

**ARKANSAS TEACHER RETIREMENT SYSTEM**  
ANNUAL ACTUARIAL VALUATION OF ANNUITIES  
BEING PAID TO RETIREES AND BENEFICIARIES  
JUNE 30, 2014

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## REPORT OF ACTUARIAL VALUATION OF ATRS RETIRED LIVES

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December 17, 2014

Board of Trustees  
Arkansas Teacher Retirement System  
Little Rock, Arkansas

Presented in this report are the results of the *Annual Actuarial Valuation of annuities being paid to retirees and beneficiaries* of the Arkansas Teacher Retirement System.

*The date of the valuation* was June 30, 2014 (using amounts payable as of July 1, 2014).

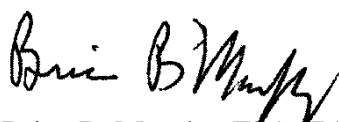
The valuation was based upon census data and financial information provided by the System's administrative staff. Data was checked for internal and year-to-year consistency, but was not otherwise audited. Preparation of this data requires considerable staff time. The helpful cooperation of the Arkansas Teacher Retirement System staff in furnishing the data is acknowledged with appreciation.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law. This report does not contain an analysis of the potential range of such future measurements.

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 of the American Academy of Actuaries. The actuarial assumptions used for the valuation produce results which, individually and in the aggregate, are reasonable.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. Brian B. Murphy and Judith A. Kermans are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,



Brian B. Murphy, FSA/EA, MAAA, FCA



Judith A. Kermans, EA, MAAA, FCA

BBM/JAK:bd

## COMMENTS

As expected, during the year ended June 30, 2014 the number of retired lives increased, as did the total amount being paid monthly to retired lives.

*The financing diagram* on page 7 shows the general pattern in which cash benefits increase (the gold line). The schedule below shows how ATRS history illustrates the general pattern.

June 30	Retired Lives Receiving Benefits		
	No.	Annual Rates	% of Active Payroll
		(millions)	
1967	3,846	\$ 6.27	
1972	5,453	11.08	
1977	7,524	23.96	
1982	8,828	36.64	
1987	10,526	66.45	10.0%
1992	12,033	115.50	10.7%
1997	14,233	194.90	15.0%
1998	14,802	220.38	16.1%
1999	15,887	248.75	17.4%
2000	16,657	280.14	18.9%
2001	17,778	309.03	19.8%
2002	19,199	334.15	20.5%
2003	20,271	359.98	21.4%
2004	21,428	386.23	22.1%
2005	22,680	415.04	21.2%
2006	24,153	449.77	21.6%
2007	25,611	484.55	21.1%
2008	26,801	515.56	21.5%
2009	28,818	564.59	22.8%
2010	30,587	612.77	23.1%
2011	32,099	657.08	24.1%
2012	34,160	709.17	26.1%
2013	36,254	763.76	28.0%
2014	38,478	822.19	29.8%

*A significant financial goal* for the Teacher Retirement System was to reach a point in time where System assets fully covered the liabilities for future benefit payments to retirees and beneficiaries then on rolls. This goal was achieved in 1980 and retired life liabilities continue to be 100% funded.

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# **FINANCIAL PRINCIPLES**

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## ANNUAL RESERVE TRANSFERS

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The annual accounting transfers listed below are recommended so that retired life accounts will be fully funded as of the valuation date.

<b>Reserve Account</b>	<b>June 30, 2014 Balance Reported</b>	<b>Transfer Amount</b>	<b>June 30, 2014 Balance After Transfer</b>
RRA	\$8,475,209,978	\$ 49,575,457	\$8,524,785,435
808 RRA	19,335,225	(794,896)	18,540,329
SBA	89,774,642	19,354	89,793,996
EAA	(3,346,284,727)	(48,799,915)	(3,395,084,642)
<b>Total</b>	<b>\$5,238,035,118</b>	<b>\$ 0</b>	<b>\$5,238,035,118</b>

Lump sum death benefits for retirees are paid from the Employer Accumulation Account and are not included in the figures shown in this report. The liabilities for lump sum death benefits for retirees are currently \$92.8 million.

## FINANCIAL PRINCIPLES AND OPERATIONAL TECHNIQUES

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***Promises Made and To Be Paid For.*** As each year is completed, the System in effect hands an “IOU” to each member then acquiring a year of service credit. The “IOU” says: “The Arkansas Teacher 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 Arkansas at the time the IOU becomes a cash demand?

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The financial objective of the ATRS is that this year’s taxpayers contribute the money to cover the IOUs being handed out this year so that ***the employer contribution rate will remain approximately level from generation to generation*** -- our children and our grandchildren will not have to contribute greater percents of pay than we contribute now. This objective was set forth in Act 793 of 1977.

(There are systems which have ***a design for deferring contributions to future taxpayers***, lured by a lower contribution rate now and putting aside the fact that the contribution rate must then relentlessly grow much greater over decades of time -- consume now, and let your children face higher contribution rates after you retire.)

An inevitable byproduct 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 accrued liabilities are the difference between (i) liabilities for service already rendered and (ii) the accrued assets of the plan).

