



March 12, 2020

Mr. David Eager  
Executive Director  
Kentucky Retirement Systems  
1260 Louisville Road  
Frankfort, KY 40601

**Re: Actuarial Analysis of Proposed Legislation SB 249 GA and its Financial Impact on the Kentucky Retirement Systems  
AA Statement 1 of 1**

Dear Mr. Eager:

We have reviewed the proposed changes in the proposed legislation SB 249 and the purpose of this letter is to communicate the actuarial analysis of this legislation on the systems maintained by the Kentucky Retirement Systems (KRS).

### Summary of Fiscal Impact

The proposed legislation increases the unfunded liability amortization period from 24 years to 30 years as of June 30, 2019 and freezes the CERS employer contribution rates for one year. Increasing the amortization period does not change the liability of or the projected benefit payments to be paid from the retirement and insurance funds. Rather it increases the number of years employers are expected to pay for the current unfunded liability, which results in a decrease in the annual contribution requirement.

#### Impact on Employer Contribution Requirements for FY 2020/2021

| Plan   | Actuarially Determined Contribution |          | Budgeted Employer Contribution |          | Decrease in FY 20/21 Contribution |
|--|-------------------------------------|----------|--------------------------------|----------|-----------------------------------|
|  | Current                             | Proposed | Current                        | Proposed |                                   |
| KERS Non-Hazardous   | 93.01%                              | 84.43%   | 93.01%                         | 84.43%   | \$123 million                     |
| KERS Hazardous   | 38.71%                              | 36.00%   | 38.71%                         | 36.00%   | \$4 million                       |
| CERS Non-Hazardous   | 31.99%                              | 29.24%   | 26.95%                         | 24.06%   | \$74 million                      |
| CERS Hazardous   | 56.78%                              | 51.88%   | 44.33%                         | 39.58%   | \$27 million                      |
| SPRS   | 156.97%                             | 143.48%  | 156.97%                        | 143.48%  | \$7 million                       |
| <b>Total Decrease in FY 20/21 Contributions (All Systems):</b> |                                     |          |                                |          | <b>\$235 million</b>              |

**Reducing the employer contribution effort (specifically for the System's lowest funded Plan – the KERS Non-Hazardous Retirement Fund) without making additional changes to the mechanism for collecting employer contributions decreases the financial stability of the System and increases the risk of plan assets being exhausted.** Please see additional discussion later in this letter.

Section 1 of the enclosed exhibits provides a 35-year projection of the fiscal impact of the proposed legislation on the unfunded actuarial accrued liability, the funded ratio, and the employer contributions of all the retirement and insurance funds maintained by KRS. Section 2 of the enclosed exhibits provides a 35-year projection of the funds under the current plan provisions and section 3 of the enclosed exhibits provides a 35-year projection of the funds under the proposed funding methods.

### **Comments on Proposed Legislation**

The amortization period of the unfunded liability was set to 30 years in the year 2007. With 24 years remaining in the funding period, the amortization period was re-set to 30 years again in the year 2013. This is the current amortization period in statute, with 24 years remaining as of the last actuarial valuation date of June 30, 2019. The proposed legislation would again re-set the amortization period of the unfunded liability as of June 30, 2019 to be 30 years. Any subsequent increases or decreases in the unfunded liability after the June 30, 2019 actuarial valuation would be amortized over 20 years as of the date of the actuarial valuation they are recognized.

**If the proposed legislation is passed, we believe this establishes a pattern of the General Assembly re-setting the amortization period every five to seven years. When an amortization period is continually re-set in this pattern, the unfunded liability and the financial condition of the System will not ever materially improve.**

*KERS Non-Hazardous Retirement Fund* – As we have noted in the 2019 actuarial valuation report, the KERS Non-Hazardous Retirement Fund has \$16.5 billion in liability and only \$2.2 billion in plan assets. Also benefit payments and expenses during fiscal year 2018/2019 totaled \$1.012 billion and the Fund is expected to receive \$0.996 billion in employer and member contributions for fiscal year 2019/2020. The proposed legislation is expected to reduce employer contributions for fiscal year 2020/2021 by \$0.123 billion. We believe there is additional risk that actual contributions will be less than this amount as contributions would continue to be collected on covered payroll as well as the possibility of enactment of other legislation to provide additional contribution relief to the quasi-governmental agencies without contributions or appropriations for other sources to offset these lower contributions.

**This legislation will result in a slight reduction in the employers' pension cost by reducing the FY 20/21 contribution rate (from 93.01% of pay to 84.43% of pay in the case of the KERS Non-Hazardous System). However, there is a known behavior of many employers in this System of continually reducing their reported covered payroll in an effort to reduce their pension cost and this proposed legislation does not address this behavior and risk to the System. As a result, we**



**recommend any KRS related pension legislation that is considered by the General Assembly include provisions that addresses the current risk of the System receiving insufficient contributions because contributions continue to be collected on reported covered payroll. For example, if enacted, HB 171 (as amended to change the amortization period to 27 years) will amend the employer contribution allocation methodology and we believe that those changes will significantly reduce the System's contribution risk and will offset the System's financial risk associated with an increase in the funding period.**

