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GASB STATEMENT NO. 68 REPORT

FOR THE

STATE POLICE RETIREMENT SYSTEM

PREPARED AS OF JUNE 30, 2016

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CONSULTING, LLC
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February 27, 2017

Board of Directors
Kentucky Retirement System
Perimeter Park West
1260 Louisville Road
Frankfort, KY 40601

Ladies and Gentlemen:

Presented in this report is information to assist the State of Kentucky in meeting the requirements of the Governmental Accounting Standards Board (GASB) Statement No. 68 as a result of its participation in the State Police Retirement System (SPRS). The information is presented for the period ending June 30, 2017 (Reporting Date).

The annual actuarial valuation used as a basis for much of the information presented in this report was performed as of June 30, 2016 (Measurement Date). The valuation was based upon data, furnished by the Executive Director and the Kentucky Retirement Systems staff, concerning active, inactive and retired members along with pertinent financial information.

To the best of our knowledge, this report is complete and accurate. The necessary calculations were performed by, and under the supervision of, independent actuaries who are members of the American Academy of Actuaries with experience in performing valuations for public retirement systems.

The calculations were prepared in accordance with the principles of practice prescribed by the Actuarial Standards Board, and, in our opinion, meet the requirements of GASB 68.

The actuarial calculations were performed by qualified actuaries according to generally accepted actuarial procedures and methods. The calculations are based on the current provisions of the System, and on actuarial assumptions that are, individually and in the aggregate, internally consistent and reasonably based on the actual experience of the System. In addition, the calculations were completed in compliance with the laws governing the System. The undersigned are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

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Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

Respectfully submitted,

Todd B. G

Beverly V Bailey

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Principal and Consulting Actuary

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Senior Actuary

TBG/bvb

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REPORT OF THE ANNUAL GASB STATEMENT NO. 68
REQUIRED INFORMATION FOR THE
STATE POLICE RETIREMENT SYSTEM
PREPARED AS OF JUNE 30, 2016

SECTION I – SUMMARY OF PRINCIPAL RESULTS

Valuation Date (VD):	June 30, 2015
Measurement Date (MD):	June 30, 2016
Single Equivalent Interest Rate (SEIR):	
Long-Term Expected Rate of Return	6.75%
Municipal Bond Index Rate	N/A
Fiscal Year in which Plan's Fiduciary Net Position is projected to be depleted from future benefit payments for current members	N/A
Single Equivalent Interest Rate	6.75%
Net Pension Liability (Beginning of Year):	
Total Pension Liability (TPL)	$ 734,156,446
Fiduciary Net Position (FNP)	247,227,579
Net Pension Liability (NPL = TPL – FNP)	$ 486,928,867
FNP as a percentage of TPL	33.68%
Net Pension Liability (End of Year):	
Total Pension Liability (TPL)	$ 795,421,298
Fiduciary Net Position (FNP)	218,012,479
Net Pension Liability (NPL = TPL – FNP)	$ 577,408,819
FNP as a percentage of TPL	27.41%
Pension Expense (PE):	$ 74,857,297
Deferred Outflows of Resources:	$ 75,651,531
Deferred Inflows of Resources:	$ 0

SECTION II – INTRODUCTION

The Governmental Accounting Standards Board issued Statement No. 68 (GASB 68), "Accounting and Financial Reporting for Pensions", in June 2012. GASB 68's effective date is for plan years beginning after June 15, 2014. This report, prepared as of June 30, 2016 (the Measurement Date), presents information to assist the Kentucky Retirement System in meeting the requirements of GASB 68 for the fiscal year ending June 30, 2017. Much of the material provided in this report is based on the results of the GASB 67 report for the State Police Retirement System.

GASB 68 creates disclosure and reporting requirements that may or may not be consistent with the basis used for funding the Plan.

The NPL shown in the GASB Statement No. 67 Report for the SPRS as of June 30, 2016 is the NPL used for purposes of GASB 68. Please refer to that report for the derivation of the collective NPL.

Pension Expense includes amounts for service cost (the normal cost under the Entry Age Normal actuarial cost method for the year), interest on the Total Pension Liability (TPL), changes in benefit structure, amortization of increases/decreases in liability due to actuarial experience and actuarial assumption changes, and amortization of investment gains/losses. The actuarial experience and assumption change impacts are amortized over the average expected remaining service life of the Plan membership as of the Measurement Date, and investment gains/losses are amortized over five years. The development of the collective PE is shown in Section V.

The unamortized portions of each year's experience, assumption changes and investment gains/losses are used to develop deferred inflows and outflows, which also must be included in the employer's financial statements. The development of the deferred inflows and outflows is shown in Section III.

Section I of this report is a summary of the principal results of the collective amounts under GASB 68. Section III and Section IV provides the results of all the necessary calculations, presented in the order laid out in GASB 68 for note disclosure and Required Supplementary Information (RSI).

SECTION III – FINANCIAL STATEMENT NOTES

The material presented herein will follow the order presented in GASB 68. Paragraph numbers are provided for ease of reference.

