GRS Gabriel Roeder Smith & Company
Consultants & Actuaries

OHIO STATE HIGHWAY PATROL RETIREMENT SYSTEM

5-YEAR EXPERIENCE STUDY

JANUARY 1, 2010 THROUGH DECEMBER 31, 2014

5 – YEAR EXPERIENCE STUDY
JANUARY 1, 2010 – DECEMBER 31, 2014

TABLE OF CONTENTS

GRS
Gabriel Roeder Smith & Company
Consultants & Actuaries
One Towne Square
Suite 800
Southfield, MI 48076-3723
248.799.9000 phone
248.799.9020 fax
www.gabrielroeder.com

March 21, 2016

The Retirement Board
Ohio State Highway Patrol Retirement System
Columbus, Ohio

Dear Board Members:

Presented in this report are the results of an ***actuarial investigation of experience*** of the Ohio State Highway Patrol Retirement System. The investigation was conducted for the purpose of updating the actuarial assumptions used in valuing Ohio State Highway Patrol Retirement System actuarial liabilities and establishing employer contribution rates.

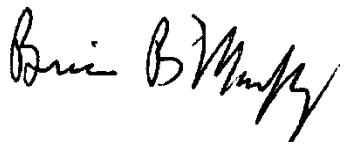
The investigation was based upon the statistical data furnished for annual actuarial valuations during the period ***January 1, 2010 to December 31, 2014.***

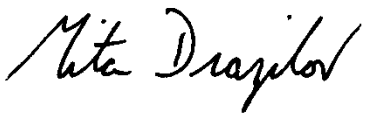
The report presents specific recommendations with respect to non-economic assumptions and presents a range of potential choices for the economic assumptions. Non-economic activities (rates of turnover, retirement, etc.) tend to be generally stable and are subject to measurement by the actuary. Economic activities (inflation, investment return) tend to be unstable and are not really subject to direct measurement. We believe that the Board should select the economic assumptions from within ranges that the actuary deems reasonable.

The investigation was carried out using generally accepted actuarial principles and techniques in accordance with standards of practice prescribed by the Actuarial Standards Board. We believe that the recommended actuarial assumptions that are the result of this investigation form a reasonable basis for computing future contributions and measuring funding progress for the Ohio State Highway Patrol Retirement System.

Brian Murphy and Mita Drazilov are Members of the American Academy of Actuaries (MAAA) as indicated and meet the Qualification Standards of the American Academy of Actuaries to render the opinions herein.

Respectfully submitted,





Brian B. Murphy, FSA, EA, MAAA Mita D. Drazilov, ASA, MAAA

BBM:MDD:dls

SECTION A

BACKGROUND AND DESCRIPTION OF STUDY

2010-2014 EXPERIENCE STUDY
INTRODUCTION

Each year as of December 31, the actuarial liabilities of Ohio State Highway Patrol Retirement System (HPRS) are valued. In order to perform the valuation, assumptions must be made regarding the future experience of the system with regard to the following risk areas:

- Rates of **withdrawal** of active members.
- Rates of **disability** among active members.
- Patterns of **salary increases** to active members.
- Rates of **retirement** among active members.
- Rates of **mortality** among active members, retirees and beneficiaries.
- Long-term rates of **investment return** to be generated by the assets of the System.

Assumptions should be carefully chosen and continually monitored. Continued use of outdated assumptions can lead to:

- Understated costs resulting in either an inability to pay benefits when due, sharp increases in required contributions at some point in the future, a misallocation of contributions between the pension and retiree health programs, or benefit provisions under the purview of the Board (i.e., COLA provision and member contribution rate) that are optimistic;

- Overstated costs resulting in either benefit levels that are kept below the level that could be supported by the computed rate or an unnecessarily large burden on the current generation of members, employers and taxpayers, a misallocation of contributions between the pension and retiree health programs, or benefit provisions under the purview of the Board (i.e., COLA provision and member contribution rate) that are pessimistic.

A single set of assumptions will not be suitable indefinitely. Things change, and our understanding of things (whether or not they are changing) also changes.

In recognition of this, assumptions used to value the liabilities of the Retirement System should be periodically studied in depth. The package of assumptions may then be adjusted to reflect basic experience trends -- but not random year to year fluctuations.

No mathematical credibility procedure was utilized in the selection of the proposed decrement assumptions. Actual experience during the last 5-year period was analyzed and actuarial professional judgement was utilized to determine if adjustments to the current decrement assumptions were warranted. Generally, if a new decrement assumption is proposed, it reflects a balance between the current assumption and actual experience. In some instances (e.g., mortality), national tables were selected, with some minor adjustments.

2010-2014 EXPERIENCE STUDY
SUMMARY OF DECREMENT EXPERIENCE

Normal (Unreduced) Retirements were slightly higher than expected for members. Minor adjustments were made to the proposed rates. See page E-2.

Early (Reduced) Retirements were slightly lower than expected for members. Minor adjustments were made to the proposed rates. See page E-4.

Withdrawals were higher than expected for members. In general, we recommend an increase to the proposed withdrawal rates and that the rates be based upon a member's service. See page D-1.

Disabilities were slightly lower than expected for members. We recommend no change to the proposed rates. See page F-1.

Post-retirement Mortality experience was analyzed and the results of the analysis are presented in Section H. Given the size of HPRS, insufficient data exists with which to create a System-specific mortality table. Unlike the other decrements, nationally published tables or experience from a larger system that is expected to be similar to that experienced by HPRS is considered. In addition to the experience of HPRS, we analyzed the experience of the Ohio Public Employees Retirement System (OPERS). The last completed Experience Study for OPERS covered the period 2006 through 2010. The Society of Actuaries (SOA) published new tables called the RP-2014 tables in October 2014 for US pension plans. The SOA also published the MP-2015 projection scales to reflect projected and observed generational mortality improvements. We recommended using these SOA tables with an adjustment to the female post-retirement mortality table based upon experience observed in OPERS. Please see section H for more information.

2010-2014 EXPERIENCE STUDY
SUMMARY OF OTHER NON-ECONOMIC ASSUMPTIONS

The following non-economic assumptions have a minor effect on overall actuarial valuation results but are needed for actuarial valuation purposes. However, data did not lend itself to detailed experience analysis of these assumptions. We continue to believe that the assumptions are acceptable.

- 85% of active members are assumed to be married for purposes of the automatic survivor coverage.

- For active valuations, female spouses are assumed to be 3 years younger than male spouses.

- A load of 0.75% of payroll is included in pension normal cost calculations for the purchase of military service.

    - A detailed study of service purchases was performed for the Ohio Retirement Study Council (ORSC) in 2006. A review of service purchases in calendar year 2014 did not indicate a substantial change in the number of service purchases nor the amount of service being purchased. Therefore, no change in this assumption is being recommended.

- For active valuations, members who receive a death-in-service benefit are assumed to have two children for whom benefits are paid for 10 years.

- 90% of males and 50% of females who retire are assumed to elect health coverage for a spouse at retirement, and that coverage would be available to surviving spouses.

SECTION B

ECONOMIC ASSUMPTIONS

ECONOMIC ASSUMPTIONS – INTRODUCTION

Economic assumptions include **long-term rates of investment return** (net of investment expenses based upon a passive investment strategy; sometimes net of administrative expenses), **price inflation**, **wage inflation** (the across-the-board portion of salary increases), pay increases due to **merit and seniority** and a **payroll growth assumption**. Unlike demographic activities, economic activities do not lend themselves to analysis solely on the basis of internal historical patterns because both salary increases and investment return are affected more by external forces; namely inflation (both wage and price), general productivity changes and the local economic environment which defy accurate long-term prediction. Estimates of economic activities are generally selected on the basis of the expectations in an inflation-free environment and then both long-term rates of investment return and wage inflation are increased by some provision for long-term price inflation.

