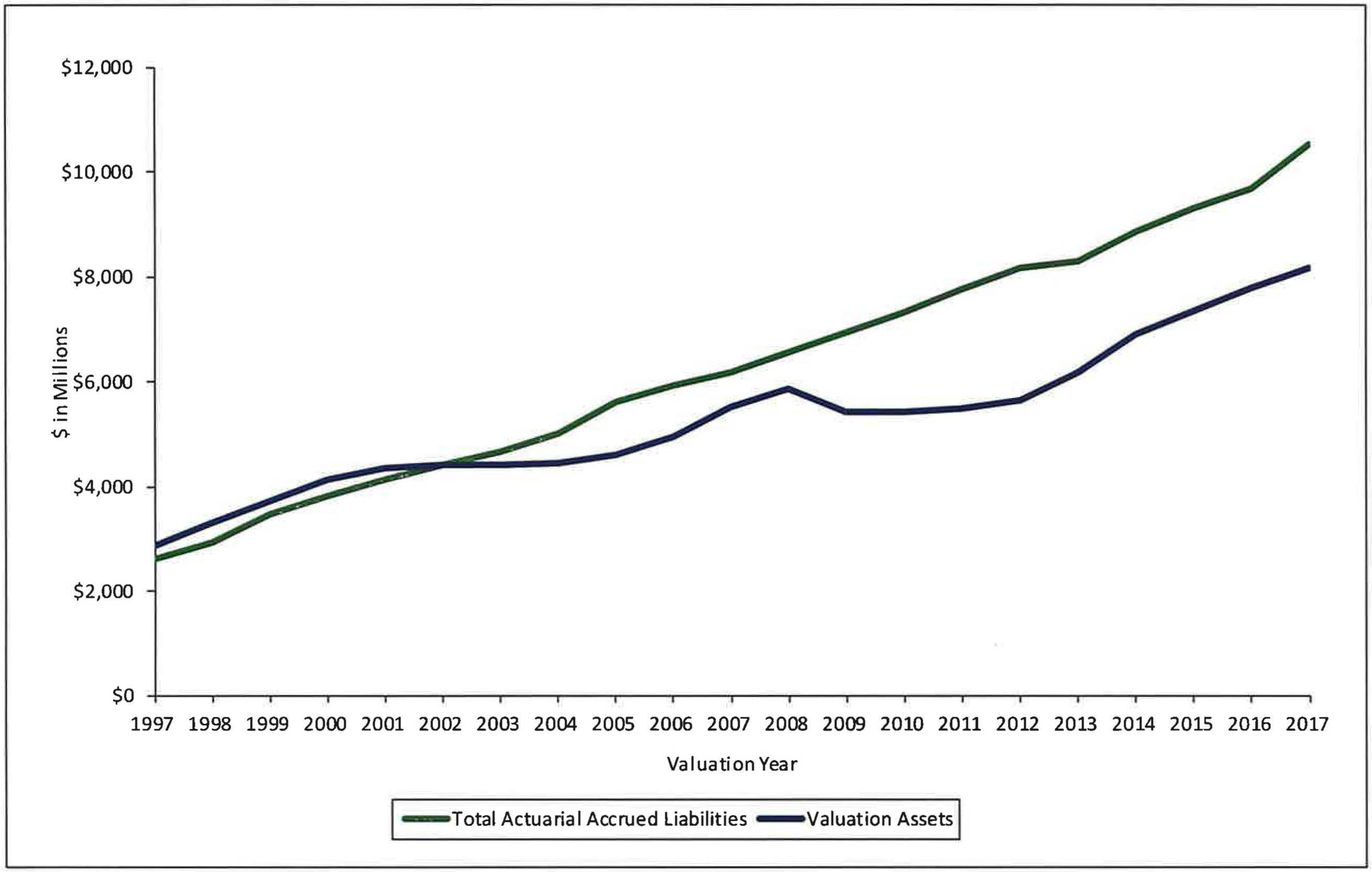
\# *After changes in actuarial assumptions.*

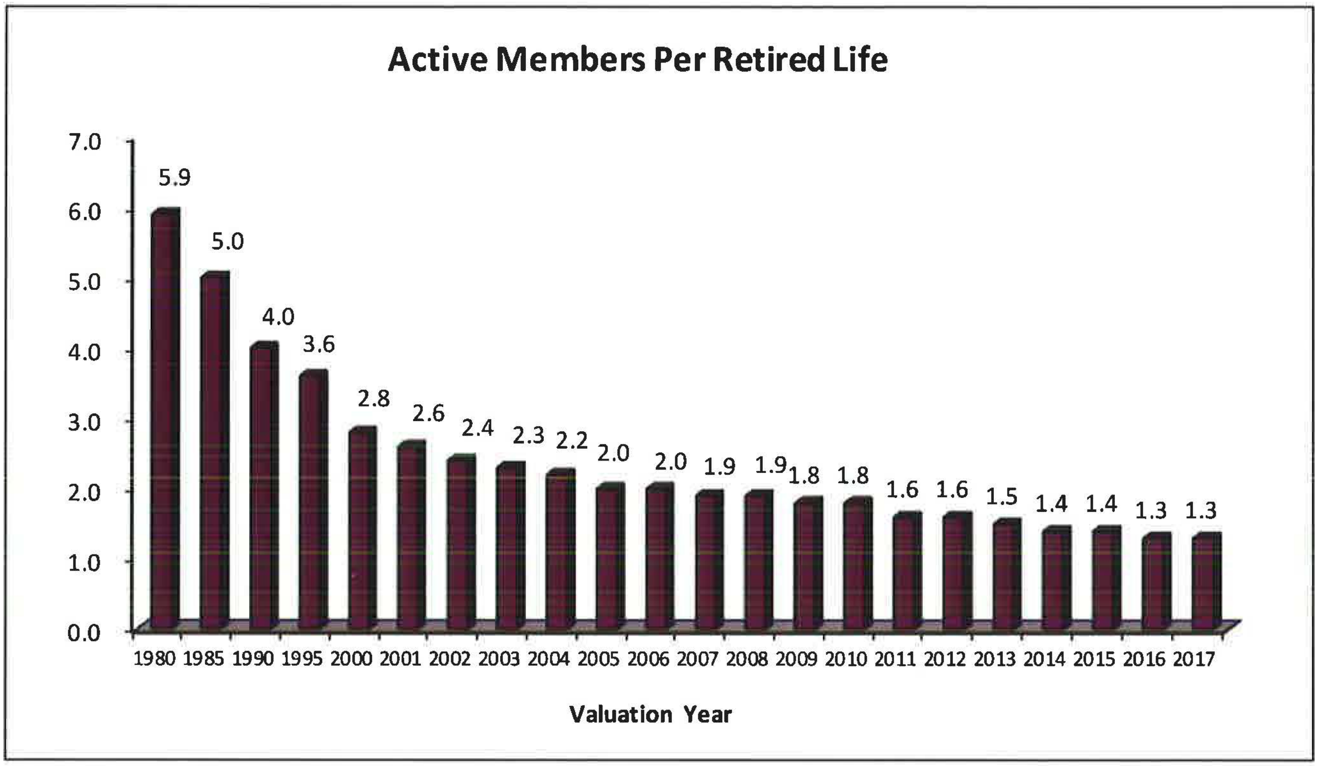
Active Members and Retired Lives
Historical Comparative Schedule

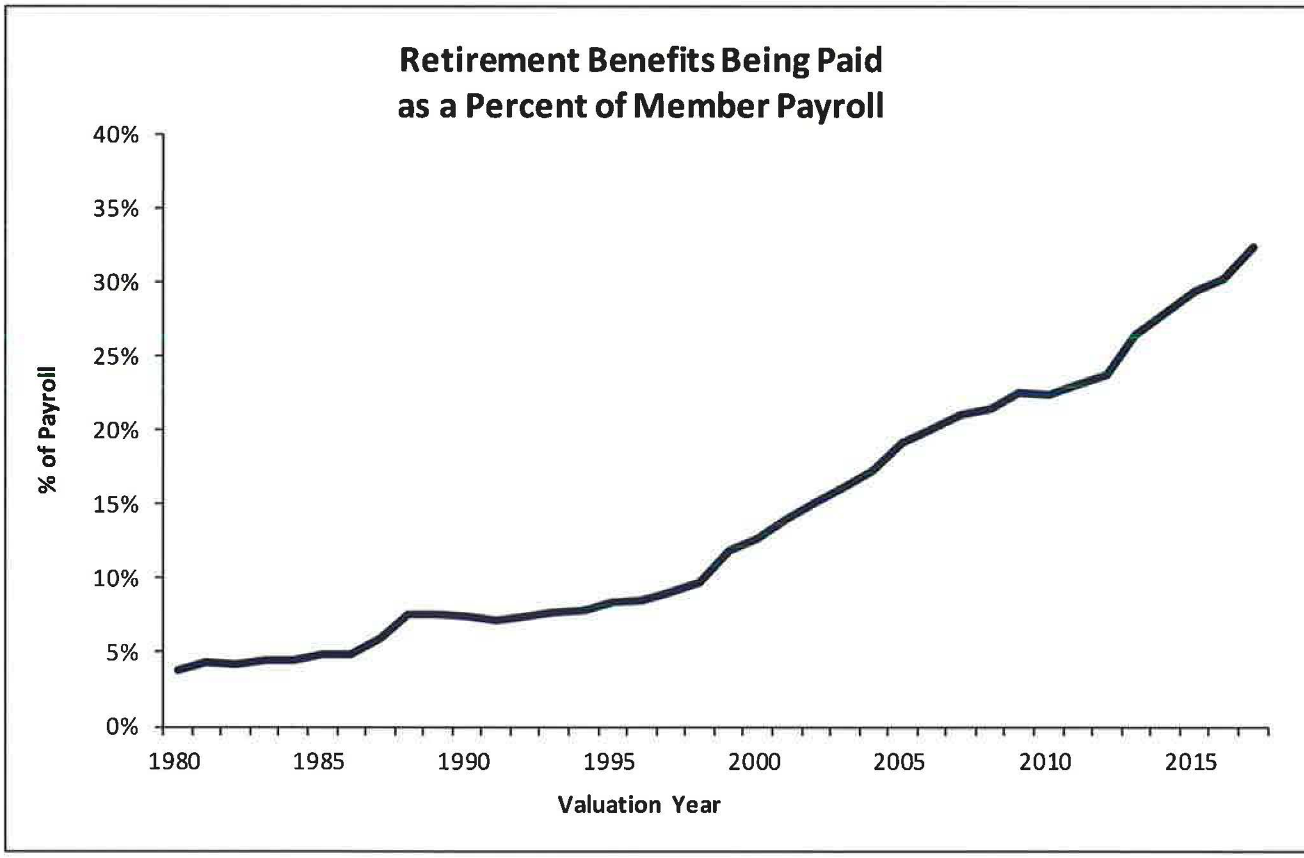
Valuation Date	Active Members No.	Valuation Payroll $ Millions	Valuation Payroll Average	% Incr.	Retired Lives No.	Active per Retired	Annual Benefits $ Millions	As a % of Pay
6/30/84	NA	NA	NA	NA	7,036	NA	$ 19.1	4.4%
6/30/85	NA	NA	NA	NA	7,331	NA	22.0	4.8%
6/30/86	NA	NA	NA	NA	7,649	NA	24.1	4.9%
6/30/87	NA	NA	NA	NA	8,074	NA	30.2	6.0%
6/30/88	NA	NA	NA	NA	9,155	NA	39.6	7.5%
6/30/89	NA	NA	NA	NA	9,418	NA	42.9	7.6%
6/30/90	NA	NA	NA	NA	9,747	NA	44.9	7.4%
6/30/91	NA	NA	NA	NA	10,110	NA	49.2	7.6%
6/30/92	39,752	$ 698.2	$ 17,564	NA	10,456	3.8	51.9	7.4%
6/30/93	39,849	733.4	18,404	4.8%	10,840	3.7	56.8	7.7%
6/30/94	40,940	778.7	19,021	3.3%	11,213	3.7	60.7	7.8%
6/30/95	42,041	834.5	19,850	4.4%	11,683	3.6	70.1	8.4%
6/30/96	42,712	889.3	20,821	4.9%	12,073	3.5	76.2	8.6%
6/30/97	43,068	938.5	21,791	4.7%	12,644	3.4	84.8	9.0%
6/30/98	43,047	974.7	22,644	3.9%	13,480	3.2	94.6	9.7%
6/30/99	43,064	1,008.9	23,427	3.5%	14,688	2.9	119.3	11.8%
6/30/00	43,121	1,050.0	24,351	3.9%	15,544	2.8	133.6	12.7%
6/30/01	42,556	1,070.1	25,146	3.3%	16,643	2.6	150.0	14.0%
6/30/02	42,230	1,111.5	26,320	4.7%	17,748	2.4	167.6	15.1%
6/30/03	42,879	1,147.9	26,772	1.7%	18,838	2.3	186.0	16.2%
6/30/04	42,826	1,175.8	27,455	2.6%	19,872	2.2	203.4	17.3%
6/30/05	42,938	1,214.9	28,295	3.1%	21,080	2.0	232.9	19.2%
6/30/06	43,453	1,267.1	29,159	3.1%	22,234	2.0	254.7	20.1%
6/30/07	43,630	1,302.6	29,855	2.4%	22,409	1.9	274.8	21.1%
6/30/08	44,357	1,379.8	31,106	4.2%	23,555	1.9	297.0	21.5%
6/30/09	44,702	1,433.7	32,073	3.1%	24,972	1.8	323.1	22.5%
6/30/10	45,394	1,522.7	33,544	4.6%	25,880	1.8	342.2	22.5%
6/30/11	45,145	1,542.9	34,177	1.9%	28,137	1.6	375.7	24.3%
6/30/12	45,937	1,606.1	34,962	2.3%	29,282	1.6	399.5	24.9%
6/30/13	45,707	1,612.7	35,285	0.9%	30,533	1.5	426.2	26.4%
6/30/14	45,841	1,638.0	35,735	1.3%	31,914	1.4	457.1	27.9%
6/30/15	45,722	1,645.0	35,979	0.7%	33,106	1.4	483.9	29.4%
6/30/16	45,676	1,686.5	36,923	2.6%	34,214	1.3	509.7	30.2%
6/30/17	**46,094**	**1,668.8**	**36,204**	**(1.9)%**	**36,260**	**1.3**	**540.1**	**32.4%**

The above valuation payroll results do not include DROP payroll.

Actuarial Accrued ·abilities & Assets




Active Members Per Retired Life
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
5.9
5.0
4.0
3.6
2.8
2.6
2.4
2.3
2.2
2.0
2.0
1.9
1.9
1.8
1.8
1.6
1.6
1.5
1.4
1.4
1.3
1.3
1980 1985 1990 1995 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
Valuation Year


Retirement Benefits Being Paid
as a Percent of Member Payroll
40%
35%
30%
25%
20%
15%
10%
5%
0%
% of Payroll
1980
1985
1990
1995
2000
2005
2010
2015
Valuation Year

Short Condition Test

The SPERS funding objective is to meet long-term benefit promises through contributions that remain approximately level from year to year as a percent of member payroll. If the contributions to the System are level in concept and soundly executed, the System will ***pay all promised benefits when due -- the ultimate test of financial soundness***. Testing for level contribution rates is ***the*** long-term condition test.

A short condition test is one means of checking a System's progress under its funding program. In a short condition test, the Plan's present assets (cash and investments) are compared with:

1) Active member contributions on deposit;
2) The liabilities for future benefits to present retired lives; and
3) The liabilities for service already rendered by active members.

In a System that has been following the discipline of level percent-of-payroll financing, the liabilities for active member contributions on deposit (liability 1) and the liabilities for future benefits to present retired lives (liability 2) will be fully covered by present assets (except in unusual circumstances). In addition, the liabilities for service already rendered by active members (liability 3) will be partially covered by the remainder of present assets. The larger the funded portion of liability 3, the stronger the condition of the System. Liability 3 being fully funded is uncommon.

Short Condition Test
Comparative Statement
($ in Millions)

Val'n. Date: June 30	Entry Age Accrued Liability (1) Active Member Contr.	(2) Retirees and Benef.	(3) Active Members (Employer Financed Portion)	Valuation Assets	Portion of Present Values Covered by Present Assets (1)	(2)	(3)	Total
	STATE DIVISION (including sub-divisions)							
1998@	$17.2	$ 640.3	$1,395.9	$2,328.5	100%	100%	119%	113%
1999@#	16.9	784.0	1,634.2	2,637.1	100%	100%	112%	108%
2000	15.8	747.5	1,865.7	2,943.3	100%	100%	117%	112%
	LOCAL GOVERNMENT DIVISION							
1998@	$ 8.8	$ 337.9	$ 501.1	$ 968.1	100%	100%	124%	114%
1999#	8.8	446.9	587.9	1,074.7	100%	100%	105%	103%
2000	7.6	440.0	706.0	1,178.1	100%	100%	103%	102%
	STATE AND LOCAL GOVERNMENT DIVISION							
2001#	$23.4	$1,305.0	$2,759.2	$4,335.5	100%	100%	109%	106%
2002@	20.5	1,502.7	2,850.8	4,397.2	100%	100%	101%	101%
2003@	20.5	1,624.7	3,004.7	4,408.3	100%	100%	92%	95%
2004	20.5	1,762.2	3,197.6	4,429.9	100%	100%	83%	89%
2005@	15.5	1,878.2	3,701.7	4,576.1	100%	100%	72%	82%
2006	15.5	1,990.6	3,907.3	4,941.1	100%	100%	75%	84%
2007#	29.7	2,268.5	3,856.7	5,489.3	100%	100%	83%	89%
2008@	45.8	2,463.9	4,014.9	5,858.1	100%	100%	83%	90%
2009	66.4	2,750.3	4,059.9	5,406.8	100%	100%	64%	79%
2009#	66.4	2,750.3	4,103.5	5,406.8	100%	100%	63%	78%
2010	92.8	2,928.7	4,266.1	5,403.5	100%	100%	56%	74%
2011@	119.2	3,268.3	4,327.8	5,462.6	100%	100%	48%	71%
2012	122.1	3,518.7	4,521.9	5,625.4	100%	100%	44%	69%
2013@	147.9	3,855.2	4,281.1	6,159.3	100%	100%	50%	74%
2014@	176.3	4,246.7	4,440.6	6,894.9	100%	100%	56%	78%
2015@	201.1	4,654.5	4,439.2	7,351.7	100%	100%	56%	79%
2016	228.4	4,929.2	4,505.1	7,768.9	100%	100%	58%	80%
2017	291.1	5,388.3	4,421.3	8,157.0	100%	100%	56%	81%
2017@	**291.1**	**5,547.3**	**4,671.8**	**8,157.0**	**100%**	**100%**	**50%**	**78%**

 # After legislated changes in benefit provisions.
@ After changes in actuarial assumptions.

Summary of Risk Measures

Valuation Date June 30,	Funded Ratio Based on AVA	Funded Ratio Based on MVA	UAAL Amortization Period	Total UAAL / Total Payroll	Total Actuarial Value of Assets / Total Payroll	Total AAL / Total Payroll	Standard Deviation of Investment Return / Total Payroll
2005 @#	82 %	83 %	22	0.9	3.8	4.6	**
2006	83	87	19	0.8	3.9	4.7	**
2007 @	89	97	18	0.5	4.2	4.7	**
2008 #	90	86	14	0.5	4.3	4.7	**
2009 @	78	62	30	1.1	3.8	4.8	**
2010	74	65	30	1.2	3.6	4.8	**
2011 #	71	75	30	1.5	3.4	4.8	**
2012	69	70	30	1.5	3.3	4.8	**
2013 #	74	77	25	1.3	3.6	4.9	**
2014 #	78	85	23	1.1	4.0	5.1	59 %
2015 #	79	81	25	1.1	4.2	5.3	58 %
2016	80	76	21	1.1	4.3	5.4	56 %
2017 #	78	76	30	1.3	4.6	5.9	56 %

@ After legislated changes in benefit provisions.
 # After changes in actuarial assumptions.
*** Unavailable. This measurement will be built prospectively beginning with the June 30, 2014 valuation.*

Funded ratio: The funded ratio is expected to trend toward 100% by June 30, 2047 under the current amortization period.

UAAL Amortization Period: The statutory amortization period is expected to decrease by one year each year.

UAAL / Total Payroll: The ratio of the unfunded actuarial accrued liability to payroll is expected to trend towards 0% by June 30, 2047.

Funding Value of Assets / Total Payroll: As the funded ratio increases, this ratio is expected to converge to the ratio of Total AAL / Payroll.

Total AAL / Total Payroll: This measure is expected to increase as the system matures.

Standard Deviation of Investment Return / Total Payroll: This measure illustrates the impact of a one standard deviation change in investment return as a percent of payroll. Investment return experience other than expected ultimately affects the employer contribution rates. The higher the ratio of this risk metric, the greater the expected volatility in employer contribution rates. Absent changes in investment policy, this metric is expected to increase as the assets grow to 100% of the AAL.

SECTION B

VALUATION DATA

Summary of Client Benefit Provisions

Summary of Provisions Evaluated
Illustration of Benefit Changes During Recent Years of Retirement & Related Changes in Purchasing Power

Year Ended June 30	Increase Beginning of Year	Benefit Dollars In Year	Inflation (Loss) In Year#	Purchasing Power at Year End	
				1985 $	% of 1985
1985	--	$ 8,000	(3.7)%	$8,000	100%
1986	$ 240	8,240	(1.7)%	8,102	101%
1987	240	8,480	(3.7)%	8,041	101%
1988	240	8,720	(3.9)%	7,958	99%
1989	240	8,960	(5.1)%	7,780	97%
1990	240	9,200	(4.7)%	7,630	95%
1991	240	9,440	(4.7)%	7,478	93%
1992	661	10,101	(3.1)%	7,761	97%
1993	303	10,404	(3.0)%	7,761	97%
1994	584	10,988	(2.5)%	7,996	100%
1995	275	11,263	(3.0)%	7,958	99%
1996	1,064	12,327	(2.8)%	8,472	106%
1997	345	12,672	(3.0)%	8,506	106%
1998	760	13,432	(2.3)%	8,761	110%
1999	309	13,741	(1.7)%	8,896	111%
2000	990	14,731	(3.7)%	9,194	115%
2001	442	15,173	(3.2)%	9,172	115%
2002	713	15,886	(1.1)%	9,502	119%
2003	477	16,363	(2.1)%	9,586	120%
2004	491	16,854	(3.0)%	9,586	120%
2005	506	17,360	(3.2)%	9,570	120%
2006	521	17,881	(4.1)%	9,465	118%
2007	715	18,596	(2.4)%	9,617	120%
2008	558	19,154	(5.6)%	9,380	118%
2009	575	19,729	2.1 %	9,864	123%
2010	592	20,321	(1.2)%	10,036	125%
2011	610	20,931	(3.6)%	9,962	125%
2012	628	21,559	(1.4)%	10,118	126%
2013	647	22,206	(2.0)%	10,221	128%
2014	666	22,872	(2.0)%	10,322	129%
2015	686	23,558	(0.2)%	10,614	133%
2016	707	24,265	(0.8)%	10,843	136%
2017	728	24,993	(1.7)%	10,979	137%
2018	750	25,743			

 # Based on Consumer Price Index, All Urban Consumers, United States City Average (July values).

Revenues and Expenditures
July 1, 2016 Through June 30, 2017
Market Value

	Totals
Balance 7/1/2016	**$7,350,771,708**
Revenues	
Member contributions	57,560,228
Employer contributions	261,058,732
Transfers	4,860,673
Other	1,641,193
Investment return*	860,485,078
Total	1,185,605,904
Expenditures	
Benefits paid and refunds	520,153,367
Expenses	9,470,120
Total	529,623,487
Reserve Adjustments	0
Balance 6/30/2017	**$8,006,754,125**
Less Contibutions Receivable	**8,233,527**
Balance Available for Funding Valuation	**$7,998,520,598**

** Net of investment expenses.*

Note: Results may not total due to rounding.

Reported Accrued Assets Available for Benefits
June 30, 2017

Retirement System Account	Reported Assets June 30, 2017	
Employer Accumulation Account	$ 1,439,724,806	*
Members Deposit Account	339,134,758	
Members Deposit Interest Reserve	53,528,395	
Retirement Reserve Account	5,547,312,139	*
Deferred Annuity Reserve Account	528,546,993	*
DROP Reserve	98,416,745	
Miscellaneous Reserves	90,289	
Total Market Value	$ 8,006,754,125	
Less Contributions Receivable	8,233,527	
Market Value Available for Funding	$ 7,998,520,598	
Funding Value of Assets	$ 8,157,037,661	
Valuation Asset Adjustment	158,517,063	
Adjusted Employer Accum. Account	$ 1,598,241,869	

* *After recommended reserve transfers (see page A-2).*

Reported Accrued Assets Available for Benefits
June 30, 2017
(Concluded)

The Employers Accumulation Account represents employer contributions accumulated for benefits on behalf of present members.

