THE REPORT OF THE ANNUAL ACTUARIAL VALUATION
OF THE
MISSOURI DEPARTMENT OF TRANSPORTATION AND HIGHWAY PATROL EMPLOYEES' RETIREMENT SYSTEM
(MPERS)
JUNE 30, 2004

Gabriel, Roeder, Smith & Company

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October 25, 2004

The Retirement Board
Missouri Department of Transportation
and Highway Patrol Employees' Retirement System
Jefferson City, Missouri

Ladies and Gentlemen:

The results of the regular annual **actuarial valuation as of** June 30, 2004 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 his staff. Data was reviewed for reasonableness, but was 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 results on pages 2, 3 and 4.

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 reasonably 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.

Respectfully submitted,

GABRIEL, ROEDER, SMITH & COMPANY

Brian B. Murphy, F.S.A.   Kenneth G. Alberts

KGA/lr

SUMMARY

This report contains the results of the June 30, 2004 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	805	5,035	5,840	890	6,730
Year 2000 Plan	297	1,824	2,121	151	2,272
Total Active Members	1,102	6,859	7,961	1,041	9,002
Retiree -- Regular Pensioners					
Closed Plan	390	3,987	4,377	707	5,084
Year 2000 Plan	194	1,299	1,493	1	1,494
Total Regular Pensioners	584	5,286	5,870	708	6,578
Disability Pensioners	12	136	148	5	153
Terminated Vested Members	176	976	1,152	133	1,285
Total	1,874	13,257	15,131	1,887	17,018
Active Member Valuation Payroll	$34,175,162	$247,864,082	$282,039,244	$ 46,171,643	$ 328,210,887
Unfunded Actuarial Accrued Liability	N/A	N/A	$909,585,537	$251,745,232	$1,161,330,769

The June 30, 2004 valuation results are used to determine the contribution rate for the plan year beginning July 1, 2005. A summary of valuation results and recommended contribution rates follows.

Investment return was positive this year and well above the assumed rate. However, due to the portion of the last two years' losses that were scheduled for recognition this year, the actuarial value of assets recognized a loss for the year.

Summary

The **total contribution rate** for the plan year beginning July 1, 2005 is shown below. This year, asset balances were reconstructed by GRS, based on detailed data supplied by the Executive Director and staff, going back to 2000. The purpose of the reconstruction was to provide a more accurate breakdown of the total unfunded liability and related contribution between the Uniformed group and the Non-Uniformed group. Based upon the results of this valuation, the employer contribution rates allocated between normal cost, unfunded liability and expenses effective July 1, 2005 are:

	Employer Contribution Rates Expressed as % of Active Payroll for Total Benefits			
	Non-Uniformed			
	Civilian Patrol Employees	**MoDOT Employees**	**Uniformed Patrol**	**Combined Rate**
Normal Cost	11.79%	11.79%	13.55%	12.04%
Unfunded Liability	17.64%	17.64%	29.66%	19.33%
Expenses	0.50%	0.50%	0.50%	0.50%
Disability Insurance*	0.56%	0.56%	0.56%	0.56%
Total	30.49%	30.49%	44.27%	32.43%
Illustrative $	$10,420,007	$75,573,759	$20,440,186	$106,433,952

** Actual charge by the insurance company is 0.60% of payroll. The difference of 0.04% of payroll is funding from a portion of the assets that were formerly held as a reserve for the LTD benefits.*

The dollar contribution amounts shown on above are illustrative and based on the June 30, 2004 valuation payroll. Actual dollar contributions should be based on covered payroll for the fiscal year beginning July 1, 2005. (For the prior valuation, the total combined dollar contribution illustrated was $97,103,734. This represented a combined rate of 30.47%.) The combined rate of 32.43% 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. Unfunded Actuarial Accrued Liabilities were amortized over a 32-year closed period beginning July 1, 2004. The objective is to reduce the period by one year each year at least until fiscal year 2006/07.

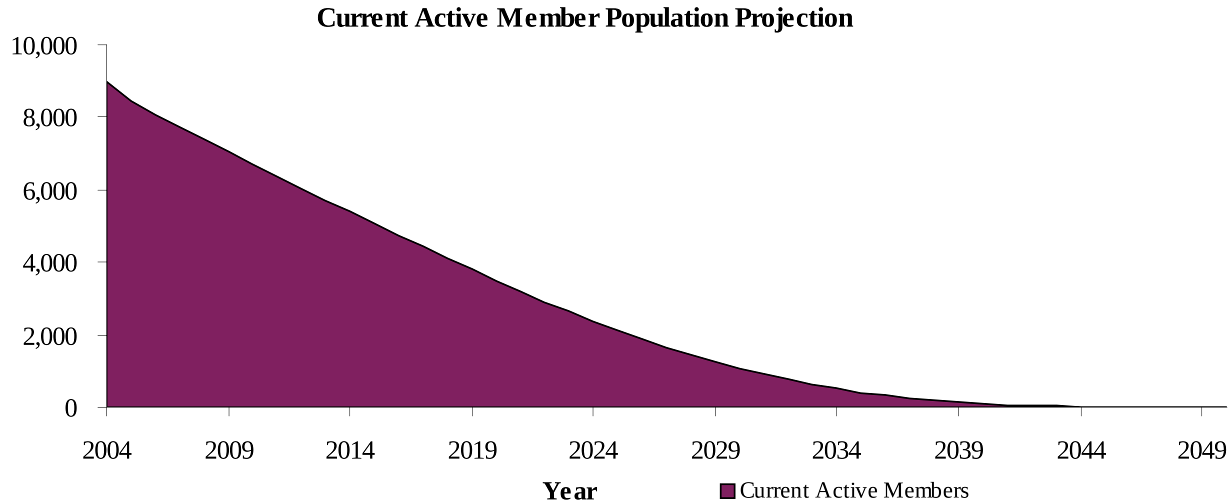
Summary
(CONCLUDED)

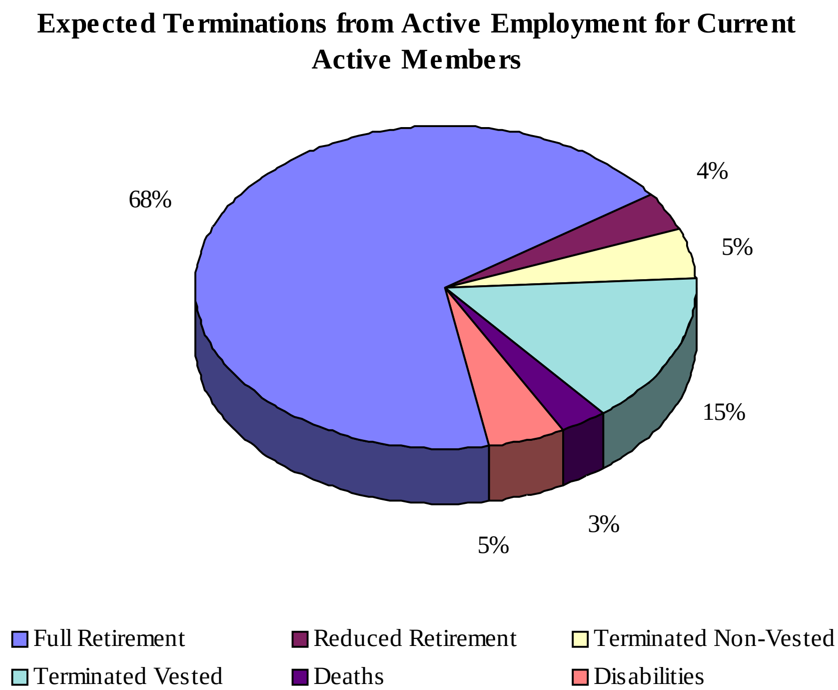
Conclusion: Based upon the results of the June 30, 2004 regular annual actuarial valuation, it is our opinion that the Missouri Department of Transportation and Highway Patrol Employees' Retirement System is in sound condition in accordance with actuarial principles of level percent of payroll financing. We are concerned that the funded ratio continues to decline and is now approaching the 50% level, while the cash flow is negative (benefit payments exceed contribution revenue). Should the funded ratio fall below 50% in the 2005 valuation, the Board may wish to consider a temporary increase in the contribution rate, at least until the funded ratio returns to a level more consistent with its historical value.