If price inflation and/or productivity increases are lower than expected, it will probably result in both actual rates of salary increases and investment return below the assumed rates. Salaries increasing at rates less than expected produce lower liabilities. However, actual investment return below the assumed rate of investment return (whether due to manager performance, change in the mix of assets, or general market conditions) results in lower than expected asset amounts.

Sources considered in the analysis of the price inflation assumption included:

- 2015 Social Security Trustees Report
- Philadelphia Federal Reserve quarterly survey of Society of Professional Forecasters
- Congressional Budget Office's 2014 Long-Term Budget Outlook
- Comparison of Treasury yields and Treasury Inflation Protected Securities (TIPS)
- Future capital market expectations of eight investment consultants that GRS monitors

Sources considered in the analysis of the investment return assumption included:

- Future capital market expectations of eight investment consultants that GRS monitors
- Future capital market expectations of HPRS's investment consultant

Sources considered in the analysis of the wage inflation, merit and seniority and payroll growth assumptions included:

- Actual HPRS experience over the last 5 years (i.e., merit and seniority pay increases)
- Historical observations of inflation statistics (both price and wage) both nationally and for HPRS

ECONOMIC ASSUMPTIONS – INTRODUCTION (CONCLUDED)

Because GRS is a benefits consulting firm and does not develop or maintain its own capital market expectations, we monitor forward-looking expectations developed by several major investment consulting firms. The eight investment consultants that GRS monitors are Towers Watson, PCA, RV Kuhns, BNY Mellon, JP Morgan, Aon, NEPC and Mercer.

Current economic assumptions for the System are as follows:

Investment Return	8.00%
Wage Inflation	4.00%
Price Inflation	3.00%
Spread Between Investment Return and Wage Inflation	4.00%
Spread Between Investment Return and Price Inflation	5.00%

Note that the investment return assumption of 8.00% is currently net of investment expenses based upon a passive investment strategy *and net of administrative expenses*. Given HPRS's administrative expenses, this assumption corresponds to an approximate investment return assumption of 8.13%, *gross of administrative expenses*.

The remainder of this section addresses the economic assumptions other than pay increases due to merit and seniority. Pay increases due to merit and seniority are addressed in Section G.

ECONOMIC ASSUMPTIONS – ASOP NO. 27

Guidance regarding the selection of economic assumptions for measuring pension obligations is provided by Actuarial Standards of Practice (ASOP) No. 27. The standard requires that the selected economic assumptions be consistent with each other. That is, the selection of the investment return assumption should be consistent with the selection of the wage inflation and price inflation assumptions.

ASOP No. 27 has been revised since the last time an Experience Study was performed for HPRS. The adopted revision of ASOP No. 27 (applicable to valuation dates on or after September 30, 2014) defines a reasonable economic assumption as an assumption that has the following characteristics:

(a) It is appropriate for the purpose of the measurement;
(b) It reflects the actuary's professional judgment;
(c) It takes into account historical and current economic data that is relevant as of the valuation date;
(d) It reflects the actuary's estimate of future experience, the actuary's observation of the estimates inherent in market data, or a combination thereof; and
(e) It has no significant bias (i.e., it is not significantly optimistic or pessimistic), except when provisions for adverse deviation or plan provisions that are difficult to measure are included and disclosed under Section 3.5.1, or when alternative assumptions are used for the assessment of risk.

The revised ASOP No. 27 has significantly reduced the range of economic assumptions that can be deemed reasonable for actuarial valuation purposes.

ECONOMIC ASSUMPTIONS – PRICE INFLATION

Price inflation underlies both the wage inflation and investment return assumptions. Since price inflation underlies the wage inflation assumption and the investment return assumption, we recommend that a specific price inflation assumption be adopted in conjunction with this Experience Study. The table below shows the average price inflation over various periods, ending December 2015:

Periods Ending December 2015	Average Annual Increase in CPI-U
Last five (5) years	1.53%
Last ten (10) years	1.86
Last fifteen (15) years	2.07
Last twenty (20) years	2.18
Last twenty-five (25) years	2.30
Last thirty (30) years	2.61

As the table shows, recent experience, both short-term and long-term, has been below the current assumption of 3.0%.

The 2015 Social Security Trustees report uses 2.7% as the long-range intermediate price inflation assumption. For the Congressional Budget Office's 2014 Long-Term Budget Outlook (a 75-year projection), a CPI increase assumption of 2.5% was used.

The Philadelphia Federal Reserve conducts a quarterly survey of the Society of Professional Forecasters. Their recent forecast, from the fourth quarter of 2015, is for inflation over the following ten years to average 2.15%. This is a decrease from the survey results from the fourth quarter of 2011, which was for inflation over the following ten years to average 2.50%.

Another source of information about future price inflation is the market for US Treasury bonds. The December 31, 2015 yield for a 20-year inflation indexed Treasury bond (20-year TIPS) was 1.07% plus actual inflation. The yield for a non-indexed 20-year Treasury bond was 2.67%. The difference between these two yields, 1.60%, gives an approximate measure of the market's expectation of price inflation over the next 20 years.

ECONOMIC ASSUMPTIONS – PRICE INFLATION (CONCLUDED)

In the process of developing capital market expectations for asset classes, investment consultants use an underlying price inflation assumption. For the eight investment consultants that GRS monitors, the average of price inflation assumptions used in their capital market expectations was 2.27%. The highest price inflation assumption was 2.50% and the lowest was 2.11%.

Based upon the reviewed data, we recommended that the Board consider a price inflation assumption between 2.25% and 2.75%. Our preferred price inflation assumption is 2.50%. We would consider a 2.75% assumption as reasonable, but aggressive, given its interaction with the investment return assumption.

The investment return assumption is the actuarial assumption that has the largest impact on actuarial valuation results. As more of the actuarial accrued liabilities are related to non-active members, the nominal (as opposed to real) investment return assumption becomes a more prominent factor. Since one of HPRS's fundamental financial objectives is the receipt of level contributions over time, the discount rate assumption is set equal to the investment return assumption (with perhaps an adjustment for conservatism).

Presented below is the asset allocation used in our analysis. The asset allocation is based upon the asset allocation reported by HPRS's investment consultant in March 2015 for GASB Statement No. 67 reporting purposes. (It is our understanding that there has been a slight change to the target asset allocation adopted in 2016. The change does not have a material impact on our analysis.)

Asset Class	Asset Allocation
Equities	
US Large Cap	25.0%
US Mid Cap	5.0
US Small Cap	5.0
Developed International	15.0
Emerging Markets	5.0
Fixed Income	
US Core Bonds	15.5
International Bonds	3.0
US High Yield Bonds	3.5
Other	
Real Estate	5.0
Hedge Funds	8.0
Private Equity	10.0

Based upon the asset allocation presented on the previous page, future return expectations of the investment consultants that GRS monitors were analyzed. The analysis was based upon the following:

(1) Since capital market expectations reported by the investment consultants are already net of passive investment expenses, no expense assumption was used. To the extent that HPRS incurs investment expenses for active management, it is assumed that HPRS will earn at least enough investment return to offset the investment expenses associated with active management.

(2) To allow for better consistency with the requirements of GASB Statement No. 67, administrative expenses other than investment expenses will be funded through an addition to the normal cost. This means that the investment return assumption will be net of passive investment expenses, but gross of administrative expenses. Administrative expenses for calendar year 2014 for totaled $1,187,649. This represented 1.20% of payroll. (Over the past 4 years, this percentage was relatively constant.) Therefore, we recommend that a normal cost contribution of 1.20% of payroll be included in the annual valuation to reflect administrative expenses. Also, given the current status of the retiree health program, we recommend that this normal cost contribution be allocated to the pension program.

(3) Results presented in the following tables are based upon a price inflation assumption of 2.50% (i.e., GRS's preferred price inflation assumption). Note that results would be higher by 0.25% if a 2.75% price inflation assumption were used.