*CERS Retirement and Insurance Funds* – While the CERS Non-Hazardous and Hazardous Retirement Systems are relatively better funded with funded ratios of 49% and 45%, respectively, the funded ratios of both these Systems are in the bottom 20<sup>th</sup> percentile of funded ratios for large retirement systems in the country. Because the calculation of the contribution rates for these Systems includes an assumption that the covered payroll will increase at the rate of 2.00% per year, the contributions these Systems will receive for the next several years will be insufficient to finance the interest on the unfunded actuarial accrued liability (i.e. negative amortization). As the projections show for the CERS Non-Hazardous Retirement System, the unfunded actuarial accrued liability is projected to increase from the current \$7.3 billion to \$7.5 billion in the year 2023 and is not projected to decrease below the current unfunded liability amount until the year 2029. Again, given the historical pattern of the General Assembly resetting the amortization period, we believe this change imposes significant long-term financial risk to both CERS Systems. Given their current financial condition and these potential financial risks, we recommend the proposed legislation keep the current funding period for the CERS Systems.

### **Basis of Calculations**

GRS based the calculations and analysis in this letter on the member and financial data provided by KRS for use in performing the actuarial valuation as of June 30, 2019. The projections assume no actuarial gains or losses will occur in the future, and that members will terminate, retire, become disabled, or die as anticipated by the actuarial assumptions used to perform the June 30, 2019 actuarial valuation. The analysis and projections were performed without regard to HB 1 that was enacted during the 2019 special session as individual employer elections regarding their future cessation from participating in KERS is unknown at this time.

Our calculations are based upon assumptions regarding future events, which may or may not materialize. Depending on actual plan experience, actual results could deviate significantly from our projections.

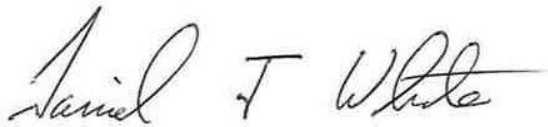


### Closing

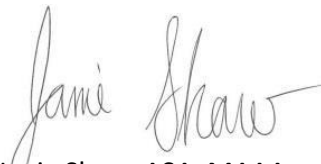
We are not attorneys, and we cannot provide a legal opinion regarding the changes in this proposed legislation. Nothing in this letter should be construed as providing legal, investment or tax advice.

Mr. White is an Enrolled Actuary. Both of the undersigned are members of the American Academy of Actuaries and we meet all of the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. In addition, all of the undersigned are experienced in performing valuations for large public retirement systems.