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

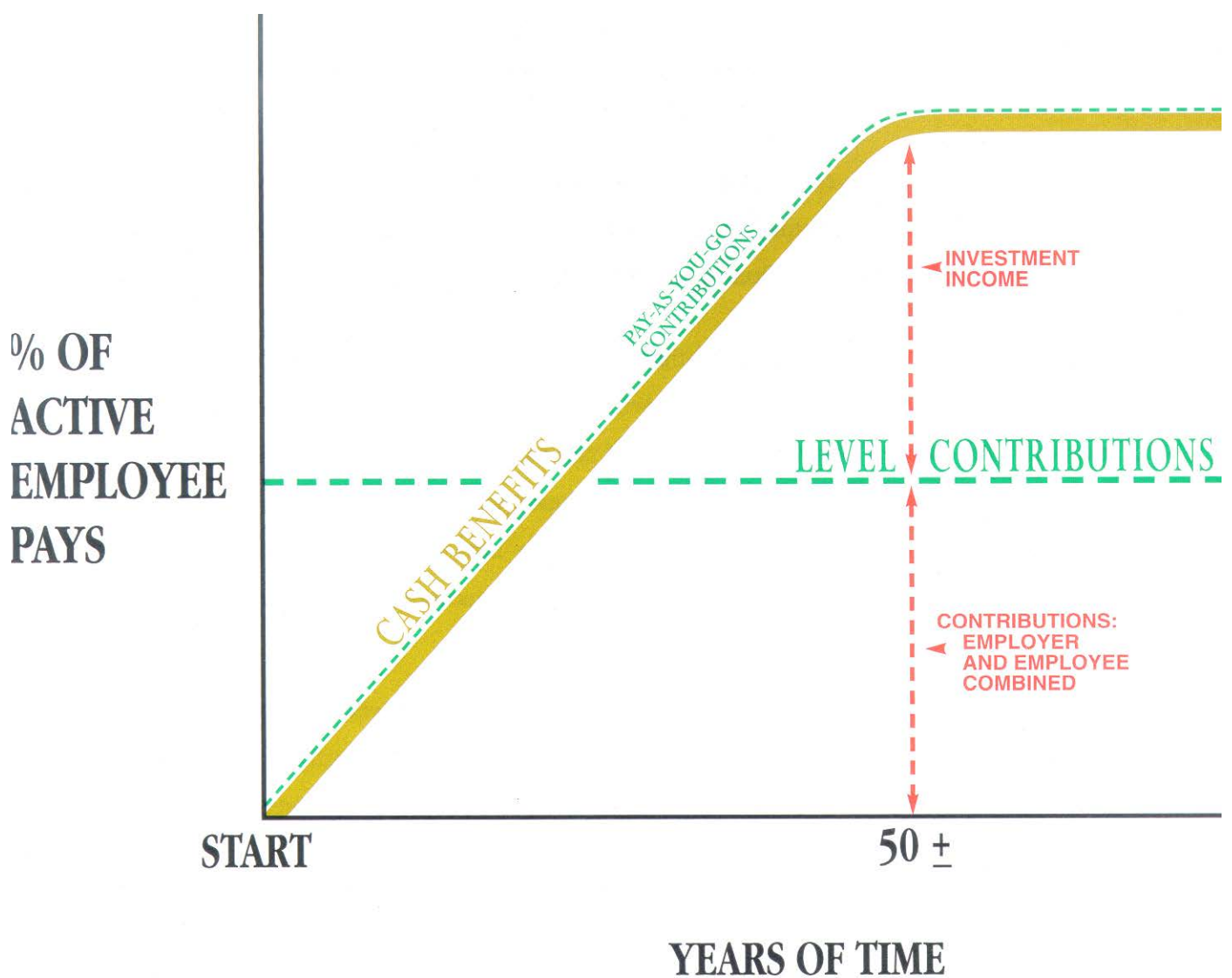
An actuarial valuation has a number of ingredients such as: the rate of investment income which plan assets will earn; the rates of withdrawal of active members who leave covered employment before qualifying for any monthly benefit; the rates of mortality; the rates of disability; the rates of pay increases; 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. Only the subsequent actual experience of the System can indicate the degree of accuracy of the assumptions.

***Reconciling Differences Between Assumed Experience and Actual Experience.*** Once actual experience has occurred and been observed, it will not coincide exactly with assumed experience, regardless of the accuracy of the assumptions or the skill of the actuary and the precision of the calculations made. The future can be predicted with considerable but not complete precision.

ATRS 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 continual 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

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*The financing diagram* on the opposite 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), and is thus an *increasing contribution method*; and the *level contribution method* which equalizes contributions between the generations.

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*The actuarial valuation* is the mathematical process by which the level contribution rate is determined, and the flow of activity constituting the valuation may be summarized as follows:

A. *Census data*, furnished by plan administrator

Retired lives now receiving benefits

Former employees with vested benefits not yet payable

Active employees

B. + *Asset data* (cash & investments), furnished by plan administrator

C. + *Benefit provisions* that establish eligibility and amounts of payments to members

D. + *Assumptions concerning future financial experience in various risk areas*, which assumptions are established by the Board of Trustees after consulting with the actuary

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*

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## **BENEFIT PROVISIONS**

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**SUMMARY OF PROVISIONS**  
**JUNE 30, 2014**

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**1. Post-Retirement Increases – A.C.A. §§ 24-7-713, 24-7-727 (compound COLA).**

Each July 1, annuities are adjusted to be equal to the base annuity times 100% plus 3% for each full year in the period from the effective date of the base annuity to the current July 1. The base annuity is the amount of the member's annuity on the later of July 1, 2001 or the effective date of retirement, as re-determined by Acts 396 of 1999 and 992 of 1997. The July 1, 2009 cost of living adjustment for retirees was compounded. The annuity was adjusted by multiplying 3% times the June 30, 2009 retirement benefit amount. After it was calculated on July 1, 2009, the base amount was reset to be the July 1, 2009 benefit amount. Future cost of living raises will be established by the new updated base amount. Future cost of living adjustments will be evaluated on an annual basis to determine if a simple or compound cost of living increase will be given, depending on the financial condition of the System. Act 967 of 2013 would allow the ATRS Board to reverse the compounding of a benefit and reset the base amount to the pre-compounding amount. If this were to occur, it would include participants in the T-DROP plan. The future benefits of a member would not be reduced to recover any benefits paid to a member as a result of the compounding. In addition, the member's benefit on the date of the reversal would not be impacted, but future COLA's would be based upon the reset base amount. This act is dependent upon the actuary's certification that the amortization period is in excess of 30 years to pay unfunded liabilities prior to any reversal of the compounding of the COLA.

**2. Lump Sum Death Benefit – A.C.A. § 24-7-720.** Beneficiaries of deceased active members or retirees with 10 or more years of ATRS credited service are eligible to receive a lump sum death benefit of up to \$10,000 (\$6,667 for non-contributory service-benefit). The amount will be prorated for members who have both contributory service and non-contributory service. Members with 15 or more years of contributory service will receive the full \$10,000 (Act 977 of 2011).

