

**DENVER PUBLIC SCHOOLS RETIREMENT SYSTEM**  
ANNUAL ACTUARIAL VALUATION REPORT  
DECEMBER 31, 2007

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April 30, 2008

The Board of Trustees  
Denver Public Schools Retirement System  
Denver, Colorado

Dear Board Members:

The results of the *Annual Actuarial Valuation* of the Denver Public Schools Retirement System are presented in this report. The purpose of the valuation was to measure the system's funding progress and to determine the computed employer contribution rate for the next fiscal year.

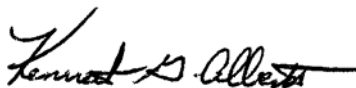
The valuation was based upon information, furnished by Retirement System staff, concerning Retirement System benefits, financial transactions, and active members, terminated members, retirees and beneficiaries. Data was checked for internal and year-to-year consistency, but was not otherwise audited. All promised benefits were included in the actuarially computed contribution rates.

The date of the valuation was *December 31, 2007*.

To the best of our knowledge, this report is complete and accurate and the valuation was conducted in accordance with standards of practice prescribed by the Actuarial Standards Board. It is our opinion, that the actuarial assumptions used for the valuation produce results which are reasonable.

The signing actuaries are Members of the American Academy of Actuaries (M.A.A.A) as indicated, and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.


Respectfully submitted,



Kenneth G. Alberts



Judith A. Kermans, EA, MAAA



Norman L. Jones, FSA, MAAA

JM:mrh

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## SECTION A

### VALUATION RESULTS

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## **FUNDING OBJECTIVE AND EXECUTIVE SUMMARY**

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The funding objective of the Retirement System is to establish and receive contributions, expressed as percents of active member payroll, that will accumulate assets during each member's working years which, together with regular interest, will be sufficient to pay promised benefits after retirement.

### **EXECUTIVE SUMMARY**

- The recommended employer contribution for the fiscal year beginning July 1, 2009, based on normal cost plus 30-year amortization of unfunded accrued liabilities is 13.92% of payroll. The funding policy contribution rate will be equal to 100% of the actuarially determined rate since the previous phase-in period has now ended.
- In aggregate, experience was very close to assumed. There was an experience loss of 0.4% of beginning of year accrued liabilities. This loss combined with larger than expected payroll growth, resulted in a decrease in the computed employer contribution rate of 0.09% of payroll.
- The current actuarial funding ratio of 87.7% has decreased slightly from 88.3% last year. The market value of assets was \$38 million higher than the funding value of assets as of December 31, 2007. In the absence of offsetting future losses, the funded ratio is likely to increase somewhat in the coming years, provided that the plan sponsor contributes 100% of the actuarially determined rate.
- The actual rate of return on a market value basis was 10.3%, above the 8.50% assumed rate. Due to the smoothing method, a 9.0% rate of return was recognized this year and the rest will be recognized in future valuations.
- Revised methods and assumptions as adopted by the Board pursuant to the 3-year experience study were included in this valuation. The Board adopted the methods and assumptions to be effective with the FY08 contributions. We have therefore adjusted historical schedules accordingly.

### **CONCLUSION**

The Denver Public Schools Retirement System continues to be in sound financial condition based on actuarial principles of level percent-of-payroll financing. In order to meet Plan obligations and to maintain a strong funding level, receipt of the recommended contribution amounts is essential.

**CONTRIBUTIONS TO PROVIDE BENEFITS  
EXPRESSED AS PERCENTS OF ACTIVE MEMBER PAYROLL  
FOR FISCAL YEARS BEGINNING JULY 1, 2008 AND 2009**

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	Employer Fiscal Year	
	Beginning 7/1/09	Beginning 7/1/08
Contributions for	Recommended	Recommended#
Normal cost of benefits:		
Age & service	12.09 %	12.11 %
Disability	1.01 %	1.02 %
Death-in-service	0.23 %	0.23 %
Refunds of member contributions	2.24 %	2.22 %
Total normal cost	15.57 %	15.58 %
Member contributions	8.00 %	8.00 %
Employer normal cost	7.57 %	7.58 %
Unfunded actuarial accrued liabilities	6.35 %*	6.43 %*
<b>COMPUTED EMPLOYER RATE</b>	<b>13.92 %</b>	<b>14.01 %</b>

\* Amortized as a level percent-of-payroll over an open period of 30 years.

# Results shown include new assumptions and assets marked to market value based on the 3-year experience study ending December 31, 2006.

*Actual employer contributions* for the last completed calendar (plan) year were reported to be \$40,572,810.

## DERIVATION OF EXPERIENCE GAIN (LOSS)

### YEAR ENDED DECEMBER 31, 2007

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Actual experience will never (except by coincidence) coincide exactly with assumed experience. Gains and losses often offset one another over a period of years, but sizable year-to-year fluctuations are common. Detail on the derivation of the experience gain (loss) is shown below.

	<u>12/31/2007#</u>
(1) UAAL* at start of year	\$394,899,799
(2) Normal cost from last valuation	52,765,653
(3) Actual contributions	68,757,380
(4) Interest accrual: $[(1) + \{(2)-(3)\}/2] \times .085$	32,886,835
(5) Expected UAAL before changes: $(1) + (2) - (3) + (4)$	411,794,907
(6) Change in demographic assumptions	39,072,279
(7) Changes in asset valuation method	(50,565,545)
(8) Expected UAAL after changes: $(5) + (6) + (7)$	400,301,641
(9) Actual UAAL at end of year	414,464,061
(10) Gain (loss): $(8) - (9)$	\$ (14,162,420)
(11) Gain (loss) as percent of actuarial accrued liabilities at start of year (\$3,193,881,106)	(0.4%)

\* *Unfunded actuarial accrued liability.*

# *Gain/Loss analysis is based on the December 31, 2006 results prior to adopting new assumptions and assets.*

# DERIVATION OF EXPERIENCE GAIN (LOSS) BY SOURCE

## YEAR ENDED DECEMBER 31, 2007##

	<u>\$ Amount</u>	<u>% of AAL*</u>
<b>Age &amp; Service Retirements</b>	\$ (2,379,943)	(0.1%)
Members retired at younger ages or with higher final average pay or service than assumed, causing a loss.		
<b>Disability Retirements</b>	573,421	0.0%
Disability claims were higher than assumed, causing a small loss.		
<b>Death-in-Service Benefits</b>	110,240	0.0%
Survivor claims were less than assumed, causing a gain.		
<b>Withdrawal from Employment</b>	8,899,591	0.3%
More liabilities were released by withdrawals than assumed, causing a gain.		
<b>Pay Increases</b>	(15,426,869)	(0.5%)
Pay increases were higher than assumed, causing a loss.		
<b>Investment Income #</b>	22,185,707	0.7%
Recognized investment income was higher than assumed, causing a gain.		
<b>New Entrants</b>	(6,966,611)	(0.2%)
New members with prior service, causing a loss.		
<b>Death After Retirement</b>	2,843,383	0.1%
Retirants lived for a shorter period than assumed, causing a gain.		
<b>Other **</b>	(24,001,339)	(0.7%)
Miscellaneous gains and losses resulting from other data adjustments, timing of financial transactions, subsidized service purchases, recognition of additional outside and non-qualified service, etc.		
<b>Gain (or Loss) During Year From Experience</b>	\$ (14,162,420)	(0.4%)

\* AAL: Beginning of year actuarial accrued liability.

# Based on old asset method.

\*\* Approximately \$8.5 million is attributable to the difference in the funding policy and the computed contribution rate.