Presented below are the results of our investment return analysis:

Investment Consultant	Investment Consultant Expected Nominal Return	Investment Consultant Inflation Assumption	Expected Real Return (2)–(3)	Actuary Inflation Assumption	Expected Nominal Return (4)+(5)	Investment Expenses	Expected Nominal Return Net of Expenses (6)-(7)		Standard Deviation of Expected Return (1-Year)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		(9)
1	6.11%	2.12%	3.99%	2.50%	6.49%	0.00%	6.49%		12.50%
2	7.16%	2.50%	4.66%	2.50%	7.16%	0.00%	7.16%		13.90%
3	7.40%	2.50%	4.90%	2.50%	7.40%	0.00%	7.40%		13.10%
4	7.22%	2.25%	4.97%	2.50%	7.47%	0.00%	7.47%		13.50%
5	7.35%	2.26%	5.09%	2.50%	7.59%	0.00%	7.59%		12.30%
6	7.35%	2.11%	5.24%	2.50%	7.74%	0.00%	7.74%		13.20%
7	7.45%	2.20%	5.25%	2.50%	7.75%	0.00%	7.75%		12.80%
8	8.31%	2.20%	6.11%	2.50%	8.61%	0.00%	8.61%		13.70%
Average	**7.29%**	**2.27%**	**5.03%**	**2.50%**	**7.53%**	**0.00%**	**7.53%**		**13.13%**

HPRS's investment consultant reported an investment return expectation for the System of 7.50%.

Investment Consultant	Distribution of 20-Year Average Geometric Net Nominal Return			Probability of exceeding 8.00%
	40th	50th	60th	
(1)	(2)	(3)	(4)	(5)
1	5.05%	5.75%	6.45%	21.0%
2	5.48%	6.26%	7.03%	28.6%
3	5.86%	6.59%	7.33%	31.4%
4	5.86%	6.61%	7.37%	32.2%
5	6.18%	6.87%	7.57%	34.1%
6	6.19%	6.93%	7.67%	35.7%
7	6.28%	6.99%	7.71%	36.1%
8	6.96%	7.73%	8.50%	46.5%
Average	**5.98%**	**6.72%**	**7.45%**	**33.2%**

The preferred investment return assumption in the actuarial community is the forward-looking expected geometric return (i.e., 50th percentile). Based upon the average of each of the investment consultants' expectations, this would lead to an investment return assumption of 6.72%. A less preferred investment return assumption, but still reasonable assumption, is the forward-looking expected arithmetic return (i.e., expected nominal return). Based on the average of each of the investment consultants' expectations, this would lead to an investment return assumption of 7.53%.

Based upon the results of our analysis, and given the current investment return assumption of 8.0%, our preferred investment return assumption would be between 7.25% and 7.50%, based upon a price inflation assumption of 2.50%. A 7.75% investment return assumption may be considered reasonable, based upon a price inflation assumption of 2.75%, but aggressive. In addition, the selection of 7.75% as the investment return assumption would leave very little margin for actuarial standards reasonability purposes in future years if capital market expectations are lowered from their current levels. In other words, if capital market assumptions are lowered from current levels, it may become necessary to lower the investment return assumption yet further prior to the next experience study.

Wage Inflation. Wage inflation consists of two components, 1) a portion due to pure price inflation (i.e., increases due to changes in the CPI), and 2) increases in average salary levels in excess of pure price inflation (i.e., increases due to changes in productivity levels, supply and demand in the labor market and other macroeconomic factors). The table below shows the difference between the increase in National Average Earnings and price inflation over various periods, ending December 2013:

Periods Ending December 2013	Difference Between Increase in National Average Earnings and CPI
Last five (5) years	(0.5)%
Last ten (10) years	0.4
Last fifteen (15) years	0.6
Last twenty (20) years	1.0
Last twenty-five (25) years	0.7
Last thirty (30) years	0.9

Based upon the reviewed data and considering the range of proposed price inflation assumption, we recommend a wage inflation assumption of 3.25%. We believe 3.50% would also be a reasonable assumption, and have presented this assumption as an alternative.

Payroll Growth. The table below shows the annual increase in HPRS payroll over various periods, ending December 2014:

Periods Ending December 2014	Annual Increase in HPRS Payroll
Last five (5) years	0.91%
Last ten (10) years	1.95
Last fifteen (15) years	2.75

The above shows that recent HPRS experience has lagged the current payroll growth assumption of 4.0%. However, if all actuarial assumptions are met, and both the number of active members and their age and service characteristics remain relatively constant, it is expected that payroll growth will be the same as wage inflation. **Therefore, we recommend a payroll growth assumption of 3.25%.** We believe 3.50% would also be a reasonable assumption, and have presented this assumption as an alternative.

SECTION C

SUMMARY OF VALUATION RESULTS

DISCUSSION OF VALUATION RESULTS

Page C-2 shows valuation results for the pension program for HPRS. Valuation results are shown based upon the present economic assumptions and upon 3 alternate economic assumption scenarios. The selection of proper economic assumptions is less of an exact science than the selection of demographic assumptions; it is recommended that the Board select the final economic assumptions from among those that are illustrated, based upon the Board's own outlook with respect to the future.

The alternate economic assumption scenarios are as follows:

Economic Assumption Scenario	Net Investment Income	Wage Inflation	Price Inflation
Present	8.00 %	4.00 %	3.00 %
Alternate 1 (Aggressive)	7.75 %	3.25 %	2.75 %
Alternate 2 (Preferred)	7.50 %	3.25 %	2.50 %
Alternate 3 (Preferred)	7.25 %	3.25 %	2.50 %
Alternate 4 (Aggressive)	7.75 %	3.50 %	2.75 %

Selection of either of the 7.75% alternates could potentially mask a need for additional contribution income. If, in the long term, it turns out that additional contribution income is needed to support the level of benefits, it would be best for HPRS to recognize that need now.

Alternates 1, 2 and 3 are based upon the premise that the proposed merit and seniority rates are adopted. There is some judgement in estimating what portion of total pay increases are based upon wage inflation and what portion is based upon merit and seniority increases. Therefore, alternate 4 is also presented, based upon the current merit and seniority pay increase rates.

Please note that the results on the following page are as of December 31, 2014. Therefore, the results do not reflect any of the investment experience observed by HPRS during calendar year 2015. In addition, the results are based upon 22.50% of the employer contribution rate being allocated to the pension program, with the remaining 4.0% of payroll being allocated to the retiree health program. We have also shown computed amortization periods if all of the employer contribution rate (i.e., 26.50% of payroll) is allocated to the pension program.

PENSION VALUATION RESULTS AS OF DECEMBER 31, 2014
COMPARISON OF PRESENT AND ALTERNATE ASSUMPTIONS
BASED ON RECOMMENDED EMPLOYER CONTRIBUTION RATE ALLOCATION
($ IN MILLIONS)

Contributions For	Present Decrement and Economic Assumptions (8.0%/4.0%)	Proposed Decrement Assumptions and Indicated Investment Return and Wage Inflation Assumptions			
		Includes Proposed Changes to Merit and Seniority Increases			No Change to Merit and Seniority Increases
		(7.75%/3.25%)	(7.50%/3.25%)	(7.25%/3.25%)	(7.75%/3.50%)
Normal Cost	18.13%	19.97%	20.94%	22.00%	19.70%
Less Portion Paid by Members	12.50%	12.50%	12.50%	12.50%	12.50%
Employer Normal Cost	5.63%	7.47%	8.44%	9.50%	7.20%
Unfunded Actuarial Accrued Liability	16.87%	15.03%	14.06%	13.00%	15.30%
Total Computed Employer Contribution	**22.50%**	**22.50%**	**22.50%**	**22.50%**	**22.50%**
Actuarial Accrued Liabilities (AAL)	$ 1,012.8	$ 1,053.8	$ 1,080.3	$ 1,108.1	$ 1,054.7
Actuarial Value of Assets (AVA)	$ 712.3	$ 712.3	$ 712.3	$ 712.3	$ 712.3
Unfunded AAL (UAAL)	$ 300.5	$ 341.5	$ 368.0	$ 395.8	$ 342.4
Funded %	70.3%	67.6%	65.9%	64.3%	67.5%
UAAL Amortization Period - 22.50% Pension Employer Contribution Rate	29 yrs.	76 yrs.	Infinite	Infinite	55 yrs.
UAAL Amortization Period - 26.50% Pension Employer Contribution Rate	20 yrs.	33 yrs.	42 yrs.	55 yrs.	31 yrs.
Total Employer Contribution Rate Needed for 30-year Amortization Period	**n/a**	**27.50%**	**29.40%**	**31.40%**	**26.70%**

While we believe that all of the "proposed" columns are reasonable and meet actuarial standards, we caution the Board that the columns based upon a 7.75% return fall on the aggressive end of the spectrum based upon the analysis given in this report.