Sincerely,



Daniel J. White, FSA, MAAA, EA  
Senior Consultant



Janie Shaw, ASA, MAAA  
Consultant

**SB 249**

**Section 1.**

**Comparison of Fiscal Impact  
Current Plan vs. Proposed Changes**

**Kentucky Retirement Systems**  
**Exhibit 1-1**  
**KERS Non-Hazardous Retirement Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Comparison of Current Plan and Proposed Legislation**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Unfunded Actuarial Accrued Liability |           |            | Funded Ratio |          |            | Employer Contributions |          |            | Employer Contribution Rate |          |            |
|-------------------------------------|--------------------------------------|-----------|------------|--------------|----------|------------|------------------------|----------|------------|----------------------------|----------|------------|
|                                     | Current                              | Proposed  | Difference | Current      | Proposed | Difference | Current                | Proposed | Difference | Current                    | Proposed | Difference |
| (1)                                 | (2)                                  | (3)       | (4)        | (5)          | (6)      | (7)        | (8)                    | (9)      | (10)       | (11)                       | (12)     | (13)       |
| 2019                                | \$ 14,260                            | \$ 14,260 | \$ -       | 13%          | 13%      | 0%         | \$ 924                 | \$ 924   | \$ -       | 64.3%                      | 64.3%    | 0.0%       |
| 2020                                | 14,192                               | 14,192    | -          | 14%          | 14%      | 0%         | 1,156                  | 1,046    | (110)      | 81.0%                      | 73.3%    | -7.7%      |
| 2021                                | 13,840                               | 13,952    | 112        | 16%          | 15%      | -1%        | 1,151                  | 1,042    | (109)      | 81.0%                      | 73.3%    | -7.7%      |
| 2022                                | 13,490                               | 13,721    | 231        | 18%          | 17%      | -1%        | 1,150                  | 1,040    | (110)      | 81.2%                      | 73.4%    | -7.8%      |
| 2023                                | 13,127                               | 13,483    | 356        | 20%          | 18%      | -2%        | 1,147                  | 1,037    | (110)      | 81.2%                      | 73.4%    | -7.8%      |
| 2024                                | 12,746                               | 13,234    | 488        | 22%          | 19%      | -3%        | 1,144                  | 1,034    | (110)      | 81.2%                      | 73.4%    | -7.8%      |
| 2025                                | 12,345                               | 12,972    | 627        | 24%          | 21%      | -3%        | 1,142                  | 1,032    | (110)      | 81.2%                      | 73.4%    | -7.8%      |
| 2026                                | 11,922                               | 12,694    | 772        | 27%          | 22%      | -5%        | 1,139                  | 1,028    | (111)      | 81.2%                      | 73.3%    | -7.9%      |
| 2027                                | 11,476                               | 12,403    | 927        | 29%          | 23%      | -6%        | 1,136                  | 1,026    | (110)      | 81.2%                      | 73.3%    | -7.9%      |
| 2028                                | 11,007                               | 12,095    | 1,088      | 31%          | 25%      | -6%        | 1,134                  | 1,023    | (111)      | 81.2%                      | 73.3%    | -7.9%      |
| 2029                                | 10,512                               | 11,771    | 1,259      | 34%          | 26%      | -8%        | 1,132                  | 1,021    | (111)      | 81.2%                      | 73.3%    | -7.9%      |
| 2030                                | 9,991                                | 11,430    | 1,439      | 36%          | 27%      | -9%        | 1,130                  | 1,019    | (111)      | 81.2%                      | 73.2%    | -8.0%      |
| 2031                                | 9,442                                | 11,071    | 1,629      | 39%          | 29%      | -10%       | 1,130                  | 1,019    | (111)      | 81.2%                      | 73.2%    | -8.0%      |
| 2032                                | 8,861                                | 10,690    | 1,829      | 42%          | 30%      | -12%       | 1,128                  | 1,016    | (112)      | 81.0%                      | 73.0%    | -8.0%      |
| 2033                                | 8,250                                | 10,290    | 2,040      | 46%          | 32%      | -14%       | 1,129                  | 1,017    | (112)      | 81.0%                      | 73.0%    | -8.0%      |