**3. Act 808 Retirement – A.C.A. § 24-4-732.** Any employee of a state agency who was an active member of the Arkansas Teacher Retirement System on April 8, 1987, and who qualified for retirement before January 1, 1988, could become a member of the Arkansas Public Employees Retirement System and retire from that system. All credited service was transferred to that system but the member's contributions were retained by the Arkansas Teacher Retirement System and the benefit amount is transferred monthly to the Arkansas Public Employees Retirement System. Each July 1, annuities are adjusted by 3% (compound escalator).

**SUMMARY OF PROVISIONS**  
**JUNE 30, 2014**

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4. **Act 793 Retirement – A.C.A. § 24-4-522.** Any employee who was a member of the rehabilitation services in 1977 was permitted to become a member of the Arkansas Public Employees Retirement System. Liabilities associated with prior service earned through June 30, 1978 remain in the Arkansas Teacher Retirement System. Future service is allocated to the Arkansas Public Employees Retirement System. Each July 1, annuities are adjusted by 3% (compound escalator).
  
5. **Retiree Health Stipend – A.C.A. § 24-7-713.** Each retired member as of June 30, 2008, with 5 or more years of ATRS credited service receives \$75 per month toward retiree health care premiums. Members in T-DROP do not receive the \$75 per month until actual retirement. For all members retiring on or after July 1, 2008, a minimum of 10 years of ATRS credited service is required to receive the \$75 per month stipend. Act 603 of 2013 allows the ATRS Board to increase or decrease the stipend to a minimum of \$1 per month and a maximum of \$75 per month. This act is dependent upon the actuary's certification that the amortization period is in excess of 30 years to pay unfunded liabilities prior to any reduction in the current stipend. The stipend for fiscal year 2015 remains at \$75 per month.
  
6. **T-DROP Cash Balance Account.** Effective July 1, 2012, a T-DROP cash balance account was established that allows members exiting (retiring) from T-DROP to place all or a portion of their T-DROP proceeds into a Cash Balance Account (CBA) at ATRS. The interest rate credited will be between 2.0% and 4.0%, increasing 25 basis points for each year on deposit.

7. **Optional Forms of Benefits – A.C.A. § 24-7-706:**

**Option 1 (*Straight Life Annuity*)**

A member will receive the maximum monthly benefit for which he/she qualifies, throughout his/her lifetime. No monthly benefits will be paid to his/her beneficiary after the member's death. Should a member die before he/she has drawn in benefits an amount equal to his/her contributions plus earned interest, the balance will be paid to a designated beneficiary. The designated beneficiary may be anyone chosen by the member.

**Option A (*100% Survivor Annuity*)**

Under this option a member will receive a reduced annuity throughout his/her lifetime. Upon the member's death, the designated beneficiary will receive the same annuity for the balance of his/her lifetime.

**SUMMARY OF PROVISIONS**  
**JUNE 30, 2014**

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**Option B (*50% Survivor Annuity*)**

Under this option a member will receive a reduced annuity throughout his/her lifetime. Upon the member's death, the designated beneficiary will receive one-half (1/2) of this annuity for the balance of his/her lifetime.

**Option C (*Annuity for Ten Years Certain and Life Thereafter*)**

A reduced monthly benefit payable for 120 months. After that time, a member's monthly allowance will revert to the amount he/she would have received under the regular plan and continue for life. If the member dies before receiving 120 payments, the designated beneficiary will receive a monthly benefit in the same amount until monthly benefits to both the member and the beneficiary equal 120 monthly payments. No further benefits are then payable to the beneficiary.

Option Factors are based upon an 8.0% interest rate and the 1971 Group Annuity Mortality Table projected to 1984, with a 75% unisex mix.

**SAMPLE BENEFIT COMPUTATIONS FOR A MEMBER  
RETIRING JULY 1, 2014 WITH A  
SIMPLE 3% COLA**

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The data for the Example member is shown below.

Monthly retirement benefit as of July 1, 2014: \$2,500

Projected Benefits, taking into account increases after retirement would be:

<u>Year Ended June 30</u>	<u>Annual Amount</u>		<u>\$ Increase</u>
	<u>Base</u>	<u>Current</u>	
2015	\$30,000	\$30,000	\$ 0
2016	30,000	30,900	900
2017	30,000	31,800	900
2018	30,000	32,700	900
2019	30,000	33,600	900

Thereafter, the amount would increase by \$900 annually for life. Act 793 members and Act 808 members receive annual compound COLAs.

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## **CHANGES IN PURCHASING POWER**

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**BENEFIT CHANGES DURING RECENT YEARS OF RETIREMENT  
& RELATED CHANGES IN PURCHASING POWER (1980 \$)**

Year Ended June 30	Increase Beginning of Year	Benefit Dollars in Year*	Inflation (Loss) in Year#	Purchasing Power at Year End	
				1980 \$	% of 1980
1980	\$ - - - -	\$ 5,000	- - - -	\$5,000	100%
1981	75	5,075	(9.6)%	4,632	93%
1982	152	5,227	(7.1)%	4,456	89%
1983	152	5,379	(2.6)%	4,471	89%
1984	431	5,810	(4.2)%	4,633	93%
1985	438	6,248	(3.7)%	4,802	96%
1986	509	6,757	(1.7)%	5,103	102%
1987	197	6,954	(3.7)%	5,067	101%
1988	400	7,354	(3.9)%	5,154	103%
1989	503	7,857	(5.1)%	5,236	105%
1990	497	8,354	(4.7)%	5,319	106%
1991	230	8,584	(4.7)%	5,220	104%
1992	762	9,346	(3.1)%	5,513	110%
1993	792	10,138	(3.0)%	5,806	116%
1994	820	10,958	(2.5)%	6,123	122%
1995	303	11,261	(3.0)%	6,107	122%
1996	303	11,564	(2.8)%	6,103	122%
1997	1,657	13,221	(2.3)%	6,821	136%
1998	1,214	14,435	(1.7)%	7,324	146%
1999	323	14,758	(2.0)%	7,344	147%
2000	1,039	15,797	(3.7)%	7,583	152%
2001	1,220	17,017	(3.2)%	7,907	158%
2002	672	17,689	(1.1)%	8,132	163%
2003	468	18,157	(2.1)%	8,174	163%
2004	468	18,625	(3.3)%	8,120	162%
2005	468	19,093	(2.5)%	8,118	162%
2006	468	19,561	(4.3)%	7,973	159%
2007	468	20,029	(2.7)%	7,950	159%
2008	468	20,497	(5.0)%	7,747	155%
2009	468	20,965	1.4 %	8,038	161%
2010	629	21,594	(1.1)%	8,193	164%
2011	648	22,242	(3.6)%	8,149	163%
2012	648	22,890	(1.7)%	8,249	165%
2013	648	23,538	(1.8)%	8,336	167%
2014	648	24,186	(2.1)%	8,392	168%
2015	648	24,834			