SECTION D

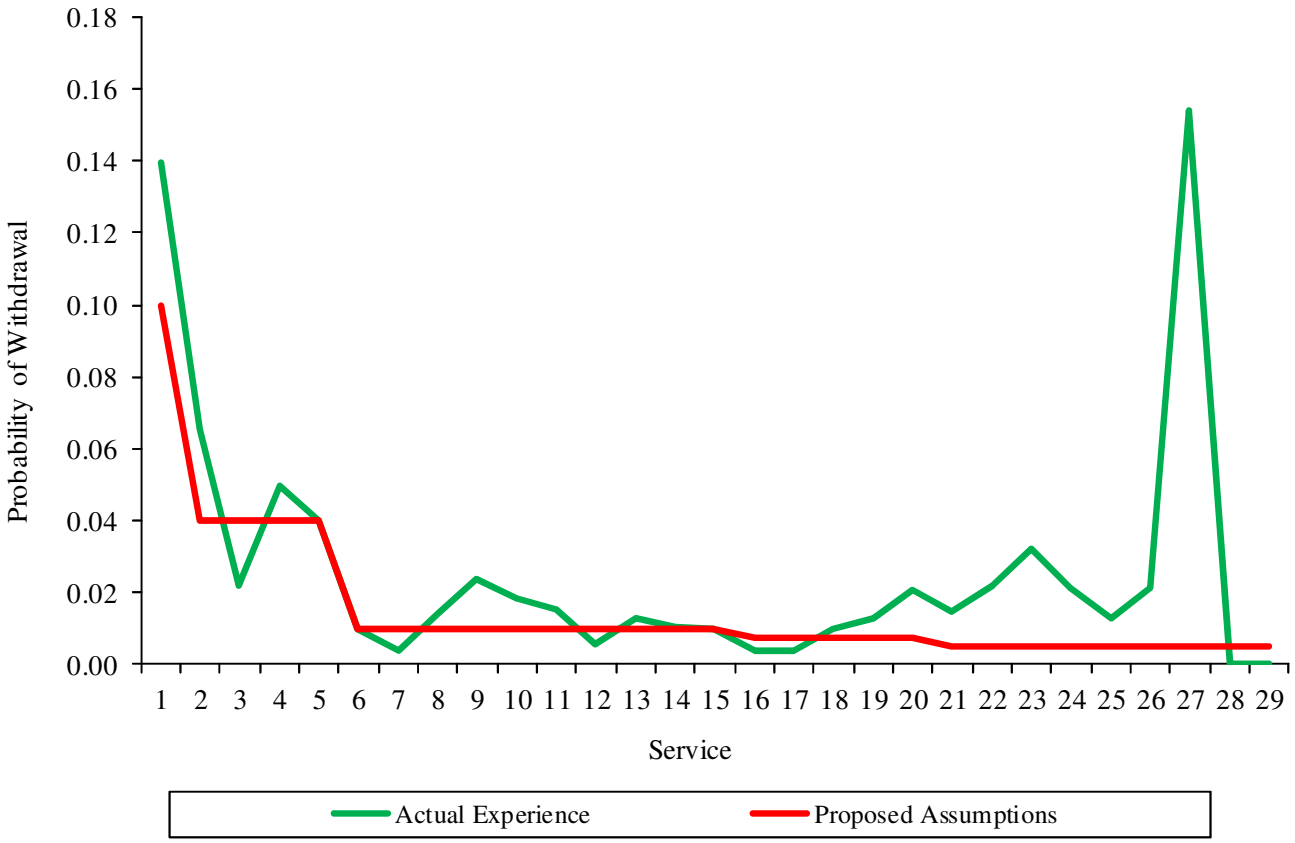
WITHDRAWAL EXPERIENCE

SERVICE BASED WITHDRAWAL EXPERIENCE

Service Index	Withdrawals	Exposure	Crude Rates	Sample Rates		Expected Withdrawals	
				Present	Proposed	Present	Proposed
1	36	258	0.1395		0.1000	15	26
2	22	338	0.0651		0.0400	7	14
3	5	230	0.0217		0.0400	5	9
4	9	181	0.0497		0.0400	3	7
5	7	174	0.0402		0.0400	3	7
6	2	209	0.0096		0.0100	4	2
7	1	250	0.0040		0.0100	4	3
8	4	289	0.0138		0.0100	5	3
9	7	293	0.0239		0.0100	4	3
10	6	333	0.0180		0.0100	5	3
11	5	323	0.0155		0.0100	4	3
12	2	360	0.0056		0.0100	5	4
13	5	383	0.0131		0.0100	5	4
14	4	374	0.0107		0.0100	4	4
15	3	315	0.0095		0.0100	3	3
16	1	286	0.0035		0.0075	3	2
17	1	273	0.0037		0.0075	2	2
18	3	297	0.0101		0.0075	2	2
19	4	312	0.0128		0.0075	2	2
20	6	292	0.0205		0.0075	2	2
21	4	273	0.0147		0.0050	1	1
22	5	228	0.0219		0.0050	1	1
23	5	157	0.0318		0.0050	1	1
24	2	95	0.0211		0.0050	-	-
25	1	79	0.0127		0.0050	-	-
26	1	47	0.0213		0.0050	-	-
27	4	26	0.1538		0.0050	-	-
28	-	18	0.0000		0.0050	-	-
29	-	7	0.0000		0.0050	-	-
30 and over	1	2	0.5000		0.0050	-	-
Totals	**156**	**6,702**	**0.0233**	**0.0134**	**0.0161**	**90**	**108**
Ref				434	1012		
Prior Experience							
2005-2009	106	7,009	0.0151			101	-

Withdrawals were higher than expected for members. In general, we recommend an increase to the proposed withdrawal rates and that the rates be based upon a member's service. (Current rates are primarily age-based, and therefore are not shown above.)

SERVICE BASED WITHDRAWAL EXPERIENCE



SECTION E

RETIREMENT EXPERIENCE

RATES OF RETIREMENT

Pages E-2 and E-4 compare the present retirement assumptions with the actual experience for both normal and early retirement.

Current retirement eligibility conditions allow a member to retire with an unreduced benefit at age 52 to 60 with 20 years of credited service, or at age 48 with 25 years of credited service. A member is eligible for a reduced pension with at least 20 years but less than 25 years of credited service and is between the ages of 48 and 52. The current retirement assumptions are based on the member's age.

As can be seen, there were more retirements than assumed for normal and fewer than assumed for early retirement.