## Before changes in methods and assumptions.



## SUMMARY STATEMENT OF SYSTEM RESOURCES AND OBLIGATIONS

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### *Present Resources and Expected Future Resources*

A.	Present valuation assets	
	1. Net assets from system financial statements	\$3,006,971,321
	2. Funding value adjustment	(38,177,285)
	3. Valuation assets	<u>2,968,794,036</u>
B.	Actuarial present value of expected future employer contributions	
	1. For normal costs	192,998,487
	2. For unfunded actuarial accrued liability	414,464,061
	3. Totals	<u>607,462,548</u>
C.	Actuarial present value of expected future member contributions	<u>204,966,570</u>
D.	<b>Total Present and Expected Future Resources</b>	<b>\$3,781,223,154</b>

### *Actuarial Present Value of Expected Future Benefit Payments*

A.	To retirees and beneficiaries	
	1. Annual allowances	\$2,363,997,006
	2. Unallocated Reserve	0
	3. Totals	<u>2,363,997,006</u>
B.	To vested terminated members	25,301,712
C.	To present active members	
	1. Allocated to service rendered prior to valuation date - actuarial accrued liability	993,959,379
	2. Allocated to service likely to be rendered after valuation date	397,965,057
	3. Totals	<u>1,391,924,436</u>
D.	<b>Total Actuarial Present Value of Expected Future Benefit Payments</b>	<b>\$3,781,223,154</b>

## COMPUTED EMPLOYER CONTRIBUTIONS COMPARATIVE STATEMENT

December 31,	No.#	Active Members			No.	Retirees & Beneficiaries		Employer Contribution Rate		
		Valuation Payroll				Annual Benefits		Normal Cost	Unfunded	
		Total	Average	% Incr.		Dollars	% of Payroll		Accrued Liabilites	Total
1998	6,434	\$248,766,208	\$38,664	3.53 %	5,037	\$ 108,710,952	43.7 %	N/A	N/A	2.90 %
1999	6,677	264,079,253	39,551	2.29 %	5,158	115,755,528	43.8 %	N/A	N/A	2.90 %
2000	7,182	292,404,031	40,713	2.94 %	5,222	125,550,888	42.9 %	N/A	N/A	2.90 %
2001	7,466	307,833,700	41,231	1.27 %	5,514	141,383,423	45.9 %	6.75 %	(1.77)%	4.98 %*
2002@	7,691	331,607,085	43,116	4.57 %	5,610	151,283,074	45.6 %	7.42 %	0.70 %	8.12 %*
2003	7,311	318,121,662	43,513	0.92 %	5,699	160,764,146	50.5 %	7.79 %	0.87 %	8.66 %*
2004@!	7,192	315,156,876	43,820	0.71 %	5,869	174,668,685	55.4 %	7.35 %	3.79 %	11.14 %*
2005	7,179	318,405,492	44,352	1.21 %	5,961	185,016,528	58.1 %	7.83 %	5.00 %	12.83 %*
2006@	7,102	328,608,500	46,270	4.32 %	6,069	194,691,350	59.2 %	7.58 %	6.43 %	14.01 %
2007	7,282	357,049,419	49,032	5.97 %	6,168	204,760,169	57.3 %	7.57 %	6.35 %	13.92 %

\* Based on funding policy, which phased into 100% of the rate recommended by the actuary.

# Excludes affiliate members.

@ After experience study.

! After benefit changes.

# ACTUARIAL ACCRUED LIABILITIES & VALUATION ASSETS COMPARATIVE STATEMENT

December 31	Actuarial Accrued Liability (AAL)	Valuation Assets	Unfunded Actuarial Accrued Liability (UAAL) (1) - (2)	Ratio of Present Assets to AAL (2)/(1)	Annual Covered Payroll	Ratio of UAAL to Valuation Payroll (3)/(5)
	(1)	(2)	(3)	(4)	(5)	(6)
1998	\$1,894,138,915	\$1,889,151,846	\$ 4,987,069	99.7 %	\$248,766,208	2.0 %
1999	1,983,399,740	2,044,332,158	(60,932,418)	103.1 %	264,079,253	-
2000	2,371,925,173	2,308,030,298	63,894,875 #	97.3 %	292,404,031	21.9 %
2001	2,550,556,774	2,462,548,441	88,008,333	96.5 %	307,833,700	28.6 %
2002*	2,712,292,741	2,465,049,249	247,243,492	90.9 %	331,607,085	74.6 %
2003	2,793,788,109	2,531,745,553	262,042,556	90.6 %	318,121,662	82.4 %
2004*@	2,960,990,156	2,611,523,735	349,466,421	88.2 %	315,156,876	110.9 %
2005	3,065,854,901	2,693,685,848	372,169,053	87.9 %	318,405,492	116.9 %
2006*	3,233,713,315	2,854,304,339	379,408,976	88.3 %	328,608,500	115.5 %
2007	3,383,258,097	2,968,794,036	414,464,061	87.7 %	357,049,419	116.1 %

# Actual UAAL on valuation date before any offsets.

\* After experience study.

@ After benefit changes.

**The Ratio of Valuation Assets to AAL** is a traditional measure of a system's funding progress. Except in years when the system is amended or actuarial assumptions are revised or there are extraordinary experience gains or losses, this ratio can be expected to move gradually toward 100%.

**The Ratio of UAAL to Valuation Payroll** is another relative index of condition. Actuarial unfunded liabilities represent debt, while active member payroll represents the system's capacity to collect contributions to pay toward debt. The lower the ratio is, the greater the financial strength and vice-versa.

**The Short Condition Test** is another way of looking at a system's progress under its funding program - based on the entry age accrued liability. In a short condition test, the plan's valuation assets are compared with:

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

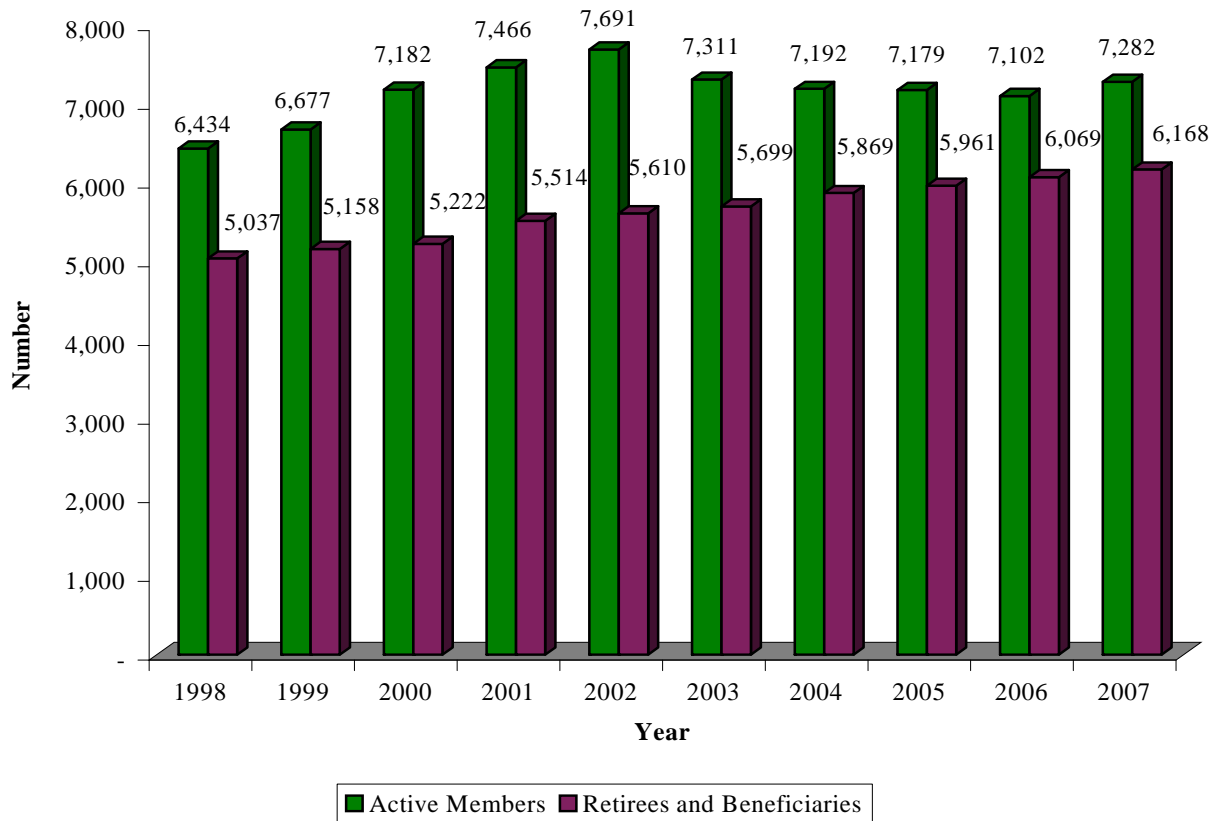
In a system that has been following the discipline of level percent of payroll financing, the liabilities for active member contributions on deposit (liability 1) and the liabilities for future benefits to present retired lives (liability 2) will be fully covered by valuation assets (except in rare circumstances).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

The schedule below illustrates the history of liabilities 1, 2 and 3.