SUMMARY OF KEY VALUATION RESULTS

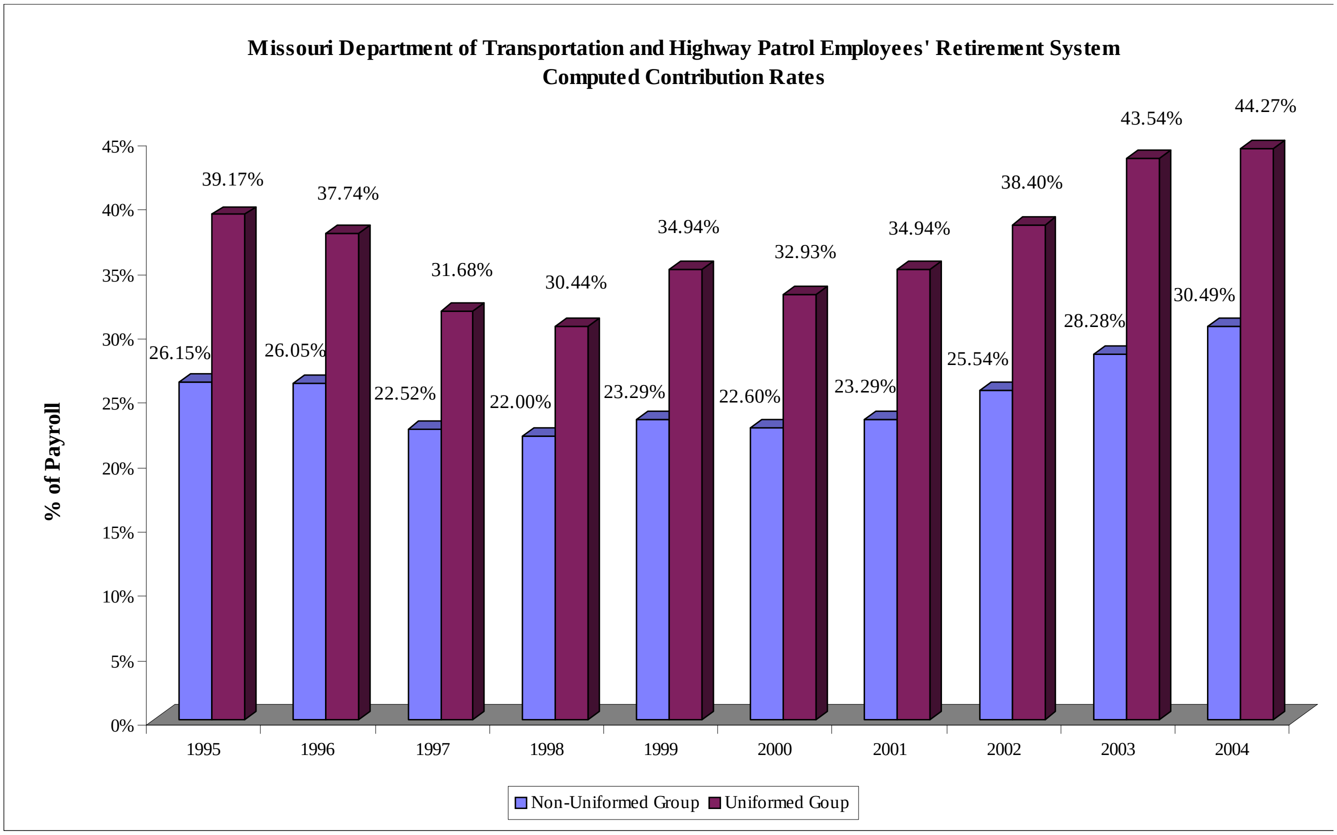
	June 30, 2004			June 30, 2003
Actuarial Present Value	(1) Actuarial Present Value	(2) Portion Covered By Future Normal Cost Contributions	(3) Actuarial Accrued Liabilities (1) - (2)	Actuarial Accrued Liabilities
Active Members				
Service retirement benefits based on service rendered before and likely to be rendered after valuation date	$1,134,969,186	$367,081,541	$ 767,887,645	$ 769,158,200
Disability benefits likely to be paid to present active members who become totally and permanently disabled	42,918,425	18,358,305	24,560,120	24,157,357
Survivor benefits likely to be paid to widows and children of present active members who die before retiring	31,464,701	12,876,612	18,588,089	18,526,461
Separation benefits likely to be paid to present active members	46,864,606	28,502,447	18,362,159	18,032,682
Active Member Totals	$1,256,216,918	$426,818,905	$ 829,398,013	$ 829,874,700
Members on Leave of Absence & Disability			4,874,556	4,845,804
Terminated Vested Members			32,468,071	28,818,999
Retired Lives			1,626,178,336	1,554,606,238
Total Actuarial Accrued Liability			$2,492,918,976	$2,418,145,741
Actuarial Value of Assets			1,331,588,207	1,363,952,522
Unfunded Actuarial Accrued Liability			$1,161,330,769	$1,054,193,219

