MOCKENHAUPT
BENEFITS GROUP

Actuarial Valuation Report

for the

City of Pittsburgh

Firemen's Relief and Pension Fund

as of

January 1, 2013

Report Date: March 28, 2014

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Section One: Commentary and Actuarial Disclosures

At the request of the City of Pittsburgh, we have completed an actuarial valuation report for the City of Pittsburgh Firemen's Relief and Pension Fund as of January 1, 2013. This actuarial valuation is based upon participant data as of January 1, 2013 and asset information as of December 31, 2012 as provided by the City.

This report has been completed in accordance with generally accepted actuarial principles and practices, and reflects our current understanding of applicable laws and regulatory requirements. This valuation was prepared to satisfy the funding and disclosure requirements of Act 205 of 1984. It also contains the cost components that may be used to compute the Plan's Minimum Municipal Obligation (MMO) in accordance with that law. This valuation should be used for no other purpose than those outlined herein.

One of the cost components of the Minimum Municipal Obligation is an amortization payment calculated according to specified rules of Act 205. The minimum amortization under Act 205 reflects the utilization of provisions of Act 82 of 1998 for which the City qualified. Under those provisions, the Unfunded Actuarial Accrued Liability as of January 1, 1998 is being amortized over 40 years calculated pursuant to special procedures described beginning on page 5. Bases for subsequent years are established according to the normal procedures of Act 205 of 1984 and amortized over various periods according to the source of the change in unfunded liability such as experience gains or losses, benefit changes, and assumption changes. These periods are not limited by average future service because the City qualifies for Distress Level II according to the requirements under Act 205 of 1984.

Because the Act 82 amortization methodology does not result in an actuarially appropriate funding level, this report also presents an actuarially recommended amortization payment based on a 30-year "fresh start" amortization payment commencing as of January 1, 2011 and additional amortization bases added thereafter according to the normal procedures of Act 205 of 1984.

The City's pension plan assets are aggregated into a single trust. An annual calculation is made to determine each Plan's portion of the assets. The receipts and disbursements for each Plan are added to the Plan's allocated value from the prior year. Then, the year's investment income is allocated proportionately to each Plan in accordance with procedures set forth in Act 205. As of December 31, 2012 the calculated market value of assets in the Firemen's Relief and Pension Fund is $199,706,235. Section Nine contains exhibits illustrating the calculation of this amount. Section Nine also shows the development of the actuarial value of assets, which is determined by using the Tabular Reserve Method first adopted as of January 1, 2009.

The City Controller obtained third-party advice from which he determined that the dedicated stream of revenue created by Ordinances 42 and 44 of 2010 can be recognized as a pension plan asset for purposes of the required actuarial report under Act 205 and the Board of Trustees of the Comprehensive Municipal Pension Trust Fund has unanimously directed us to combine the assets listed in the CAFR with the value of the revenue stream as determined by an independent accounting firm, Gleason & Associates. The value so provided is consistent with Paragraph 3.5 (Assets that are Difficult to Value) of ASOP 44, Selection and Use of Asset Valuation Methods for Pension Valuations. The Public Employee Retirement Commission (PERC) has accepted the Revised Actuarial Valuation Report as of January 1, 2011 which included the present value of the revenue stream as a pension plan asset for Act 205 actuarial valuation purposes. The inclusion of the present value of this stream of dedicated future parking meter revenues does not imply that it necessarily qualifies as a pension plan asset under GAS 25 or for any other purpose.

2013 Results

Certain highlights of this actuarial valuation compared with the prior valuation are shown in Section Three. The use of pension bond proceeds to reduce the Unfunded Actuarial Accrued Liability has split the funding of the pension plan into actuarial costs and debt service. The actuarial costs consist of normal cost, administrative expense contributions and amortization payments to eliminate the remainder of the Unfunded Actuarial Accrued Liability. The actuarial information used to develop contribution requirements according to the rules of Act 205 is shown in Section Five. Debt service payments repay the money borrowed and subsequently deposited into the plan. Information concerning the annual debt service is contained in Section Ten. The demographics of the Plan population are summarized in Section Eight.

The actuarial cost components as of January 1, 2013 compared to the prior year are as follows:

	Current Year 2013	Prior Year 2011
Normal Cost as a Percentage of Total W-2 Payroll	14.256%	11.849%
Expenses as a Percentage of Total W-2 Payroll	1.200%	1.600%
Minimum Amortization Payment	$11,224,426	$7,971,360

The change in actuarial costs from valuation to valuation can be affected by changes in Plan provisions, assumption changes, and experience changes. Pension bonds were issued in March 1998. The debt service payment for 2013 is approximately $7.68 million.

Assumption Changes

Multiple assumption changes have been made for this actuarial valuation. The most significant is the change in the interest rate assumption, which the City decided to lower from 8.0% to 7.5% per year. We believe this to be a reasonable and more conservative assumption.

Act 205 requires that the City have an experience study prepared every four years. The purpose of this experience study is to compare the plan's actual experience with the valuation assumptions. This comparison can indicate that actuarial assumptions should be changed. Based on the January 1, 2013 experience study, the mortality assumptions have been changed for this valuation.

The mortality assumptions are all based on the RP-2000 Mortality Tables with various adjustments. The changes in the mortality assumptions are summarized in the following chart:

	Prior	Current
Active Participants	Employee Rates	Employee Rates projected with Scale AA
Retired Participants	Healthy Annuitant rates adjusted by blue collar ratios and set forward two years	Healthy Annuitant rates adjusted by blue collar ratios, set forward one year and projected from 2005 with Scale AA
Disabled Participants	Same as Retired, but with five year set forward	Same as Retired, but with four year set forward
Surviving Beneficiary	Healthy Annuitant rates adjusted by blue collar ratios, set forward two years and adjusted by ratio of female beneficiary experience to overall female mortality	Healthy Annuitant rates set forward one year, adjusted by ratio of female beneficiary experience to overall female mortality and projected from 2005 with Scale AA

The interest rate and mortality assumption changes increased the actuarial accrued liability (AAL) by $41,016,905. This amount will be amortized over 15 years.

Benefit Changes

There were no benefit changes during the period from January 1, 2011 through January 1, 2013. The benefits provided are summarized in Section Four of this report.

Experience Changes

Plan experience during the year affects the Plan cost for the following year. Both the normal cost and the amortization payment can change.

Normal cost is the portion of the total cost allocated to the current year by the actuarial cost method. Unless Plan provisions or assumptions change, normal cost usually remains fairly stable, changing only moderately from year to year. The changes that do occur relate to changes in the age and service distribution of the participant group.

Generally, experience changes affect the current year's actuarial gain or loss to a greater degree than they affect normal cost. Since foresight can never be perfect, actuarial assumptions will not perfectly match the experience that actually develops from year to year. The determination and amortization of actuarial gains and losses provide the mechanism for correcting these gains and losses and maintaining the Plan's funding on a sound basis.

The actuarial gain or loss computed in the current valuation reflects differences since the prior valuation between actual experience and the experience anticipated by the actuarial assumptions. For bases established in 2009 and later, Act 205 requires the amortization of actuarial gains or losses over a 20-year period. An actuarial gain will reduce the total amortization payment and an actuarial loss will increase the payment.