The Members Deposit Account represents member contributions accumulated for (1) monthly benefits at retirement, and (2) refunds upon termination if monthly benefits are not payable.

The Members Deposit Interest Reserve Account represents interest credited on member contributions.

The Retirement Reserve Account represents reserves, from employer and member contributions, held for the monthly benefits being paid to present retired lives.

The Deferred Annuity Account represents employer reserves held for future monthly benefits to present inactive members.

In financing the liabilities, the Fund balances displayed on the previous page were applied to the actuarial accrued liabilities.

Development of Funding Value of Assets

	Valuation Date June 30:	2015	2016	2017	2018	2019	2020
A.	Funding Value Beginning of Year	$ 6,894,878,773	$ 7,351,734,654	$7,768,871,751			
B.	Market Value End of Year	7,530,670,312	7,350,771,708	7,998,520,598			
C.	Market Value Beginning of Year	7,512,167,348	7,530,670,312	7,350,771,708			
D.	Non-Investment Net Cash Flow	(143,395,439)	(175,483,016)	(204,502,660)			
E.	Investment Income						
	E1. Market Total: B - C - D	161,898,403	(4,415,588)	852,251,550			
	E2. Assumed Rate	7.75%	7.50%	7.50%	7.15%		
	E3. Amount for Immediate Recognition	528,865,652	544,878,798	575,088,960			
	E4. Amount for Phased-In Recognition	(366,967,249)	(549,294,386)	277,162,590			
F.	Phased-In Recognition of Investment Income						
	F1. Current Year: 0.25 x E4	(91,741,812)	(137,323,597)	69,290,648			
	F2. First Prior Year	177,354,370	(91,741,812)	(137,323,597)	$ 69,290,648		
	F3. Second Prior Year	99,452,354	177,354,370	(91,741,812)	(137,323,597)	$ 69,290,648	
	F4. Third Prior Year	(113,679,244)	99,452,354	177,354,371	(91,741,813)	(137,323,595)	$ 69,290,646
	F5. Total Phase-Ins	71,385,668	47,741,315	17,579,610	(159,774,762)	(68,032,947)	69,290,646
G.	Preliminary Funding Value End of Year: A + D + E3 + F5	$ 7,351,734,654	$ 7,768,871,751	$8,157,037,661			
H.	Adjustment to Minimum of 75% of B, Maximum 125% of B	0	0	0			
I.	**Funding Value End of Year**	**$ 7,351,734,654**	**$ 7,768,871,751**	**$8,157,037,661**			
J.	Difference Between Market & Funding Value	178,935,658	(418,100,043)	(158,517,063)			
K.	**Recognized Rate of Return**	**8.8%**	**8.2%**	**7.7%**			
L.	Market Rate of Return	2.2%	(0.1)%	11.8%			
M.	Ratio of Funding Value to Market Value	98%	106%	102%			

The Funding Value of Assets recognizes assumed investment return (line E3) fully each year. Differences between actual and assumed investment return (Line E4) are phased-in over a closed 4-year period. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than Market Value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than Market Value. If assumed rates are exactly realized for 3 consecutive years, Funding Value will become equal to Market Value.

Summary of Annuitants on Rolls

Retirees and beneficiaries (including DROP participants) on rolls included in the valuation totaled 36,260, involving annual annuities of $540,131,520, distributed as follows:

Division	Number	Annuities Being Paid July 1, 2017	
		Monthly	Annualized
State & Local	34,602	$ 41,334,979	$ 496,019,748
General Assembly	119	165,297	1,983,564
Governor	1	5,823	69,876
Wildlife	115	344,715	4,136,580
State Constitutional Officers	11	43,547	522,564
Penitentiary	0	0	0
Sub-total	**34,848**	**41,894,361**	**502,732,332**
DROP	1,412	3,116,599	37,399,188
Totals	**36,260**	**$ 45,010,960**	**$ 540,131,520**

Inactive members, entitled to deferred annuities, included in the valuation totaled 14,873, involving estimated deferred monthly annuities of $6,331,591, distributed as follows:

Division	Number of Inactive Members	Estimated Deferred Annuities	
		Monthly	Annualized
State and Local	14,823	$ 6,322,069	$ 75,864,828
General Assembly	45	6,063	72,756
Wildlife	3	1,569	18,828
State Constitutional Officers	2	1,890	22,680
Totals	**14,873**	**$ 6,331,591**	**$ 75,979,092**

Retirement System Totals
Annuities Being Paid Retirees and Beneficiaries and DROP Participants
June 30, 2017
by Attained Age and Type of Retirement

Attained Ages	DROP No.	DROP Annual Amount	Age & Service* No.	Age & Service* Annual Annuities	Disability No.	Disability Annual Annuities	Death-in-Service Beneficiaries No.	Death-in-Service Beneficiaries Annual Annuities	Totals No.	Totals Annual Annuities
Under 40			46	$ 253,824	27	$ 126,912	197	$ 864,804	270	$ 1,245,540
40-44		$ -	36	320,904	57	354,828	23	132,972	116	808,704
45-49	17	311,016	99	1,684,344	117	943,104	47	410,484	280	3,348,948
50-54	210	4,751,424	463	11,387,100	259	2,397,300	76	691,860	1,008	19,227,684
55-59	584	16,615,956	2,281	45,635,340	510	4,684,224	132	1,001,916	3,507	67,937,436
60-64	456	12,421,320	5,182	87,226,728	717	7,116,552	177	1,493,604	6,532	108,258,204
65-69	119	2,795,616	7,615	112,802,712	747	7,251,096	137	1,217,472	8,618	124,066,896
70-74	22	436,284	6,138	87,913,524	479	4,486,764	127	1,206,612	6,766	94,043,184
75-79	4	67,572	4,062	53,474,124	151	1,443,588	88	760,164	4,305	55,745,448
80-84			2,643	35,354,052	58	673,380	53	530,820	2,754	36,558,252
85-89			1,345	18,086,028	14	185,292	28	258,876	1,387	18,530,196
90-94			539	8,224,140	4	47,268	17	216,828	560	8,488,236
95-99			132	1,604,484			5	51,312	137	1,655,796
Over 100			20	216,996					20	216,996
Totals	**1,412**	**$37,399,188**	**30,601**	**$464,184,300**	**3,140**	**$29,710,308**	**1,107**	**$8,837,724**	**36,260**	**$540,131,520**

** Including survivor beneficiaries of deceased retirees and QDRO alternate payees.*

Annuities Being Paid June 30, 2017
by Type of Annuity

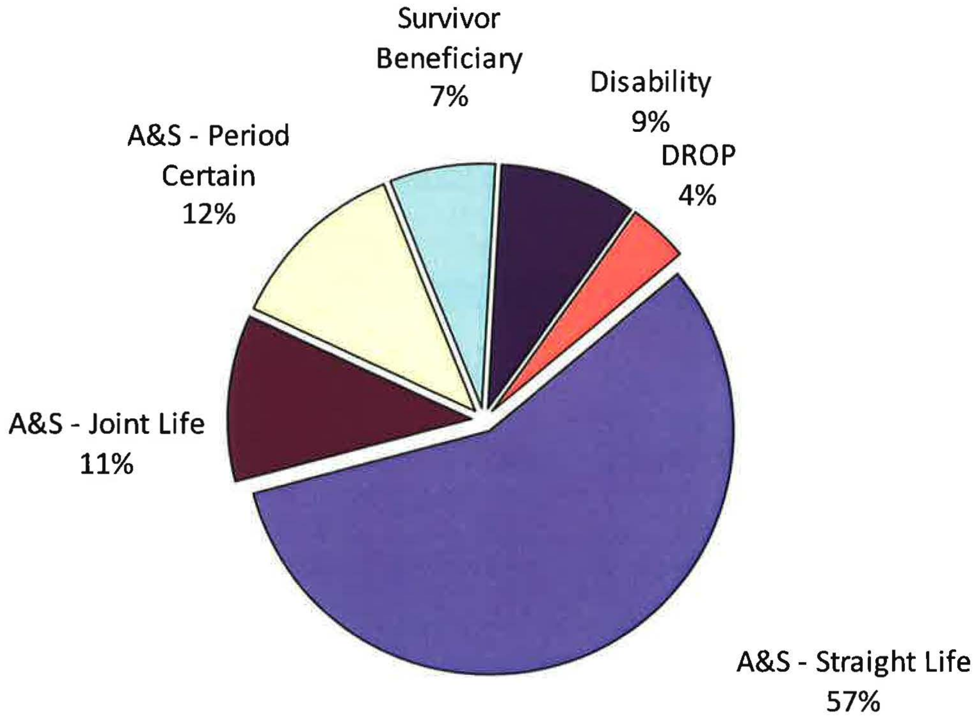
Type of Annuity	Number	Annual Annuities
Age & Service Retirees		
Life	20,662	$ 323,892,072
Option A- 60 (5 years certain)	1,565	20,635,356
Option A-120 (10 years certain)	2,834	34,886,280
Option B- 50 (joint and 50% survivor)	1,524	29,859,024
Option B- 75 (joint and 75% survivor)	2,457	39,854,532
Totals	29,042	449,127,264
Disability Retirees		
Life	2,170	20,955,876
Option A- 60	164	1,410,420
Option A-120	380	3,447,888
Option B- 50	162	1,559,136
Option B- 75	264	2,336,988
Totals	3,140	29,710,308
Beneficiaries of Age & Service and Disability Retirees		
Life	49	960,804
Option A- 60	32	297,132
Option A-120	219	1,935,060
Option B- 50	355	3,195,264
Option B- 75	665	6,870,480
Totals	1,320	13,258,740
Total Age & Service Retirees & Beneficiaries	30,362	462,386,004
Death-in-Service Beneficiaries	1,107	8,837,724
Total Death and Disability Retirees & Beneficiaries	4,247	38,548,032
QDRO Alternate Payees	239	1,798,296
Total Retirees & Beneficiaries	**34,848**	**502,732,332**
DROP Participants	1,412	37,399,188
Total Including DROP Participants	**36,260**	**$ 540,131,520**

The average monthly benefit is $1,241.34

Schedule of Average Benefit Payments (Voluntary Retirements Still Receiving Benefits as of June 30, 2017)

	Years of Credited Service				
	10-14	15-19	20-24	25-29	30+
Retirement Effective Dates					
July 1, 2016 to June 30, 2017					
Average Monthly Benefit	$ 463.18	$ 998.89	$ 1,361.92	$2,272.89	$3,021.21
Average Monthly FAS	2,736.39	3,341.89	3,497.65	3,605.81	3,807.59
Number of Active Retirees	981	343	225	528	264
Retirement Effective Dates					
July 1, 2015 to June 30, 2016					
Average Monthly Benefit	458.52	968.78	1,394.06	2,311.49	2,930.95
Average Monthly FAS	2,811.73	3,323.26	3,768.80	3,850.76	4,216.82
Number of Active Retirees	857	240	159	438	218
Retirement Effective Dates					
July 1, 2014 to June 30, 2015					
Average Monthly Benefit	555.13	997.31	1,396.88	2,305.40	2,805.57
Average Monthly FAS	2,759.44	3,301.08	3,832.59	4,142.67	4,064.83
Number of Active Retirees	912	252	210	448	196
Retirement Effective Dates					
July 1, 2013 to June 30, 2014					
Average Monthly Benefit	465.55	906.81	1,358.82	2,249.22	2,772.73
Average Monthly FAS	2,687.58	3,035.24	3,418.03	3,888.23	8,759.97
Number of Active Retirees	821	227	174	456	154
Retirement Effective Dates					
July 1, 2012 to June 30, 2013					
Average Monthly Benefit	455.91	891.09	1,488.26	2,304.43	2,818.61
Average Monthly FAS	2,540.30	2,907.92	4,025.64	3,785.80	4,245.29
Number of Active Retirees	855	199	182	479	181
Retirement Effective Dates					
July 1, 2011 to June 30, 2012					
Average Monthly Benefit	432.53	904.90	1,276.53	2,266.18	2,723.21
Average Monthly FAS	2,544.71	2,998.37	3,325.55	3,788.46	4,131.52
Number of Active Retirees	789	208	165	415	143
Retirement Effective Dates					
July 1, 2010 to June 30, 2011					
Average Monthly Benefit	449.71	942.02	1,424.82	2,257.15	2,671.38
Average Monthly FAS	2,596.61	2,830.13	3,304.14	3,764.59	4,211.63
Number of Active Retirees	716	180	175	417	170
Retirement Effective Dates					
July 1, 2009 to June 30, 2010					
Average Monthly Benefit	383.68	805.27	1,180.62	2,197.89	2,554.49
Average Monthly FAS	2,311.09	2,647.57	2,876.89	3,941.93	4,212.25
Number of Active Retirees	629	165	149	342	160
Retirement Effective Dates					
July 1, 2008 to June 30, 2009					
Average Monthly Benefit	480.72	812.09	1,231.85	2,204.82	2,637.21
Average Monthly FAS	2,224.60	2,607.43	3,785.38	3,509.85	4,119.77
Number of Active Retirees	718	199	180	485	207
Retirement Effective Dates					
July 1, 2007 to June 30, 2008					
Average Monthly Benefit	444.93	876.45	1,201.48	2,058.84	2,796.08
Average Monthly FAS	2,495.87	2,690.02	2,772.99	3,672.62	4,995.83
Number of Active Retirees	562	154	145	398	117
Retirement Effective Dates					
July 1, 2007 to June 30, 2017					
Average Monthly Benefit	**462.43**	**1,929.04**	**3,207.70**	**2,928.17**	**6,661.11**
Average Monthly FAS	**1,529.22**	**1,865.90**	**1,994.59**	**2,050.12**	**2,673.27**
Number of Active Retirees	**7,840**	**2,167**	**1,764**	**4,406**	**1,810**

Annuities Being Paid by Type
June 30, 2017



New Retirees
June 30, 2017

	New Retirees June 30, 2017	
	Age & Service	Disability
Number*	2,335	116
Average Age (yrs.)	62.3	54.9
Average Service (yrs.)	18.3	13.4
Average Monthly Benefit	$1,326.46	$745.57

** May include members who become new retirees from a non-active status.*

Retirement System Totals
Annuities Likely to be Paid Present Inactive Members
June 30, 2017
by Attained Age

Attained Ages	No.	Estimated Annual Annuities
Under 40	2,440	$ 11,612,717
40-44	1,973	9,986,143
45-49	2,797	14,254,175
50-54	2,936	15,901,161
55-59	2,356	12,469,621
60-64	1,585	8,790,940
65-69	786	2,964,335
Totals	**14,873**	**$ 75,979,092**

Liabilities for Deferred Annuities June 30, 2017

Number of Inactive Members	Estimated Annual Annuities	Annuity Liabilities
14,873	$ 75,979,092	$ 528,546,993

State and Local Division
(Excluding General Assembly)
Active Members* in Valuation June 30, 2017
by Attained Age and Years of Service

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 plus	No.	Valuation Payroll
Under 20	287							287	$ 4,912,849
20-24	2,842	25						2,867	69,792,887
25-29	3,774	645	23					4,442	130,291,697
30-34	2,765	1,367	483	19				4,634	155,123,830
35-39	2,303	1,334	1,147	340	3			5,127	186,588,196
40-44	1,843	1,181	1,062	848	211	4		5,149	194,150,286
45-49	1,946	1,201	995	905	673	242	2	5,964	229,966,548
50-54	1,568	1,050	948	880	692	572	112	5,822	228,084,547
55-59	1,282	1,047	956	846	630	512	209	5,482	219,056,255
60	213	202	190	177	97	100	27	1,006	39,911,436
61	182	179	154	160	141	75	40	931	38,082,688
62	169	166	161	139	99	78	29	841	33,388,679
63	113	134	118	110	94	67	29	665	28,325,537
64	133	126	115	111	78	50	28	641	25,986,677
65	76	106	80	79	74	34	16	465	18,555,001
66	81	78	55	46	32	34	17	343	13,876,332
67	68	41	56	38	20	12	10	245	9,565,901
68	51	58	46	36	23	15	8	237	8,776,768
69	59	33	39	36	18	11	10	206	8,241,454
70 & over	204	148	138	122	59	42	24	737	25,989,796
Totals	**19,959**	**9,121**	**6,766**	**4,892**	**2,944**	**1,848**	**561**	**46,091**	**$1,668,667,364**

* *Not including DROP participants.*

Group Averages

Age:	44.4 years
Service:	8.8 years
Annual Pay:	$36,204

General Assembly Sub-Division
Active Members in Valuation June 30, 2017
by Attained Age and Years of Service

Attained Age	Years of Service to Valuation Date								
	0-4	5-9	10-14	15-19	20-24	25-27	28 Plus	No.	Valuation Payroll
25-29									
30-34									
35-39									
40-44									
45-49			1					1	$ 39,399
50-54									
55-59			1					1	39,399
60									
61									
62									
63									
64									
65									
66									
67									
68									
69									
70									
71									
72									
73			1					1	39,399
Totals			**3**					**3**	**$118,197**

While not used in the computations, the following ***group averages*** are computed and shown for their general interest.

Group Averages

Age:	59.2 years
Service:	13.2 years
Annual Pay:	$39,399

SECTION C

GAIN/(LOSS) ANALYSIS

Gain/(Loss) Analysis
Comments

Purpose of Gain/(Loss) Analysis. Regular actuarial valuations give valuable information about the composite change in unfunded actuarial accrued liabilities – whether or not the liabilities are increasing or decreasing and by how much.

But valuations do not show the portion of the change attributable to each risk area within the Retirement System: the rate of investment return which plan assets earn; the rates of withdrawal of active members who leave covered employment; the rates of mortality; the rates of disability; the rates of pay increases; and the ages at actual retirement. In an actuarial valuation, assumptions must be made as to what these rates will be, for the next year and for decades in the future.

The objective of a gain and loss analysis is to determine the portion of the change in actuarial condition (unfunded actuarial accrued liabilities) attributable to each risk area.

The fact that actual experience differs from assumed experience is to be expected – ***the future cannot be predicted with precision***. The economic risk areas (particularly investment return and pay increases) are volatile. Inflation directly affects economic risk areas, and inflation seems to defy reliable prediction.

Changes in the valuation assumed experience for a risk area should be made when the differences between assumed and actual experience have been observed to be sizable and persistent. A gain and loss analysis covering a relatively short period may or may not be indicative of ***long-term trends, which are the basis of actuarial assumptions***.

Changes in Unfunded Actuarial Accrued Liabilities During the Period July 1, 2016 to June 30, 2017

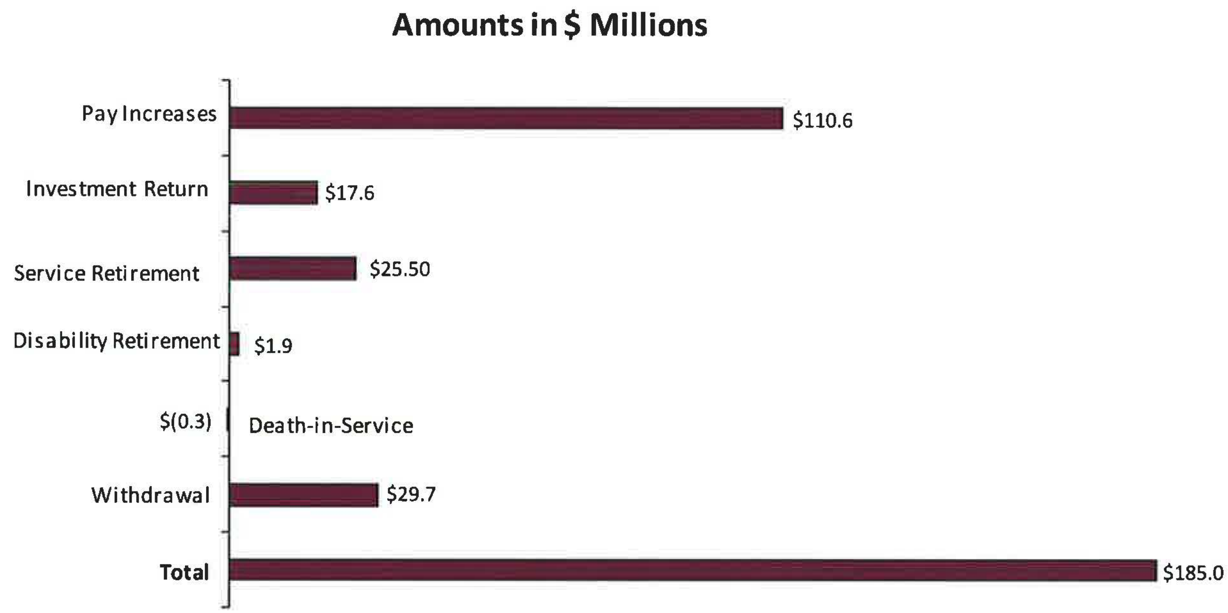
	Total ($ in millions)
(1) UAAL* at beginning of year	$ 1,893.8
(2) Employer normal cost from last valuation	134.6
(3) Actual employer contributions	261.1
(4) Interest accrual: [(1) + ½[(2) - (3)]]x .0750	137.3
(5) Expected UAAL before changes: (1) + (2) - (3) + (4)	1,904.6
(6) Increase from benefit changes	0.0
(7) Changes from revised actuarial assumptions and methods	409.5
(8) New entrant liabilities	67.6
(9) Expected UAAL after changes: (5) + (6) + (7) + (8)	2,381.7
(10) Actual UAAL at end of year	2,353.1
(11) Gain/(Loss): (9) - (10)	$ 28.6

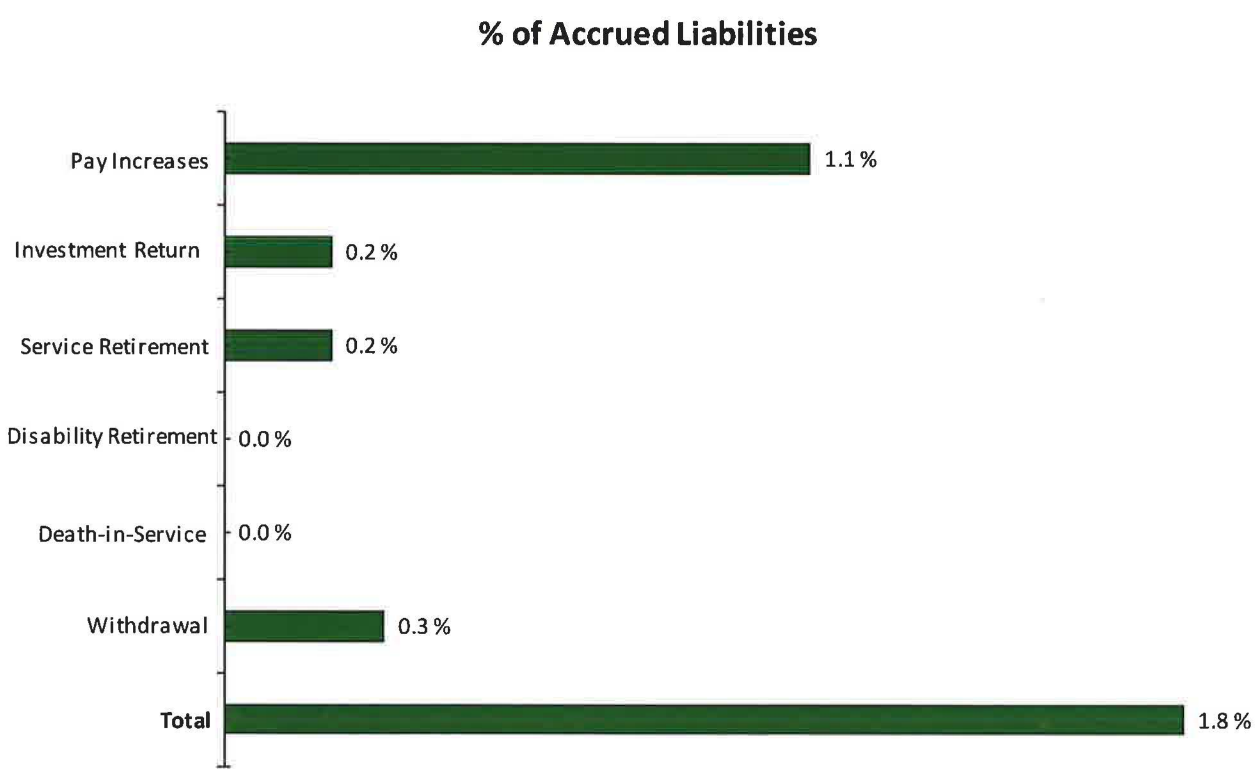
** Unfunded actuarial accrued liability.*