Paragraphs 40(a) and (b): The information required is to be supplied by KRS.

Paragraph 40(c): The data required regarding the membership of the State Police Retirement System were furnished by the Kentucky Retirement Systems office. The following table summarizes the membership of the system as of June 30, 2016, the Measurement Date.

Membership

	Number
Inactive Members Or Their Beneficiaries Currently Receiving Benefits	1,515
Inactive Members Entitled To But Not Yet Receiving Benefits	455
Active Members	908
Total	2,878

Paragraphs 40(d) and (e): The information required is to be supplied by the Kentucky Retirement System.

Paragraphs 41: This paragraph requires information regarding the actuarial assumptions used to measure the TPL. The actuarial assumptions utilized in developing the TPL are outlined in Schedule C. The total pension liability was determined as of June 30, 2016 using standard roll-forward techniques, using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	3.25 percent
Salary increases	4.00 percent, average, including inflation
Investment rate of return	6.75 percent, net of pension plan investment expense, including inflation

The mortality table used for active members is RP-2000 Combined Mortality Table projected with Scale BB to 2013 (multiplied by 50% for males and 30% for females). For healthy retired members and beneficiaries, the mortality table used is the RP-2000 Combined Mortality Table projected with Scale BB to 2013 (set back 1 year for females). For disabled members, the RP-2000 Combined Disabled Mortality Table projected with Scale BB to 2013 (set back 4 years for males) is used for the period after disability retirement. There is some margin in the current mortality tables for possible future improvement in mortality rates and that margin will be reviewed again when the next experience investigation is conducted.

The actuarial assumptions used in the June 30, 2015 valuation were based on the results of an actuarial experience study for the period July 1, 2008 – June 30, 2013.

Paragraph 42:

- **(a) Discount rate:** The discount rate used to measure the total pension liability was 6.75%.
- **(b) Projected cash flows:** The projection of cash flows used to determine the discount rate assumed that local employers would contribute the actuarially determined contribution rate of projected compensation over the remaining 28 year amortization period of the unfunded actuarial accrued liability. The actuarial determined contribution rate is adjusted to reflect the phase in of anticipated gains on actuarial value of assets over the first four years of the projection period.
- **(c) Long term rate of return:** The long-term expected return on plan assets is reviewed as part of the regular experience studies prepared every five years for the System. The most recent analysis was dated December 3, 2015. Several factors are considered in evaluating the long-term rate of return assumption including long term historical data, estimates inherent in current market data, and a log-normal distribution analysis in which best-estimate ranges of expected future real rates of return (expected return, net of investment expense and inflation) were developed by the investment consultant for each major asset class. These ranges were combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and then adding expected inflation. The capital market assumptions developed by the investment consultant are intended for use over a 10-year horizon and may not be useful in setting the long-term rate of return for funding pension plans which covers a longer timeframe. The assumption is intended to be a long term assumption and is not expected to change absent a significant change in the asset allocation, a change in the inflation assumption, or a fundamental change in the market that alters expected returns in future years.
- **(d) Municipal bond rate:** the discount rate determination does not use a municipal bond rate.
- **(e) Periods of projected benefit payments:** projected future benefit payments for all current plan members were projected through 2117.

(f) **Assumed Asset Allocation:** The target asset allocation and best estimates of arithmetic real rates of return for each major asset class are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Global Equity	54%	5.30%
Intermediate Duration Fixed Income	9	1.00
Custom KRS Fixed Income	9	3.33
Core Real Estate	5	4.25
Diversified Hedge Funds	10	4.00
Private Equity	2	8.00
Diversified Inflation Strategy	8	3.15
Cash Equivalent	3	-0.25
Total	100%	

Paragraph 42(g): This paragraph requires disclosure of the sensitivity of the net pension liability to changes in the discount rate. The following presents the net pension liability of the System, calculated using the discount rate of percent, as well as what the System's net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (5.75 percent) or 1-percentage-point higher (7.75 percent) than the current rate:

	1% Decrease (5.75%)	Current Discount Rate (6.75%)	1% Increase (7.75%)
System's net pension liability	$665,253,333	$577,408,819	$503,953,106

Paragraph 43: This information is will be provided by KRS.

Paragraph 44: This paragraph requires a schedule of changes in Net Pension Liability. The needed information is provided in the table below.

CHANGES IN THE NET PENSION LIABILITY

	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) – (b)
Balances at June 30, 2015	$734,156,446	$247,227,579	$486,928,867
Prior Year Adjustment	0	4	(4)
Changes for the year:			
Service cost	$8,401,685		$8,401,685
Interest	52,951,274		52,951,274
Benefit changes	0		0
Assumption Changes	56,190,811		56,190,811
Difference between expected and actual experience	0		0
Contributions – employer		$25,822,003	(25,822,003)
Contributions – employee		5,262,749	(5,262,749)
Net investment income		(3,843,029)	3,843,029
Benefit payments	(56,267,681)	(56,267,681)	0
Refund of employee contributions	(11,237)	(11,237)	0
Administrative expense		(177,909)	177,909
Other changes	0	0	0
Net changes	61,264,852	(29,215,104)	90,479,956
Balances at June 30, 2016	$795,421,298	$218,012,479	$577,408,819

Paragraph 45(a): June 30, 2015 is the actuarial valuation date upon which the TPL is based. An expected TPL is determined as of June 30, 2016 using standard roll forward techniques. The roll forward calculation adds the annual normal cost (also called the service cost), subtracts the actual benefit payments and refunds for the plan year and then applies the expected investment rate of return for the year. Please refer to the GASB Statement No. 67 Report for the for the roll forward procedure used to determine the TPL as of June 30, 2016.