For 2013, a new actuarial gain base of $723,617 has been established. This relatively small net actuarial gain is the net effect of larger sources of gain and loss (although none of the sources were overly large). The primary source of gain was due to contributions to the plan in excess of the minimum amounts required based on the January 1, 2011 actuarial valuation report (based on the Act 82 amortization). The contribution gain was partially offset by losses from return on the actuarial value of assets (AVA) that was less than the assumed rate (under the tabular smoothing method interest is credited on the AVA each year at a rate that is one percent less than the assumed interest rate of the plan).

Funded Ratios

Another measure of comparison between valuations is the plan's funded ratio, the actuarial value of assets divided by the actuarial accrued liability. This ratio is currently 56.7 percent (refer to Table 1). As of January 1, 2011, the corresponding ratio was 61.9 percent so the current valuation shows a decrease of 5.2 percent. This decrease was primarily due to the change to more conservative assumptions (which should help the plan's funded status in the long run). The funded ratio based on the market value of assets is 50.5%.

Accounting Information

This valuation also includes certain actuarial information required for accounting purposes. Section Six contains a summary of the actuarial present values of accumulated Plan benefits and a summary of certain information required by GAS#27.

Actuarially Recommended Amortization Payment

Act 82 of 1998 has a significant impact on the minimum funding requirements. We believe that the procedure for determining amortization amounts in accordance with Act 82 no longer produces an actuarially appropriate funding level. The adoption of a funding policy based on the alternative Actuarially Recommended Amortization Payment in this report is highly recommended.

Act 82 allowed the City to change the minimum funding amortization schedule for its Unfunded Actuarial Accrued Liability because pension bond proceeds were deposited by the City into the pension plan during 1998 that changed the ratio of the Actuarial Value of Assets to the Actuarial Accrued Liability by more than 25 percent. Act 82 allowed the City to amortize the January 1, 1998 Unfunded Actuarial Accrued Liability, reduced by pension bond proceeds deposited during 1998, over a 40-year period using a special procedure that was mechanically complex but lowered the amortization payment from what it otherwise would have been. The annual amortization payment was calculated in several steps. An amortization payment was calculated that would eliminate the Unfunded Actuarial Accrued Liability net of 1998 bond proceeds over a 40-year period using a statutory interest rate of 8.75 percent. Next, the future value of these payments at the end of the 40-year period was calculated using 8.75 percent interest. Finally, an amortization payment was calculated using 10 percent interest that would have the same future value at the end of the 40-year period as the previous calculation. The 10 percent amortization amount became the amortization payment starting in 1998.

There are several drawbacks to this approach in the long-term. Under the Act 82 amortization schedule, the outstanding balance of Unfunded Actuarial Accrued Liability for the affected 1998 base actually grows for several years, extending the funding of obligations beyond normal payment periods. For example, the Unfunded Actuarial Accrued Liability for this special base has increased from $73,627,561 as of January 1, 1998 to $107,661,060 as of January 1, 2013 and doesn't start to decline until during the year 2024. Therefore, this amortization method does not maintain normal generational funding objectives.

Act 82 requires that valuations include a comparative interest rate tabulation. This annual tabulation compares the balance of the accumulated Act 82 amortization payments using the actual earnings of the fund during the year with the balance assuming a 10 percent rate of return. If the fund earns more than 10 percent during the year, there will be an actuarial gain. If the fund earns less than 10 percent, there will be an actuarial loss on the comparative interest rate balance. When this legislation was enacted in 1998, investment conditions were different, and an average 10 percent rate of return on a significant block of assets no longer seems reasonable. This balance grows over time and the losses from this source will tend to grow significantly. In fact, because benefits are being paid out as contributions are coming in, the comparative interest rate balance, which isn't adjusted for benefit payments, eventually will become larger than the total market value of assets. This will likely lead to significant experience losses, an increasing pattern of amortization payments and a funding ratio which will still be well below 100% at the end of the 40-year period due to remaining balances on these losses.

By contrast, funding the plan on the basis of the actuarially recommended amortization payment is expected to result in a more level amortization schedule, that will result in higher contributions now but ultimately lower contributions, and will likely lead to a funding ratio much closer to 100% by the fixed target year.

Section Two: Certification

In the actuary's opinion, the actuarial assumptions used in the valuation are reasonably related to the experience of the Plan and to reasonable expectations. They represent the actuary's best estimate of anticipated experience under the Plan. To the best of our knowledge, the report is complete and accurate, based on the data outlined herein and the disclosures in Section One.

We will be happy to answer any questions concerning this report and provide further information as needed.

MOCKENHAUPT BENEFITS GROUP

I, David H. Stimpson, am a member of the American Academy of Actuaries and I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Prepared and Certified by:

David H. Stimpson, E.A., F.C.A., M.A.A.A.
Vice President of Actuarial Services

Section Three: Valuation Highlights

Participant Count	01/01/13	01/01/11	Change
Total Active	584	611	(27)
Vested	148	180	(32)
Not Vested	436	431	5
Total In Payment Status	1,111	1,124	(13)
Retirement Benefits	555	557	(2)
Disability Benefits	230	233	(3)
Survivor Benefits	326	334	(8)
Deferred	1	0	1
Total	**1,696**	**1,735**	**(39)**

Average Monthly Benefit

In Payment Status			
Retirement Benefits	$ 2,900	$ 2,795	$ 105
Disability Benefits	$ 2,274	$ 2,198	$ 76
Survivor Benefits	$ 726	$ 675	$ 51
Deferred	$ 3,551	$ 0	$ 3,551

Active Participant Averages

Hire Age	29.8	29.7	0.1
Attained Age	46.1	45.1	1.0
Normal Retirement Age	56.5	53.5	3.0
Assumed Future Service	16.0	17.0	(1.0)
Monthly Compensation	$7,353	$6,621	$732

Financial Data

Market Value of Assets	$199,706,235	$188,721,694	$10,984,541
Accumulated Employee Contributions	$36,944,365	$34,008,260	$2,936,105

Cost Components

Normal Cost as a percentage of total payroll	14.256%	11.849%	2.407%
Expenses as a percentage of total payroll	1.200%	1.600%	-0.400%
Total	15.456%	13.449%	2.007%
Amortization Payment	$11,224,426	$7,971,360	$3,253,066

Section Four: Summary of Plan Provisions

Plan Year	Twelve-month period beginning January 1 and ending December 31
Plan Established	May 25, 1933
Principal Definitions	
Employee	Any uniformed employee of the City of Pittsburgh Bureau of Fire
Retirement Benefit Commencement Date	Assumed to be the first day of the month coincident with or next following eligibility for and election to retire
Service Increment	Additional monthly benefit of $20 for each completed year of service in excess of 20 years, excluding years of service after age 65 For members hired on or after January 1, 2005: Additional monthly benefit of $10 for each completed year of service in excess of 20 years, excluding years of service after age 65 (Payable only after age 50)
Service	Completed years of service calculated from date of hire through date of retirement or severance, plus periods of service purchased
Normal Form of Payment	Monthly pension benefit payable for life
Participation Requirements	
Entry Date	Date of hire
Compensation	Total wages excluding sick buyback and Dependent Partner Benefit pay. For members hired on or after January 1, 2005: total wages excluding longevity, sick buyback and Dependent Partner Benefit pay.
Average Compensation	Compensation averaged over the 36-month period prior to retirement or severance
Normal Retirement	
Eligibility	Later of age 50 or completion of 20 years of service
Members hired before January 1, 1976	Completion of 20 years of service
Monthly Benefit	Equal to 50% of average compensation plus service increment, if any
Late Retirement	
Eligibility	Employment beyond normal retirement
Amount of Benefit	Normal retirement benefit based upon average compensation as calculated at actual retirement

