Public Employees Retirement System of Ohio

Proposal for Actuarial Audit

Boomershine Consulting Group

Greg Stump, Vice President
Executive Center 1
3300 North Ridge Road, Suite 300
Ellicott City, MD 21043
Tel: 410-418-5591 | Fax: 410-418-5644
www.boomershineconsulting.com

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4.1 Proposal Summary

We understand that you seek a fee quote for actuarial auditing services.

The Ohio Retirement Study Council (ORSC) is currently seeking an actuarial firm to prepare an actuarial audit of the Public Employees Retirement System (PERS, the System).

An actuarial audit for the PERS is a prudent action, and we commend ORSC for starting the process. At face value, the System appears to be well funded based on the actuary's calculations. It is the actuarial auditor's job to determine if this is a true and justifiable statement. We do this by digging deeper than just a few summary statistics (funding ratio, contribution levels, etc.). Boomershine Consulting Group (BCG) has the experience, expertise, and resources to conduct a thorough audit for the System.

Our proposal approach will address all of the major areas of concern for the System. We will assess data validity and reliability, as well as appropriateness of the actuary's assumptions and methods. We will also conduct a full valuation of the pension and retiree healthcare benefits for comparison to the System actuary's figures. Our approach is both efficient and robust, and will be of great value to PERS and the State of Ohio.

Please refer to our proposal project outline and schedule in Section 4.5 for more details. We would be happy to discuss the advantages of this approach with the ORSC and PERS. Please feel free to contact Greg Stump with any questions at (410) 418-5591 or gstump@boomershineconsulting.com.



4.2 Capabilities and Experience

Experience

Our senior actuary, Greg Stump has extensive experience with actuarial audits, including his work with the following:

- 1. New Jersey Police and Fire Retirement System (Current); 65,000 members
- 2. City of Philadelphia Municipal Retirement System (2013); 65,000 members
- 3. California Public Employees' Retirement System (2005-2012); 1,600,000 members
- 4. Connecticut Governor's Post-Employment Benefits Commission (2010); 100,000 members

All of the above are multi-billion dollar retirement systems. Mr. Stump's capacity in each assignment was different, with (1) and (3) being full scope actuarial audits, wherein the valuations were fully replicated and the plan actuary's work thoroughly reviewed. For (2) and (4), the audits were more limited in scope, but still very valuable to the stakeholders.

In each case, a set of recommendations was made and provided in written report and/or board presentation format. The audits served not only as a review of the actuary's work for accuracy and completeness, but a review of what could be done differently with the intent of strengthening the funding of the system.

BCG's senior actuaries, Dave Boomershine and Greg Stump, each have many years of experience in working with both public and private pension systems. Their expertise in assumption development, cost methods, and overall plan funding, is a valuable asset for an actuarial audit. They have frequently been asked to review reports completed by other actuaries to identify any possible areas of concern. This is a form of a limited scope audit.

Our expertise in actuarial modeling also allows us to create customized projection models which are used to estimate contributions and funding progress over decades of time under a large variety of scenarios. More importantly, we are able to understand and articulate in plain English, the factors that influence pension plan funding over time.

Resources

In addition to our customized funding projection models, we have several technical resources that allow us to thoroughly evaluate actuarial calculations. One of these tools is our investment return simulation model. Based on inputs from many investment consultants/experts, we can model any asset mix over a given period of time to determine the probability of a specific return (e.g., what is the probability the fund's compound investment return will be less than 7% over the next 10 years?)



Another significant resource we have is a secondary valuation software system, completely independent from our primary system. The combination of the two systems is used specifically for full scope actuarial audits. We run the valuation on each system and compare our own internal calculations to each other. This tremendously increases the reliability of our calculations, which can then be compared to the plan actuary's work. Each system is capable of quickly processing over 400,000 records.

Quality and Experience of Actuarial Team

BCG offers an experienced actuarial consulting team with a long history (8+ years) of working together. We operate a small office, and all staff members work together on a frequent, often daily basis. We have robust data processing and auditing capabilities, and provide full actuarial services to many public sector plans.

Company Background

Boomershine Consulting Group (BCG) is a Maryland Limited Liability Company (LLC) founded in April 2007, by David S. Boomershine. The first priority of the new firm was the acquisition of Yaffe & Company's Actuarial Division, which had been providing actuarial consulting services in the mid-Atlantic region for over 25 years. Therefore, the acquired firm has been in existence for about 30 years.