EXPECTED DEVELOPMENT OF PRESENT POPULATION AS OF JUNE 30, 2004

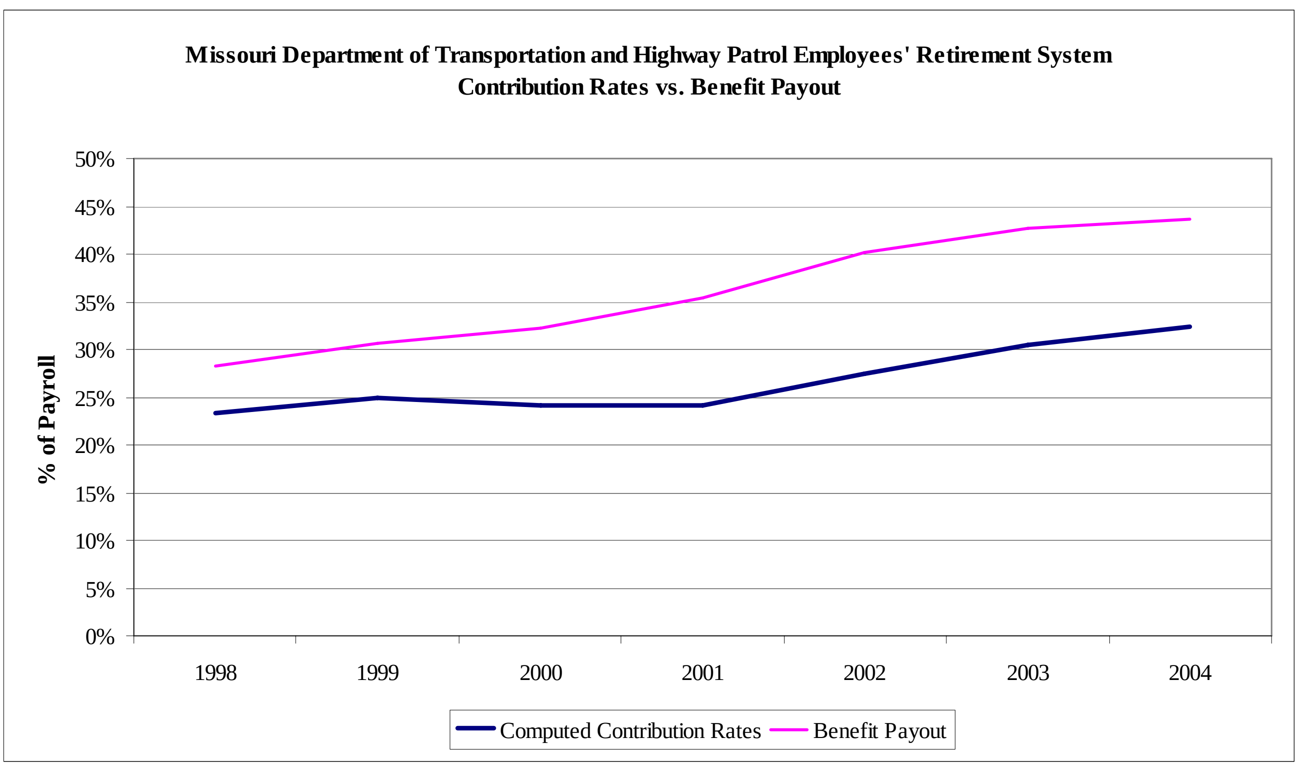




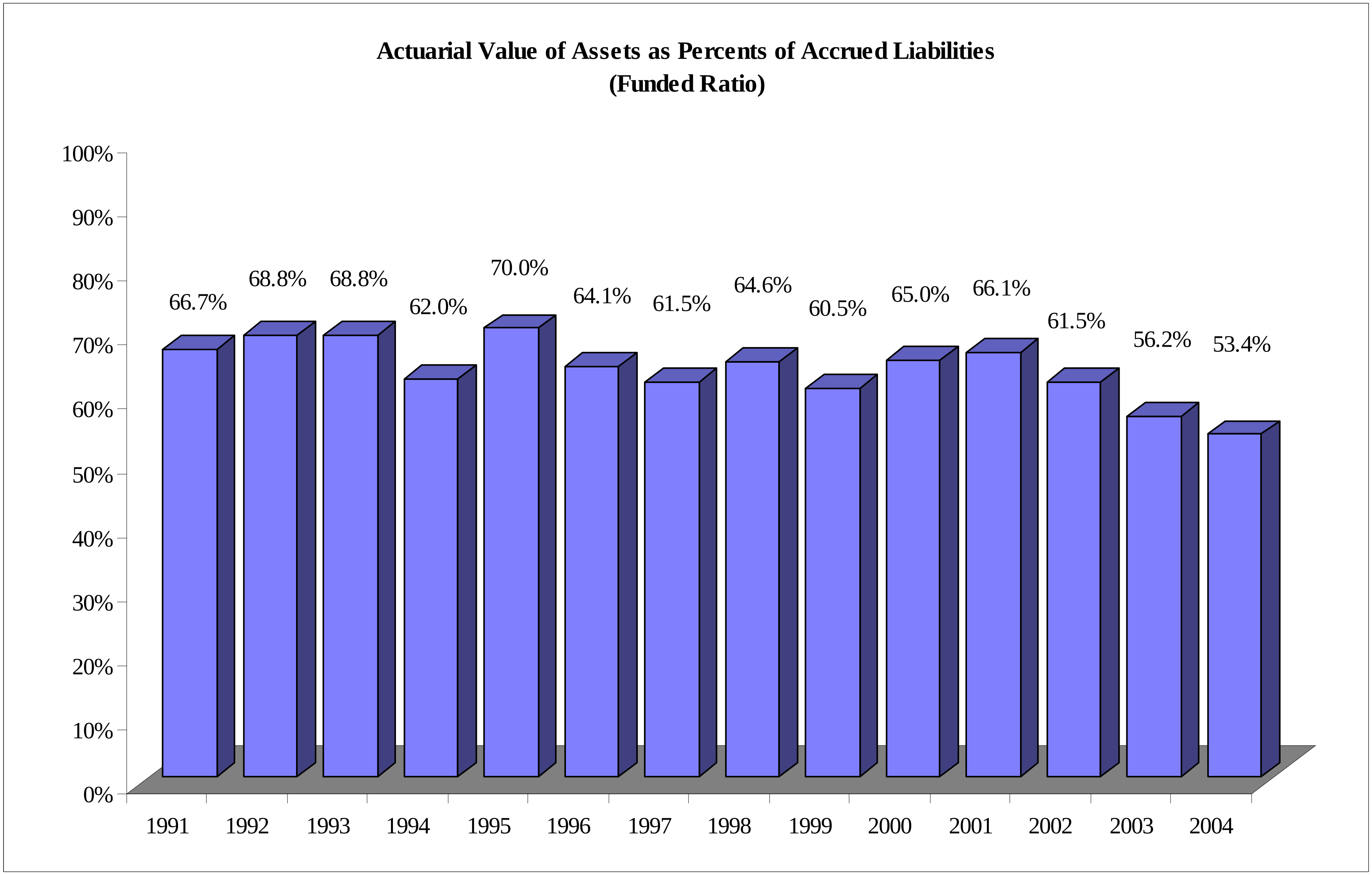
The charts show the expected future development of the present population in simplified terms. The retirement system presently covers 9,002 active members. Eventually, 5% of the population is expected to terminate covered employment prior to retirement and forfeit eligibility for an employer provided benefit. Of the present population, 87% is expected to receive monthly retirement benefits either by retiring directly from active service, or by separating from service with a vested benefit and 8% of the present population is expected to become eligible for death-in-service or disability benefits. Within 13 years, over half of the covered membership is expected to consist of new hires.



Missouri Department of Transportation and Highway Patrol Employees' Retirement System
Computed Contribution Rates
% of Payroll
0%
5%
10%
15%
20%
25%
30%
35%
40%
45%
26.15%
39.17%
26.05%
37.74%
22.52%
31.68%
22.00%
30.44%
23.29%
34.94%
22.60%
32.93%
23.29%
34.94%
25.54%
38.40%
28.28%
43.54%
30.49%
44.27%
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
Non-Uniformed Group
Uniformed Goup



Missouri Department of Transportation and Highway Patrol Employees' Retirement System
Contribution Rates vs. Benefit Payout
% of Payroll
0%
5%
10%
15%
20%
25%
30%
35%
40%
45%
50%
1998
1999
2000
2001
2002
2003
2004
Computed Contribution Rates
Benefit Payout


Actuarial Value of Assets as Percents of Accrued Liabilities
(Funded Ratio)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
66.7%
68.8%
68.8%
62.0%
70.0%
64.1%
61.5%
64.6%
60.5%
65.0%
66.1%
61.5%
56.2%
53.4%
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004

Section A

Valuation Results

COMPUTED CONTRIBUTIONS TO SUPPORT BENEFITS
FOR PLAN YEAR BEGINNING JULY 1, 2005
CONTRIBUTIONS COMPUTED AS OF JUNE 30, 2004

Contributions for	**Non-Uniformed Employees**	**Uniformed Patrol**	**Total**
Normal Cost			
Age & service benefits	10.11%	12.12%	10.39%
Disability benefits #	0.54%	0.26%	0.50%
Survivor benefits	0.37%	0.35%	0.37%
Separation benefits	0.77%	0.82%	0.78%
Total Normal Cost	11.79%	13.55%	12.04%
Unfunded Actuarial Accrued Liabilities*	17.64%	29.66%	19.33%
Expense Provision	0.50%	0.50%	0.50%
Disability Insurance	0.56%	0.56%	0.56%
Recommended Contribution Rate	30.49%	44.27%	32.43%
Illustrative Dollar Contribution	$85,993,766	$20,440,186	$106,433,952
Prior Year			
Recommended Contribution	28.28%	43.54%	30.47%
Illustrative Dollars	$77,237,490	$19,866,244	$ 97,103,734

* *Amortized as a level-percentage of payroll over 32 years from June 30, 2004. This is equivalent to a 31-year amortizaton from the contribution start date of July 1, 2005.*

\# *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.*

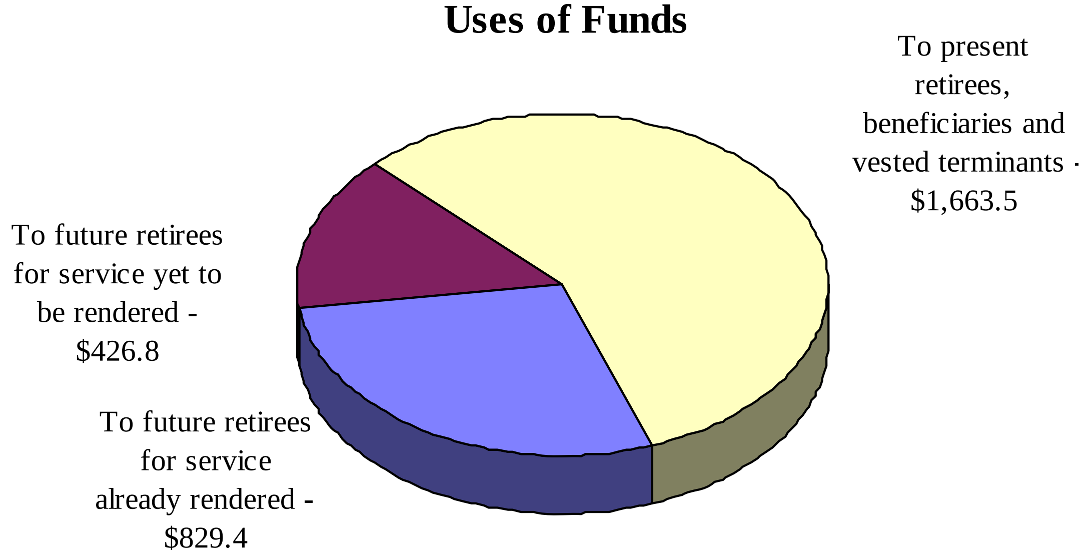
DEVELOPMENT OF LIABILITIES
AS OF JUNE 30, 2004

	Non-Uniformed Employees	Uniformed Patrol	Total
Present Value of Future Benefits - Inactives			
Retirees and Survivors	$1,253,072,796	$356,802,721	$1,609,875,517
Disability Pensioners	19,015,724	2,161,651	21,177,375
Vested Terminated Employees	25,294,201	7,173,870	32,468,071
Subtotal PVFB - Inactives	1,297,382,721	366,138,242	1,663,520,963
Present Value of Future Benefits - Actives			
Age & Service benefits	887,225,186	247,744,000	1,134,969,186
Normal and Work Related Disability benefits	39,185,046	3,733,379	42,918,425
Survivor benefits	26,370,587	5,094,114	31,464,701
Separation benefits	38,760,505	8,104,101	46,864,606
Subtotal PVFB - Actives	991,541,324	264,675,594	1,256,216,918
Total Present Value of Future Benefits	2,288,924,045	630,813,836	2,919,737,881
Less Present Value of Future Entry Age Normal Costs	355,980,870	70,838,035	426,818,905
Equals Actuarial Accrued Liability	1,932,943,175	559,975,801	2,492,918,976
Less Actuarial Value of Assets	1,023,357,638	308,230,569	1,331,588,207
Equals Unfunded Actuarial Accrued Liabilities	909,585,537	251,745,232	1,161,330,769
32-Year Amortization Payment on UAAL	$ 53,805,259	$ 14,812,187	$ 68,617,446
as a % of Projected Payroll	17.64%	29.66%	19.33%