| 2034                                | 7,605                                | 9,866     | 2,261      | 49%          | 34%      | -15%       | 1,126                  | 1,014    | (112)      | 80.7%                      | 72.7%    | -8.0%      |
| 2035                                | 6,926                                | 9,422     | 2,496      | 53%          | 36%      | -17%       | 1,128                  | 1,015    | (113)      | 80.7%                      | 72.7%    | -8.0%      |
| 2036                                | 6,210                                | 8,952     | 2,742      | 57%          | 38%      | -19%       | 1,126                  | 1,013    | (113)      | 80.4%                      | 72.3%    | -8.1%      |
| 2037                                | 5,457                                | 8,458     | 3,001      | 62%          | 41%      | -21%       | 1,130                  | 1,017    | (113)      | 80.4%                      | 72.3%    | -8.1%      |
| 2038                                | 4,657                                | 7,932     | 3,275      | 67%          | 44%      | -23%       | 1,126                  | 1,013    | (113)      | 79.7%                      | 71.7%    | -8.0%      |
| 2039                                | 3,821                                | 7,383     | 3,562      | 72%          | 47%      | -25%       | 1,131                  | 1,018    | (113)      | 79.7%                      | 71.7%    | -8.0%      |
| 2040                                | 2,934                                | 6,800     | 3,866      | 78%          | 50%      | -28%       | 1,123                  | 1,012    | (111)      | 78.7%                      | 70.9%    | -7.8%      |
| 2041                                | 2,009                                | 6,192     | 4,183      | 85%          | 54%      | -31%       | 1,128                  | 1,016    | (112)      | 78.7%                      | 70.9%    | -7.8%      |
| 2042                                | 1,031                                | 5,547     | 4,516      | 92%          | 58%      | -34%       | 1,118                  | 1,010    | (108)      | 77.8%                      | 70.2%    | -7.6%      |
| 2043                                | -                                    | 4,874     | 4,874      | 100%         | 62%      | -38%       | 64                     | 1,014    | 950        | 4.4%                       | 70.2%    | 65.8%      |
| 2044                                | -                                    | 4,162     | 4,162      | 100%         | 67%      | -33%       | 64                     | 1,009    | 945        | 4.4%                       | 69.6%    | 65.2%      |
| 2045                                | -                                    | 3,418     | 3,418      | 100%         | 73%      | -27%       | 63                     | 1,012    | 949        | 4.4%                       | 69.6%    | 65.2%      |
| 2046                                | -                                    | 2,631     | 2,631      | 100%         | 79%      | -21%       | 63                     | 1,009    | 946        | 4.3%                       | 69.3%    | 65.0%      |
| 2047                                | -                                    | 1,805     | 1,805      | 100%         | 85%      | -15%       | 63                     | 1,012    | 949        | 4.3%                       | 69.3%    | 65.0%      |
| 2048                                | -                                    | 933       | 933        | 100%         | 92%      | -8%        | 63                     | 1,015    | 952        | 4.3%                       | 69.3%    | 65.0%      |
| 2049                                | -                                    | -         | -          | 100%         | 100%     | 0%         | 62                     | 62       | -          | 4.3%                       | 4.3%     | 0.0%       |
| 2050                                | -                                    | -         | -          | 100%         | 100%     | 0%         | 63                     | 63       | -          | 4.2%                       | 4.2%     | 0.0%       |
| 2051                                | -                                    | -         | -          | 100%         | 100%     | 0%         | 64                     | 64       | -          | 4.2%                       | 4.2%     | 0.0%       |
| 2052                                | -                                    | -         | -          | 100%         | 100%     | 0%         | 65                     | 65       | -          | 4.2%                       | 4.2%     | 0.0%       |
| 2053                                | -                                    | -         | -          | 100%         | 100%     | 0%         | 66                     | 66       | -          | 4.2%                       | 4.2%     | 0.0%       |