Disability

Eligibility	- Permanent disablement in line of duty *or* - Permanent disablement (not in line of duty) after completing 10 years of service
Benefit Amount	- 50% of earnings in year prior to disablement
Benefit Commencement Date	- First day of calendar month following determination of disablement *and* - Continuing for the duration of disability prior to normal retirement date and life thereafter
Vesting	- If member completed 20 years of service, may collect normal retirement benefit based on average compensation at termination (providing terminated member continues contributions at rate in effect at termination) - Benefit deferred to age 50

Death Benefits

Accidental Death	- Benefit plus return of member's accumulated contributions - Benefit plus workers' compensation or other payments is equal to 50% of member's wages at death - Payable for 500 weeks or until surviving spouse dies or remarries - If no surviving spouse or unmarried children, dependent parents receive payments
- *Children Benefits (No surviving spouse/ or discontinued payment to surviving spouse)*	- Unmarried child under age 18 receives payments equal to 25% of payments to spouse - Total payments to one family may not exceed 50% of member's wages at time of death - $60 minimum monthly payment if only one child - If maximum amount payable, divide equally among entitled children - Payments terminate when child reaches age 18, dies, marries - Payments may continue indefinitely to incompetent child
Death Prior to Retirement Active service/ not accidental	- If so elected, spouse paid benefit equal to 50% of pension member would have received if retired on date of death - No election, accumulated contributions without interest paid to beneficiary or estate

Death After Retirement	- If so elected, spouse paid benefit equal to 50% of pension member was receiving - No surviving spouse, benefit may be paid to surviving children or dependent parents
Lump Sum Benefit	- Lump sum of $1,200 to beneficiary of any deceased member
Employee Contributions	- 6.5 percent of compensation plus $1 per month - $1 per month ceases at age 65 - If surviving spouse benefit elected, add 1/2 percent of compensation

Section Five: Development of Contribution Requirements

Table 1: Normal Cost and Actuarial Accrued Liability

Normal Cost

Retirement Benefits	$4,995,540
Disability Benefits	2,180,244
Preretirement Death Benefits	168,336
Postretirement Death Benefits	2,591
Refunds to Withdrawals	94,704
Medicare Premium Benefits	0
Vested Benefits	25,078
Total	**$7,466,493**

Actuarial Accrued Liability

Actuarial Present Value of Benefits at Attained Age

	Deferred	In Payment	Active	All
Retirement Benefits	$520,141	$182,241,070	$165,868,799	$348,630,010
Disability Benefits	0	58,674,208	49,125,243	107,799,451
Survivor Benefits	0	20,631,963	0	20,631,963
Preretirement Death Benefits	0	0	2,724,118	2,724,118
Postretirement Death Benefits	0	0	76,559	76,559
Refunds to Withdrawals	0	0	889,595	889,595
Medicare Premium Benefits	0	0	0	0
Vested Benefits	0	0	476,069	476,069
Total	**$520,141**	**$261,547,241**	**$219,160,383**	**$481,227,765**

Actuarial Present Value of Future Normal Costs

Retirement Benefits	$57,662,239	
Disability Benefits	24,960,084	
Preretirement Death Benefits	1,827,605	
Postretirement Death Benefits	24,093	
Refunds to Withdrawals	1,089,582	
Medicare Premium Benefits	0	
Vested Benefits	340,558	
Total	**$85,904,161**	**($85,904,161)**

Actuarial Accrued Liability	$395,323,604

Unfunded Actuarial Accrued Liability

Actuarial Accrued Liability	$395,323,604
Actuarial Value of Assets	(224,050,549)
Unfunded Actuarial Accrued Liability	**$171,273,055**
Funded Ratio	**56.7%**

Table 2: Actuarial (Gain) Loss Determination

Reconciliation of Funded Status

	2011	2012	
Unfunded Actuarial Accrued Liability as of January 1, 2011			$129,198,421
Normal Cost/Administrative Expenses Assumed	$6,659,206	$6,995,540	13,654,746
Interest Charged at Valuation Rate			23,166,352
Contributions Made			
- Municipality	$8,440,820	$9,359,487	
- State Aid Allocated	9,106,716	6,203,826	
- Employees	3,562,550	3,704,596	$(40,377,995)
Interest Credited at Valuation Rate			(3,451,395)
Special Adjustment Because of Higher Act 82 Interest Rate			(5,371,976)
Expected Unfunded Actuarial Accrued Liability Before Adjustments			$116,818,152
Experience from Investment Return			
- Comparative Interest Rate Amortization Tab. (Gain) Loss		$7,658,975	
- Other Investment Return (Gain) Loss		(86,532)	7,572,443
Experience (Gain) Loss from all Other Sources			5,865,555
Increase (Decrease) in Unfunded Actuarial Accrued Liability			
- Benefit Modifications for Actives		$ 0	
- Benefit Modifications for Retirees		0	
- Change in Actuarial Assumptions		41,016,905	41,016,905
Actual Unfunded Actuarial Accrued Liability			$171,273,055

Loss (Gain) to be Amortized

Experience (Gain) Loss from January 1, 2011		$13,437,998
Actuarially Required Contributions and Bond Proceeds with Interest	$29,667,775	
Actual Contributions with Interest	(43,829,390)	
Contribution (Gain) Loss		(14,161,615)
Loss (Gain) to be Amortized		$(723,617)

Comparative Interest Rate Amortization Tabulation

Balance Calculated Using Actual Investment Return	2011	2012	
Act 82 Amortization Balance at January 1	$116,889,487	$124,614,554	
Act 82 Amortization Payment	4,333,255	4,333,255	
Comparative Interest Rate Balance at January 1	$ 121,222,742	$ 128,947,809	
Actual Investment Return on Balance	3,391,812	14,839,314	
Actual Act 82 Amort. Balance at December 31	$ 124,614,554	$143,787,123	$143,787,123

Balance Calculated Using 10 Percent Investment Return	2011	2012	
Comparative Interest Rate Balance at January 1	121,222,742	$ 137,678,271	
Interest at 10 Percent	12,122,274	13,767,827	
Comparative Act 82 Amort. Bal. at December 31	$ 133,345,016	$ 151,446,098	$ 151,446,098

Comparative Interest Rate Amortization Tabulation (Gain) Loss	$ 7,658,975

Table 3: Amortization of Unfunded Actuarial Accrued Liability

Source	Original Amount	Year Est.	Target Year	Remaining Balance	Remaining Payments	Annual Amount
Initial	$73,627,561	1998	2037	$107,661,060	25	$4,333,255
Assumption Change	(2,712,163)	1998	2017	(1,133,222)	5	(260,551)
Experience Gain	(7,309,856)	1999	2013	(813,637)	1	(813,637)
Experience Gain	(10,034,869)	2000	2014	(2,143,134)	2	(1,110,298)
Experience Loss	14,852,702	2001	2015	4,567,584	3	1,633,868
Experience Loss	1,151,699	2002	2016	453,603	4	125,982
Investment Loss	18,857,549	2002	2032	16,009,880	20	1,460,878
Assumption Change	(17,287,129)	2003	2022	(11,955,709)	10	(1,620,259)
Ben. Mod. - Actives	957,341	2003	2022	662,095	10	89,728
Experience Gain	(1,201,890)	2003	2017	(568,714)	5	(130,759)
Investment Loss	27,829,106	2003	2032	24,459,717	20	2,231,914
Assumption Change	847,777	2005	2024	655,689	12	78,852
Experience Gain	(10,559,362)	2005	2019	(6,482,115)	7	(1,138,442)
Experience Loss	50,924,405	2007	2021	37,330,670	9	5,443,928
Assumption Change	(7,157,970)	2009	2028	(6,453,136)	16	(656,666)
Experience Loss	55,699,104	2009	2028	50,214,497	16	5,109,788
Experience Gain	(85,365,441)	2011	2030	(81,485,361)	18	(7,809,630)
Agg. Changes through Last Valuation	N/A	N/A	2026	$23,318,707	14	$2,634,696
Assumption Change	$41,016,905	2013	2027	$41,016,905	15	$4,322,504
Ben. Mod. – Actives	N/A					
Ben. Mod. – Retired	N/A					
Experience Gain	(723,617)	2013	2032	(723,617)	20	(66,029)
Agg. Changes-2013	N/A	N/A	2027	$40,293,288	15	4,256,475
Aggregate Changes	N/A	N/A	2027	$63,611,995	15	$6,891,171
Aggregate	N/A	N/A		$171,273,055		$11,224,426