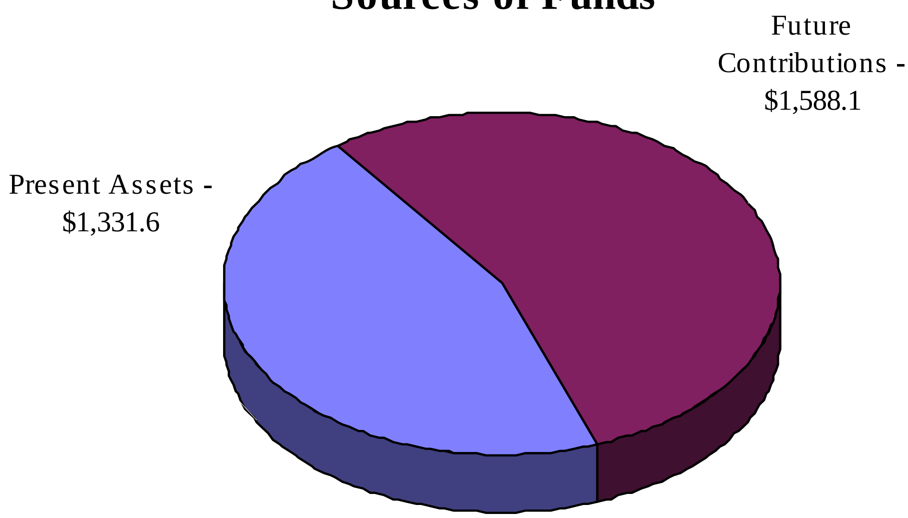
SYSTEM RESOURCES & OBLIGATIONS
SOURCES AND USES OF $2,919.7 MILLION
AS OF JUNE 30, 2004

($ Millions)

Uses of Funds



Sources of Funds



FINANCING UNFUNDED ACTUARIAL ACCRUED LIABILITIES WHICH WERE CALCULATED USING A WAGE INFLATION ASSUMPTION OF 4.00% AND AN INVESTMENT RETURN ASSUMPTION OF 8.25% COMPOUNDED ANNUALLY
32-YEAR AMORTIZATION FROM JULY 1, 2005

Fiscal Year Ending June 30	Active Employee Payroll	Unfunded Actuarial Accrued Liability at End of Year	Annual Contributions During Fiscal Year		UAAL as % of Payroll
			Dollars	% of Payroll	
2004	$ 328,210,887	$ 1,161,330,769			
2005	341,339,323	1,194,654,974	$ 60,041,587	17.59%	350.0%
2006	354,992,896	1,221,812,195	68,609,078	19.33%	344.2%
2007	369,192,612	1,248,353,814	71,353,441	19.33%	338.1%
2008	383,960,316	1,274,114,801	74,207,579	19.33%	331.8%
2009	399,318,729	1,298,911,942	77,175,882	19.33%	325.3%
2010	415,291,478	1,322,542,154	80,262,917	19.33%	318.5%
2011	431,903,137	1,344,780,657	83,473,434	19.33%	311.4%
2012	449,179,262	1,365,378,988	86,812,371	19.33%	304.0%
2013	467,146,432	1,384,062,838	90,284,866	19.33%	296.3%
2014	485,832,289	1,400,529,709	93,896,261	19.33%	288.3%
2015	505,265,581	1,414,446,364	97,652,111	19.33%	279.9%
2016	525,476,204	1,425,446,062	101,558,196	19.33%	271.3%
2017	546,495,252	1,433,125,550	105,620,523	19.33%	262.2%
2018	568,355,062	1,437,041,803	109,845,344	19.33%	252.8%
2019	591,089,264	1,436,708,482	114,239,158	19.33%	243.1%
2020	614,732,835	1,431,592,092	118,808,724	19.33%	232.9%
2021	639,322,148	1,421,107,806	123,561,073	19.33%	222.3%
2022	664,895,034	1,404,614,941	128,503,516	19.33%	211.3%
2023	691,490,835	1,381,412,044	133,643,657	19.33%	199.8%
2024	719,150,468	1,350,731,563	138,989,403	19.33%	187.8%
2025	747,916,487	1,311,734,064	144,548,979	19.33%	175.4%
2026	777,833,146	1,263,501,957	150,330,939	19.33%	162.4%
2027	808,946,472	1,205,032,694	156,344,176	19.33%	149.0%
2028	841,304,331	1,135,231,390	162,597,943	19.33%	134.9%
2029	874,956,504	1,052,902,818	169,101,861	19.33%	120.3%
2030	909,954,764	956,742,733	175,865,935	19.33%	105.1%
2031	946,352,955	845,328,458	182,900,573	19.33%	89.3%
2032	984,207,073	717,108,683	190,216,596	19.33%	72.9%
2033	1,023,575,356	570,392,402	197,825,260	19.33%	55.7%
2034	1,064,518,370	403,336,918	205,738,270	19.33%	37.9%
2035	1,107,099,105	213,934,842	213,967,801	19.33%	19.3%
2036	1,151,383,069	0	222,526,513	19.33%	0.0%

GASB NO. 25
SCHEDULE OF FUNDING PROGRESS*
JUNE 30, 2004

Year Ending June 30	Actuarial Asset Value	Entry Age Normal Accrued Liability	Unfunded Accrued Liability (UAAL)	Funded Ratio	Estimated Covered Payroll		UAAL as a Percentage of Covered Payroll
1991	$ 560,976,822	$ 841,195,967	$ 280,219,145	66.69%	$ 220,856,988	**	126.88%
1992	622,018,133	904,097,721	282,079,588	68.80%	220,919,382		127.68%
1993	688,963,225	1,000,704,491	311,741,266	68.85%	228,032,159		136.71%
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%

* *Prior to 2003 this schedule was not required for the LTD Plan because it used the aggregate funding method. Therefore the 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, 2004

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
1991	$ 190,667,552	**	$ 35,864,567	18.81%	18.81%	$ 35,864,567	100.00%
1992	190,312,781		37,929,337	19.93%	19.93%	37,929,337	100.00%
1993	197,027,356		41,454,556	21.04%	21.04%	41,454,556	100.00%
1994	204,032,785		40,949,380	20.07%	20.07%	40,949,380	100.00%
1995	208,329,222		56,144,725	26.95%	26.95%	56,144,725	100.00%
1996	215,155,118		56,842,321	26.42%	26.42%	56,842,321	100.00%
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%

* *Prior to 2003 this schedule was not required for the LTD Plan because it used the aggregate funding method. Therefore the 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.*

GASB No. 25
Schedule of Employer Contributions*
Uniformed Patrol Group
June 30, 2004

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
1991	$ 30,189,436	**	$ 10,545,170	34.93%	34.93%	$ 10,545,170	100.00%
1992	30,606,601		11,101,014	36.27%	36.27%	11,101,014	100.00%
1993	31,004,803		9,868,829	31.83%	31.83%	9,868,829	100.00%
1994	32,715,429		9,739,383	29.77%	29.77%	9,739,383	100.00%
1995	35,232,287		14,462,854	41.05%	41.05%	14,462,854	100.00%
1996	39,557,621		15,743,114	39.80%	39.80%	15,743,114	100.00%
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%

* *Prior to 2003 this schedule was not required for the LTD Plan because it used the aggregate funding method. Therefore the 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.*

DEVELOPMENT OF GAIN/(LOSS)
JULY 1, 2003 TO JUNE 30, 2004

	UAAL =	AAL -	Assets
Beginning of Year Values (at July 1)	$1,054,193,219	$2,418,145,741	$1,363,952,522
Normal Cost	38,722,446	38,722,446	0
Contributions	(87,567,578)	0	87,567,578
Disbursements	0	(156,779,056)	(156,779,056)
Interest	84,926,917	194,627,188	109,700,271
Expected Value Before Any Changes	1,090,161,862	2,494,716,319	1,404,554,457
Effect of Changes in Assumptions & Methods	0	0	0
Expected Value After Changes	1,090,161,862	2,494,716,319	1,404,554,457
End of Year Values (at June 30)	1,161,330,769	2,492,918,976	1,331,588,207
Gain/(Loss) for Year	$ (71,168,907)	$ 1,797,343	$ (72,966,250)

SECTION B

Summary of Benefits

MISSOURI DEPARTMENT OF TRANSPORTATION AND HIGHWAY PATROL EMPLOYEES' RETIREMENT SYSTEM

SUMMARY OF BENEFIT PROVISIONS EVALUATED AS OF JUNE 30, 2004

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).

Closed Plan	Year 2000 Plan
<u>Normal Retirement Benefit Amount</u>	**<u>Normal Retirement Benefit Amount</u>**
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. Supplemental 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.	***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.
<u>Early Retirement (reduced benefit)</u>	**<u>Early Retirement (reduced benefit)</u>**
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.	***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.
<u>Vested Deferred Benefits</u>	**<u>Vested Deferred Benefits</u>**
Eligibility: All Employees Fully vested in accrued pension with 5 years of creditable service. The benefit will commence at the age the individual is for early or normal retirement, considering years of creditable service.	***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.

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
<u>Pop-Up Provision</u> 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.	**<u>Pop-Up Provision</u>** Same.
<u>$5000 Death Benefit</u> MPERS provides a $5,000 death benefit for a designated beneficiary(ies) of members who retire or elect normal or work-related disability benefits after September 28, 1985.	**<u>$5000 Death Benefit</u>** MPERS provides a $5,000 death benefit for a designated beneficiary(ies) of members who retire or elect work-related disability benefits.
<u>Purchase of Service</u> <u>Military</u>: 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 ***<u>can</u>*** be used to satisfy the vesting requirement. Periods of military service cannot coincide with employment in a state agency.	**<u>Purchase of Service</u>** <u>Military</u>: 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 ***<u>cannot</u>*** be used to satisfy the vesting requirement. Periods of military service cannot coincide with employment in a state agency.
<u>Police Service</u>*:* 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.	<u>Police Service</u>: Not available.
<u>Portability</u>: 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.	<u>Portability</u>: 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.