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**Kentucky Retirement Systems**  
**Exhibit 1-2**  
**KERS Hazardous Retirement Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Comparison of Current Plan and Proposed Legislation**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Unfunded Actuarial Accrued Liability |          |            | Funded Ratio |          |            | Employer Contributions |          |            | Employer Contribution Rate |          |            |
|-------------------------------------|--------------------------------------|----------|------------|--------------|----------|------------|------------------------|----------|------------|----------------------------|----------|------------|
|                                     | Current                              | Proposed | Difference | Current      | Proposed | Difference | Current                | Proposed | Difference | Current                    | Proposed | Difference |
| (1)                                 | (2)                                  | (3)      | (4)        | (5)          | (6)      | (7)        | (8)                    | (9)      | (10)       | (11)                       | (12)     | (13)       |
| 2019                                | \$ 554                               | \$ 554   | \$ -       | 55%          | 55%      | 0%         | \$ 52                  | \$ 52    | \$ -       | 34.4%                      | 34.4%    | 0.0%       |
| 2020                                | 552                                  | 552      | -          | 56%          | 56%      | 0%         | 58                     | 54       | (4)        | 38.7%                      | 36.0%    | -2.7%      |
| 2021                                | 532                                  | 536      | 4          | 58%          | 58%      | 0%         | 59                     | 55       | (4)        | 38.7%                      | 36.0%    | -2.7%      |
| 2022                                | 517                                  | 526      | 9          | 60%          | 60%      | 0%         | 57                     | 53       | (4)        | 37.3%                      | 34.7%    | -2.6%      |
| 2023                                | 506                                  | 519      | 13         | 62%          | 61%      | -1%        | 57                     | 53       | (4)        | 37.3%                      | 34.7%    | -2.6%      |
| 2024                                | 493                                  | 511      | 18         | 64%          | 62%      | -2%        | 56                     | 52       | (4)        | 36.4%                      | 33.9%    | -2.5%      |
| 2025                                | 479                                  | 503      | 24         | 65%          | 63%      | -2%        | 56                     | 52       | (4)        | 36.4%                      | 33.9%    | -2.5%      |
| 2026                                | 464                                  | 494      | 30         | 67%          | 65%      | -2%        | 56                     | 52       | (4)        | 35.8%                      | 33.2%    | -2.6%      |
| 2027                                | 450                                  | 485      | 35         | 68%          | 66%      | -2%        | 56                     | 52       | (4)        | 35.8%                      | 33.2%    | -2.6%      |
| 2028                                | 433                                  | 474      | 41         | 70%          | 67%      | -3%        | 55                     | 51       | (4)        | 35.2%                      | 32.6%    | -2.6%      |
| 2029                                | 415                                  | 463      | 48         | 71%          | 68%      | -3%        | 56                     | 52       | (4)        | 35.2%                      | 32.6%    | -2.6%      |
| 2030                                | 397                                  | 452      | 55         | 73%          | 69%      | -4%        | 55                     | 51       | (4)        | 34.6%                      | 32.1%    | -2.5%      |
| 2031                                | 376                                  | 439      | 63         | 75%          | 71%      | -4%        | 56                     | 52       | (4)        | 34.6%                      | 32.1%    | -2.5%      |
| 2032                                | 355                                  | 426      | 71         | 76%          | 72%      | -4%        | 55                     | 51       | (4)        | 33.9%                      | 31.5%    | -2.4%      |
| 2033                                | 333                                  | 412      | 79         | 78%          | 73%      | -5%        | 56                     | 52       | (4)        | 33.9%                      | 31.5%    | -2.4%      |
| 2034                                | 308                                  | 397      | 89         | 80%          | 74%      | -6%        | 56                     | 51       | (5)        | 33.3%                      | 30.9%    | -2.4%      |
| 2035                                | 282                                  | 381      | 99         | 82%          | 76%      | -6%        | 56                     | 52       | (4)        | 33.3%                      | 30.9%    | -2.4%      |
| 2036                                | 254                                  | 364      | 110        | 84%          | 77%      | -7%        | 56                     | 51       | (5)        | 32.7%                      | 30.3%    | -2.4%      |
| 2037                                | 225                                  | 345      | 120        | 86%          | 79%      | -7%        | 56                     | 52       | (4)        | 32.7%                      | 30.3%    | -2.4%      |
| 2038                                | 194                                  | 326      | 132        | 88%          | 80%      | -8%        | 56                     | 51       | (5)        | 32.4%                      | 29.9%    | -2.5%      |
| 2039                                | 161                                  | 305      | 144        | 90%          | 82%      | -8%        | 56                     | 52       | (4)        | 32.4%                      | 29.9%    | -2.5%      |
| 2040                                | 125                                  | 283      | 158        | 93%          | 83%      | -10%       | 56                     | 51       | (5)        | 32.2%                      | 29.6%    | -2.6%      |
| 2041                                | 87                                   | 259      | 172        | 95%          | 85%      | -10%       | 56                     | 51       | (5)        | 32.2%                      | 29.6%    | -2.6%      |
| 2042                                | 46                                   | 234      | 188        | 97%          | 86%      | -11%       | 57                     | 51       | (6)        | 32.9%                      | 29.4%    | -3.5%      |
| 2043                                | -                                    | 209      | 209        | 100%         | 88%      | -12%       | 10                     | 51       | 41         | 5.9%                       | 29.4%    | 23.5%      |
| 2044                                | -                                    | 180      | 180        | 100%         | 90%      | -10%       | 10                     | 52       | 42         | 5.8%                       | 29.6%    | 23.8%      |
| 2045                                | -                                    | 150      | 150        | 100%         | 92%      | -8%        | 10                     | 52       | 42         | 5.8%                       | 29.6%    | 23.8%      |
| 2046                                | -                                    | 119      | 119        | 100%         | 93%      | -7%        | 10                     | 53       | 43         | 5.8%                       | 30.3%    | 24.5%      |
| 2047                                | -                                    | 83       | 83         | 100%         | 96%      | -4%        | 10                     | 52       | 42         | 5.8%                       | 30.3%    | 24.5%      |
| 2048                                | -                                    | 47       | 47         | 100%         | 97%      | -3%        | 10                     | 56       | 46         | 5.8%                       | 32.6%    | 26.8%      |
| 2049                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 10                     | 10       | -          | 5.8%                       | 5.8%     | 0.0%       |
| 2050                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 10                     | 10       | -          | 5.8%                       | 5.8%     | 0.0%       |
| 2051                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 10                     | 10       | -          | 5.8%                       | 5.8%     | 0.0%       |
| 2052                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 11                     | 11       | -          | 5.8%                       | 5.8%     | 0.0%       |
| 2053                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 11                     | 11       | -          | 5.8%                       | 5.8%     | 0.0%       |