Details of the Calculation of Act 82 Payment

Act 82 Unfunded Actuarial Accrued Liability	$	73,627,561
40-Year Amortization Payment	$	6,138,285
Future Value at end of 40-Year period	$	2,109,653,057
Payment to provide the same future value with 10% annual earnings	$	4,333,255

Table 4: Municipal Contributions

Required Municipal Contributions (Reflecting Act 82 of 1998)

The Financial Requirement of the Plan is based on the Normal Cost Percentage and other components shown below. The Normal Cost Percentage is applied to the payroll of the members for the applicable fiscal year.

Normal Cost (Table 1)	$ 7,466,493
Total Annual Payroll	$ 52,375,212
Percentages for Budget	
• Normal Cost (Normal Cost divided by Total Annual Payroll)	14.256%
• Administrative Expense (as a % of Payroll)	1.200%
• Gross Normal Cost	15.456%
Net Amortization Payment (Table 3)	$ 11,224,426
Funding Adjustment	$ 0

Amortization Payment for Actuarially Recommended Contribution

See Section One for further explanation of the basis of this recommendation.

Source	Original Amount	Year Est.	Target Year	Remaining Balance	Remaining Payments	Annual Amount
Initial	$129,198,421	2011	2040	$126,826,201	28	$10,193,901
Experience Loss	3,429,949	2013	2032	3,429,949	20	312,978
Assumption Change	41,016,905	2013	2027	41,016,905	15	4,322,504
Aggregate			2035	$171,273,055	23	$14,829,383

Section Six: Accounting Information

Accumulated Plan Benefits		01/01/13	01/01/11
Assets at Market Value		$ 199,706,235	$188,721,694
Actuarial Present Value of Vested Benefits			
Retired	$261,547,241		
Deferred	520,141		
Employee Contributions	4,980,607		
Active	55,661,286		
Total		$322,709,275	$282,703,072
Unfunded Actuarial Present Value of Vested Benefits		$123,003,040	$93,981,378
Actuarial Present Value of Accrued Benefits			
Retired	$261,547,241		
Deferred	520,141		
Employee Contributions	501,043		
Active	101,142,573		
Total		$363,710,998	$314,403,082
Unfunded Actuarial Present Value of Accrued Benefits		$164,004,763	$125,681,388

GAS #27 Information

Summary of Annual Pension Cost and Net Pension Obligation (NPO) for Prior Years

	2011	2012
Annual Required Contribution (ARC)	$ 21,466,123	$ 13,927,553
Interest on NPO	(979,263)	(632,154)
Adjustment to the ARC	1,399,532	1,000,416
Annual pension cost	21,886,392	14,295,815
Contributions made	17,547,536	15,563,313
Change in NPO	4,338,856	(1,267,498)
NPO, Beginning of Year (1/1)	(12,240,786)	(7,901,930)
NPO, End of Year (12/31)	$ (7,901,930)	$(9,169,428)

Annual Pension Cost for the Year Beginning 1/1/2013

Annual Required Contribution (ARC)	$ 14,158,929
Interest on NPO	(733,554)
Adjustment to the ARC	1,167,021
Annual Pension Cost	$ 14,592,396

Other Information from the 1/1/2013 Actuarial Valuation for GAS #25 and GAS #27

Actuarial Cost Method	Entry Age
Asset Valuation Method	Tabular Smoothing
Amortization Method	Level Dollar Closed
Aggregate Remaining Amortization Period (Years)	30
Actuarial Assumptions	
Investment Rate of Return	7.50%
Projected Salary Increases	5.75%
Underlying Inflation Rate	3.00%

Section Seven: Actuarial Basis of Valuation

Actuarial Assumptions: January 1, 2013

Economic

Interest Rate	7.50% increase per year
Salary Projection	5.75% increase per year Merit Increase 2.75 percent increase per year Inflation 3.0 percent increase per year

Employee Characteristics

Mortality	RP-2000 Mortality Tables, with adjustments to reflect Pittsburgh Pension Plan mortality experience as confirmed by experience studies. The adjusted rates are based on the following:
Active Participants	RP-2000 Employee Mortality Rates projected with scale AA.
Retired/Term Vested Participants	RP-2000 Healthy Annuitant Mortality Rates adjusted by blue collar ratios, set forward one year and projected from 2005 with scale AA.
Disability Retirees	Same as Retired, but with ages set forward four years.
Surviving Beneficiaries	RP-2000 Healthy Annuitant Rates adjusted by ratios of female beneficiary experience to overall female RP-2000 Healthy Annuitant Mortality Rates (Appendix D of *RP-2000 Mortality Tables Report*), set forward one year, and projected from 2005 with scale AA

Sample Base Rates (Rounded):

Age	Active Male Participant	Male Regular Retiree	Male Disabled Retiree	Male Beneficiary
45	0.15%	0.19%	0.52%	0.20%
55	0.30%	0.77%	0.97%	0.86%
65	0.76%	1.82%	2.44%	1.91%
75	N/A	4.77%	6.41%	4.51%
85	N/A	12.64%	16.64%	12.81%

Age	Active Female Participant	Female Regular Retiree	Female Disabled Retiree	Female Beneficiary
45	0.11%	0.15%	0.22%	0.15%
55	0.25%	0.32%	0.55%	0.55%
65	0.58%	1.25%	1.68%	1.47%
75	N/A	3.38%	4.44%	3.31%
85	N/A	9.23%	12.48%	9.01%

Withdrawal

Sample rates:

Age	Rate
20	0.82%
25	0.79%
30	0.76%
35	0.70%
40	0.53%
45	0.27%
50	0.06%
55	0.00%

Disablement

Sample rates:

Age	Male	Female
30	0.14%	0.17%
40	0.33%	0.64%
50	1.00%	1.26%
60	2.97%	2.27%

Retirement Age

Percentage of employees eligible for retirement who retire at each age:

Age	Percentage
50	8
51	3
52	3
53	3
54	3
55	3
56	3
57	3
58	9
59	9
60	9
61	9
62	18
63	18
64	18
65	100

Duty Related Mortality	20% of deaths in active service are assumed to be duty related.
Duty Related Disability	50% of disabilities occurring during employment are assumed to occur in the line of duty.
Percentage Married	80% of male participants and 65% of female participants.
Spouse Age	Female spouses are assumed to be two years younger than male spouses.