Closed Plan	Year 2000 Plan

Closed Plan

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% 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 increase, or
ii) 5%.

Member Contributions

None

Year 2000 Plan

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 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, 2004
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 3.5% and Post-Retirement Increases are 2.8%
2005	$12,800
2006	13,158
2007	13,527
2008	13,906
2009	14,295
2010	14,695
2011	15,107
2012	15,530
2013	15,964
2014	16,411

SAMPLE BENEFIT COMPUTATION FOR CLOSED PLAN MEMBERS RETIRING JULY 1, 2004 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 annnual supplementary benefit payable to age 65.

Year Ended June 30	Annual Amount Payable if Price Inflation is 3.5% and Post-Retirement Increases are 2.8%
2005	$17,066
2006	17,544
2007	18,035
2008	18,540
2009	19,060
2010	19,593
2011	20,142
2012	20,706
2013	21,286
2014	21,882

Sample Benefit Computation for Year 2000 Plan Members Retiring July 1, 2004

	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

Sample Computation Steps

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 3.5% and Post-Retirement Increases are 2.8%
2005	$20,000
2006	20,560
2007	14,372
2008	14,775
2009	15,188
2010	15,614
2011	16,051
2012	16,500
2013	16,962
2014	17,437

SECTION C

Financial Information

SUMMARY OF FUND OPERATIONS

	2004	2003
Market Value of Fund Beginning of Fiscal Year	$1,241,550,328	$1,268,238,497
Contributions		
Employer	86,724,914	79,987,770
Transfer from MOSERS	174,140	2,050,813
Service Purchase (Employee)	668,524	533,444
Total Contributions	$ 87,567,578	$ 82,572,027
Investment Return		
Interest	$ 20,103,834	$ 24,693,847
Dividends	7,876,950	10,875,905
Realized Capital Gains	182,126,399	31,811,075
Realized Capital Losses	(33,761,897)	(157,370,771)
Miscellaneous Income	0	137,332
Securities Lending Income	333,367	129,258
Other	104,384	0
Total Investment Return	$ 176,783,037	$ (89,723,354)
Other Income (Rental Income and Misc)	33,853	0
Increase (Decrease) in Unrealized Appreciation	7,988,530	129,261,011
Benefit Payments		
Retirement Payments	$ 139,702,971	$ 131,689,970
Retirement Payments - BackDROP	14,318,622	11,696,862
Death Benefits	410,000	410,000
Long-Term Disability Payments	555,434	537,513
Insured Disability Program	152,896	0
Refund and Final Settlement	0	0
Total Benefit Payments	$ 155,139,923	$ 144,334,345
Expenses		
Investment	$ 4,007,870	$ 3,011,653
Actuarial	117,937	115,190
Outsourcing Disability Costs	12,238	0
Other	1,508,958	1,336,665
Total Expenses	$ 5,647,003	$ 4,463,508
Market Value of Fund End of Fiscal Year	$1,353,136,400	$1,241,550,328

DEVELOPMENT OF ACTUARIAL VALUE OF RETIREMENT SYSTEM ASSETS
JUNE 30, 2004

Valuation Date of June 30	2001	2002	2003	2004	2005	2006
A. Actuarial value at beginning of year	$1,431,554,156	$1,529,835,552	$1,458,914,009	$1,364,305,996		
B. Market value at end of year	1,413,243,545	1,268,150,170	1,241,550,328	1,353,136,400		
C. Market value at beginning of year	1,477,276,993	1,413,243,545	1,268,238,498	1,241,550,328		
D. Cash flow						
D1. Contributions	81,353,019	77,440,468	79,987,770	87,567,578		
D2. Benefit Payments	(111,985,065)	(133,498,815)	(144,334,345)	(155,139,923)		
D3. Administrative Expenses	(835,215)	(1,415,592)	(1,451,855)	(1,639,133)		
D4. Non-Investment Net Cash Flow	(31,467,261)	(57,473,939)	(65,798,430)	(69,211,478)		
E. Investment income						
E1. Market total (B - C - D4)	(32,566,187)	(87,619,436)	39,110,260	180,797,550		
E2. Assumed Rate of Return	8.25%	8.25%	8.25%	8.25%	8.25%	8.25%
E3. Amount for Immediate Recognition (A+.5xD4)xE2	116,805,193	123,840,633	117,646,221	109,700,271		
E4. Amount for Phased-In Recognition	(149,371,380)	(211,460,069)	(78,535,961)	71,097,279		
F. Phased in recognition of investment income						
F1. Current Year (33 1/3% of E4)	(49,790,460)	(70,486,690)	(26,178,654)	23,699,093		
F2. First Prior Year	(17,011,086)	(49,790,460)	(70,486,690)	(26,178,654)	$ 23,699,093	
F3. Second Prior Year	18,013,290	(17,011,087)	(49,790,460)	(70,486,689)	(26,178,653)	$23,699,093
F4. Total Recognized Investment Gain (F1 + F2 + F3)	(48,788,256)	(137,288,237)	(146,455,804)	(72,966,250)	(2,479,560)	23,699,093
F5. Phase-In of Initial (BOY) difference between MVA and AVA	61,731,720	0	0	0	0	0
G. Actuarial value at end of year (A + D4 + E3 + F4)	1,529,835,552	1,458,914,009	1,364,305,996	1,331,828,539		
Less LTD Assets	9,035,143	8,406,577	353,474	240,332	127,497	0
H. Plan AVA	1,520,800,409	1,450,507,432	1,363,952,522	1,331,588,207		
Difference between market and actuarial values	(116,592,007)	(190,763,839)	(122,755,668)	21,307,861		
Recognized actuarial rate of return	9.16%	(0.90)%	(2.02)%	2.76%		
Market Rate of Return	(2.23)%	(6.33)%	3.17%	14.98%		

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:

	as of June 30	
	2004	**2003**
1. Other Income	$ 33,853	N/A
2. Investment Income		
a) Uniformed Patrol	39,665,335	N/A
b) Non-Uniformed Employees	137,106,614	N/A
c) Total	176,771,949	
3. Other Income Split		
a) Uniformed Patrol		
(2a) / (2c) x (1)	7,596	N/A
b) Non-Uniformed Employees		
(2b) / (2c) x (1)	26,257	N/A
c) Total	33,853	
4. Funding Value of Assets	1,331,588,207	1,363,952,522
5. Market Value of Assets (less LTD assets)		
a) Uniformed Patrol	313,136,636	N/A
b) Non-Uniformed Employees	1,039,646,291	N/A
c) Total	1,352,782,927	
6. Funding Value of Assets Split		
a) Uniformed Patrol		
(5a) / (5c) x (4)	308,230,569	289,577,835
b) Non-Uniformed Employees		
(5b) / (5c) x (4)	1,023,357,638	1,074,374,687
Total Assets Allocated	$1,331,588,207	$1,363,952,522

SECTION D

Summary of Member Data

UNIFORMED PATROL ACTIVE MEMBERS
AS OF JUNE 30, 2004
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
20-24	25							25	$ 848,027
25-29	93	32						125	4,420,279
30-34	50	163	28					241	9,213,629
35-39	13	102	124	9				248	10,233,375
40-44	4	25	43	61	20			153	7,113,691
45-49	2	4	9	33	46	32		126	6,664,930
50				1	8	11	2	22	1,282,440
51				1	1	22	3	27	1,639,642
52					4	11	6	21	1,300,643
53					2	7	8	17	1,094,335
54					2	2	8	12	788,328
55					3	1	5	9	579,677
56						2	7	9	608,770
57							3	3	185,281
58							1	1	62,993
59							2	2	135,603
60									
61									
62									
63									
64									
65									
66									
67									
68									
69									
70									
Over 70									
Totals	**187**	**326**	**204**	**105**	**86**	**88**	**45**	**1,041**	**$46,171,643**

Average Age: 38.2 years
Average Service: 12.9 years
Average Pay: $44,353

MoDOT Active Members
as of June 30, 2004
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	7							7	$ 94,643
20-24	293	9						302	9,763,332
25-29	447	143	3					593	19,438,652
30-34	376	304	140	4				824	28,400,485
35-39	331	215	289	113	10			958	33,459,368
40-44	320	230	214	303	165	27		1,259	46,522,452
45-49	204	179	182	234	171	267	14	1,251	46,860,024
50	34	25	30	32	26	52	8	207	7,544,037
51	41	22	33	32	21	54	27	230	8,775,650
52	28	29	27	37	23	24	11	179	6,575,478
53	28	22	18	33	14	27	29	171	6,634,162
54	22	19	24	19	21	28	18	151	5,739,606
55	16	14	14	23	10	15	19	111	4,443,986
56	24	17	21	24	10	12	20	128	4,964,099
57	14	13	23	20	12	16	18	116	4,442,164
58	19	10	12	14	10	8	18	91	3,398,181
59	5	8	10	6	3	5	13	50	1,949,697
60	14	9	7	16	3	3	10	62	2,529,646
61	11	7	7	16	6	3	12	62	2,234,173
62	6	6	7	7	5	3	4	38	1,305,094
63	5	5	3	1		4	6	24	1,047,050
64	2		1	1	1	1	1	7	272,867
65	2	1	2	5		3	2	15	603,440
66	2	2	2	2			1	9	272,757
67			1			1		2	67,509
68	1		1	1			1	4	195,531
69	1		1					2	95,324
70									
Over 70	1	2	1		1	1		6	234,675
Totals	**2,254**	**1,291**	**1,073**	**943**	**512**	**554**	**232**	**6,859**	**$247,864,082**