Our primary business is actuarial consulting to public and private pension and retiree healthcare systems. BCG also provides benefit communication services – including detailed individualized annual employee benefit statements. We currently have 12 employees, including three credentialed actuaries. Our proposed team for the Town is shown in our response to 2(c) below.

Our team model is simple – we are all client consultants, here only to help clients with their actuarial and retirement plan needs. This cost effectiveness is passed on to our clients. The message is also simple – our focus is our clients.

BCG has established a set of principles as the foundation for the services that we provide to our clients. This is summarized in our Mission Statement:

We strive to provide independent, innovative and professional actuarial and retirement plan services of the highest standards. Our clients are our focus. We pledge to listen and respond in a timely manner and cost-effective basis.

The translation of these principles is that we simply take great pride in our:

Independence – We provide objective solutions, based on sound actuarial principles and impartial advice that always places the client's best interest first.

Expertise – We possess a depth of professional actuarial and plan administration knowledge that is acquired only through years of experience in the field.



Experience – In addition to our wealth in years with the many facets of actuarial consulting and retirement plan administration, we also provide comprehensive services to all types of employers in the private, public and non-profit sectors, small, medium and large. Examples include corporations, healthcare organizations, government entities and associations.

Quality – We consistently deliver precise, timely accurate reports and consulting services in accordance with the high standards and requirements of the American Academy of Actuaries (AAA), the American Society of Pension Professionals and Actuaries (ASPPA), the Society of Actuaries (SOA) and the Conference of Consulting Actuaries (CCA).

Commitment – We know how to listen, what the current issues are and what questions to ask. We are determined to develop individually tailored solutions that meet clients' goals.

Our on-going actuarial staff research and education include tracking public sector/governmental plan issues in the actuarial and public sector literature sources, including: NCPERS, GFOA, GASB and NASRA sources, as well as many other sources. We also produce a monthly newsletter, called <u>BCG Retirement News Roundup</u>, which is a compilation of current pertinent articles and includes a section on public sector issues.

The location of our office is: Boomershine Consulting Group, LLC 3300 North Ridge Road, Suite 300 Ellicott City, MD 21043

More information is available on our company website: www.boomershineconsulting.com.



4.3 References

Recent/Current Audit Assignments:

- Pennsylvania Intergovernmental Cooperation Authority - limited scope audit of Philadelphia Pension system
- New Jersey Police Officers and Fire Fighters Retirement System – full scope audit (ongoing)

Prior Audit Assignments by Greg Stump (full scope):

- California Judicial Retirement Systems
- California State & Schools Retirement Systems
- California Public Agencies (2000 municipalities)
- California 1959 Death Benefit Plan
- City of Ann Arbor, MI

(916) 795-2473

Current and Former Audit Client References:

New Jersey State Policemen's Benevolent Association Rob Nixon, Director of Government Affairs rnixon@njspha.com (732) 636-8860

California Public Employees' Retirement System David Lamoureux, Deputy Chief Actuary David_Lamoureux@CALpers.ca.gov (Greg Stump with former employer)

Below is a representative list of our governmental clients:

City of Lansing, Michigan
City of Danville, Virginia
City of Lynchburg, Virginia
City of Winston-Salem, North Carolina
Loudoun County Public Schools, Virginia
Loudoun County, Virginia
Maryland National Capital Park and Planning Commission
New Castle County, Delaware
Town of Greenwich, Connecticut
Washington Suburban Sanitary Commission



4.4 Staff Qualifications

All work under this contract will be performed under the supervision of Greg Stump, who has all of the requested professional actuarial designations.

Gregory M. Stump, FSA, EA, MAAA, FCA

Vice President and Senior Actuary gstump@boomershineconsulting.com

Phone: 410-418-5591 | Fax: 410-418-5644

Greg has attained the following professional actuarial credentials:

- Fellow of the Society of Actuaries (FSA)
- Enrolled Actuary (EA)
- Member of the American Academy of Actuaries (MAAA)
- Fellow in the Conference of Consulting Actuaries (FCA)

Greg has fourteen years of experience as a pension actuary, specializing in public sector defined benefit and retiree healthcare plans. He is a Fellow of the Society of Actuaries, an Enrolled Actuary, a Fellow of the Conference of Consulting Actuaries, and a Member of the American Academy of Actuaries.