Paragraph 45(b): A special funding situation does not exist therefore there is no proportioning of the net pension liability.

Paragraph 45(c): **S**ince the prior measurement date, the demographic and economic assumptions that affect the measurement of the total pension liability have been updated as described in Schedule C. A summary is shown below:

- The assumed investment rate of return was decreased from 7.50% to 6.75%.

Paragraph 45(d): There were no changes in the benefit terms that affected the measurement of the total pension liability since the prior measurement date.

Paragraph 45(e): There are no benefit payments in the measurement period attributable to the purchase of allocated insurance contracts were purchased in the measurement period.

Paragraph 45(f): There were no changes in the between the measurement date of the net pension liability and the employer's reporting date.

Paragraph 45(g): See Section V for the development of the pension expense.

Paragraph 45(h): Since certain expense items are amortized over closed periods each year, the deferred portions of these items must be tracked annually. If the amounts serve to reduce pension expense they are labeled deferred inflows. If they will increase pension expense they are labeled deferred outflows. As noted in the previous section, the amortization of these amounts is accomplished on a level dollar basis, with no interest included in the deferred amounts. Experience gains/losses and the impact of changes in actuarial assumptions, if any, are amortized over the average remaining service life of the active and inactive System members at the beginning of the fiscal year. Investment gains and losses are amortized over a fixed five year period.

The table below provides a summary of the deferred inflows and outflows as of the measurement date June 30, 2016.

	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	$ 3,709,907	$0
Changes of assumptions	53,989,476	0
Net difference between projected and actual earnings on plan investments	17,952,148	0
Employer contributions subsequent to the Measurement Date	0	0
Total	$ 75,651,531	$0

* The deferred outflows of resources reported by an employer should include contributions made by the employer during the fiscal year that will be reflected in the net pension liability in the next measurement period.

Paragraph 45(i): $0 reported as deferred outflows of resources related to pensions resulting from Employer contributions subsequent to the Measurement Date will be recognized as a reduction of the net pension liability in the year ended. Other amounts reported as deferred outflows of resources and deferred inflows of resources related to pensions will be recognized in pension expense as follows:

Deferred Amounts to be recognized in Fiscal Years Following the Reporting Date	**Deferred (Inflows)/Outflows of Resources**
Year 1	$36,179,798
Year 2	26,034,766
Year 3	9,150,238
Year 4	4,286,729
Year 5	0
Thereafter	0

SECTION IV – REQUIRED SUPPLEMENTARY INFORMATION

There are several tables of Required Supplementary Information (RSI) that need to be included in the System's financial statements:

Paragraphs 46(a) and (b): The required tables are provided in Schedule A and the information is as of the Measurement Dates.

Paragraph 46(c): The required table is provided in Schedule A and the information is as of the Employer's Fiscal Year Ends.

Paragraph 47: In addition the following should be noted regarding the RSI:

Changes of benefit terms: The following changes were made by the Kentucky Legislature and reflected in the valuation performed as of June 30 listed below:

2009: A new benefit tier for members who first participate on or after September 1, 2008 was introduced which included the following changes:

1. Tiered Structure for benefit accrual rates
2. New retirement eligibility requirements
3. Different rules for the computation of final average compensation

2014: As cash balance plan was introduced for member whose participation date is on or after January 1, 2014

Changes of assumption: The following changes were made by the Kentucky Legislature and reflected in the valuation performed as of June 30 listed below:

2015

- The assumed investment rate of return was decreased from 7.75% to7.50%.
- The assumed rate of inflation was reduced from 3.50% to 3.25%.
- The assumed rate of wage inflation was reduced from 1.00% to 0.75%.
- Payroll growth assumption was reduced from 4.50% to 4.00%.
- The mortality table used for active members is RP-2000 Combined Mortality Table projected with Scale BB to 2013 (multiplied by 50% for males and 30% for females).
- For healthy retired members and beneficiaries, the mortality table used is the RP-2000 Combined Mortality Table projected with Scale BB to 2013 (set back 1 year for females). For disabled members, the RP-2000 Combined Disabled Mortality Table projected with Scale BB to 2013 (set back 4 years for males) is used for the period after disability retirement. There is some margin in the current mortality tables for possible future

improvement in mortality rates and that margin will be reviewed again when the next experience investigation is conducted.

- The assumed rates of Retirement and Withdrawal were updated to more accurately reflect experience.

2016

- The assumed investment rate of return was decreased from 7.50% to 6.75%.