### SHORT CONDITION TEST COMPARATIVE STATEMENT

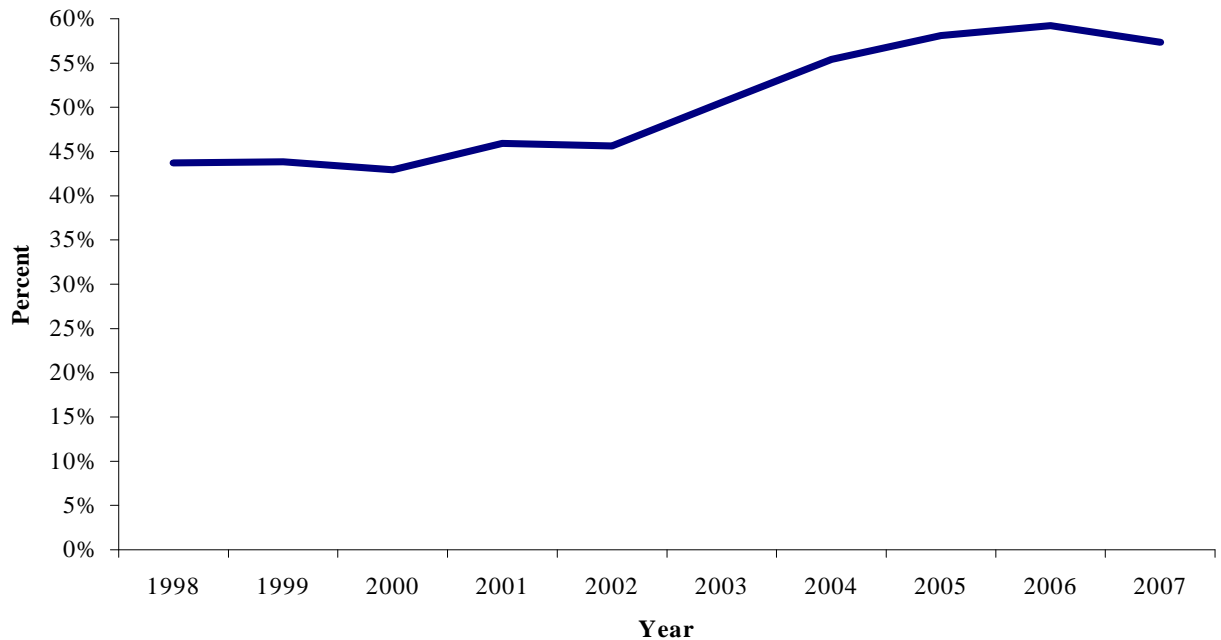
Valuation Date	Entry Age Accrued Liability			Valuation Assets	Accrued Liability Covered by Assets		
	(1)	(2)	(3)		(1)	(2)	(3)
	Active Member Contr.	Retirants and Benef.	Active Members (Employer Financed Portion)				
1/1/2001	\$206,820	\$1,431,788	\$733,317	\$2,308,030	100%	100%	91%
1/1/2002	200,222	1,631,424	718,910	2,462,548	100	100	88
1/1/2003	212,403	1,742,486	757,404	2,465,049	100	100	67
1/1/2004	229,828	1,841,065	722,895	2,531,746	100	100	64
1/1/2005	226,554	2,029,799	704,637	2,611,524	100	100	50
1/1/2006	233,032	2,132,638	700,185	2,693,686	100	100	47
1/1/2007	240,040	2,255,016	738,657	2,854,304	100	100	49
1/1/2008	247,305	2,363,997	771,956	2,968,794	100	100	46

### Active\* and Retired Members and Beneficiaries



\* Excludes affiliate members.

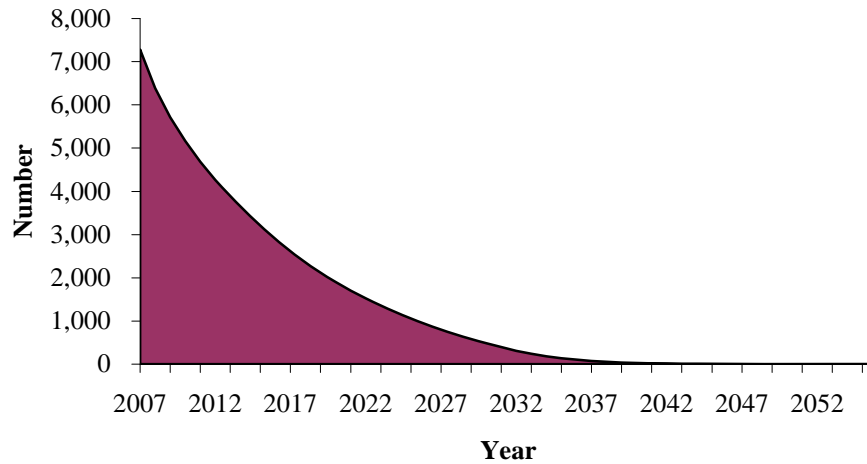
### Benefits as a Percent of Payroll



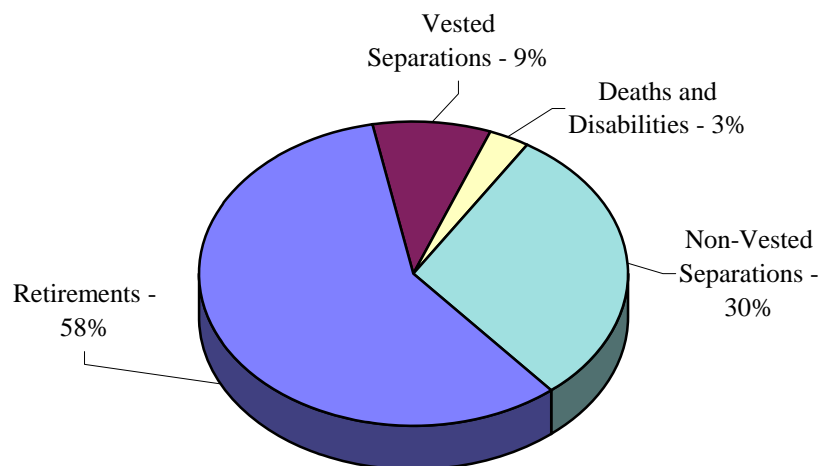
## EXPECTED DEVELOPMENT OF PRESENT POPULATION BASED ON CURRENT PLAN ASSUMPTIONS

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**Closed Group Population Projection**



**Expected Terminations from Active Employment  
for Current Active Members**



## PURCHASE OF NON-COVERED SERVICE

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Section 30.03(8) of the plan provides that periods of non-covered employment will qualify as accredited and as active service with the district provided that certain conditions are met. The charge for purchasing such service is intended to be set at a rate that is cost neutral. Once set, the rate is to be periodically analyzed by the actuary and reviewed by the Board.

The current rate is 34% of highest average salary (HAS) per year of service purchased. This rate was developed based on the analysis of service purchased during 2002. Based on supplemental data furnished by DPSRS regarding purchases in 2007, we completed the following analysis:

Number of purchases *	24
Average age of purchasers	56
Total charge for purchases:	\$ 1,040,232
Current rate as a % of HAS	34%
Total years purchased	54.2 years
Estimated Average HAS	\$ 56,448
Average benefit service years:	
Before purchase	20.8
After purchase	23.0
Increase in present value of future benefits:	
Actives	\$ 669,147
Retired	\$ 360,436
Affiliated	-
Term vested	-
Total	\$ 1,029,583
Average per year purchased	\$ 18,996
Average increase in present value per year purchased as a percent of HAS	33.7%

\* Excludes one affiliated member due to incomplete data.

### Historical Cost of Service Purchases

<b>Calendar Year</b>	<b>No. of Purchasers</b>	<b>Average Cost as a % of HAS</b>	<b>Current rate as a % of HAS</b>
2005	43	36.4%	34.0%
2006	49	36.2%	34.0%
2007	24	33.7%	34.0%

We recommend no change in the rate currently charged for the purchase of non-covered service.

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## **SECTION B**

### **SUMMARY OF BENEFIT PROVISIONS AND VALUATION DATA**

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## BRIEF SUMMARY OF BENEFIT PROVISIONS EVALUATED DECEMBER 31, 2007

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### **Regular Retirement** (no reduction factor for age):

**Eligibility** - Age 50 with 30 or more years of earned service or age 55 with 25 or more years of earned and outside service (must include 15 years with the District), or age 65 with 5 years of earned service.

**Type of Final Average Salary (FAS)** - Highest 36 months of earned service or career average, whichever is greater.

**Annual Amount** - 2.5% of FAS times earned service. Minimum benefit is \$15 times first 10 years of earned service plus \$20 times earned service over 10 years plus an amount equal to the annuitized member balance, including any amount paid to purchase service.

### **Early Retirement:**

**Eligibility** – Age 55 with 15 years of service with the District but less than 25 years of service or any age with at least 25 years of service with the District.