During his career, Greg has worked with a variety of pension and retiree healthcare plans, both public and private, throughout the United States. He has worked with some of the largest and most complex public plans in the nation, as well as numerous cities, towns, counties, and special governmental entities.

- From 2005 to 2012, Greg was responsible for the annual actuarial audits of each subsystem within CalPERS, the nation's largest pension fund.
- In 2010, Greg was appointed and served on Governor Rell's Post-Employment Benefits Commission, tasked with reviewing the State of Connecticut's retirement benefits and liabilities as well as evaluating and proposing various solutions. Greg was the only actuary on the panel, and his insight and extensive pension knowledge proved to be invaluable to the group.
- From 2005 to 2012, he served as the actuary for the four U.S. judicial retirement systems, providing benefits for federal judges and their beneficiaries.
- From 2005 to 2010, Greg served as the actuary for the D.C. Retirement Board, which provides pension benefits to the City's Teachers, Police Officers, and Firefighters. He was also the contracted consulting actuary for the Department of Treasury's Office of D.C. Pensions from 2007 through 2012.

His corporate pension experience includes work with a number of multi-billion dollar pension funds. His recent work has focused on pension cost projections and the risks faced by public



plans. He has helped a number of governmental plans in their development and refinement of funding policy and benefit design efforts.

Greg is also a frequent speaker at national and regional public pension conferences, including a number of presentations for the National Conference of Public Employee Retirement Systems (NCPERS).

He earned a BS in Mathematics from Indiana University of Pennsylvania, graduating Summa Cum Laude in 1993.

As noted above, Greg Stump will supervise this project. Dave Boomershine and Sunita Bhatia will be providing support and review under this contract. Their professional designations and résumés are listed below; along with the supporting team members.

David S. Boomershine, EA, MAAA, FCA, MSPA

President and Senior Actuary dboomershine@boomershineconsulting.com Phone: 410-418-5567 | Fax: 410-418-5564

David has attained the following professional actuarial credentials:

- Enrolled Actuary (EA)
- Member of the American Academy of Actuaries (MAAA)
- Fellow in the Conference of Consulting Actuaries (FCA)
- Member of the American Society of Pension Professionals and Actuaries (MSPA)

As Senior Actuary and President of Boomershine Consulting Group, Dave has primary responsibilities for delivering consulting services and providing strategic retirement and health and welfare consulting solutions to clients.

His business background includes more than 37 years of experience with major national employee benefit consulting firms in senior positions. He specializes in helping clients design, administer, fund and communicate employee benefit plans and has worked with all sizes of employers in the public and private sector, as well as non-profit organizations. He has extensive experience in analyzing, re-designing and developing solutions for retirement and other benefit programs.

Dave Boomershine is a frequent speaker at many state and national conferences including the 2012 Virginia Government Finance Officers Association conference, the 2011 and 2012 Maryland Government Finance Officers Association conference, the Mid-Atlantic Plan Sponsors Conference, the Worldwide Employees Benefits Network, and is a regular speaker on the Money and Politics radio program.



Dave has spoken on a broad range of retirement topics in numerous forums including regional and national conferences and seminars, including the Davenport OPEB conference, the International Foundation of Employee Benefit Plans (IFEBP), the Government Finance Officers Association (GFOA) and the Worldwide Employee Benefits (WEB) Network. He is an Enrolled Actuary (EA), a member of the American Academy of Actuaries (MAAA), a member of the American Society of Pension Professionals and Actuaries (MSPA), a Fellow in the Conference of Consulting Actuaries (FCA) and a member of the National Retirement and Savings Committee of the American Benefits Council.

Mr. Boomershine earned a BA in Mathematics, with concentrations in Business Administration, Economics and Computer Science from Shippensburg University.