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**Kentucky Retirement Systems**  
**Exhibit 1-3**  
**CERS Non-Hazardous Retirement Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Comparison of Current Plan and Proposed Legislation**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Unfunded Actuarial Accrued Liability |          |            | Funded Ratio |          |            | Employer Contributions |          |            | Employer Contribution Rate |          |            |
|-------------------------------------|--------------------------------------|----------|------------|--------------|----------|------------|------------------------|----------|------------|----------------------------|----------|------------|
|                                     | Current                              | Proposed | Difference | Current      | Proposed | Difference | Current                | Proposed | Difference | Current                    | Proposed | Difference |
| (1)                                 | (2)                                  | (3)      | (4)        | (5)          | (6)      | (7)        | (8)                    | (9)      | (10)       | (11)                       | (12)     | (13)       |
| 2019                                | \$ 7,306                             | \$ 7,306 | \$ -       | 49%          | 49%      | 0%         | \$ 487                 | \$ 487   | \$ -       | 19.3%                      | 19.3%    | 0.0%       |
| 2020                                | 7,445                                | 7,445    | -          | 49%          | 49%      | 0%         | 558                    | 498      | (60)       | 21.6%                      | 19.3%    | -2.3%      |
| 2021                                | 7,410                                | 7,472    | 62         | 51%          | 50%      | -1%        | 648                    | 572      | (76)       | 24.6%                      | 21.7%    | -2.9%      |
| 2022                                | 7,357                                | 7,502    | 145        | 52%          | 51%      | -1%        | 692                    | 628      | (64)       | 25.7%                      | 23.3%    | -2.4%      |
| 2023                                | 7,288                                | 7,508    | 220        | 54%          | 52%      | -2%        | 697                    | 632      | (65)       | 25.4%                      | 23.0%    | -2.4%      |
| 2024                                | 7,198                                | 7,498    | 300        | 55%          | 53%      | -2%        | 707                    | 640      | (67)       | 25.2%                      | 22.8%    | -2.4%      |
| 2025                                | 7,091                                | 7,479    | 388        | 57%          | 54%      | -3%        | 716                    | 648      | (68)       | 25.0%                      | 22.6%    | -2.4%      |
| 2026                                | 6,965                                | 7,447    | 482        | 58%          | 55%      | -3%        | 725                    | 656      | (69)       | 24.8%                      | 22.4%    | -2.4%      |
| 2027                                | 6,820                                | 7,404    | 584        | 60%          | 56%      | -4%        | 735                    | 664      | (71)       | 24.6%                      | 22.3%    | -2.3%      |
| 2028                                | 6,654                                | 7,348    | 694        | 61%          | 57%      | -4%        | 746                    | 673      | (73)       | 24.5%                      | 22.1%    | -2.4%      |
| 2029                                | 6,466                                | 7,278    | 812        | 63%          | 58%      | -5%        | 758                    | 683      | (75)       | 24.4%                      | 22.0%    | -2.4%      |
| 2030                                | 6,253                                | 7,192    | 939        | 64%          | 59%      | -5%        | 770                    | 694      | (76)       | 24.3%                      | 21.9%    | -2.4%      |
| 2031                                | 6,014                                | 7,090    | 1,076      | 66%          | 60%      | -6%        | 784                    | 706      | (78)       | 24.2%                      | 21.8%    | -2.4%      |
| 2032                                | 5,744                                | 6,969    | 1,225      | 68%          | 61%      | -7%        | 798                    | 718      | (80)       | 24.1%                      | 21.7%    | -2.4%      |
| 2033                                | 5,444                                | 6,828    | 1,384      | 70%          | 62%      | -8%        | 813                    | 730      | (83)       | 24.0%                      | 21.6%    | -2.4%      |
| 2034                                | 5,111                                | 6,666    | 1,555      | 72%          | 63%      | -9%        | 829                    | 744      | (85)       | 23.9%                      | 21.5%    | -2.4%      |
| 2035                                | 4,742                                | 6,482    | 1,740      | 74%          | 65%      | -9%        | 845                    | 759      | (86)       | 23.8%                      | 21.4%    | -2.4%      |
| 2036                                | 4,334                                | 6,272    | 1,938      | 77%          | 66%      | -11%       | 864                    | 774      | (90)       | 23.8%                      | 21.3%    | -2.5%      |
| 2037                                | 3,884                                | 6,036    | 2,152      | 79%          | 68%      | -11%       | 884                    | 790      | (94)       | 23.8%                      | 21.3%    | -2.5%      |
| 2038                                | 3,387                                | 5,769    | 2,382      | 82%          | 69%      | -13%       | 904                    | 808      | (96)       | 23.7%                      | 21.2%    | -2.5%      |
| 2039                                | 2,841                                | 5,472    | 2,631      | 85%          | 71%      | -14%       | 927                    | 825      | (102)      | 23.7%                      | 21.1%    | -2.6%      |
| 2040                                | 2,241                                | 5,142    | 2,901      | 88%          | 73%      | -15%       | 951                    | 844      | (107)      | 23.7%                      | 21.1%    | -2.6%      |
| 2041                                | 1,582                                | 4,774    | 3,192      | 92%          | 75%      | -17%       | 980                    | 863      | (117)      | 23.9%                      | 21.0%    | -2.9%      |
| 2042                                | 856                                  | 4,369    | 3,513      | 96%          | 78%      | -18%       | 1,020                  | 883      | (137)      | 24.2%                      | 21.0%    | -3.2%      |
| 2043                                | -                                    | 3,920    | 3,920      | 100%         | 80%      | -20%       | 162                    | 905      | 743        | 3.8%                       | 21.0%    | 17.2%      |
| 2044                                | -                                    | 3,425    | 3,425      | 100%         | 83%      | -17%       | 165                    | 928      | 763        | 3.7%                       | 21.0%    | 17.3%      |
| 2045                                | -                                    | 2,881    | 2,881      | 100%         | 86%      | -14%       | 169                    | 953      | 784        | 3.7%                       | 21.1%    | 17.4%      |
| 2046                                | -                                    | 2,280    | 2,280      | 100%         | 89%      | -11%       | 172                    | 981      | 809        | 3.7%                       | 21.2%    | 17.5%      |
| 2047                                | -                                    | 1,619    | 1,619      | 100%         | 92%      | -8%        | 176                    | 1,015    | 839        | 3.7%                       | 21.4%    | 17.7%      |
| 2048                                | -                                    | 886      | 886        | 100%         | 96%      | -4%        | 179                    | 1,065    | 886        | 3.7%                       | 21.9%    | 18.2%      |
| 2049                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 183                    | 183      | -          | 3.7%                       | 3.7%     | 0.0%       |
| 2050                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 187                    | 187      | -          | 3.7%                       | 3.7%     | 0.0%       |
| 2051                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 190                    | 190      | -          | 3.7%                       | 3.7%     | 0.0%       |
| 2052                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 195                    | 195      | -          | 3.7%                       | 3.7%     | 0.0%       |
| 2053                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 199                    | 199      | -          | 3.7%                       | 3.7%     | 0.0%       |

