GRS Gabriel Roeder Smith & Company
Consultants & Actuaries

MISSOURI DEPARTMENT OF TRANSPORTATION AND HIGHWAY PATROL EMPLOYEES' RETIREMENT SYSTEM (MPERS)

ACTUARIAL VALUATION REPORT

AS OF JUNE 30, 2009

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October 15, 2009

The Retirement Board
Missouri Department of Transportation
and Highway Patrol Employees' Retirement System
1913 William Street
Jefferson City, Missouri 65102-1930

Ladies and Gentlemen:

The results of the regular annual actuarial valuation as of June 30, 2009 of the Missouri Department of Transportation and Highway Patrol Employees' Retirement System, as established by Chapter 104 of the Missouri Revised Statutes, are presented in this report.

The member statistical data required for the valuation together with pertinent data on financial operations was furnished by your Executive Director and her staff. Member data was reviewed for reasonableness, but was not audited by the actuary. Financial data was received in aggregate and reviewed for reasonableness. Individual investments were not reviewed. Assets are not audited by the actuary. The actuarial assumptions used in making the valuation are shown in Section E of this report.

Your attention is directed particularly to the summary of the results on pages 2-6.

The actuarial calculations were performed in accordance with accepted actuarial procedures. The calculations were based upon current plan provisions of the Retirement System, the plan provisions of the Missouri State Employees Year 2000 Plan and upon actuarial assumptions that are internally consistent and reasonable based upon the actual experience of the System.

The cooperation of the Executive Director and the staff in furnishing materials requested for this valuation, and the complete and excellent condition of the records, is acknowledged with appreciation.

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 opinion contained herein.

Respectfully submitted,

Brian B. Murphy, F.S.A., E.A., M.A.A.A.

Kenneth G. Alberts

SUMMARY

This report contains the results of the June 30, 2009 valuation. The table below shows a summary of the data used in the valuation as well as the unfunded actuarial accrued liability for the two experience rated groups. This data was the basis for determining valuation results and recommended employer contribution rates.

	Non-Uniformed				
	Civilian Patrol Employees	**MoDOT Employees**	**Non-Uniformed Total**	**Uniformed Patrol**	**Total**
Participants					
Active Members					
Closed Plan	609	3,694	4,303	751	5,054
Year 2000 Plan	513	2,885	3,398	332	3,730
Total Active Members	1,122	6,579	7,701	1,083	8,784
Total Active Members Prior Year	*1,125*	*6,404*	*7,529*	*1,070*	*8,599*
Retiree -- Regular Pensioners					
Closed Plan	413	3,792	4,205	777	4,982
Year 2000 Plan	335	2,006	2,341	1	2,342
Total Regular Pensioners	748	5,798	6,546	778	7,324
Self Insured Disability Pensioners	6	78	84	3	87
Fully Insured Disability Pensioners	4	55	59	0	59
Terminated Vested Members	212	1,364	1,576	157	1,733
Total	2,092	13,874	15,966	2,021	17,987
Active Member Valuation Payroll	$41,561,449	$268,487,978	$310,049,427	$67,602,818	$377,652,245
Active Mem. Val. Payroll Prior Year	*$40,220,687*	*$261,235,905*	*$301,456,592*	*$67,968,061*	*$369,424,653*
Unfunded Actuarial Accrued Liability	N/A	N/A	$1,260,133,816	$381,763,169	$1,641,896,985

The June 30, 2009 valuation results are used to determine the contribution rate for the plan year beginning July 1, 2010. A summary of valuation results and recommended contribution rates follows.

The **total contribution rate** for the plan year beginning July 1, 2010 is shown below.

	Employer Contribution Rates Expressed As % of Active Payroll For Total Benefits					
	Non-Uniformed				Uniformed Patrol	
	FY2011			FY2010 Total#	FY2011	FY2010#
	Civilian Patrol Employees	MoDOT Employees	Total			
Normal Cost	11.29%	11.29%	11.29%	11.15%	13.08%	13.04%
Unfunded Liability	26.95%	26.95%	26.95%	18.84%	35.23%	25.50%
Expenses	0.69%	0.69%	0.69%	0.88%	0.69%	0.88%
Subtotal	38.93%	38.93%	38.93%	30.87%	49.00%	39.42%
Disability Insurance	0.53%	0.53%	0.53%	0.53%	0.53%	0.53%
Total	39.46%	39.46%	39.46%	31.40%	49.53%	39.95%
Illustrative $	$16,400,148	$105,945,356	$122,345,504	$94,657,370	$33,483,676	$27,153,240

The dollar contribution amounts shown above are illustrated and based on the June 30, 2009 valuation payroll. Actual dollar contributions should be based on covered payroll for the fiscal year beginning July 1, 2010. The total contribution is based on a 15-year amortization period for unfunded retiree liabilities and a 30-year amortization period for other unfunded liabilities from July 1, 2010 in accordance with Board policy adopted September 17, 2009.

The combined contribution rate is less than the actual benefit payout rate. The difference is intended to be made up by investment return. The ability to contribute less than the benefit payout is one of the advantages of a funded retirement plan.

\# *After the June 30, 2008 report was issued, the disability premium was reduced to 0.53% and the Non-Uniformed rate was reduced to 31.40% and the Uniformed group was reduced to 39.95%.*

Assumptions and Methods: There were no changes in the assumptions and methods for the June 30, 2009 valuation.

Experience: Aggregate experience during the year was less favorable than expected resulting in an experience loss of approximately $380.8 million which is approximately 12.6% of beginning of year accrued liabilities. The primary source of experience loss was a lower than expected rate of return. System assets earned (24.97%) this year (please see page C-2) compared with an assumed rate of 8.25%. The funded status of the fund decreased from 59.1% funded last year to 47.3% funded this year.

Currently the asset smoothing method spreads gains and losses over a 3 year period. However, the final asset value is smoothed value, but no more than 120% of the market value and no less than 80% of the market value (a 20% corridor). This corridor resulted in recognizing twice as much of the loss that would have been recognized without the corridor. The remaining portion of this year's loss will be recognized over the next two years and will result in further contribution increases unless offset by future gains.

Investment Losses were partially offset by gains due to pay increases that were less than assumed. Most of the other demographic activity (retirements, quits, deaths, etc.) was relatively close to assumed activity.

Funding Policy:

Permanent Policy: The total contribution will be based on normal cost plus a 26-year amortization of unfunded actuarial accrued liabilities. The amortization period is closed 26-year period starting July 1, 2010.

Temporary Accelerated Policy: The total contribution is based on normal cost plus a 15-year amortization period for unfunded retiree liabilities and a 30-year amortization period for other unfunded liabilities. Both amortization periods are closed periods starting July 1, 2010.

This temporary accelerated policy was adopted by the Retirement Board on September 17, 2009 and will remain in effect until such time as the retiree liability becomes 100% funded or the permanent policy produces a higher contribution rate.

Rate Reconciliation: The table below shows the computed rate last year and the approximate effect of the changes that occurred during the year.

	Non-Uniform	Uniform
Computed employer contribution rate, prior valuation	31.43% #	39.98% #
Effects of:		
Change in disability premiums	(0.03%)	(0.03%)
Change in Funding Policy	1.73%	0.15%
08/'09 recognized investment loss (gain)	5.64%	8.36%
08/'09 liability experience loss (gain)	0.07%	(0.71%)
Change in administrative expenses	(0.19%)	(0.19%)
Misc (demographic, payroll weighting, contribution delay, etc.)	0.81%	1.97%
Computed employer contribution rate, current valuation	39.46%	49.53%

Accelerated Amortization Schedule: In accordance with RSMo 105.684 an accelerated amortization schedule was prepared and presented to the Board. On September 17, 2009, the Board adopted that accelerated schedule as a temporary funding policy, until such time as the retiree liability becomes 100% funded or the permanent policy produces a higher contribution rate.

 # Published rate from prior report, before recognizing reduction in disability premium that occurred between the report publication date and the beginning of the fiscal year for which the contributions were due.

Funded Status of Retiree Liability: The chart below indicates the funding status of retiree liabilities on a funding value asset basis and a market value asset basis:

Asset Basis	Non-Uniformed	Uniformed	Total
Funding Value	73.4%	83.2%	75.6%
Market Value	61.1%	69.3%	63.0%

Recommendation: The combination of a low funding ratio and the market downturn in FY 2009 has resulted in MPERS retiree liabilities being underfunded. Given that the FY 2009 losses will continue to have upward pressure on the contribution rates and downward pressure on the funded status over the next two years, we have made the following recommendations to the Board:

- Review the funding policy and consider funding the unfunded retiree liability over a shorter time (such as 15 years) that better reflects the life expectancy of that group;
- Continue to review methods and assumptions in the 5-year study which is scheduled to follow the 2009 valuation;
- Consider updating the short term projections of liabilities and contribution rates that were performed last year.

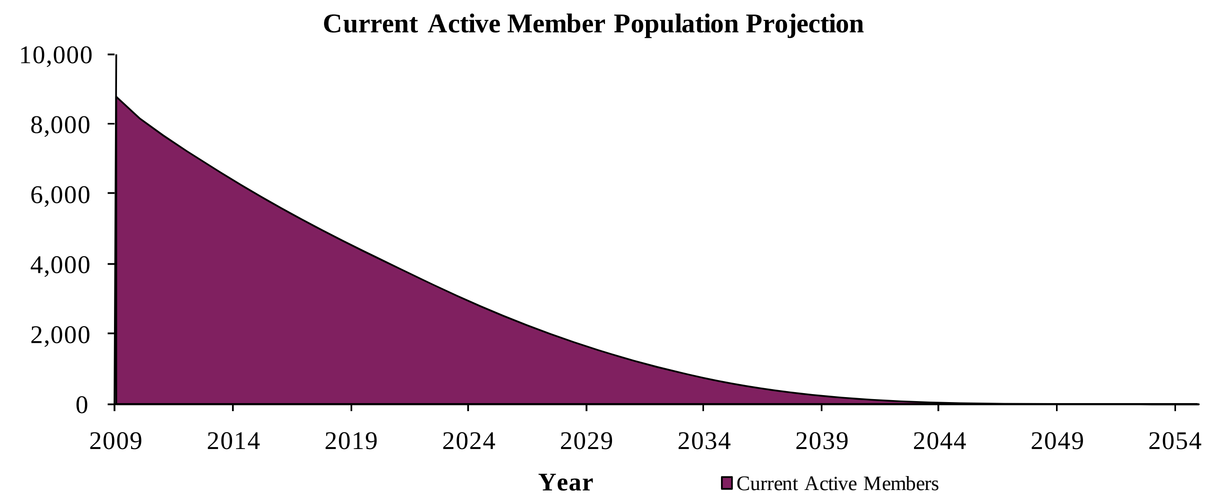
The Board accepted all of our recommendations at its September 17, 2009 meeting while reviewing preliminary valuation results. Recommendations that affect valuation results were incorporated into this (final) report.

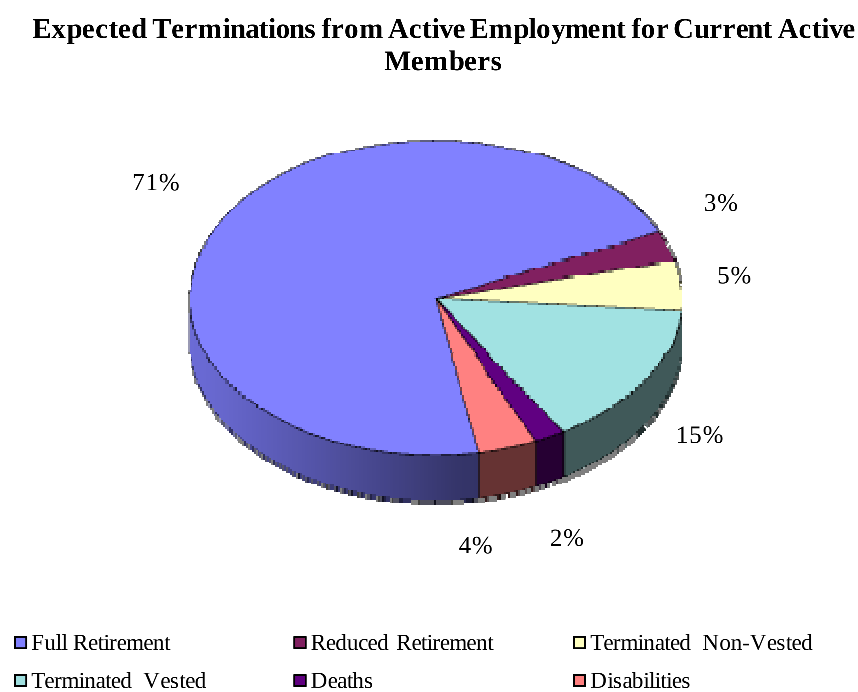
Conclusion: Based upon the results of the June 30, 2009 regular annual actuarial valuation, it is our opinion that the Missouri Department of Transportation and Highway Patrol Employees' Retirement System continues to be financed in accordance with actuarial principles of level percent of payroll financing. This statement is based upon the fact that the employer is contributing to the system based upon actuarially determined rates and presumes a continuation of payment of actuarially determined contributions. In addition, we commend the Board in its decision to more aggressively address the unfunded retiree liability issue.

SUMMARY OF KEY VALUATION RESULTS

Actuarial Present Value	June 30, 2009 (1) Actuarial Present Value	June 30, 2009 (2) Portion Covered By Future Normal Cost Contributions	June 30, 2009 (3) Actuarial Accrued Liabilities (1) - (2)	June 30, 2008 Actuarial Accrued Liabilities
Active Members				
Service retirement benefits based on service rendered before and likely to be rendered after valuation date	$ 1,381,163,124	$353,008,232	$ 1,028,154,892	$ 1,008,324,133
Disability benefits likely to be paid to present active members who become totally and permanently disabled	53,725,710	17,730,373	35,995,337	33,426,675
Survivor benefits likely to be paid to widows and children of present active members who die before retiring	28,841,537	8,953,344	19,888,193	19,789,963
Separation benefits likely to be paid to present active members	52,239,587	23,378,320	28,861,267	28,839,978
Active Member Totals	$ 1,515,969,958	$403,070,269	$ 1,112,899,689	$ 1,090,380,749
Terminated Vested Members			53,039,681	56,359,055
Retired Lives			1,947,454,275	1,872,893,977
Total Actuarial Accrued Liability			$ 3,113,393,645	$ 3,019,633,781
Actuarial Value of Assets			1,471,496,660	1,783,902,280
Unfunded Actuarial Accrued Liability			$ 1,641,896,985	$ 1,235,731,501