**Annual Amount** - Same as regular retirement but reduced by the following amount:

<u>Age</u>	<u>Service</u>	<u>Reduction Amount*</u>
Under 50	30 years	4% for each year prior to age 50
Under 50	25-30 years	Greater of: <ul style="list-style-type: none"><li>• 4% for each year of service below 30 years</li><li>• 4% for each year below age 50</li></ul>
Age 50 - 55	25-30 years	Lesser of: <ul style="list-style-type: none"><li>• 4% for each year under age 55</li><li>• 4% for each year of service below 30 years</li></ul>
Over 55	15 years	Lesser of: <ul style="list-style-type: none"><li>• 4% for each year under age 65</li><li>• 4% for each year below 25 years</li></ul>

\* Reduction amounts based on 6% rather than 4% for those hired (or re-hired, if contributions were refunded) on or after July 1, 2005.

### **Deferred Retirement** (vested benefit):

**Eligibility** - 5 years of service. Benefit begins at age 50 with 30 years of service, age 55 with 25 years of service (15 with District), or age 65 with 5 years of service.

**Annual Amount** - Computed as regular retirement but based upon service and final average salary at time of termination. In lieu of retirement benefits, members may receive 200% of accumulated contributions in a lump sum or an annuity equal to the actuarial equivalent of 200% of contributions plus minimum benefit.

## Disability Retirement:

**Eligibility** – 5 years of service. Recalculated benefit is payable at age 55 with 25 years of service, at age 50 with 30 years of service, or at age 65.

**Annual Amount** – Accrued benefit immediately. Upon attaining voluntary retirement age, additional qualified service credit is granted and benefit is recomputed.

## Death Before Retirement:

**Eligibility** - No age or service requirements for a refund of member contributions.

**Annual Amount** – If the member is eligible for retirement, the beneficiary may receive a refund of accumulated contributions, survivor benefits, or the regular or early retirement benefit.

Survivor benefits are as follows and require that the member have a minimum of 5 years of earned service with the district immediately prior to death:

Type of Survivor	Survivor Benefits
Child	The greater of 10% of Final Average Salary for each child up to a limit of 30%; and \$160 (pro-rated) for each child up to a limit of \$480.
Spouse and child	The greater of the difference between the child benefit above and 30% (40% if 15 years of service plus 2% for each year of service beyond 25 years) of Final Average Salary; and \$480.
Dependent Parent	The greater of 10% of Final Average Salary; and \$240 per parent.
Spouse:	
• Less than 15 years of service	The lesser of 30% of Final Average Salary; and \$480.
• 15 years of service or more	The greater of 30% of Final Average Salary, plus an additional 1% for each year of service over 15 years; and \$480.
Spouse's benefit is payable at age 50 with at least 15 years of service or at age 60.	

## Member Contributions:

8.0% of annual compensation. Interest is credited at a rate of 5% per year compounded monthly.

## Post-Retirement Increases: (ARAA)

3.25% per year compounded. Effective on the January 1<sup>st</sup> immediately following retirement. Associate members are not eligible for the annual retirement increase. For those hired on or after July 1, 2005, the increase is based on the lesser of 3.00% per year or the increase in the Consumer Price Index (CPI-W) for all urban wage earners and clerical workers, with the first increase calculated on a pro-rated basis.

## SERVICE

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*Earned Service* is used in the determination of benefits and eligibility. It includes periods of employment (regular or casual) with the District, a Charter School or the System.

*Outside and Non-qualified service* counts as service up to a total of 10 years of service in determining eligibility for full retirement with 25 years of service. If purchased, also counts as earned service.

## OPTIONAL FORMS OF PAYMENT

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Option A:	Single life annuity (SLA) with residual refund of member contributions.
Option B:	Installment refund annuity (SLA with reserve balance paid to beneficiary in monthly installments upon employee's death).
Option C:	100% joint and survivor with 10 years certain.
Option D:	Cash refund on annuity portion and SLA on pension portion.
Option E:	50% joint and survivor with 10 years certain.
Option P2:	50% joint and survivor with pop-up and residual refund of member contributions.
Option P3:	100% joint and survivor with pop-up and residual refund of member contributions.

# **RETIREES AND BENEFICIARIES DECEMBER 31, 2007** **TABULATED BY OPTIONAL FORM BEING PAID**

	Optional Form							
	A	B	C	D	E	P2	P3	TOTAL
<b>Superannuation and Early Retirement</b>								
(Includes survivors of deceased employees)								
Males								
Number	190	133	1,257	141	166	10	22	1,919
Average Monthly Benefit	\$2,862	\$2,845	\$3,361	\$3,055	\$2,939	\$2,673	\$2,770	\$3,207
Females								
Number	777	523	1,199	778	375	39	58	3,749
Average Monthly Benefit	\$2,787	\$2,387	\$2,793	\$2,857	\$2,525	\$3,263	\$2,708	\$2,725
<b>Total</b>								
<b>Number</b>	<b>967</b>	<b>656</b>	<b>2,456</b>	<b>919</b>	<b>541</b>	<b>49</b>	<b>80</b>	<b>5,668</b>
<b>Average Monthly Benefit</b>	<b>\$2,802</b>	<b>\$2,480</b>	<b>\$3,084</b>	<b>\$2,887</b>	<b>\$2,652</b>	<b>\$3,143</b>	<b>\$2,725</b>	<b>\$2,888</b>
<b>Regular Disability</b>								
Males								
Number	57	8	31	5	7	0	2	110
Average Monthly Benefit	\$1,535	\$1,085	\$1,625	\$2,034	\$1,944	\$0	\$591	\$1,559
Females								
Number	147	19	55	24	15	2	1	263
Average Monthly Benefit	\$1,632	\$1,303	\$1,390	\$1,225	\$1,181	\$1,695	\$1,081	\$1,493
<b>Total</b>								
<b>Number</b>	<b>204</b>	<b>27</b>	<b>86</b>	<b>29</b>	<b>22</b>	<b>2</b>	<b>3</b>	<b>373</b>
<b>Average Monthly Benefit</b>	<b>\$1,605</b>	<b>\$1,238</b>	<b>\$1,475</b>	<b>\$1,364</b>	<b>\$1,424</b>	<b>\$1,695</b>	<b>\$754</b>	<b>\$1,512</b>
<b>Survivors of Active Members and Disability Deaths</b>								
<b>Number</b>								<b>127</b>
<b>Average Monthly Benefit</b>								<b>\$1,016</b>
<b>Grand Total</b>								
<b>Number</b>								<b>6,168</b>
<b>Average Monthly Benefit</b>								<b>\$2,766</b>

# **RETIREES AND BENEFICIARIES DECEMBER 31, 2007** **TABULATED BY ATTAINED AGES**

Attained Ages	Years Since Retirement								Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+		
Under 45	Number	5	3	0	0	0	0	0	8
	Total Benefit	\$ 58,284	\$ 30,462	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 88,746
45-49	Number	25	3	5	0	0	0	0	33
	Total Benefit	\$ 582,853	\$ 10,217	\$ 40,061	\$ 0	\$ 0	\$ 0	\$ 0	\$ 633,131
50-54	Number	92	19	5	0	0	0	0	116
	Total Benefit	\$ 3,393,633	\$ 301,542	\$ 51,811	\$ 0	\$ 0	\$ 0	\$ 0	\$ 3,746,986
55-59	Number	426	130	16	8	2	0	0	582
	Total Benefit	\$ 17,598,312	\$ 5,032,467	\$ 338,674	\$ 77,047	\$ 21,185	\$ 0	\$ 0	\$ 23,067,685
60-64	Number	381	597	88	17	2	2	1	1,088
	Total Benefit	\$ 14,485,633	\$ 25,483,069	\$ 2,644,436	\$ 341,560	\$ 22,365	\$ 7,965	\$ 3,289	\$ 42,988,317
65-69	Number	309	264	204	188	3	0	0	968
	Total Benefit	\$ 7,468,989	\$ 10,044,052	\$ 7,512,058	\$ 7,196,705	\$ 32,633	\$ 0	\$ 0	\$ 32,254,437
70-74	Number	53	247	94	462	14	1	0	871
	Total Benefit	\$ 1,064,166	\$ 5,744,093	\$ 3,054,857	\$ 18,585,986	\$ 363,773	\$ 4,169	\$ 0	\$ 28,817,044
75-79	Number	16	32	122	513	231	1	0	915
	Total Benefit	\$ 385,206	\$ 736,527	\$ 2,195,200	\$ 19,118,678	\$ 7,892,094	\$ 13,864	\$ 0	\$ 30,341,569
80-84	Number	3	2	14	373	319	117	5	833
	Total Benefit	\$ 75,606	\$ 22,030	\$ 322,013	\$ 10,419,225	\$ 11,384,741	\$ 3,403,687	\$ 74,726	\$ 25,702,028
85-89	Number	0	3	1	49	263	133	23	472
	Total Benefit	\$ 0	\$ 72,268	\$ 39,699	\$ 1,118,697	\$ 6,578,354	\$ 3,641,298	\$ 425,354	\$ 11,875,670
90 & Over	Number	0	0	0	2	32	152	96	282
	Total Benefit	\$ 0	\$ 0	\$ 0	\$ 37,688	\$ 705,918	\$ 2,566,038	\$ 1,934,912	\$ 5,244,556
Totals	Number	1,310	1,300	549	1,612	866	406	125	6,168
	Total Benefit	\$ 45,112,682	\$ 47,476,727	\$ 16,198,809	\$ 56,895,586	\$ 27,001,063	\$ 9,637,021	\$ 2,438,281	\$ 204,760,169