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**Kentucky Retirement Systems**  
**Exhibit 1-4**  
**CERS Hazardous Retirement Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Comparison of Current Plan and Proposed Legislation**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Unfunded Actuarial Accrued Liability |          |            | Funded Ratio |          |            | Employer Contributions |          |            | Employer Contribution Rate |          |            |
|-------------------------------------|--------------------------------------|----------|------------|--------------|----------|------------|------------------------|----------|------------|----------------------------|----------|------------|
|                                     | Current                              | Proposed | Difference | Current      | Proposed | Difference | Current                | Proposed | Difference | Current                    | Proposed | Difference |
| (1)                                 | (2)                                  | (3)      | (4)        | (5)          | (6)      | (7)        | (8)                    | (9)      | (10)       | (11)                       | (12)     | (13)       |
| 2019                                | \$ 2,870                             | \$ 2,870 | \$ -       | 45%          | 45%      | 0%         | \$ 168                 | \$ 168   | \$ -       | 30.1%                      | 30.1%    | 0.0%       |
| 2020                                | 2,945                                | 2,945    | -          | 46%          | 46%      | 0%         | 190                    | 169      | (21)       | 33.9%                      | 30.1%    | -3.8%      |
| 2021                                | 2,965                                | 2,987    | 22         | 47%          | 46%      | -1%        | 226                    | 199      | (27)       | 39.7%                      | 35.0%    | -4.7%      |
| 2022                                | 2,974                                | 3,026    | 52         | 48%          | 47%      | -1%        | 268                    | 237      | (31)       | 46.4%                      | 41.0%    | -5.4%      |
| 2023                                | 2,952                                | 3,038    | 86         | 49%          | 48%      | -1%        | 275                    | 249      | (26)       | 46.8%                      | 42.3%    | -4.5%      |
| 2024                                | 2,916                                | 3,036    | 120        | 51%          | 49%      | -2%        | 279                    | 252      | (27)       | 46.6%                      | 42.1%    | -4.5%      |
| 2025                                | 2,873                                | 3,027    | 154        | 53%          | 50%      | -3%        | 283                    | 255      | (28)       | 46.4%                      | 41.8%    | -4.6%      |
| 2026                                | 2,823                                | 3,016    | 193        | 55%          | 51%      | -4%        | 287                    | 259      | (28)       | 46.1%                      | 41.6%    | -4.5%      |
| 2027                                | 2,764                                | 2,998    | 234        | 56%          | 53%      | -3%        | 291                    | 262      | (29)       | 45.9%                      | 41.3%    | -4.6%      |
| 2028                                | 2,696                                | 2,975    | 279        | 58%          | 54%      | -4%        | 296                    | 266      | (30)       | 45.6%                      | 41.1%    | -4.5%      |
| 2029                                | 2,620                                | 2,946    | 326        | 60%          | 55%      | -5%        | 301                    | 270      | (31)       | 45.4%                      | 40.8%    | -4.6%      |
| 2030                                | 2,532                                | 2,910    | 378        | 62%          | 56%      | -6%        | 307                    | 275      | (32)       | 45.1%                      | 40.5%    | -4.6%      |
| 2031                                | 2,433                                | 2,867    | 434        | 64%          | 58%      | -6%        | 312                    | 280      | (32)       | 44.7%                      | 40.2%    | -4.5%      |
| 2032                                | 2,323                                | 2,817    | 494        | 66%          | 59%      | -7%        | 319                    | 286      | (33)       | 44.4%                      | 39.9%    | -4.5%      |
| 2033                                | 2,199                                | 2,757    | 558        | 69%          | 61%      | -8%        | 325                    | 292      | (33)       | 44.1%                      | 39.6%    | -4.5%      |
| 2034                                | 2,062                                | 2,690    | 628        | 71%          | 62%      | -9%        | 331                    | 297      | (34)       | 43.8%                      | 39.2%    | -4.6%      |
| 2035                                | 1,911                                | 2,613    | 702        | 74%          | 64%      | -10%       | 338                    | 302      | (36)       | 43.5%                      | 38.9%    | -4.6%      |
| 2036                                | 1,743                                | 2,526    | 783        | 76%          | 66%      | -10%       | 344                    | 308      | (36)       | 43.2%                      | 38.7%    | -4.5%      |
| 2037                                | 1,559                                | 2,428    | 869        | 79%          | 68%      | -11%       | 350                    | 313      | (37)       | 43.0%                      | 38.4%    | -4.6%      |
| 2038                                | 1,359                                | 2,320    | 961        | 82%          | 70%      | -12%       | 357                    | 319      | (38)       | 42.8%                      | 38.3%    | -4.5%      |
| 2039                                | 1,138                                | 2,198    | 1,060      | 85%          | 72%      | -13%       | 365                    | 325      | (40)       | 42.8%                      | 38.1%    | -4.7%      |
| 2040                                | 896                                  | 2,064    | 1,168      | 89%          | 74%      | -15%       | 373                    | 331      | (42)       | 42.8%                      | 38.0%    | -4.8%      |
| 2041                                | 630                                  | 1,914    | 1,284      | 92%          | 76%      | -16%       | 384                    | 338      | (46)       | 43.0%                      | 37.9%    | -5.1%      |
| 2042                                | 339                                  | 1,750    | 1,411      | 96%          | 79%      | -17%       | 398                    | 346      | (52)       | 43.5%                      | 37.8%    | -5.7%      |
| 2043                                | -                                    | 1,569    | 1,569      | 100%         | 81%      | -19%       | 56                     | 354      | 298        | 6.0%                       | 37.8%    | 31.8%      |
| 2044                                | -                                    | 1,369    | 1,369      | 100%         | 84%      | -16%       | 57                     | 362      | 305        | 6.0%                       | 37.8%    | 31.8%      |
| 2045                                | -                                    | 1,150    | 1,150      | 100%         | 87%      | -13%       | 58                     | 370      | 312        | 6.0%                       | 38.0%    | 32.0%      |
| 2046                                | -                                    | 911      | 911        | 100%         | 90%      | -10%       | 59                     | 382      | 323        | 6.0%                       | 38.3%    | 32.3%      |
| 2047                                | -                                    | 646      | 646        | 100%         | 93%      | -7%        | 60                     | 395      | 335        | 5.9%                       | 38.8%    | 32.9%      |
| 2048                                | -                                    | 353      | 353        | 100%         | 96%      | -4%        | 62                     | 414      | 352        | 5.9%                       | 39.9%    | 34.0%      |
| 2049                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 63                     | 63       | -          | 5.9%                       | 5.9%     | 0.0%       |
| 2050                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 64                     | 64       | -          | 5.9%                       | 5.9%     | 0.0%       |
| 2051                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 66                     | 66       | -          | 5.9%                       | 5.9%     | 0.0%       |
| 2052                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 67                     | 67       | -          | 5.9%                       | 5.9%     | 0.0%       |
| 2053                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 68                     | 68       | -          | 5.9%                       | 5.9%     | 0.0%       |