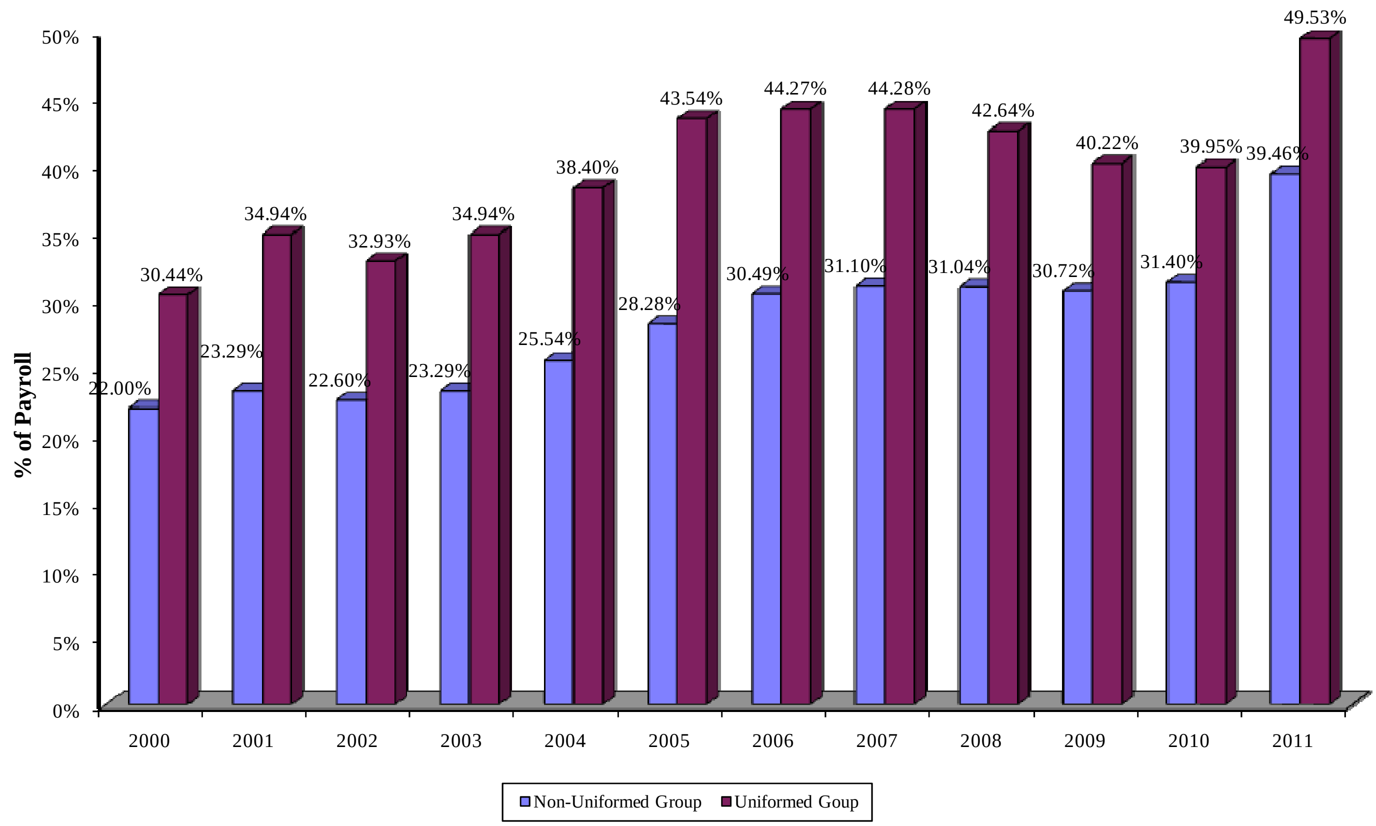
EXPECTED DEVELOPMENT OF PRESENT POPULATION AS OF JUNE 30, 2009



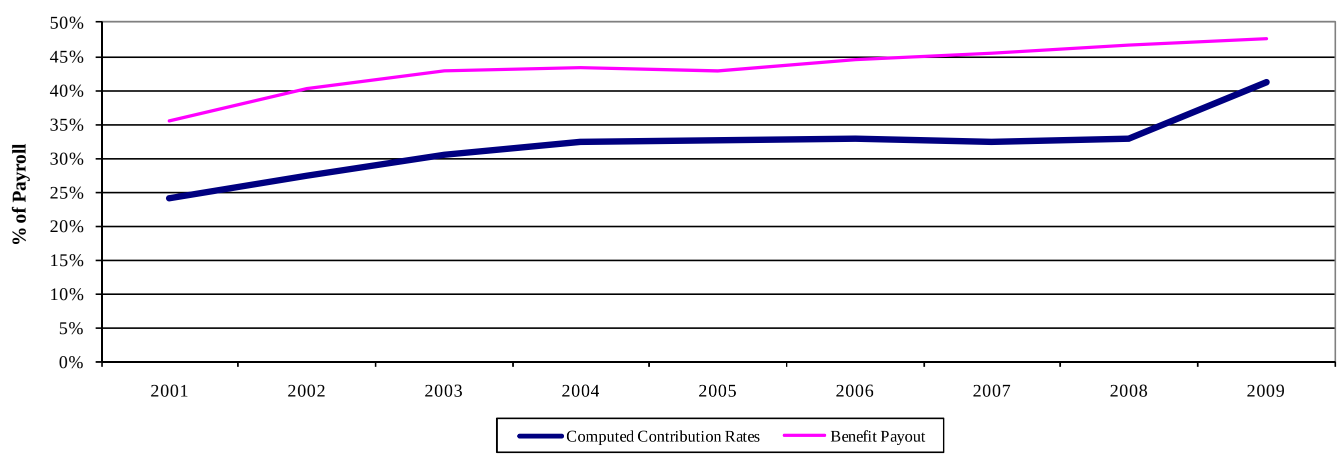


The charts above show the expected future development of the present population in simplified terms. The retirement system presently covers 8,784 active members. Eventually, 5% of the population is expected to terminate covered employment prior to retirement and forfeit eligibility for an employer provided benefit. Of the present population, 89% is expected to receive monthly retirement benefits either by retiring directly from active service, or by separating from service with a vested benefit and 6% of the present population is expected to become eligible for death-in-service or disability benefits. Within 11 years, over half of the covered membership is expected to consist of new hires.

Computed Contribution Rates

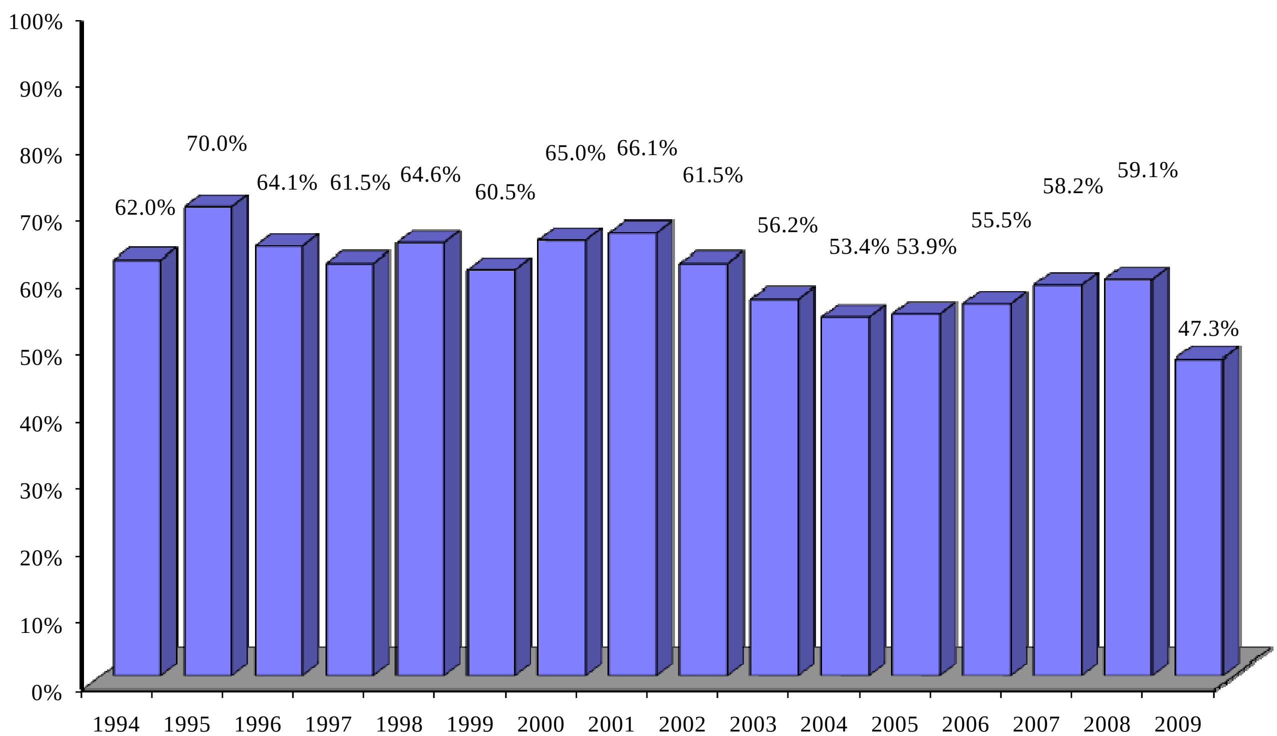


Contribution Rates vs. Benefit Payout



Historical Funded Ratios

Actuarial Value of Assets as Percents of Accrued Liabilities
(Funded Ratio)



SECTION A

VALUATION RESULTS

COMPUTED CONTRIBUTIONS TO SUPPORT BENEFITS
FOR PLAN YEAR BEGINNING JULY 1, 2010
CONTRIBUTIONS COMPUTED AS OF JUNE 30, 2009

Contributions for	Non-Uniformed Employees	Uniformed Patrol	Total
Normal Cost			
Age & service benefits	9.73%	12.18%	10.17%
Disability benefits #	0.60%	0.19%	0.53%
Survivor benefits	0.26%	0.25%	0.26%
Separation benefits	0.70%	0.46%	0.66%
Total Normal Cost	11.29%	13.08%	11.62%
Unfunded Actuarial Accrued Liabilities*	26.95%	35.23%	28.43%
Expense Provision	0.69%	0.69%	0.69%
Subtotal	38.93%	49.00%	40.74%
Disability Insurance	0.53%	0.53%	0.53%
Total Contribution Rate	39.46%	49.53%	41.27%
Illustrative Dollar Contribution	$ 122,345,504	$ 33,483,676	$ 155,829,180
Prior Year			
Total Contribution Rate##	31.40%	39.95%	32.97%
Illustrative Dollar Contribution	$ 94,657,370	$ 27,153,240	$ 121,810,610

\# *Includes costs for benefits payable after conversion to normal retirement and/or benefits payable to survivors. Costs for disability benefits payable prior to conversion are shown under Disability Insurance which is outsourced.*

* *Amortized as a level-percentage of payroll over a 15-year amortization period for unfunded retiree liabilities and a 30-year amortization period for other unfunded liabilities from July 1, 2010.*

\## *After post-valuation change in disability premium.*

Development of Liabilities as of June 30, 2009

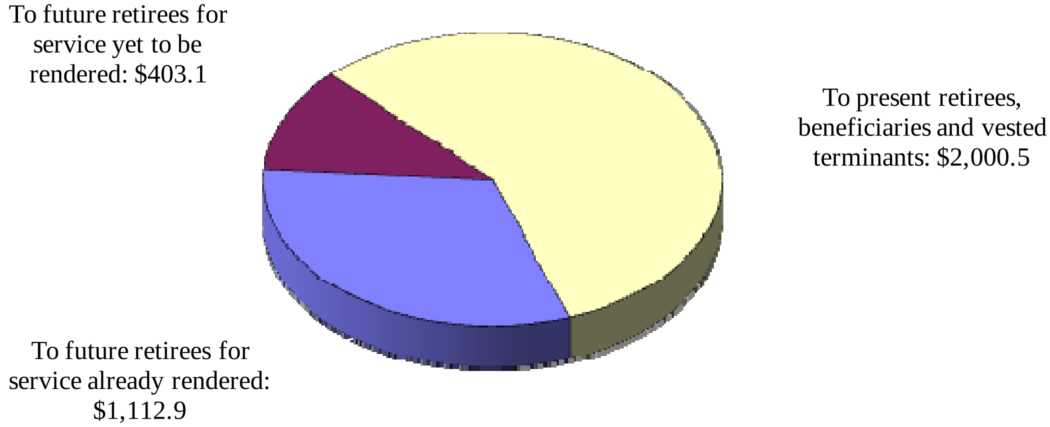
	Non-Uniformed Employees	Uniformed Patrol	Total
Present Value of Future Benefits - Inactives			
Retirees and Survivors	$ 1,484,328,668	$ 436,745,939	$ 1,921,074,607
Disability Pensioners	24,894,584	1,485,084	26,379,668
Vested Terminated Employees	44,477,000	8,562,681	53,039,681
Subtotal PVFB - Inactives	1,553,700,252	446,793,704	2,000,493,956
Present Value of Future Benefits - Actives			
Age & Service benefits	1,012,782,616	368,380,508	1,381,163,124
Normal and Work Related Disability benefits	49,065,273	4,660,437	53,725,710
Survivor benefits	22,229,848	6,611,689	28,841,537
Separation benefits	43,199,101	9,040,486	52,239,587
Subtotal PVFB - Actives	1,127,276,838	388,693,120	1,515,969,958
Total Present Value of Future Benefits	2,680,977,090	835,486,824	3,516,463,914
Less Present Value of Future Entry Age Normal Costs	313,767,906	89,302,363	403,070,269
Equals Actuarial Accrued Liability	2,367,209,184	746,184,461	3,113,393,645
Less Actuarial Value of Assets	1,107,075,368	364,421,292	1,471,496,660
Equals Unfunded Actuarial Accrued Liability	1,260,133,816	381,763,169	1,641,896,985
Amortization Payment on UAAL*	$ 89,930,082	$ 25,639,300	$ 115,569,382
as a % of Projected Payroll	26.95%	35.23%	28.43%

**Amortized as a level-percentage of payroll over a 15-year amortization period for unfunded retiree liabilities and a 30-year amortization period for other unfunded liabilities from July 1, 2010.*

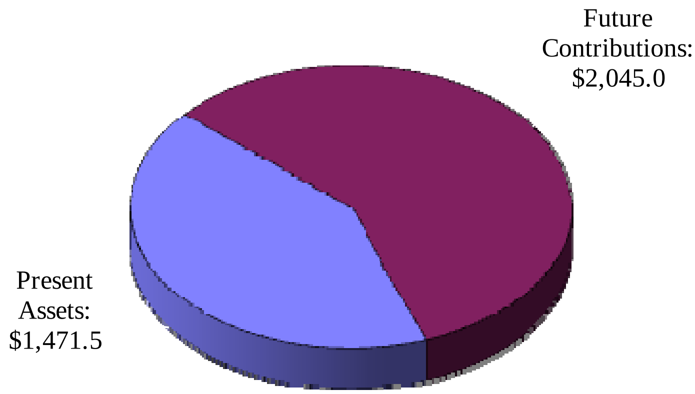
System Resources & Obligations
Sources and Uses of $3,516.5 Million
as of June 30, 2009

($ Millions)

Uses of Funds



Sources of Funds



Financing Unfunded Actuarial Accrued Liabilities (UAAL) which were Calculated Using a Wage Inflation Assumption of 3.75% and an Investment Return Assumption of 8.25% Compounded Annually 15/30 Year Amortization*

Fiscal Year Ending June 30	Active Employee Payroll	Unfunded Actuarial Accrued Liability at End of Year	Annual UAAL Contributions During Fiscal Year		UAAL at Year End as % of Payroll
			Dollars	% of Payroll	
2009	$ 377,652,245	$ 1,641,896,985			
2010	391,814,204	1,695,556,224	$ 78,597,929	20.06%	432.7%
2011	406,507,237	1,711,678,777	118,920,183	29.25%	421.1%
2012	421,751,258	1,724,490,409	123,379,690	29.25%	408.9%
2013	437,566,930	1,733,543,930	128,006,429	29.25%	396.2%
2014	453,975,690	1,738,348,732	132,806,670	29.25%	382.9%
2015	470,999,778	1,738,366,958	137,786,920	29.25%	369.1%
2016	488,662,270	1,733,009,355	142,953,930	29.25%	354.6%
2017	506,987,105	1,721,630,767	148,314,702	29.25%	339.6%
2018	525,999,121	1,703,525,250	153,876,504	29.25%	323.9%
2019	545,724,088	1,677,920,777	159,646,872	29.25%	307.5%
2020	566,188,741	1,643,973,485	165,633,630	29.25%	290.4%
2021	587,420,819	1,600,761,451	171,844,891	29.25%	272.5%
2022	609,449,100	1,547,277,930	178,289,074	29.25%	253.9%
2023	632,303,441	1,482,424,031	184,974,914	29.25%	234.4%
2024	656,014,820	1,405,000,773	191,911,474	29.25%	214.2%
2025	680,615,376	1,392,681,419	123,216,388	18.10%	204.6%
2026	706,138,453	1,374,537,021	127,837,003	18.10%	194.7%
2027	732,618,645	1,349,906,688	132,630,890	18.10%	184.3%
2028	760,091,844	1,318,068,240	137,604,549	18.10%	173.4%
2029	788,595,288	1,278,232,905	142,764,719	18.10%	162.1%
2030	818,167,611	1,229,539,556	148,118,396	18.10%	150.3%
2031	848,848,896	1,171,048,472	153,672,836	18.10%	138.0%
2032	880,680,730	1,101,734,570	159,435,568	18.10%	125.1%
2033	913,706,257	1,020,480,068	165,414,402	18.10%	111.7%
2034	947,970,242	926,066,534	171,617,442	18.10%	97.7%
2035	983,519,126	817,166,267	178,053,095	18.10%	83.1%
2036	1,020,401,093	692,332,949	184,730,087	18.10%	67.8%
2037	1,058,666,134	549,991,525	191,657,465	18.10%	52.0%
2038	1,098,366,114	388,427,226	198,844,619	18.10%	35.4%
2039	1,139,554,843	205,773,674	206,301,293	18.10%	18.1%
2040	1,182,288,150	0	214,037,591	18.10%	0.0%

* *Amortized as a level-percentage of payroll over a 15-year amortization period for unfunded retiree liabilities and a 30-year amortization period for other unfunded liabilities from July 1, 2010.*