Average Age: 42.0 years
Average Service: 11.4 years
Average Pay: $36,137

CIVILIAN PATROL ACTIVE MEMBERS
AS OF JUNE 30, 2004
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	3							3	$ 35,622
20-24	41							41	944,280
25-29	66	23	1					90	2,323,198
30-34	51	48	11	1				111	3,187,603
35-39	42	48	30	14	3			137	4,072,567
40-44	51	38	30	38	27	2		186	5,814,980
45-49	24	30	23	33	39	35	2	186	6,375,119
50	7	4	3	7	5	10	3	39	1,359,401
51	9	9	3	7	5	7	3	43	1,457,280
52	9	4	2	5	5	7	5	37	1,343,373
53	2	3	5	3	6	5	6	30	1,089,397
54	9	4	1	4	7	6	8	39	1,376,244
55	7	3	6	3	2	3	7	31	990,415
56	3	8	3	7	6	4	1	32	1,022,365
57	4	3	4	5	4	2		22	681,621
58	3	4	3	1	3		4	18	530,045
59	3	3	1	3	3			13	364,029
60	3	3	4	4				14	358,460
61	3	3		2	1	1		10	305,286
62	1		3	2			1	7	187,370
63	1		1					2	74,040
64		1	3		1			5	109,165
65				1				1	38,088
66							1	1	26,916
67									
68	1			1				2	47,652
69									
70									
Over 70				1			1	2	60,646
Totals	**343**	**239**	**137**	**142**	**117**	**82**	**42**	**1,102**	**$34,175,162**

Average Age: 43.3 years
Average Service: 11.8 years
Average Pay: $31,012

GROWTH OF ACTIVE MEMBER PAYROLL

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%
			Ten-Year Average	2.9%

COUNT AND TOTAL MONTHLY BENEFITS OF UNIFORMED PATROL RETIRED (NON-DISABLED) MEMBERS AND SURVIVORS AS OF JUNE 30, 2004 BY ATTAINED AGE

Age	Number	Monthly Benefit Amount
Less than 20		
20-24	1	$ 753
25-29		
30-34		
35-39		
40-44	3	4,078
45-49	5	7,767
50-54	40	122,182
55-59	149	504,922
60-64	143	524,941
65-69	122	486,288
70-74	77	307,094
75-79	69	227,643
80-84	44	110,287
85-89	24	39,517
90 & Over	31	37,731
TOTAL	**708**	**$2,373,203**

COUNT AND TOTAL MONTHLY BENEFITS OF MODOT RETIRED (NON-DISABLED) MEMBERS AND SURVIVORS AS OF JUNE 30, 2004 BY ATTAINED AGE

Age	Number	Monthly Benefit Amount
Less than 20	16	$ 3,998
20-24	3	232
25-29	1	63
30-34	2	747
35-39	5	2,330
40-44	8	7,578
45-49	30	24,941
50-54	222	515,967
55-59	592	1,318,541
60-64	807	1,417,007
65-69	1,002	1,799,470
70-74	834	1,434,053
75-79	724	1,105,071
80-84	533	511,053
85-89	287	202,619
90 & Over	220	122,719
TOTAL	**5,286**	**$8,466,389**

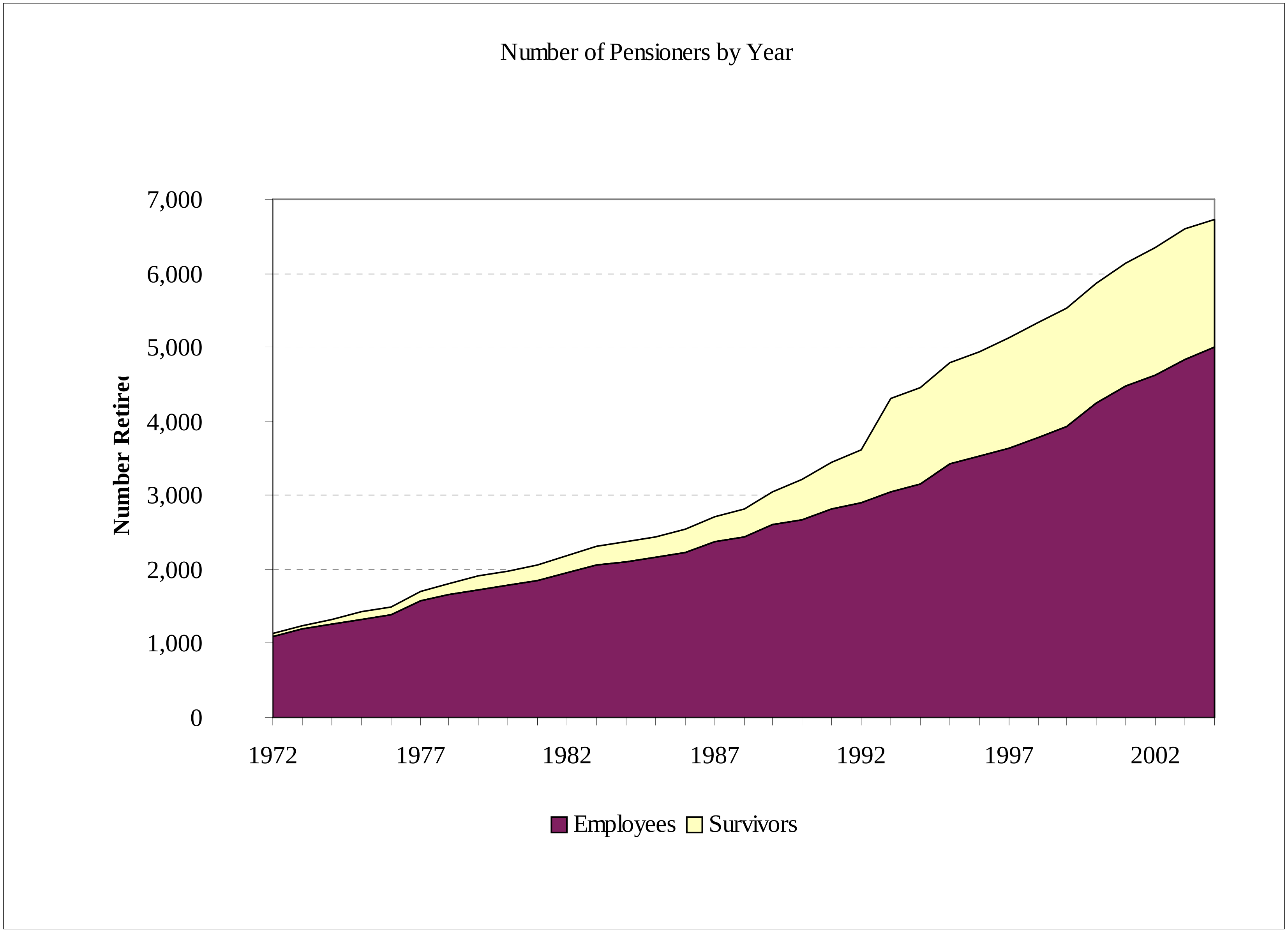
COUNT AND TOTAL MONTHLY BENEFITS OF CIVILIAN PATROL RETIRED (NON-DISABLED) MEMBERS AND SURVIVORS AS OF JUNE 30, 2004 BY ATTAINED AGE

Age	Number	Monthly Benefit Amount
Less than 20		
20-24		
25-29		
30-34		
35-39		
40-44	1	$ 1,118
45-49	2	1,457
50-54	36	77,904
55-59	78	177,256
60-64	114	191,470
65-69	106	137,710
70-74	117	168,725
75-79	66	81,772
80-84	40	39,673
85-89	17	15,444
90 & Over	7	5,915
TOTAL	**584**	**$898,444**

GROWTH OF PENSION POPULATION BY YEAR

Year	Retired Employees	Survivors	Total	% Increase	Annual Benefits	Active Payroll	Benefits as a % of Payroll
1972	1,102	35	1,137				
1973	1,197	50	1,247	9.7 %	-	-	-
1974	1,262	65	1,327	6.4 %	-	-	-
1975	1,327	96	1,423	7.2 %	-	-	-
1976	1,389	103	1,492	4.8 %	-	-	-
1977	1,573	130	1,703	14.1 %	-	-	-
1978	1,658	145	1,803	5.9 %	-	-	-
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 %	143,425,063	328,210,887	43.7%