Method and assumptions used in calculations of actuarially determined contributions. The actuarially determined contribution rates are determined on a biennial basis beginning with the fiscal years ended 2016 and 2017, determined as of July 1, 2015. The amortization period of the unfunded liability has been reset as of July 1, 2013 to a closed 30-year period. The following actuarial methods and assumptions were used to determine contribution rates reported in that schedule:

Actuarial cost method	Entry age
Amortization method	Level percentage of payroll, closed
Remaining amortization period	27 years
Asset valuation method	5-year smoothed market
Inflation	3.25 percent
Salary increase	4.00 percent, average, including inflation
Investment rate of return	6.75 percent, net of pension plan investment expense, including inflation

SECTION V – PENSION EXPENSE

As noted earlier, the Pension Expense (PE) consists of a number of different items. GASB 68 refers to the first as Service Cost which is the Normal Cost using the Entry Age Normal actuarial funding method. To this is added interest on the TPL at the rate of return in effect as of the prior measurement date.

The next three items refer to any changes that occurred in the TPL (i.e., actuarial accrued liability (AAL) under EAN) due to:

1. Benefit changes,
2. Actual versus expected experience or
3. Changes in actuarial assumptions.

Benefit changes, which are reflected immediately in PE, can be positive, if there is a benefit improvement for existing Plan members, or negative if there is a benefit reduction. For the year ended June 30, 2016 there were no benefit changes to be recognized.

The remaining service life of active members is the average number of years the active members are expected to remain active. For the year ended this number is 9.30. The remaining service life of the inactive members is, of course, zero. The figure to use for the amortization is the weighted average of these two amounts, or 3.09.

Calculation of Weighted Average Years of Working Lifetime

Category	Number (1)	Average Years of Working Lifetime (2)
a. Active Members	937	9.30
b. Inactive Members	1,885	0.00
c. Total	2,822	
Weighted Average Years of Working Lifetime [(a1 * a2) + (b1 * b2)]/c1		3.09

The next item to be recognized is the portion of current year changes in TPL due to actual versus expected experience for the year. The portion to recognize in the current year is determined by spreading the total change over the average expected remaining service life of the entire Plan membership. For the year ended June 30, 2016, there was no change due to actual versus expected experience.

The last items under changes in TPL are changes in actuarial assumptions. The portion to recognize in the current year is determined by spreading the total change over the average expected remaining service life of the entire Plan membership, similar to the way experience gains and losses are recognized. For the year ended June 30, 2016 this amount was equal to $56,190,811. $18,184,728 will be recognized in pension expense and $38,006,083 is a deferred outflow of resources.

Member contributions for the year and projected earnings on the FNP at the discount rate serve to reduce the expense.

One-fifth of current-period difference between actual and projected earning on the FNP are recognized in the pension expense. For the year ended June 30, 2016 this amount was $21,433,645 due to investment return less than the assumed return of 7.50%. $4,286,729 will be recognized in pension expense and $17,146,916 is a deferred outflow of resources.

Investment Earnings (Gain)/Loss as of June 30, 2016		
a	Expected asset return rate	7.50%
b	Beginning of year market value assets (BOY)	$ 247,227,579
c	Adjustment to BOY market value of assets	4
d	BOY market value assets	247,227,583
e	End of year market value assets (EOY)	218,012,479
f	Expected return on BOY for plan year (a x d)	18,542,069
	External Cash Flow	
	Contributions - employer	25,822,003
	Contributions - member	5,262,749
	Refunds of contributions	(11,237)
	Benefits paid	(56,267,681)
	Admin expenses	(177,909)
	Other changes	0
g	Total net external cash flow	(25,372,075)
h	Expected return on net cash flow (a x 0.5 x g)	(951,453)
i	Projected earnings for plan year (f + h)	17,590,616
j	Net investment income (e - d - g)	(3,843,029)
	Investment earnings (gain)/loss (i - j)	**21,433,645**

The current year portions of previously determined experience, assumption, and earnings amounts, recognized as deferred inflows and outflows are included. Deferred outflows are added to the PE and deferred inflows are subtracted from the PE. Finally administrative expenses and other miscellaneous items are included.

The Pension Expense determined as of the measurement date of June 30, 2016 for the SPRS is shown in the table below.

Pension Expense Determined as of the Measurement Date	
Service Cost	$ 8,401,685
Interest on the total pension liability	52,951,274
Current-period benefit changes	0
Expensed portion of current-period difference between expected and actual experience in the total pension liability	0
Expensed portion of current-period changes of assumptions	18,184,728
Member contributions	(5,262,749)
Projected earnings on plan investments	(17,590,616)
Expensed portion of current-period differences between actual and projected earnings on plan investments	4,286,729
Administrative expense	177,909
Other*	(4)
Recognition of beginning deferred outflows of resources as pension expense	14,919,167
Recognition of beginning deferred inflows of resources as pension expense	(1,210,826)
Pension Expense	$74,857,297