GASB No. 25
Schedule of Funding Progress*
June 30, 2009

Year Ending June 30	Actuarial Asset Value	Entry Age Accrued Liability	Unfunded Accrued Liability (UAAL)	Funded Ratio	Estimated Covered Payroll		UAAL as a Percentage of Covered Payroll
1994	$ 746,946,221	$ 1,204,313,635	$ 457,367,414	62.02%	$ 236,748,214		193.19%
1995	931,031,253	1,330,909,279	499,878,026	69.95%	243,561,510		205.24%
1996	916,553,828	1,429,910,844	513,357,016	64.10%	254,712,739		201.54%
1997	1,015,906,708	1,651,811,690	635,904,982	61.50%	271,070,643		234.59%
1998	1,126,961,804	1,744,052,411	617,090,607	64.62%	278,690,426		221.43%
1999+	1,242,744,403	2,052,700,427	809,956,023	60.54%	288,068,083	**	281.17%
2000#	1,422,796,011	2,188,826,322	766,030,311	65.00%	301,421,805	**	254.14%
2001	1,520,800,409	2,301,402,527	780,602,118	66.08%	323,400,023	**	241.37%
2002	1,450,507,432	2,358,452,163	907,944,731	61.50%	308,654,239	**	294.16%
2003	1,363,952,522	2,418,145,741	1,054,193,219	56.40%	319,345,949	**	330.11%
2004	1,331,588,207	2,492,918,976	1,161,330,769	53.41%	316,224,468	**	367.25%
2005#	1,417,348,982	2,627,409,025	1,210,060,043	53.94%	334,030,151	**	362.26%
2006	1,521,142,953	2,740,437,837	1,219,294,884	55.51%	341,227,890	**	357.33%
2007#	1,685,807,004	2,897,267,409	1,211,460,405	58.19%	365,012,472	**	331.90%
2008	1,783,902,280	3,019,633,781	1,235,731,501	59.08%	375,600,448	**	329.00%
2009	1,471,496,660	3,113,393,645	1,641,896,985	47.26%	379,590,273	**	432.54%

* *Prior to 2003 this schedule was not required for the LTD Plan because it used the aggregate funding method. Therefore the LTD Plan assets and liabilities were excluded prior to 2003. In 2003 the LTD Plan was merged into the base plan. Assets and liabilities for existing LTD members are included beginning in 2003.*

** *Values are estimated from contribution rate and amount.*

\+ *Introduction of Year 2000 Plan; Change in Actuary.*

\# *New assumptions adopted.*

GASB No. 25
Schedule of Employer Contributions*
Non-Uniformed Group
June 30, 2009

Fiscal Year Ending June 30,	Estimated Covered Payroll		Actual Employer Contributions	Actual Employer Contribution %	Annual Required Contribution (ARC) %	Annual Pension Cost	Percentage of APC Contributed
1997	$ 228,828,537		$ 59,838,662	26.15%	26.15%	$ 59,838,662	100.00%
1998	234,703,387		61,140,232	26.05%	26.05%	61,140,232	100.00%
1999+	244,185,511	**	54,990,577	22.52%	22.52%	54,990,577	100.00%
2000#	257,124,568	**	56,567,405	22.00%	22.00%	56,567,405	100.00%
2001	273,311,348	**	63,654,213	23.29%	23.29%	63,654,213	100.00%
2002	260,972,727	**	60,780,548	23.29%	23.29%@	60,780,548	100.00%
2003	271,173,431	**	63,156,292	23.29%	23.29%@	63,156,292	100.00%
2004	269,890,983	**	68,932,856	25.54%	25.54%	68,932,856	100.00%
2005	283,070,661	**	80,052,383	28.28%	28.28%	80,052,383	100.00%
2006	286,784,251	**	87,440,518	30.49%	30.49%	87,440,518	100.00%
2007#	302,223,556	**	93,991,526	31.10%	31.10%@	93,991,526	100.00%
2008	307,243,438	**	95,368,363	31.04%	31.04%	95,368,363	100.00%
2009	311,718,239	**	95,759,843	30.72%	30.72%	95,759,843	100.00%

* *Prior to 2003 this schedule was not required for the LTD Plan because it used the aggregate funding method. Therefore the LTD Plan assets and liabilities were excluded prior to 2003. In 2003 the LTD Plan was merged into the base plan. Assets and liabilities for existing LTD members are included beginning in 2003.*

** *Values are estimated from contribution rate and amount.*

\+ *Introduction of Year 2000 Plan; Change in Actuary.*

\# *New assumptions adopted.*

@ *The ARC is the rate adopted by the Retirement Board. This rate exceeded the actuarially calculated rate.*

Includes non-uniformed employees of MoDOT, Patrol, and MPERS.

This information is presented in draft form for review by the System's auditor. Please let us know if there are any items that the auditor changes so that we may maintain consistency with the System's financial statements.

GASB No. 25
Schedule of Employer Contributions*
Uniformed Patrol Group
June 30, 2009

Fiscal Year Ending June 30,	Estimated Covered Payroll		Actual Employer Contributions	Actual Employer Contribution %	Annual Required Contribution (ARC) %	Annual Pension Cost	Percentage of APC Contributed
1997	$ 42,242,106		$ 16,546,233	39.17%	39.17%	$ 16,546,233	100.00%
1998	43,987,039		16,600,708	37.74%	37.74%	16,600,708	100.00%
1999+	43,882,573	**	13,901,999	31.68%	31.68%	13,901,999	100.00%
2000#	44,297,237	**	13,484,079	30.44%	30.44%	13,484,079	100.00%
2001	50,088,675	**	17,500,983	34.94%	34.94%	17,500,983	100.00%
2002	47,681,512	**	16,659,920	34.94%	34.94%@	16,659,920	100.00%
2003	48,172,519	**	16,831,478	34.94%	34.94%@	16,831,478	100.00%
2004	46,333,484	**	17,792,058	38.40%	38.40%	17,792,058	100.00%
2005	50,959,490	**	22,187,762	43.54%	43.54%	22,187,762	100.00%
2006	54,443,639	**	24,102,199	44.27%	44.27%	24,102,199	100.00%
2007#	62,788,916	**	27,802,932	44.28%	44.28%@	27,802,932	100.00%
2008	68,357,010	**	29,147,429	42.64%	42.64%	29,147,429	100.00%
2009	67,872,034	**	27,298,132	40.22%	40.22%	27,298,132	100.00%

* *Prior to 2003 this schedule was not required for the LTD Plan because it used the aggregate funding method. Therefore the LTD Plan assets and liabilities were excluded prior to 2003. In 2003 the LTD Plan was merged into the base plan. Assets and liabilities for existing LTD members are included beginning in 2003.*

** *Values are estimated from contribution rate and amount.*

\+ *Introduction of Year 2000 Plan; Change in Actuary.*

\# *New assumptions adopted.*

@ *The ARC is the rate adopted by the Retirement Board. This rate exceeded the actuarially calculated rate.*

This information is presented in draft form for review by the System's auditor. Please let us know if there are any items that the auditor changes so that we may maintain consistency with the System's financial statements.

DEVELOPMENT OF GAIN/(LOSS)
JULY 1, 2008 TO JUNE 30, 2009

	UAAL =	AAL -	Assets
Beginning of Year Values (at July 1)	$1,235,731,501	$3,019,633,781	$1,783,902,280
Normal Cost	49,481,200	49,481,200	0
Contributions	(123,057,975)	0	123,057,975
Disbursements	0	(194,617,908)	(194,617,908)
Interest	98,912,807	243,132,898	144,220,091
Expected Value Before Any Changes	1,261,067,533	3,117,629,971	1,856,562,438
Effect of Changes in Assumptions & Methods	0	0	0
Expected Value After Changes	1,261,067,533	3,117,629,971	1,856,562,438
End of Year Values (at June 30)	1,641,896,985	3,113,393,645	1,471,496,660
Gain/(Loss) for Year	(380,829,452)	$ 4,236,326	$ (385,065,778)

DEVELOPMENT OF GAIN/(LOSS)
JULY 1, 2008 TO JUNE 30, 2009

	Total	Non-Uniform	Uniform
Beginning of Year UAAL (at July 1)	$ 1,235,731,501	$ 946,205,647	$ 289,525,854
Normal Cost	49,481,200	39,282,809	10,198,391
Contributions	(123,057,975)	(95,759,843)	(27,298,132)
Interest	98,912,807	75,732,288	23,180,519
Net Change in LTD Assets	0	0	0
Expected Value Before Any Changes	1,261,067,533	965,460,901	295,606,632
Effect of Changes in Assumptions & Methods	0	0	0
Expected Value After Changes	1,261,067,533	965,460,901	295,606,632
End of Year UAAL (at June 30)	1,641,896,985	1,260,133,816	381,763,169

Aggregate Gain/(Loss) for Year	$ (380,829,452)	$ (294,672,915)	$ (86,156,537)
Gain/(Loss) as a % of Beginning of Year Liabilities	(12.61)%	(12.84)%	(11.88)%

Asset Gain/(Loss) for Year	$ (385,065,778)	$ (290,978,459)	$ (94,087,319)
Liability Gain/(Loss) for Year	4,236,326	(3,694,456)	7,930,782
Aggregate Gain/(Loss) for Year	$ (380,829,452)	$ (294,672,915)	$ (86,156,537)

SECTION B

SUMMARY OF BENEFITS

MISSOURI DEPARTMENT OF TRANSPORTATION AND HIGHWAY PATROL EMPLOYEES' RETIREMENT SYSTEM SUMMARY OF BENEFIT PROVISIONS EVALUATED AS OF JUNE 30, 2009

Closed Plan

Participation

Participants include:
All MPERS active members, vested terminated members, disability recipients, retirees and survivors who first became members prior to July 1, 2000 and who do not elect to transfer to the Year 2000 Plan.

Normal Retirement Eligibility (unreduced benefit)

All Employees: The earlier of attaining:

1. Age 65 with at least 4 years of creditable service.
2. Age 60 with at least 15 years of creditable service.
3. Age 48 with age plus creditable service equal to 80 or more.

Uniformed Patrol Employees Only: The earlier of attaining:

1. Age 55 with at least 4 years of creditable service.
2. Mandatory retirement at age 60 with 5 or more years of creditable service.

Final Average Pay Used for Benefit Determination

Final Average Pay is the average annual pay of a member for the three consecutive years of service during which pay was highest (overtime pay is included for purposes of determining average pay). Employees retiring from active service will receive 1/12 of a year of creditable service for every 168 hours of unused sick leave (usable only for benefit computation, not eligibility).

Year 2000 Plan

Participation

Participants include:

1. All new employees who first become members on or after July 1, 2000.
2. MPERS active members and vested former members who elect to transfer to the Year 2000 Plan at retirement.
3. MPERS retirees who elected to transfer to the Year 2000 Plan during the election window from July 1, 2000 through July 1, 2001, and their survivors.
4. MPERS members who left state employment prior to becoming vested (not eligible for a future retirement benefit) and return to work in a benefit eligible position on or after July 1, 2000.

Normal Retirement Eligibility (unreduced benefit)

All Employees: The earlier of attaining:

1. Age 62 with at least 5 years of creditable service.
2. Age 48 with age plus creditable service equal to 80 or more.

Uniformed Patrol Employees Only:

1. Age 60 with at least 5 years of creditable service.

Final Average Pay Used for Benefit Determination

Final Average Pay is the average annual pay of a member for the three consecutive years of service during which pay was highest (overtime pay is included for purposes of determining average pay). All members will receive 1/12 of a year of creditable service for every 168 hours of unused sick leave (usable only for benefit computation, not eligibility).

SUMMARY OF BENEFIT PROVISIONS EVALUATED AS OF JUNE 30, 2009 (CONTINUED)

Closed Plan

Normal Retirement Benefit Amount

Non-Uniformed Employees:

Life Benefit: 1.6% of final average pay times years of creditable service.

Uniformed Patrol Employees:

Life Benefit: 2.1333% of final average pay times years of creditable service.

Special Benefit: $90 per month payable until age 65. Offset by any amount earned from gainful employment. This benefit does not apply to uniformed members hired on or after January 1, 1995.

Early Retirement (reduced benefit)

Eligibility: Non-Uniformed Employees

Age 55 with at least 10 years of creditable service.

Amount:

Normal retirement amount reduced by 0.6% for each month that retirement precedes eligibility for normal retirement.

Uniformed Patrol members are not eligible for early retirement.

Vested Deferred Benefits

Eligibility: All Employees

Fully vested in accrued pension with 5 years of creditable service. The benefit will commence at the age the individual is eligible for early or normal retirement, considering years of creditable service.

Minimum Base Benefit

Receive a monthly base benefit of no less than $15 for each full year of creditable service. Must be eligible to receive a normal or early retirement benefit the first of the month immediately following the date you leave state employment. Not required to immediately start drawing a benefit.

Year 2000 Plan

Normal Retirement Benefit Amount

All Employees:

Life Benefit: 1.7% of final average pay times years of creditable service.

Temporary Benefit: If member retires between ages 48 and 62 with age plus creditable service equal to 80 or more, a temporary benefit is payable in the amount of 0.8% of final average pay times years of creditable service until attainment of the minimum age at which reduced social security benefits are payable or death, whichever occurs first. Uniformed Patrol members are eligible for the temporary benefit when they reach mandatory retirement age (currently age 60) and have five years of creditable service.

Early Retirement (reduced benefit)

Eligibility: All Employees

Age 57 with at least 5 years of creditable service.

Amount:

Normal retirement amount reduced by 0.5% for each month that retirement precedes eligibility for normal retirement.

Vested Deferred Benefits

Eligibility: All Employees

Fully vested in accrued pension with 5 years of creditable service. The benefit will commence at the age the individual is eligible for early or normal retirement considering years of creditable service.

Minimum Base Benefit

Same.

Closed Plan

Death Prior to Retirement

A death benefit is payable to the surviving spouse or eligible children of the member who dies after earning 3 years of creditable service. The survivor annuity shall be the total monthly payment equal to twenty-five percent of the deceased member's accrued annuity calculated as if the member was of normal retirement age as of the date of death.

The spouse of the member who dies after accruing 5 years of creditable service may elect to receive an annuity as if the employee had retired on the date of death and elected a joint and 100% survivor annuity.

If no eligible spouse survives or upon the death of the spouse, 80% of the member's accrued annuity will be paid to eligible children until age 21.

If the death is duty-related, there is no service requirement and the minimum annuity is 50% of the final average pay (FAP) to the surviving spouse or eligible children.

Death After Retirement

The benefit payable is 50% of the benefit the retired member was receiving on the date of death (the normal form of payment), or the benefit payable under the joint and survivor or period certain form of payment, if the member elected an optional form of payment at time of retirement.

A member who is not married at retirement but marries thereafter may designate a spouse as beneficiary within one year of the marriage. Additionally, a member may designate a new spouse as beneficiary in the event of the death of the spouse the member was married to at the date of retirement.

For period certain annuities, beneficiaries may be changed at any time.

Year 2000 Plan

Death Prior to Retirement

The spouse of the member who dies after accruing 5 years of creditable service may elect to receive an annuity as if the employee had retired on the date of death and elected a joint and 100% survivor annuity.

If no eligible spouse survives or upon the death of the spouse, 80% of the member's accrued annuity will be paid to eligible children until age 21.

If the death is duty related, there is no service requirement and the minimum annuity is 50% of the final average pay (FAP) to the surviving spouse or eligible children.

Death After Retirement

The benefit payable under the joint and survivor or period certain form of payment, if the member elected an optional form of payment at time of retirement.

A member who is not married at retirement but marries thereafter may designate a spouse as beneficiary. Additionally, a member may designate a new spouse as beneficiary in the event of the death of the spouse the member was married to at the date of retirement. The election must be completed within one year of the date of marriage.

For period certain annuities, beneficiaries may be changed at any time.

Closed Plan	Year 2000 Plan
Pop-Up Provision	**Pop-Up Provision**
Benefits to members who choose a reduced survivor form of payment and whose spouse precedes the member in death, will "pop-up" or revert to the amount the member would have received had he/she not elected a reduced survivor option.	Same.
$5,000 Death Benefit	**$5,000 Death Benefit**
MPERS provides a $5,000 death benefit for a designated beneficiary(ies) of members who retire from service or elect normal or work-related disability benefits after September 28, 1985. Members who die while on terminated vested status or long-term disability status do not qualify for this benefit. Long-term disability recipients who retire on or after September 28, 1985 are eligible to receive this benefit.	MPERS provides a $5,000 death benefit for a designated beneficiary(ies) of members who retire from service or elect work-related disability benefits. Members who die while on terminated vested status or long-term disability status do not qualify for this benefit. Long-term disability recipients who retire on or after September 28, 1985 are eligible to receive this benefit.
Purchase of Service	**Purchase of Service**
Military: Prior to retirement, qualifying members may purchase up to a maximum of 4 years military service that includes active service, and/or active and inactive duty training from which they were honorably discharged. All months the member is eligible for must be purchased. This service credit ***can*** be used to satisfy the vesting requirement. Periods of military service cannot coincide with employment in a state agency.	**Military:** Prior to retirement, qualifying members may purchase up to a maximum of 4 years military service that includes active service from which they were honorably discharged. All months the member is eligible for must be purchased. This service credit ***cannot*** be used to satisfy the vesting requirement. Periods of military service cannot coincide with employment in a state agency.
Police Service: Prior to retirement, uniformed patrol members only, may purchase up to a maximum of 4 years police service. Members must purchase all months of service they are eligible for.	**Police Service:** Not available.
Portability: Section 105.691 allows vested members to acquire (purchase/transfer) service credit for any non-federal, full-time public sector employment within Missouri. Service may be purchased/transferred by using the member's own money and/or using the value of the retirement benefit in the prior retirement plan if that plan has an agreement with MPERS. Any non-federal public employment **not covered** by a retirement plan must be purchased.	**Portability:** Same as Closed Plan Section 105.691. In addition, Section 104.1090 provides that in-state vested service with another retirement system may be granted after 10 years of state service if the other retirement plan agrees to transfer assets equal to the accrued liability to MPERS. Service may be purchased/transferred by using the member's own money and/or using the value of the retirement benefit in the prior retirement plan if that plan has an agreement with MPERS. Any non-federal public employment **not covered** by a retirement plan must be purchased.