GROWTH OF PENSION POPULATION BY YEAR



DISABLED RETIRED MEMBERS
AS OF JUNE 30, 2004

Age	Number	Monthly Benefit Amount
Less than 20		
20-24		
25-29		
30-34	1	$ 2,406
35-39	2	2,790
40-44	9	10,438
45-49	6	6,468
50-54	19	23,384
55-59	16	14,913
60-64	8	6,839
65-69	6	5,785
70-74	2	1,320
75-79	4	3,564
80-84	3	2,000
85-89	1	244
90 & Over	1	536
TOTAL	**78**	**$80,687**

SCHEDULE OF LONG-TERM DISABILITY RECIPIENTS AS OF JUNE 30, 2004
NUMBER AND AVERAGE BENEFITS BY AGE

Age	Number	Percent	Benefit Amount	Average Benefit
Less than 20	0	0%	$ 0	$ 0
20-24	0	0%	0	0
25-29	1	1%	887	887
30-34	2	3%	2,402	1,201
35-39	5	7%	3,568	714
40-44	12	16%	9,513	793
45-49	15	20%	13,386	892
50-54	18	24%	14,660	814
55-59	11	14%	6,763	615
60-64	11	15%	5,769	524
65-69	0	0%	0	0
70 & Over	0	0%	0	0
TOTAL	**75**	**100%**	**$56,948**	**$ 759**

SECTION E

Assumptions Used in the Valuation

APPENDIX

SUMMARY OF VALUATION METHOD AND ASSUMPTIONS

JUNE 30, 2004

The actuarial assumptions used in the valuation are shown in this Appendix of the report. The assumptions were established for the June 30, 2000 actuarial valuation, following a five-year actuarial investigation. They were adopted by the Board after obtaining the advice of the Actuary and other professionals.

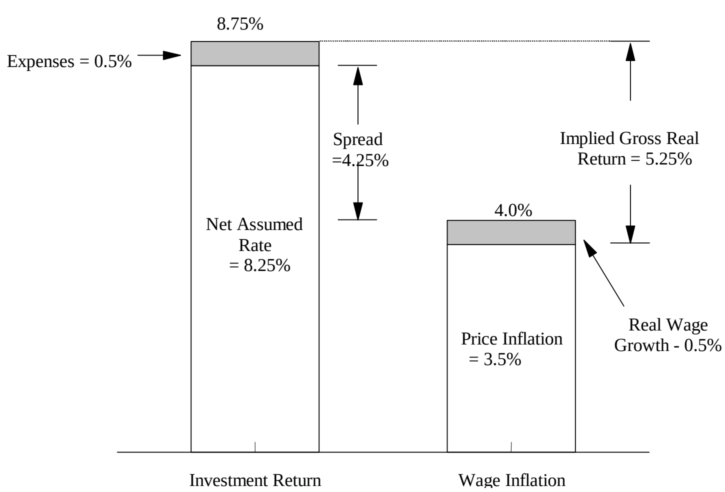
Economic Assumptions

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 4.00%. The real rate of return is the portion of total investment return, which is more than the rate of wage inflation. The 8.25% investment return rate and 4.00% wage inflation rate translates to an assumed real rate of return net of expenses of 4.25%.

Pay increase assumptions for merit and seniority for individual active members are shown on page E-4. Part of the total assumed pay increase at each age is for merit and/or seniority, and the other 4.00% recognizes wage inflation. ***The active member payroll*** is assumed to increase 4.0% annually.

The price inflation rate is assumed to be 3.5% 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.

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.

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	3.00%	4.00%	7.00%	4.00%	4.00%	8.00%
21	3.00%	4.00%	7.00%	4.00%	4.00%	8.00%
22	3.00%	4.00%	7.00%	3.50%	4.00%	7.50%
23	3.00%	4.00%	7.00%	3.50%	4.00%	7.50%
24	3.00%	4.00%	7.00%	3.50%	4.00%	7.50%
25	3.00%	4.00%	7.00%	3.50%	4.00%	7.50%
26	3.00%	4.00%	7.00%	3.50%	4.00%	7.50%
27	3.00%	4.00%	7.00%	3.50%	4.00%	7.50%
28	2.95%	4.00%	6.95%	3.20%	4.00%	7.20%
29	2.90%	4.00%	6.90%	2.90%	4.00%	6.90%
30	2.85%	4.00%	6.85%	2.60%	4.00%	6.60%
31	2.80%	4.00%	6.80%	2.30%	4.00%	6.30%
32	2.70%	4.00%	6.70%	2.00%	4.00%	6.00%
33	2.50%	4.00%	6.50%	1.90%	4.00%	5.90%
34	2.30%	4.00%	6.30%	1.80%	4.00%	5.80%
35	2.20%	4.00%	6.20%	1.70%	4.00%	5.70%
36	2.10%	4.00%	6.10%	1.60%	4.00%	5.60%
37	2.00%	4.00%	6.00%	1.50%	4.00%	5.50%
38	1.90%	4.00%	5.90%	1.30%	4.00%	5.30%
39	1.80%	4.00%	5.80%	1.10%	4.00%	5.10%
40	1.70%	4.00%	5.70%	0.90%	4.00%	4.90%
41	1.60%	4.00%	5.60%	0.80%	4.00%	4.80%
42	1.50%	4.00%	5.50%	0.70%	4.00%	4.70%
43	1.50%	4.00%	5.50%	0.60%	4.00%	4.60%
44	1.40%	4.00%	5.40%	0.50%	4.00%	4.50%
45	1.30%	4.00%	5.30%	0.40%	4.00%	4.40%
46	1.00%	4.00%	5.00%	0.30%	4.00%	4.30%
47	0.90%	4.00%	4.90%	0.30%	4.00%	4.30%
48	0.90%	4.00%	4.90%	0.30%	4.00%	4.30%
49	0.80%	4.00%	4.80%	0.30%	4.00%	4.30%
50	0.80%	4.00%	4.80%	0.30%	4.00%	4.30%
51	0.70%	4.00%	4.70%	0.30%	4.00%	4.30%
52	0.70%	4.00%	4.70%	0.30%	4.00%	4.30%
53	0.60%	4.00%	4.60%	0.30%	4.00%	4.30%
54	0.60%	4.00%	4.60%	0.30%	4.00%	4.30%
55	0.60%	4.00%	4.60%	0.30%	4.00%	4.30%
56	0.60%	4.00%	4.60%	0.30%	4.00%	4.30%
57	0.60%	4.00%	4.60%	0.30%	4.00%	4.30%
58	0.50%	4.00%	4.50%	0.30%	4.00%	4.30%
59	0.40%	4.00%	4.40%	0.30%	4.00%	4.30%
60	0.30%	4.00%	4.30%	0.30%	4.00%	4.30%

POST-RETIREMENT MORTALITY

Age	Regular		Disabled		Age	Regular		Disabled	
	Male	Female	Male	Female		Male	Female	Male	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	0.20689	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	0.20689	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	Present Value of $1 Monthly for Life		Future Life Expectancy (years)	
Ages	Men	Women	Men	Women
50	$182.67	$184.82	29.17	34.67
55	170.40	172.61	24.82	30.06
60	155.98	158.31	20.70	25.67
65	139.48	141.76	16.82	21.50
70	121.62	123.47	13.32	17.57
75	103.29	104.62	10.36	13.99
80	85.27	86.19	7.83	10.91

The present values shown above are for illustrative purposes only and include the value of future post-retirement increases at 2.8% per year and a 50% survivor benefit. Males are assumed to be 3 years older than their spouse.

RATES OF RETIREMENT

Age	Non-Uniformed				Uniformed	
	Male		Female		Male	Female
	Normal	Early	Normal	Early	Normal	
50	0.1200		0.1200		0.5000	0.5000
51	0.1200		0.1200		0.2000	0.2000
52	0.1200		0.1200		0.2500	0.2500
53	0.1200		0.1200		0.1500	0.1500
54	0.1200		0.1200		0.2500	0.2500
55	0.1200	0.0800	0.1200	0.0600	0.3000	0.3000
56	0.1200	0.0800	0.1200	0.0600	0.3000	0.3000
57	0.1200	0.0800	0.1200	0.0600	0.3000	0.3000
58	0.1200	0.0800	0.1500	0.0600	0.3000	0.3000
59	0.1200	0.0800	0.1500	0.0600	0.3000	0.3000
60	0.1600		0.1000		1.0000	1.0000
61	0.1800		0.1000		1.0000	1.0000
62	0.5000		0.5000		1.0000	1.0000
63	0.4000		0.1500		1.0000	1.0000
64	0.3000		0.1500		1.0000	1.0000
65	0.4000		0.5000		1.0000	1.0000
66	0.3500		0.5000		1.0000	1.0000
67	0.3500		0.5000		1.0000	1.0000
68	0.3500		0.5000		1.0000	1.0000
69	0.3500		0.5000		1.0000	1.0000
70	1.0000		1.0000		1.0000	1.0000

The rates of retirement used were the above rates with the following adjustments:

- For Non-Uniformed members retiring prior to age 62, rates were reduced by 80% of the original value for the first 2 years of eligibility, 60% for the third year, 40% for the fourth and 20% for the fifth. For Uniformed members retiring prior to age 62, rates were reduced by 40% of the original value for the first 2 years of eligibility, 30% for the third year, 20% for the fourth and 10% for the fifth.
- At five full years of eligibility 100% of the original rate was used. For members retiring prior to age 62 and 6 or more years from initial eligibility, 110% of the original rates were used.
- For members retiring at age 62 or later who were eligible for the BackDROP, 150% of the original retirement rates were used.
- Members with a normal retirement age of 62 or greater did not have the above rates adjusted.