\* The \$5,000 benefit used to begin this schedule is an arbitrary amount. A different beginning amount would show a different purchasing power amount, but the same in percent loss.

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

**BENEFIT CHANGES DURING RECENT YEARS OF RETIREMENT  
& RELATED CHANGES IN PURCHASING POWER (1990 \$)**

Year Ended June 30	Increase Beginning of Year	Benefit Dollars in Year*	Inflation (Loss) in Year#	Purchasing Power At Year End	
				1990 \$	% of 1990
1990	\$ - - - -	\$ 5,000	- - - -	\$5,000	100%
1991	150	5,150	(4.7)%	4,919	98%
1992	457	5,607	(3.1)%	5,195	104%
1993	475	6,082	(3.0)%	5,471	109%
1994	492	6,574	(2.5)%	5,770	115%
1995	182	6,756	(3.0)%	5,755	115%
1996	182	6,938	(2.8)%	5,751	115%
1997	330	7,268	(2.3)%	5,889	118%
1998	667	7,935	(1.7)%	6,324	126%
1999	177	8,112	(2.0)%	6,340	127%
2000	849	8,961	(3.7)%	6,756	135%
2001	826	9,787	(3.2)%	7,143	143%
2002	387	10,174	(1.1)%	7,346	147%
2003	270	10,444	(2.1)%	7,385	148%
2004	270	10,714	(3.3)%	7,337	147%
2005	270	10,984	(2.5)%	7,336	147%
2006	270	11,254	(4.3)%	7,205	144%
2007	270	11,524	(2.7)%	7,185	144%
2008	270	11,794	(5.0)%	7,002	140%
2009	270	12,064	1.4 %	7,265	145%
2010	362	12,426	(1.1)%	7,405	148%
2011	373	12,799	(3.6)%	7,366	147%
2012	373	13,171	(1.7)%	7,456	149%
2013	373	13,544	(1.8)%	7,535	151%
2014	373	13,917	(2.1)%	7,585	152%
2015	373	14,290			

\* The \$5,000 benefit used to begin this schedule is an arbitrary amount. A different beginning amount would show a different purchasing power amount, but the same in percent loss.

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

**BENEFIT CHANGES DURING RECENT YEARS OF RETIREMENT  
& RELATED CHANGES IN PURCHASING POWER (2000 \$)**

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Year Ended June 30	Increase Beginning of Year	Benefit Dollars in Year*	Inflation (Loss) in Year#	Purchasing Power At Year End	
				2000 \$	% of 2000
2000	\$ - - - -	\$ 5,900	- - - -	\$5,900	100%
2001	177	6,077	(3.2)%	5,886	100%
2002	252	6,329	(1.1)%	6,065	103%
2003	179	6,508	(2.1)%	6,108	104%
2004	179	6,687	(3.3)%	6,078	103%
2005	179	6,867	(2.5)%	6,086	103%
2006	179	7,046	(4.3)%	5,987	101%
2007	179	7,225	(2.7)%	5,978	101%
2008	179	7,404	(5.0)%	5,834	99%
2009	179	7,583	1.4 %	6,061	103%
2010	228	7,811	(1.1)%	6,178	105%
2011	234	8,045	(3.6)%	6,145	104%
2012	234	8,280	(1.7)%	6,221	105%
2013	234	8,515	(1.8)%	6,287	107%
2014	234	8,749	(2.1)%	6,328	107%
2015	234	8,983			

\* The \$5,900 benefit used to begin this schedule is an arbitrary amount. A different beginning amount would show a different purchasing power amount, but the same in percent loss.

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

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## **VALUATION DATA**

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**SUMMARY OF  
ANNUITIES BEING PAID RETIREES AND BENEFICIARIES JULY 1, 2014  
BY DISBURSING ACCOUNT AND GENDER**

Disbursing Account	Men		Women		Totals	
	No.	Annual Annuities	No.	Annual Annuities	No.	Annual Annuities
<b>Retirement Reserve Account</b>						
Age & Service Annuities						
Retirees	8,132	\$ 203,372,303	25,677	\$546,729,606	33,809	\$ 750,101,909
Beneficiaries	245	4,342,013	634	13,238,774	879	17,580,787
Totals	8,377	207,714,316	26,311	559,968,380	34,688	767,682,696
Disability						
Retirees	534	7,455,424	2,032	28,439,712	2,566	35,895,136
Beneficiaries	149	2,053,756	145	2,384,398	294	4,438,154
Totals	683	9,509,180	2,177	30,824,110	2,860	40,333,290
Act 793	107	1,404,100	100	730,779	207	2,134,879
Total retirees and beneficiaries being paid from Retirement Reserve Account	9,167	218,627,596	28,588	591,523,269	37,755	810,150,865
<b>Survivor's Benefit Account</b>	315	3,869,968	339	4,991,766	654	8,861,734
<b>Act 808</b>	37	2,183,201	32	998,358	69	3,181,559
<b>Totals</b>	<b>9,519</b>	<b>224,680,765</b>	<b>28,959</b>	<b>597,513,393</b>	<b>38,478</b>	<b>822,194,158</b>
Prior Year Totals	9,076	\$ 213,697,435	27,178	\$550,063,792	36,254	\$ 763,761,227