Sunita K. Bhatia, ASA, EA, MAAA, ACA

Senior Consultant/Actuary sbhatia@boomershineconsulting.com

Phone: 410-418-5529 | Fax: 410-418-5644

Sunita has attained the following professional actuarial credentials:

- Associate of the Society of Actuaries (ASA)
- Enrolled Actuary (EA)
- Member of the American Academy of Actuaries (MAAA)
- Member in the Conference of Consulting Actuaries (ACA)

Sunita has over 19 years of experience working with retirement plans, with a concentration on defined benefit plans. This experience includes assisting clients with the various aspects of their plans and interacting with the clients' boards and committees, as well as their employees. She has been involved in performing funding and FAS 87 valuations, FAS 158 and PPA 2006 calculations, regulatory compliance and discrimination testing. She has also been involved in Plan design and implementation of new retirement programs, and has assisted clients in analyzing and modifying their total benefit programs.

Ms. Bhatia earned a MS in Mathematics from the University of Maryland, Baltimore County and is an Enrolled Actuary, an Associate of the Society of Actuaries, a Member of the American Academy of Actuaries, and a Member of the Conference of Consulting Actuaries.



Other personnel who will perform work under the contract and their résumés follow

Marshal Banks Senior Analyst

Marshal has over 18 years of experience in various aspects of defined benefit retirement services, including data maintenance, reconciliation and update, benefit calculations, benefit statements and government filings. He also has a wide range of knowledge about Medicare Part D from completing the required testing, interacting with the website to requesting of the subsidy and the fiscal recommendations. He has completed these tasks for over 50 different clients ranging in retiree population size from 10 to over 5,000. He has attended the various RDS sponsored seminars in Dallas, Baltimore and Boston. He also provides retiree medical administrative services.

In addition he uses his background to help clients with automating the various tasks related to pension plan administration.

Mr. Banks earned a BS in Actuarial Science from Towson State University.

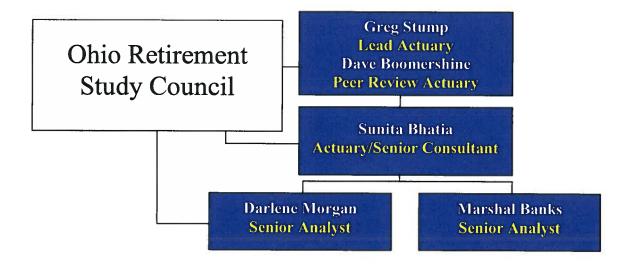
Darlene Morgan, CEBS Senior Analyst

Darlene Morgan has over 30 years of experience in various aspects of defined benefit retirement services, including data maintenance, reconciliation, and update, benefit calculations, benefit statements, actuarial valuations, financial information, and government filings. Darlene has earned the Certified Employee Benefit Specialist (CEBS) designation and is a member of the International Society of Certified Employee Benefit Specialists and the International Foundation of Employee Benefit Plans.



The following diagram shows how the BCG actuarial team will work with ORSC. It shows that depending on the issue, any member of the team could interact with appropriate parties.

Team Member	Role	
Greg Stump	Senior Lead Actuary, project development and confirmation, presentations, peer review; Account Manager/Contract Representative, client communications	
David Boomershine	Peer review; consultation as needed	
Sunita Bhatia	Valuation/project management, actuary, and delivery of services; consultation as needed	
Marshal Banks Darlene Morgan	Valuation and actuarial analysis	



The purpose of assigning a full team to this study is so that there is always a team member available to address any questions. We also guarantee that any phone calls or emails will be addressed within 24 hours (most calls will be returned immediately).



4.5 Methodology, Work Product and Timeline

Scope of Audit

An audit can be a valuable tool to obtain a second opinion on the health of a pension system. While this project is not likely to uncover any erroneous computations done by the plan actuary, it does allow us as the auditing actuary to review all of the information shown in the written reports.

The key elements of the review are the following:

- 1. **Data Validating:** We will request from the plan actuary all of the demographic information that they used for their valuation work. This would be after any adjustments that they made for formatting or data massaging. We will also collect from the PERS, all of the financial information that was provided to the actuary.
- 2. Actuarial Methods: We will review the actuarial cost method, asset smoothing, and amortization to evaluate if the PERS's goals and objectives are being addressed.
- 3. Actuarial Valuation Assumptions: We will examine the actuary's tables of assumed retirement, termination, disability probabilities. Primarily, we look for is internal consistency, reasonableness in comparison to similar plans, and validity in relation to recent plan experience. This will be accomplished through a review of the most recent experience study. We will evaluate the methods the actuary used to review each assumption, as well as their conclusions. We will develop alternative assumptions for consideration, as appropriate, and estimate the impact of each.