RATES OF DISABILITY

Age	Non-Uniformed		Uniformed		Age	Non-Uniformed		Uniformed	
	Male	Female	Male	Female		Male	Female	Male	Female
21	0.0001	0.0006	0.0003	0.0003	51	0.0042	0.0059	0.0029	0.0029
22	0.0001	0.0006	0.0003	0.0003	52	0.0048	0.0068	0.0032	0.0032
23	0.0001	0.0006	0.0004	0.0004	53	0.0054	0.0081	0.0037	0.0037
24	0.0001	0.0006	0.0004	0.0004	54	0.0060	0.0097	0.0042	0.0042
25	0.0001	0.0007	0.0004	0.0004	55	0.0066	0.0063	0.0000	0.0000
26	0.0001	0.0007	0.0004	0.0004	56	0.0066	0.0079	0.0000	0.0000
27	0.0001	0.0007	0.0004	0.0004	57	0.0066	0.0097	0.0000	0.0000
28	0.0001	0.0007	0.0005	0.0005	58	0.0066	0.0116	0.0000	0.0000
29	0.0001	0.0008	0.0005	0.0005	59	0.0066	0.0135	0.0000	0.0000
30	0.0001	0.0008	0.0005	0.0005	60	0.0000	0.0000	0.0000	0.0000
31	0.0002	0.0009	0.0005	0.0005	61	0.0000	0.0000	0.0000	0.0000
32	0.0003	0.0010	0.0006	0.0006	62	0.0000	0.0000	0.0000	0.0000
33	0.0004	0.0011	0.0006	0.0006	63	0.0000	0.0000	0.0000	0.0000
35	0.0006	0.0012	0.0007	0.0007	65	0.0000	0.0000	0.0000	0.0000
36	0.0007	0.0013	0.0008	0.0008	66	0.0000	0.0000	0.0000	0.0000
37	0.0007	0.0014	0.0008	0.0008	67	0.0000	0.0000	0.0000	0.0000
38	0.0008	0.0016	0.0009	0.0009	68	0.0000	0.0000	0.0000	0.0000
39	0.0008	0.0017	0.0009	0.0009	69	0.0000	0.0000	0.0000	0.0000
40	0.0009	0.0019	0.0010	0.0010	70	0.0000	0.0000	0.0000	0.0000
41	0.0011	0.0022	0.0010	0.0010	71	0.0000	0.0000	0.0000	0.0000
42	0.0014	0.0024	0.0012	0.0012	72	0.0000	0.0000	0.0000	0.0000
43	0.0016	0.0027	0.0012	0.0012	73	0.0000	0.0000	0.0000	0.0000
44	0.0019	0.0031	0.0014	0.0014	74	0.0000	0.0000	0.0000	0.0000
45	0.0021	0.0034	0.0015	0.0015	75	0.0000	0.0000	0.0000	0.0000
46	0.0024	0.0038	0.0017	0.0017	76	0.0000	0.0000	0.0000	0.0000
47	0.0027	0.0041	0.0019	0.0019	77	0.0000	0.0000	0.0000	0.0000
48	0.0030	0.0045	0.0021	0.0021	78	0.0000	0.0000	0.0000	0.0000
49	0.0033	0.0049	0.0023	0.0023	79	0.0000	0.0000	0.0000	0.0000
50	0.0036	0.0053	0.0026	0.0026	80	0.0000	0.0000	0.0000	0.0000

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

	Non-Uniformed		Uniformed	
Service	Male	Female	Male	Female
0-1	0.2000	0.1600	0.0500	0.0500
1-2	0.1000	0.0900	0.0400	0.0400
2-3	0.0700	0.0800	0.0300	0.0300
3-4	0.0600	0.0700	0.0200	0.0200
4-5	0.0500	0.0600	0.0200	0.0200

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

Age	Non-Uniformed		Uniformed	
	Male	Female	Male	Female
25	0.0400	0.0550	0.0250	0.0250
26	0.0390	0.0550	0.0250	0.0250
27	0.0390	0.0530	0.0250	0.0250
28	0.0380	0.0530	0.0230	0.0230
29	0.0360	0.0520	0.0210	0.0210
30	0.0340	0.0520	0.0180	0.0180
31	0.0320	0.0510	0.0160	0.0160
32	0.0300	0.0510	0.0140	0.0140
33	0.0290	0.0500	0.0140	0.0140
34	0.0270	0.0480	0.0140	0.0140
35	0.0250	0.0460	0.0140	0.0140
36	0.0240	0.0440	0.0140	0.0140
37	0.0220	0.0420	0.0140	0.0140
38	0.0210	0.0390	0.0130	0.0130
39	0.0190	0.0370	0.0120	0.0120
40	0.0180	0.0350	0.0110	0.0110
41	0.0160	0.0330	0.0100	0.0100
42	0.0150	0.0300	0.0100	0.0100
43	0.0140	0.0300	0.0100	0.0100
44	0.0130	0.0300	0.0090	0.0090
45	0.0130	0.0300	0.0090	0.0090
46	0.0120	0.0300	0.0080	0.0080
47	0.0110	0.0300	0.0080	0.0080
48	0.0100	0.0290	0.0080	0.0080
49	0.0090	0.0280	0.0070	0.0070
50	0.0080	0.0260	0.0070	0.0070
51	0.0070	0.0240	0.0060	0.0060
52	0.0060	0.0230	0.0030	0.0030
53	0.0060	0.0210	0.0030	0.0030
54	0.0050	0.0190	0.0020	0.0020
55	0.0040	0.0140	0.0020	0.0020
56	0.0030	0.0090	0.0020	0.0020
57	0.0020	0.0040	0.0010	0.0010
58	0.0010	0.0030	0.0010	0.0010
59	0.0010	0.0020	0.0010	0.0010
60	0.0010	0.0010	0.0010	0.0010

MISCELLANEOUS AND TECHNICAL ASSUMPTIONS

Administrative Expenses:	0.50% of payroll, based upon actual results from previous year.
Disability Expenses:	0.56% 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 for all other members.
Optional Benefit Factors:	Optional Benefit Factors are in accordance with tables adopted by the Board.
Other:	Disability and turnover decrements do not operate during retirement eligibility.
Miscellaneous Loading Factors:	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. The present value of future retirement and vested benefits for the Closed Plan Non-Uniformed active members was increased by 0.23% to account for the transition of some members into the Year 2000 Plan. The Normal Cost for the normal retirement decrement for Non-Uniformed members was increased by 0.45% to account for anticipated changes in the pattern of retirements due to the Year 2000 Plan. Differences in benefits between the Closed Plan and the Year 2000 Plan are not expected to yield significant changes in the pattern of retirements for the Uniformed group.

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 normal retirement component of the normal cost for the Non-Uniformed group was increased by 0.45% of payroll (5% of the normal retirement normal cost of 8.81%) to account for anticipated changes in retirement behavior of this group as the transition to the Year 2000 Plan occurs.

The ***Present 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. Active members hired on or after July 1, 2000 have their benefits determined by the Year 2000 Plan. The present value of future benefits for Non-Uniformed active members hired prior to July 1, 2000 was increased by 0.2% to reflect the ability of members to select the plan benefits that are most advantageous to them. These results are derived from a comparative analysis of the type and amount of benefits payable to plan members under various situations. We expect that this assumption will be revised as experience emerges with regard to plan-to-plan transition. The calculated normal and early retirement benefits were increased by 4.3% for Uniformed members and 2.6% for Non-Uniformed members to account for the inclusion of unused sick leave in the calculation of Average Pay.

METHOD OF FINANCING FUTURE BENEFITS FOR PRESENT ACTIVE MEMBERS (CONCLUDED)

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, 2004 resulted in ***Unfunded Actuarial Accrued Liabilities*** which were amortized as a level percent of payroll over a period of 31 years. Continued yearly reductions in the amortization period will result in a 30-year period being used for the June 30, 2006 valuation. This is consistent with GASB amortization period requirements.

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.

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GLOSSARY (CONCLUDED)

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 ACTUARIAL 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.

October 25, 2004

Mr. Norm Robinson, Executive Director
Missouri Department of Transportation and
Highway Patrol Employees' Retirement System
1913 Williams Street
Jefferson City, MO 65109

Dear Norm:

Enclosed are 20 bound copies of the June 30, 2004 actuarial valuation of the Missouri Department of Transportation and Highway Patrol Employees' Retirement System.

An additional unbound, 3-hole punched copy is enclosed for your convenience.

Sincerely,

Kenneth G. Alberts

KGA:lr
Enclosures

cc: Brian B. Murphy

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Brad Armstrong
Mita Drazilov
Judy Kermans