* Prior Year Adjustment

SCHEDULE A

REQUIRED SUPPLEMENTARY INFORMATION

SCHEDULE OF CHANGES IN THE NET PENSION LIABILITY

	2016	2015	2014
Total pension liability			
Service Cost	8,401,685	7,695,435	7,141,935
Interest	52,951,274	50,661,229	50,390,898
Benefit changes	0	0	0
Difference between expected and actual experience	0	9,330,978	0
Changes of assumptions	56,190,811	40,200,657	0
Benefit payments	(56,267,681)	(54,765,255)	(53,025,585)
Refunds of contributions	(11,237)	(85,000)	(213,540)
Net change in total pension liability	61,264,852	53,038,044	4,293,708
Total pension liability - beginning	734,156,446	681,118,402	676,824,694
Total pension liability - ending (a)	795,421,298	734,156,446	681,118,402
Plan net position			
Contributions - employer	25,822,003	31,989,753	20,279,448
Contributions - member	5,262,749	5,244,508	5,075,173
Net investment income	(3,843,029)	3,425,666	40,373,917
Benefit payments	(56,267,681)	(54,765,255)	(53,025,585)
Administrative expense	(177,909)	(201,108)	(214,953)
Refunds of contributions	(11,237)	(85,000)	(213,540)
Other	0	644,756	0
Net change in plan net position	(29,215,104)	(13,746,680)	12,274,460
	0	260,974,259	248,699,799
Plan net position - beginning	247,227,579	260,974,259	248,699,799
Prior period adjustment	4	0	0
Plan net position - ending (b)	218,012,479	247,227,579	260,974,259
Net pension liability - ending (a) - (b)	577,408,819	486,928,867	420,144,143

SCHEDULE OF THE NET PENSION LIABILITY

	2016	2015	2014
Total pension liability	795,421,298	734,156,446	681,118,402
Plan net position	218,012,479	247,227,579	260,974,259
Net pension liability	577,408,819	486,928,867	420,144,143
Ratio of plan net position to total pension liability	27.41%	33.68%	38.32%
Covered-employee payroll	46,684,796	45,764,515	44,615,885
Net pension liability as a percentage of covered-employee payroll	1,236.82%	1,063.99%	941.69%

SCHEDULE OF EMPLOYER CONTRIBUTIONS

($ in Thousands)

	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
Actuarially determined employer contribution	$25,723	$31,444	$25,808	$23,117	$20,498	$18,463	$18,765	$15,952	$13,823	$9,024
Actual employer contributions	25,822	31,990	20,279	18,501	15,362	12,657	9,489	8,186	7,443	6,142
Annual contribution deficiency (excess)	(99)	(546)	5,529	4,616	5,136	5,806	9,276	7,766	6,380	2,882
Covered-employee payroll	$46,685	$45,765	$44,616	$45,256	$48,373	$48,693	$51,507	$51,660	$53,269	$49,248
Actual contributions as a percentage of covered-employee payroll	55.31%	69.90%	45.45%	40.88%	31.76%	25.99%	18.42%	15.85%	13.97%	12.47%

SCHEDULE B

SUMMARY OF MAIN BENEFIT AND CONTRIBUTION PROVISIONS

This schedule summarizes the major retirement benefit provisions of SPRS included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Plan Year: July 1 through June 30

Normal Retirement:

Members whose participation began before 9/1/2008

Age Requirement 55

Service Requirement At least one month of hazardous duty service credit

Amount If a member has at least 60 months of service, the monthly benefit is 2.50% multiplied by final average compensation, multiplied by years of service.

Final compensation is calculated by taking the average of the highest three (3) fiscal years of salary. If the number of months of service credit during the three (3) year period is less than twenty-four (24), one (1) or more additional fiscal years shall be used.

If a member has less than 60 months of service, the monthly benefit is the actuarial equivalent of two times the member's contributions with interest.

Members whose participation began on or after 9/1/2008 but before 1/1/2014

Age Requirement 60

Service Requirement At least 60 months of hazardous duty service credit

Amount The monthly benefit is the following benefit factor based on service credit at retirement, multiplied by final average compensation, multiplied by years of service.

Service Credit	Benefit Factor
10 years or less	1.30%
10+ – 20 years	1.50%
20+ – 25 years	2.25%
25+ years	2.50%

Final compensation is calculated by taking the average of the highest three (3) complete fiscal years of salary. Each fiscal year used to determine final compensation must contain twelve (12) months of service credit.

Members whose participation began on or after 1/1/2014

Age Requirement	60
Service Requirement	At least 60 months of hazardous duty service credit or 25 or more years of service, with no age requirement
Amount	Each year that a member is an active contributing member to the System, the member and the member's employer will contribute 8.00% and 7.50% of creditable compensation respectively into a hypothetical account. This hypothetical account will earn interest annually on both the member's and employer's contribution at a minimum rate of 4%. If the System's geometric average net investment return for the previous five years exceeds 4%, then the hypothetical account will be credited with an additional amount of interest equal to 75% of the amount of the return which exceeds 4%. All interest credits will be applied to the hypothetical account balance on June 30 based on the account balance as of June 30 of the previous year. Upon retirement the hypothetical account which includes member contributions, employer contributions and interest credits can be withdrawn from the System as a lump sum or annuitized into a single life annuity option.