Gains/(Losses) by Risk Area
During the Period July 1, 2016 to June 30, 2017

Type of Risk Area	Total ($ in millions)	% of Accrued Liabilities
ECONOMIC RISK AREAS		
Pay Increases. If there are smaller pay increases than assumed, there is a gain. If greater increases, a loss.	$ 110.6	1.1 %
Investment Return. If there is greater investment return than assumed, there is a gain. If less return, a loss.	17.6	0.2 %
NON-ECONOMIC RISK AREAS		
Non-Casualty Retirements. If members retire at older ages or with lower final average pays than assumed, there is a gain. If younger ages or higher average pays, a loss.	25.5	0.2 %
Disability Retirements. If there are fewer disabilities than assumed, there is a gain. If more, a loss.	1.9	0.0 %
Death-in-Service Benefits. If there are fewer claims than assumed, there is a gain. If more, a loss.	(0.3)	0.0 %
Withdrawal. If more liabilities are released by other separations than assumed, there is a gain. If smaller releases, a loss.	29.7	0.3 %
Total Active Member Actuarial Gains/(Losses)	$ 185.0	1.8 %
Retired Life Mortality.	30.0	0.3 %
Other. Includes data adjustments at retirement, timing of financial transactions, and miscellaneous unidentified sources.	(186.4)	(1.8)%
Total Actuarial Gains/(Losses)	$ 28.6	0.3 %

Actuarial Gains/(Losses)
Active Members
2016-2017 Plan Year





Actuarial Gains/(Losses) by Risk Area
Active Members - Comparative Statement
($ in Millions)

Year Ending June 30	Gain/(Loss) By Risk Area: Pay Increases	Investments	Age & Service Retirement	Disability	Death-In-Service	Withdrawal	Total Experience Gain/(Loss): Dollars	% of AAL	Accrued Liability End of Year
1992	$2.7	$27.9	$ 2.7	$ 1.2	$ 2.1	$(6.1)	$30.5	3.2 %	$ 1,607.6
1993	(2.6)	36.3	1.6	1.3	3.1	4.2	43.9	2.7 %	1,711.3
1994	26.0	21.5	3.8	1.4	2.4	(2.2)	52.9	3.1 %	1,853.8
1995	32.0	68.1	(2.1)	(1.5)	(3.0)	(1.7)	91.8	4.5 %	2,057.4
1996	(0.7)	103.5	5.7	2.9	1.4	5.3	118.1	5.8 %	2,290.6
1997	(2.2)	155.3	7.7	3.6	1.9	4.9	171.2	7.5 %	2,605.6
1998	18.2	197.4	(4.4)	4.2	2.1	20.6	238.1	9.1 %	2,882.5
1999	(0.6)	153.1	(0.3)	3.2	(0.1)	25.8	181.1	5.5 %	3,478.7
2000	(13.1)	134.1	2.2	2.8	(0.1)	20.7	146.6	4.2 %	3,803.4
2001	31.3	(37.0)	3.3	3.0	0.1	18.9	19.6	0.5 %	4,111.0
2002	5.4	(247.1)	3.7	(2.5)	0.5	(4.2)	(244.2)	(5.6)%	4,398.0
2003	36.0	(292.6)	11.2	3.3	(0.1)	15.2	(227.0)	(4.9)%	4,398.0
2004	16.2	(274.0)	18.4	0.5	0.2	8.6	(230.0)	(4.6)%	5,004.5
2005	46.7	(143.4)	20.1	0.5	0.5	28.5	(47.1)	(0.8)%	5,619.4
2006	(15.4)	46.5	17.0	0.8	0.0	11.4	60.3	1.0 %	5,936.3
2007	53.2	215.5	12.4	0.8	0.1	17.2	299.2	4.8 %	6,173.8
2008	(35.8)	(0.5)	(1.4)	0.9	0.1	10.0	(26.7)	(0.4)%	6,542.7
2009	1.9	(808.1)	(7.3)	1.1	0.0	4.9	(807.5)	(11.6)%	6,937.9
2010	(2.8)	(319.7)	(2.1)	2.4	(0.1)	(7.7)	(330.0)	(4.5)%	7,304.2
2011	65.1	(259.8)	10.7	(5.9)	(0.1)	7.7	(182.3)	(2.4)%	7,734.1
2012	35.8	(189.5)	11.1	0.8	(0.2)	(4.2)	(146.1)	(1.8)%	8,162.7
2013	89.2	190.9	27.6	0.8	(0.3)	3.4	311.6	3.7 %	8,284.2
2014	86.7	351.3	13.4	0.9	(0.3)	5.6	457.6	5.3 %	8,863.6
2015	93.6	71.4	17.1	1.3	(0.3)	23.8	206.9	2.3 %	9,294.8
2016	(10.8)	47.7	18.7	1.2	(0.3)	14.6	71.1	0.8 %	9,662.7
2017	**110.6**	**17.6**	**25.5**	**1.9**	**(0.3)**	**29.7**	**185.0**	**1.8 %**	**10,510.2**

Development of Gain/(Loss) from Investment Return* During the Period July 1, 2016 to June 30, 2017

		$ Millions
1.	Total Assets Beginning of Year	$ 7,768.9
2.	Total Assets End of Year (Funding Value)	
	a. Actual	$ 8,157.0
	b. If net investment return had been 7.50%	$ 8,139.4
3.	Gain/(Loss): 2a. minus 2b.	$ 17.6

* *"Investment return" as used in this Gain/(Loss) Analysis means essentially: assumed investment income; plus/minus a four-year phase-in of differences between actual and assumed investment return (see page B-10).*

Active Members Who Became Age & Service Retirees During the Period July 1, 2016 to June 30, 2017 (Retirement with Unreduced Benefit Beginning Immediately) Attained Age of 65 or Older with Less Than 28 Years of Service

	State & Local Retirements	
Ages	Actual#	Expected
65	87	89
66	91	69
67	69	56
68	30	26
69	37	24
70	40	25
71	19	14
72	13	11
73	18	13
74	8	12
75 & Up	34	26
	446	**365**

 # Additionally, there were 48 new age and service retirees with less than 28 years of non-reciprocal service and under the age of 65.

Averages, in Years:

Age at retirement	68.9
Service at retirement	14.9

Active Members Who Became Reduced Early Retirees During the Period July 1, 2016 to June 30, 2017 (Early Retirements with Reduced Benefits Beginning Immediately)

Ages	State & Local Early Retirement	
	Actual #	Expected
55	17	12
56	20	12
57	20	17
58	22	17
59	29	23
60	34	29
61	42	25
62	117	88
63	85	77
64	80	47
Totals	**466**	**347**

 # Additionally, there were 39 new early retirees under the age of 55.

Averages, in Years:

Age at retirement	60.7
Service at retirement	15.6

Active Members Who Retired or Entered the DROP During the Period July 1, 2016 to June 30, 2017 (28 or More Years of Service)

Years of Service	State & Local			
	Retirement		DROP	
	Actual	Expected	Actual	Expected
28	70	54	156	n/a
29	24	28	29	n/a
30	23	18	25	n/a
31	17	16	13	n/a
32	12	12	12	n/a
33	18	11	11	n/a
34	12	8	8	n/a
35	12	14	24	n/a
36	4	10		
37	2	7		
38 & Up	32	53		
Totals	**226**	**232**	**278**	

Averages, in Years:

Age at retirement	61.1	58.2
Service at retirement	32.8	29.7

Active Members Who Became Disability Retirees During the Period July 1, 2016 to June 30, 2017 (and Who were Active Members as of June 30, 2016)

	State & Local Disabilities	
Ages	**Actual**	**Expected**
20- 24		
25- 29		
30- 34		2
35- 39	1	3
40- 44	2	6
45- 49	2	11
50- 54	7	20
55- 59	19	31
60 & Up	23	31
Totals	**54**	**104**

Averages, in Years:

Age at retirement	57.1
Service at retirement	14.4

Active Members Who Left Active Status with a Deferred Benefit Payable During the Period July 1, 2016 to June 30, 2017 (Vested Separations)

	State & Local Vested Separations	
Ages	Actual	Expected
Below 30	168	103
30- 34	264	182
35- 39	329	180
40- 44	258	155
45- 49	296	144
50- 54	304	118
55- 59	194	81
60 & Up	210	48
Totals	**2,023**	**1,011**

Averages, in Years:

Age at termination	47.9
Service at termination	11.2

Active Members Who Left Active Status with No Benefit Payable During the Period July 1, 2016 to June 30, 2017 (Non-Vested Separations)

Service at Termination	State & Local Non-Vested Separations	
	Actual	Expected
0	2,160	2,082
1	1,096	1,104
2	627	667
3	443	423
4	3	107
Totals	**4,329**	**4,383**

Averages, in Years:

Age at termination	45.7
Service at termination	1.5

Members Active Both Beginning and End of Year
Salary Increases by Age Group
During the Period July 1, 2016 to June 30, 2017

Age Groups	Number	Beginning Pay	Ending Pay		Percentage Increase	
			Expected	Actual	Expected	Actual
Below 25	1,448	$ 36,415,095	$ 39,852,901	$ 39,665,889	9.4%	8.9%
25- 29	3,055	93,346,182	100,213,000	98,085,641	7.4%	5.1%
30- 34	3,672	128,033,855	135,729,640	132,754,493	6.0%	3.7%
35- 39	4,213	158,753,777	167,340,428	162,480,177	5.4%	2.3%
40- 44	4,424	172,733,735	181,383,682	175,351,821	5.0%	1.5%
45- 49	5,552	216,389,399	226,373,320	220,464,467	4.6%	1.9%
50- 54	5,163	207,376,907	216,227,796	209,677,041	4.3%	1.1%
55- 59	4,933	200,750,961	208,881,375	202,359,989	4.1%	0.8%
60-64	3,514	144,724,563	150,202,977	145,726,146	3.8%	0.7%
65 & Over	1,784	69,144,399	71,391,592	69,550,129	3.3%	0.6%
Totals	**37,758**				**4.9%**	**2.0%**

Section D

District Judges – Valuation Results and Valuation Data

District Judges
Employer Contribution Rates Computed June 30, 2017

Contribution for	Computed Employer Contributions: New Plan and Paid-Off Old Plan (% of Active Payroll)	Computed Employer Contributions: Still Paying Old Plan (Annual $)
Normal Cost:		
Age and service annuities (including reduced retirement)	19.30%	
Separation benefits	1.59%	
Disability benefits	1.53%	
Death-in-service annuities	0.00%	
Total	22.42%	
Member contributions	5.00%	
Employer Normal Cost	17.42%	
Unfunded Actuarial Accrued Liabilities	21.57% *	$813,409 **
Total Employer Contribution	38.99%	$813,409

* *Unfunded actuarial accrued liabilities were amortized over a 9.6-year period.*
** *Unfunded actuarial accrued liabilities were amortized over a 18-year period.*

District Judges

Summary Statement of System Resources and Obligations
Year Ended June 30, 2017

Present Resources and Expected Future Resources

		Totals
A.	Present Valuation Assets:	
	1. Net assets from system financial statements	$ 22,042,664
	2. Market value adjustment	981,539
	3. Valuation assets	23,024,203
B.	Actuarial present value of expected future employer contributions:	
	1. For normal costs	1,560,058
	2. For unfunded actuarial accrued liability	11,655,517
	3. Total	13,215,575
C.	Actuarial present value of expected future member contributions	448,534
D.	Total Present and Expected Future Resources	$ 36,688,312

Actuarial Present Value of Expected Future Benefit Payments and Reserves

A.	To retirees and beneficiaries	$ 20,123,412
B.	To vested terminated members	6,380,004
C.	To present active members:	
	1. Allocated to service rendered prior to valuation date - actuarial accrued liability	8,176,304
	2. Allocated to service likely to be rendered after valuation date	2,008,592
	3. Total	10,184,896
D.	Reserve	0
E.	Total Actuarial Present Value of Expected Future Benefit Payments	$ 36,688,312

District Judges
Computed Actuarial Liabilities and Allocation Using Entry Age Actuarial Cost Method as of June 30, 2017

Actuarial Present Value of	(1) Total Present Value	(2) Portion Covered By Future Normal Cost Contributions	Actuarial Accrued Liabilities (1) - (2)
Benefits to be paid to current retirees, beneficiaries, and future beneficiaries of current retirees	$20,123,412	$ 0	$20,123,412
Age and service allowances based on total service likely to be rendered by present active members	9,805,663	1,717,424	8,088,239
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active and inactive members	6,591,377	150,661	6,440,716
Disability benefits likely to be paid to present active members	167,860	140,507	27,353
Death-in-service benefits likely to be paid on behalf of present active members	0	0	0
Total	$36,688,312	$2,008,592	$34,679,720
Applicable assets (funding value)	23,024,203	0	23,024,203
Liabilities to be covered by future contributions	$13,664,109	$2,008,592	$11,655,517

District Judges
Summary of Provisions Evaluated

Voluntary Retirement	*With a full benefit*, after either (a) age 50 with 20 years of eligibility service, (b) age 60 with 16 years of eligibility service, or (c) age 65 with 8 years of eligibility service.
Final Average Compensation (FAC)	Average of the final three calendar years of employment.
Benefit Service	Service performed on or after January 1, 2005.
Eligibility Service	Benefit service plus service in Old Local District Judges Plan.
Full Age & Service Retirement Benefit	2.50% of FAC times actual service.
Benefit Increases After Retirement	Annually, there will be a cost-of-living adjustment equal to 3% of the current benefit.
Member Contribution Rates	Active members contribute 5% of their salaries. If a member leaves service before becoming eligible to retire, accumulated contributions may be refunded.
Vested Retirement Benefits	8 years of eligibility service. Deferred full retirement benefit, based on benefit service and pay at termination, begins when member would have been eligible for voluntary retirement.
Total and Permanent Disability	An active member with 3 or more consecutive years of eligibility service who becomes totally and permanently disabled may be retired and receive a disability annuity computed in the same manner as an age and service annuity.
Death After Retirement	If the member was eligible for normal retirement at the time of death, an eligible beneficiary will begin receiving a 50% joint and survivor pension computed in the same manner as a service retirement pension as if the member had retired the last day of his life.

District Judges
Revenues and Expenditures
July 1, 2016 Through June 30, 2017
Market Value

	Plan		
	New Plan and Paid-Off Old Plan	Still Paying Old Plan	Totals
Balance 7/1/2016	$16,112,450	$3,873,992	$19,986,442
Adjustment	0	0	0
Revenues			
Member contributions	151,199	0	151,199
Employer contributions	771,478	1,285,801	2,057,279
Other	0	0	0
Investment return	1,426,891	353,690	1,780,581
Total	$ 2,349,568	$1,639,491	$ 3,989,059
Expenditures			
Benefits paid	794,829	1,014,357	1,809,186
Refunds	0	0	0
Investment Expenses	78,455	19,447	97,902
Administrative Expenses	20,634	5,115	25,749
Total	$ 893,918	$ 1,038,919	$ 1,932,837
Preliminary Balance	$17,568,100	$4,474,564	$22,042,664
Employer Paid Off Old Liability	797,190	(797,190)	0
Balance 6/30/2017	**$18,365,290**	**$3,677,374**	**$22,042,664**

Note: Results may not total due to rounding.

Development of Funding Value of Assets
New Plan and Paid-Off Old Plan
June 30, 2017

Valuation Date June 30:	2015	2016	2017	2018	2019	2020
A. Funding Value Beginning of Year	$ 14,293,743	$ 15,915,500	$ 17,514,502			
B. Market Value End of Year	15,536,710	16,112,450	18,365,290			
C. Market Value Beginning of Year	15,107,940	15,536,710	16,112,450			
D. Non-Investment Net Cash Flow	642,008	650,292	904,404			
E. Investment Income						
E1. Market Total: B - C - D	(213,238)	(74,552)	1,348,436			
E2. Assumed Rate	7.75%	7.50%	7.50%	7.15%		
E3. Amount for Immediate Recognition	1,132,333	1,217,755	1,347,094			
E4. Amount for Phased-In Recognition	(1,345,571)	(1,292,307)	1,342			
F. Phased-In Recognition of Investment Income						
F1. Current Year: 0.25 x E4	(336,393)	(323,077)	336			
F2. First Prior Year	239,963	(336,393)	(323,077)	$ 336		
F3. Second Prior Year	150,463	239,963	(336,393)	(323,077)	$ 336	
F4. Third Prior Year	(206,617)	150,462	239,963	(336,392)	(323,076)	$ 334
F5. Total Phase-Ins	(152,584)	(269,045)	(419,171)	(659,133)	(322,740)	334
G. Preliminary Funding Value End of Year: A + D + E3 + F5	15,915,500	17,514,502	19,346,829			
H. Adjustment to Minimum of 75% of B, Maximum 125% of B	0	0	0			
I. Funding Value End of Year	**15,915,500**	**17,514,502**	**19,346,829**			
J. Difference Between Market & Funding Value	(378,790)	(1,402,052)	(981,539)			
K. Recognized Rate of Return	**6.7%**	**5.8%**	**5.2%**			
L. Market Rate of Return	(1.4)%	(0.5)%	8.1%			
M. Ratio of Funding Value to Market Value	102%	109%	105%			

The Funding Value of Assets recognizes assumed investment return (line E3) fully each year. Differences between actual and assumed investment return (Line E4) are phased-in over a closed 4-year period. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than Market Value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than Market Value. If assumed rates are exactly realized for 3 consecutive years, Funding Value will become equal to Market Value.

District Judges
Summary of Annuitants on Rolls

Retirees and beneficiaries on rolls included in the valuation totaled 174, involving monthly annuities of $178,445, distributed as follows:

Plan	Number of Retired Records	Annuities Being Paid July 1, 2017	
		Monthly	Annualized
New Plan	34	$ 39,823	$ 477,876
Old Plan Paid Off	49	51,210	614,520
Still Paying Old Plan	91	87,412	1,048,944
Totals	**174**	**$ 178,445**	**$ 2,141,340**

A retiree's monthly benefit may be allocated to more than one employer or more than one plan. The actual number of retired members as of June 30, 2017 was reported to be 122, consisting of 108 original retirees and 14 survivors.

Actual Number of Retired Members: 122

Average Age: 73.4 years

Average Age at Retirement: 64.1 years

Average Years of Service: 11.1 years

Average Monthly Benefit: $1,462.66

Inactive members, entitled to deferred annuities, included in the valuation totaled 101, involving estimated deferred monthly annuities of $51,131 distributed as follows:

Plan	Number of Inactive Records	Estimated Deferred Annuities	
		Monthly	Annualized
New Plan	7	$ 5,988	$ 71,856
Old Plan Paid Off	37	21,844	262,128
Still Paying Old Plan	57	23,299	279,588
Totals	**101**	**$ 51,131**	**$ 613,572**

An inactive member's monthly benefit may be allocated to more than one employer or more than one plan. The actual number of deferred members as of June 30, 2017 was reported to be 85.

District Judges
Detail by Employer

ER ID	Participants Covered Deferred Vested	Retired	Retiree Mon. Ben. 7/1/2017	Deferred Mon. Ben. 7/1/2017	Retiree Liability 6/30/2017	Deferred Liability 6/30/2017	Total Liability 6/30/2017	Assets Allocated 6/30/2017	Unfunded Actuarial Liability (UAL)	18-year Payoff of Unfunded Liability
90141	2	2	$ 466.28	$ 550.08	$ 34,474	$ 70,647	$ 105,121	$ 47,042	$ 58,079	$ 5,637
90941	2	2	771.63	910.30	58,388	116,910	175,298	78,876	96,422	9,359
90132	1	2	1,218.61	155.62	154,235	10,802	165,037	48,614	116,423	11,300
90511	0	1	1,016.67	0.00	98,098	0	98,098	(15,133)	113,231	10,990
90962	0	2	2,398.38	0.00	229,660	0	229,660	77,275	152,385	14,791
90108	1	1	152.78	475.94	16,914	64,015	80,929	50,819	30,110	2,923
90908	2	2	1,251.98	700.94	164,674	93,855	258,529	109,544	148,985	14,461
90159	0	1	150.00	0.00	19,406	0	19,406	276	19,130	1,857
90133	0	1	517.50	0.00	45,195	0	45,195	(17,222)	62,417	6,058
90148	1	0	0.00	444.72	0	68,322	68,322	50,957	17,365	1,685
90123	1	2	3,413.05	966.66	350,989	121,874	472,863	175,679	297,184	28,845
90166	0	3	4,406.12	0.00	421,752	0	421,752	(56,405)	478,157	46,411
90109	2	1	312.50	205.08	36,902	26,337	63,239	10,070	53,169	5,161
90909	2	1	312.50	205.08	36,902	26,337	63,239	10,070	53,169	5,161
90359	0	1	225.00	0.00	29,419	0	29,419	595	28,824	2,798
90101	1	1	733.48	519.44	68,328	65,401	133,729	55,876	77,853	7,557
90121	0	4	2,773.34	0.00	316,504	0	316,504	90,550	225,954	21,931
90252	2	1	531.53	136.07	63,985	14,071	78,056	21,456	56,600	5,494
90172	1	1	833.33	241.35	98,059	31,262	129,321	101,377	27,944	2,712
90265	0	1	771.00	0.00	91,282	0	91,282	(6,921)	98,203	9,532
90202	1	1	450.00	457.19	32,320	58,849	91,169	48,920	42,249	4,101
90154	2	1	384.38	27.72	18,401	1,857	20,258	(26,647)	46,905	4,553
90954	2	1	384.38	27.72	18,401	1,857	20,258	(26,647)	46,905	4,553
90110	0	2	762.50	0.00	79,915	0	79,915	(23,375)	103,290	10,025
90929	0	2	762.50	0.00	79,915	0	79,915	(13,084)	92,999	9,027
90126	4	3	4,772.59	3,592.02	502,288	432,800	935,088	212,639	722,449	70,122
90938	0	2	1,016.99	0.00	113,347	0	113,347	38,097	75,250	7,304
90260	11	13	23,705.51	4,636.19	2,569,735	618,273	3,188,008	1,060,817	2,127,191	206,468
90114	0	1	641.98	0.00	56,795	0	56,795	35,776	21,019	2,040
90256	0	1	948.14	0.00	75,912	0	75,912	(8,396)	84,308	8,183

District Judges
Detail by Employer

	Participants Covered		Retiree	Deferred	Retiree	Deferred	Total	Assets	Unfunded	18-year
	Deferred		Mon. Ben.	Mon. Ben.	Liability	Liability	Liability	Allocated	Actuarial	Payoff of
ER ID	Vested	Retired	7/1/2017	7/1/2017	6/30/2017	6/30/2017	6/30/2017	6/30/2017	Liability (UAL)	Unfunded Liability
90964	0	1	$ 701.31	$ 0.00	$ 69,716	$ 0	$ 69,716	$ 19,642	$ 50,074	$ 4,860
90103	0	3	3,574.25	0.00	384,555	0	384,555	90,251	294,304	28,566
90134	1	2	1,035.91	234.22	97,920	31,905	129,825	36,653	93,172	9,043
90460	9	11	15,336.69	4,867.87	1,465,850	643,596	2,109,446	677,589	1,431,857	138,978
90124	0	2	1,125.19	0.00	131,365	0	131,365	63,627	67,738	6,575
90924	0	2	1,125.19	0.00	131,365	0	131,365	62,204	69,161	6,713
90161	1	1	466.18	210.07	64,693	26,164	90,857	24,684	66,173	6,423
90961	1	1	466.18	210.07	64,693	26,164	90,857	23,914	66,943	6,498
90372	0	2	1,861.93	0.00	203,309	0	203,309	2,420	200,889	19,499
90113	1	0	0.00	780.00	0	87,784	87,784	85,437	2,347	228
90273	1	2	1,383.33	1,179.36	118,932	147,427	266,359	110,017	156,342	15,175
90201	1	2	704.61	530.85	55,254	71,913	127,167	69,106	58,061	5,635
90901	1	2	861.18	648.82	67,532	87,894	155,426	84,694	70,732	6,865
90356	1	0	0.00	224.77	0	30,437	30,437	2,160	28,277	2,745
90456	1	1	850.64	40.12	109,667	4,287	113,954	62,206	51,748	5,023
90254	1	1	928.00	120.27	108,595	13,963	122,558	104,970	17,588	1,707
90519	0	1	906.73	0.00	107,045	0	107,045	26,305	80,740	7,837
.>0 as of 6/30/2017	**57**	**91**	**$87,411.97**	**$23,298.54**	**$9,062,686**	**$2,995,003**	**$12,057,689**	**$3,677,374**	**$8,380,315**	**$813,409**

District Judges
Active Members in Valuation June 30, 2017
by Attained Age and Years of Eligibility Service