AGE AND SERVICE RETIREMENT EXPERIENCE

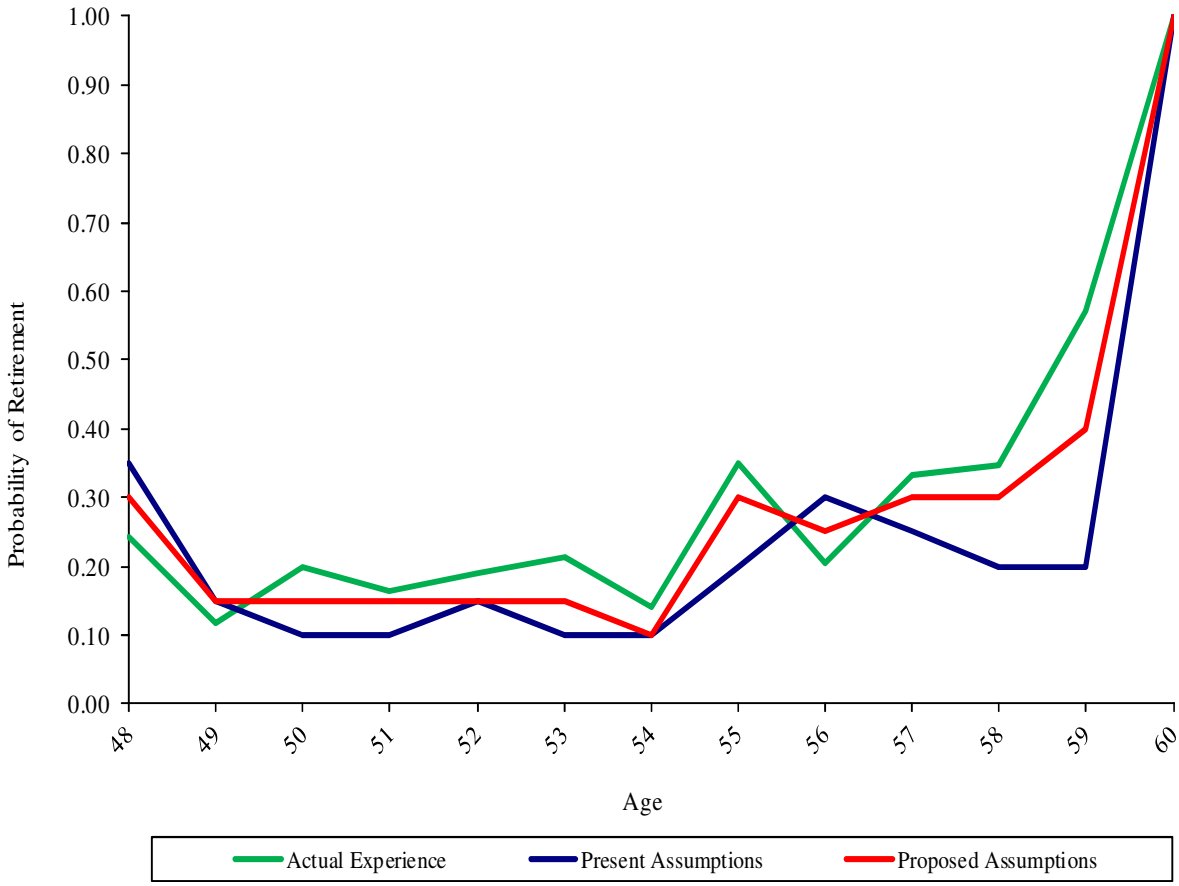
Age	Retirements	Exposure	Crude Rates	Sample Rates		Expected Retirements*	
				Present	Proposed	Present	Proposed
Under 45	-	-	N/A	N/A	N/A	-	
45	-	-	N/A	N/A	N/A	-	
46	-	-	N/A	N/A	N/A	-	
47	1	1	1.0000	N/A	N/A	-	
48	21	87	0.2414	0.3500	0.3000	30	
49	12	101	0.1188	0.1500	0.1500	15	
50	21	105	0.2000	0.1000	0.1500	11	
51	18	110	0.1636	0.1000	0.1500	11	
52	24	127	0.1890	0.1500	0.1500	19	
53	21	98	0.2143	0.1000	0.1500	10	
54	11	78	0.1410	0.1000	0.1000	8	
55	23	66	0.3485	0.2000	0.3000	14	
56	9	44	0.2045	0.3000	0.2500	29	
57	11	33	0.3333	0.2500	0.3000	12	
58	8	23	0.3478	0.2000	0.3000	7	
59	8	14	0.5714	0.2000	0.4000	4	
60	6	6	1.0000	1.0000	1.0000	6	
61 & up	1	1	1.0000	1.0000	1.0000	1	
Total	**195**	**894**	**0.2181**			**177**	
	Prior Experience						
2005-2009	117	680	0.1721			197	122

* *"Expected retirements - Proposed" are not shown due to the assumption that 100% of eligible members age 55 and older would retire upon attaining 34 years of service. "Expected retirements - Present" is the sum of actual probabilities applied in the valuation.*

In addition, it was assumed that 100% of eligible members age 55 and older would retire upon attaining 34 years of service. A member was assumed eligible for unreduced retirement at age 48 or greater with 25 or more years of service or age 52 or greater with 20 or more years of service. A member was assumed eligible for reduced retirement at age 48 or greater with 20 or more years of service.

It was assumed that members eligible to DROP would either retire or "DROP in" at first eligibility for unreduced retirement. 100% of members still working 8 years after first reaching retirement eligibility are assumed to retire.

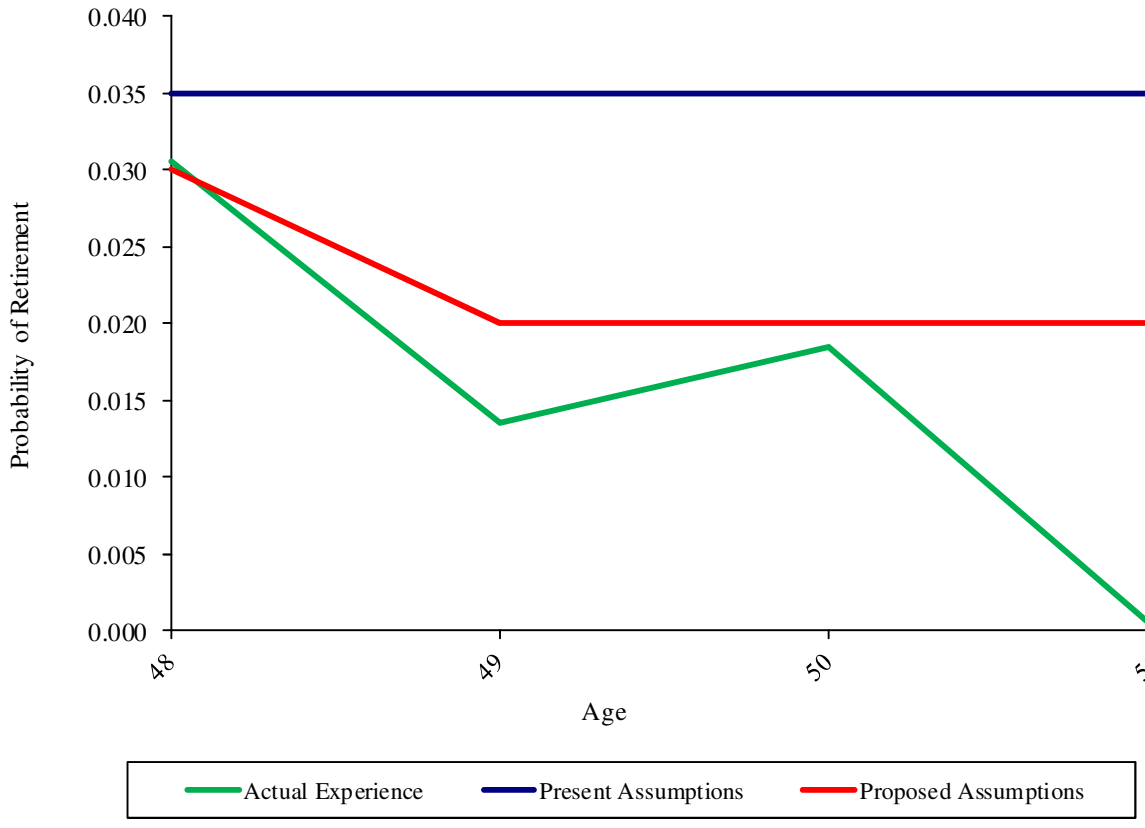
AGE AND SERVICE RETIREMENT EXPERIENCE



EARLY RETIREMENT EXPERIENCE

Age	Retirements	Exposure	Crude Rates	Sample Rates		Expected Retirements*	
				Present	Proposed	Present	Proposed
48	3	98	0.0306	0.0350	0.0300	3	3
49	1	74	0.0135	0.0350	0.0200	3	1
50	1	54	0.0185	0.0350	0.0200	2	1
51	-	34	0.0000	0.0350	0.0200	1	1
Total	**5**	**260**	**0.0192**			**9**	**6**
	Prior Experience						
2005-2009	2	174	0.0115			13	6