SUMMARY OF BENEFIT PROVISIONS EVALUATED AS OF JUNE 30, 2009 (CONTINUED)

Closed Plan

Public Employment Prior Service (Subsidized purchase):

Section 104.040.6 allows, prior to retirement, uniformed patrol members only, may purchase up to a maximum of 4 years full-time "public employment". Public employment refers to employment with a city, county, municipality, public school, or other political subdivision. Federal and out-of-state employment is not eligible. Members must purchase all months of service they are eligible for up to 4 years.

Disability

Benefits that may be payable during the period of disability (whether Normal, Work-related, or LTD) are administered through a separate program and were not considered for purposes of the valuation.

Normal retirement benefits become payable at the time a disabled member becomes eligible for normal retirement, and are computed based on: i) the service that would have accrued to the member if active employment had continued; and ii) the member's rate of pay at the time of disability.

Post-Retirement Benefit Adjustments

For active and inactive employees hired prior to August 28, 1997 and current retirees, the benefits of pensioners and their beneficiaries are increased annually by 80% of the increase in the Consumer Price Index (subject to a maximum increase of 5% and a minimum of 4%). These increases are made until the total of the increases reaches 65% of initial benefit at which time the increases will have the minimum removed.

For employees hired on or after August 28, 1997 the annual percentage increase is equal to the lesser of:

i) 80% of the CPI-U increase, or
ii) 5%.

Member Contributions

None

Year 2000 Plan

Public Employment Prior Service (Subsidized purchase):

Not available.

Disability

Same.

Post-Retirement Benefit Adjustments

Benefits are increased to retired members (including survivors) annually in accordance with the following:

Annual benefit percentage increase equal to the lesser of:

i) 80% of the CPI-U increase, or
ii) 5%.

Member Contributions

None

The Closed Plan & Year 2000 Plan
BackDROP Option

Legislation effective January 1, 2002 provides a Deferred Retirement Option Provision (BackDROP) to members of MPERS. It is available in both the Closed Plan and the Year 2000 Plan.

To be eligible to participate in the BackDROP, a member must have been eligible to retire under normal age and/or service conditions for at least two years. A retroactive starting date is established for BackDROP purposes which is the later of: 1) the member's normal retirement date, or 2) five years prior to the annuity starting date under the retirement plan selected by the member.

The BackDROP period for the accumulation of the BackDROP account is from the retroactive starting date to the annuity starting date. This results in a BackDROP period of one to five years depending upon the individual situation.

A theoretical BackDROP account is accumulated that includes 90% of the value of the benefit payments that would have been paid during the BackDROP period had the member retired at the retroactive starting date. These payments include applicable post-retirement benefit increases. These payments do not include any reduction for spouse options during the BackDROP period. The member may choose the BackDROP period in twelve-month increments or their maximum period, not to exceed 60 months.

The member is paid the resulting lump sum value of the BackDROP account as of the annuity starting date or as three equal annual installments beginning at the annuity starting date.

The annuity benefit payable from the actual retirement date is computed with years of service and final average pay as of the retroactive starting date for the BackDROP. Post-retirement benefit increases that occurred during the BackDROP period are applied in the calculation of the monthly annuity.

Sample Benefit Computation for Closed Plan Members
Retiring July 1, 2009
Non-Uniformed Employee

	Data	Description
A.	$40,000	Final Average Pay
B.	20	Years of Creditable Service
C.	60	Age of Retiree
D.	50%	Automatic percentage to continue to spouse after retirant's death

Sample Computation Steps

E. Retirement Benefit Formula: 0.016 x 20 x $40,000 = $12,800

Benefit payable to:

F.	Retiree while spouse is alive (E)	$ 12,800
G.	Spouse after retiree's death (D x E)	$ 6,400
H.	Retiree after spouse's death	$ 12,800

Year Ended June 30	Annual Amount Payable if Price Inflation is 3.25% and Post-Retirement Increases are 2.6%
2010	$12,800
2011	13,133
2012	13,474
2013	13,825
2014	14,184
2015	14,553
2016	14,931
2017	15,319
2018	15,718
2019	16,126

Sample Benefit Computation for Closed Plan Members
Retiring July 1, 2009
Uniformed Patrol

	Data	Description
A.	$40,000	Final Average Pay
B.	20	Years of Creditable Service
C.	60	Age of Retiree
D.	50%	Automatic percentage to continue to spouse after retirant's death

Sample Computation Steps

E.	Retirement Benefit Formula:	0.021333 x 20 x $40,000 = $17,066
	Benefit payable to:	
F.	Retiree while spouse is alive (E)	$ 17,066
G.	Spouse after retiree's death (D x E)	$ 8,533
H.	Retiree after spouse's death	$ 17,066

Amounts shown below do not include the $1,080 annual supplementary benefit payable to age 65.

Year Ended June 30	Annual Amount Payable if Price Inflation is 3.25% and Post-Retirement Increases are 2.6%
2010	$17,066
2011	17,510
2012	17,965
2013	18,432
2014	18,912
2015	19,403
2016	19,908
2017	20,426
2018	20,957
2019	21,501

SAMPLE BENEFIT COMPUTATION FOR YEAR 2000 PLAN MEMBERS RETIRING JULY 1, 2009

	Data	Description
A.	$40,000	Final Average Pay
B.	20	Years of Creditable Service
C.	60	Age of Retiree
D.	0%	Automatic percentage to continue to spouse after retirant's death

E1.	Retirement Benefit Formula:	0.017 x 20 x $40,000 = $13,600
E2.	Supplemental Benefit Formula:	.008 x 20 x $40,000 = $6,400
	Benefit payable to:	
F1.	Retiree prior to age 62 (E1+E2)	$ 20,000
F2.	Retiree after age 62 (E1)	$ 13,600
G.	Spouse after retiree's death (D x E)	$ 0

Year Ended June 30	Annual Amount Payable if Price Inflation is 3.25% and Post-Retirement Increases are 2.6%
2010	$20,000
2011	20,520
2012	14,316
2013	14,689
2014	15,071
2015	15,462
2016	15,864
2017	16,277
2018	16,700
2019	17,134

SECTION C

FINANCIAL INFORMATION

Summary of Fund Operations

	2009	2008
Market Value of Fund (Beginning of Fiscal Year)	$1,717,754,176	$1,825,204,289
Post Valuation Audit Adjustment	920,874	0
Contributions		
Employer	122,613,975	123,323,265
Transfer from MOSERS	0	251,443
Service Purchase (Employee)	444,000	941,084
Total Contributions	$ 123,057,975	$ 124,515,792
Investment Return		
Interest	$ 10,686,015	$ 11,278,346
Dividends	3,600,161	6,469,546
Real Estate	6,446,870	0
Realized Capital Gains	486,995,198	349,449,702
Realized Capital Losses	(603,382,106)	(221,568,306)
Miscellaneous Income	101,773	129,955
Securities Lending Income	392,802	413,514
Other	381,647	6,065,485
Total Investment Return	$ (94,777,640)	$ 152,238,242
Other Income (Rental Income and Misc)	33,709	31,546
Increase (Decrease) in Unrealized Appreciation	(311,110,094)	(167,619,572)
Benefit Payments		
Retirement Payments	$ 176,468,321	$ 168,590,195
Retirement Payments - BackDROP	12,859,452	14,631,932
Death Benefits	660,000	520,000
Long-Term Disability Payments	179,239	223,501
Insured Disability Program	1,847,673	1,835,734
Service Transfer Payments - Employer	0	0
Total Benefit Payments	$ 192,014,685	$ 185,801,362
Expenses		
Investment	$ 15,013,875	$ 27,552,226
Actuarial	53,380	53,380
Outsourcing Disability Costs	0	0
Other	2,549,843	3,209,153
Total Expenses	$ 17,617,098	$ 30,814,759
Market Value of Fund (End of Fiscal Year)	$1,226,247,217	$1,717,754,176

MISSOURI MPERS
DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

	Valuation Date of June 30	2006	2007	2008	2009	2010	2011
A.	**Actuarial value at beginning of year**	$1,417,476,479	$1,521,142,953	$1,685,807,004	$1,783,902,280		
B.	**Market value at end of year**	1,598,136,375	1,825,204,289	1,717,754,176	1,226,247,217		
C.	**Market value at beginning of year**	1,441,054,574	1,598,136,375	1,825,204,289	1,717,754,176		
D.	**Cash flow**						
	D1. Contributions	111,542,717	121,773,287	124,515,792	123,057,975		
	D2. Benefit Payments	(164,997,183)	(175,970,479)	(185,801,362)	(192,014,685)		
	D3. Administrative Expenses	(1,927,594)	(2,099,592)	(3,262,533)	(2,603,223)		
	D4. Non-Investment Net Cash Flow	(55,382,060)	(56,296,784)	(64,548,103)	(71,559,933)		
E.	**Investment income**						
	E1. Market total (B - C - D4)	212,463,861	283,364,698	(42,902,010)	(419,947,026)		
	E2. Assumed Rate of Return	8.25%	8.25%	8.25%	8.25%		
	E3. Amount for Immediate Recognition (A+.5xD4)xE2	114,657,300	123,172,051	136,416,469	144,220,091		
	E4. Amount for Phased-In Recognition	97,806,561	160,192,647	(179,318,479)	(564,167,117)		
F.	**Phased in recognition of investment income**						
	F1. Current Year (33 1/3% of E4)	32,602,187	53,397,549	(59,772,826)	(188,055,706)		
	F2. First Prior Year	11,789,047	32,602,187	53,397,549	(59,772,826)	$ (92,738,309)	
	F3. Second Prior Year	0	11,789,048	32,602,187	53,397,549	(59,772,827)	$(92,738,308)
	F4. Total Recognized Investment Gain (F1 + F2 + F3)	44,391,234	97,788,784	26,226,910	(194,430,983)	(152,511,136)	(92,738,308)
	F5. Phase-In of Initial (BOY) difference between MVA and AVA	0	0	0	0		
G.	**Actuarial value at end of year (A + D4 + E3 + F4)**	1,521,142,953	1,685,807,004	1,783,902,280	1,662,131,455		
	Less LTD Assets	0	0	0	0	0	0
H.	**Preliminary Plan AVA**	1,521,142,953	1,685,807,004	1,783,902,280	1,662,131,455		
I.	**Corridor (Maximum of 120% of Market Value)**	1,917,763,650	2,190,245,147	2,061,305,011	1,471,496,660		
J.	**Corridor (Minimum of 80% of Market Value)**	1,278,509,100	1,460,163,431	1,374,203,341	980,997,774		
K.	**Additional Investment Gain/(Loss) recognized due to corridor**	0	0	0	190,634,795		
L.	**Final Plan AVA after corridor adjustment, if any**	1,521,142,953	1,685,807,004	1,783,902,280	1,471,496,660		
	Difference between market and actuarial values	76,993,422	139,397,285	(66,148,104)	(245,249,443)		
	Market Rate of Return	15.03%	18.04%	(2.39)%	(24.97)%		
	Ratio of Funding Value to Market Value	95.18%	92.36%	103.85%	120.00%		
	Funding Value Rate of Return	11.44%	14.80%	9.84%	(3.04)%		

ALLOCATION OF ASSETS BETWEEN GROUPS

The division between the Uniformed Patrol and Non-Uniformed Employee groups is in proportion to their market value of assets, as shown below:

	June 30	
Allocation of Other Income	**2009**	**2008**
1. Other Income	$ 33,709	$ 31,546
2. Investment Income		
a) Uniformed Patrol	(23,278,041)	36,845,194
b) Non-Uniformed Employees	(71,499,599)	115,393,048
c) Total	(94,777,640)	152,238,242
3. Other Income Split		
a) Uniformed Patrol		
(2a) / (2c) x (1)	8,279	7,635
b) Non-Uniformed Employees		
(2b) / (2c) x (1)	25,430	23,911
c) Total	33,709	31,546

	June 30	
Allocation of Funding Value of Assets	**2009**	**2008**
1. Funding Value of Assets	1,471,496,660	1,783,902,280
2. Market Value of Assets		
a) Uniformed Patrol	303,684,410	419,388,731
b) Non-Uniformed Employees	922,562,807	1,298,365,445
c) Total	1,226,247,217	1,717,754,176
3. Funding Value of Assets Split		
a) Uniformed Patrol		
(2a) / (2c) x (1)	364,421,292	435,538,754
b) Non-Uniformed Employees		
(2b) / (2c) x (1)	1,107,075,368	1,348,363,526
4. Total Assets Allocated	1,471,496,660	1,783,902,280

SECTION D

SUMMARY OF MEMBER DATA

Civilian Patrol Closed Active Members
as of June 30, 2009
by Attained Age and Years of Service

Attained Age	Count by Complete Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30+	No.	Valuation Payroll
Under 20									
20-24									
25-29		1	1					2	$ 66,530
30-34		5	21	2				28	1,044,934
35-39		8	39	12				59	2,485,890
40-44		6	43	33	17	5		104	4,297,038
45-49		8	33	30	35	29	3	138	5,737,777
50		1	7	3	6	8	4	29	1,269,564
51			6	3	9	7	5	30	1,232,000
52		1	3	7	4	7	3	25	1,181,237
53		1	6	3	8	5	7	30	1,261,218
54		2	5	6	7	2	3	25	1,055,784
55		1	3	1	4	4	3	16	722,047
56		2	7	2	7	3	2	23	1,016,202
57		1	5	3	5	6	1	21	888,452
58		1	4	5	5	1	4	20	752,280
59			3	2	3	1	1	10	372,807
60			6	5		3	1	15	583,215
61			3	3	8	2	2	18	684,432
62		1		3	1			5	177,443
63			3	1	1			5	152,298
64			1	1	1			3	72,232
65			1	1				2	83,692
66									
67									
68									
69									
70									
Over 70					1			1	30,418
Totals	**0**	**39**	**200**	**126**	**122**	**83**	**39**	**609**	**$ 25,167,490**

Average Age: 48.8 years
Average Service: 18.6 years
Average Pay: $41,326

CIVILIAN PATROL YEAR 2000 ACTIVE MEMBERS
AS OF JUNE 30, 2009
BY ATTAINED AGE AND YEARS OF SERVICE

Attained Age	Count by Complete Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30+	No.	Valuation Payroll
Under 20									
20-24	39	2						41	$ 1,143,236
25-29	69	35						104	3,571,367
30-34	51	29						80	2,703,256
35-39	37	28						65	2,117,273
40-44	39	21						60	1,902,557
45-49	20	31						51	1,618,653
50	6	1						7	192,169
51	5	6						11	335,715
52	6	4						10	263,745
53	7	2						9	275,945
54	2	6						8	235,321
55	2	6						8	242,443
56	5	3						8	258,902
57	1	4						5	180,593
58	4	2						6	148,643
59	2	4						6	181,909
60	2	6						8	277,659
61	3	2						5	121,568
62	2	5						7	189,798
63	2	2						4	153,831
64	1	1						2	58,925
65		3						3	95,611
66									
67	2	2						4	100,324
68									
69									
70									
Over 70		1						1	24,516
Totals	**307**	**206**	**0**	**0**	**0**	**0**	**0**	**513**	**$ 16,393,959**

Average Age: 39.4 years
Average Service: 4.2 years
Average Pay: $31,957

MoDOT Closed Active Members
as of June 30, 2009
by Attained Age and Years of Service

Attained Age	Count by Complete Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30+	No.	Valuation Payroll
Under 20									
20-24									
25-29		19	10					29	$ 1,002,425
30-34		76	141	4				221	9,327,216
35-39		57	264	145	7			473	21,981,105
40-44		69	192	259	134	15		669	31,606,613
45-49		52	184	198	271	177	41	923	44,325,773
50		8	33	26	62	36	31	196	9,527,585
51		8	30	29	44	24	33	168	7,826,639
52		4	30	30	39	33	28	164	7,679,854
53		5	21	26	40	20	32	144	6,967,850
54		6	23	30	26	13	22	120	5,519,890
55		5	15	31	19	14	21	105	4,741,563
56		4	23	21	32	8	18	106	4,843,794
57		4	16	20	17	9	10	76	3,403,769
58		5	13	16	17	7	12	70	3,248,698
59		4	11	14	19	6	6	60	2,667,029
60		1	13	10	13	5	9	51	2,488,004
61		3	8	13	6	1	10	41	1,882,202
62		3	6	11	8		2	30	1,245,016
63		2	3	2		2	2	11	495,095
64		1	1	2	2	2	2	10	429,602
65			2	1	2	2	1	8	321,548
66		1	1	1				3	102,951
67		1	3				1	5	222,688
68			1					1	43,320
69				1				1	51,391
70				1			1	2	119,671
Over 70			1	2		1	3	7	315,224
Totals	**0**	**338**	**1,045**	**893**	**758**	**375**	**285**	**3,694**	**$ 172,386,515**