Attained	Years of Service to Valuation Date							Totals	
Age	0-4	5-9	10-14	15-19	20-24	25-29	30 plus	No.	Valuation Payroll
Under 20									
20-24									
25-29									
30-34									
35-39									
40-44									
45-49			1					1	$ 69,999
50-54			1	1				2	209,998
55-59			4	1	1			6	467,612
60			2	1	1			4	340,386
61			1				1	2	175,176
62			1					1	69,999
63						1		1	27,168
64									
65				1				1	50,535
66				1	1			2	156,379
67									
68							2	2	196,610
69			2					2	209,998
70 & over			1			1	1	3	304,610
Totals			**13**	**5**	**3**	**2**	**4**	**27**	**$2,278,470**

Group Averages

Age:	61.9 years
Benefit Service:	12.5 years
Eligibility Service:	19.0 years
Annual Pay:	$84,388

District Judges
Change in Unfunded Actuarial Accrued Liabilities
During the Period July 1, 2016 to June 30, 2017

	New Plan and Paid Off Old Plan	Still Paying Old Plan	Total
(1) UAAL* at beginning of year	$ 2,108,791	$ 8,893,495	$ 11,002,286
(2) Normal cost from last valuation	479,618	-	479,618
(3) Actual contributions	922,677	1,285,801	2,208,478
(4) Interest accrual: [(1) + ½[(2) - (3)]]x .0750	141,545	618,795	760,340
(5) Expected UAAL before changes: (1) + (2) - (3) + (4)	1,807,277	8,226,489	10,033,766
(6) Increase from benefit changes	-	-	-
(7) Changes from revised actuarial assumptions and methods	712,708	306,938	1,019,646
(8) Expected UAAL after changes: (5) + (6) + (7)	2,519,985	8,533,427	11,053,412
(9) Actual UAAL at end of year	3,275,202	8,380,315	11,655,517
(10) Gain/(Loss): (8) - (9)	$ (755,217)	$ 153,112	$ (602,105)

** Unfunded actuarial accrued liability.*

District Judges
Schedule of Funding Progress

Actuarial Valuation Date	Actuarial Value of Assets (a)	Entry Age AAL (b)	UAAL (b)-(a)	Funded Ratio (a)/(b)	Annual Covered Payroll (c)	UAAL as a Percentage of Covered Payroll [(b-a)/(c)]
12/31/04	$ 0	$ 0	$ 0	100.0 %	$1,841,022	0.0%
6/30/05	7,569,919	24,134,114	16,564,195	31.4 %	3,222,495	514.0%
6/30/06	10,141,040	24,943,381	14,802,341	40.7 %	3,313,454	446.7%
6/30/07	12,582,548	24,387,433	11,804,885	51.6 %	3,366,861	350.6%
6/30/08 @	12,398,225	24,797,303	12,399,078	50.0 %	3,526,319	351.6%
6/30/09	10,004,394	25,671,893	15,667,499	39.0 %	3,368,169	465.2%
6/30/10	11,112,521	26,775,249	15,662,728	41.5 %	3,554,044	440.7%
6/30/11	12,950,730	27,524,848	14,574,118	47.1 %	3,345,497	435.6%
6/30/12	13,925,350	28,343,368	14,418,018	49.1 %	3,374,982	427.2%
6/30/13 @	16,090,536	28,823,709	12,733,173	55.8 %	2,989,465	425.9%
6/30/14 @	18,562,875	30,005,138	11,442,263	61.9 %	3,108,024	368.2%
6/30/15 @	19,950,819	31,433,278	11,482,459	63.5 %	3,173,245	361.9%
6/30/16	21,388,494	32,390,780	11,002,286	66.0 %	3,328,256	330.6%
6/30/17	**23,024,203**	**33,660,074**	**10,635,871**	**68.4 %**	**2,278,470**	**466.8%**
6/30/17 @	**23,024,203**	**34,679,720**	**11,655,517**	**66.4 %**	**2,278,470**	**511.6%**

@ After changes in actuarial assumptions and methods.

SECTION E

ACTUARIAL METHODS AND ASSUMPTIONS AND OTHER TECHNICAL ASSUMPTIONS

Summary of Assumptions Used For SPERS Actuarial Valuations Assumptions Adopted by Board of Trustees after Consulting with Actuary

In accordance with the State Code, the Board of Trustees adopts the actuarial assumptions used for actuarial valuation purposes.

The actuarial assumptions used in the valuation are shown in this section. Assumptions were established based upon an Experience Study covering the period July 1, 2007 through June 30, 2012 (please see our report dated February 13, 2013) and updated in conjunction with an Economic Assumption Review dated May 17, 2017. The actuarial assumptions represent estimates of future experience.

Economic Assumptions

The investment return rate used in making the valuation was 7.15% per year, compounded annually (net after investment expenses). This rate of return is not the assumed real rate of return. The real rate of return is the portion of investment return which is more than the wage inflation rate. Considering the assumed wage inflation rate of 3.25%, the 7.15% investment return rate translates to an assumed net real rate of return of 3.90%. The wage inflation assumption was first used for the June 30, 2015 valuation, including also the District Judges division. The investment return assumption was first used for the June 30, 2017 valuation, including also the District Judges division.

Pay increase assumptions for individual active members are shown on pages E-8 and E-10. Part of the assumption for each age is for a merit and/or seniority increase, and the other 3.25% recognizes wage inflation. The wage inflation assumption consists of 2.50% for price inflation and 0.75% for real wage growth. These assumptions were first used for the June 30, 2015 valuation and for the District Judges division for the June 30, 2015 valuation.

Total active member payroll is assumed to increase 3.25% a year, which is the portion of the individual pay increase assumptions attributable to wage inflation. This assumption was first used for the June 30, 2015 valuation and for the District Judges division for the June 30, 2015 valuation.

The number of active members is assumed to continue at the present number.

Non-Economic Assumptions

The mortality table used to measure retired life mortality was the RP-2000 Combined Healthy mortality table, projected to 2020 using Projection Scale BB, set-forward 2 years for males and 1 year for females. Related values are shown on page E-3. Based upon the experience observed during the most recent experience study, it appears that at the time of the study the current table provides for an approximate 15% margin for future mortality improvement. This assumption was first used for the June 30, 2013 valuation.

Non-Economic Assumptions (Concluded)

The probabilities of retirement for members eligible to retire are shown on pages E-4 through E-7. These probabilities were first used for the June 30, 2013 valuation and for the June 30, 2007 valuation for the District Judges division.

The probabilities of withdrawal from service, death-in-service and ***disability*** are shown for sample ages on pages E-8 through E-10. These probabilities were first used for the June 30, 2013 valuation and for the District Judges division for the June 30, 2013 valuation.

The individual entry-age normal actuarial cost method of the valuation was used in determining liabilities and normal cost.

Differences in the past between assumed experience and actual experience (actuarial gains and losses) become part of actuarial accrued liabilities.

Unfunded actuarial accrued liabilities are amortized to produce contribution amounts (principal and interest) which are level percent-of-payroll contributions. For the District Judges division, unfunded actuarial accrued liabilities are amortized as a level dollar contribution.

Recognizing the special circumstances of the General Assembly division, modifications of the above assumptions were made where appropriate.

Present assets (cash & investments) were valued on a market related basis in which differences between actual and assumed returns are phased-in over a four-year period (including District Judges New Plan and Paid Off Old Plan). The funding value of assets may not deviate from the market value of assets by more than 25%. District Judges Still Paying Old Plan present assets (cash & investments) were valued on a market value basis.

The data about persons now covered and about present assets were furnished by the System's administrative staff. Although examined for general reasonableness, the data was not audited by the Actuary.

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

Single Life Retirement Values
Based on RP-2000 Combined, Projected to 2020
7.15% Interest
June 30, 2017

Sample Attained Ages	Present Value of $1.00 Monthly for Life		Present Value of $1.00 Monthly for Life Increasing 3% Annually		Future Life Expectancy (Years)	
	Men	Women	Men	Women	Men	Women
40	$ 158.58	$ 161.65	$ 232.12	$ 240.73	40.56	44.21
45	153.51	157.47	219.05	229.05	35.81	39.39
50	146.83	151.96	203.71	215.32	31.13	34.64
55	138.32	144.76	186.13	199.31	26.58	29.98
60	127.88	135.57	166.56	180.97	22.23	25.44
65	115.48	124.43	145.34	160.75	18.14	21.14
70	100.98	111.52	122.67	139.27	14.35	17.16
75	84.94	97.06	99.59	117.12	10.95	13.56
80	68.15	81.29	77.21	94.80	8.02	10.35
85	51.64	64.96	56.70	73.37	5.60	7.59

Sample Attained Ages	Benefit Increasing 3.0% Yearly	Portion of Age 60 Lives Still Alive	
		Men	Women
60	$100	100 %	100 %
65	116	96	97
70	134	90	92
75	155	80	84
80	180	66	72

The mortality table was set forward 10 years for disabilities.

Based on RP-2000 Combined Healthy mortality table, projected to 2020 using Projection Scale BB, set-forward 2 years for males and 1 year for females.

State and Local Government Division
Age-Based Retirement
June 30, 2017

Retirement Ages (with less than 28 years of service)	Percent of Eligible Active Members Retiring Within Next Year	
	Unreduced	Reduced
55		2 %
56		2
57		3
58		3
59		4
60		5
61		5
62		18
63		17
64		13
65	23 %	
66	23	
67	23	
68	15	
69	15	
70	17	
71	17	
72	17	
73	17	
74-75	20	
76-78	15	
79-84	20	
85 & Over	100	

A member was assumed eligible for unreduced retirement after attaining age 65 with 5 years of service or 28 years regardless of age. A member was assumed eligible for reduced retirement after attaining age 55 with 10 or more years of service.

State and Local Government Division
Service Based Retirement
June 30, 2017

Service	Percent of Eligible Active Members Retiring Within Next Year
28	15 %
29	13
30	11
31	11
32	12
33	12
34	12
35	20
36	25
37	25
38	30
39	30
40 & Over	100

General Assembly Division
Probabilities of Retirement
for Members Eligible to Retire
June 30, 2017

Retirement Ages	Percent of Eligible Active Members Retiring Within Next Year
50	30 %
51	30
52	30
53	30
54	30
55	30
56	30
57	30
58	30
59	30
60	30
61	30
62	50
63	30
64	30
65	50
66	30
67-79	20
80 & Over	100

Member may retire at age 50 with 20 or more years of service, age 60 with 16 or more years of service, or age 65 with 8 or more years of service.

District Judges Division
Age-Based Retirement
June 30, 2017

Retirement Ages	Percent of Eligible Active Members Retiring Within Next Year
50	10 %
51	10
52	10
53	10
54	10
55	12
56	12
57	14
58	14
59	14
60	18
61	18
62-73	30
74 & Over	100

Members may retire at age 50 with 20 or more years of service, age 60 with 16 or more years of service, or age 65 with 8 or more years of service.

State and Local Government Division
Separations from Active Employment before Service Retirement
June 30, 2017

		Percent of Active Members Separating within the Next Year						Pay Increase Assumptions for an Individual Employee		
Sample	Years of	Withdrawal		Death		Disability		Merit &	Base	Increase
Ages	Service	Men	Women	Men	Women	Men	Women	Seniority	(Economy)	Next Year
	0	40.0 %	40.0 %							
	1	25.0	25.0							
	2	20.0	20.0							
	3	15.0	15.0							
	4	12.0	12.0							
20	5+	10.0	10.0	0.02 %	0.01 %	0.01 %	0.01 %	6.60 %	3.25 %	9.85 %
25		10.0	10.0	0.02	0.01	0.05	0.05	5.10	3.25	8.35
30		8.8	8.8	0.03	0.01	0.08	0.08	3.20	3.25	6.45
35		6.2	6.2	0.04	0.02	0.10	0.10	2.30	3.25	5.55
40		4.4	4.4	0.06	0.03	0.15	0.15	1.90	3.25	5.15
45		3.4	3.4	0.08	0.05	0.20	0.20	1.50	3.25	4.75
50		2.7	2.7	0.13	0.08	0.40	0.40	1.10	3.25	4.35
55		1.9	1.9	0.22	0.12	0.70	0.70	0.80	3.25	4.05
60		1.2	1.2	0.37	0.21	1.00	1.00	0.70	3.25	3.95

Pay increase rates are age based only, and not service based.

General Assembly Division
Separations from Active Employment before Service Retirement
June 30, 2017

Sample Ages	Years of Service	Percent of Active Members Separating within the Next Year: Withdrawal Men	Withdrawal Women	Death Men	Death Women	Disability Men	Disability Women
	0	30.0 %	30.0 %				
	1	25.0	25.0				
	2	20.0	20.0				
	3	15.0	15.0				
	4	12.0	12.0				
20	5+	9.0	9.0	0.02 %	0.01 %	0.06 %	0.06 %
25		8.3	8.3	0.02	0.01	0.06	0.06
30		5.3	5.3	0.03	0.01	0.06	0.06
35		3.0	3.0	0.04	0.02	0.06	0.06
40		2.6	2.6	0.06	0.04	0.16	0.16
45		2.4	2.4	0.08	0.06	0.22	0.22
50		1.1	1.1	0.13	0.09	0.39	0.39
55		0.8	0.8	0.22	0.14	0.71	0.71
60		0.8	0.8	0.37	0.23	1.13	1.13

District Judges
Separations from Active Employment before Service Retirement
June 30, 2017

Sample Ages	Percent of Active Members Separating within the Next Year: Withdrawal Men	Withdrawal Women	Disability Men	Disability Women	Pay Increase Assumptions For An Individual Employee: Merit & Seniority	Base (Economy)	Increase Next Year
20	2.0 %	2.0 %	0.08 %	0.08 %	2.70 %	3.25 %	5.95 %
25	2.0	2.0	0.08	0.08	2.60	3.25	5.85
30	2.0	2.0	0.08	0.08	2.20	3.25	5.45
35	2.0	2.0	0.08	0.08	1.90	3.25	5.15
40	2.0	2.0	0.20	0.20	1.40	3.25	4.65
45	2.0	2.0	0.27	0.27	1.20	3.25	4.45
50	2.0	2.0	0.49	0.49	0.70	3.25	3.95
55	2.0	2.0	0.89	0.89	0.70	3.25	3.95
60	2.0	2.0	1.41	1.41	0.00	3.25	3.25

Summary of Assumptions Used
June 30, 2017
Miscellaneous and Technical Assumptions

Marriage Assumption. 80% of males and 80% of females are assumed to be married for purposes of death-in-service benefits. District Judges division - 100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. 80% of males and 80% of females are assumed to be married for purposes of death-after-retirement benefits for active member valuation purposes.

Pay Increase Timing. Beginning of (Fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.

Decrement Timing. Decrements of all types are assumed to occur mid-year.

Other Liability Adjustments. Active member non-refund normal costs and actuarial accrued liabilities were increased by 1.5% to reflect non-reported reciprocal service. Also, a 0.2% load to the normal cost and actuarial accrued liabilities is being used to account for survivor benefits payable if a retiree dies within the first year of retirement. Actuarial accrued liabilities were also increased by $130 million to partially mitigate the expected effect of mortality table changes in the upcoming 5-year Experience Study.

Eligibility Testing. Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.

Benefit Service. Exact fractional service is used to determine the amount of benefit payable.

Decrement Relativity. Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.

Normal Form of Benefit. The assumed normal form of benefit is the straight life form.

District Judges Division Old Plan Deferred Members. For members that are eligible for a deferred benefit in the Old Plan and are currently active in the New Plan, it is assumed that the deferred benefit will commence at the first age at which the member is eligible to receive the benefit.

Incidence of Contributions. Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made. New entrant normal cost contributions are applied to the funding of new entrant benefits.

DROP Duration. We assume on average the total DROP duration is 4 years for those members currently participating in the DROP.

Summary of Assumptions Used
June 30, 2017
Miscellaneous and Technical Assumptions

DROP Interest Credit. The current interest rate credit for DROP accounts is assumed to be 3.0%.

Payroll for DROP Participants and Retired Members Returned to Work. Employers now contribute on the pays of DROP participants and retired members returned to work. For the June 30, 2017 valuation the reported payroll for these members was approximately $117,000,000.

Pre-Retirement Mortality. The weighting of duty and ordinary deaths-in-service is 0%/100%.

Administrative Expenses. The normal cost was increased by 0.40% of payroll to fund administrative expenses.

SECTION F

FINANCIAL PRINCIPLES

Financial Principles and Operational Techniques of SPERS

Promises Made, and To Be Paid For. As each year is completed, SPERS in effect hands an "IOU" to each member then acquiring a year of service credit --- the "IOU" says: "The Sample Public Employees Retirement System owes you one year's worth of retirement benefits, payments in cash commencing when you qualify for retirement."

The related ***key financial questions*** are:

Which generation of taxpayers contributes the money to cover the IOU?

The present taxpayers, who receive the benefit of the member's present year of service? ***Or the future taxpayers,*** who happen to be in the State at the time the IOU becomes a cash demand, years and often decades later?

The law governing SPERS financing intends that this year's taxpayers contribute the money to cover the IOUs being handed out this year. With this financial objective, ***the employer contribution rate is expected to remain approximately level from generation to generation of taxpayers.***

There are systems which have a design for deferring contributions to future taxpayers. Lured by a lower contribution rate now, they put aside the consequence that the contribution rate must then relentlessly grow to a level much higher than would be required if a level contribution pattern were followed.

An inevitable by-product of the level-cost design is the accumulation of reserve assets, for decades, and the income produced when the assets are invested. ***Investment income*** becomes ***the third and largest contributor*** for benefits to employees, and is interlocked with the contribution amounts required from employees and employers.

Translated to actuarial terminology, this level-cost objective means that the contribution rates must total at least the following:

Normal Cost (the cost of members' service being rendered this year)

... plus ...

Interest on Unfunded Actuarial Accrued Liabilities (unfunded actuarial accrued liabilities are the difference between: the actuarial accrued liabilities for service already rendered and the actuarial value of assets).

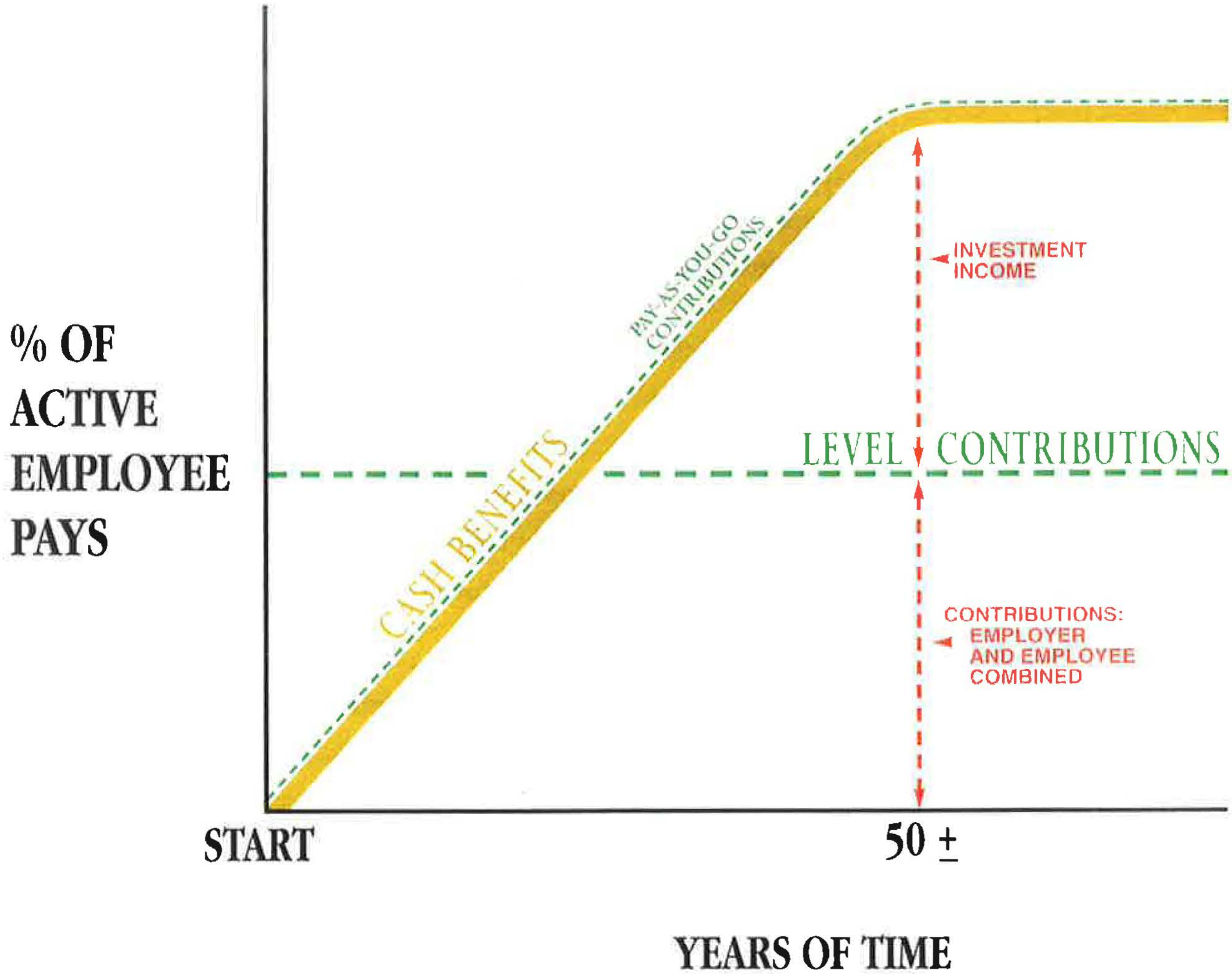
Computing Contributions to Support Fund Benefits. From a given schedule of benefits and from employee and asset data, the actuary calculates the contribution rates to support the benefits by means of ***an actuarial valuation and a funding method.***

An actuarial valuation has a number of ingredients such as: the rate of investment return which plan assets will earn; the rates of withdrawal of active members who leave covered employment; the rates of mortality; the rates of disability; the rates of pay increases; and the assumed age or ages at actual retirement.

In an actuarial valuation, assumptions must be made as to what the above rates will be for the next year and for decades in the future. The assumptions are established by the Retirement Board after receiving the advice of the actuary.

Reconciling Differences Between Assumed Experience and Actual Experience. Once actual experience has occurred and has been observed, it will not coincide exactly with assumed experience, regardless of the skill of the actuary and the many calculations made. The future cannot be predicted with 100% precision.

SPERS copes with these continually changing differences by having annual actuarial valuations. Each actuarial valuation is a complete recalculation of assumed future experience, taking into account all past differences between assumed and actual experience. The result is ***continuing adjustments in financial position.***



CASH BENEFITS LINE. This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).

LEVEL CONTRIBUTION LINE. Determining the level contribution line requires detailed assumptions concerning a variety of experiences in future decades, including:

- Economic Risk Areas
  - Rates of investment return
  - Rates of pay increase
  - Changes in active member group size
- Non-Economic Risk Areas
  - Ages at actual retirement
  - Rates of mortality
  - Rates of withdrawal of active members (turnover)
  - Rates of disability

The Actuarial Valuation Process

The financing diagram on the preceding page shows the relationship between ***the two fundamentally different philosophies of paying*** for retirement benefits: the method where contributions match cash benefit payments (or barely exceed cash benefit payments, as in the Federal Social Security program) which is thus an ***increasing contribution method;*** and, the ***level contribution method*** which attempts to equalize contributions between the generations.

The actuarial valuation is the mathematical process by which the level contribution rate is determined. The activity constituting the valuation may be summarized as follows:

A.		***Census Data,*** including:
		Retired lives now receiving benefits Former employees with vested benefits not yet payable Active employees
B.	+	***Asset data*** (cash & investments)
C.	+	***Benefit provisions*** that establish eligibility and amounts of payments to members
D.	+	***Assumptions concerning future experience*** in various risk areas
E.	+	***The funding method*** for employer contributions (the long-term, planned pattern for employer contributions)
F.	+	***Mathematically combining the assumptions, the funding method, and the data***
G.	=	Determination of:
		Plan Financial position; and/or New Employer Contribution Rate

Glossary

Actuarial Accrued Liability. The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as "accrued liability" or "past service liability."

Accrued Service. The service credited under the plan which was rendered before the date of the actuarial valuation.

Accumulated Benefit Obligation. The actuarial present value of vested and non-vested benefits based on service to date and past and current salary levels.

Actuarial Assumptions. Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

Actuarial Cost Method. A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future plan benefits" between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the "actuarial funding method."

Actuarial Equivalent. A single amount or series of amounts of equal value to another single amount or series of amounts, computed on the basis of the rate(s) of interest and mortality tables used by the plan.

Actuarial Present Value. The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Amortization. Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.

Glossary

Experience Gain (Loss). A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.