* *"Expected retirements - Proposed" is calculated as the sum of rates applied to exposure at individual ages. "Expected retirements - Present" is the sum of actual probabilities applied in the valuation.*



SECTION F

DISABILITY EXPERIENCE

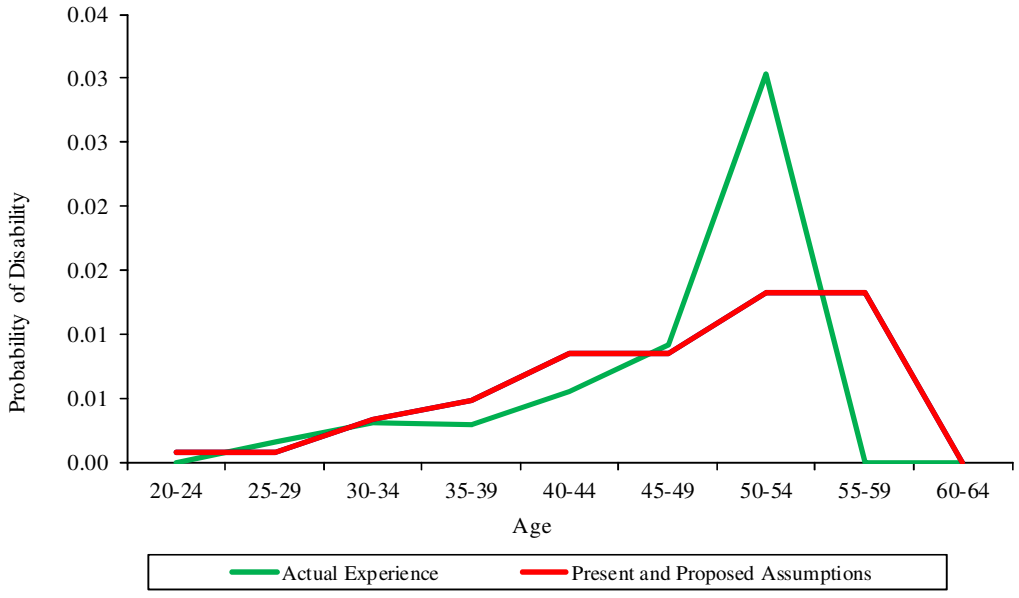
DISABILITY EXPERIENCE

Age	Disabilities	Exposure	Crude Rates	Sample Rates*		Expected Disabilities**	
				Present	Proposed	Present	Proposed
Under 20	-	-	N/A	0.0008	0.0008	-	-
20-24	-	106	0.0000	0.0008	0.0008	-	-
25-29	1	635	0.0016	0.0008	0.0008	1	1
30-34	4	1,285	0.0031	0.0033	0.0033	4	4
35-39	5	1,709	0.0029	0.0048	0.0048	9	9
40-44	10	1,818	0.0055	0.0085	0.0085	15	15
45-49	8	865	0.0092	0.0085	0.0085	7	7
50-54	1	33	0.0303	0.0132	0.0132	-	-
55-59	-	-	N/A	0.0132	0.0132	-	-
60-64	-	-	N/A	0.0000	0.0000	-	-
65-69	-	-	N/A	0.0000	0.0000	-	-
70-74	-	-	N/A	0.0000	0.0000	-	-
75 and over	-	-	N/A	0.0000	0.0000	-	-
Totals	**29**	**6,451**	**0.0045**	**0.0056**	**0.0056**	**36**	**36**
Ref				465	465		
				1.00	1.00		
Prior Experience							
2005-2009	33	6,873	0.0048			33	33

* *Sample rates are taken from midpoint of age group.*

** *"Expected disabilities - Proposed" is calculated as the sum of rates applied to exposure at individual ages. "Expected disabilities - Present" is the sum of actual probabilities applied in the valuation.*

The number of disabilities were slightly lower than expected over the experience period. We recommend no change in disability rates.



SECTION G

SALARY INCREASE EXPERIENCE

SALARY INCREASE EXPERIENCE

Pay increase rates (merit and seniority portion) for members were found to be somewhat higher than expected for members. See page G-2. We recommend a slight increase to the merit and seniority portion of the pay increases assumption at most service indices. However, when combined with the proposed reduction to the wage inflation assumption, assumed total pay increases are proposed to be lower than the current assumption at most service indices.

SALARY INCREASE EXPERIENCE

Service Index	Merit/Seniority % Increase		
		Sample Values	
	Actual	Present	Proposed
1	16.65%	10.00%	13.00 %
2	11.41%	10.00%	10.00 %
3	5.31%	3.00%	5.00 %
4	2.72%	3.00%	3.00 %
5	3.62%	3.00%	3.00 %
6	3.62%	1.00%	3.00 %
7	3.58%	1.00%	3.00 %
8	2.33%	1.00%	0.80 %
9	0.78%	1.00%	0.80 %
10	1.59%	1.00%	0.80 %
11	1.84%	0.30%	0.80 %
12	1.96%	0.30%	0.80 %
13	1.68%	0.30%	0.80 %
14	2.67%	0.30%	0.80 %
15	1.66%	0.30%	0.80 %
16	0.23%	0.30%	0.80 %
17	1.11%	0.30%	0.80 %
18	1.52%	0.30%	0.80 %
19	1.99%	0.30%	0.80 %
20	2.39%	0.30%	0.80 %
21	1.08%	0.30%	0.40 %
22	2.11%	0.30%	0.40 %
23	1.04%	0.30%	0.40 %
24	(0.09)%	0.30%	0.40 %
25	0.81%	0.30%	0.40 %
26	(1.57)%	0.30%	0.40 %
27	1.18%	0.30%	0.40 %
28	(0.47)%	0.30%	0.40 %
29	(0.28)%	0.30%	0.40 %
30	(1.33)%	0.30%	0.40 %
31	2.16%	0.30%	0.40 %
32	2.15%	0.30%	0.40 %
33	3.15%	0.30%	0.40 %
34	(1.97)%	0.30%	0.40 %
35 & higher	3.73%	0.30%	0.40 %

SECTION H

MORTALITY EXPERIENCE

MORTALITY EXPERIENCE

Findings

Post-retirement mortality is an important, but relatively stable ingredient in cost calculations. This assumption should be updated from time to time to reflect longevity improvements.

Another consideration is that Actuarial Standard of Practice (ASOP) No. 35 has recently been revised with regard to the Mortality assumption. ASOP No. 35 Disclosure Section 4.1.1 now states, "The disclosure of the mortality assumption should contain sufficient detail to permit another qualified actuary to understand the provision made for future mortality improvement. If the actuary assumes zero mortality improvement after the measurement date, the actuary should state that no provision was made for future mortality improvement." The current rates include such margin in the tables by assuming rates lower than those actually observed (referred to as a static improvement assumption).

The proposed rates take a different approach and assume that future mortality rates will continue to decline with each generation. For this "generational" approach, we remove any static margin from the base tables and apply a mortality improvement scale to project rates getting lower each year in the future. This means that next year's 65-year-old will have a slightly longer life expectancy than this year's, etc.

The approach we have taken is based on the RPEC_2014 model described by the Society of Actuaries (SOA). The base mortality tables we select from are the RP-2014 mortality tables. That is, our starting point was the RP-2014 tables adjusted for mortality improvement back to the observation period base year of 2006. The improvement scales we consider are the 2-dimensional MP-2015 mortality improvement scales. It is anticipated that the SOA will release new improvement scales annually. For purposes of HPRS valuations, we recommend maintaining the MP-2015 improvement scales until the next experience study.