Early Retirement:

Members whose participation began before 9/1/2008

Requirement	Age 50 with 15 years of service or any age with 20 years service.
Amount	Normal retirement benefit reduced by 6.5% per year for the first five years and 4.5% per year for the next five years for each year the member is younger than age 55 or has less than 20 years service, whichever is smaller.

Members whose participation began on or after 9/1/2008 but before 1/1/2014

Requirement	Age 50 with 15 years of service or any age with 25 years service.
Amount	Normal retirement benefit reduced by 6.5% per year for the first five years and 4.5% per year for the next five years for each year the member is younger than age 60 or has less than 25 years service, whichever is smaller.

Disability:

Age Requirement	None
Service Requirement	60 months (waived if in line of duty disability)
Members whose participation began before 8/1/2004	Normal retirement benefit except if the member's total service credit is less than 20 years, service credit will be added for the period from the last day of paid employment to the member's 55th birthday. The maximum service credit added will not exceed the total service the member had on this last day of paid employment and the maximum service credit for calculating his retirement allowance, including total service and service added will not exceed 20 years. May not apply if eligible for an unreduced retirement allowance. A member in a hazardous position who is disabled in the line of duty is entitled to the normal retirement benefit based on years of service and final compensation determined as of the date of disability (no penalty), except that the monthly retirement allowance payable shall not be less than 25% of the member's monthly final monthly rate of pay. Each dependent child shall receive 10% of the disabled member's monthly final rate of pay; however the total maximum dependent children's benefit shall not exceed 40% of the member's monthly final rate of pay.
Members whose participation began on or after 8/1/2004 but before 1/1/2014	Normal retirement benefit based on years of service and final compensation determined as of the date of disability (no penalty) or, if larger, 25% of the member's monthly final rate of pay.
Members whose participation began on or after 1/1/2014	The hypothetical account which includes member contributions, employer contributions and interest credits can be withdrawn from the System as a lump sum or an

annuity equal to the larger of 25% of the member's monthly final rate of pay or the annuitized hypothetical account into a single life annuity option.

Vesting:

Members whose participation began before 9/1/2008

Age Requirement	None
Service Requirement	60 months. Service purchased after August 1, 2004 does not count toward vesting insurance benefits. Service purchased by employees who began participating on or after August 1, 2004 does not count toward vesting retirement benefits. Recontribution of refunds and omitted service purchases are the exception to this rule for service requirement.
Amount	Normal retirement benefit deferred to normal retirement age or reduced benefit payable at early retirement age.
Normal Retirement Age	55

Members whose participation began on or after 9/1/2008 but before 1/1/2014

Age Requirement	None
Service Requirement	60 months.
Amount	Normal retirement benefit deferred to normal retirement age or reduced benefit payable at early retirement age.

Members whose participation began on or after 1/1/2014

Age Requirement	None
Service Requirement	60 months.
Amount	Upon termination the hypothetical account which includes member contributions, employer contributions and interest credits can be withdrawn from the System as a lump sum or the member can elect to leave the hypothetical account balance in the System. If the member does not withdraw the account balance, it will continue to earn 4% interest. Upon reaching normal retirement age the member can apply for retirement and

	receive the account balance as a lump sum payment or annuitize the account balance into a single life annuity.

Pre-Retirement Death Benefit (not in line of duty):

Members whose participation began before 1/1/2014

Requirement	Eligible for Normal or Early Retirement, or any age in active employment with 60 months service, or any age and not in active employment with at least 144 months of service.
Amount	Benefit equal to the benefit the member would have received had the member retired on the day before the date of death and elected a 100% joint and survivor form. Benefit is actuarially reduced if member is less than normal retirement age at the date of death.

Members whose participation began on or after 1/1/2014

Requirement	60 months service
Amount	The maximum of the benefit equal to the benefit the member would have received had the member retired on the day before the date of death.

Spouse's Pre-Retirement Death Benefit (in line of duty):

Requirement	None
Amount	The spouse may choose (1) a $10,000 lump sum payment and monthly payments of 25% of the member's final monthly rate of pay or (2) benefit options offered under death not in line of duty.

Dependent Non-Spouse's Death Benefit (in line of duty):

Requirement	None
Amount	The non-spouse may choose (1) a $10,000 lump sum payment or (2) benefit options offered under death not in line of duty.

Dependent Child's Death Benefit (in line of duty):

Requirement	None

Amount	10% of member's final monthly rate of pay. Dependent child payments cannot exceed 40% of the member's monthly final rate of pay.