Normal Cost. The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as "current service cost." Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.

Plan Termination Liability. The actuarial present value of future plan benefits based on the assumption that there will be no further accruals for future service and salary. The termination liability will generally be less than the liabilities computed on a "going concern" basis and is not normally determined in a routine actuarial valuation.

Reserve Account. An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.

Unfunded Actuarial Accrued Liability. The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as "unfunded accrued liability."

Valuation Assets. The value of current plan assets recognized for valuation purposes. Generally based on a phase-in of differences between actual and assumed market rates of return.

Meaning of "Unfunded Actuarial Accrued Liabilities"

"***Actuarial accrued liabilities***" are ***the present value of the portions of promised benefits that are not covered by future normal cost contributions*** --- a liability has been established ("accrued") because the service has been rendered but the resulting monthly cash benefit may not be payable until years in the future.

If "actuarial accrued liabilities" at any time exceed the plan's accrued assets (cash & investments), the difference is "***unfunded actuarial accrued liabilities***." This is the common condition. It is less common when a plan's assets equal or exceed the plan's "actuarial accrued liabilities."

Each time a plan adds a new benefit which applies to service already rendered, an "actuarial accrued liability" is created, which is also an "unfunded actuarial accrued liability" because the plan can't print instant cash to cover the value of the new benefit promises. Payment for such unfunded actuarial accrued liabilities is spread over a period of years, commonly in the 15-30 year range.

Unfunded actuarial accrued liabilities can occur in another way: if actual plan experience is less favorable than assumed, the difference is added to unfunded actuarial accrued liabilities. For example, in plans where benefits are directly related to an employee's pay near time of retirement, unfunded actuarial accrued liabilities increased rapidly during the 1970's because unexpected rates of pay increase created additional actuarial accrued liabilities which could not be matched by reasonable investment results. Most of the unexpected pay increases were the direct result of inflation, which is a very destructive force on financial stability.

The existence of unfunded actuarial accrued liabilities is not bad but the changes from year to year in the amount of unfunded actuarial accrued liabilities are important --- "bad" or "good" or somewhere in between.

Nor are unfunded actuarial accrued liabilities a bill payable immediately, but it is important that policy-makers prevent the amount from becoming unreasonably high and ***it is vital for plans to have a sound method for making payments toward them*** so that they are controlled.

GRS Retirement Consulting

800.521.0498 | P: 248.799.9000 | F: 248.799.9020 | www.grsconsulting.com

November 8, 2017

Executive Director
Sample Public Employees Retirement System
123 Main Street
City, State 12345

Re: Report of the June 30, 2017 Actuarial Valuation and Gain/(Loss) Analysis of Financial Experience

Dear Executive Director:

Enclosed are 40 copies of this report.

Sincerely,

Consultant A, ASA, FCA, MAAA

Enclosures

One Towne Square | Suite 800 | Southfield, Michigan 48076-3723

ABC State Employees Retirement System

GASB Statement Nos. 67 and 68 Accounting and Financial Reporting for Pensions

June 30, 2014

GRS Retirement Consulting

800.521.0498 | P: 248.799.9000 | F: 248.799.9020 | www.grsconsulting.com

September 6, 2017

Board of Trustees
ABC State Employees Retirement System

Dear Board Members:

This report provides accounting and financial reporting information that is intended to comply with the Governmental Accounting Standards Board (GASB) Statement Nos. 67 and 68 for the ABC State Employees Retirement System ("ASERS"). These calculations have been made on a basis that is consistent with our understanding of these Statements.

GASB Statement No. 67 is the accounting standard that applies to the stand-alone financial reports issued by retirement systems. GASB Statement No. 68 establishes accounting and financial reporting for state and local government employers who provide their employees (including former employees) pension benefits through a trust.

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of providing reporting and disclosure information that satisfies the requirements of GASB Statement Nos. 67 and 68. The Net Pension Liability is not an appropriate measure for measuring the sufficiency of plan assets to cover the estimated cost of settling the employer's benefit obligation. The Net Pension Liability is not an appropriate measure for assessing the need for or amount of future employer contributions. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statement Nos. 67 and 68 may produce significantly different results. This report may be provided to parties other than the ABC State Employees Retirement System ("ASERS") only in its entirety and only with the permission of ASERS. GRS is not responsible for unauthorized use of this report.

This report is based upon information, furnished to us by ASERS, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. This information was checked for internal consistency, but it was not audited.

This report complements the actuarial valuation report that was provided to ASERS and should be considered in conjunction with that report. Please see the actuarial valuation report as of June 30, 2014 for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions.

To the best of our knowledge, the information contained with this report is accurate and fairly represents the actuarial position of the ABC State Employees Retirement System. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

One Towne Square | Suite 800 | Southfield, Michigan 48076-3723

The signing individuals are independent of the plan sponsor.

Ingrid Sharpe and Shane Wiseman are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,

Ingrid Sharpe, EA, MAAA

Shane Wiseman, FSA, EA, MAAA

SRW

Auditor's Note – This information is intended to assist in preparation of the financial statements of the ABC State Employees Retirement System. Financial statements are the responsibility of management, subject to the auditor's review. Please let us know if the auditor recommends any changes.

Table of Contents

SECTION A

EXECUTIVE SUMMARY

Executive Summary
as of June 30, 2014

		2014
Actuarial Valuation Date		June 30, 2014
Measurement Date of the Net Pension Liability		June 30, 2014
Employer's Fiscal Year Ending Date (Reporting Date)		June 30, 2014
Membership		
Number of		
- Retirees and Beneficiaries		10,088
- Inactive, Nonretired Members		2,999
- Active Members		22,019
- Total		35,106
Covered Payroll	$	1,297,536,507
Net Pension Liability		
Total Pension Liability	$	2,497,742,710
Plan Fiduciary Net Position		1,827,768,322
Net Pension Liability	$	669,974,388
Plan Fiduciary Net Position as a Percentage of Total Pension Liability		73.18 %
Net Pension Liability as a Percentage of Covered Payroll		51.63 %
Development of the Single Discount Rate		
Single Discount Rate		7.50 %
Long-Term Expected Rate of Investment Return		7.50 %
Long-Term Municipal Bond Rate*		3.48 %
Last year ending June 30 in the 2015 to 2114 projection period for which projected benefit payments are fully funded		2114
Total Pension Expense	$	84,315,144

Deferred Outflows and Deferred Inflows of Resources by Source to be recognized in Future Pension Expenses

		Deferred Outflows of Resources		Deferred Inflows of Resources
Difference between expected and actual experience	$	972,549	$	9,694,999
Changes in assumptions		3,049,108		3,282,353
Net difference between projected and actual earnings on pension plan investments		112,167,664		3,660,000
Total	$	116,189,321	$	16,637,352

*Source: *Fixed-income municipal bonds with 20 years to maturity that include only federally tax-exempt municipal bonds as reported in Fidelity Index's "20-Year Municipal GO AA Index" as of June 28, 2014. In describing this index, Fidelity notes that the municipal curves are constructed using option-adjusted analytics of a diverse population of over 10,000 tax exempt securities.*

Discussion

Accounting Standard

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67 establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability. Similarly, GASB Statement No. 68 establishes standards for state and local government employers (as well as non-employer contributing entities) to account for and disclose the net pension liability, pension expense, and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain information, such as notes regarding accounting policies and investments, is not included in this report and the retirement system and/or plan sponsor will be responsible for preparing and disclosing that information to comply with these accounting standards.

Financial Statements

GASB Statement No. 68 requires state or local governments to recognize the net pension liability and the pension expense on their financial statements. The net pension liability is the difference between the total pension liability and the plan's fiduciary net position. In traditional actuarial terms, this is analogous to the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

Paragraph 57 of GASB Statement No. 68 states, "Contributions to the pension plan from the employer subsequent to the measurement date of the collective net pension liability and before the end of the employer's reporting period should be reported as a deferred outflow of resources related to pensions." The information contained in this report does not incorporate any contributions made to ASERS subsequent to the measurement date of June 30, 2014.

The pension expense recognized each fiscal year is equal to the change in the net pension liability from the beginning of the year to the end of the year, adjusted for deferred recognition of the liability and investment experience.

Pension plans that prepare their own, stand-alone financial statements are required to present two financial statements – a statement of fiduciary net position and a statement of changes in fiduciary net position in accordance with GASB Statement No. 67. The *statement of fiduciary net position* presents the assets and liabilities of the pension plan at the end of the pension plan's reporting period. The *statement of changes in fiduciary net position* presents the additions, such as contributions and investment income, and deductions, such as benefit payments and expenses, and net increase or decrease in the fiduciary net position.

Notes to Financial Statements

GASB Statement No. 68 requires the notes of the employer's financial statements to disclose the total pension expense, the pension plan's liabilities and assets, and deferred outflows and inflows of resources related to pensions.

GASB Statement Nos. 67 and 68 require the notes of the financial statements for the employers and pension plans to include certain additional information. The list of disclosure items should include:

- a description of benefits provided by the plan;
- the type of employees and number of members covered by the pension plan;
- a description of the plan's funding policy, which includes member and employer contribution requirements;
- the pension plan's investment policies;
- the pension plan's fiduciary net position and the net pension liability;
- the net pension liability using a discount rate that is 1% higher and 1% lower than used to calculate the total pension liability and net pension liability for financial reporting purposes;
- significant assumptions and methods used to calculate the total pension liability;
- inputs to the discount rates; and
- certain information about mortality assumptions and the dates of experience studies.

Retirement systems that issue stand-alone financial statements are required to disclose additional information in accordance with GASB Statement No. 67. This information includes:

- the composition of the pension plan's Board and the authority under which benefit terms may be amended;
- a description of how fair value is determined;
- information regarding certain reserves and investments, which include concentrations of investments greater than or equal to 5%, receivables, and insurance contracts excluded from plan assets;
- annual money-weighted rate of return; and
- a description of the terms of the plan's deferred retirement option program (DROP) and the total DROP balance for those members currently participating in the DROP.

Required Supplementary Information

GASB Statement No. 67 requires a 10-year fiscal history of:

- sources of changes in the net pension liability;
- information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability, and the net pension liability as a percent of covered-employee payroll; and
- a comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 7.50% on the actuarial value of assets), then the following outcomes are expected:

1. The employer normal cost as a percentage of pay is expected to remain level as a percentage of payroll.
2. The unfunded liability is expected to be paid off in approximately 28 years, which is the number of years remaining in the closed amortization schedule of the unfunded liability.
3. The funded status of the plan is expected to reach a 100% funded ratio in approximately 28 years, which is the number of years remaining in the closed amortization schedule of the unfunded liability.

This funding policy results in the expectation that the plan's assets will be able to fully pay for promised benefits through at least 2114. The projections in this report are strictly for the purpose of determining the GASB single discount rate and are different from a funding projection for the ongoing plan.

Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of June 30, 2014 and a measurement date of June 30, 2014.

Single Discount Rate

Projected benefit payments are required to be discounted to their actuarial present values using a Single Discount Rate that reflects (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating (which is published by the Federal Reserve) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.50%; the municipal bond rate is 3.48% (based on the daily rate closest to but not later than the measurement date of the Fidelity "20-Year Municipal GO AA Index"); and the resulting Single Discount Rate is 7.50%.

Effective Date and Transition

GASB Statement Nos. 67 and 68 are effective for fiscal years beginning after June 15, 2013, and June 15, 2014 respectively, earlier application is encouraged by the GASB.

SECTION B

FINANCIAL STATEMENTS

Auditor's Note – This information is intended to assist in preparation of the financial statements of the ABC State Employees Retirement System. Financial statements are the responsibility of management, subject to the auditor's review. Please let us know if the auditor recommends any changes.

Statement of Pension Expense under GASB Statement No. 68
Fiscal Year Ended June 30, 2014

A. Expense

1. Service Cost	$	71,115,442
2. Interest on the Total Pension Liability		169,059,742
3. Current-Period Benefit Changes		4,645,715
4. Employee Contributions (made negative for addition here)		(49,142,379)
5. Projected Earnings on Plan Investments (made negative for addition here)		(139,254,073)
6. Pension Plan Administrative Expense		3,574,923
7. Other Changes in Plan Fiduciary Net Position		(340,942)
8. Recognition of Outflow (Inflow) of Resources due to Liabilities		(2,315,200)
9. Recognition of Outflow (Inflow) of Resources due to Assets		26,971,916
10. Total Pension Expense	**$**	**84,315,144**

Statement of Outflows and Inflows
Arising from Current Reporting Period
Fiscal Year Ended June 30, 2014

A. Outflows (Inflows) of Resources due to Liabilities

1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses	$	(8,287,630)
2. Assumption Changes (gains) or losses	$	2,001,050
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}		5.7176
4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience of the Total Pension Liability	$	(1,449,495)
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for assumption changes	$	349,981
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	$	(1,099,514)
7. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for the difference between expected and actual experience of the Total Pension Liability	$	(6,838,136)
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for assumption changes	$	1,651,069
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	$	(5,187,067)

B. Outflows (Inflows) of Resources due to Assets

1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	$	137,959,580
2. Recognition period for Assets {in years}		5.0000
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets	$	27,591,916
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	$	110,367,664

Statement of Outflows and Inflows
Arising from Current and Prior Reporting Periods
Fiscal Year Ended June 30

A. Outflows and Inflows of Resources due to Liabilities and Assets to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Due to Liabilities	$ 1,114,687	$ 3,429,887	$ (2,315,200)
2. Due to Assets	28,191,916	1,220,000	26,971,916
3. Total	$ 29,306,603	$ 4,649,887	$ 24,656,716

B. Outflows and Inflows of Resources by Source to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experien	$ 313,725	$ 2,371,063	$ (2,057,338)
2. Assumption Changes	800,961	1,058,824	(257,862)
3. Net Difference between projected and actual earnings on pension plan investments	28,191,916	1,220,000	26,971,916
4. Total	$ 29,306,603	$ 4,649,887	$ 24,656,716

C. Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows of Resources
1. Differences between expected and actual experien	$ 972,549	$ 9,694,999	$ (8,722,450)
2. Assumption Changes	3,049,108	3,282,353	(233,244)
3. Net Difference between projected and actual earnings on pension plan investments	112,167,664	3,660,000	108,507,664
4. Total	$ 116,189,321	$ 16,637,352	$ 99,551,970

D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses

Year Ending June 30	Net Deferred Outflows of Resources
2015	$ 24,656,716
2016	24,656,716
2017	24,656,716
2018	26,370,834
2019	(789,011)
Thereafter	0
Total	$ 99,551,970

Statement of Fiduciary Net Position
as of June 30, 2014

	2014
Assets	
Cash and Deposits	$ 65,604,278
Receivables	
Accounts Receivable - Sale of Investments	$ 56,960,120
Accrued Interest and Other Dividends	3,320,820
Contributions	-
Accounts Receivable - Other	926,632
Total Receivables	$ 61,207,572
Investments	
Fixed Income	$ 143,632,489
Domestic Equities	498,632,867
International Equities	-
Real Estate	150,085,750
Other	999,911,228
Total Investments	$ 1,792,262,334
Total Assets	$ 1,919,074,184
Liabilities	
Payables	
Accounts Payable - Purchase of Investments	$ 2,775,296
Accrued Expenses	-
Accounts Payable - Other	88,530,566
Total Liabilities	$ 91,305,862
Net Position Restricted for Pensions	$ 1,827,768,322

Statement of Changes in Fiduciary Net Position for Year Ended June 30, 2014

		2014
Additions		
Contributions		
Employer	$	52,934,245
Employee		49,142,379
Other		0
Total Contributions	$	102,076,624
Investment Income		
Net Appreciation in Fair Value of Investments	$	(35,410,525)
Interest and Dividends		46,872,178
Less Investment Expense		(10,167,160)
Net Investment Income	$	1,294,493
Other	$	340,942
Total Additions	$	103,712,059
Deductions		
Benefit Payments, including Refunds of Employee Contributions	$	159,336,933
Pension Plan Administrative Expense		3,574,923
Other		0
Total Deductions	$	162,911,856
Net Increase in Net Position	$	(59,199,797)
Net Position Restricted for Pensions		
Beginning of Year	$	1,886,968,119
End of Year	$	1,827,768,322

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Auditor's Note – This information is intended to assist in preparation of the financial statements of the ABC State Employees Retirement System. Financial statements are the responsibility of management, subject to the auditor's review. Please let us know if the auditor recommends any changes.

Schedule of Changes in Net Pension Liability and Related Ratios
Current Reporting Period
Fiscal Year Ended June 30, 2014

A. Total pension liability		
1. Service cost	$	71,115,442
2. Interest on the total pension liability		169,059,742
3. Changes of benefit terms		4,645,715
4. Difference between expected and actual experience of the total pension liability		(8,287,630)
5. Changes of assumptions		2,001,050
6. Benefit payments, including refunds of employee contributions		(159,336,933)
7. Net change in total pension liability		79,197,386
8. Total pension liability – beginning		2,418,545,325
9. Total pension liability – ending	$	2,497,742,710
B. Plan fiduciary net position		
1. Contributions – employer	$	52,934,245
2. Contributions – employee		49,142,379
3. Net investment income		1,294,493
4. Benefit payments, including refunds of employee contributions		(159,336,933)
5. Pension plan administrative expense		(3,574,923)
6. Other		340,942
7. Net change in plan fiduciary net position		(59,199,797)
8. Plan fiduciary net position – beginning		1,886,968,119
9. Plan fiduciary net position – ending	$	1,827,768,322
C. Net pension liability	$	669,974,388
D. Plan fiduciary net position as a percentage of the total pension liability		73.18 %
E. Covered-employee payroll	$	1,297,536,507
F. Net pension liability as a percentage of covered-employee payroll		51.63 %

Schedules of Required Supplementary Information

Schedule of Changes in Net Pension Liability and Related Ratios Multiyear

Last 10 Fiscal Years (which may be built prospectively)

Fiscal year ending June 30,	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005
Total pension liability										
Service cost	$ 71,115,442									
Interest on the total pension liability	169,059,742									
Changes of benefit terms	4,645,715									
Difference between expected and actual experience	(8,287,630)									
Changes of assumptions	2,001,050									
Benefit payments, including refunds of employee contributions	(159,336,933)									
Net change in total pension liability	79,197,386									
Total pension liability - beginning	2,418,545,325									
Total pension liability - ending (a)	$ 2,497,742,710									
Plan fiduciary net position										
Employer contributions	$ 52,934,245									
Employee contributions	49,142,379									
Pension plan net investment income	1,294,493									
Benefit payments, including refunds of employee contributions	(159,336,933)									
Pension plan administrative expense	(3,574,923)									
Other	340,942									
Net change in plan fiduciary net position	(59,199,797)									
Plan fiduciary net position - beginning	1,886,968,119									
Plan fiduciary net position - ending (b)	$ 1,827,768,322									
Net pension liability - ending (a) - (b)	$ 669,974,388									
Plan fiduciary net position as a percentage of total pension liability	73.18 %									
Covered-employee payroll	$ 1,297,536,507									
Net pension liability as a percentage of covered-employee payroll	51.63 %									

Notes to Schedule:

N/A

Schedules of Required Supplementary Information
Schedule of Net Pension Liability Multiyear

Last 10 Fiscal Years (which may be built prospectively)

FY Ending June 30,	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered Payroll	Net Pension Liability as a % of Covered Payroll
2005	$ 1,615,883,432	$ 994,184,864	$ 621,698,568	61.53 %	$ 994,453,690	62.52 %
2006	1,696,677,603	1,063,777,804	632,899,799	62.70 %	1,024,287,300	61.79 %
2007	1,781,511,484	1,138,242,251	643,269,233	63.89 %	1,055,015,919	60.97 %
2008	1,870,587,058	1,217,919,208	652,667,850	65.11 %	1,086,666,397	60.06 %
2009	1,964,116,411	1,303,173,553	660,942,858	66.35 %	1,119,266,389	59.05 %
2010	2,062,322,231	1,394,395,702	667,926,530	67.61 %	1,152,844,381	57.94 %
2011	2,165,438,343	1,492,003,401	673,434,942	68.90 %	1,187,429,712	56.71 %
2012	2,273,710,260	1,596,443,639	677,266,621	70.21 %	1,223,052,603	55.38 %
2013	2,387,395,773	1,708,194,693	679,201,079	71.55 %	1,259,744,182	53.92 %
2014	2,497,742,710	1,827,768,322	669,974,388	73.18 %	1,297,536,507	51.63 %

Schedule of Contributions Multiyear
Last 10 Fiscal Years

FY Ending June 30,	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll	Actual Contribution as a % of Covered Payroll
2005	$ 26,934,435	$ 26,934,435	$ 0	$ 866,502,000	3.11 %
2006	29,089,189	29,089,189	0	977,817,000	2.97 %
2007	31,416,325	31,416,325	0	1,050,217,000	2.99 %
2008	33,929,631	33,929,631	0	1,111,828,000	3.05 %
2009	36,644,001	36,644,001	0	1,161,432,000	3.16 %
2010	38,334,140	38,334,140	0	1,211,140,000	3.17 %
2011	37,281,658	37,281,658	0	1,208,093,000	3.09 %
2012	35,146,816	37,607,093	(2,460,277)	1,191,290,000	3.16 %
2013	47,118,111	50,887,560	(3,769,449)	1,256,973,000	4.05 %
2014	52,934,245	52,934,245	0	1,297,536,507	4.08 %

Notes to Schedule of Contributions

Valuation Date:

Notes	Actuarially determined contribution rates are calculated as of December 31 of odd numbered years, which is 18 months prior to the beginning of the fiscal year biennium in which contributions are reported.

Methods and Assumptions Used to Determine Contribution Rates:

Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Closed
Remaining Amortization Period	28 years
Asset Valuation Method	5-Year smoothed market; 25% corridor
Inflation	3.00% -- approximate; No explicit price inflation assumption is used in this valuation.
Salary Increases	3.75% to 9.05% including inflation
Investment Rate of Return	7.50%
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2010 valuation pursuant to an experience study of the period 2005 - 2009.
Mortality	1994 Group Annuity Mortality Table set back 3 years for both males and females.
Cost-of-Living Adjustment	None

Other Information:

Schedule of Investment Returns Multiyear
Last 10 Fiscal Years

FY Ending June 30,	Annual Return[1]
2005	7.36 %
2006	8.96 %
2007	6.06 %
2008	(18.16)%
2009	(23.26)%
2010	4.36 %
2011	9.46 %
2012	13.56 %
2013	12.66 %
2014	7.99 %

[1] *Annual money-weighted rate of return, net of investment expenses.*

SECTION D

NOTES TO FINANCIAL STATEMENTS

Auditor's Note – This information is intended to assist in preparation of the financial statements of the ABC State Employees Retirement System. Financial statements are the responsibility of management, subject to the auditor's review. Please let us know if the auditor recommends any changes.

Single Discount Rate

A Single Discount Rate of 7.50% was used to measure the total pension liability. This Single Discount Rate was based on the expected rate of return on pension plan investments of 7.50%. The projection of cash flows used to determine this Single Discount Rate assumed that plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the difference between actuarially determined contribution rates and the member rate. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Regarding the sensitivity of the net pension liability to changes in the Single Discount Rate, the following presents the plan's net pension liability, calculated using a Single Discount Rate of 7.50%, as well as what the plan's net pension liability would be if it were calculated using a Single Discount Rate that is one percent lower or one percent higher:

Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

1% Decrease 6.50%	Current Single Discount Rate Assumption 7.50%	1% Increase 8.50%
$ 929,673,796	$ 669,974,388	$ 451,109,461

Disclosure Regarding the Deferred Retirement Option Program

Reconciliation of DROP Accounts

Year Ended 9/30	Balance at Beginning of Year	Credits	Interest	Distributions	Adjustments	Balance at End of Year
2002	$	$ 25,536	$ 559	$	$	$ 26,095
2003	26,095	35,048	962	(33,734)		28,371
2004	28,371	67,278	4,210			99,859
2005	99,859	107,716	9,307	(54,224)		163,658
2006	162,658	88,332	13,653			264,643
2007	264,643	164,844	22,183			451,670
2008	451,670	188,434	24,255	(215,043)	2,665	451,981
2009	451,981	557,339	46,178			1,055,498
2010	1,055,0498	993,753	96,296	(91,000)		2,054,547

Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	10,088
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	2,999
Active Plan Members	22,019
Total Plan Members	35,106

SECTION E

SUMMARY OF BENEFITS

Summary of Benefits

A. Effective Date

July 1, 1972

B. Plan Year

October 1 through September 30

C. Type of Plan

Qualified, governmental defined benefit retirement plan; for GASB purposes it is a single employer plan.

D. Eligibility Requirements

All full-time police officers are eligible for membership on the first day of the month coincident with or next following date of employment.