The first step in this procedure is to select the appropriate version of the RP-2014 mortality tables for the aggregate HPRS population of healthy retirees.

MORTALITY EXPERIENCE

Healthy Retirees

Given that the vast majority of healthy HPRS retirees are male, we reviewed the mortality experience of healthy male retirees during the 5-year period. The results are shown on page H-4. The plan experienced fewer deaths among males than projected by the present assumptions. Also, as in previous years, HPRS mortality experience for the male healthy retiree population is generally better than what we observe for the male healthy retiree OPERS population. We recommend adopting the RP-2014 Healthy Annuitant mortality table for males, adjusted for mortality improvement back to the observation period base year of 2006.

We also compared the experience of the female healthy retiree OPERS population to the RP-2014 adjusted tables. We would expect that since most of the HPRS female post-retirement population would be beneficiaries, we would not expect significant differences between HPRS and OPERS female post-retirement mortality experience. We observed that the female healthy retiree OPERS population has not experienced the same level of mortality improvement as that incorporated in the RP 2014 mortality table. We recommend adopting the RP-2014 Healthy Annuitant mortality table for females, adjusted for mortality improvement back to the observation period base year of 2006, and then establish the base year as 2012.

Disabled Retirees

Disabled mortality experience during the study period was not sufficient to be credible. We recommend adopting the RP-2014 disabled mortality tables, adjusted for mortality improvement back to the observation period base year of 2006, and then establish the base year for females as 2012.

Active Members

Active mortality experience during the study period was not sufficient to be credible. We recommend adopting the RP-2014 Employees mortality tables, adjusted for mortality improvement back to the observation period base year of 2006, and then establish the base year for females as 2012.

Mortality Improvement

The Society of Actuaries' MP-2015 report recommends considering applying MP-2015 fully generational to the selected RP-2014 table adjusted to the base year of 2006. We have applied this adjustment as recommended.

Future Life Expectancy

The table below shows the future life expectancy of a Healthy Annuitant based on the current and proposed mortality tables.

Sample Attained Ages	Future Life Expectancy (years)			
	Present		Proposed*	
	Men	Women	Men	Women
50	32.77	34.63	34.78	36.53
55	28.04	29.88	30.03	31.60
60	23.47	25.31	25.48	26.82
65	19.17	21.02	21.10	22.25
70	15.22	17.06	16.92	17.95
75	11.58	13.47	13.09	14.01
80	8.42	10.23	9.72	10.50

** Applicable to calendar year 2014. Life expectancy in future years are determined by the MP-2015 projection scale.*

RETIRED LIFE MORTALITY
NON-DISABILITY RETIREES
MALES

Age	Deaths	Exposure	Crude Rates	Sample Rates*		Expected Deaths**	
				Present	Proposed	Present	Proposed
50-54	2	488	0.004098	0.001781	0.004954	0.9	2.7
55-59	2	791	0.002528	0.003331	0.006574	2.7	5.4
60-64	6	1,120	0.005357	0.006473	0.008952	7.6	11.1
65-69	13	1,197	0.010860	0.012374	0.013435	14.6	18.2
70-74	11	734	0.014986	0.020164	0.021506	14.7	17.8
75-79	10	374	0.026738	0.036105	0.035492	13.3	14.9
80-84	19	278	0.068345	0.068542	0.060378	19.0	18.8
85-89	14	122	0.114754	0.120616	0.105120	14.0	13.6
90-94	8	32	0.250000	0.203973	0.178833	6.2	5.9
95-99	2	7	0.285714	0.288083	0.266128	1.9	1.8
100-104	-	-	N/A	0.371685	0.365543	-	-
105-109	-	-	N/A	0.400000	0.456722	-	-
Other	1	47	0.021277			0.1	0.2
Totals	**88**	**5,190**	**0.016956**	**0.018304**	**0.021272**	**95.0**	**110.4**
Prior Experience							
2005-2009	73	4,805	0.0152			94.6	71.6

* *Sample rates are taken from midpoint of age group.*

** *"Expected deaths - Proposed" is calculated as the sum of rates applied to exposure at individual ages. "Expected deaths - Present" is the sum of actual probabilities applied in the valuation.*

There were slightly fewer male non-disability deaths than expected during the experience period.

SECTION I

COMPLETE LISTING OF RECOMMENDED ASSUMPTIONS

PROPOSED MERIT AND LONGEVITY PAY INCREASE RATES

% Merit Increases in Salaries Next Year	
Service Index	**Rate**
1	13.0%
2	10.0%
3	5.0%
4	3.0%
5	3.0%
6	3.0%
7	3.0%
8	0.8%
9	0.8%
10	0.8%
11	0.8%
12	0.8%
13	0.8%
14	0.8%
15	0.8%
16	0.8%
17	0.8%
18	0.8%
19	0.8%
20	0.8%
21+	0.4%
Ref	672

PROPOSED WITHDRAWAL RATES

Service Index	Proposed
1	0.1000
2	0.0400
3	0.0400
4	0.0400
5	0.0400
6	0.0100
7	0.0100
8	0.0100
9	0.0100
10	0.0100
11	0.0100
12	0.0100
13	0.0100
14	0.0100
15	0.0100
16	0.0075
17	0.0075
18	0.0075
19	0.0075
20	0.0075
21	0.0050
22	0.0050
23	0.0050
24	0.0050
25	0.0050
26	0.0050
27	0.0050
28	0.0050
29	0.0050
30 & Over	0.0050
Sw	1012

PROPOSED DISABILITY RATES

Age	% Becoming Disabled	
	Male	Female
20	0.08%	0.08%
21	0.08%	0.08%
22	0.08%	0.08%
23	0.08%	0.08%
24	0.08%	0.08%
25	0.08%	0.08%
26	0.08%	0.08%
27	0.08%	0.08%
28	0.13%	0.13%
29	0.18%	0.18%
30	0.23%	0.23%
31	0.28%	0.28%
32	0.33%	0.33%
33	0.36%	0.36%
34	0.39%	0.39%
35	0.42%	0.42%
36	0.45%	0.45%
37	0.48%	0.48%
38	0.55%	0.55%
39	0.63%	0.63%
40	0.70%	0.70%
41	0.78%	0.78%
42	0.85%	0.85%
43	0.85%	0.85%
44	0.85%	0.85%
45	0.85%	0.85%
46	0.85%	0.85%
47	0.85%	0.85%
48	0.94%	0.94%
49	1.04%	1.04%
50	1.13%	1.13%
51	1.23%	1.23%
52	1.32%	1.32%
53	1.32%	1.32%
54	1.32%	1.32%
55	1.32%	1.32%
56	1.32%	1.32%
57	1.32%	1.32%
58	1.32%	1.32%
59	1.32%	1.32%
60	0.00%	0.00%
Hx	465	465
Mult	100%	100%

PROPOSED RETIREMENT RATES

Age	% Retiring	
	Male	Female
48	30%	30%
49	15%	15%
50	15%	15%
51	15%	15%
52	15%	15%
53	15%	15%
54	10%	10%
55	30%	30%
56	25%	25%
57	30%	30%
58	30%	30%
59	40%	40%
60	100%	100%
Rx	2599	2599
anchor	48	48

In addition, it was assumed that 100% of eligible members age 55 and older would retire upon attaining 34 years of service. A member was assumed eligible for unreduced retirement at age 48 or greater with 25 or more years of service or age 52 or greater with 20 or more years of service. A member was assumed eligible for reduced retirement at age 48 or greater with 20 or more years of service.

It was assumed that members eligible to DROP would either retire or "DROP in" at first eligibility for unreduced retirement. 100% of members still working 8 years after first reaching retirement eligibility are assumed to retire.