Through this review, we will be able to contribute to the overall strengthening of the actuarial process and funding for the System.

We will use our simulation software to determine how reasonable the System's inflation and investment return assumptions are, given the Fund's specific asset mix.

4. **Parallel Valuation:** In addition to the technical elements outlined above, it is also necessary to assess the plan actuary's compliance with generally accepted actuarial practices and Actuarial Standards of Practice (ASOPs). There are six such relevant ASOPs that deal with pension work.

We will set up valuation programs (computer models) in each of our two systems, such that we can produce all of the relevant actuarial computations.

We will compare our calculations to those shown in the actuary's reported values. We do not expect to match their figures exactly; however, there are tolerances that we will establish prior to the project initiation which will allow us to determine materiality of any



discrepancies (e.g., total actuarial liability must be within 3%). To the extent there are material discrepancies, we will (with PERS's permission) work with the actuary to understand the causes of such.

Future Funding and Risk Assessment: Based on the information available in the report, we will construct a projection model to provide a sense of future contributions and funding progress, taking into both recent changes as well as possible future deviations from expected experience. This will tell PERS not only where they are going in terms of funding, but also what risks could become relevant.

5. Review of Health Care As requested in the RFP, we will review the employee populations covered by the benefit plans and assess them for appropriateness and consistency and determine if the system's health care polices differ from those determinations.



The Proposed task outline and timing for the proposed audit.

Month Target Date		Audit Activity	Involvement
	5	Data Collection/Validity	PERS, BCG, GRS
September	19	Biweekly Status Call: Data collection and related issues	BCG, PERS, ORSC
	30	Actuarial Assumptions Review and Methods	BCG
	3	Biweekly Status Call: Update on assumption review, possible questions for System actuary	BCG, PERS, ORSC, GRS
	16	Review of Valuation Report and ASOP compliance	BCG
October	17	Biweekly Status Call: Clarification on report items	BCG, PERS, ORSC, GRS
	30	Create Customized Valuation Software	BCG
	31	Biweekly Status Call: BCG to report on modeling progress, and emerging issues	BCG, PERS, ORSC
	13	Comparison of Actuarial Results; Reconcile differences	BCG, GRS
November	14 & 28	Biweekly Status Calls: BCG to report on overall progress and any preliminary conclusions	BCG, PERS, ORSC
	15	Future Funding and Risk Assessment	BCG
December	12 & TBD	Biweekly Status Call: Report and Presentation Topics and Logistics	BCG, PERS, ORSC
January, 2015		Written Report and Presentation	BCG, PERS, ORSC

The proposed topics above for each conference call may be adjusted as the project evolves.



4.6 Additional Information

The report and presentation that will be provide will be presented in a clear concise manner and will include charts and graphs similar to the ones displayed below. The final written report will include all the requested information including:

- An overall opinion as to the validity, completeness and appropriateness of the demographic and financial information
- An overall opinion as to the reasonableness, conclusions, conformance with generally accepted actuarial standards and practices.

The following is an excerpt of key findings from BCG's recent review of a large governmental system.

Assumption	Current	Comments- Effects	
Investment Return and Inflation	7.95% assumed return, with 3.30% inflation	Assumed real return of 4.65% falls within a reasonable range based on the Fund's current asset mix. However, both are somewhat higher than typical.	
Salary Increases	Age-based rates assumed, higher at younger ages	The pattern of assumed increases appears reasonable; however, a service based assumption is typically more appropriate than age based rates.	
Mortality	RP 2000, with age adjustments (no projected improvements)	The current assumption is based on actual experience, so it has a basis; however, past and future mortality improvements should also be consider	
Retirement, Termination, and Disability Rates	Tables for each assumption, that vary by Plan, employee group, and gender for some	All rates appear reasonable in comparison with similar plans, and are based on the System's actual experience. We also found that on average, the gain and loss from non-investment experience over the last six years averages very close to \$0, indicating reasonable assumptions.	
Pension Adjustment Fund (PAF)	No explicit assumption is included for funding purposes	This should be included in the annual valuation as an additional liability. The Actuary's estimated value of the PAF based on stochastic simulation is a reasonable approach.	
Deferred Retirement Option Plan (DROP)	DROP participation is implicitly included in retirement assumption	It would be helpful for the Actuary to develop a specific set of DROP assumptions.	