E. Credited Service

Service is measured as the total number of full years (and fraction thereof) of continuous service from the date of employment to the date of termination. No service is credited for any periods of employment for which the member received a refund of employee contributions.

F. Compensation

Actual compensation reported to the Internal Revenue Service for income tax purposes, plus deferred compensation.

G. Average Monthly Earnings (AME)

The average of Compensation over the last 5 years of Credited Service; includes lump sum payment of unused leave pay.

H. Normal Retirement

Eligibility:	A member may retire on the first day of the month coincident with or next following the earlier of: (1) age 52 and 10 years of Credited Service, or (2) 20 years of Credited Service regardless of age.
Benefit:	3.50% of AME multiplied by years of Credited Service with a maximum equal to 100% of AME.
Normal Form of Benefit:	10 Years Certain and Life thereafter; other options are also available.
Supplemental Benefit:	A monthly supplemental benefit of $12.50 per year of Credited Service is payable to all retirees and their beneficiaries in pay status.
COLA:	There are currently no annual cost-of-living increases, but ad hoc increases may be authorized by the Board of Trustees. Also see Section V, Cost-of-Living Increases.

I. Early Retirement

Eligibility:	A member may elect to retire earlier than the Normal Retirement Eligibility upon attainment of age 50 and 10 years of Credited Service.
Benefit:	The Normal Retirement Benefit is reduced by 3.00% for each year by which the Early Retirement date precedes the Normal Retirement date.
Normal Form of Benefit:	10 Years Certain and Life thereafter; other options are also available.
Supplemental Benefit:	A monthly supplemental benefit of $12.50 per year of Credited Service is payable to all retirees and their beneficiaries in pay status.
COLA:	There are currently no annual cost-of-living increases, but ad hoc increases may be authorized by the Board of Trustees. Also see Section V, Cost-of-Living Increases.

J. Delayed Retirement

Same as Normal Retirement taking into account compensation earned and service credited until the date of actual retirement.

K. Service Connected Disability

Eligibility: Any member who becomes totally and permanently disabled and unable to render useful and efficient service as a police officer for a period of at least 6 months resulting from an act occurring in the performance of service for the City is eligible for a disability benefit.

Benefit: 60% of the current rate of pay, but no less than the accrued Normal Retirement Benefit taking into account compensation earned and service credited until the date of disability. Disability benefits, when combined with Social Security, Worker's Compensation or any other local, state or federal government benefits, cannot exceed and will be limited to the AME on the date of disability.

Normal Form of Benefit: 10 Years Certain and Life thereafter; other options are also available.

Supplemental Benefit: A monthly supplemental benefit of $12.50 per year of Credited Service is payable to all retirees and their beneficiaries in pay status.

COLA: There are currently no annual cost-of-living increases, but ad hoc increases may be authorized by the Board of Trustees. Also see Section V, Cost-of-Living Increases.

L. Non-Service Connected Disability

Eligibility: Any member with 10 years of Credited Service who becomes totally and permanently disabled and unable to render useful and efficient service as a police officer for a period of at least 6 months is eligible for a disability benefit.

Benefit: 2.50% of AME multiplied by Credited Service, but not less than 25% of salary or the accrued Normal Retirement Benefit taking into account compensation earned and service credited until the date of disability. Disability benefits, when combined with Social Security, Worker's Compensation or any other local, state or federal government benefits, cannot exceed and will be limited to the AME on the date of disability.

Normal Form of Benefit: 10 Years Certain and Life thereafter; other options are also available.

Supplemental Benefit: A monthly supplemental benefit of $12.50 per year of Credited Service is payable to all retirees and their beneficiaries in pay status.

COLA: There are currently no annual cost-of-living increases, but ad hoc increases may be authorized by the Board of Trustees. Also see Section V, Cost-of-Living Increases.

M. Death in the Line of Duty

Eligibility: Members who die as a result of personal injury or disease arising out of the member's actual performance of duties are eligible for survivor benefits regardless of Credited Service.

Benefit: The surviving spouse will receive the greater of:
(1) 50% of the member's AME, or
(2) the member's accrued Normal Retirement Benefit as of the date of death with no actuarial reduction for Early Retirement.

If there is no spouse, or if the surviving spouse dies, the spouse's benefit determined above shall be distributed equally among any eligible children. If there is no spouse or eligible children, the benefit will be paid to the deceased member's estate.

Normal Form of Benefit: Spouse's benefits are payable until death; children's benefits are payable until age 18 (24 if a full-time student), marriage, death, or adoption. Benefits paid to a member's estate may be paid as a lump sum at the discretion of the Board of Trustees.

Supplemental Benefit: A monthly supplemental benefit of $12.50 per year of Credited Service is payable to all retirees and their beneficiaries in pay status.

COLA: There are currently no annual cost-of-living increases, but ad hoc increases may be authorized by the Board of Trustees. Also see Section V, Cost-of-Living Increases.

N. Other Pre-Retirement Death

Eligibility: Members are eligible for survivor benefits after the completion of 5 or more years of Credited Service

Benefit: The survivor benefit payable to the designated beneficiary is the member's accrued Normal Retirement Benefit. Benefit is payable at the member's Early or Normal retirement date and will be actuarially reduced for Early Retirement when applicable.

Normal Form of Benefit: For member's eligible for Normal or Delayed Retirement on the date of death, the designated beneficiary's benefit will be paid for life. For members not yet eligible, benefits will be paid for 10 years.

Supplemental Benefit: A monthly supplemental benefit of $12.50 per year of Credited Service is payable to all retirees and their beneficiaries in pay status.

COLA: There are currently no annual cost-of-living increases, but ad hoc increases may be authorized by the Board of Trustees. Also see Section V, Cost-of-Living Increases.

The beneficiary of a plan member with less than 5 years of Credited Service at the time of death will receive a refund of the member's accumulated contributions without interest.

O. Post Retirement Death

Benefit determined by the form of benefit elected upon retirement.

P. Optional Forms

In lieu of electing the Normal Form of benefit, the optional forms of benefits available to all retirees are a Single Life Annuity or the 50%, 66 2/3%, 75% and 100% Joint and Survivor options.

Q. Vested Termination

Eligibility: A member has earned a non-forfeitable right to plan benefits after the completion of 5 years of Credited Service (see vesting table below).

Years of Credited Service	Vested %
Under 5	0%
5	25
6	40
7	55
8	70
9	85
10 or more	100

Benefit:	The benefit is the member's vested accrued Normal Retirement Benefit as of the date of termination. Benefit begins at the member's Normal Retirement date. Alternatively, members with at least 10 years of Credited Service may elect to receive an actuarially reduced Early Retirement Benefit any time after age 50.
Normal Form of Benefit:	10 Years Certain and Life thereafter; other options are also available.
Supplemental Benefit:	A monthly supplemental benefit of $12.50 per year of Credited Service is payable to all retirees and their beneficiaries once in pay status.
COLA:	There are currently no annual cost-of-living increases, but ad hoc increases may be authorized by the Board of Trustees. Also see Section V, Cost-of-Living Increases.

Members terminating employment with less than 5 years of Credited Service will receive a refund of their own accumulated contributions without interest.

R. Refunds

Eligibility:	All members terminating employment with less than 5 years of Credited Service are eligible. Optionally, vested members (those with 5 or more years of Credited Service) may elect a refund in lieu of the vested benefits otherwise due.
Benefit:	Refund of the member's contributions without interest.

S. Member Contributions

8.60% of Compensation

T. State Contributions

Chapter 185 Premium Tax Refunds

U. Employer Contributions

Any additional amount needed to fund the plan properly according to State laws.

V. Cost-of-Living Increases

Actuarial gains realized for the prior fiscal year may be used to increase benefits on July 1st of each year for members who have been retired for at least 1 year. Upon approval by the Board of Trustees, the gain will be distributed to all pensioners as an equal percentage increase in their benefit, but is limited to 4% in any year. If there was no actuarial gain realized for the prior fiscal year, then no cost-of-living adjustment will be authorized.

W. 13th Check

Not Applicable

X. Deferred Retirement Option Plan

Eligibility:	A member may enter the DROP on the first day of the month coincident with or next following the earlier of: (1) age 52 and 10 years of Credited Service, or (2) 20 years of Credited Service regardless of age. Members who meet eligibility must submit a written election to participate in the DROP. The election to participate must be made within the first 28.5 years of Credited Service and members can no longer participate after attaining 33.5 years of employment service.
Benefit:	The member's Credited Service and AME are frozen upon entry into the DROP. The monthly retirement benefit as described under Normal Retirement is calculated based upon the frozen Credited Service and AME.
Maximum DROP Period:	60 months
Interest Credited:	The member's DROP account is credited quarterly at an interest rate based upon the option chosen by the member. Members must elect from 1 of the 2 following options: 1. Gain or loss at the same rate earned by the Plan, or 2. Guaranteed rate of 6.50% per annum.
Normal Form of Benefit:	Lump Sum; member may also elect that the DROP distribution be paid in 3 equal payments over 3 years or used to purchase an annuity to be paid in monthly installments.

COLA: There are currently no annual cost-of-living increases, but ad hoc increases may be authorized by the Board of Trustees. Also see Section V, Cost-of-Living Increases.

Y. Other Ancillary Benefits

There are no other ancillary benefits in the retirement plan that might be deemed a retirement plan liability.

Z. Changes from Previous Valuation

There have been no changes in benefits since the previous valuation.

SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

Actuarial Assumptions and Cost Method

Valuation Methods

Actuarial Cost Method - Normal cost and the allocation of benefit values between service rendered before and after the valuation date were determined using an ***Individual Entry-Age Actuarial Cost Method*** having the following characteristics:

(i) the annual normal cost for each individual active member, payable from the date of employment to the date of retirement, is sufficient to accumulate the value of the member's benefit at the time of retirement; and

(ii) each annual normal cost is a constant percentage of the member's year by year projected covered pay.

Actuarial gains/(losses), as they occur, reduce (increase) the Unfunded Actuarial Accrued Liability.

Valuation Assumptions

The actuarial assumptions used in the valuation are shown in this Section.

Economic Assumptions

The investment return rate assumed in the valuation is 7.50% per year, compounded annually (net after investment expenses).

The ***Wage Inflation Rate*** assumed in this valuation was 3.00% per year. The Wage Inflation Rate is defined to be the portion of total pay increases for an individual that are due to macro economic forces including productivity, price inflation, and labor market conditions. The wage inflation rate does not include pay changes related to individual merit and seniority effects.

The assumed ***real rate of return*** over wage inflation is defined to be the portion of total investment return that is more than the assumed wage inflation rate. Considering other economic assumptions, the 7.50% investment return rate translates to an assumed real rate of return over wage inflation of 4.50%.

The rate of salary increase used for individual members is 7.50% per year. Part of the assumption is for merit and/or seniority increase, and the other 3.00% recognizes wage inflation, including price inflation, productivity increases, and other macroeconomic forces. This assumption is used to project a member's current salary to the salaries upon which benefits will be based.

Reported base pay for new hires is increased by 15.00% to allow for overtime pay in the first year of employment.

For purposes of financing the unfunded liabilities, total payroll is assumed to grow at 5.00% per year. The most recent ten-year average is 5.10%.

Demographic Assumptions

The mortality table was the RP -2000 Generational Mortality Table for males and females.

Sample Attained Ages (in 2009)	Probability of Dying Next Year		Future Life Expectancy (years)	
	Men	Women	Men	Women
50	0.18 %	0.14 %	33.90	35.42
55	0.30	0.25	28.79	30.47
60	0.57	0.48	23.88	25.70
65	1.11	0.92	19.30	21.22
70	1.91	1.59	15.14	17.12
75	3.29	2.59	11.43	13.41
80	5.82	4.28	8.28	10.14

This assumption is used to measure the probabilities of each benefit payment being made after retirement. For active members, the probabilities of dying before retirement were based upon the same mortality table as members dying after retirement (75% of deaths are assumed to be service-connected).

For disabled retirees, the regular mortality tables are set forward 5 years in ages to reflect impaired longevity.

The ***rates of retirement*** used to measure the probability of eligible members retiring during the next year are as follows:

		Age															
		42 -	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
	10	0.0%	0.0%	0.0%	0.0	0.0	2.5	2.5%	20.0%	20.0%	20.0%	55.0%	65.0%	65.0%	65.0%	65.0%	100.0%
	11	0.0%	0.0%	0.0	0.0	0.0	2.5	2.5%	10.0%	10.0%	10.0%	47.5%	57.5%	60.0%	60.0%	60.0%	100.0
	12	0.0%	0.0%	0.0	0.0	0.0	2.5	2.5%	10.0%	10.0%	10.0%	47.5%	57.5%	60.0%	60.0%	60.0%	100.0
	13	0.0%	0.0%	0.0	0.0	0.0	2.5	2.5%	10.0%	10.0%	10.0%	47.5%	57.5%	60.0%	60.0%	60.0%	100.0
S	14	0.0%	0.0%	0.0	0.0	0.0	2.5	2.5%	10.0%	10.0%	10.0%	47.5%	57.5%	60.0%	60.0%	60.0%	100.0
e	15	0.0%	0.0%	0.0	0.0	0.0	2.5	2.5%	10.0%	10.0%	10.0%	47.5%	57.5%	60.0%	60.0%	60.0%	100.0
r	16	0.0%	0.0%	0.0	0.0	0.0	2.5	2.5%	10.0%	10.0%	10.0%	47.5%	57.5%	60.0%	60.0%	60.0%	100.0
v	17	0.0%	0.0%	0.0	0.0	0.0	2.5	2.5%	10.0%	10.0%	10.0%	47.5%	57.5%	60.0%	60.0%	60.0%	100.0
i	18	0.0%	0.0%	0.0	0.0	0.0	2.5	2.5%	10.0%	10.0%	10.0%	47.5%	57.5%	60.0%	60.0%	60.0%	100.0
c	19	0.0%	0.0%	0.0	0.0	0.0	2.5	2.5%	10.0%	10.0%	10.0%	47.5%	57.5%	60.0%	60.0%	60.0%	100.0
e	20	20.0%	22.5%	22.5%	22.5%	22.5%	25.0%	27.5%	30.0%	40.0%	45.0%	70.0%	80.0%	80.0%	80.0%	80.0%	100.0
	21	5.0%	5.0%	5.0%	10.0%	10.0%	12.5%	12.5%	12.5%	15.0%	15.0%	47.5%	65.0%	65.0%	65.0%	65.0%	100.0
	22	5.0%	5.0%	5.0%	10.0%	10.0%	12.5%	12.5%	12.5%	15.0%	15.0%	47.5%	65.0%	65.0%	65.0%	65.0%	100.0
	23	5.0%	5.0%	5.0%	10.0%	10.0%	15.0%	15.0%	15.0%	15.0%	15.0%	47.5%	65.0%	65.0%	65.0%	65.0%	100.0
	24	5.0%	5.0%	5.0%	10.0%	10.0%	15.0%	15.0%	15.0%	15.0%	15.0%	47.5%	65.0%	65.0%	65.0%	65.0%	100.0
	25	100.0%	100.0%	100.0%	100.0%	100.0	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0

Rates of separation from active membership were as shown below (rates do not apply to members eligible to retire and do not include separation on account of death or disability). This assumption measures the probabilities of members remaining in employment.

Sample Ages	% of Active Members Separating within Next Year
20	6.0 %
25	5.7
30	5.0
35	3.7
40	2.6
45	1.6
50	0.8
55	0.3

Rates of disability among active members (75% of disabilities are assumed to be service-connected).

Sample Ages	% of Active Members Becoming Disabled within Next Year
20	0.21 %
25	0.23
30	0.27
35	0.35
40	0.45
45	0.77
50	1.50
55	2.32

Miscellaneous and Technical Assumptions

Administrative & Investment Expenses	The investment return assumption is intended to be the return net of investment expenses. Annual administrative expenses are assumed to be equal to the average of the prior two years' expenses. Assumed administrative expenses are added to the Normal Cost.
Benefit Service	Exact fractional service is used to determine the amount of benefit payable.
Decrement Operation	Disability and mortality decrements operate during retirement eligibility.
Decrement Timing	Decrements of all types are assumed to occur at the beginning of the year.
Eligibility Testing	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Forfeitures	For vested separations from service, it is assumed that 0% of members separating will withdraw their contributions and forfeit an employer financed benefit. It was further assumed that the liability at termination is the greater of the vested deferred benefit (if any) or the member's accumulated contributions.
Incidence of Contributions	Employer contributions are assumed to be made in equal installments at the end of each quarter. Member contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.
Liability Load	Projected normal and early retirement benefits are loaded by 6% to allow for the inclusion of unused sick and vacation pay in final average earnings.
Marriage Assumption	100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses for active member valuation purposes.
Normal Form of Benefit	A 10-year certain and life annuity is the normal form of benefit.

Pay Increase Timing	Middle of fiscal year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.
Service Credit Accruals	It is assumed that members accrue one year of service credit per year.

SECTION G

CALCULATION OF THE SINGLE DISCOUNT RATE

Calculation of the Single Discount Rate

GASB Statement No. 67 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the Fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The Plan Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the assumed valuation discount rate is used. In years where assets are not projected to be sufficient to meet benefit payments, the use of a municipal bond rate is required, as described in the following paragraph.

The Single Discount Rate (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating (which is published by the Federal Reserve) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.50%; the municipal bond rate is 3.48%; and the resulting Single Discount Rate is 7.50%.

The tables in this section provide background for the development of the Single Discount Rate.

The **Projection of Contributions** table shows the development of expected contributions in future years. Normal Cost contributions for future hires are not included (nor are their liabilities).

The **Projection of Plan Net Position** table shows the development of expected asset levels in future years.

The **Present Values of Projected Benefit Payments** table shows the development of the Single Discount Rate (SDR). It breaks down the benefit payments into present values for funded and unfunded portions and shows the equivalent total at the SDR.

The projections in this report are strictly for the purpose of determining the GASB single discount rate and are different from a funding projection for the ongoing plan.

Single Discount Rate Development
Projection of Contributions ending June 30 for 2015 to 2064

Year	Projected Payroll for Current Employees	Projected Contributions from Current Employees	Projected Service Cost and Expense Contributions	Projected UAL Contributions	Projected Total Contributions
0	$ 1,297,536,507				
1	1,254,481,272	$ 37,634,438	$ 34,869,506	$ 36,951,560	$ 109,455,504
2	1,206,192,574	36,185,777	33,680,853	38,337,243	108,203,874
3	1,164,471,019	34,934,131	32,681,549	39,774,890	107,390,569
4	1,127,645,988	33,829,380	31,801,998	41,266,448	106,897,826
5	1,093,002,964	32,790,089	30,939,783	42,813,940	106,543,812
6	1,059,054,874	31,771,646	30,048,617	44,419,463	106,239,726
7	1,026,012,261	30,780,368	29,130,244	46,085,193	105,995,805
8	993,768,103	29,813,043	28,185,326	47,813,388	105,811,756
9	961,975,724	28,859,272	27,194,807	49,606,390	105,660,468
10	929,864,585	27,895,938	26,157,482	51,466,629	105,520,049
11	896,922,680	26,907,680	25,032,721	53,396,628	105,337,029
12	862,070,916	25,862,127	23,801,787	55,399,001	105,062,916
13	824,724,008	24,741,720	22,449,319	57,476,464	104,667,503
14	786,923,987	23,607,720	21,061,566	59,631,831	104,301,117
15	751,082,957	22,532,489	19,733,624	61,868,025	104,134,138
16	717,190,917	21,515,728	18,464,268	64,188,076	104,168,072
17	684,529,193	20,535,876	17,252,740	66,595,129	104,383,745
18	652,729,656	19,581,890	16,094,542	69,092,446	104,768,878
19	619,682,219	18,590,467	14,961,172	71,683,413	105,235,051
20	584,642,477	17,539,274	13,825,301	74,371,541	105,736,116
21	549,639,352	16,489,181	12,740,198	77,160,473	106,389,852
22	515,077,589	15,452,328	11,706,858	80,053,991	107,213,177
23	480,569,016	14,417,070	10,722,092	83,056,016	108,195,178
24	445,330,799	13,359,924	9,756,380	86,170,617	109,286,920
25	408,985,267	12,269,558	8,805,743	89,402,015	110,477,316
26	372,622,904	11,178,687	7,887,927	92,754,590	111,821,204
27	336,722,208	10,101,666	7,010,713	96,232,887	113,345,267
28	299,891,392	8,996,742	6,154,017	99,841,621	114,992,379
29	260,420,217	7,812,607	5,286,417	0	13,099,023
30	219,338,592	6,580,158	4,417,730	0	10,997,888
31	182,000,411	5,460,012	3,641,244	0	9,101,256
32	150,575,783	4,517,273	2,988,191	0	7,505,464
33	122,922,441	3,687,673	2,421,027	0	6,108,700
34	98,108,568	2,943,257	1,917,361	0	4,860,618
35	76,222,001	2,286,660	1,477,770	0	3,764,431
36	57,385,956	1,721,579	1,109,196	0	2,830,775
37	41,065,701	1,231,971	793,341	0	2,025,313
38	26,440,911	793,227	517,687	0	1,310,914
39	14,412,367	432,371	291,810	0	724,181
40	6,569,555	197,087	143,479	0	340,565
41	3,117,823	93,535	73,198	0	166,732
42	1,921,895	57,657	44,308	0	101,964
43	1,036,722	31,102	23,507	0	54,609
44	432,175	12,965	9,525	0	22,490
45	89,455	2,684	1,933	0	4,617
46	0	0	0	0	0
47	0	0	0	0	0
48	0	0	0	0	0
49	0	0	0	0	0
50	0	0	0	0	0

Single Discount Rate Development
Projection of Plan Net Position ending June 30 for 2015 to 2064

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.500%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
1	$ 1,922,507,631	$ 109,455,504	$ 163,813,111	$ 0	$ 142,186,513	$ 2,010,336,537
2	2,010,336,537	108,203,874	168,937,025	0	148,538,920	2,098,142,306
3	2,098,142,306	107,390,569	172,980,300	0	154,945,523	2,187,498,099
4	2,187,498,099	106,897,826	177,117,633	0	161,476,719	2,278,755,011
5	2,278,755,011	106,543,812	181,356,610	0	168,151,864	2,372,094,077
6	2,372,094,077	106,239,726	185,965,543	0	174,971,386	2,467,339,646
7	2,467,339,646	105,995,805	191,300,792	0	181,909,367	2,563,944,027
8	2,563,944,027	105,811,756	196,764,711	0	188,946,726	2,661,937,798
9	2,661,937,798	105,660,468	202,333,805	0	196,085,623	2,761,350,083
10	2,761,350,083	105,520,049	209,368,236	0	203,277,351	2,860,779,248
11	2,860,779,248	105,337,029	216,905,902	0	210,450,247	2,959,660,622
12	2,959,660,622	105,062,916	227,880,695	0	217,452,142	3,054,294,985
13	3,054,294,985	104,667,503	240,730,702	0	224,061,996	3,142,293,782
14	3,142,293,782	104,301,117	251,799,102	0	230,240,853	3,225,036,649
15	3,225,036,649	104,134,138	262,197,872	0	236,057,515	3,303,030,430
16	3,303,030,430	104,168,072	271,214,098	0	241,576,302	3,377,560,706
17	3,377,560,706	104,383,745	279,157,148	0	246,881,535	3,449,668,837
18	3,449,668,837	104,768,878	286,077,618	0	252,049,000	3,520,409,097
19	3,520,409,097	105,235,051	292,510,172	0	257,134,825	3,590,268,802
20	3,590,268,802	105,736,116	299,051,602	0	262,151,884	3,659,105,199
21	3,659,105,199	106,389,852	305,046,092	0	267,117,956	3,727,566,916
22	3,727,566,916	107,213,177	309,898,968	0	272,104,209	3,796,985,334
23	3,796,985,334	108,195,178	313,625,320	0	277,209,537	3,868,764,729
24	3,868,764,729	109,286,920	316,526,107	0	282,526,379	3,944,051,922
25	3,944,051,922	110,477,316	318,644,649	0	288,138,743	4,024,023,331
26	4,024,023,331	111,821,204	320,804,283	0	294,106,561	4,109,146,813
27	4,109,146,813	113,345,267	324,345,476	0	300,416,547	4,198,563,151
28	4,198,563,151	114,992,379	329,262,838	0	307,002,355	4,291,295,047
29	4,291,295,047	13,099,023	335,686,179	0	309,968,802	4,278,676,694
30	4,278,676,694	10,997,888	343,096,083	0	308,672,210	4,255,250,709
31	4,255,250,709	9,101,256	349,689,883	0	306,602,626	4,221,264,708
32	4,221,264,708	7,505,464	355,220,461	0	303,791,268	4,177,340,980
33	4,177,340,980	6,108,700	360,378,009	0	300,255,645	4,123,327,316
34	4,123,327,316	4,860,618	365,479,726	0	295,970,807	4,058,679,015
35	4,058,679,015	3,764,431	370,344,783	0	290,902,680	3,983,001,343
36	3,983,001,343	2,830,775	373,821,278	0	285,064,463	3,897,075,302
37	3,897,075,302	2,025,313	375,903,325	0	278,513,686	3,801,710,976
38	3,801,710,976	1,310,914	376,615,601	0	271,308,829	3,697,715,118
39	3,697,715,118	724,181	375,778,955	0	263,518,342	3,586,178,685
40	3,586,178,685	340,565	373,194,573	0	255,234,146	3,468,558,824
41	3,468,558,824	166,732	368,889,115	0	246,564,791	3,346,401,233
42	3,346,401,233	101,964	363,495,334	0	237,599,197	3,220,607,060
43	3,220,607,060	54,609	357,556,643	0	228,381,565	3,091,486,591
44	3,091,486,591	22,490	351,058,729	0	218,935,614	2,959,385,967
45	2,959,385,967	4,617	343,981,965	0	209,287,990	2,824,696,610
46	2,824,696,610	0	336,306,500	0	199,468,745	2,687,858,855
47	2,687,858,855	0	328,066,333	0	189,509,333	2,549,301,855
48	2,549,301,855	0	319,271,992	0	179,441,384	2,409,471,247
49	2,409,471,247	0	309,908,888	0	169,298,857	2,268,861,216
50	2,268,861,216	0	299,967,567	0	159,119,165	2,128,012,815