PROPOSED EARLY RETIREMENT RATES

Age	% Retiring	
	Male	Female
48	3.0%	3.0%
49	2.0%	2.0%
50	2.0%	2.0%
51	2.0%	2.0%
Rx	1137	1137
anchor	48	48

PROPOSED PRE-RETIREMENT MORTALITY RATES*

Age	% Dying Next Year	
	Male	Female
20	0.0371%	0.0187%
21	0.0411%	0.0183%
22	0.0448%	0.0179%
23	0.0469%	0.0179%
24	0.0469%	0.0178%
25	0.0450%	0.0178%
26	0.0432%	0.0181%
27	0.0422%	0.0184%
28	0.0419%	0.0189%
29	0.0419%	0.0197%
30	0.0432%	0.0209%
31	0.0445%	0.0223%
32	0.0461%	0.0240%
33	0.0477%	0.0260%
34	0.0492%	0.0281%
35	0.0507%	0.0304%
36	0.0519%	0.0327%
37	0.0534%	0.0355%
38	0.0552%	0.0386%
39	0.0576%	0.0421%
40	0.0608%	0.0459%
41	0.0648%	0.0501%
42	0.0699%	0.0547%
43	0.0766%	0.0600%
44	0.0847%	0.0658%
45	0.0946%	0.0722%
46	0.1062%	0.0792%
47	0.1195%	0.0869%
48	0.1344%	0.0947%
49	0.1508%	0.1029%
50	0.1686%	0.1120%
51	0.1879%	0.1217%
52	0.2092%	0.1326%
53	0.2307%	0.1447%
54	0.2541%	0.1583%
55	0.2798%	0.1734%
56	0.3085%	0.1902%
57	0.3412%	0.2088%
58	0.3783%	0.2292%
59	0.4205%	0.2515%
60	0.4687%	0.2756%
61	0.5234%	0.3020%
62	0.5855%	0.3303%
63	0.6565%	0.3613%
64	0.7371%	0.3952%
65	0.8287%	0.4319%
Ref	#2133sb0x1	#2134sb0x1

** Applicable to calendar year 2014. Rates in future years are determined by the above rates and the MP-2015 projection scale.*

PROPOSED POST-RETIREMENT MORTALITY RATES
NON-DISABILITY RETIREES*

Age	% Dying Next Year	
	Male	Female
50	0.4064%	0.2813%
51	0.4403%	0.2934%
52	0.4753%	0.3083%
53	0.5082%	0.3266%
54	0.5413%	0.3488%
55	0.5754%	0.3752%
56	0.6110%	0.4065%
57	0.6487%	0.4429%
58	0.6884%	0.4848%
59	0.7308%	0.5326%
60	0.7768%	0.5859%
61	0.8274%	0.6453%
62	0.8835%	0.7101%
63	0.9475%	0.7804%
64	1.0200%	0.8573%
65	1.1025%	0.9404%
66	1.1967%	1.0322%
67	1.3030%	1.1331%
68	1.4233%	1.2448%
69	1.5598%	1.3679%
70	1.7130%	1.5041%
71	1.8842%	1.6541%
72	2.0762%	1.8188%
73	2.2906%	2.0004%
74	2.5297%	2.2012%
75	2.7961%	2.4239%
76	3.0947%	2.6720%
77	3.4292%	2.9511%
78	3.8048%	3.2668%
79	4.2274%	3.6241%
80	4.7044%	4.0308%

Age	% Dying Next Year	
	Male	Female
81	5.2395%	4.4956%
82	5.8449%	5.0227%
83	6.5271%	5.6235%
84	7.2957%	6.3063%
85	8.1564%	7.0747%
86	9.1195%	7.9385%
87	10.1959%	8.9037%
88	11.3933%	9.9722%
89	12.7200%	11.1493%
90	14.1920%	12.4513%
91	15.7467%	13.8527%
92	17.3455%	15.3330%
93	18.9632%	16.8743%
94	20.5910%	18.4634%
95	22.2226%	20.0981%
96	24.0281%	21.8622%
97	25.8833%	23.6929%
98	27.7999%	25.5856%
99	29.7738%	27.5384%
100	31.7884%	29.5342%
101	33.8204%	31.5486%
102	35.8304%	33.5660%
103	37.8206%	35.5684%
104	39.7572%	37.5189%
105	41.6171%	39.4299%
106	43.4211%	41.2705%
107	45.1122%	43.0138%
108	46.7214%	44.6686%
109	48.2403%	46.2173%
110	100.0000%	100.0000%
Ref	#2135sb0x1	#2136sb0x1

* *Applicable to calendar year 2014. Rates in future years are determined by the above rates and the MP-2015 projection scale.*

PROPOSED POST-RETIREMENT MORTALITY RATES
DISABILITY RETIREES*

Age	% Dying Next Year	
	Male	Female
50	2.0393%	1.2104%
51	2.1111%	1.2571%
52	2.1824%	1.3087%
53	2.2387%	1.3664%
54	2.2916%	1.4304%
55	2.3450%	1.5001%
56	2.3999%	1.5760%
57	2.4591%	1.6566%
58	2.5216%	1.7410%
59	2.5878%	1.8291%
60	2.6595%	1.9188%
61	2.7380%	2.0119%
62	2.8251%	2.1079%
63	2.9260%	2.2089%
64	3.0405%	2.3186%
65	3.1721%	2.4377%
66	3.3223%	2.5715%
67	3.4899%	2.7220%
68	3.6783%	2.8919%
69	3.8892%	3.0827%
70	4.1213%	3.2967%
71	4.3760%	3.5344%
72	4.6564%	3.7964%
73	4.9622%	4.0854%
74	5.2959%	4.4034%
75	5.6584%	4.7517%
76	6.0553%	5.1332%
77	6.4891%	5.5522%
78	6.9640%	6.0119%
79	7.4851%	6.5133%
80	8.0594%	7.0607%

Age	% Dying Next Year	
	Male	Female
81	8.6874%	7.6592%
82	9.3828%	8.3049%
83	10.1499%	9.0056%
84	10.9963%	9.7634%
85	11.9248%	10.5728%
86	12.9444%	11.4386%
87	14.0637%	12.3589%
88	15.2864%	13.3277%
89	16.6162%	14.3433%
90	18.0659%	15.4181%
91	19.5076%	16.5917%
92	20.9383%	17.8505%
93	22.3528%	19.1784%
94	23.7522%	20.5596%
95	25.1315%	21.9893%
96	26.6769%	23.5525%
97	28.2394%	25.1748%
98	29.8284%	26.8486%
99	31.4427%	28.5723%
100	33.0771%	30.3335%
101	34.7318%	32.1185%
102	36.4074%	33.9297%
103	38.1234%	35.7606%
104	39.8626%	37.5864%
105	41.6171%	39.4299%
106	43.4211%	41.2705%
107	45.1122%	43.0138%
108	46.7214%	44.6686%
109	48.2403%	46.2173%
110	100.0000%	100.0000%
Ref	#2137sb0x1	#2138sb0x1

** Applicable to calendar year 2014. Rates in future years are determined by the above rates and the MP-2015 projection scale.*

GRS
Gabriel Roeder Smith & Company
Consultants & Actuaries
One Towne Square
Suite 800
Southfield, MI 48076-3723
248.799.9000 phone
248.799.9020 fax
www.gabrielroeder.com

March 21, 2016

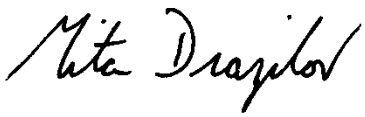
Mr. Mark Atkeson, Executive Director
Ohio State Highway Patrol
Retirement System
1900 Polaris Parkway, Suite 201
Columbus, Ohio 43240-4037

Dear Mark:

Enclosed are 20 copies of the report of an actuarial investigation of decrement experience covering the period from January 1, 2010 through December 31, 2014.

We look forward to meeting and discussing the results of this study with the Board.

Sincerely,



Mita D. Drazilov

MDD:sc

Enclosures