Average Age = 71.7

Average Years Since Retirement 13.2  
(excluding beneficiaries)

**INACTIVE MEMBERS**  
**ELIGIBLE FOR DEFERRED BENEFITS DECEMBER 31, 2007**  
**TABULATED BY ATTAINED AGES**

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<b>Attained Ages</b>	<b>No.</b>	<b>Monthly Allowances</b>
25-29	2	\$ 3,100
30-34	30	40,357
35-39	65	87,159
40-44	63	93,739
45-49	57	77,065
50-54	65	85,239
55-59	88	85,778
60-64	80	66,010
66	1	564
<b>Totals</b>	<b>451</b>	<b>\$539,011</b>

**ACTIVE MALE MEMBERS DECEMBER 31, 2007**  
**BY ATTAINED AGE AND YEARS OF SERVICE**

Attained Age	Years of Service to Valuation Date							No.	Totals Valuation Payroll
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus		
Under 20									
20-24	47	2						49	\$ 1,505,640
25-29	134	21	3					158	5,665,561
30-34	162	79	18	3				262	10,784,935
35-39	109	99	45	10				263	12,714,452
40-44	104	61	48	28	16	2		259	14,040,196
45-49	85	74	41	63	44	18	8	333	18,339,321
50-54	55	66	55	51	48	31	9	315	17,028,142
55-59	56	49	37	43	34	14	9	242	13,442,251
60	7	15	8	9	6	3	2	50	2,878,817
61	8	11	6	9	6	3	2	45	2,575,346
62	3	7	8	5	3	2		28	1,694,817
63	4	6		6			1	17	870,784
64	3	3	2	3	1		2	14	734,551
65	3	2	1	4	4	1		15	742,157
66	2	5	1			1		9	467,652
67		2	1	1	1	1		6	246,811
68	2	2						4	173,814
69		1	2	2	1			6	319,896
70	1							1	42,230
71	2			1	1			4	155,250
72	2			1				3	116,211
73		2		1				3	128,831
74									
75	1				1			2	84,750
76				1		1		2	42,612
77									
78				1				1	26,280
79			1	1				2	66,547
<b>Totals</b>	<b>790</b>	<b>507</b>	<b>277</b>	<b>243</b>	<b>166</b>	<b>77</b>	<b>33</b>	<b>2,093</b>	<b>\$104,887,854</b>

**Group Averages**

Age: 44.7 years  
Service: 9.30 years  
Annual Pay: \$50,114

**ACTIVE FEMALE MEMBERS DECEMBER 31, 2007**  
**BY ATTAINED AGE AND YEARS OF SERVICE**

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
Under 20	2							2	\$ 48,532
20-24	134	3						137	4,640,660
25-29	473	51	2					526	18,984,007
30-34	415	251	30	1				697	29,331,981
35-39	254	264	97	11				626	29,661,359
40-44	188	173	103	82	8			554	26,676,904
45-49	143	147	123	105	77	16		611	30,456,414
50-54	120	145	125	137	130	82	11	750	40,379,850
55-59	130	119	105	151	106	105	27	743	41,708,724
60	16	26	10	14	10	15	2	93	5,012,744
61	12	19	19	18	15	22	12	117	6,880,589
62	14	13	10	18	12	10	6	83	4,696,821
63	9	8	10	12	8	5	4	56	3,058,586
64	2	15	10	12	6	10	5	60	3,326,517
65	1	12	5	11	5	7	2	43	2,638,950
66	2	7	3	2	5	3	2	24	1,308,748
67	3	3	1	3	5	2	3	20	1,082,469
68	1	3		3		2	3	12	636,494
69			1	4	1	1	3	10	436,555
70			1			1	1	3	180,940
71	1	1		1		1		4	190,933
72	2		1	1		1	1	6	291,041
73									
74				1	1		1	3	131,956
75				2		1		3	117,737
76				1				1	78,078
77			1					1	30,355
78							1	1	64,821
79	2		1					3	108,800
<b>Totals</b>	<b>1,924</b>	<b>1,260</b>	<b>658</b>	<b>590</b>	<b>389</b>	<b>284</b>	<b>84</b>	<b>5,189</b>	<b>\$252,161,565</b>

**Group Averages**

Age: 44.4 years  
Service: 9.57 years  
Annual Pay: \$48,595



**TOTAL ACTIVE MEMBERS DECEMBER 31, 2007**  
**BY ATTAINED AGE AND YEARS OF SERVICE**

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
Under 20	2							2	\$ 48,532
20-24	181	5						186	6,146,300
25-29	607	72	5					684	24,649,568
30-34	577	330	48	4				959	40,116,916
35-39	363	363	142	21				889	42,375,811
40-44	292	234	151	110	24	2		813	40,717,100
45-49	228	221	164	168	121	34	8	944	48,795,735
50-54	175	211	180	188	178	113	20	1065	57,407,992
55-59	186	168	142	194	140	119	36	985	55,150,975
60	23	41	18	23	16	18	4	143	7,891,561
61	20	30	25	27	21	25	14	162	9,455,935
62	17	20	18	23	15	12	6	111	6,391,638
63	13	14	10	18	8	5	5	73	3,929,370
64	5	18	12	15	7	10	7	74	4,061,068
65	4	14	6	15	9	8	2	58	3,381,107
66	4	12	4	2	5	4	2	33	1,776,400
67	3	5	2	4	6	3	3	26	1,329,280
68	3	5		3		2	3	16	810,308
69		1	3	6	2	1	3	16	756,451
70	1		1			1	1	4	223,170
71	3	1		2	1	1		8	346,183
72	4		1	2		1	1	9	407,252
73		2		1				3	128,831
74				1	1		1	3	131,956
75	1			2	1	1		5	202,487
76				2		1		3	120,690
77			1					1	30,355
78				1			1	2	91,101
79	2		2	1				5	175,347
<b>Totals</b>	<b>2,714</b>	<b>1,767</b>	<b>935</b>	<b>833</b>	<b>555</b>	<b>361</b>	<b>117</b>	<b>7,282</b>	<b>\$357,049,419</b>

**Group Averages**

Age: 44.5 years  
Service: 9.5 years  
Annual Pay: \$49,032

## COMPARATIVE SCHEDULES

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### Active Members December 31,

	2007	2006	2005	2004	2003
Active and Affiliate Members	7,303	7,130	7,212	7,223	7,339
Payroll (in thousands)*	\$357,049	\$328,609	\$318,405	\$315,157	\$318,122
Average Salary*	\$ 49,032	\$ 46,270	\$ 44,352	\$ 43,820	\$ 43,513
Average Age*	44.5	44.8	44.7	44.6	44.6
Average Service*	9.5	9.8	9.8	9.8	10.2

\* Excluding Affiliate Members.