**SUMMARY OF  
ANNUITIES BEING PAID RETIREES AND BENEFICIARIES JULY 1, 2014  
BY DISBURSING ACCOUNT AND SOURCE OF FINANCING**

Disbursing Account	Annual Annuities		Total	
	Employee Financed	Employer Financed	No.	Annual Annuities
<b>Retirement Reserve Account</b>				
Age & Service Annuities				
Retirees	\$ 81,569,042	\$ 668,532,867	33,809	\$ 750,101,909
Beneficiaries	656,298	16,924,489	879	17,580,787
Totals	82,225,340	685,457,356	34,688	767,682,696
Disability				
Retirees	2,651,811	33,243,325	2,566	35,895,136
Beneficiaries	240,079	4,198,075	294	4,438,154
Totals	2,891,890	37,441,400	2,860	40,333,290
Act 793	176,731	1,958,148	207	2,134,879
Total retirees and beneficiaries being paid from Retirement Reserve Account	85,293,961	724,856,904	37,755	810,150,865
<b>Survivor's Benefit Account</b>	521,797	8,339,937	654	8,861,734
<b>Act 808</b>	159,774	3,021,785	69	3,181,559
<b>Totals</b>	<b>85,975,532</b>	<b>736,218,626</b>	<b>38,478</b>	<b>822,194,158</b>
Prior Year Totals	\$ 85,844,462	\$ 677,916,765	36,254	\$ 763,761,227

**ANNUITIES BEING PAID RETIREES AND BENEFICIARIES JULY 1, 2014**  
**BY TYPE OF ANNUITY BEING PAID**

Type of Annuity	No.	Annual Amounts		
		Original Annuities	Base Annuities	Current Annuities
<b>RETIREMENT RESERVE ACCOUNT</b>				
Age & Service				
Option 1 (Basic single life)	26,765	\$ 385,402,617	\$ 504,900,335	\$ 574,291,556
Option A (Joint & 100% Survivor)	4,127	68,340,786	82,954,183	94,231,282
Option B (Joint & 50% Survivor)	2,159	46,321,066	58,739,307	66,943,104
Option C (10 year certain)	758	11,728,044	12,943,484	14,635,967
Beneficiaries	879	13,909,204	15,331,318	17,580,787
Totals	34,688	525,701,717	674,868,627	767,682,696
Disability				
Option 1	2,087	20,032,736	26,001,039	29,360,976
Option A	346	3,551,375	4,139,743	4,643,185
Option B	75	961,711	1,192,718	1,352,675
Option C	58	462,755	475,499	538,300
Beneficiaries	294	2,971,204	3,864,073	4,438,154
Totals	2,860	27,979,781	35,673,072	40,333,290
Totals	37,548	553,681,498	710,541,699	808,015,986
<b>SURVIVOR'S BENEFIT ACCOUNT</b>				
Beneficiaries of Deceased Members	654	\$ 6,040,647	\$ 7,838,913	\$ 8,861,734
<b>OTHER ANNUITIES</b>				
Act 793	207	\$ 1,196,749	\$ 2,134,879	2,134,879
Act 808	69	1,262,561	3,181,559	3,181,559
<b>RETIREMENT SYSTEM TOTALS</b>				
Total Annuities Being Paid	38,478	\$ 562,181,455	\$ 723,697,050	\$ 822,194,158

**The Original Annuity** is the annuity at the date of retirement.

**The Base Annuity** is the amount from which the 3.0% COLA is calculated.

**The Current Annuity** is the annuity payable at July 1, 2014.

**ANNUITIES BEING PAID JULY 1, 2014  
FROM THE RETIREMENT RESERVE ACCOUNT TO  
AGE AND SERVICE RETIREES AND BENEFICIARIES  
BY ATTAINED AGES**

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Attained Age	Annual Amounts			
	No.	Original Annuities	Base Annuities	Current Annuities
Under 40	10	\$ 167,342	\$ 160,267	\$ 182,343
40-44	4	51,535	51,457	59,176
45-49	28	445,634	445,443	462,384
50-54	357	8,764,260	8,807,330	9,475,255
55-59	1,368	36,258,675	37,848,226	42,749,493
60-64	6,850	123,251,615	135,821,815	152,295,344
65-69	10,006	163,541,408	192,162,978	218,246,513
70-74	6,980	97,211,650	128,806,746	147,910,542
75-79	4,276	51,108,236	78,305,376	89,997,923
80-84	2,666	28,141,137	51,072,832	58,715,709
85-89	1,426	12,290,871	27,485,318	31,603,601
90-94	537	3,623,940	10,582,826	12,168,697
95 & Up	180	845,414	3,318,013	3,815,716
<b>Totals</b>	<b>34,688</b>	<b>\$525,701,717</b>	<b>\$674,868,627</b>	<b>\$767,682,696</b>



**ANNUITIES BEING PAID JULY 1, 2014**  
**FROM THE RETIREMENT RESERVE ACCOUNT TO**  
**DISABILITY RETIREES AND BENEFICIARIES BY ATTAINED AGES**

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Attained Age	Annual Amounts			
	No.	Original Annuities	Base Annuities	Current Annuities
Under 40	44	\$ 400,062	\$ 396,903	\$ 434,977
40-44	51	399,736	402,914	435,367
45-49	116	1,249,407	1,270,407	1,374,681
50-54	310	3,104,131	3,246,676	3,547,464
55-59	520	5,365,298	5,770,798	6,402,965
60-64	643	6,469,692	7,340,856	8,319,561
65-69	554	5,768,569	7,427,370	8,529,768
70-74	294	2,866,653	4,377,101	5,032,480
75-79	140	1,275,158	2,344,839	2,696,566
80-84	93	641,247	1,655,694	1,904,049
85-89	64	303,449	967,589	1,112,732
90-94	24	121,011	396,091	455,471
95 & Up	7	15,368	75,834	87,209
<b>Totals</b>	<b>2,860</b>	<b>\$27,979,781</b>	<b>\$35,673,072</b>	<b>\$40,333,290</b>