Post-Retirement Death Benefit:

Requirement	Retired member in receipt of monthly benefit based on at least 48 months or more of combined service with KERS, CERS or SPRS.
Amount	$5,000

Member Contributions:

Members whose participation began before 9/1/2008	8% of all creditable compensation. Interest paid on the members' accounts is currently set at 2.5% and per statute, shall not be less than 2.0%. Member entitled to a full refund of contributions with interest.
Members whose participation began on or after 9/1/2008 and up to 1/1/2014	9% of all creditable compensation, with 8% being credited to the member's account and 1% deposited to the KRS 401(h) Account. Interest paid on the members' accounts will be set at 2.5%. Member entitled to a full refund of contributions and interest in their individual account, however, the 1% contributed to the insurance fund is non-refundable.
Members whose participation began on or after 1/1/2014	9% of all creditable compensation, with 8% being credited to the member's account and 1% deposited to the KRS 401(h) Account. Member entitled to a full refund of contributions and interest on the member's portion of the hypothetical account, however, the 1% contributed to the insurance fund is non-refundable

SCHEDULE C

STATEMENT OF ACTUARIAL ASSUMPTIONS AND METHODS

The assumptions and methods used in the valuation were based on the actuarial experience study for the five-year period ending June 30, 2013, submitted April 30, 2014, and adopted by the Board on December 4, 2014.

INVESTMENT RATE OF RETURN: 6.75% per annum, compounded annually for retirement and insurance benefits.

PRICE INFLATION: 3.25% per annum, compounded annually.

PAYROLL GROWTH: 4.00% per annum, compounded annually.

SALARY INCREASES: The assumed annual rates of future salary increases are as follows and include inflation at 4.00% per annum:

Service Years	Annual Rates of Salary Increases		
	Merit & Seniority	Base (Economy)	Increase Next Year
0-1	12.02%	4.00%	16.50%
1-2	7.21%	4.00%	11.50%
2-3	5.29%	4.00%	9.50%
3-4	4.33%	4.00%	8.50%
4-5	3.37%	4.00%	7.50%
5-6	2.40%	4.00%	6.50%
6-7	1.92%	4.00%	6.00%
7-8	1.92%	4.00%	6.00%
8-9	0.96%	4.00%	5.00%
9-10	0.48%	4.00%	4.50%
10 & Over	0.00%	4.00%	4.00%

DISABILITY: Representative assumed annual rates of disability are as follows:

Nearest Age	Annual Rates of Disability	
	Male	Female
20	0.05%	0.05%
30	0.09%	0.09%
40	0.20%	0.20%
50	0.56%	0.56%
60	1.46%	1.46%

RETIREMENT: The assumed annual rates of retirement are as follows:

Annual Rates of Retirement		
Service	Those Eligible for Service Retirement+	Those Eligible for Service Retirement++
20	22.00%	
21	22.00%	
22	22.00%	
23	28.00%	
24	28.00%	
25	28.00%	22.00%
26	28.00%	22.00%
27	28.00%	22.00%
28	44.00%	28.00%
29	44.00%	28.00%
30	44.00%	28.00%
31	58.00%	28.00%
32	58.00%	28.00%
33	58.00%	44.00%
34	58.00%	44.00%
35	58.00%	44.00%
36	58.00%	58.00%
37	58.00%	58.00%
38	58.00%	58.00%
39	58.00%	58.00%
40	58.00%	58.00%

+ For members participating before September 1, 2008. The annual rate of service retirement is 100% at age 55.
++ For members participating on or after September 1, 2008. The annual rate of service retirement is 100% at age 60.

WITHDRAWAL: The assumed annual rates of withdrawal are as follows:

Service Years	Annual Rates of Withdrawal
0-1	20.00%
1-2	7.00%
2-9	3.00%
9 & Over	2.50%

DEATH BEFORE RETIREMENT: The rates of mortality for the period before retirement are according to the RP-2000 Combined Mortality Table projected with Scale BB to 2013 (multiplied by 50% for males and 30% for females).

DEATH AFTER RETIREMENT: The rates of mortality for the period after service retirement are according to the RP-2000 Combined Mortality Table projected with Scale BB to 2013 (set back 1 year for females) for all healthy retired members and beneficiaries. The RP-2000 Combined Disabled Mortality Table projected with Scale BB to 2013 (set back 4 years for males) is used for the period after disability retirement. These assumptions are used to measure the probabilities of each benefit payment being made after retirement. These assumptions contain margin for mortality improvements.

PERCENT MARRIED: 100% of employees are assumed to be married, with the wife 3 years younger than the husband.

DEPENDENT CHILDREN: For hazardous members' duty-related death benefits, it is assumed that the member is survived by two dependent children each age 6.

FORM OF PAYMENT: Participants are assumed to elect a life-only form of payment.

ACTUARIAL COST METHOD: Costs were determined using the Entry Age Normal, Level Percentage of Pay Actuarial Cost Method. Under this method, a calculation is made for retirement benefits to determine the uniform and constant percentage rate of contribution which, if applied to the compensation of the average new member during the entire period of his or her anticipated covered service, would be required to meet the cost of benefits payable. Actuarial gains and losses are reflected in the unfunded actuarial accrued liability.

ASSET VALUATION METHOD: For GASB 68 purposes, assets are equal to the market value of assets. For funding purposes, the assets are equal to actuarial value of assets which recognizes a portion of the difference between the market value of assets and the expected market value of assets, based on the assumed valuation rate of return. The amount recognized each year is 20% of the difference between market value and expected market value.