Actuarial Basis of Valuation: Actuarial Cost Method

The actuarial costs of this Plan are determined under the Entry Age Normal Actuarial Cost Method as described in Act 205 of 1984. The total contribution (the financial requirements of the Pension Plan) is made up of three components: normal cost, administrative expense and amortization payment or funding adjustment.

Normal Cost

For each active participant covered by the Plan, normal cost is calculated to be the annual contribution necessary to completely fund the participant's pension by the participant's retirement age. Contributions are assumed to begin with the year of employment and to be a constant percentage of the participant's annual pay.

For the Plan, normal cost is expressed as a percentage of the total annual payroll of the participants used in budgeting of required contributions.

Administrative Expense

Estimated annual expense to be incurred by the fund for the contribution year for which the financial requirements are determined.

Actuarial Accrued Liability

Total actuarial present value of all future benefits less the actuarial present value of the future normal costs. The total unfunded actuarial accrued liability as of the valuation date is the actuarial accrued liability less the total value of all assets owned by the Plan.

Amortization Payment

Sum of the annual level amortization contribution requirements specified by the Act for the applicable portions of the unfunded actuarial accrued liability. The Plan's unfunded actuarial accrued liability was re-established in 1998. In the subsequent years, experience gains and losses, changes in benefit provisions, and changes in valuation assumptions would result in increases or decreases to the unfunded actuarial accrued liability. If the unfunded actuarial accrued liability is negative, the amortization payment is zero and a funding adjustment is created.

Section Eight: Demographic Summaries

Distribution of Active Members by Age and Service

Years of Service											
Age	Number of People in Category										
	1	**2**	**3**	**4-5**	**6-10**	**11-15**	**16-20**	**21-25**	**26-30**	**30+**	**Total by Age**
< 20	0	0	0	0	0	0	0	0	0	0	**0**
20-24	0	0	0	0	0	0	0	0	0	0	**0**
25-29	0	0	0	6	18	0	0	0	0	0	**24**
30-34	0	0	0	13	47	2	0	0	0	0	**62**
35-39	0	0	0	5	43	20	1	0	0	0	**69**
40-44	0	0	0	4	28	29	32	0	0	0	**93**
45-49	0	1	0	0	9	32	51	3	5	0	**101**
50-54	0	0	0	3	13	24	28	6	25	15	**114**
55-59	0	0	0	0	3	5	14	8	27	32	**89**
60-64	0	0	0	0	0	2	2	2	7	18	**31**
65+	0	0	0	0	0	0	1	0	0	0	**1**
Total	**0**	**1**	**0**	**31**	**161**	**114**	**129**	**19**	**64**	**65**	**584**

Age Distribution of Deferred Vested Participants

Persons Entitled to Deferred Benefits			
Age Group	Number of People	Total Annual Benefit	Average Annual Benefit
< 30	0	0.00	0.00
30-34	0	0.00	0.00
35-39	0	0.00	0.00
40-44	0	0.00	0.00
45-49	0	0.00	0.00
50-54	1	$42,610.80	$42,610.80
55-59	0	0.00	0.00
60-64	0	0.00	0.00
65-69	0	0.00	0.00
70-74	0	0.00	0.00
75-79	0	0.00	0.00
80-84	0	0.00	0.00
85+	0	0.00	0.00
Total	**1**	**$ 42,610.80**	**$ 42,610.80**

Age Distribution of Retired Participants

Regular Retirements			
Age Group	Number of People	Total Annual Benefit	Average Annual Benefit
< 30	0	0.00	0.00
30-34	0	0.00	0.00
35-39	0	0.00	0.00
40-44	0	0.00	0.00
45-49	0	0.00	0.00
50-54	7	$ 318,766.44	$ 45,538.06
55-59	61	2,486,459.04	40,761.62
60-64	147	5,920,494.36	40,275.47
65-69	114	4,525,965.48	39,701.45
70-74	69	2,286,026.40	33,130.82
75-79	56	1,671,070.32	29,840.54
80-84	52	1,200,380.64	23,084.24
85+	49	905,493.72	18,479.46
Total	**555**	**$19,314,656.40**	**$ 34,801.18**

Age Distribution of Retired Participants

Disability Retirements			
Age Group	Number of People	Total Annual Benefit	Average Annual Benefit
< 30	0	0.00	0.00
30-34	0	0.00	0.00
35-39	0	0.00	0.00
40-44	6	$196,319.28	$32,719.88
45-49	7	227,795.04	32,542.15
50-54	8	256,037.28	32,004.66
55-59	28	1,013,334.00	36,190.50
60-64	55	1,644,776.52	29,905.03
65-69	45	1,324,387.56	29,430.83
70-74	19	495,640.20	26,086.33
75-79	21	424,193.52	20,199.69
80-84	21	382,700.52	18,223.83
85+	20	311,478.96	15,573.95
Total	**230**	**$ 6,276,662.88**	**$ 27,289.84**

Age Distribution of Retired Participants

Survivors			
Age Group	Number of People	Total Annual Benefit	Average Annual Benefit
< 30	0	$ 0.00	$ 0.00
30-34	1	5,734.92	5,734.92
35-39	0	0.00	0.00
40-44	0	0.00	0.00
45-49	0	0.00	0.00
50-54	2	32,091.36	16,045.68
55-59	17	272,267.04	16,015.71
60-64	17	211,548.12	12,444.01
65-69	21	246,183.00	11,723.00
70-74	38	413,858.04	10,891.00
75-79	50	451,910.40	9,038.21
80-84	75	564,620.52	7,528.27
85+	105	642,230.40	6,116.48
Total	**326**	**$ 2,840,443.80**	**$ 8,713.02**

Age Distribution of Retired Participants

All Persons Receiving Benefits			
Age Group	**Number of People**	**Total Annual Benefit**	**Average Annual Benefit**
< 30	0	$ 0.00	$ 0.00
30-34	1	5,734.92	5,734.92
35-39	0	0.00	0.00
40-44	6	196,319.28	32,719.88
45-49	7	227,795.04	32,542.15
50-54	17	606,895.08	35,699.71
55-59	106	3,772,060.08	35,585.47
60-64	219	7,776,819.00	35,510.59
65-69	180	6,096,536.04	33,869.64
70-74	126	3,195,524.64	25,361.31
75-79	127	2,547,174.24	20,056.49
80-84	148	2,147,701.68	14,511.50
85+	174	1,859,203.08	10,685.08
Total	**1,111**	**$ 28,431,763.08**	**$ 25,591.15**

Demographic Data as of January 1, 2013

Changes in Plan Participation for Active Members

Active Members	Number
As of January 1, 2011	611
New Entrants	25
Transfer From Another Plan	0
Total	636
Separation from Active Service	
Separation with a Deferred Benefit	(1)
Separation without a Deferred Benefit	(8)
Disability	(9)
Death	(1)
Retirement with a Service Retirement Benefit	(33)
Total Separations	(52)
Data Adjustments	0
Active Members as of January 1, 2013	584

Changes in Plan Participants for Inactive Members and Survivors

	Deferred Vested	Regular Retirements	Disability Retirement	Survivors Child	Survivors Other	Total
As of January 1, 2011	0	557	233	2	332	1,124
New Benefit Recipients	1	33	9	0	30	73
Death	0	(35)	(12)	0	(37)	(84)
Other Cessation of Benefits	0	0	0	(1)	0	(1)
Net Data Adjustments	0	0	0	0	0	0
As of January 1, 2013	1	555	230	1	325	1,112

Section Nine: Plan Assets

Combined Municipal Pension Trust Fund Calendar Year 2011

Source of Asset Information

The assets of the Aggregated Trust for the City's pension plans are summarized in the following tables based on the information provided by the City and by Maher Duessel. As directed by the Trustees of the City of Pittsburgh Comprehensive Municipal Pension Trust Fund, the values represent a combination of the assets listed in the City's 2011 Comprehensive Annual Financial Report (CAFR) and the present value calculated by Gleason and Associates of the dedicated stream of revenues created by City Ordinances 42 & 44 of 2010. Assets are shown at market value.