**ANNUITIES BEING PAID JULY 1, 2014  
FROM THE RETIREMENT RESERVE ACCOUNT TO  
ACT 793 RETIREES AND BENEFICIARIES BY ATTAINED AGES**

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Attained Age	Annual Amounts		
	No.	Original Annuities	Current Annuities
Under 40	-	\$ -	\$ -
40-44	-	-	-
45-49	-	-	-
50-54	-	-	-
55-59	2	4,908	7,019
60-64	24	76,550	108,049
65-69	48	244,722	376,534
70-74	44	299,945	496,858
75-79	33	226,650	388,911
80-84	33	224,721	447,194
85-89	20	101,518	262,424
90-94	3	17,735	47,890
95 & Up	-	-	-
<b>Totals</b>	<b>207</b>	<b>\$1,196,749</b>	<b>\$2,134,879</b>

Base annuities are equal to current annuities since the COLA is compound.

**ANNUITIES BEING PAID JULY 1, 2014  
FROM THE RETIREMENT RESERVE ACCOUNT TO  
SURVIVOR BENEFICIARIES BY ATTAINED AGES**

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Attained Age	Annual Amounts			
	No.	Original Annuities	Base Annuities	Current Annuities
Under 40	142	\$ 841,384	\$ 882,147	\$ 971,603
40-44	8	25,596	30,668	35,268
45-49	17	112,849	125,542	139,443
50-54	28	298,036	308,307	333,292
55-59	61	852,105	937,971	1,057,639
60-64	93	1,121,666	1,277,530	1,433,437
65-69	112	1,375,752	1,664,949	1,893,412
70-74	79	721,920	1,028,097	1,177,336
75-79	54	408,497	753,399	865,504
80-84	37	227,869	604,144	694,717
85-89	15	39,366	136,647	157,145
90-94	6	13,623	76,080	87,491
95 & Up	2	1,984	13,432	15,447
<b>Totals</b>	<b>654</b>	<b>\$6,040,647</b>	<b>\$7,838,913</b>	<b>\$8,861,734</b>

**ANNUITIES BEING PAID JULY 1, 2014**  
**FROM THE ACT 808 RETIREMENT RESERVE ACCOUNT TO**  
**ACT 808 RETIREES AND BENEFICIARIES BY ATTAINED AGES**

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Attained Age	Annual Amounts		
	No.	Original Annuities	Current Annuities
Under 40	-	\$ -	\$ -
40-44	-	-	-
45-49	-	-	-
50-54	-	-	-
55-59	-	-	-
60-64	-	-	-
65-69	-	-	-
70-74	-	-	-
75-79	11	221,021	580,480
80-84	26	451,526	1,119,887
85-89	23	470,370	1,159,324
90-94	8	115,071	308,981
95 & Up	1	4,573	12,887
<b>Totals</b>	<b>69</b>	<b>\$1,262,561</b>	<b>\$3,181,559</b>

Base annuities are the same as current annuities since the COLA is compound.

**RETIREE AND BENEFICIARY DATA  
AS OF JUNE 30**

Year	Estimated Number		Total Retirees	Annual Allowances (Millions)	% Increase in Annual Allowances	Average Annual Allowances
	Added	Removed				
1990	588	337	11,654	\$ 92.69	7.0%	\$ 7,954
1991	489	253	11,890	104.60	12.8%	8,797
1992	455	312	12,033	115.50	10.4%	9,599
1993	589	316	12,306	129.71	12.3%	10,540
1994	846	512	12,640	141.87	9.4%	11,224
1995	908	342	13,206	156.59	10.4%	11,857
1996	1,107	654	13,659	170.59	8.9%	12,489
1997	1,049	475	14,233	194.90	14.3%	13,694
1998	809	240	14,802	220.38	13.1%	14,888
1999	1,582	497	15,887	248.75	12.9%	15,658
2000	1,249	479	16,657	280.14	12.6%	16,818
2001	1,571	450	17,778	309.03	10.3%	17,383
2002	1,989	568	19,199	334.15	8.1%	17,404
2003	1,621	549	20,271	359.98	7.7%	17,758
2004	1,685	528	21,428	386.23	7.3%	18,025
2005	1,822	570	22,680	415.04	7.5%	18,300
2006	1,958	485	24,153	449.77	8.4%	18,622
2007	2,017	559	25,611	484.55	7.7%	18,920
2008	1,703	513	26,801	515.56	6.4%	19,237
2009	2,721	704	28,818	564.59	9.5%	19,591
2010	2,588	819	30,587	612.77	8.5%	20,034
2011	2,394	882	32,099	657.08	7.2%	20,470
2012	2,932	871	34,160	709.17	7.9%	20,760
2013	3,039	945	36,254	763.76	7.7%	21,067
2014	3,156	932	38,478	822.19	7.7%	21,368

T-DROP participants are classified as active members for purposes of the valuation and are not included in this schedule.

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## **REPORTED ASSETS**

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*The assets* of the Retirement System, as of June 30, 2014, were reported to your actuary to be \$14,856,276,668. This amount, together with a funding value adjustment of \$(1,481,511,168), is used to finance the Retirement System liability.