SCHEDULE D

SCHEDULE OF DIFFERENCES BETWEEN EXPECTED AND ACTUAL EXPERIENCE

Year	Difference Between Expected and Actual Experience	Recognition Period (Years)	Increase/(Decrease) in Pension Expense Arising from the Recognition of the Effects of Differences Between Expected and Actual Experience 2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	Thereafter
2013-2014	$0	3.32	$0	$0	$0	$0	$0	$0
2014-2015	$9,330,977	3.32	$2,810,535	$2,810,535	$899,372	$0	$0	$0
2015-2016	$0	3.09	$0	$0	$0	$0	$0	$0
			$2,810,535	$2,810,535	$899,372	$0	$0	$0

DEFERRED OUTFLOWS OF RESOURCES AND DEFERRED INFLOWS OF RESOURCES ARISING FROM DIFFERENCES BETWEEN EXPECTED AND ACTUAL EXPERIENCE

Year	Experience Losses (a)	Experience Gains (b)	Amounts Recognized in Pension Expense Through June 30, 2016	Deferred Outflows of Resources (a) – (c)	Deferred Inflows of Resources (b) – (c)
2013-2014	$0	$0	$0	$0	$0
2014-2015	$9,330,977	$0	$5,621,070	$3,709,907	$0
2015-2016	$0	$0	$0	$0	$0
			$5,621,070	$3,709,907	$0

SCHEDULE OF DIFFERENCES BETWEEN PROJECTED AND ACTUAL EARNINGS ON PENSION PLAN INVESTMENTS

			Increase/(Decrease) in Pension Expense Arising from the Recognition of the Effects of Differences Between Projected and Actual Earnings on Pension Plan Investments					
Year	Difference Between Projected and Actual Earnings on Pension Plan Investments	Recognition Period (Years)	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	Thereafter
2013-2014	($22,188,538)	5.0	($4,437,708)	($4,437,708)	($4,437,706)	$0	$0	$0
2014-2015	$16,134,410	5.0	$3,226,882	$3,226,882	$3,226,882	$3,226,882	$0	$0
2015-2016	$21,433,645	5.0	$4,286,729	$4,286,729	$4,286,729	$4,286,729	$4,286,729	$0
			$3,075,903	$3,075,903	$3,075,905	$7,513,611	$4,286,729	$0

DEFERRED OUTFLOWS OF RESOURCES AND DEFERRED INFLOWS OF RESOURCES ARISING FROM DIFFERENCES BETWEEN EXPECTED AND ACTUAL INVESTMENT EARNINGS

Year	Differences Between Expected and Actual Investment Earnings (a)	Amounts Recognized in Pension Expense through June 30, 2016 (b)	Amounts of Deferred Resources (Inflows)/Outflows (a) – (b)
2013-2014	$(22,188,538)	($13,313,124)	($8,875,414)
2014-2015	$16,134,410	$6,453,764	$9,680,646
2015-2016	$21,433,645	$4,286,729	$17,146,916
		($2,572,631)	$17,952,148

SCHEDULE OF CHANGES OF ASSUMPTION

			Increase/(Decrease) in Pension Expense Arising from the Recognition of the Effects of Changes of Assumptions					
Year	Changes of Assumptions	Recognition Period (Years)	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	Thereafter
2013-2014	$0	3.32	$0	$0	$0	$0	$0	$0
2014-2015	$40,200,657	3.32	$12,108,632	$12,108,632	$3,874,761	$0	$0	$0
2015-2016	$56,190,811	3.09	$18,184,728	$18,184,728	$18,184,728	$1,636,627	$0	$0
			$30,293,360	$30,293,360	$22,059,489	$1,636,627	$0	$0

DEFERRED OUTFLOWS OF RESOURCES AND DEFERRED INFLOWS OF RESOURCES ARISING FROM CHANGES OF ASSUMPTION

Year	Changes Due to Changes in Assumptions (Decreases)/Increases (a)	Amounts Recognized in Pension Expense Through June 30, 2016 (b)	Deferred Outflows/(Inflows) of Resources (a) – (b)
2013-2014	$0	$0	$0
2014-2015	$40,200,657	$24,217,264	$15,983,393
2015-2016	$56,190,811	$18,184,728	$38,006,083
		$42,401,992	$53,989,476

SUMMARY OF RECOGNIZED OUTFLOWS OF RESOURCES AND DEFERRED INFLOWS OF RESOURCES

	Net Increase/(Decrease) in Pension Expense					
	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	Thereafter
Differences between Expected and Actual Experience	$2,810,535	$2,810,535	$899,372	$0	$0	$0
Changes of Assumptions	$30,293,360	$30,293,360	$22,059,489	$1,636,627	$0	$0
Differences between Projected and Actual Earnings on Pension Plan Investments	$3,075,903	$3,075,903	$3,075,905	$7,513,611	$4,286,729	$0
Grand Total	$36,179,798	$36,179,798	$26,034,766	$9,150,238	$4,286,729	$0