Summary of Values for Aggregated Trust

	1/1/11	1/1/12
Invested Portfolio	$334,927,888	$325,275,669
Dedicated Funding from Parking Assets	238,572,759	246,267,849
Accrued Interest	540,982	506,858
Accrued Contributions	12,606	0
Due from City of Pittsburgh	0	1,402,380
Accrued Expenses and Other Payables	(2,671,784)	(2,660,726)
Market Value of Assets - Accrual Basis	$571,382,451	$570,792,030

Summary of Transactions for the Aggregated Trust

Balance as of January 1, 2011		$571,382,451
Contributions Toward Pension Liability		
- Policemen's	$25,581,920	
- Firemen's	23,013,090	
- Municipal	15,527,698	$ 64,122,708
Miscellaneous and Pass Through Items		4,418,518
Interest and Dividends		5,241,252
Net Appreciation (Decline) in Fair Value Of Investments		9,622,836
Payments to Participants		
- Policemen's	$ 32,545,291	
- Firemen's	28,200,726	
- Municipal	21,133,734	(81,879,751)
Expenses		(2,115,984)
Balance as of December 31, 2011		**$570,792,030**

Undivided Participation Calculation Calendar Year 2011 - Accrual Basis

	Policemen's	Firemen's	Municipal	Total
January 1, 2011 Market Value	$216,050,208	$188,721,694	$ 166,610,549	$571,382,451
Plan-Specific Contributions	26,885,936	23,384,367	17,372,712	67,643,014
Plan-Specific Distributions	(32,873,373)	(28,393,023)	(21,420,864)	(82,687,260)
Sub-Total	$210,062,771	$183,713,038	$ 162,562,397	$556,338,205
Sub-Total Percentages	37.76%	33.02%	29.22%	100.00%
Allocated Expenses	(494,080)	(432,058)	(382,336)	(1,308,475)
Allocated Investment Earnings	5,951,844	5,204,711	4,605,745	15,762,300
December 31, 2011 Market Value	$215,520,534	$188,485,691	$166,785,805	$570,792,030

Contributions and Distributions for 2011 - Accrual Basis

Plan-Specific Contributions	Policemen's	Firemen's	Municipal	Total
General Municipal Pension System State Aid	$ 11,402,091	$ 9,106,716	$ 6,398,832	$26,907,639
Member Contributions	3,591,870	3,562,550	3,196,201	10,350,620
City Contributions	10,587,959	8,440,820	5,932,666	24,961,445
Wilkinsburg Fire Transfer	0	1,903,004	0	1,903,004
Pass Through Contributions	1,304,016	361,800	1,772,618	3,438,434
Miscellaneous Income	0	9,477	72,395	81,872
Total Contributions	**$26,885,936**	**$23,384,367**	**$17,372,712**	**$67,643,014**
Plan-Specific Distributions				
Benefit Payments to Participants	$32,297,162	$28,159,257	$20,562,562	$81,018,981
Refunds to Participants	248,129	41,469	571,172	860,770
Administrative Expenses	328,082	192,297	287,130	807,509
Total Distributions	**$32,873,373**	**$28,393,023**	**$21,420,864**	**$82,687,260**

Combined Municipal Pension Trust Fund Calendar Year 2012

Source of Asset Information

The assets of the Aggregated Trust for the City's pension plans are summarized in the following tables based on the information provided by the City and by Maher Duessel. As directed by the Trustees of the City of Pittsburgh Comprehensive Municipal Pension Trust Fund, the values represent a combination of the assets listed in the City's 2012 Comprehensive Annual Financial Report (CAFR) and the present value calculated by Gleason and Associates of the dedicated stream of revenues created by City Ordinances 42 & 44 of 2010. Assets are shown at market value.

Summary of Values for the Aggregated Trust

	1/1/12	1/1/13
Invested Portfolio	$ 325,275,669	$ 355,308,381
Dedicated Funding from Parking Assets	246,267,849	252,251,944
Accrued Interest	506,858	534,057
Accrued Contributions	0	0
Due From City of Pittsburgh	1,402,380	688,949
Accrued Expenses and Other Payables	(2,660,726)	(2,660,148)
Market Value of Assets – Accrual Basis	$ 570,792,030	$ 606,123,183

Summary of Transactions for the Aggregated Trust

Balance as of January 1, 2012		$ 570,792,030
Contributions Toward Pension Liability		
-Policemen's	$ 19,697,172	
-Firemen's	19,267,909	
-Municipal	14,078,478	$ 53,043,559
Miscellaneous and Pass Through Items		3,506,306
Interest and Dividends		4,675,117
Net Appreciation (Decline) in Fair Value of Investments		59,319,524
Payments to Participants		
-Policemen's	$ 32,627,580	
-Firemen's	28,849,451	
-Municipal	21,573,218	(83,050,249)
Expenses		(2,163,104)
Balance as of December 31, 2012		**$ 606,123,183**

Undivided Participation Calculation Calendar Year 2012 - Accrual Basis

	Policemen's	Firemen's	Municipal	Total
January 1, 2012 Market Value	$215,520,534	$188,485,691	$166,785,805	$570,792,030
Plan-Specific Contributions	20,955,098	19,592,765	15,897,202	56,445,065
Plan-Specific Distributions	(32,994,063)	(29,071,505)	(21,868,627)	(83,934,195)
Sub-Total	$203,481,569	$179,006,951	$160,814,380	$543,302,900
Sub-Total Percentages	37.45%	32.95%	29.60%	100.00%
Allocated Expenses	(479,045)	(421,483)	(378,631)	(1,279,158)
Allocated Investment Earnings	24,005,241	21,120,766	18,973,434	64,099,441
December 31, 2012 Market Value	$227,007,765	$ 199,706,235	$ 179,409,183	$606,123,183

Contributions and Distributions for 2012 - Accrual Basis

Plan-Specific Contributions	Policemen's	Firemen's	Municipal	Total
General Municipal Pension System State Aid	$ 6,383,196	$ 6,203,826	$ 4,320,825	$16,907,847
Member Contributions	3,684,218	3,704,596	3,236,377	10,625,191
City Contributions	9,629,757	9,359,487	6,521,276	25,510,521
Pass Through Contributions	1,257,926	315,400	1,798,849	3,372,175
Miscellaneous Income	0	9,456	19,875	29,331
Total Contributions	**$20,955,098**	**$19,592,765**	**$15,897,202**	**$56,445,065**
Plan-Specific Distributions				
Benefit Payments to Participants	$32,402,642	$28,667,452	$21,055,082	$ 82,125,176
Refunds to Participants	224,938	181,999	518,136	925,073
Administrative Expenses	366,483	222,054	295,409	883,946
Total Distributions	**$32,994,063**	**$29,071,505**	**$21,868,627**	**$83,934,195**

Calculation of Actuarial Value of Assets

Description of Method

The Actuarial Value of Assets is determined by a Tabular Smoothing Method which takes the Actuarial Value of Assets from the prior valuation report and brings it forward using a specified interest rate. The Actuarial Value of Assets in the prior report, contributions by year, and annual disbursements are each credited with interest at a rate of one percent less than the prior valuation interest rate assumption. The resulting value is further subject to a minimum of 80 percent and a maximum of 120 percent of the market value of assets.