Average Age: 47.3 years
Average Service: 18.4 years
Average Pay: $46,667

MoDOT Year 2000 Active Members
as of June 30, 2009
by Attained Age and Years of Service

Attained Age	Count by Complete Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30+	No.	Valuation Payroll
Under 20	14							14	$ 222,854
20-24	217	2						219	6,425,591
25-29	367	162						529	18,270,408
30-34	258	213						471	16,262,194
35-39	243	184	6					433	14,409,452
40-44	230	150	3	2	1			386	12,033,020
45-49	195	163	1		2			361	11,951,583
50	42	25						67	2,163,289
51	28	21						49	1,639,789
52	28	22						50	1,562,870
53	21	16						37	1,539,147
54	24	18	1					43	1,839,174
55	29	18						47	1,506,933
56	20	16	1	1				38	1,313,520
57	15	15						30	992,064
58	10	10						20	678,934
59	10	11						21	662,971
60	11	6						17	637,407
61	9	8						17	643,038
62	7	5						12	412,192
63	7	3						10	371,365
64	2	4						6	204,749
65	3	1						4	188,086
66	1	1						2	108,903
67	1							1	31,304
68									
69									
70									
Over 70		1						1	30,626
Totals	**1,792**	**1,075**	**12**	**3**	**3**	**0**	**0**	**2,885**	**$ 96,101,463**

Average Age: 38.5 years
Average Service: 4.0 years
Average Pay: $33,311

Uniformed Patrol Closed Active Members
as of June 30, 2009
by Attained Age and Years of Service

Attained Age	0-4	5-9	10-14	15-19	20-24	25-29	30+	Totals No.	Totals Valuation Payroll
Under 20									
20-24									
25-29									
30-34		17	43					60	$ 3,373,187
35-39		10	161	29				200	12,549,556
40-44		5	77	115	11			208	14,470,969
45-49		2	21	38	62	24		147	11,223,582
50			1	5	5	15		26	2,044,034
51			2	1	5	5	4	17	1,254,235
52			1	1	6	6	6	20	1,589,779
53					4	7	9	20	1,628,386
54					4	4	5	13	1,045,678
55					1	3	9	13	1,041,559
56							11	11	934,492
57						3	6	9	725,955
58						1	2	3	245,718
59						1	3	4	323,368
60									
61									
62									
63									
64									
65									
66									
67									
68									
69									
70									
Over 70									
Totals	**0**	**34**	**306**	**189**	**98**	**69**	**55**	**751**	**$ 52,450,498**

Average Age: 43.4 years
Average Service: 18.2 years
Average Pay: $69,841

UNIFORMED PATROL YEAR 2000 ACTIVE MEMBERS
AS OF JUNE 30, 2009
BY ATTAINED AGE AND YEARS OF SERVICE

Attained Age	Count by Complete Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30+	No.	Valuation Payroll
Under 20									
20-24	54							54	$ 2,072,686
25-29	80	32						112	5,071,869
30-34	33	70						103	5,065,809
35-39	9	36						45	2,124,403
40-44	5	9						14	630,150
45-49	1	1						2	86,362
50		1						1	49,072
51									
52									
53									
54		1						1	51,969
55									
56									
57									
58									
59									
60									
61									
62									
63									
64									
65									
66									
67									
68									
69									
70									
Over 70									
Totals	**182**	**150**	**0**	**0**	**0**	**0**	**0**	**332**	**$ 15,152,320**

Average Age: 30.5 years
Average Service: 4.6 years
Average Pay: $45,640

Actuarial Valuation for June 30,	Number	Covered Payroll	Average Pay	% Change in Average Pay from Prior Year
1989	8,181	$194,452,400	$23,769	(0.5)%
1990	8,256	211,414,753	25,607	7.7%
1991	8,308	220,856,988	26,584	3.8%
1992	8,591	228,503,592	26,598	0.1%
1993	8,658	236,236,082	27,285	2.6%
1994	8,849	242,864,780	27,445	0.6%
1995	8,904	250,529,253	28,137	2.5%
1996	9,023	264,196,115	29,280	4.1%
1997	8,997	280,209,116	31,145	6.4%
1998	8,871	284,889,796	32,115	3.1%
1999	9,140	298,673,247	32,678	1.8%
2000	9,171	312,532,009	34,078	4.3%
2001	9,087	327,049,257	35,991	5.6%
2002	8,695	312,747,492	35,969	(0.1)%
2003	8,892	318,744,192	35,846	(0.3)%
2004	9,002	328,210,887	36,460	1.7%
2005	9,193	345,695,867	37,604	3.1%
2006	9,033	348,614,699	38,593	2.6%
2007	8,640	360,842,421	41,764	8.2%
2008	8,599	369,424,653	42,961	2.9%
2009	8,784	377,652,245	42,993	0.1%
			Ten-Year Average	2.8%

Count and Total Monthly Benefits of Civilian Patrol Closed Retired (Non-Disabled) Members and Survivors as of June 30, 2009 by Attained Age

Age	Number	Monthly Benefit Amount
Less than 20		
20-24		
25-29		
30-34		
35-39		
40-44		
45-49	2	$ 1,942
50-54	3	2,271
55-59	16	18,659
60-64	30	32,472
65-69	67	109,945
70-74	98	157,616
75-79	102	164,641
80-84	59	72,427
85-89	28	30,630
90 & Over	8	6,940
TOTAL	**413**	**$ 597,543**

COUNT AND TOTAL MONTHLY BENEFITS OF CIVILIAN PATROL YEAR 2000 RETIRED (NON-DISABLED) MEMBERS AND SURVIVORS AS OF JUNE 30, 2009 BY ATTAINED AGE

Age	Number	Monthly Benefit Amount
Less than 20		
20-24		
25-29		
30-34		
35-39		
40-44		
45-49		
50-54	32	$ 80,914
55-59	104	253,186
60-64	109	184,772
65-69	69	98,180
70-74	6	2,718
75-79	4	3,162
80-84	4	7,658
85-89	6	8,940
90 & Over	1	277
TOTAL	**335**	**$ 639,807**

Count and Total Monthly Benefits of MoDOT Closed Retired (Non-Disabled) Members and Survivors as of June 30, 2009 by Attained Age

Age	Number	Monthly Benefit Amount
Less than 20	11	$ 2,262
20-24	3	513
25-29		
30-34	1	76
35-39	3	1,330
40-44	16	11,676
45-49	18	17,119
50-54	45	38,932
55-59	97	94,337
60-64	238	284,685
65-69	557	999,230
70-74	946	2,017,695
75-79	771	1,500,498
80-84	586	985,161
85-89	327	331,983
90 & Over	173	105,564
TOTAL	**3,792**	**$ 6,391,061**

COUNT AND TOTAL MONTHLY BENEFITS OF MODOT YEAR 2000 RETIRED (NON-DISABLED) MEMBERS AND SURVIVORS AS OF JUNE 30, 2009 BY ATTAINED AGE

Age	Number	Monthly Benefit Amount
Less than 20	7	$ 3,909
20-24	1	495
25-29		
30-34		
35-39	1	1,078
40-44		
45-49	6	14,656
50-54	184	470,064
55-59	511	1,297,721
60-64	700	1,429,610
65-69	406	648,563
70-74	43	54,863
75-79	33	50,614
80-84	54	89,011
85-89	40	42,274
90 & Over	20	29,543
TOTAL	**2,006**	**$ 4,132,401**

Count and Total Monthly Benefits of Uniformed Patrol Closed Retired (Non-Disabled) Members and Survivors as of June 30, 2009 by Attained Age

Age	Number	Monthly Benefit Amount
Less than 20	1	$ 2,186
20-24		
25-29		
30-34	2	4,063
35-39	3	5,860
40-44		
45-49	5	8,215
50-54	33	117,380
55-59	117	406,131
60-64	170	702,582
65-69	137	598,445
70-74	121	546,712
75-79	72	305,223
80-84	64	231,933
85-89	32	86,695
90 & Over	20	34,841
TOTAL	**777**	**$ 3,050,266**

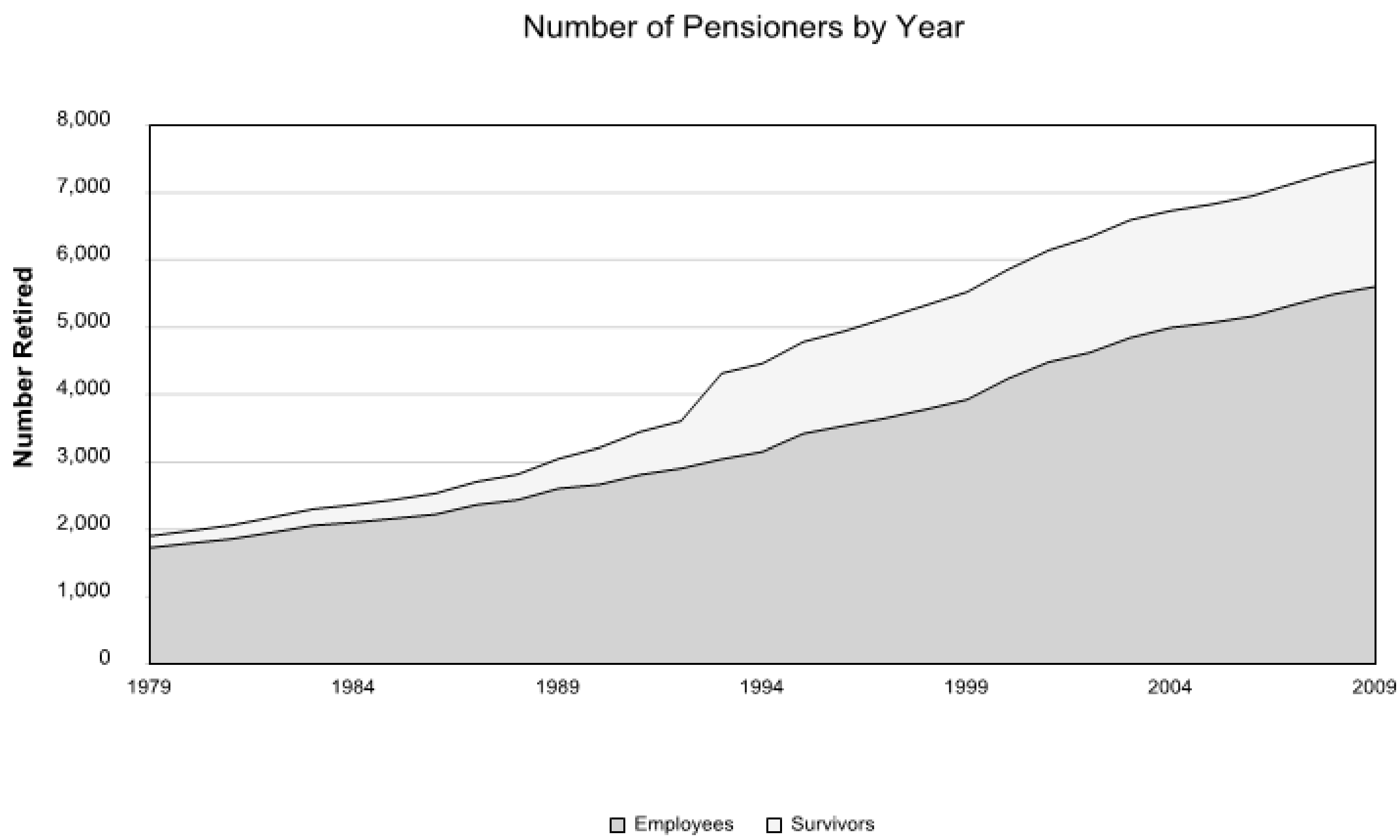
COUNT AND TOTAL MONTHLY BENEFITS OF UNIFORMED PATROL YEAR 2000 RETIRED (NON-DISABLED) MEMBERS AND SURVIVORS AS OF JUNE 30, 2009 BY ATTAINED AGE

Age	Number	Monthly Benefit Amount
Less than 20		
20-24		
25-29		
30-34	1	$ 1,536
35-39		
40-44		
45-49		
50-54		
55-59		
60-64		
65-69		
70-74		
75-79		
80-84		
85-89		
90 & Over		
TOTAL	**1**	**$ 1,536**

GROWTH OF PENSION POPULATION BY YEAR

Year	Retired Employees	Survivors	Total	% Increase	Annual Benefits	Active Payroll	Benefits as a % of Payroll
1979	1,730	174	1,904	5.6%			
1980	1,797	186	1,983	4.1%			
1981	1,860	204	2,064	4.1%			
1982	1,957	225	2,182	5.7%			
1983	2,061	244	2,305	5.6%			
1984	2,107	261	2,368	2.7%			
1985	2,164	280	2,444	3.2%			
1986	2,227	312	2,539	3.9%			
1987	2,369	341	2,710	6.7%			
1988	2,440	380	2,820	4.1%			
1989	2,610	441	3,051	8.2%			
1990	2,669	543	3,212	5.3%			
1991	2,814	632	3,446	7.3%			
1992	2,908	699	3,607	4.7%			
1993	3,047	1,269	4,316	19.7%			
1994	3,156	1,307	4,463	3.4%			
1995	3,419	1,365	4,784	7.2%			
1996	3,536	1,405	4,941	3.3%			
1997	3,646	1,486	5,132	3.9%			
1998	3,781	1,549	5,330	3.9%	$80,686,152	$284,889,796	28.3%
1999	3,924	1,600	5,524	3.6%	91,512,311	298,673,247	30.6%
2000	4,236	1,621	5,857	6.0%	100,794,676	312,532,009	32.3%
2001	4,482	1,663	6,145	4.9%	115,998,915	327,049,257	35.5%
2002	4,623	1,716	6,339	3.2%	125,623,460	312,747,492	40.2%
2003	4,845	1,751	6,596	4.1%	136,320,125	318,744,192	42.8%
2004	4,996	1,735	6,731	2.0%	142,359,307	328,210,887	43.4%
2005	5,068	1,761	6,829	1.5%	148,340,170	345,695,867	42.9%
2006	5,164	1,790	6,954	1.8%	155,230,301	348,614,699	44.5%
2007	5,336	1,805	7,141	2.7%	164,048,455	360,842,421	45.5%
2008	5,496	1,829	7,325	2.6%	172,112,941	369,424,653	46.6%
2009	5,604	1,866	7,470	2.0%	179,850,466	377,652,245	47.6%

Growth of Pension Population by Year



SELF INSURED DISABLED RETIRED MEMBERS
AS OF JUNE 30, 2009

Age	Number	Monthly Benefit Amount
Less than 20		
20-24		
25-29		
30-34	1	$ 429
35-39	3	5,097
40-44	8	5,917
45-49	18	14,223
50-54	14	13,680
55-59	21	21,847
60-64	10	9,404
65-69	6	6,526
70-74	4	4,890
75-79	1	98
80-84	1	584
85-89		
90 & Over		
TOTAL	**87**	**$ 82,695**

These members became disabled prior to outsourcing disability claims. Liabilities for these members include benefits payable during and after the period of disability.

Fully Insured Disabled Retired Members as of June 30, 2009

Age	Number	Monthly Benefit Amount
Less than 20		
20-24		
25-29		
30-34	1	$ 2,257
35-39	5	12,731
40-44	6	12,844
45-49	12	21,631
50-54	15	22,224
55-59	14	16,566
60-64	6	4,028
65-69		
70-74		
75-79		
80-84		
85-89		
90 & Over		
TOTAL	**59**	**$ 92,281**

These members became disabled after disability claims became outsourced. Liabilities for these members during the period of disability are an obligation of the insurance company and not included in this valuation. Liabilities for these members after the period of disability are included in the valuation.

SECTION E

ASSUMPTIONS USED IN THE VALUATION

SUMMARY OF VALUATION METHOD AND ASSUMPTIONS
JUNE 30, 2009

The actuarial assumptions used in the valuation are shown in this Section of the report unless stated otherwise. The assumptions were established for the June 30, 2005 actuarial valuation, following a five-year actuarial investigation. They were adopted by the Board after obtaining the advice of the Actuary and other professionals.