Single Discount Rate Development
Present Values of Projected Benefits ending June 30 for 2015 to 2064

Year	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Projected Benefit Payments	Unfunded Portion of Projected Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of All Benefit Payments using Single Discount Rate (SDR)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+SDR)^(a-.5)
1	$ 1,922,507,631	$ 163,813,111	$ 163,813,111	$ 0	$ 157,995,394	$ 0	$ 157,995,394
2	2,010,336,537	168,937,025	168,937,025	0	151,569,614	0	151,569,614
3	2,098,142,306	172,980,300	172,980,300	0	144,369,511	0	144,369,511
4	2,187,498,099	177,117,633	177,117,633	0	137,509,333	0	137,509,333
5	2,278,755,011	181,356,610	181,356,610	0	130,977,079	0	130,977,079
6	2,372,094,077	185,965,543	185,965,543	0	124,935,520	0	124,935,520
7	2,467,339,646	191,300,792	191,300,792	0	119,553,350	0	119,553,350
8	2,563,944,027	196,764,711	196,764,711	0	114,388,860	0	114,388,860
9	2,661,937,798	202,333,805	202,333,805	0	109,419,948	0	109,419,948
10	2,761,350,083	209,368,236	209,368,236	0	105,324,737	0	105,324,737
11	2,860,779,248	216,905,902	216,905,902	0	101,503,845	0	101,503,845
12	2,959,660,622	227,880,695	227,880,695	0	99,199,663	0	99,199,663
13	3,054,294,985	240,730,702	240,730,702	0	97,482,280	0	97,482,280
14	3,142,293,782	251,799,102	251,799,102	0	94,850,562	0	94,850,562
15	3,225,036,649	262,197,872	262,197,872	0	91,876,920	0	91,876,920
16	3,303,030,430	271,214,098	271,214,098	0	88,405,862	0	88,405,862
17	3,377,560,706	279,157,148	279,157,148	0	84,646,517	0	84,646,517
18	3,449,668,837	286,077,618	286,077,618	0	80,692,980	0	80,692,980
19	3,520,409,097	292,510,172	292,510,172	0	76,751,060	0	76,751,060
20	3,590,268,802	299,051,602	299,051,602	0	72,992,978	0	72,992,978
21	3,659,105,199	305,046,092	305,046,092	0	69,261,509	0	69,261,509
22	3,727,566,916	309,898,968	309,898,968	0	65,454,295	0	65,454,295
23	3,796,985,334	313,625,320	313,625,320	0	61,619,855	0	61,619,855
24	3,868,764,729	316,526,107	316,526,107	0	57,850,968	0	57,850,968
25	3,944,051,922	318,644,649	318,644,649	0	54,175,042	0	54,175,042
26	4,024,023,331	320,804,283	320,804,283	0	50,736,946	0	50,736,946
27	4,109,146,813	324,345,476	324,345,476	0	47,718,144	0	47,718,144
28	4,198,563,151	329,262,838	329,262,838	0	45,061,947	0	45,061,947
29	4,291,295,047	335,686,179	335,686,179	0	42,735,838	0	42,735,838
30	4,278,676,694	343,096,083	343,096,083	0	40,631,800	0	40,631,800
31	4,255,250,709	349,689,883	349,689,883	0	38,523,426	0	38,523,426
32	4,221,264,708	355,220,461	355,220,461	0	36,402,512	0	36,402,512
33	4,177,340,980	360,378,009	360,378,009	0	34,354,465	0	34,354,465
34	4,123,327,316	365,479,726	365,479,726	0	32,410,053	0	32,410,053
35	4,058,679,015	370,344,783	370,344,783	0	30,550,211	0	30,550,211
36	3,983,001,343	373,821,278	373,821,278	0	28,685,574	0	28,685,574
37	3,897,075,302	375,903,325	375,903,325	0	26,832,876	0	26,832,876
38	3,801,710,976	376,615,601	376,615,601	0	25,008,111	0	25,008,111
39	3,697,715,118	375,778,955	375,778,955	0	23,211,680	0	23,211,680
40	3,586,178,685	373,194,573	373,194,573	0	21,443,762	0	21,443,762
41	3,468,558,824	368,889,115	368,889,115	0	19,717,554	0	19,717,554
42	3,346,401,233	363,495,334	363,495,334	0	18,073,721	0	18,073,721
43	3,220,607,060	357,556,643	357,556,643	0	16,538,081	0	16,538,081
44	3,091,486,591	351,058,729	351,058,729	0	15,104,682	0	15,104,682
45	2,959,385,967	343,981,965	343,981,965	0	13,767,625	0	13,767,625
46	2,824,696,610	336,306,500	336,306,500	0	12,521,321	0	12,521,321
47	2,687,858,855	328,066,333	328,066,333	0	11,362,348	0	11,362,348
48	2,549,301,855	319,271,992	319,271,992	0	10,286,290	0	10,286,290
49	2,409,471,247	309,908,888	309,908,888	0	9,288,028	0	9,288,028
50	2,268,861,216	299,967,567	299,967,567	0	8,362,869	0	8,362,869

Single Discount Rate Development
Present Values of Projected Benefits ending June 30 for 2065 to 2114 (concluded)

Year	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Projected Benefit Payments	Unfunded Portion of Projected Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of All Benefit Payments using Single Discount Rate (SDR)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+SDR)^(a-.5)
51	$ 2,128,012,815	$ 289,448,103	$ 289,448,103	$ 0	$ 7,506,600	$ 0	$ 7,506,600
52	1,987,507,596	278,358,964	278,358,964	0	6,715,360	0	6,715,360
53	1,847,961,948	266,719,274	266,719,274	0	5,985,632	0	5,985,632
54	1,710,018,665	254,560,310	254,560,310	0	5,314,199	0	5,314,199
55	1,574,336,318	241,923,181	241,923,181	0	4,698,034	0	4,698,034
56	1,441,580,249	228,858,917	228,858,917	0	4,134,263	0	4,134,263
57	1,312,412,793	215,428,172	215,428,172	0	3,620,131	0	3,620,131
58	1,187,483,070	201,700,570	201,700,570	0	3,152,974	0	3,152,974
59	1,067,416,697	187,756,043	187,756,043	0	2,730,227	0	2,730,227
60	952,803,341	173,683,807	173,683,807	0	2,349,393	0	2,349,393
61	844,184,388	159,582,434	159,582,434	0	2,008,043	0	2,008,043
62	742,039,628	145,558,725	145,558,725	0	1,703,796	0	1,703,796
63	646,774,101	131,726,559	131,726,559	0	1,434,314	0	1,434,314
64	558,705,156	118,203,976	118,203,976	0	1,197,277	0	1,197,277
65	478,051,552	105,109,689	105,109,689	0	990,368	0	990,368
66	404,925,373	92,559,109	92,559,109	0	811,269	0	811,269
67	339,327,449	80,660,582	80,660,582	0	657,656	0	657,656
68	281,146,336	69,511,924	69,511,924	0	527,215	0	527,215
69	230,160,814	59,196,654	59,196,654	0	417,655	0	417,655
70	186,046,478	49,779,740	49,779,740	0	326,711	0	326,711
71	148,387,230	41,304,540	41,304,540	0	252,174	0	252,174
72	116,690,814	33,790,571	33,790,571	0	191,907	0	191,907
73	90,407,815	27,232,941	27,232,941	0	143,874	0	143,874
74	68,952,686	21,603,638	21,603,638	0	106,171	0	106,171
75	51,725,009	16,854,077	16,854,077	0	77,050	0	77,050
76	38,129,706	12,918,799	12,918,799	0	54,939	0	54,939
77	27,594,938	9,719,585	9,719,585	0	38,450	0	38,450
78	19,587,079	7,170,135	7,170,135	0	26,386	0	26,386
79	13,621,955	5,180,656	5,180,656	0	17,735	0	17,735
80	9,272,183	3,662,047	3,662,047	0	11,661	0	11,661
81	6,170,706	2,529,541	2,529,541	0	7,493	0	7,493
82	4,010,824	1,705,311	1,705,311	0	4,699	0	4,699
83	2,543,532	1,120,674	1,120,674	0	2,873	0	2,873
84	1,572,357	717,056	717,056	0	1,710	0	1,710
85	946,825	446,245	446,245	0	990	0	990
86	555,160	269,954	269,954	0	557	0	557
87	316,902	158,708	158,708	0	305	0	305
88	176,118	90,687	90,687	0	162	0	162
89	95,301	50,387	50,387	0	84	0	84
90	50,206	27,229	27,229	0	42	0	42
91	25,739	14,326	14,326	0	21	0	21
92	12,816	7,348	7,348	0	10	0	10
93	6,159	3,676	3,676	0	5	0	5
94	2,809	1,776	1,776	0	2	0	2
95	1,178	809	809	0	1	0	1
96	428	327	327	0	0	0	0
97	121	103	103	0	0	0	0
98	24	21	21	0	0	0	0
99	4	3	3	0	0	0	0
100	1	1	1	(0)	0	(0)	0
				Totals	$ 3,209,357,963	$ 0	$ 3,209,357,963

Single Discount Rate Development
Projection of Contributions ending June 30 for 2015 to 2114

Year	Projected Payroll for Current Employees	Projected Contributions from Current Employees	Projected Service Cost and Expense Contributions	Projected UAL Contributions	Projected Total Contributions
0	$ 1,297,536,507				
1	1,254,481,272	$ 37,634,438	$ 34,869,506	$ 36,951,560	$ 109,455,504
2	1,206,192,574	36,185,777	33,680,853	38,337,243	108,203,874
3	1,164,471,019	34,934,131	32,681,549	39,774,890	107,390,569
4	1,127,645,988	33,829,380	31,801,998	41,266,448	106,897,826
5	1,093,002,964	32,790,089	30,939,783	42,813,940	106,543,812
6	1,059,054,874	31,771,646	30,048,617	44,419,463	106,239,726
7	1,026,012,261	30,780,368	29,130,244	46,085,193	105,995,805
8	993,768,103	29,813,043	28,185,326	47,813,388	105,811,756
9	961,975,724	28,859,272	27,194,807	49,606,390	105,660,468
10	929,864,585	27,895,938	26,157,482	51,466,629	105,520,049
20	584,642,477	17,539,274	13,825,301	74,371,541	105,736,116
30	219,338,592	6,580,158	4,417,730	0	10,997,888
40	6,569,555	197,087	143,479	0	340,565
50	0	0	0	0	0
60	0	0	0	0	0
70	0	0	0	0	0
80	0	0	0	0	0
90	0	0	0	0	0
100	0	0	0	0	0

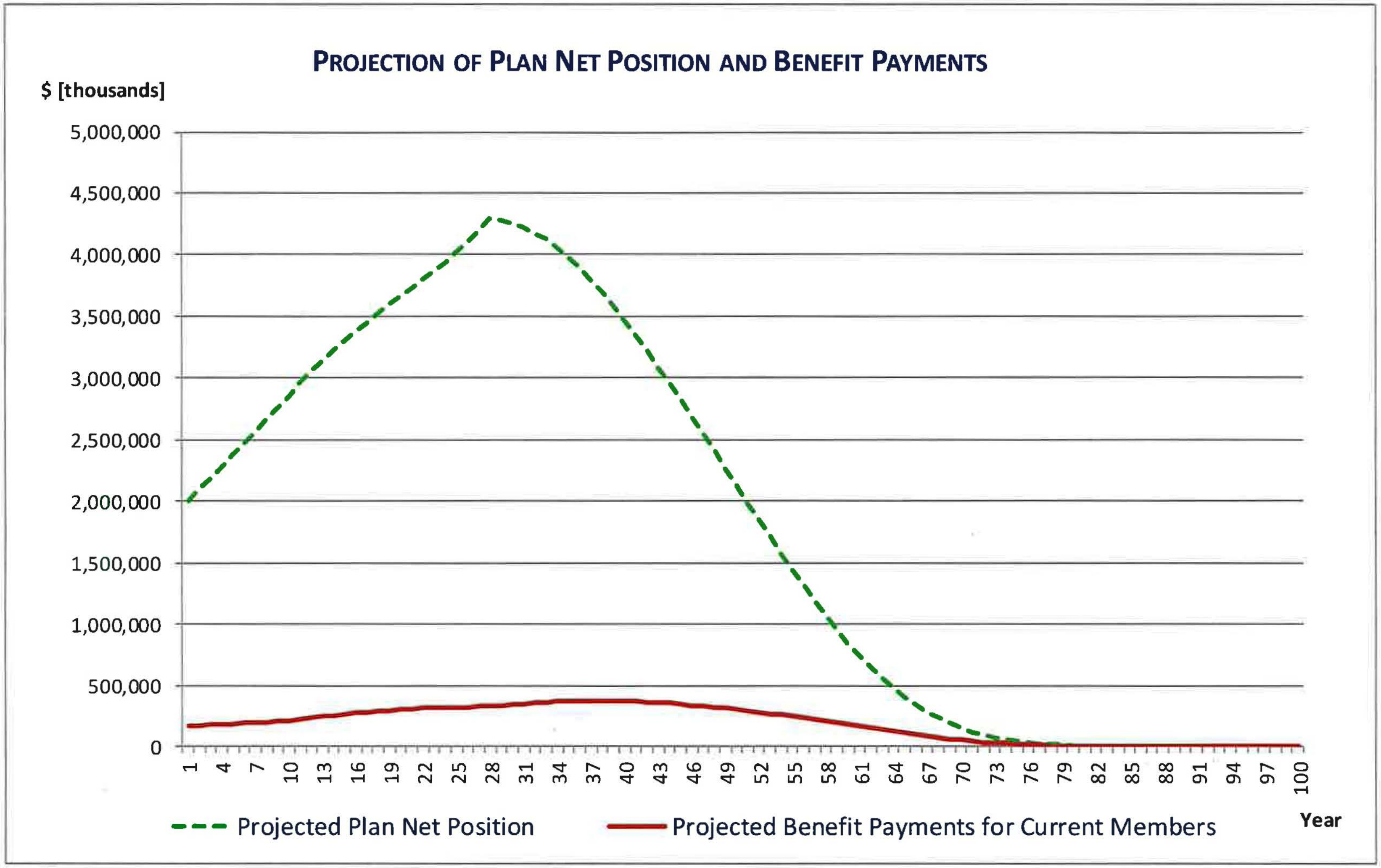
Single Discount Rate Development
Projection of Plan Net Position ending June 30 for 2015 to 2114

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.500%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
1	$ 1,922,507,631	$ 109,455,504	$ 163,813,111	$ 0	$ 142,186,513	$ 2,010,336,537
2	2,010,336,537	108,203,874	168,937,025	0	148,538,920	2,098,142,306
3	2,098,142,306	107,390,569	172,980,300	0	154,945,523	2,187,498,099
4	2,187,498,099	106,897,826	177,117,633	0	161,476,719	2,278,755,011
5	2,278,755,011	106,543,812	181,356,610	0	168,151,864	2,372,094,077
6	2,372,094,077	106,239,726	185,965,543	0	174,971,386	2,467,339,646
7	2,467,339,646	105,995,805	191,300,792	0	181,909,367	2,563,944,027
8	2,563,944,027	105,811,756	196,764,711	0	188,946,726	2,661,937,798
9	2,661,937,798	105,660,468	202,333,805	0	196,085,623	2,761,350,083
10	2,761,350,083	105,520,049	209,368,236	0	203,277,351	2,860,779,248
20	3,590,268,802	105,736,116	299,051,602	0	262,151,884	3,659,105,199
30	4,278,676,694	10,997,888	343,096,083	0	308,672,210	4,255,250,709
40	3,586,178,685	340,565	373,194,573	0	255,234,146	3,468,558,824
50	2,268,861,216	0	299,967,567	0	159,119,165	2,128,012,815
60	952,803,341	0	173,683,807	0	65,064,854	844,184,388
70	186,046,478	0	49,779,740	0	12,120,493	148,387,230
80	9,272,183	0	3,662,047	0	560,570	6,170,706
90	50,206	0	27,229	0	2,763	25,739
100	1	0	1	0	0	0

Single Discount Rate Development
Present Values of Projected Benefits ending June 30 for 2015 to 2114

Year	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Projected Benefit Payments	Unfunded Portion of Projected Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of All Benefit Payments using Single Discount Rate (SDR)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+SDR)^(a-.5)
1	$ 1,922,507,631	$ 163,813,111	$ 163,813,111	$ -	$ 157,995,394	$ -	$ 157,995,394
2	2,010,336,537	168,937,025	168,937,025	-	151,569,614	-	151,569,614
3	2,098,142,306	172,980,300	172,980,300	-	144,369,511	-	144,369,511
4	2,187,498,099	177,117,633	177,117,633	-	137,509,333	-	137,509,333
5	2,278,755,011	181,356,610	181,356,610	-	130,977,079	-	130,977,079
6	2,372,094,077	185,965,543	185,965,543	-	124,935,520	-	124,935,520
7	2,467,339,646	191,300,792	191,300,792	-	119,553,350	-	119,553,350
8	2,563,944,027	196,764,711	196,764,711	-	114,388,860	-	114,388,860
9	2,661,937,798	202,333,805	202,333,805	-	109,419,948	-	109,419,948
10	2,761,350,083	209,368,236	209,368,236	-	105,324,737	-	105,324,737
20	3,590,268,802	299,051,602	299,051,602	-	72,992,978	-	72,992,978
30	4,278,676,694	343,096,083	343,096,083	-	40,631,800	-	40,631,800
40	3,586,178,685	373,194,573	373,194,573	-	21,443,762	-	21,443,762
50	2,268,861,216	299,967,567	299,967,567	-	8,362,869	-	8,362,869
60	952,803,341	173,683,807	173,683,807	-	2,349,393	-	2,349,393
70	186,046,478	49,779,740	49,779,740	-	326,711	-	326,711
80	9,272,183	3,662,047	3,662,047	-	11,661	-	11,661
90	50,206	27,229	27,229	-	42	-	42
100	1	1	1	(0)	0	(0)	0
				Totals[1]	$ 3,209,357,963	$ 0	$ 3,209,357,963

[1] *These totals are values that are summed over a period of 100 years. However, only select values from this 100-year period are shown above.*



PROJECTION OF PLAN NET POSITION AND BENEFIT PAYMENTS
$ [thousands]
5,000,000
4,500,000
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
1
4
7
10
13
16
19
22
25
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31
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37
40
43
46
49
52
55
58
61
64
67
70
73
76
79
82
85
88
91
94
97
100
Year
Projected Plan Net Position
Projected Benefit Payments for Current Members

SECTION H

GLOSSARY OF TERMS

Glossary of Terms

Accrued Service	Service credited under the system that was rendered before the date of the actuarial valuation.
Actuarial Accrued Liability (AAL)	The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the Actuarial Accrued Liability and the present value of future normal costs. The AAL may also be referred to as "accrued liability" or "actuarial liability."
Actuarial Assumptions	These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation.
Actuarial Cost Method	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method.
Actuarial Equivalent	A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.
Actuarial Gain (Loss)	The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities.
Actuarial Present Value (APV)	The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future payments at predetermined rates of interest and probabilities of payment.
Actuarial Valuation	The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions.
Actuarial Valuation Date	The date as of which an actuarial valuation is performed.
Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)	A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the Actuarially Determined Contribution has a normal cost payment and an amortization payment.

Glossary of Terms

Amortization Method	The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be "open" (meaning, reset each year) or "closed" (the number of years remaining will decline each year).
Amortization Payment	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
Cost-of-Living Adjustments	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)	A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.
Covered-Employee Payroll	The payroll of employees that are provided with pensions through the pension plan.
Deferred Inflows and Outflows	The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.
Deferred Retirement Option Program (DROP)	A program that permits a plan member to elect a calculation of benefit payments based on service credits and salary, as applicable, as of the DROP entry date. The plan member continues to provide service to the employer and is paid for the service by the employer after the DROP entry date; however, the pensions that would have been paid to the plan member are credited to an individual member account within the defined benefit pension plan until the end of the DROP period. Other variations for DROP exist and will be more fully detailed in the plan provision section of the valuation report.

Glossary of Terms

Discount Rate

For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically:

1. The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and
2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

Entry Age Actuarial Cost Method (EAN)

The EAN is a cost method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit ages(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.

Fiduciary Net Position

The fiduciary net position is the market value of the assets of the trust dedicated to the defined benefit provisions.

GASB

The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.

Money-Weighted Rate of Return

The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.

Multiple-Employer Defined Benefit Pension Plan

A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.

Municipal Bond Rate

The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted.

Net Pension Liability (NPL)

The NPL is the liability of employers and non-employer contributing entities to plan members for benefits provided through a defined benefit pension plan.

Glossary of Terms

Other Postemployment Benefits (OPEB) — All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits regardless of the manner in which they are provided. Other post-employment benefits do not include termination benefits.

Real Rate of Return — The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.

Service Cost — The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.

Total Pension Expense — The total pension expense is the sum of the following items that are recognized at the end of the employer's fiscal year:

1. Service Cost
2. Interest on the Total Pension Liability
3. Current-Period Benefit Changes
4. Employee Contributions (made negative for addition here)
5. Projected Earnings on Plan Investments (made negative for addition here)
6. Pension Plan Administrative Expense
7. Other Changes in Plan Fiduciary Net Position
8. Recognition of Outflow (Inflow) of Resources due to Liabilities
9. Recognition of Outflow (Inflow) of Resources due to Assets

Total Pension Liability (TPL) — The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.

Unfunded Actuarial Accrued Liability (UAAL) — The UAAL is the difference between actuarial accrued liability and valuation assets.

Valuation Assets — The valuation assets are the assets used in determining the unfunded liability of the plan. For purposes of GASB Statement Nos. 67 and 68, the valuation assets are equal to the market value of assets.

GRS Retirement Consulting

800.521.0498 | P: 248.799.9000 | F: 248.799.9020 | www.grsconsulting.com

September 6, 2017

Ms. Harmon
ABC State Employees Retirement System
101 Main St.
Suite 500
Room M
Newton, CA 95122

Dear Ms. Harmon:

Please find enclosed copies of the GASB Statement Nos. 67 and 68 Accounting and Financial Reporting for Pensions report of the ABC State Employees Retirement System.