4.7 Glossary of Actuarial Terminology

The following is a list of technical terms found in this and related actuarial reports. The list is not exhaustive, and other similar definitions could also be deemed acceptable.

Active Participant

An actively employed plan member.

Actuarial Accrued Liability (AAL):

The portion of benefits deemed to be accrued by participants based on past service. The AAL serves as the asset funding target, when annual contributions are determined.

Actuarial Assumptions

The amount calculated based on actuarial assumptions that represents the present value of the pension benefits accrued in a pension plan.

Actuarial Methods

Determines the periodic employer contribution to the pension plan; also called *actuarial funding method*. It is used to measure pension expense and related funding.

Actuarial Standards of Practice (ASOPs)

The ASOPs provide a framework for performing professional assignments and offer guidance on recommended practices, documentation, and disclosure. The U.S. actuarial profession has established three kinds of standards.

- 1. The Code of Professional Conduct identifies actuaries' ethical responsibilities to the public, to clients and employers, and to the actuarial profession.
- 2. The **ASOPs** provide a framework for performing professional assignments and offer guidance on recommended practices, documentation, and disclosure.
- 3. The **Qualification Standards** specify requirements for basic education, experience, and continuing education that must be met by actuaries issuing statements of actuarial opinion (SAOs).

Actuarial Value of Assets (AVA):

The smoothed value of assets, used to compute the Unfunded AAL. The purpose of the AVA is to control volatility in annual contributions.



GLOSSARY OF KEY ACTUARIAL TERMINOLOGY (continued)

Amortization of Unfunded

Liability:

The portion of the annual contribution that represents a portion of the Unfunded AAL. The

amortization can be positive or negative.

Amortization Method:

Used to distinguish between level dollar and level

percentage of pay amortization payments.

Annual Pension Cost (APC):

An accrual-basis measure of the periodic cost of a

pension plan (GASB term).

Annual Required Contribution

(ARC):

A GASB accounting term, representing the annual

benefit accrual and the amortization.

Closed Group Valuation:

A valuation that does not take into account any

future plan members, only those who are participating (active or inactive) as of the valuation

date.

Employer's Contributions:

Contributions made in relation to the ARC. An employer has made a contribution in relation to the ARC if the employer has (a) made payments of

benefits directly to or on behalf of a retiree or beneficiary, (b) made premium payments to an insurer, or (c) irrevocably transferred assets to a trust, or an equivalent arrangement, in which plan assets are dedicated to providing benefits to retirees and their beneficiaries in accordance with the terms of the plan and are legally protected from creditors

of the employers(s) or plan administrator.

Funded Ratio:

The plan asset value expressed as a percentage of

the actuarial accrued liability.

Discount Rate:

The rate used to adjust future benefit payments or a

stream of payments, to reflect the time value of money (often equal to the expected rate of return on

plan assets).

Inactive Participant:

A former employee or beneficiary, entitled to a

benefit from the plan.



GLOSSARY OF KEY ACTUARIAL TERMINOLOGY (continued)

Level Percentage of Projected Payroll Amortization Method:

Amortization payments are calculated so that they are a constant percentage of the projected payroll of active plan members over a given number of years, resulting in an increasing payment. This method should not be used if the plan is closed to new entrants.

Market Value of Assets

(MVA):

The total value of Plan assets available to pay

benefits.

Net Pension Obligation: GASB term for the cumulative difference between

annual pension cost and the employer's contributions to the plan, with some adjustments.

Normal Cost: That portion of the annual contribution that

represents one year's accrual of benefits.

Payroll Growth Rate: An actuarial assumption regarding future increases

in total covered payroll; used in applying the level percentage of projected payroll amortization

method.

Unfunded Actuarial Accrued

Liability

The difference between the Actuarial Value of

Assets and the Actuarial Accrued Liability.



4.8. Cost Information

Estimated fixed fee

	Range of Fees	Best Estimate
Full Actuarial Audit, including	\$95,000-\$120,000	\$109,000
all components denoted herein		

Classification	Hourly Rate	Estimated Hours
Lead/Senior Actuary	\$380	90
Actuary	\$255	130
Senior Analyst	\$215	90
Analyst	\$185	100
Administrative	\$95	40

Total = 450

If the Council and System prefer a fixed fee arrangement, we will agree to the Best Estimate shown above.