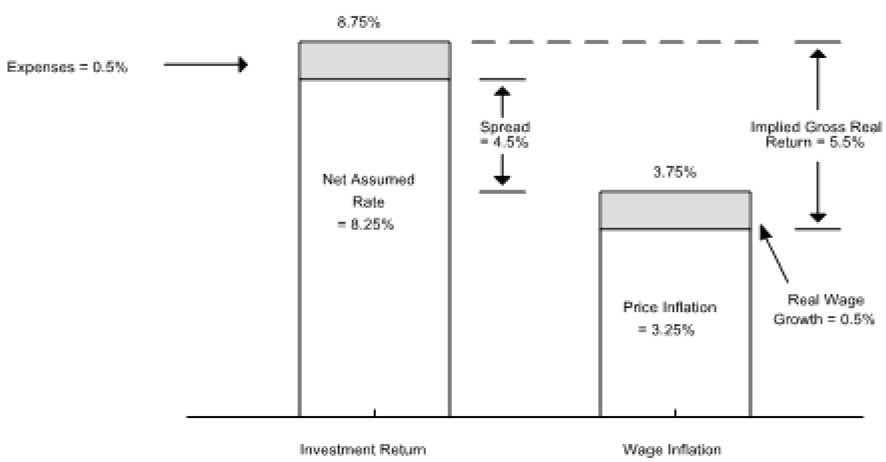
Economic Assumptions

The investment return rate used in making the valuations was 8.25% per year, compounded annually (net after investment expenses). The ***wage inflation rate*** was assumed to be 3.75%. The real rate of return over wage growth is defined to be the portion of total investment return, which is more than the rate of wage inflation. The 8.25% investment return rate and 3.75% wage inflation rate translates to an assumed real rate of return over wage growth net of expenses of 4.5%. Based upon other assumptions, the net real rate of return over price inflation is 5%.

Pay increase assumptions for merit and seniority for individual active members are shown on page E-3. Part of the total assumed pay increase at each age is for merit and/or seniority, and the other 3.75% recognizes wage inflation. ***The active member payroll*** is assumed to increase 3.75% annually.

The price inflation rate is assumed to be 3.25% annually. This is the inflation rate upon which the post-retirement increases are based. The difference between wage and price inflation of 0.5% is attributable to overall productivity increases and macro economic factors.

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



Non-Economic Assumptions

The mortality tables, for post-retirement mortality, used in evaluating allowances to be paid to non-disabled pensioners were the 1971 Group Annuity Mortality Tables projected to the year 2000 set back 1 year for males and 7 years for females. Pre-retirement mortality used was 50% of the 71GAM2000 tables set back 1 year for males and 7 years for females. Disabled pension mortality was based on PBGC Disabled Mortality tables. Related values are shown on page E-4.

The probabilities of age and service retirement are shown on page E-6. Upon retirement, members are assumed to pick the BackDROP period that when combined with the remaining annuity produces the highest liability.

The probabilities of withdrawal from service are shown on pages E-8 and E-9. ***The probabilities of disability*** are shown on page E-7.

The entry age normal actuarial cost method of valuation was used in determining liabilities and normal cost. The normal cost was calculated as if everyone were in the Year 2000 Plan.

> Differences in the past between assumed experience and actual experience ("actuarial gains and losses") become part of actuarial accrued liabilities.
> Unfunded actuarial accrued liabilities are amortized to produce payments (principal & interest) which are level percents of payroll contributions.

Employer contributions were assumed to be ***paid in equal installments*** throughout the employer fiscal year.

Present assets (cash & investments) were used with a market value adjustment. Assets may be used in the valuation prior to the final audit. The exact method is shown on page C-2.

The data about persons now covered and about present assets were furnished by the System's administrative staff. Although examined for general reasonableness, the data was not audited by the Actuary. Data was furnished as of May 31 and assumed to be statistically equivalent to June 30.

The actuarial valuation computations were made by or under the supervision of a Member of the American Academy of Actuaries (M.A.A.A.) who has experience performing public plan valuations.

AGE BASED SALARY SCALE

Age	Salary Increase Assumptions for an Individual Member					
	Non-Uniformed			Uniformed		
	Merit & Seniority	Base (Economic)	Increase Next Year	Merit & Seniority	Base (Economic)	Increase Next Year
20	8.00%	3.75%	11.75%	6.00%	3.75%	9.75%
21	8.00%	3.75%	11.75%	6.00%	3.75%	9.75%
22	8.00%	3.75%	11.75%	6.00%	3.75%	9.75%
23	7.30%	3.75%	11.05%	5.80%	3.75%	9.55%
24	6.52%	3.75%	10.27%	5.60%	3.75%	9.35%
25	5.66%	3.75%	9.41%	5.40%	3.75%	9.15%
26	4.72%	3.75%	8.47%	5.20%	3.75%	8.95%
27	4.50%	3.75%	8.25%	5.00%	3.75%	8.75%
28	4.10%	3.75%	7.85%	4.50%	3.75%	8.25%
29	3.70%	3.75%	7.45%	4.00%	3.75%	7.75%
30	3.30%	3.75%	7.05%	3.50%	3.75%	7.25%
31	2.90%	3.75%	6.65%	3.00%	3.75%	6.75%
32	2.50%	3.75%	6.25%	2.50%	3.75%	6.25%
33	2.35%	3.75%	6.10%	2.25%	3.75%	6.00%
34	2.20%	3.75%	5.95%	2.00%	3.75%	5.75%
35	2.05%	3.75%	5.80%	1.75%	3.75%	5.50%
36	1.90%	3.75%	5.65%	1.50%	3.75%	5.25%
37	1.75%	3.75%	5.50%	1.25%	3.75%	5.00%
38	1.65%	3.75%	5.40%	1.20%	3.75%	4.95%
39	1.55%	3.75%	5.30%	1.15%	3.75%	4.90%
40	1.45%	3.75%	5.20%	1.10%	3.75%	4.85%
41	1.35%	3.75%	5.10%	1.05%	3.75%	4.80%
42	1.25%	3.75%	5.00%	1.00%	3.75%	4.75%
43	1.15%	3.75%	4.90%	0.88%	3.75%	4.63%
44	1.05%	3.75%	4.80%	0.76%	3.75%	4.51%
45	0.95%	3.75%	4.70%	0.64%	3.75%	4.39%
46	0.85%	3.75%	4.60%	0.52%	3.75%	4.27%
47	0.75%	3.75%	4.50%	0.40%	3.75%	4.15%
48	0.70%	3.75%	4.45%	0.39%	3.75%	4.14%
49	0.65%	3.75%	4.40%	0.38%	3.75%	4.13%
50	0.60%	3.75%	4.35%	0.37%	3.75%	4.12%
51	0.55%	3.75%	4.30%	0.36%	3.75%	4.11%
52	0.50%	3.75%	4.25%	0.35%	3.75%	4.10%
53	0.46%	3.75%	4.21%	0.33%	3.75%	4.08%
54	0.42%	3.75%	4.17%	0.31%	3.75%	4.06%
55	0.38%	3.75%	4.13%	0.29%	3.75%	4.04%
56	0.34%	3.75%	4.09%	0.27%	3.75%	4.02%
57	0.30%	3.75%	4.05%	0.25%	3.75%	4.00%
58	0.30%	3.75%	4.05%	0.00%	3.75%	3.75%
59	0.30%	3.75%	4.05%	0.00%	3.75%	3.75%
60	0.30%	3.75%	4.05%	0.00%	3.75%	3.75%

Post-Retirement Mortality

Age	Regular Male	Regular Female	Disabled Male	Disabled Female	Age	Regular Male	Regular Female	Disabled Male	Disabled Female
21	0.00042	0.00035	0.04830	0.02630	61	0.01086	0.00646	0.06240	0.03390
22	0.00043	0.00036	0.04830	0.02630	62	0.01195	0.00705	0.06430	0.03470
23	0.00045	0.00037	0.04830	0.02630	63	0.01313	0.00767	0.06570	0.03550
24	0.00047	0.00038	0.04830	0.02630	64	0.01441	0.00831	0.06680	0.03620
25	0.00049	0.00039	0.04830	0.02630	65	0.01593	0.00901	0.06780	0.03700
26	0.00051	0.00040	0.04610	0.02570	66	0.01770	0.00987	0.06870	0.03780
27	0.00054	0.00042	0.04360	0.02530	67	0.01974	0.01086	0.06970	0.03860
28	0.00057	0.00043	0.04110	0.02470	68	0.02204	0.01195	0.07090	0.03940
29	0.00060	0.00045	0.03880	0.02420	69	0.02451	0.01313	0.07230	0.04020
30	0.00063	0.00047	0.03620	0.02370	70	0.02740	0.01441	0.07390	0.04110
31	0.00067	0.00049	0.03390	0.02320	71	0.03068	0.01593	0.07570	0.04210
32	0.00071	0.00051	0.03200	0.02270	72	0.03419	0.01770	0.07760	0.04330
33	0.00076	0.00054	0.03020	0.02220	73	0.03768	0.01974	0.07960	0.04470
34	0.00081	0.00057	0.02880	0.02180	74	0.04106	0.02204	0.08180	0.04650
35	0.00087	0.00060	0.02780	0.02140	75	0.04455	0.02451	0.08420	0.04920
36	0.00093	0.00063	0.02720	0.02120	76	0.04837	0.02740	0.08690	0.05290
37	0.00100	0.00067	0.02710	0.02100	77	0.05286	0.03068	0.09080	0.05780
38	0.00107	0.00071	0.02730	0.02080	78	0.05835	0.03419	0.09620	0.06310
39	0.00116	0.00076	0.02760	0.02080	79	0.06463	0.03768	0.10430	0.06860
40	0.00125	0.00081	0.02820	0.02090	80	0.07136	0.04106	0.11280	0.07460
41	0.00135	0.00087	0.02880	0.02100	81	0.07875	0.04455	0.12210	0.08130
42	0.00148	0.00093	0.02970	0.02130	82	0.08647	0.04837	0.13220	0.08850
43	0.00166	0.00100	0.03050	0.02160	83	0.09449	0.05286	0.14320	0.09620
44	0.00187	0.00107	0.03140	0.02190	84	0.10293	0.05835	0.15510	0.10430
45	0.00213	0.00116	0.03220	0.02240	85	0.11166	0.06463	0.16810	0.11280
46	0.00242	0.00125	0.03300	0.02290	86	0.12064	0.07136	0.18250	0.12210
47	0.00275	0.00135	0.03400	0.02350	87	0.12994	0.07875	0.19800	0.13220
48	0.00311	0.00148	0.03530	0.02420	88	0.13951	0.08647	0.21500	0.14320
49	0.00350	0.00166	0.03670	0.02490	89	0.14955	0.09449	0.23300	0.15510
50	0.00392	0.00187	0.03830	0.02570	90	0.16012	0.10293	0.25250	0.16820
51	0.00437	0.00213	0.04010	0.02640	91	0.17131	0.11166	0.27390	0.18250
52	0.00486	0.00242	0.04200	0.02720	92	0.18291	0.12064	0.29720	0.19800
53	0.00536	0.00275	0.04390	0.02810	93	0.19478	0.12994	0.32260	0.21500
54	0.00590	0.00311	0.04600	0.02880	94	0.20690	0.13951	0.34950	0.23300
55	0.00646	0.00350	0.04820	0.02950	95	0.22134	0.14955	0.37890	0.25250
56	0.00705	0.00392	0.05060	0.03010	96	0.23700	0.16012	0.41090	0.27390
57	0.00767	0.00437	0.05310	0.03070	97	0.25325	0.17131	0.44580	0.29720
58	0.00831	0.00486	0.05550	0.03150	98	0.27090	0.18291	0.48380	0.32260
59	0.00901	0.00536	0.05810	0.03230	99	0.29016	0.19478	0.52430	0.34950
60	0.00987	0.00590	0.06030	0.03310	100	0.30913	0.20690	0.56840	0.37890

Pre-Retirement mortality is 50% of the regular post-retirement mortality values.

Joint Life Retirement Values
(8.25% Interest)

Sample Attained Ages	Present Value of $1 Monthly for Life		Future Life Expectancy (years)	
	Men	Women	Men	Women
50	$136.25	$138.71	29.17	34.67
55	130.87	133.76	24.82	30.06
60	123.96	127.37	20.70	25.67
65	115.20	119.22	16.82	21.50
70	104.65	109.02	13.32	17.57
75	92.87	96.93	10.36	13.99
80	79.94	83.93	7.83	10.91

The present values shown above are for illustrative purposes only and include a 50% survivor benefit but do not include the value of future post-retirement increases. Males are assumed to be 3 years older than their spouses.

	Non-Uniformed				Uniformed	
	Male		Female		Male	Female
Age	Normal	Early	Normal	Early	Normal	
50	0.1800		0.1800		0.5000	0.5000
51	0.1800		0.1800		0.2500	0.2500
52	0.1800		0.1800		0.2000	0.2000
53	0.1800		0.1800		0.2000	0.2000
54	0.1800		0.1800		0.2000	0.2000
55	0.1800	0.0400	0.1800	0.0400	0.2500	0.2500
56	0.1800	0.0400	0.1800	0.0400	0.3000	0.3000
57	0.1800	0.0400	0.1800	0.0400	0.3500	0.3500
58	0.1800	0.0400	0.1800	0.0400	0.3500	0.3500
59	0.1800	0.0400	0.2000	0.0400	0.3500	0.3500
60	0.1800	0.0400	0.2000	0.0400	1.0000	1.0000
61	0.1800	0.0400	0.2000	0.0400	1.0000	1.0000
62	0.5000	0.3500	0.2500	0.4000	1.0000	1.0000
63	0.4000	0.0400	0.2000	0.3000	1.0000	1.0000
64	0.3000	0.0400	0.2000	0.3000	1.0000	1.0000
65	0.4500		0.4000		1.0000	1.0000
66	0.4000		0.4000		1.0000	1.0000
67	0.3500		0.4000		1.0000	1.0000
68	0.3500		0.4000		1.0000	1.0000
69	0.3500		0.4000		1.0000	1.0000
70	1.0000		1.0000		1.0000	1.0000

RATES OF DISABILITY

Age	Non-Uniformed		Uniformed		Age	Non-Uniformed		Uniformed	
	Male	Female	Male	Female		Male	Female	Male	Female
21	0.0001	0.0005	0.0002	0.0002	51	0.0042	0.0050	0.0017	0.0017
22	0.0001	0.0005	0.0002	0.0002	52	0.0048	0.0058	0.0019	0.0019
23	0.0001	0.0005	0.0002	0.0002	53	0.0054	0.0069	0.0022	0.0022
24	0.0001	0.0005	0.0002	0.0002	54	0.0060	0.0082	0.0025	0.0025
25	0.0001	0.0006	0.0003	0.0003	55	0.0066	0.0054	0.0000	0.0000
26	0.0001	0.0006	0.0003	0.0003	56	0.0066	0.0067	0.0000	0.0000
27	0.0001	0.0006	0.0003	0.0003	57	0.0066	0.0083	0.0000	0.0000
28	0.0001	0.0006	0.0003	0.0003	58	0.0066	0.0099	0.0000	0.0000
29	0.0001	0.0007	0.0003	0.0003	59	0.0066	0.0115	0.0000	0.0000
30	0.0001	0.0007	0.0003	0.0003	60	0.0000	0.0000	0.0000	0.0000
31	0.0002	0.0008	0.0003	0.0003	61	0.0000	0.0000	0.0000	0.0000
32	0.0003	0.0008	0.0004	0.0004	62	0.0000	0.0000	0.0000	0.0000
33	0.0004	0.0009	0.0004	0.0004	63	0.0000	0.0000	0.0000	0.0000
34	0.0005	0.0010	0.0004	0.0004	64	0.0000	0.0000	0.0000	0.0000
35	0.0006	0.0010	0.0004	0.0004	65	0.0000	0.0000	0.0000	0.0000
36	0.0007	0.0011	0.0005	0.0005	66	0.0000	0.0000	0.0000	0.0000
37	0.0007	0.0012	0.0005	0.0005	67	0.0000	0.0000	0.0000	0.0000
38	0.0008	0.0013	0.0005	0.0005	68	0.0000	0.0000	0.0000	0.0000
39	0.0008	0.0015	0.0005	0.0005	69	0.0000	0.0000	0.0000	0.0000
40	0.0009	0.0016	0.0006	0.0006	70	0.0000	0.0000	0.0000	0.0000
41	0.0011	0.0018	0.0006	0.0006	71	0.0000	0.0000	0.0000	0.0000
42	0.0014	0.0020	0.0007	0.0007	72	0.0000	0.0000	0.0000	0.0000
43	0.0016	0.0023	0.0008	0.0008	73	0.0000	0.0000	0.0000	0.0000
44	0.0019	0.0026	0.0008	0.0008	74	0.0000	0.0000	0.0000	0.0000
45	0.0021	0.0029	0.0009	0.0009	75	0.0000	0.0000	0.0000	0.0000
46	0.0024	0.0032	0.0010	0.0010	76	0.0000	0.0000	0.0000	0.0000
47	0.0027	0.0035	0.0011	0.0011	77	0.0000	0.0000	0.0000	0.0000
48	0.0030	0.0038	0.0013	0.0013	78	0.0000	0.0000	0.0000	0.0000
49	0.0033	0.0041	0.0014	0.0014	79	0.0000	0.0000	0.0000	0.0000
50	0.0036	0.0045	0.0015	0.0015	80	0.0000	0.0000	0.0000	0.0000

Rates of Separation from Active Employment
Less Than 5 Years of Service

Service	Non-Uniformed		Uniformed	
	Male	Female	Male	Female
0-1	0.2500	0.1800	0.0800	0.0800
1-2	0.1200	0.1100	0.0600	0.0600
2-3	0.0700	0.0900	0.0450	0.0450
3-4	0.0600	0.0700	0.0400	0.0400
4-5	0.0500	0.0600	0.0400	0.0400

This assumption was first used in the June 30, 2007 valuation.