Sincerely,

Ingrid Sharpe, EA, MAAA

SRW
Enclosures

One Towne Square | Suite 800 | Southfield, Michigan 48076-3723

Appendix E
Statement of Professional
Liability Insurance

APPENDIX E

STATEMENT OF PROFESSIONAL LIABILITY INSURANCE

GABRROE-01 SHERCEG

ACORD

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 07/02/2018

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
Southfield / AssuredPartners NL
3000 Town Center, Suite 1850
Southfield, MI 48075

CONTACT NAME: Malissa Herceg
PHONE (A/C, No, Ext): (248) 827-5600 FAX (A/C, No): (248) 827-3733
E-MAIL ADDRESS:

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Continental Insurance Company	35289
INSURER B : National Fire Insurance Co of Hartford	20478
INSURER C : Travelers Indemnity Co of America	25666
INSURER D : Hudson Specialty Insurance Co	37079
INSURER E : Travelers Casualty & Surety Co of America	31194
INSURER F :	

INSURED
Gabriel, Roeder, Smith & Co. Holdings, Inc.
One Towne Square, Suite 800
Southfield, MI 48076

COVERAGES CERTIFICATE NUMBER: REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY; CLAIMS-MADE; X OCCUR; GEN'L AGGREGATE LIMIT APPLIES PER: POLICY; PRO-JECT; X LOC; OTHER:	X	X	6017079918	06/30/2018	06/30/2019	EACH OCCURRENCE	$ 1,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 1,000,000
							MED EXP (Any one person)	$ 15,000
							PERSONAL & ADV INJURY	$ 1,000,000
							GENERAL AGGREGATE	$ 2,000,000
							PRODUCTS - COMP/OP AGG	$ 2,000,000
							EBL AGGREGATE	$ 1,000,000
	AUTOMOBILE LIABILITY; ANY AUTO; OWNED AUTOS ONLY; SCHEDULED AUTOS; X HIRED AUTOS ONLY; X NON-OWNED AUTOS ONLY			6017079904	06/30/2018	06/30/2019	COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
							BODILY INJURY (Per person)	$
							BODILY INJURY (Per accident)	$
							PROPERTY DAMAGE (Per accident)	$
								$
A	UMBRELLA LIAB; X OCCUR; X EXCESS LIAB; CLAIMS-MADE; DED; RETENTION $			6017079899	06/30/2018	06/30/2019	EACH OCCURRENCE	$ 4,000,000
							AGGREGATE	$ 4,000,000
								$
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y/N; ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH); If yes, describe under DESCRIPTION OF OPERATIONS below	N/A	X	UB-9H841052-18-42-E	06/30/2018	06/30/2019	PER STATUTE; OTH-ER	
							E.L. EACH ACCIDENT	$ 1,000,000
							E.L. DISEASE - EA EMPLOYEE	$ 1,000,000
							E.L. DISEASE - POLICY LIMIT	$ 1,000,000
D	Professional Liabili			EMB 11989 7	06/30/2018	06/30/2019	Limit	2,000,000
E	Cyber Risk/Internet			106298251	06/30/2018	06/30/2019	Limit	2,500,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Additional Named Insured's:
Gabriel, Roeder, Smith & Co.
Gabriel, Roeder, Smith & Company Health & Welfare Consulting, LLC
Kruse O'Connor & Ling, Inc.

A $250,000 per claim retention applies on the Professional Liability.

SEE ATTACHED ACORD 101

CERTIFICATE HOLDER

FOR INFORMATIONAL PURPOSES ONLY

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Maureen Gallagher

AGENCY CUSTOMER ID: GABRROE-01 SHERCEG
LOC #: 1

ACORD

ADDITIONAL REMARKS SCHEDULE

AGENCY Southfield / AssuredPartners NL		NAMED INSURED Gabriel, Roeder, Smith & Co. Holdings, Inc. One Towne Square, Suite 800 Southfield, MI 48076
POLICY NUMBER SEE PAGE 1		
CARRIER SEE PAGE 1	NAIC CODE SEE P 1	EFFECTIVE DATE: SEE PAGE 1

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,
FORM NUMBER: ACORD 25 FORM TITLE: Certificate of Liability Insurance

Description of Operations/Locations/Vehicles:
Crime Policy: 6/30/18-6/30/19
Carrier: National Union Fire
Policy #01-565-69-13
$5,000,000 Employee Theft, $25,000 Deductible
$250,000 Forgery or alteration
$225,000 Theft of Money & Securities Inside Premises
$225,000 Outside Premises
$500,000 Computer Fraud
$500,000 Funds Transfer Fraud
$1,000 Deductible

3rd Party Crime Coverage
$500,000 limit of liability
$5,000 deductible

*3rd Party Crime coverage included coverage for loss or damage to Money, Securities and Other Property sustained by the Insured's Client resulting directly from Theft committed by an identified employee, acting alone or in collusion with other persons.

Cyber Liability Coverage Continued:
Third Party Insuring Agreements:
Network and Information Security - $5,000,000/each Claim - $25,000 deductible
Communitcation and Media Liability - $5,000,000/each Claim - $25,000 deductible
Regulatory Defense Expenses - $5,000,000/each claim - $25,000 deductible

First Party Insuring Aggreements:
Crisis Event Management Event Expenses - $2,500,000/each single first party insured event - Deductible $25,000
Security Breach Remediation and Notification Expenses- $2,500,000/each single first party insured event - Deductible $25,000

Computer Program and Electronic Data Restoration Expenses - $2,500,000/each single first party insured event - Deductible $25,000
Computer Fraud - $2,500,000/each single first party insured event - Deductible $25,000
Funds Transfer Fraud - $2,500,000/each single first party insured event - Deductible $25,000
E-Commerce Extortion - $2,500,000/each single first party insured event - Deductible $25,000
Business Interruption and Additional Expenses - $2,500,000/each single first party insured event - Waiting period 12 hours

Blanket Additional Insured and Waiver of Subrogation included on the General Liability per written contract or agreement.

Blanket Waiver of Subrogation by written contract included on the Workers' Compensation policy.

60 day written notice of cancellation - 10 days for non-payment of premium.

Cancellation Notice (Other than Named Insured) as required by contract - General Liability, Auto Liability & Workers Compensation policies can be endorsed to provide 30 days written notice of cancellation- 10 days for non-payment of premium.

Primary and Non-contributory status as required by written contract

Contractual Liability:
An insured contract is that part of any contract or agreement pertaining to GRS under which GRS assumes the tort liability of another party to pay for "BI or "PD to a 3rd person / org, provided the "BI or "PD is caused, in whole or in part, by GRS or by those acting on the behalf of GRS. Tort liability means a liability that would be imposed by law in the absence of any contract or agreement. For further clarification of the contractual liability coverage, a copy of the policy form is available upon request.

APPENDIX F

GRS TECHNOLOGY TOOLS

GRS Technology

GRS' technology is designed around the following principles:

- Our clients should receive the highest quality valuation work available in the industry
- The presentation of results should facilitate an informed decision making process
- Clients should have access to the most up-to date analytical and administrative software that helps them manage their benefit plans

As the public sector leader, our consultants' significant pension experience and our talented software engineers turn these principles into reality. GRS' technology group creates the industry's best tools for use both internally by GRS associates and externally by our clients. These tools range from valuation software to pension administration platforms, from projection models to executive dashboards, and from benefit calculators to liability (cost) estimate generators. Different from the private sector where all pension plans are valued similarly and have similar funding provisions, public sector retirement systems are all unique, with great variety in benefit provisions and funding sources. Our technology products allow us to better meet our clients' specific needs at an extremely reasonable cost without relying on external contractors.

For example, our first two principles are realized because GRS develops and maintains its own valuation system, ValPlex™. Our experience has taught us that valuation software can only be an effective consulting and advisory tool when it has the capability to model benefits in a flexible and comprehensive manner. Because GRS has served over 1000 actuarial clients, it is likely that nearly every benefit provision used in the country has already been modeled in our software.

Our commitment to maintaining our software is evidenced by our investment in GRS' Client Software Services (CSS) group, which dedicates 100% of its time developing and maintaining GRS' software. In addition to valuation software, this group also develops software that our clients can use for funding analysis, plan design and plan administration, which fulfills our third principle. We also have a committee of actuaries that oversee the work of the CSS group. The continual investments and attention we give to our software products is for the benefit of our clients.

These benefits include:

- Up-to-date compliance with actuarial standards of practice and regulatory requirements
- Timely integration of new benefit designs as they emerge
- Confidence that quality of valuation reports and studies will result in appropriate funding and benefit policy decisions
- A robust offering of analytical and administrative software that can be tailored to the client's operational needs

ValPlex™ Capabilities*	
Plan Structure	**Funding & Accounting Analysis**
Traditional Defined Benefit	GASB 67/68 Compliant
DB and DC Hybrids	GASB 43/45 Compliant
Cash Balance Plans	Solvency Valuation
Risk-Sharing Variable Annuity Plans	Entry-Age Normal Method
Deferred Retirement Option Plans	Projected Unit Credit Method
Excess Benefit Plans	Aggregate Method
	Statutory Funding
Benefit Features	**Assumption Setting Features**
Tiered Multipliers	Experience Study Module
Joint & Survivor Options	Gain/Loss Analysis by Source
COLAs	
Lump Sum Payout Options	
Service Purchase Credit	
Early Retirement Windows	**Chart is illustrative and does not mention every capability.*

Client Software*	
Administrative	**Actuarial & Analytical**
Web-Based Benefit Estimators	MagVal™ Projection Suite
Minute Master	Service Purchase Credit Calculator
	§415 Screening Tool
**Client software is sold separately from regular valuation services*	

ValPlex™: Valuation Technology for the Public Sector

A unique aspect of public sector plans is the diversity and number of different plan design structures and features. We have integrated nearly every benefit design found in the public sector today into ValPlex™, our core valuation software. This makes ValPlex™ exceptionally well-suited for public sector benefit valuations and analysis.

Of particular note is the fact that no firm in the industry, other than GRS, has been willing to develop pension valuation software specifically for the public sector. We believe our commitment to doing so is a testament to the importance GRS places on benefits for public sector employees and retirees.

A key strength of GRS' software development process is the input of our consultants. We have over 50 credentialed actuaries providing services to public plans, so our consultants are a continual source of suggestions and updates for our software. When a consultant informs our programmers of a client specific need, we are able to modify the software quickly—often in a matter of hours. This agility is particularly critical for legislative proposals and bargaining group negotiations, both of which are nearly always time sensitive situations.

Analytical Tools and Software for Benefit and Funding Policy

We also place deeper analytical capabilities into the hands of our actuaries and clients through complementary software applications like GRS' Capital Market Assumption Modeler (CMAM) and MagVal™ Projection Suite.

Capital Market Assumption Modeler (CMAM)

The investment return assumption is the most important and perhaps most debated assumption used in the actuarial valuation process. It is critical for GRS consulting teams to present clients with information in a complete and unbiased manner so that policymakers can make fully informed decisions. GRS' CMAM tool helps our clients accomplish this goal.

Below are tables, illustrating the output of the model, that are useful in discussing the results with our clients.

In this example, GRS is using the capital market assumptions from ten different investment consulting firms to identify the expected one-year return as well as the volatility (i.e., standard deviation) associated with the return expectation.

Investment Consultant	Investment Consultant Expected Nominal Return	Investment Consultant Inflation Assumption	Expected Real Return (2)–(3)	Actuary Inflation Assumption	Expected Nominal Return (4)+(5)	Plan Incurred Administrative Expenses	Expected Nominal Return Net of Expenses (6)-(7)	Standard Deviation of Expected Return (1-Year)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	7.02%	2.50%	4.52%	2.50%	7.02%	0.20%	6.82%	13.71%
2	7.18%	2.25%	4.93%	2.50%	7.43%	0.20%	7.23%	12.95%
3	7.27%	2.25%	5.02%	2.50%	7.52%	0.20%	7.32%	13.61%
4	6.71%	1.56%	5.15%	2.50%	7.65%	0.20%	7.45%	11.87%
5	7.39%	2.20%	5.19%	2.50%	7.69%	0.20%	7.49%	12.50%
6	7.49%	2.00%	5.49%	2.50%	7.99%	0.20%	7.79%	14.10%
7	7.94%	2.26%	5.68%	2.50%	8.18%	0.20%	7.98%	12.91%
8	8.09%	2.20%	5.89%	2.50%	8.39%	0.20%	8.19%	14.23%
Average	**7.39%**	**2.15%**	**5.23%**	**2.50%**	**7.73%**	**0.20%**	**7.53%**	**13.24%**

GRS Technology

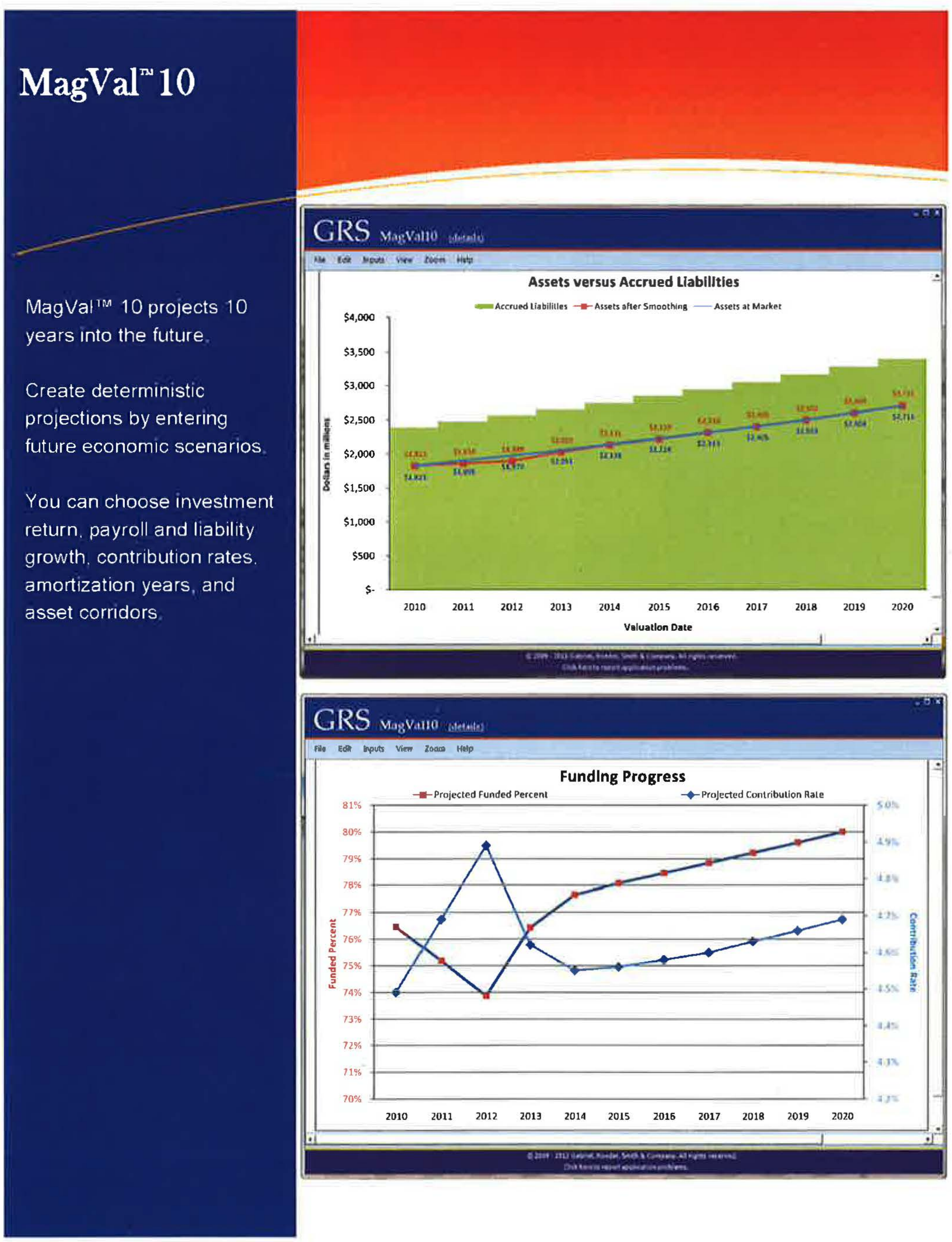
The second table provides the expected average return the plan will earn over the next 20 years as well as the probability that the plan will exceed its current investment return assumption.

Clients find this process invaluable when discussing and identifying an appropriate valuation interest rate assumption, as well as being a methodology that is able to withstand rigorous scrutiny from outside constituents.

Investment Consultant	Distribution of 20-Year Average Geometric Net Nominal Return			Probability of Exceeding	Probability of Exceeding	Probability of Exceeding	Probability of Exceeding
	40th	50th	60th	7.50%	7.25%	7.00%	6.75%
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	5.18%	5.95%	6.72%	30.56%	33.47%	36.49%	39.61%
2	5.73%	6.46%	7.19%	35.86%	39.14%	42.51%	45.94%
3	5.70%	6.46%	7.23%	36.57%	39.71%	42.93%	46.20%
4	6.13%	6.80%	7.47%	39.52%	43.20%	46.95%	50.73%
5	6.07%	6.77%	7.47%	39.60%	43.10%	46.66%	50.26%
6	6.09%	6.88%	7.67%	42.12%	45.27%	48.45%	51.66%
7	6.49%	7.21%	7.94%	46.00%	49.48%	52.97%	56.45%
8	6.47%	7.26%	8.06%	47.00%	50.17%	53.34%	56.50%
Average	**5.99%**	**6.72%**	**7.47%**	**39.65%**	**42.94%**	**46.29%**	**49.67%**

MagVal™ Suite

GRS provides further valuation insights through projection technologies. Valuation results produced through ValPlex™ are incorporated into our MagVal™ Projection Suite products. This provides our clients with benefit design and cost studies that not only reflect the unique nature of public sector benefit plans, but the client's unique plan features.

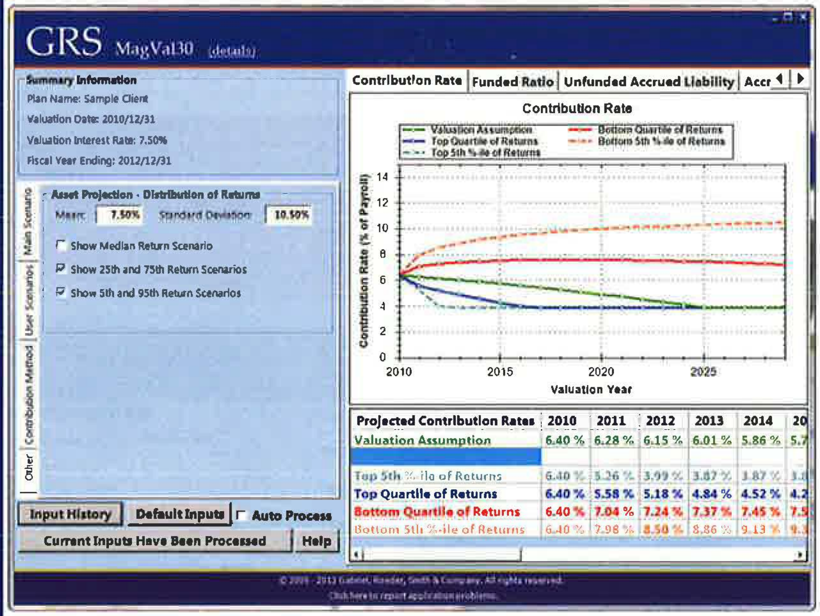


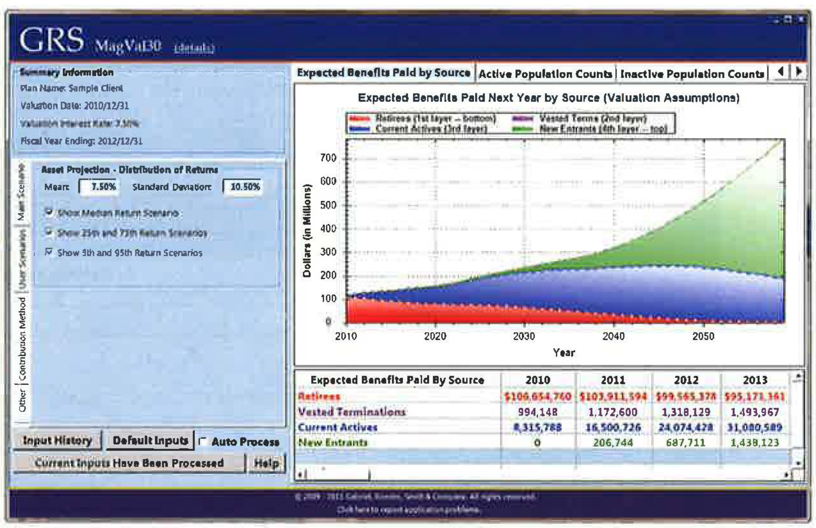
MagVal™ 30

MagVal™ 30 projection results span decades.

You can produce a probable range of projected outcomes based on varying economic scenarios that the software generates using statistical techniques.

Clients can use the results for budget forecasts, risk management strategies, and to gain insight on the impact of future realized rates of return and inflation.

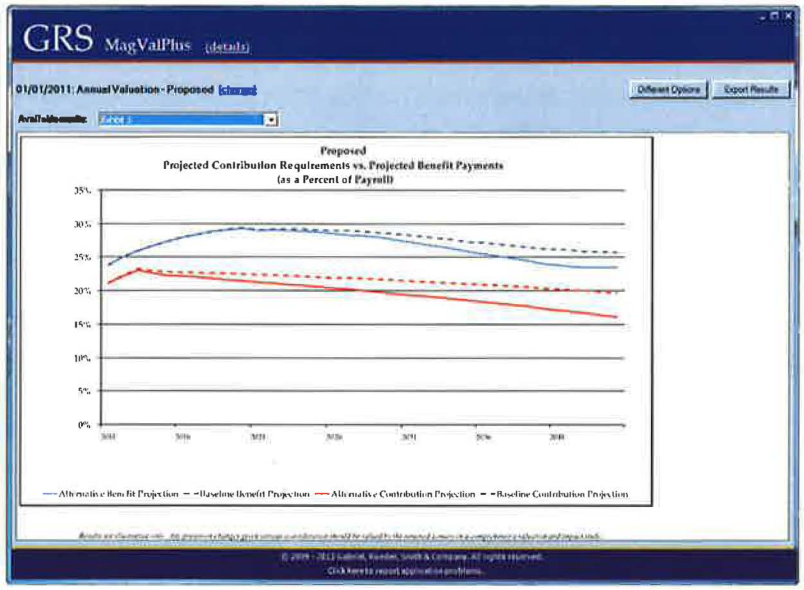


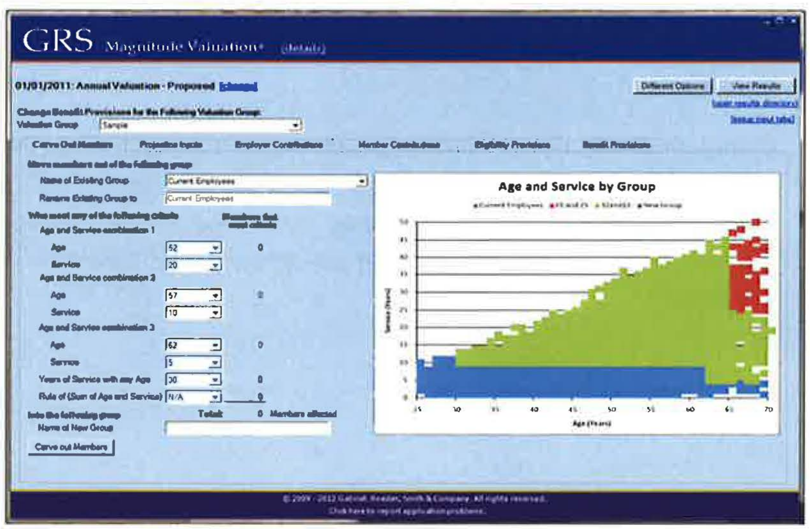


MagVal™ Plus

You can use MagVal™ Plus for plan design studies and risk modeling exercises.

The software values benefit and assumption changes. The effect of the changes can be broken out by retirees, active members, and future new hires.





GRS Technology

City of Seattle Retirement Inter-Departmental Team: MagValTM Plus, GRS benefit design projection tool, was recently used by the City of Seattle Retirement Inter-Departmental Team ("IDT") to develop five alternative benefit designs for the Seattle City Employees' Retirement System. These five alternative benefit designs increase the long-term sustainability of the System and continue to provide meaningful benefits to long-service employees.

The MagVal Plus projection tool provided to the IDT included all main benefit parameters as user inputs (eligibility, benefit multipliers, early retirement factors, COLA, etc.). MagVal Plus allowed members of the IDT team to determine the cost savings, both short and long-term, of these individual benefit changes in real-time. Members of the IDT were able to quickly identify the interaction between benefit provisions and which provision changes provided meaningful savings.

<u>ValPlex™ Specialty Modules</u>

To further demonstrate the robust nature of ValPlex™, we describe some of the unique specialty modules that our consultants have access to.

1. ValPlex™ has sophisticated actuarial gain/loss software to track differences between the actual experience and the expected experience based on the actuarial assumptions. These annual gain/loss analyses will identify any recurring patterns and, therefore, by the time the experience study is performed there should be no surprises in the changes being recommended.

2. A distinguishing feature of ValPlex™, which has been used to research termination and retirement assumptions for clients of all sizes, relates to the methodology of basing termination expectations on years of retirement eligibility instead of solely on age. The results of our research are being utilized in the valuations of GRS clients today.

3. ValPlex™ allows GRS actuaries to examine the annual reconciliation of data with unmatched efficiency and truly understand how the liabilities of an actuarial valuation are affected by the methodologies used to set the assumptions. The software allows the actuary to examine the data for several parameters giving the actuary the ability to set the assumptions based on the most appropriate methodologies for the client.