Development of the Actuarial Value of Assets

Market Value of Assets at January 1, 2013	$199,706,235
Actuarial Value of Assets at January 1, 2011	$209,936,926
Contributions During 2011	23,374,890
Disbursements During 2011	(28,825,081)
Interest Credited During 2011	14,494,478
Tabular Smoothing Value of Assets at January 1, 2012	$218,981,213
Tabular Smoothing Value of Assets at January 1, 2012	$218,981,213
Contributions During 2012	19,583,309
Disbursements During 2012	(29,492,988)
Interest Credited During 2012	14,979,014
Tabular Smoothing Value of Assets at January 1, 2013	$224,050,549
Low Limit: 80% of Market Value	$159,764,988
High Limit: 120% of Market Value	$239,647,482
Actuarial Value of Assets at January 1, 2013	$224,050,549

Section Ten: Supplementary Exhibits for Plans Funded With Pension Bond Proceeds

Table 5: Unfunded Actuarial Accrued Liability Excluding Assets Arising from Pension Bond Proceeds

Assets Excluding Pension Bond Proceeds			
Assets Excluding Bond Proceeds at January 1, 2011			$ 112,008,009
Receipts	**2011**	**2012**	
Employer Contributions	$9,914,081	$9,359,487	
Employee Contributions	3,562,550	3,704,596	
State Aid	9,106,716	6,203,826	
Investment Income	5,373,196	4,448,234	
Net Appreciation	(2,363,157)	7,652,177	
Pass Through Contibutions, Misc. Income, Wilkinsburg Fire Transfer (2011 only)	2,274,281	324,856	
Total Receipts			59,560,843
Disbursements			
Monthly Benefit Payments	$27,797,457	$ 28,352,052	
Refund of Employee Contributions	41,469	181,999	
Administrative Expenses	575,723	542,818	
Pass Through Payments	361,800	315,400	
Total Disbursements.			(58,168,718)
Assets Excluding Bond Proceeds at January 1, 2013			$ 113,400,134

Development of Actuarial Value of Assets Excluding Bond Proceeds

Market Value of Assets Excluding Bond Proceeds at January 1, 2013	$ 113,400,134
Actuarial Value of Assets Excluding Bond Proceeds at January 1, 2011	$ 118,234,353
Contributions During 2011	24,848,151
Disbursements During 2011	(28,776,449)
Interest Credited During 2011	8,085,301
Tabular Smoothing Value of Assets at January 1, 2012	$ 122,391,356
Tabular Smoothing Value of Assets at January 1, 2012	$ 122,391,356
Contributions During 2012	19,583,309
Disbursements During 2012	(29,392,269)
Interest Credited During 2012	8,221,190
Tabular Smoothing Value of Assets at January 1, 2013	$ 120,803,586
Low Limit — 80 Percent of Market Value	$ 90,720,107
High Limit — 120 Percent of Market Value	$ 136,080,161
Actuarial Value of Assets Excluding Bond Proceeds at January 1, 2013	**$ 120,803,586**

Unfunded Actuarial Accrued Liability Excluding Assets from Bond Proceeds

Actuarial Accrued Liability (Table 1)	$ 395,323,604
Actuarial Value of Assets Excluding Bond Proceeds at January 1, 2013	(120,803,586)
Adjusted Unfunded Actuarial Accrued Liability	$ 274,520,018

Table 6: Actuarial (Gain) Loss Determination Excluding Assets Arising from Pension Bond Proceeds

Reconciliation of Funded Status			
Unfunded Actuarial Accrued Liability as of January 1, 2011			$220,900,994
	2011	**2012**	
Normal Cost/Administrative Expenses Assumed	$ 6,659,206	$ 6,995,540	13,654,746
Interest Charged at Valuation Rate			38,425,660
Contributions Made			
- Municipality	$ 9,914,081	$ 9,359,487	
- State Aid Allocated	9,106,716	6,203,826	
- Employees	3,562,550	3,704,596	$(41,851,256)
Interest Credited at Valuation Rate			(3,581,120)
Special Adjustment Because of Higher Act 82 Interest Rate			(10,995,115)
Expected Unfunded Actuarial Accrued Liability Before Adjustments			$216,553,908
Experience from Investment Return			
- Comparative Int. Rate Amortization Tab. (Gain) Loss		$ 15,676,039	
- Other Investment Return (Gain) Loss		(4,621,827)	11,054,212
Experience (Gain) Loss from all Other Sources			5,894,993
Increase (Decrease) in Unfunded Actuarial Accrued Liability			
- Benefit Modifications for Actives		$0	
- Benefit Modifications for Retirees		0	
- Change in Actuarial Assumptions		41,016,905	41,016,905
Actual Unfunded Actuarial Accrued Liability			$274,520,018

Loss (Gain) to be Amortized		
Experience (Gain) Loss from January 1, 2011		$ 16,949,205
Actuarially Required Contributions and Bond Proceeds w/Interest	$33,318,082	
Actual Contributions with Interest	(45,432,377)	
Contribution (Gain) Loss		(12,114,295)
Loss (Gain) to be Amortized		$ 4,834,910

Comparative Interest Rate Amortization Tabulation			
Balance Calculated Using Actual Investment Return	**2011**	**2012**	
Act 82 Amortization Balance at January 1	$ 239,244,043	$ 255,055,357	
Act 82 Amortization Payment	8,869,108	8,869,108	
Comparative Interest Rate Balance at January 1	$ 248,113,151	$ 263,924,465	
Actual Investment Return on Balance	6,942,206	30,372,427	
Actual Act 82 Amort. Balance at December 31	$255,055,357	$294,296,892	$294,296,892
Balance Calculated Using 10 Percent Investment Return			
Comparative Interest Rate Balance at January 1	$ 248,113,151	$ 281,793,574	
Interest at 10 Percent	24,811,315	28,179,357	
Comparative Act 82 Amort. Balance at December 31	$ 272,924,466	$ 309,972,931	$309,972,931
Comparative Interest Rate Amortization Tabulation (Gain) Loss			$ 15,676,039

Table 7: Amortization of Unfunded Actuarial Accrued Liability Excluding Assets Arising from Pension Bond Proceeds

Source	Original Amount	Year Est.	Target Year	Remaining Balance	Remaining Payments	Annual Amount
Initial	$150,697,522	1998	2037	$220,355,728	25	$8,869,108
Assumption Change	(2,712,163)	1998	2017	(1,133,222)	5	(260,551)
Experience Gain	(8,740,776)	1999	2013	(972,908)	1	(972,908)
Experience Gain	(5,967,507)	2000	2014	(1,274,473)	2	(660,269)
Experience Loss	5,187,425	2001	2015	1,595,265	3	570,641
Experience Loss	12,280,996	2002	2016	492,107	4	136,676
Investment Loss	9,840,706	2002	2032	8,354,665	20	762,351
Assumption Change	(17,287,129)	2003	2022	(11,955,710)	10	(1,620,259)
Ben. Mod. - Actives	957,341	2003	2022	662,095	10	89,728
Experience Gain	(930,312)	2003	2017	(440,208)	7	(101,213)
Investment Loss	14,203,883	2003	2032	12,484,159	20	1,139,161
Assumption Change	847,777	2005	2024	655,689	12	78,852
Experience Loss	2,347,661	2005	2019	1,441,169	7	253,110
Experience Loss	52,958,493	2007	2021	38,821,779	9	5,661,377
Assumption Change	12,126,548	2009	2028	10,932,464	16	1,112,479
Experience Loss	31,000,351	2009	2028	27,947,793	16	2,843,946
Experience Gain	(83,074,123)	2011	2030	(79,298,189)	18	(7,600,009)
Agg. Changes through Last Valuation	N/A	N/A	2020	$8,312,475	8	$1,433,112
Assumption Change	$41,016,905	2013	2027	$41,016,905	15	$4,322,504
Ben. Mod. - Actives	N/A					
Ben. Mod. - Retired	N/A					
Experience Gain	4,834,910	2013	2032	4,834,910	20	441,179
Agg. Changes -2013	N/A	N/A	2028	$45,851,815	16	$4,763,683
Aggregate Changes	N/A	N/A	2026	$54,164,290	14	$6,196,795
Aggregate	N/A	N/A		$274,520,018		$15,065,903