Accounts	Assets at June 30	
	2014	2013
Regular Accounts		
Members' Deposit Accounts		
Contributions	\$ 1,050,880,172	\$ 1,001,177,347
Interest	7,959,009,433	6,215,559,708
Total	9,009,889,605	7,216,737,055
T-Drop Member Deposit Accounts		
Contributions	25,948,037	25,387,239
Interest	51,429,946	57,429,987
Total	77,377,983	82,817,226
Cash Balance Account	32,505,783	14,034,807
Employer's Accumulation Account	(3,346,284,727)	(3,033,603,218)
Retirement Reserve Account	8,475,209,978	7,933,255,409
Act 808 Retirement Reserve Account	19,335,225	21,150,401
T-Lump Payable	488,217,048	497,306,284
Survivors Benefit Account	89,774,642	87,759,726
Total Regular Accounts	14,846,025,538	12,819,457,690
Other Accounts		
Income Expense Account	10,251,130	10,107,888
Other Special Reserves	-	-
Miscellaneous	-	-
Total Other Accounts	10,251,130	10,107,888
Total Accounting Value of Assets	14,856,276,668	12,829,565,578
Market Value Adjustment	(1,481,511,168)	(582,760,381)
<b>Funding Value of Assets</b>	<b>\$13,374,765,500</b>	<b>\$12,246,805,197</b>

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## **VALUATION RESULTS**

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**LIABILITIES FOR ANNUITIES BEING PAID JULY 1, 2014**  
**TABULATED BY TYPE OF ANNUITY BEING PAID**

Type of Annuity	Liabilities July 1, 2014*		
	Men	Women	Totals
<b>RETIREMENT RESERVE ACCOUNT</b>			
Age & Service Annuities			
Option 1 (Straight Life)	\$ 1,125,959,370	\$ 4,696,273,665	\$ 5,822,233,035
Option A (100% Joint & Survivor)	631,013,215	566,750,995	1,197,764,210
Option B (50% Joint & Survivor)	319,459,541	443,373,629	762,833,170
Option C (10 Years Certain & Life)	38,429,435	138,084,205	176,513,640
Beneficiaries	34,710,450	115,993,867	150,704,317
Total Age & Service	2,149,572,011	5,960,476,361	8,110,048,372
Disability Annuities			
Option 1	43,224,638	245,712,068	288,936,706
Option A	25,681,128	35,883,064	61,564,192
Option B	4,482,623	10,106,225	14,588,848
Option C	984,922	5,800,907	6,785,829
Beneficiaries	19,827,387	23,034,101	42,861,488
Total Disability	94,200,698	320,536,365	414,737,063
Total Retirement Reserve Account	2,243,772,709	6,281,012,726	8,524,785,435
<b>SURVIVORS' BENEFIT ACCOUNT</b>			
Beneficiaries of Deceased Members	\$ 39,112,754	\$ 50,681,242	\$ 89,793,996
<b>OTHER LIABILITIES</b>			
Act 793	\$ 11,994,199	\$ 6,615,037	\$ 18,609,236
Act 808	12,625,860	5,914,469	18,540,329
Cash Balance Account	N/A	N/A	32,505,783
<b>RETIREMENT SYSTEM TOTALS**</b>			
Total Annuity Liabilities	\$ 2,307,505,522	\$ 6,344,223,474	\$ 8,684,234,779

\* Does not include liabilities associated with lump sum death benefit.

\*\* Men and Women Retirement System Totals exclude Cash Balance Account liabilities.

**RETIREMENT RESERVE ACCOUNT**  
**COMPARATIVE STATEMENT OF ANNUITIES, ACCRUED LIABILITIES AND ASSETS**  
**(\$ MILLIONS)**

Valuation Date June 30	Annual Annuities Being Paid			Average	Computed Liabilities	Applicable Assets	Unfunded Retired Life Liabilities	Ratio of Assets to Liabilities
	No.	Amount	% Incr.					
1975*	6,381	\$ 19.80	21.4%	\$ 3,102	\$ 188.00	\$ 142.9	\$ 45.1	76.0%
1980*#	8,001	30.10	3.5%	3,761	280.7	280.7	none	100.0%
1985*+	9,331	51.49	13.6%	5,518	479.9	479.9	none	100.0%
1990	11,054	87.84	7.2%	7,946	847.7	847.7	none	100.0%
1995	12,622	150.45	10.8%	11,920	1,428.6	1,428.6	none	100.0%
2000* ##	16,172	275.65	14.6%	17,045	2,828.8	2,828.8	none	100.0%
2005	22,147	409.42	7.5%	18,486	4,148.1	4,148.1	none	100.0%
2006	23,606	443.98	8.4%	18,808	4,483.4	4,483.4	none	100.0%
2007	25,038	478.30	7.7%	19,103	4,816.4	4,816.4	none	100.0%
2008	26,258	509.29	6.5%	19,396	5,391.3	5,391.3	none	100.0%
2009	28,228	557.83	9.5%	19,762	5,891.9	5,891.9	none	100.0%
2010	29,969	605.55	8.6%	20,206	6,358.0	6,358.0	none	100.0%
2011**	31,498	649.47	7.3%	20,619	6,972.6	6,972.6	none	100.0%
2012	33,533	701.09	7.9%	20,907	7,481.0	7,481.0	none	100.0%
2013	35,622	755.26	7.7%	21,202	8,004.8	8,004.8	none	100.0%
2014	37,617	811.20	7.4%	21,565	8,575.8	8,543.3	none	99.6%

\* Includes amendments which increased benefits to retirees.

# After change in interest assumption from 6.0% to 7.0%, change in post-retirement adjustments from 1.5% to 3.0% and recommended reserve transfer.

+ After redetermination of base, retroactive application of new minimum benefit formula and reserve transfers.

## Includes Act 808 and Act 793 retirees beginning in 2000.

\*\* After changes in assumptions.

**SURVIVORS' BENEFIT ACCOUNT  
ACCRUED LIABILITIES AND ASSETS  
COMPARATIVE STATEMENT**

Valuation Date June 30	Annual Annuities Being Paid		Computed Liabilities	Applicable Assets	Unfunded Accrued Liabilities	Ratio of Assets to Liabilities
	No.	Amount				
1975*	274	\$ 462,116	\$ 4,321,044	\$ 4,098,953	\$ 222,091	94.9%
1980*#	393	772,631	7,042,644	7,042,644	none	100.0%
1985*+	421	1,240,399	12,411,800	12,411,800	none	100.0%
1990	424	1,830,743	18,117,244	18,117,244	none	100.0%
1995	416	2,723,940	26,220,218	26,220,218	none	100.0%
2000*	485	4,487,519	43,701,138	43,701,138	none	100.0%
2005	533	5,619,675	56,257,745	56,257,745	none	100.0%
2006	547	5,791,974	57,605,939	57,605,939	none	100.0%
2007	573	6,250,603	63,481,565	63,481,565	none	100.0%
2008	543	6,269,551	66,496,539	66,496,539	none	100.0%
2009	590	6,761,034	70,857,161	70,857,161	none	100.0%
2010	618	7,224,585	75,108,334	75,108,334	none	100.0%
2011**	601	7,605,212	81,150,385	81,150,385	none	100.0%
2012	627	8,081,913	84,930,745	84,930,745	none	100.0%
2013	632	8,491,667	88,139,802	88,139,802	none	100.0%
2014	654	8,861,734	89,793,996	89,793,996	none	100.0%

\* Includes amendments.