Rates of Separation from Active Employment
More Than 5 Years of Service

Age	Non-Uniformed		Uniformed	
	Male	Female	Male	Female
25	0.0470	0.0625	0.0450	0.0450
26	0.0470	0.0609	0.0450	0.0450
27	0.0470	0.0593	0.0450	0.0450
28	0.0426	0.0580	0.0426	0.0426
29	0.0402	0.0568	0.0402	0.0402
30	0.0378	0.0555	0.0378	0.0378
31	0.0354	0.0543	0.0354	0.0354
32	0.0340	0.0530	0.0330	0.0330
33	0.0322	0.0514	0.0294	0.0294
34	0.0304	0.0498	0.0258	0.0258
35	0.0286	0.0482	0.0222	0.0222
36	0.0268	0.0466	0.0186	0.0186
37	0.0250	0.0450	0.0150	0.0150
38	0.0232	0.0426	0.0140	0.0140
39	0.0214	0.0402	0.0130	0.0130
40	0.0196	0.0378	0.0120	0.0120
41	0.0178	0.0354	0.0110	0.0110
42	0.0160	0.0330	0.0100	0.0100
43	0.0150	0.0324	0.0094	0.0094
44	0.0140	0.0318	0.0088	0.0088
45	0.0130	0.0312	0.0082	0.0082
46	0.0120	0.0306	0.0076	0.0076
47	0.0110	0.0300	0.0070	0.0070
48	0.0106	0.0300	0.0062	0.0062
49	0.0102	0.0300	0.0054	0.0054
50	0.0098	0.0300	0.0046	0.0046
51	0.0094	0.0300	0.0038	0.0038
52	0.0090	0.0300	0.0030	0.0030
53	0.0082	0.0250	0.0026	0.0026
54	0.0074	0.0200	0.0022	0.0022
55	0.0066	0.0150	0.0018	0.0018
56	0.0058	0.0100	0.0014	0.0014
57	0.0050	0.0050	0.0010	0.0010
58	0.0040	0.0050	0.0010	0.0010
59	0.0030	0.0050	0.0010	0.0010
60	0.0021	0.0050	0.0010	0.0010

MISCELLANEOUS AND TECHNICAL ASSUMPTIONS

Administrative Expenses:	0.69% of payroll, based upon actual results from previous year.
Disability Expenses:	0.53% of payroll included in contribution. Retirement system pays premium directly to an outside insurance company or TPA.
Marriage Assumption:	90% of participants are assumed to be married for purposes of death-in-service benefits. Applies to disabled members entitled to future retirement benefits also.
Pay Increase Timing:	Beginning of (Fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.
Decrement Timing:	Decrements of all types are assumed to occur mid-year.
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Benefit Service:	Exact fractional service is used to determine the amount of benefit payable.
Decrement Relativity:	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
Normal Form of Benefit:	The assumed normal form of benefit is a 50% joint & survivor benefit for married members in the Closed Plan and a straight life benefit for all other members.
Optional Benefit Factors:	Optional Benefit Factors are in accordance with tables adopted by the Board. The Normal Cost and Actuarial Accrued Liability for the normal, early, and vesting decrements were increased by 1.5% for Uniformed Year 2000 Plan members and 1.0% for Non-Uniformed Year 2000 Plan members to account for subsidized option factors codified in the Statute.
Active Member Data:	Actual census date of data was May 31. Data was assumed to be statistically equivalent to June 30.
Other:	Disability and turnover decrements do not operate during retirement eligibility.
Miscellaneous Loading:	The calculated normal and early retirement benefits were increased by 4.3% for Uniformed and 2.6% for Non-Uniformed to account for the inclusion of unused sick leave in the calculation of Average Pay. Post disability benefit liabilities were loaded by 150% to account for potential survivor benefits payable by the retirement system during the period of disability.

METHOD OF FINANCING FUTURE BENEFITS FOR PRESENT ACTIVE MEMBERS

The valuation was prepared in accordance with Section 104.1066 of the Missouri Revised Statutes, which requires the use of the entry-age normal actuarial cost method for determining normal cost and level percent-of-payroll financing of unfunded actuarial accrued liabilities. Details of the application of these methods are described below.

Normal cost and the allocation of present values between service rendered before and after the valuation date were determined using an individual entry-age actuarial cost method having the following characteristics:

(i) the annual normal costs for each individual active member, payable from the date of employment to the date of retirement, are sufficient to accumulate the value of the member's benefit at the time of retirement.

(ii) for the purposes of determining the normal cost, the benefits of the Year 2000 Plan were used. This creates a normal cost that is a constant percentage of the member's year-by-year projected covered pay even as members transition from the current plan benefits to the Year 2000 Plan benefits.

The ***Value of Future Benefits*** was calculated using the benefits assumed to be payable in the future to current active, terminated vested and retired members. It was assumed that current active and retired Uniformed Patrol members hired prior to July 1, 2000 would elect to retain the benefits under the current plan. Computed costs were increased in accordance with the loads described on page E-10.

The ***Present Value of Future Normal Costs*** was defined as the average normal cost rate multiplied by the present value of future payroll for the group.

The ***Actuarial Accrued Liabilities*** were defined as the difference between the present value of future benefits and the present value of future normal costs.

Actuarial Accrued Liabilities, less pension assets as of June 30, 2009, resulted in ***Unfunded Actuarial Accrued Liabilities*** which were amortized using the following funding policy.

Permanent Policy: The total contribution will be based on normal cost plus a 26-year amortization of unfunded actuarial accrued liabilities. The amortization period is a closed 26-year period starting July 1, 2010.

Temporary Accelerated Policy: The total contribution is based on normal cost plus a 15-year amortization period for unfunded retiree liabilities and a 30-year amortization period for other unfunded liabilities. Both amortization periods are closed periods starting July 1, 2010.

This temporary accelerated policy was adopted by the Retirement Board on September 17, 2009 and will remain in effect until such time as the retiree liability becomes 100% funded or the permanent policy produces a higher contribution rate.

GLOSSARY

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

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

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

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

Actuarial Equivalent. A series of payments is called an actuarial equivalent of another series of payments if the two series have the same actuarial present value.

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

Actuarial value of assets. Also referred to as funding value of assets, smoothed market value of assets, or valuation assets.

Valuation assets recognize assumed investment return fully each year. Differences between actual and assumed investment return are phased in over a closed 3-year period. This treatment helps remove the timing of investment activities from the valuation process. During periods when investment performance exceeds the assumed rate, valuation assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, valuation assets will tend to be greater than market value. If assumed rates are exactly realized for 4 consecutive years, valuation assets will become equal to market value.

Actuary. A person who is trained in the applications of probability and compound interest to problems in business and finance that involve payment of money in the future, contingent upon the occurrence of future events. Most actuaries in the United States are Members of the American Academy of Actuaries. The Society of Actuaries is an international research, education and membership organization for actuaries in the life and health insurance, employee benefits, and pension fields. It administers a series of examinations leading initially to Associateship and the designation A.S.A. and ultimately to Fellowship with the designation F.S.A.

(Concluded on Next Page)

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

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

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

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

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

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

The existence of unfunded actuarial accrued liabilities is not in itself bad, any more than a mortgage on a house is bad. Unfunded actuarial accrued liabilities do not represent a debt that is payable today. What is important is the ability to amortize the unfunded actuarial accrued liabilities and the trend in their amount (after due allowance for devaluation of the dollar).

Valuation Payroll. Active member payroll that is intended to reflect the annual salary considered as covered compensation for Retirement System benefits.

SECTION F

FINANCIAL PRINCIPLES AND OPERATIONAL TECHNIQUES

FINANCIAL PRINCIPLES AND OPERATIONAL TECHNIQUES OF THE RETIREMENT SYSTEM

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

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 objective of level percent-of-payroll financing is that this year's taxpayers contribute the money to cover the IOUs being handed out this year. By following this objective, ***the employer contribution rate will remain approximately level from year to year*** --- and will not have to be increased for future generations of taxpayers. However, "Level percent-of-payroll" does NOT mean "Fixed percent-of-payroll". The level percent of payroll is an estimate that may change from one year to the next.

(There are systems which have a design for deferring contributions to future taxpayers, lured by a lower contribution rate now and putting aside the consequence that the contribution rate must then relentlessly grow much greater over decades of time.)

An inevitable by-product of the level-cost design is the accumulation of reserve assets, for decades, and the income produced when the assets are invested. ***Invested assets are a by-product and not the objective.*** Investment income becomes the 3rd contributor for benefits to employees, and is interlocked with the contribution amounts required from employees and employer.

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

> ***Normal Cost*** (the value assigned to service being rendered this year)
> . . . plus . . .
> ***Interest on Unfunded Actuarial Accrued Liabilities*** (the difference between liabilities for service already rendered and the accrued assets of the Retirement System).

Computing Contributions To Support System Benefits From a given schedule of benefits and from the employee data and asset data furnished by the system, 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 return which plan assets will earn; the rates of withdrawal of active members who leave covered employment; the rates of mortality; the rates of disability; the rates of pay increases and the assumed age or ages at actual retirement.

In an actuarial valuation the actuary must assume what the above rates will be, for the next year and for decades in the future. Only the subsequent actual experience of the plan can indicate the degree of accuracy of the assumptions.

Reconciling Differences Between Assumed Experience and Actual Experience Once actual experience has occurred and has been observed, it will not coincide exactly with assumed experience, regardless of the skill of the actuary and the many calculations made. Most retirement systems cope with such differences by having annual actuarial valuations. Each actuarial valuation is a complete recalculation of assumed future experience, taking into account all past differences between assumed and actual experience. The result is ***continuing adjustments to the financial position.***

THE ACTUARIAL VALUATION PROCESS

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

A. ***Covered people data*** furnished by plan administrator, including:

Retired lives now receiving benefits

Former employees with vested benefits not yet payable

Active employees

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

C. + ***Benefit provisions*** which specify eligibility and amounts of pensions

D. + ***Assumptions concerning future experience in various risk areas,*** which are established by the Retirement Board 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

MEANING OF "UNFUNDED ACCRUED LIABILITIES"

"Actuarial accrued liabilities" are the portion of the present value of plan promises to pay benefits in the future that are not covered by future normal cost contributions. A liability has been established ("accrued") because the service has been rendered but the resulting monthly cash benefit may not be payable until years in the future. Actuarial accrued liabilities are the result of complex mathematical calculations, which are made by the plan's actuary.

If "actuarial accrued liabilities" exceed the plan's accrued assets (cash & investments), the difference is ***"unfunded actuarial accrued liabilities."*** This is the usual condition. If the plan's assets equaled the plan's "actuarial accrued liabilities," then the plan would be termed "fully funded." This is an unusual condition.

Each time a plan adds a new benefit, which applies to service already rendered, an "actuarial accrued liability" is created, which is also an "unfunded actuarial accrued liability" because the plan can't print instant cash to cover the value of the new benefit promises. Payment for such unfunded actuarial accrued liabilities is spread over a period of years, commonly in the 20-50 year range.

Unfunded actuarial accrued liabilities can occur in another way: if actual plan experience is less favorable than assumed plan experience, the difference is added to unfunded actuarial accrued liabilities. In plans where benefits are directly related to an employee's pay near time of retirement, unfunded actuarial accrued liabilities rose dramatically during the 1970's. Unexpected rates of pay increase created additional actuarial accrued liabilities, which could not be matched by reasonable investment results. More recent experience has generally been more favorable with some reductions in unfunded actuarial accrued liabilities.

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

Even though unfunded actuarial accrued liabilities don't constitute a bill payable immediately, it is important that policy-makers prevent the amount from becoming unreasonably high and ***it is vital for plans to have a sound method for making payments toward them*** so that they are controlled.

SECTION G

SUPPLEMENTAL INFORMATION FOR COMPREHENSIVE ANNUAL FINANCIAL REPORTING

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October 13, 2009

The Retirement Board
Missouri Department of Transportation
and Highway Patrol Employees' Retirement System
P.O. Box 1930
Jefferson City, Missouri 65102-1930

Dear Board Members:

The basic financial objective of the Missouri Department of Transportation and Highway Patrol Employees' Retirement System (MPERS) is to establish and receive contributions which;

(1) when expressed in terms of percents of active member payroll, will remain approximately level from generation to generation of Missouri citizens, and which

(2) when combined with present assets and future investment returns, will be sufficient to meet the present and future financial obligations of MPERS.

In order to measure progress toward this fundamental objective, MPERS has annual actuarial valuations performed. The valuations (i) measure present financial position, and (ii) establish contribution rates that provide for the current cost and level percent-of-payroll amortization of unfunded actuarial liabilities over a reasonable period. An actuarial valuation was performed based upon benefit conditions, data and assumptions as of June 30, 2009. This valuation indicates that contribution rates for the period beginning July 1, 2010 that are at least equal to the calculated contributions rates will meet the Board's financial objective. The calculated contribution rates are 39.46% of payroll for the 7,701 Non-Uniformed employees and 49.53% of payroll for the 1,083 Uniformed patrol employees.

The actuarial valuations are based upon financial and participant data (which is prepared by retirement system staff) assumptions regarding future rates of investment return and inflation, and rates of retirement, turnover, death, and disability among MPERS' members and their beneficiaries. We review the data for internal and year-to-year consistency as well as general reasonableness prior to its use in the actuarial valuations. It is also summarized and tabulated for the purpose of analyzing trends. The assumptions were adopted by the Board of Trustees and were based upon actual experience of MPERS during the period July 1, 1999 to June 30, 2004. The funding policy was adopted by the Board at the September 17, 2009 Board meeting and was designed to better address the unfunded retiree liability. Assets were valued using a three-year smoothing method. The assumptions and methods utilized in this valuation, in our opinion, meet the parameters established by the Governmental Accounting Standards Board Statement No. 25.

The current benefit structure is outlined in the Introductory Section. We provided the information used in the supporting schedules in the Actuarial Section and the Schedules of Funding Progress in the Financial Section, as well as the employer contribution rates shown in the Schedule of Employer Contributions in the Financial Section.

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 opinion contained herein.

Based upon the valuation results, it is our opinion that the Missouri Department of Transportation and Highway Patrol Employees' Retirement System continues to operate in accordance with actuarial principles of level percent-of-payroll financing. It is important to the well-being of the system that it continues to receive contributions at the actuarially determined levels. It is also important to continue to monitor both the total funded status and the funded status of the retiree liabilities to ensure that the funding policy is consistent with the expected life span of the respective unfunded obligation.

Respectfully submitted,

Brian B. Murphy, F.S.A., E.A., M.A.A.A.

Kenneth G. Alberts

SOLVENCY TEST

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

A solvency test is one means of checking a system's progress under its funding program. In a solvency test for a non-contributory plan, the plan's present assets (cash and investments) are compared with: 1) The liabilities for future benefits to present retired lives and 2) The liabilities for service already rendered by members. In a system that has been following the discipline of level percent of payroll financing, the liabilities for future benefits to present retired lives (liability 1) will be fully covered by present assets (except in rare circumstances). In addition, the liabilities for service already rendered by members (liability 2) will be partially covered by the remainder of present assets. The larger the funded portion of liability 2, the stronger the condition of the system.

The schedule below illustrates the history of liability 2 of the System. Progress on solvency has been negatively impacted by the 2000-2002 investment market.

Val. Date June 30	(1) Retirees and Benef.	(2) Active and Inactive Members	Present Valuation Assets	Portion of Present Values Covered by Present Assets (1)	(2)	Total
	------------$ Millions-------------					
1999	1,132	921	1,243	100%	12%	61%
2000	1,238	951	1,423	100%	19%	65%
2001	1,375	926	1,521	100%	16%	66%
2002#	1,470	888	1,451	99%	0%	62%
2003	1,555	863	1,364	88%	0%	56%
2004	1,626	867	1,332	82%	0%	53%
2005	1,669	958	1,417	85%	0%	54%
2006	1,734	1,007	1,521	88%	0%	56%
2007	1,810	1,087	1,686	93%	0%	58%
2008	1,873	1,147	1,784	95%	0%	59%
2009	1,947	1,166	1,471	76%	0%	47%

\# *New Assumptions adopted.*

DERIVATION OF EXPERIENCE GAIN (LOSS)

Actual experience will never coincide exactly with assumed experience (except by coincidence). Gains and losses may offset each other over a period of years, but sizeable year-to-year variations from assumed experience are common. Detail on the derivation of the experience gain (loss) is shown below.