### All Plan Members December 31, 2007

	<u>Males</u>	<u>Females</u>	<u>Total</u>
Active Members			
Number	2,093	5,189	7,282
Annual Payroll	\$ 104,887,854	\$ 252,161,565	\$ 357,049,419
Affiliate Members	4	17	21
Deferred Retirements			
Number	125	326	451
Estimated Monthly Benefit	\$ 174,593	\$ 364,418	\$ 539,011
Retired Members			
Number	1,962	3,833	5,795
Annual Benefit	\$ 74,398,087	\$ 123,591,860	\$ 197,989,947
Disabled Participants			
Number	110	263	373
Annual Benefits	\$ 2,057,758	\$ 4,712,464	\$ 6,770,222
Subtotal Number	4,294	9,628	13,922
Nonvested and Unelected Vested Terminations			
Terminated, Owed Refunds			683
<b>Total Number</b>			<b>14,605</b>

# DEVELOPMENT OF FUNDING VALUE OF RETIREMENT SYSTEM ASSETS DECEMBER 31, 2007

Valuation Date December 31:	2007	2008	2009	2010
A. Funding Value Beginning of Year	\$ 2,854,304,339			
B. Market Value End of Year	3,006,971,321			
C. Market Value Beginning of Year	2,854,304,339			
D. Non-Investment Net Cash Flow	(135,109,769)			
E. Investment Income				
E1. Market Total: B-C-D	287,776,751			
E2. Assumed Rate	8.50%			
E3. Amount for Immediate Recognition	236,873,704			
E4. Amount for Phased-In Recognition	50,903,047			
F. Phased-In Recognition of Investment Income				
F1. Current Year: 0.25 x E4	12,725,762			
F2. First Prior Year		\$ 12,725,762		
F3. Second Prior Year			\$ 12,725,762	
F4. Third Prior Year				\$ 12,725,761
F5. Total Recognized Investment Gain	12,725,762	12,725,762	12,725,762	12,725,761
<b>G. Funding Value End of Year</b>				
G1. Preliminary Funding Value End of Year: A+D+E3+F5	\$ 2,968,794,036			
G2. Upper Corridor Limit: 120% x B	\$ 3,608,365,585			
G3. Lower Corridor Limit: 80% x B	\$ 2,405,577,057			
G4. Actuarial Value End of Year	\$ 2,968,794,036			
H. Difference Between Market & Funding Value	38,177,285			
<b>I. Recognized Rate of Return</b>	<b>9.0%</b>			
J. Market Rate of Return	10.3%			
K. Ratio of Funding Value to Market Value	99%			

The Funding Value of Assets recognizes 25% of the difference between Market Value and expected Funding Value each year. Expected Funding Value is equal to last year's Funding Value increased by contributions and assumed investment income and decreased by benefit payments. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than Market Value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than Market Value.

# SUMMARY OF ACTUARIAL ASSETS, REVENUES AND EXPENDITURES

## BALANCE SHEET

Valuation Assets		Reserves for	
Cash, receivables, accruals and other short-term assets	\$ (31,094,718)	Member contributions	\$ 248,953,538
Stocks	1,768,416,684	Pensions and annuities	2,315,002,970
Bonds	957,362,859	Deferred retirement allowances	16,827,643
Other	312,286,496	Unrealized asset appreciation	426,187,170
Funding value adjustment	(38,177,285)	Funding value adjustment	(38,177,285)
Total Current Assets	\$2,968,794,036	Total Applied Reserves	\$2,968,794,036

## REVENUES AND EXPENDITURES

	2007	2006
Balance - January 1	\$2,854,304,339	\$2,693,685,848
BOY Adjustments	0	0
Adjusted BOY Balance (A)	2,854,304,339	2,693,685,848
Revenues		
Member contributions	28,184,570	28,098,414
Employer contributions	40,572,810	33,684,185
Recognized investment income (I)	253,012,399	240,533,964
Total	321,769,779	302,316,563
Expenditures		
Benefit payments	203,867,149	193,675,737
Administrative expenses (E)	3,412,933	3,345,367
Total	207,280,082	197,021,104
Balance - December 31	2,968,794,036	2,798,981,307
EOY Adjustments	0	55,323,032
Adjusted EOY Balance (B)	\$2,968,794,036	\$2,854,304,339
Recognized rate of return: $(I-E)/[1/2 \times (A+B-I+E)]$	9.0%*	9.0%*

\* Market value rate of return was 10.3% in 2007 and 12.2% in 2006.

## RECOMMENDED RESERVE TRANSFERS DECEMBER 31, 2007

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<b>1. Reserve for Retired Service and Age - Basic</b>	
a. Ledger Reserve as of December 31, 2007	\$1,251,990,654
b. Required reserve according to actuarial valuation	1,269,028,940
c. Amount to be transferred to this reserve	<u>17,038,286</u>
<b>2. Reserve for Retired Regular Disability - Basic</b>	
a. Ledger Reserve as of December 31, 2007	\$ 39,466,089
b. Required reserve according to actuarial valuation	40,429,179
c. Amount to be transferred to this reserve	<u>963,090</u>
<b>3. Reserve for Survivor Benefits - Basic</b>	
a. Ledger Reserve as of December 31, 2007	\$ 7,519,416
b. Required reserve according to actuarial valuation	7,596,051
c. Amount to be transferred to this reserve	<u>76,635</u>
<b>4. Reserve for Retired Service and Age - ARAA</b>	
a. Ledger Reserve as of December 31, 2007	\$ 990,091,884
b. Required reserve according to actuarial valuation	1,010,304,246
c. Amount to be transferred to this reserve	<u>20,212,362</u>
<b>5. Reserve for Retired Regular Disability - ARAA</b>	
a. Ledger Reserve as of December 31, 2007	\$ 28,641,225
b. Required reserve according to actuarial valuation	29,710,798
c. Amount to be transferred to this reserve	<u>1,069,573</u>
<b>6. Reserve for Survivor Benefits - ARAA</b>	
a. Ledger Reserve as of December 31, 2007	\$ 7,268,277
b. Required reserve according to actuarial valuation	6,927,792
c. Amount to be transferred to this reserve	<u>(340,485)</u>
<b>7. Total Reserve Liability Transfers</b>	
a. Ledger Reserve as of December 31, 2007	\$2,324,977,545
b. Required reserve according to actuarial valuation	2,363,997,006
c. Amount to be transferred to this reserve	<u>39,019,461</u>

In order to maintain an exact balance between reserve accounts and retiree liabilities, as calculated in the December 31, 2007 valuation, the above transfers should be made.

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## **SECTION C**

### **SUMMARY OF VALUATION METHODS AND ASSUMPTIONS**

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## ACTUARIAL COST METHODS

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**Normal Cost.** Normal cost and the allocation of benefit values between service rendered before and after the valuation date was determined using an individual entry-age actuarial cost method having the following characteristics:

- (i) the annual normal cost for each individual active member, payable from the date of employment to the date of retirement, is sufficient to accumulate the value of the member's benefit at the time of retirement;
- (ii) each annual normal cost is a constant percentage of the member's year-by-year projected covered pay.

The normal cost and the present value of future normal cost is based on the benefit levels available to members hired on or after July 1, 2005. The present value of benefits is based on the benefit levels available to each member. The accrued liability is the difference between the present value of benefits and the present value of normal cost.

**Financing of Unfunded Actuarial Accrued Liabilities (UAAL).** Unfunded actuarial accrued liabilities (full funding credit of assets exceed liabilities) are amortized by level (principal & interest combined) percent-of-payroll contributions over a period of 30 future years from the contribution effective date. There is currently a 1.5 year lag between the valuation date and the computed employer contribution effective date. Employer contribution rates during this lag have been previously adopted by the Board. To determine the percent of payroll contribution needed to pay off the UAAL, the UAAL as of the valuation date is projected to the contribution effective date based on:

- valuation payroll;
- payroll projections to the appropriate employer fiscal year using the wage growth assumption;
- the employer contribution rates previously adopted by the Board;
- assumed interest; and
- a 30-year level percent of payroll amortization factor.

## **ACTUARIAL ASSUMPTIONS USED FOR THE VALUATION**

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The actuary calculates the contribution requirements and benefit values by applying actuarial assumptions to the benefit provisions and census data furnished, using the actuarial cost methods described on the previous page.

The principal areas of financial risk which require assumptions about future experiences are:

- long-term rates of investment return to be generated by system assets.
- patterns of pay increases to members.
- rates of mortality among members, retirees and beneficiaries.
- rates of separation (withdrawal) from active membership.
- rates of disability among active members.
- the age patterns of actual retirement.

In a valuation, the actuary calculates the monetary effect of each assumption for as long as each covered person survives - - - a period of time which can be as long as a century.

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Actual experience of the Fund will not coincide exactly with assumed experience, regardless of the quality of the assumptions, or the skill of the actuary and the precision of the many calculations made. Each valuation provides a complete recalculation of assumed future experience and takes into account all past differences between assumed and actual experience. The result is a continual series of adjustments (usually small) to the computed contribution rate.

From time to time it is appropriate to modify one or more of the assumptions to reflect experience trends (but not random year-to-year fluctuations).



**The rates of salary increase** used for individual members are in accordance with the following table. This assumption is used to project a member's current salary to the salaries upon which benefits will be based.