# After change in interest assumption from 6.0% to 7.0%, change in post-retirement adjustments from 1.5% to 3.0% and recommended reserve transfer.

+ After redetermination of base annuity, retroactive application of new minimum benefit formula and recommended reserve transfer.

\*\* After changes in assumptions.

**ANNUAL ALLOWANCES OF RETIRED LIVES  
BY YEAR OF RETIREMENT  
AS OF JUNE 30, 2014**

Calendar Year of Retirement	No.	Annual Amount Being Paid			Average
		Original	Total Increase	Current	
2014*	604	\$ 6,136,639	\$ 215,025	\$ 6,351,664	\$ 10,516
2013	2,882	47,706,123	5,698,737	53,404,860	18,530
2012	2,872	45,215,217	6,783,640	51,998,857	18,105
2011	2,571	41,113,305	7,383,634	48,496,939	18,863
2010	2,235	35,322,301	7,881,194	43,203,495	19,330
2009	2,334	37,228,455	9,804,454	47,032,909	20,151
2008	2,227	34,407,958	9,838,073	44,246,031	19,868
2007	2,109	31,855,742	9,845,915	41,701,657	19,773
2006	1,902	29,030,229	10,293,418	39,323,647	20,675
2005	1,864	28,874,755	11,520,192	40,394,947	21,671
2004	1,664	24,197,316	10,087,516	34,284,832	20,604
2003	1,508	21,640,033	9,690,367	31,330,400	20,776
2002	1,440	21,540,552	10,097,785	31,638,337	21,971
2001	1,559	20,318,898	10,220,088	30,538,986	19,589
2000	1,296	19,553,011	11,111,923	30,664,934	23,661
1999	1,124	15,800,051	10,434,671	26,234,722	23,341
1998	1,118	14,271,353	10,482,358	24,753,711	22,141
1997	830	12,406,866	10,158,142	22,565,008	27,187
1996	705	10,786,744	9,194,312	19,981,056	28,342
1995	747	11,541,096	10,376,396	21,917,492	29,341
1994	766	11,835,088	11,543,395	23,378,483	30,520
1993	578	8,900,135	9,062,443	17,962,578	31,077
1992	438	5,486,700	6,542,804	12,029,504	27,465
1991	314	3,388,699	4,702,636	8,091,335	25,769
1990	357	3,633,262	5,630,800	9,264,062	25,950
1989	343	3,607,828	5,829,341	9,437,169	27,514
1988	365	3,707,125	6,276,863	9,983,988	27,353
1987	380	3,752,844	7,101,360	10,854,204	28,564
1986	254	2,257,485	4,740,156	6,997,641	27,550
1985	241	2,000,480	4,283,449	6,283,929	26,074
1984	164	1,179,097	2,894,620	4,073,717	24,840
1983	146	965,705	2,259,553	3,225,258	22,091
1982	97	627,525	1,676,843	2,304,368	23,756
1981	107	609,421	1,675,339	2,284,760	21,353
1980	65	306,705	1,023,605	1,330,310	20,466
Before 1979	272	976,712	3,651,656	4,628,368	17,016
<b>TOTAL</b>	<b>38,478</b>	<b>\$562,181,455</b>	<b>\$260,012,703</b>	<b>\$822,194,158</b>	<b>\$21,368</b>

\* Reporting for calendar year 2014 is not yet complete. The July 1<sup>st</sup> retirees are not included in the schedule.

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## **APPENDIX**

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## APPENDIX

*Single Life Retirement Values  
Based on RP-2000 Mortality Tables Projected  
25 Years with Scale AA (95% for Men & 87% for Women) & 8.0% Interest*

Sample Attained Ages	Present Value of \$1.00 Monthly for Life		Present Value of \$1 Monthly for Life Increasing 3.0% Annually		Future Life Expectancy (years)		Percent Dying within Next Year	
	Men	Women	Men	Women	Men	Women	Men	Women
40	\$147.45	\$148.74	\$192.83	\$195.36	43.26	45.92	0.08 %	0.04 %
45	144.24	145.78	186.54	189.56	38.45	41.03	0.10 %	0.07 %
50	139.69	141.63	178.19	181.91	33.65	36.18	0.13 %	0.10 %
55	133.32	135.93	167.29	172.06	28.89	31.39	0.21 %	0.19 %
60	124.93	128.62	153.79	160.06	24.28	26.77	0.43 %	0.39 %
65	114.53	119.62	137.94	146.03	19.92	22.41	0.85 %	0.74 %
70	102.19	109.01	120.09	130.24	15.89	18.36	1.45 %	1.28 %
75	87.25	96.62	99.84	112.72	12.15	14.64	2.53 %	2.00 %
80	70.65	82.27	78.66	93.60	8.86	11.25	4.76 %	3.35 %
85	54.64	66.59	59.29	73.90	6.25	8.29	8.83 %	5.80 %
Ref:	472 x 0.95	473 x 0.87	472 x 0.95	473 x 0.87				

Sample Attained Ages	Benefit Increasing 3.0% Yearly	Portion of Age 60 Lives Still Alive	
		Men	Women
60	\$100.00	100%	100%
65	115.00	97%	97%
70	130.00	92%	93%
75	145.00	84%	86%
80	160.00	71%	76%
Ref		472 x 0.95	473 x 0.87

For disabled retirees the mortality table used was the 1983 Group Annuity Mortality Table set forward 5 years.