	$ Millions
UAAL Beginning of Year (at July 1)	$ 1,235,731,501
Normal Cost	49,481,200
Contributions	(123,057,975)
Interest	98,912,807
Net Change in LTD Assets	-
Expected UAAL Before Any Changes	1,261,067,533
Effect of Changes in Assumptions & Methods	-
Expected UAAL After Changes	1,261,067,533
End of Year UAAL (at June 30)	$ 1,641,896,985
Gain/(Loss) for Year	$ (380,829,452)
Gain/(Loss) as a percent of actuarial accrued liabilities at start of year ($2,897.3 million)	(12.6)%

Valuation Date June 30	Experience Gain (Loss) as % of Beginning Accrued Liability
1999	(7.7)%
2000	(0.1)%
2001	(9.3)%
2002	(4.5)%
2003	(5.2)%
2004	(2.9)%
2005	(1.5)%
2006	1.4 %
2007	1.1 %
2008	(0.2)%
2009	**(12.6)%**

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Valuation Date:	June 30, 2009
Actuarial Cost Method:	Entry Age
Amortized Method:	Closed, level percent of payroll
Remaining Amortization Period:	24-years#
Asset Valuation Method:	3-year smoothing
Actuarial Assumptions:	
Investment Rate of Return:	8.25%
Projected Salary Increase:	3.75% to 11.75%
Cost-of-Living Adjustments:	2.6% Compound
Includes Wage Inflation at:	3.75%

 # single equivalent period.

An actuarial valuation is based upon an actuarial cost method, an asset valuation method, and actuarial assumptions. These methods and assumptions are chosen by the Board of Trustees after consultation with the Actuary and other advisors.

The actuarial cost method is called the Entry Age Actuarial Cost Method. This method is consistent with the Board's level percent of payroll funding objective. With this method, the level percent of payroll is determined that will fund a member's retirement benefit over the member's entire working lifetime, from date of hire (Entry Age) to date of exit from the active member population. Differences in the past between assumed and actual experience become part of unfunded actuarial accrued liabilities and are amortized with level percent of payroll contributions. This cost method was first used in the ***June 30, 1999*** valuation.

The asset valuation method is a three year smoothed market value method in which assumed investment return is recognized immediately each year and differences between actual and assumed investment return are phased in over a closed three year period. This asset valuation method is intended to give recognition to the long term accuracy of market values while filtering out and dampening short term market swings. This method was first used in the ***June 30, 1999*** valuation.

The actuarial assumptions used in producing the valuation fall into two broad classes: economic assumptions, and demographic assumptions. Economic assumptions refer to long term rates of investment return, wage growth, covered population growth, and inflation. Demographic assumptions refer to retirement rates, turnover rates, disability rates, merit and seniority pay increases, and mortality rates. The current assumptions are based upon a 1999-2004 study of experience of the MPERS. The assumptions are reviewed from time to time to keep them reasonably current with expected experience.

Economic Assumptions

The investment return rate used in making the valuation was 8.25% per year, compounded annually (net after administrative expenses). This rate of return is not the assumed real rate of return. The real rate of return over wage inflation is defined to be the portion of investment return which is more than the wage inflation rate. Considering wage inflation recognition of 3.75%, the 8.25% rate translates to an assumed real rate of return over wage inflation of 4.5%. This rate was first used for the ***June 30, 2005*** valuation.

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS (CONTINUED)

Pay increase assumptions for individual active members are shown on Tables IV. Part of the assumption for each age is for a merit and/or seniority increase, and the other 3.75% recognizes wage inflation. These rates were first used for the **June 30, 2005** valuation.

Price Inflation is assumed to be 3.25%. This results in a 2.6% annual COLA assumption. It is assumed that the 2.6% COLA will always be paid.

The Active Member Group size is assumed to remain constant at its present level.

Total active member payroll is assumed to increase 3.75% a year, which is the portion of the individual pay increase assumptions attributable to wage inflation. This rate was first used for the **June 30, 2005** valuation.

Non Economic Assumptions

The mortality table used to measure retired life mortality was the 1971 Group Annuity Mortality Tables projected to the year 2000 set back 1 year for males and 7 years for females. Related values are shown on Table I. This table was first used for the June 30, 2000 valuation. Disabled pension mortality was based on PBGC Disabled Mortality tables.

The probabilities of retirement for members eligible to retire are shown on Table II. The rates for full retirement were first used in the **June 30, 2005** valuation. The rates for reduced retirement were first used in the **June 30, 2005** valuation. Upon retirement, members are assumed to pick the BackDROP period that when combined with the remaining annuity produces the highest liability.

The probabilities of disability for members eligible to retire are shown on Table III. The rates for disability were first used in the **June 30, 2005** valuation.

The probabilities of withdrawal from service, death in service and disability are shown for sample ages on Tables IV and V. The death-in-service and disability rates were first used in the **June 30, 2005** valuation. The withdrawal rates for Uniform members were first used in the **June 30, 2007** valuation. The withdrawal rates for Non-uniform members were first used in the **June 30, 2005** valuation.

The data about persons now covered and about present assets was furnished by the System's administrative staff. Although examined for general reasonableness, the data was not audited by the Actuary. Data was furnished as of May 31 and assumed to be statistically equivalent to June 30.

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

TABLE I
JOINT LIFE RETIREMENT VALUES
(8.25% INTEREST)

Sample Attained Ages	Present Value of $1 Monthly for Life		Future Life Expectancy (years)	
	Men	Women	Men	Women
50	$136.25	$138.71	29.17	34.67
55	130.87	133.76	24.82	30.06
60	123.96	127.37	20.70	25.67
65	115.20	119.22	16.82	21.50
70	104.65	109.02	13.32	17.57
75	92.87	96.93	10.36	13.99
80	79.94	83.93	7.83	10.91

The present values shown above are for illustrative purposes only and include a 50% survivor benefit but do not include the value of future post-retirement increases. Males are assumed to be 3 years older than their spouses.

TABLE II
RATES OF RETIREMENT

	Non-Uniformed				Uniformed	
	Male		Female		Male	Female
Age	Normal	Early	Normal	Early	Normal	
50	0.1800		0.1800		0.5000	0.5000
51	0.1800		0.1800		0.2500	0.2500
52	0.1800		0.1800		0.2000	0.2000
53	0.1800		0.1800		0.2000	0.2000
54	0.1800		0.1800		0.2000	0.2000
55	0.1800	0.0400	0.1800	0.0400	0.2500	0.2500
56	0.1800	0.0400	0.1800	0.0400	0.3000	0.3000
57	0.1800	0.0400	0.1800	0.0400	0.3500	0.3500
58	0.1800	0.0400	0.1800	0.0400	0.3500	0.3500
59	0.1800	0.0400	0.2000	0.0400	0.3500	0.3500
60	0.1800	0.0400	0.2000	0.0400	1.0000	1.0000
61	0.1800	0.0400	0.2000	0.0400	1.0000	1.0000
62	0.5000	0.3500	0.2500	0.4000	1.0000	1.0000
63	0.4000	0.0400	0.2000	0.3000	1.0000	1.0000
64	0.3000	0.0400	0.2000	0.3000	1.0000	1.0000
65	0.4500		0.4000		1.0000	1.0000
66	0.4000		0.4000		1.0000	1.0000
67	0.3500		0.4000		1.0000	1.0000
68	0.3500		0.4000		1.0000	1.0000
69	0.3500		0.4000		1.0000	1.0000
70	1.0000		1.0000		1.0000	1.0000

TABLE III
RATES OF DISABILITY

Age	Non-Uniformed		Uniformed		Age	Non-Uniformed		Uniformed	
	Male	Female	Male	Female		Male	Female	Male	Female
21	0.0001	0.0005	0.0002	0.0002	51	0.0042	0.0050	0.0017	0.0017
22	0.0001	0.0005	0.0002	0.0002	52	0.0048	0.0058	0.0019	0.0019
23	0.0001	0.0005	0.0002	0.0002	53	0.0054	0.0069	0.0022	0.0022
24	0.0001	0.0005	0.0002	0.0002	54	0.0060	0.0082	0.0025	0.0025
25	0.0001	0.0006	0.0003	0.0003	55	0.0066	0.0054	0.0000	0.0000
26	0.0001	0.0006	0.0003	0.0003	56	0.0066	0.0067	0.0000	0.0000
27	0.0001	0.0006	0.0003	0.0003	57	0.0066	0.0083	0.0000	0.0000
28	0.0001	0.0006	0.0003	0.0003	58	0.0066	0.0099	0.0000	0.0000
29	0.0001	0.0007	0.0003	0.0003	59	0.0066	0.0115	0.0000	0.0000
30	0.0001	0.0007	0.0003	0.0003	60	0.0000	0.0000	0.0000	0.0000
31	0.0002	0.0008	0.0003	0.0003	61	0.0000	0.0000	0.0000	0.0000
32	0.0003	0.0008	0.0004	0.0004	62	0.0000	0.0000	0.0000	0.0000
33	0.0004	0.0009	0.0004	0.0004	63	0.0000	0.0000	0.0000	0.0000
34	0.0005	0.0010	0.0004	0.0004	64	0.0000	0.0000	0.0000	0.0000
35	0.0006	0.0010	0.0004	0.0004	65	0.0000	0.0000	0.0000	0.0000
36	0.0007	0.0011	0.0005	0.0005	66	0.0000	0.0000	0.0000	0.0000
37	0.0007	0.0012	0.0005	0.0005	67	0.0000	0.0000	0.0000	0.0000
38	0.0008	0.0013	0.0005	0.0005	68	0.0000	0.0000	0.0000	0.0000
39	0.0008	0.0015	0.0005	0.0005	69	0.0000	0.0000	0.0000	0.0000
40	0.0009	0.0016	0.0006	0.0006	70	0.0000	0.0000	0.0000	0.0000
41	0.0011	0.0018	0.0006	0.0006	71	0.0000	0.0000	0.0000	0.0000
42	0.0014	0.0020	0.0007	0.0007	72	0.0000	0.0000	0.0000	0.0000
43	0.0016	0.0023	0.0008	0.0008	73	0.0000	0.0000	0.0000	0.0000
44	0.0019	0.0026	0.0008	0.0008	74	0.0000	0.0000	0.0000	0.0000
45	0.0021	0.0029	0.0009	0.0009	75	0.0000	0.0000	0.0000	0.0000
46	0.0024	0.0032	0.0010	0.0010	76	0.0000	0.0000	0.0000	0.0000
47	0.0027	0.0035	0.0011	0.0011	77	0.0000	0.0000	0.0000	0.0000
48	0.0030	0.0038	0.0013	0.0013	78	0.0000	0.0000	0.0000	0.0000
49	0.0033	0.0041	0.0014	0.0014	79	0.0000	0.0000	0.0000	0.0000
50	0.0036	0.0045	0.0015	0.0015	80	0.0000	0.0000	0.0000	0.0000

TABLE IV
RATES OF SEPARATION FROM ACTIVE EMPLOYMENT
LESS THAN 5 YEARS OF SERVICE

	Non-Uniformed		Uniformed	
Service	Male	Female	Male	Female
0-1	0.2500	0.1800	0.0800	0.0800
1-2	0.1200	0.1100	0.0600	0.0600
2-3	0.0700	0.0900	0.0450	0.0450
3-4	0.0600	0.0700	0.0400	0.0400
4-5	0.0500	0.0600	0.0400	0.0400

Table V
Rates of Separation from Active Employment
More Than 5 Years of Service

Age	Non-Uniformed		Uniformed	
	Male	Female	Male	Female
25	0.0470	0.0625	0.0450	0.0450
26	0.0470	0.0609	0.0450	0.0450
27	0.0470	0.0593	0.0450	0.0450
28	0.0426	0.0580	0.0426	0.0426
29	0.0402	0.0568	0.0402	0.0402
30	0.0378	0.0555	0.0378	0.0378
31	0.0354	0.0543	0.0354	0.0354
32	0.0340	0.0530	0.0330	0.0330
33	0.0322	0.0514	0.0294	0.0294
34	0.0304	0.0498	0.0258	0.0258
35	0.0286	0.0482	0.0222	0.0222
36	0.0268	0.0466	0.0186	0.0186
37	0.0250	0.0450	0.0150	0.0150
38	0.0232	0.0426	0.0140	0.0140
39	0.0214	0.0402	0.0130	0.0130
40	0.0196	0.0378	0.0120	0.0120
41	0.0178	0.0354	0.0110	0.0110
42	0.0160	0.0330	0.0100	0.0100
43	0.0150	0.0324	0.0094	0.0094
44	0.0140	0.0318	0.0088	0.0088
45	0.0130	0.0312	0.0082	0.0082
46	0.0120	0.0306	0.0076	0.0076
47	0.0110	0.0300	0.0070	0.0070
48	0.0106	0.0300	0.0062	0.0062
49	0.0102	0.0300	0.0054	0.0054
50	0.0098	0.0300	0.0046	0.0046
51	0.0094	0.0300	0.0038	0.0038
52	0.0090	0.0300	0.0030	0.0030
53	0.0082	0.0250	0.0026	0.0026
54	0.0074	0.0200	0.0022	0.0022
55	0.0066	0.0150	0.0018	0.0018
56	0.0058	0.0100	0.0014	0.0014
57	0.0050	0.0050	0.0010	0.0010
58	0.0040	0.0050	0.0010	0.0010
59	0.0030	0.0050	0.0010	0.0010
60	0.0021	0.0050	0.0010	0.0010

TABLE VI
AGE BASED SALARY SCALE

	Salary Increase Assumptions for an Individual Member					
	Non-Uniformed			Uniformed		
Age	Merit & Seniority	Base (Economic)	Increase Next Year	Merit & Seniority	Base (Economic)	Increase Next Year
20	8.00%	3.75%	11.75%	6.00%	3.75%	9.75%
21	8.00%	3.75%	11.75%	6.00%	3.75%	9.75%
22	8.00%	3.75%	11.75%	6.00%	3.75%	9.75%
23	7.30%	3.75%	11.05%	5.80%	3.75%	9.55%
24	6.52%	3.75%	10.27%	5.60%	3.75%	9.35%
25	5.66%	3.75%	9.41%	5.40%	3.75%	9.15%
26	4.72%	3.75%	8.47%	5.20%	3.75%	8.95%
27	4.50%	3.75%	8.25%	5.00%	3.75%	8.75%
28	4.10%	3.75%	7.85%	4.50%	3.75%	8.25%
29	3.70%	3.75%	7.45%	4.00%	3.75%	7.75%
30	3.30%	3.75%	7.05%	3.50%	3.75%	7.25%
31	2.90%	3.75%	6.65%	3.00%	3.75%	6.75%
32	2.50%	3.75%	6.25%	2.50%	3.75%	6.25%
33	2.35%	3.75%	6.10%	2.25%	3.75%	6.00%
34	2.20%	3.75%	5.95%	2.00%	3.75%	5.75%
35	2.05%	3.75%	5.80%	1.75%	3.75%	5.50%
36	1.90%	3.75%	5.65%	1.50%	3.75%	5.25%
37	1.75%	3.75%	5.50%	1.25%	3.75%	5.00%
38	1.65%	3.75%	5.40%	1.20%	3.75%	4.95%
39	1.55%	3.75%	5.30%	1.15%	3.75%	4.90%
40	1.45%	3.75%	5.20%	1.10%	3.75%	4.85%
41	1.35%	3.75%	5.10%	1.05%	3.75%	4.80%
42	1.25%	3.75%	5.00%	1.00%	3.75%	4.75%
43	1.15%	3.75%	4.90%	0.88%	3.75%	4.63%
44	1.05%	3.75%	4.80%	0.76%	3.75%	4.51%
45	0.95%	3.75%	4.70%	0.64%	3.75%	4.39%
46	0.85%	3.75%	4.60%	0.52%	3.75%	4.27%
47	0.75%	3.75%	4.50%	0.40%	3.75%	4.15%
48	0.70%	3.75%	4.45%	0.39%	3.75%	4.14%
49	0.65%	3.75%	4.40%	0.38%	3.75%	4.13%
50	0.60%	3.75%	4.35%	0.37%	3.75%	4.12%
51	0.55%	3.75%	4.30%	0.36%	3.75%	4.11%
52	0.50%	3.75%	4.25%	0.35%	3.75%	4.10%
53	0.46%	3.75%	4.21%	0.33%	3.75%	4.08%
54	0.42%	3.75%	4.17%	0.31%	3.75%	4.06%
55	0.38%	3.75%	4.13%	0.29%	3.75%	4.04%
56	0.34%	3.75%	4.09%	0.27%	3.75%	4.02%
57	0.30%	3.75%	4.05%	0.25%	3.75%	4.00%
58	0.30%	3.75%	4.05%	0.00%	3.75%	3.75%
59	0.30%	3.75%	4.05%	0.00%	3.75%	3.75%
60	0.30%	3.75%	4.05%	0.00%	3.75%	3.75%