Sample Ages	% Increase in Salary at Sample Ages		
	Merit and Seniority	Base (Economic)*	Increase Next Year
20	3.5%	4.5%	8.0%
25	3.5%	4.5%	8.0%
30	3.2%	4.5%	7.7%
35	2.8%	4.5%	7.3%
40	2.1%	4.5%	6.6%
45	1.3%	4.5%	5.8%
50	0.8%	4.5%	5.3%
55	0.4%	4.5%	4.9%
60	0.2%	4.5%	4.7%
65	0.0%	4.5%	4.5%

\* Includes 3.75% for price inflation and 0.75% for productivity increases.

The payroll growth rate for financing unfunded actuarial accrued liabilities was assumed to be 4.5% per year.

**The rate of net investment return** was 8.50% a year, compounded annually. This assumption is used to make money payable at one point in time equal in value to a different amount of money payable at another point in time.

The assumed real return is the rate of return in excess of price inflation. Considering other assumptions used in the valuation, the 8.50% nominal rate translates to a net real return of 5.00% a year. Experience over the last 4 years has been more favorable than assumed, as illustrated below:

	Year Ended December 31				4-Year Average
	2007	2006	2005	2004	
1. Nominal rate (net)	9.0 %	9.0 %	8.2 %	8.2 %	8.6 %
2. Increase in CPI	4.1 %	2.5 %	3.4 %	3.3 %	3.3 %
3. Average salary increase	6.0 %	4.3 %	1.2 %	0.7 %	3.0 %
4. Real return as measured by					
- CPI: (1)-(2)					5.3 %
- Salary increases: (1)-(3)					5.6 %

The nominal rate of return was computed using the approximate formula:  $i = I$  divided by  $1/2 (A+B-I)$ , where  $I$  is realized investment income,  $A$  is the beginning of year asset value and  $B$  is the end of year asset value.

*The mortality table* was as shown below:

Sample Attained Ages	Value at Retirement of \$1 Monthly Increasing 3.25% Annually After Retirement		Future Life Expectancy (years)	
	Men	Women	Men	Women
50	\$181.42	\$192.26	32.65	36.49
55	169.93	181.53	28.35	31.85
60	156.09	168.39	24.11	27.27
65	139.54	153.10	19.98	22.88
70	121.87	135.71	16.22	18.72
75	103.91	116.40	12.91	14.84
80	86.45	96.35	10.08	11.39

This assumption is used to measure the probabilities of each benefit payment being made after retirement. The possibility of members dying before retirement is 50% of the rates shown above.

Disabled life mortality was based on the healthy life mortality rates, set forward 10 years.

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

Retirement Ages	Normal Retirement		Early Retirement	
	Men	Women	Men	Women
50	30%	30%	10%	5%
51	30%	30%	10%	5%
52	30%	30%	10%	6%
53	30%	30%	10%	7%
54	35%	35%	10%	8%
55	35%	35%	10%	8%
56	35%	25%	10%	9%
57	35%	25%	10%	10%
58	30%	25%	11%	10%
59	30%	25%	12%	10%
60	30%	20%	13%	11%
61	35%	20%	14%	12%
62	40%	30%	15%	13%
63	35%	20%	15%	14%
64	35%	30%	15%	15%
65	35%	35%		
66	30%	30%		
67	25%	25%		
68	25%	25%		
69	25%	25%		
70	100%	100%		

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

Sample Ages	Years of Service	% of Active Members Separating Within Next Year	
		Men	Women
ALL	0	23.00%	23.00%
	1	20.00%	20.00%
	2	16.00%	16.00%
	3	14.00%	14.00%
	4	12.00%	12.00%
25	5 & Over	7.36%	9.89%
30		6.09%	8.85%
35		5.12%	7.36%
40		4.43%	5.82%
45		3.91%	3.93%
50		3.39%	2.76%
55		3.11%	2.53%
60		2.88%	2.53%
65		2.30%	2.53%

*Rates of disability* among active members.

Sample Ages	% Becoming Disabled Within Next Year	
	Men	Women
20	0.00%	0.00%
25	0.06%	0.05%
30	0.06%	0.05%
35	0.07%	0.06%
40	0.10%	0.09%
45	0.17%	0.15%
50	0.31%	0.28%
55	0.56%	0.50%
60	1.19%	1.07%
65	0.00%	0.00%

## **MISCELLANEOUS AND TECHNICAL ASSUMPTIONS**

### **DECEMBER 31, 2007**

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<b>Marriage Assumption</b>	80% of members are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses.
<b>Pay Increase Timing</b>	Eight months after valuation date.
<b>Decrement Timing</b>	Decrements of all types are assumed to occur at the middle of the year.
<b>Eligibility Testing</b>	Eligibility for benefits is determined based upon the age nearest birthday and exact fractional service.
<b>Decrement Relativity</b>	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
<b>Decrement Operation</b>	All decrements operate during the first 5 years of service.
<b>Incidence of Contributions</b>	Contributions are assumed to be received continuously throughout the year based upon the computed percent-of-payroll shown in this report, and the actual payroll payable at the time contributions are made.
<b>Normal Form of Benefit</b>	Straight Life.
<b>Option Factors</b>	Option factors are based on 8.50% interest and a 50% unisex blend of male and female mortality. The average option factor for retirees electing 100% joint and survivor with pop-up was assumed to be 80%, for those electing 50% joint and survivor with pop-up the average assumed factor was 90%.
<b>Other Adjustments</b>	Active Accrued liabilities and normal costs for future normal, early and deferred retirement benefits were increased by 1.75% to account for the option factor subsidy which is a result of not recognizing the cost of post-retirement increases when joint life forms of payment are elected.
<b>Service Accruals</b>	It is assumed that members accrue one year of service credit per year.
<b>Price Inflation</b>	3.75% per year
<b>Assumed COLA Increases</b>	3.25% for members hired before July 1, 2005; 3.0% for members hired on or after July 1, 2005.

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## **SECTION D**

### **BASIC FINANCIAL OBJECTIVE AND OPERATION OF THE RETIREMENT SYSTEM**

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## BASIC FINANCIAL OBJECTIVE AND OPERATION OF THE RETIREMENT SYSTEM

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***Benefit Promises Made Which Must Be Paid For.*** A retirement program is an orderly means of handing out, keeping track of, and financing contingent pension promises to a group of employees. As each member of the retirement program acquires a unit of service credit they are, in effect, handed an “IOU” which reads: “Your Retirement System promises to pay you one unit of retirement benefits, payments in cash commencing when you retire.”

The principal related financial question is: When shall the money required to cover the “IOU” be contributed? This year, when the benefit of the member’s service is received? Or, some future year when the “IOU” becomes a cash demand?

***The financial objective of DPSRS relative to funding the benefits is to establish and receive contributions, expressed as percents of active member payroll, which will remain approximately level*** from year-to-year and will not have to be increased for future generations of taxpayers.

Translated into actuarial terminology, a level percent-of-payroll contribution objective means that the contribution rate must be at least:

***Normal Cost*** (the current value of benefits likely to be paid on account of members’ service being rendered in the current year)

. . . plus . . .

***Interest on the Unfunded Actuarial Accrued Liability*** (the difference between the actuarial accrued liability and current system assets).

If contributions to the retirement program are less than the preceding amount, the difference, *plus investment earnings not realized thereon*, will have to be contributed at some later time, or, benefits will have to be reduced, to satisfy the fundamental fiscal equation under which all retirement programs must operate; that is:

$$B = C + I - E$$

Benefit payments to any group of members and their beneficiaries cannot exceed the sum of:

Contributions received on behalf of the group

. . . plus . . .