Details of the Calculation of Act 82 Payment

Act 82 Unfunded Actuarial Accrued Liability	$ 150,697,522
40-Year Amortization Payment	$ 12,563,560
Future Value at end of 40-Year period	$ 4,317,941,320
Payment to provide the same future value with 10% annual earnings	$ 8,869,108

Debt Service Schedule by Plan Year
Pension Bond Issue of March 10, 1998

	Date of Original Borrowing	Total Principal Borrowed	Total Principal to this Plan	Percentage to this Plan	Date of Refinancing
	3/10/98	$255,865,000.00	$77,782,960.48	30.1%	N/A
Plan Year	Required Principal Pymt.	Required Interest Pymt.	Annual Debt Service	Premium or Discount Amortized	Principal Balance at Valuation Date
1997					
1998		$2,531,176.79	$2,531,176.79		$77,782,960.48
1999	$ 304,000.00	5,053,765.57	5,357,765.57		77,782,960.48
2000	304,000.00	5,036,665.57	5,340,665.57		77,478,960.48
2001	304,000.00	5,019,474.37	5,323,474.37		77,174,960.48
2002	304,000.00	5,001,963.97	5,305,963.97		76,870,960.48
2003	304,000.00	4,984,316.77	5,288,316.77		76,566,960.48
2004	304,000.00	4,966,487.17	5,270,487.17		76,262,960.48
2005	761,520.00	4,934,627.98	5,696,147.98		75,958,960.48
2006	705,280.00	4,890,447.65	5,595,727.65		75,197,440.48
2007	747,840.00	4,846,303.81	5,594,143.81		74,492,160.48
2008	779,760.00	4,799,614.54	5,579,374.54		73,744,320.48
2009	842,080.01	4,746,261.58	5,588,341.59		72,964,560.48
2010	915,040.01	4,688,193.78	5,603,233.79		72,122,480.47
2011	981,920.01	4,628,913.78	5,610,833.79		71,207,440.46
2012	2,398,560.01	4,522,674.15	6,921,234.16		70,225,520.45
2013	3,339,440.02	4,341,092.29	7,680,532.31		67,826,960.44
2014	3,553,760.02	4,119,567.87	7,673,327.89		64,487,520.42
2015	3,865,360.02	3,878,446.47	7,743,806.49		60,933,760.40
2016	4,122,240.03	3,618,849.46	7,741,089.49		57,068,400.38
2017	5,546,480.03	3,304,616.06	8,851,096.09		52,946,160.35
2018	4,023,440.02	2,993,593.66	7,017,033.68		47,399,680.32
2019	6,089,120.04	2,661,890.89	8,751,010.93		43,376,240.30
2020	6,505,600.04	2,246,265.13	8,751,865.17		37,287,120.26
2021	6,949,440.04	1,802,248.81	8,751,688.85		30,781,520.22
2022	7,425,200.06	1,327,885.67	8,753,085.73		23,832,080.18
2023	7,932,880.06	821,069.03	8,753,949.09		16,406,880.12
2024	8,474,000.06	279,641.99	8,753,642.05		8,474,000.06

Section Eleven: Glossary

Accrued Benefit
The portion of the participant's retirement benefit that is attributable to service completed before the calculation date. The calculation typically uses actual service as of the calculation date and may involve other factors such as average pay at the determination date and projected service through the retirement eligibility date.

Act 205 of 1984
Municipal Pension Plan Funding Standard and Recovery Act of December 18, 1984, P.L. 1005, No. 205. The Act controls pension funding in Pennsylvania. This Act also provides for reporting of actuarial information and for a recovery program for qualifying municipalities.

Actuarial Accrued Liability
The portion of the actuarial cost assigned to prior years.

Actuarial Assumptions
Factors used by the actuary to forecast future events. These factors include items relating to future economic conditions, the survival of the participants and their beneficiaries, and the length of employment.

Actuarial Cost Method
A means of assigning costs to periods of employment. This method is used to determine a funding level that will provide sufficient assets to pay benefits for each participant upon retirement. Act 205 specifies that the entry age normal cost method, as described in the Act, should be used for this determination.

Actuarial Gain or Loss
The effect on the actuarial accrued liability of differences between events as predicted by the actuarial assumptions and those that actually occurred. This difference can increase or decrease the contribution in future years.

Actuarial Present Value
The lump sum value that is equivalent to an expected series of future payments. This value is determined by using the actuarial assumptions. An actuarial present value, as of the valuation date, represents the amount of funds that would be sufficient to provide the series of payments, if experience precisely matches the actuarial assumptions.

Actuarial Value of Assets
The value of current plan assets which is used by the actuary to evaluate the current funding status and determine future funding requirements. Under Act 205, a corridor limitation requires that this value be between 80 and 120 percent of the fair market value of the assets except for certain temporary periods for which an expanded corridor of between 70 and 130 percent of fair market value applies.

Administrative Expenses
The average of expenses to administer the plan that is paid in the year preceding the most recent valuation and the anticipated expenses for the year following this valuation. The average is converted to a percentage of payroll and used as part of the Minimum Municipal Obligation calculation.

Amortization Payment
The annual payment required to eventually eliminate the unfunded actuarial accrued liability according to the schedule established in Act 205.

Funding Adjustment
Occurs when the actuarial value of assets exceeds the actuarial accrued liability; it is defined by Act 205 as 10 percent of the excess. This adjustment reduces the amount that must be contributed to the pension plan.

General Municipal Pension System State Aid
Annually municipalities receive a portion of the insurance premium tax levied on casualty insurance companies headquartered outside of Pennsylvania. If they have paid firefighters, they also receive a portion of the premium tax on out-of-state fire insurance companies. These taxes are distributed according to formula contained in Act 205.

Minimum Municipal Obligation
The amount that must be contributed to a pension plan by a municipality for a given year. The calculation of this amount uses the normal cost, anticipated administrative expenses, amortization payment or funding adjustment, and anticipated employee contributions to determine a municipality's contribution requirement. General Municipal Pension System State Aid may be used to reduce the contribution.

Normal Cost
The actuarial cost assigned to a given year to pay for the portion of the anticipated benefit derived from service during that year.

Unfunded Actuarial Accrued Liability
The amount by which the actuarial accrued liability exceeds the actuarial value of assets. A valuation will identify the value of changes in the unfunded actuarial accrued liability that result from changes in plan benefits, actuarial assumptions, or actuarial gains and losses.

Vesting
The participant's non-forfeitable right to receive a benefit, provided that the participant survives until benefit eligibility.