Investment earnings on contributions received and not required for immediate payment of benefits

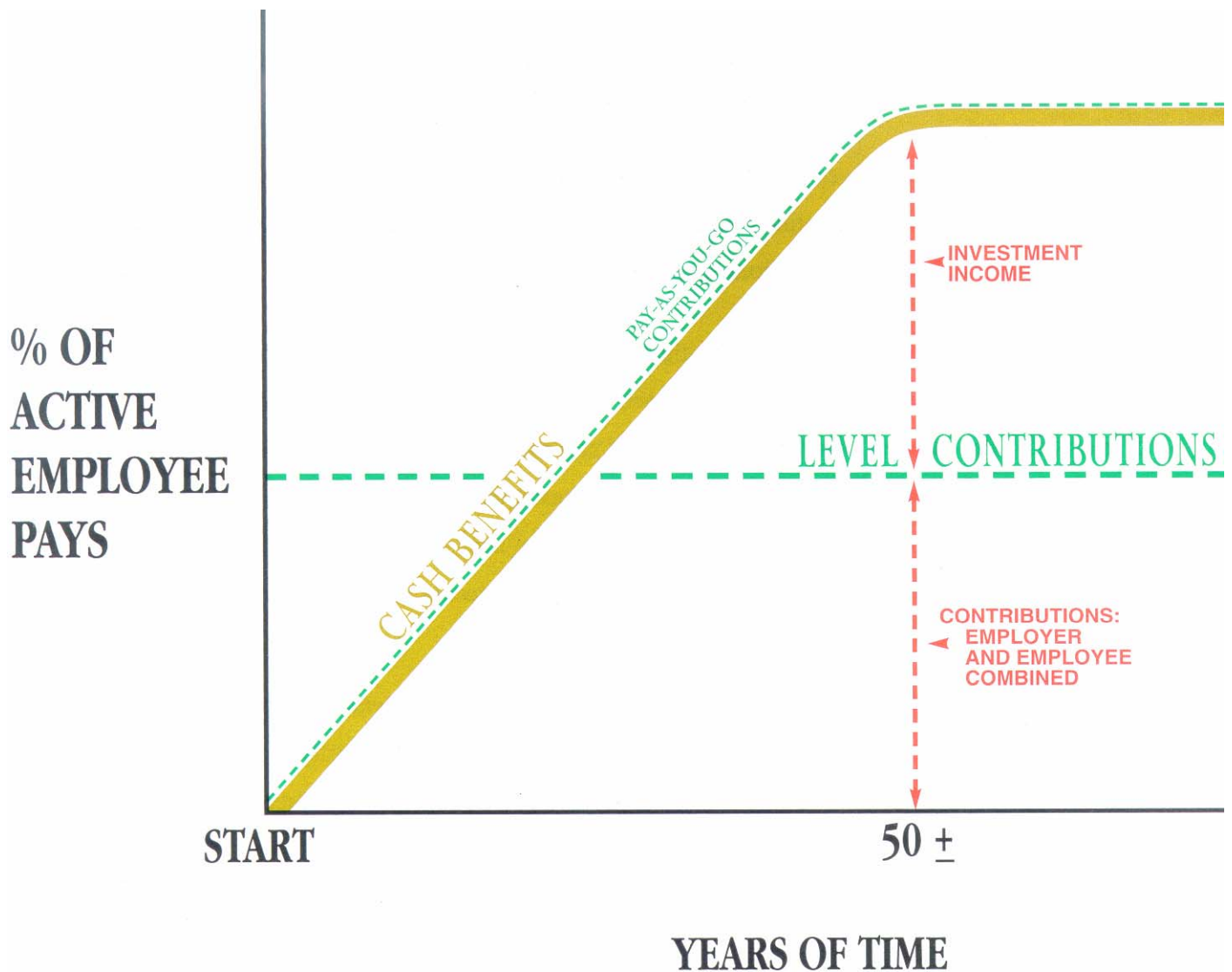
. . . minus . . .

Expenses incurred in operating the program.

There are retirement programs designed to defer the bulk of contributions far into the future. Lured by artificially low present contributions, the inevitable consequence is a relentlessly increasing contribution rate to a level greatly in excess of the level percent-of-payroll rate.

A by-product of the level percent-of-payroll contribution objective is the accumulation of invested assets for varying periods of time. Invested assets are a by-product of level percent-of-payroll contributions, not the objective. *Investment income becomes the major contributor* to the retirement program, and the amount is directly related to the amount of contributions and investment performance.

***Computed Contribution Rate Needed To Finance Benefits.*** From a given schedule of benefits and from the data furnished him, the actuary calculates the contribution rate *by means of an actuarial valuation* - the technique of assigning monetary values to the risks assumed in operating a retirement program.



**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



## SELECTION OF ASSUMPTIONS USED IN ACTUARIAL VALUATIONS

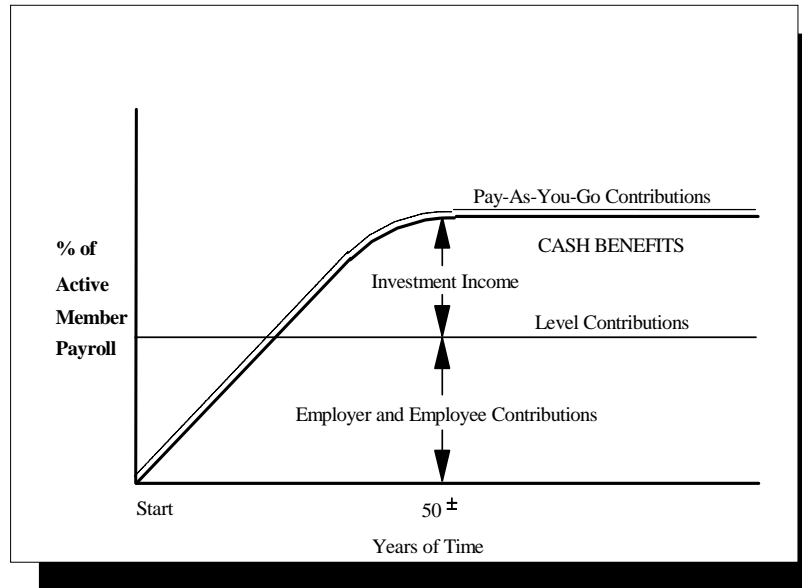
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### Economic Assumptions

Investment return  
Pay increases to individual employees:  
the portion for economic changes  
Active member group size and  
total payroll growth

### Demographic Assumptions

Actual ages at service retirement  
Pay increases to individual members:  
the portion for merit & seniority  
Disability while actively employed  
Separations before retirement  
Mortality after retirement  
Mortality before retirement



## RELATIONSHIP BETWEEN PLAN GOVERNING BODY AND THE ACTUARY

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The actuary should have the primary responsibility for choosing the *demographic* assumptions used in the actuarial valuation, making use of specialized training and experience.

The actuary and other professionals can provide guidance concerning the choice of suitable economic assumptions, but the basis of the economic assumptions is the assumed rate of *inflation*, a quantity which defies accurate prediction. Given an assumed rate of future inflation, it is very important that this rate be applied in a consistent manner in deriving the assumed rate of investment return, the economic portion of the assumption on pay increases to individual employees, and the assumed rate of growth of active member payroll. Consistent application of assumptions is an area in which the actuary has specialized training.

A sound procedure is that the actuary suggests reasonable alternatives for economic assumptions, followed by discussion involving the actuary, the Plan Governing Body, and other professionals, and the Plan Governing Body then makes a final choice from the various alternatives.

## GLOSSARY

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<b>Actuarial Accrued Liability</b>	The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as “accrued liability” or “past service liability.”
<b>Accrued Service</b>	The service credited under the plan which was rendered before the date of the actuarial valuation.
<b>Actuarial Assumptions</b>	Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.
<b>Actuarial Cost Method</b>	A mathematical budgeting procedure for allocating the dollar amount of the “actuarial present value of future plan benefits” between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the “actuarial funding method.”
<b>Actuarial Equivalent</b>	A single amount or series of amounts of equal value to another single amount or series of amounts, computed on the basis of the rate(s) of interest and mortality tables used by the plan.
<b>Actuarial Present Value</b>	The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.
<b>Amortization</b>	Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.
<b>Experience Gain (Loss)</b>	A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.

<b>Normal Cost</b>	The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as “current service cost.” Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.
<b>Plan Termination Liability</b>	The actuarial present value of future plan benefits based on the assumption that there will be no further accruals for the future service and salary. The termination liability will generally be less than the liabilities computed on a “going-concern” basis and is not normally determined in a routine actuarial valuation.
<b>Reserve Account</b>	An account used to indicate that funds have been set aside for a specific purpose and that are not generally available for other uses.
<b>Unfunded Actuarial Accrued Liability</b>	The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as “unfunded accrued liability.”
<b>Valuation Assets</b>	The value of current plan assets recognized for valuation purposes. Generally related to market value in a manner which spreads unexpected gains or losses over a period of future years.



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April 30, 2008

Mr. Norman Ruggles  
Executive Director  
Denver Public Schools Retirement System  
3700 East Alameda Ave.  
Suite 400  
Denver, Colorado 80209-3172

Dear Mr. Ruggles:

Enclosed are seventy-five copies of the Annual Actuarial Valuation as of December 31, 2007 of the Denver Public Schools Retirement System. Please let us know if you need additional copies.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kenneth G. Alberts'.

Kenneth G. Alberts

KGA:mrh  
Enclosures

cc: Karen Holden  
Norman L. Jones  
Judith A. Kermans