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**Kentucky Retirement Systems**  
**Exhibit 1-5**  
**State Police Retirement System Retirement Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Comparison of Current Plan and Proposed Legislation**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Unfunded Actuarial Accrued Liability |          |            | Funded Ratio |          |            | Employer Contributions |          |            | Employer Contribution Rate |          |            |
|-------------------------------------|--------------------------------------|----------|------------|--------------|----------|------------|------------------------|----------|------------|----------------------------|----------|------------|
|                                     | Current                              | Proposed | Difference | Current      | Proposed | Difference | Current                | Proposed | Difference | Current                    | Proposed | Difference |
| (1)                                 | (2)                                  | (3)      | (4)        | (5)          | (6)      | (7)        | (8)                    | (9)      | (10)       | (11)                       | (12)     | (13)       |
| 2019                                | \$ 763                               | \$ 763   | \$ -       | 27%          | 27%      | 0%         | \$ 57                  | \$ 57    | \$ -       | 119.1%                     | 119.1%   | 0.0%       |
| 2020                                | 755                                  | 755      | -          | 28%          | 28%      | 0%         | 64                     | 58       | (6)        | 136.1%                     | 123.8%   | -12.3%     |
| 2021                                | 734                                  | 740      | 6          | 30%          | 30%      | 0%         | 64                     | 58       | (6)        | 136.1%                     | 123.8%   | -12.3%     |
| 2022                                | 715                                  | 727      | 12         | 32%          | 31%      | -1%        | 64                     | 58       | (6)        | 137.1%                     | 124.5%   | -12.6%     |
| 2023                                | 696                                  | 714      | 18         | 34%          | 32%      | -2%        | 63                     | 58       | (5)        | 137.1%                     | 124.5%   | -12.6%     |
| 2024                                | 676                                  | 701      | 25         | 36%          | 33%      | -3%        | 63                     | 57       | (6)        | 136.6%                     | 124.0%   | -12.6%     |
| 2025                                | 654                                  | 687      | 33         | 38%          | 35%      | -3%        | 63                     | 57       | (6)        | 136.6%                     | 124.0%   | -12.6%     |
| 2026                                | 631                                  | 672      | 41         | 40%          | 36%      | -4%        | 63                     | 57       | (6)        | 136.7%                     | 123.9%   | -12.8%     |
| 2027                                | 609                                  | 658      | 49         | 41%          | 37%      | -4%        | 63                     | 57       | (6)        | 136.7%                     | 123.9%   | -12.8%     |
| 2028                                | 583                                  | 641      | 58         | 44%          | 38%      | -6%        | 62                     | 56       | (6)        | 135.5%                     | 122.6%   | -12.9%     |
| 2029                                | 556                                  | 623      | 67         | 46%          | 39%      | -7%        | 62                     | 56       | (6)        | 135.5%                     | 122.6%   | -12.9%     |
| 2030                                | 528                                  | 605      | 77         | 48%          | 41%      | -7%        | 62                     | 56       | (6)        | 133.8%                     | 121.1%   | -12.7%     |
| 2031                                | 499                                  | 585      | 86         | 51%          | 42%      | -9%        | 63                     | 57       | (6)        | 133.8%                     | 121.1%   | -12.7%     |
| 2032                                | 467                                  | 564      | 97         | 54%          | 44%      | -10%       | 62                     | 56       | (6)        | 130.8%                     | 118.3%   | -12.5%     |
| 2033                                | 434                                  | 542      | 108        | 56%          | 46%      | -10%       | 63                     | 57       | (6)        | 130.8%                     | 118.3%   | -12.5%     |
| 2034                                | 398                                  | 518      | 120        | 60%          | 48%      | -12%       | 61                     | 56       | (5)        | 127.2%                     | 115.2%   | -12.0%     |
| 2035                                | 363                                  | 495      | 132        | 63%          | 49%      | -14%       | 62                     | 56       | (6)        | 127.2%                     | 115.2%   | -12.0%     |
| 2036                                | 323                                  | 468      | 145        | 67%          | 52%      | -15%       | 61                     | 55       | (6)        | 123.9%                     | 112.4%   | -11.5%     |
| 2037                                | 284                                  | 442      | 158        | 70%          | 54%      | -16%       | 61                     | 55       | (6)        | 123.9%                     | 112.4%   | -11.5%     |
| 2038                                | 242                                  | 414      | 172        | 75%          | 57%      | -18%       | 60                     | 54       | (6)        | 121.9%                     | 110.6%   | -11.3%     |
| 2039                                | 199                                  | 387      | 188        | 79%          | 59%      | -20%       | 60                     | 54       | (6)        | 121.9%                     | 110.6%   | -11.3%     |
| 2040                                | 152                                  | 355      | 203        | 84%          | 62%      | -22%       | 59                     | 54       | (5)        | 120.7%                     | 109.5%   | -11.2%     |
| 2041                                | 105                                  | 324      | 219        | 89%          | 65%      | -24%       | 59                     | 54       | (5)        | 120.7%                     | 109.5%   | -11.2%     |
| 2042                                | 55                                   | 291      | 236        | 94%          | 68%      | -26%       | 60                     | 54       | (6)        | 122.1%                     | 109.6%   | -12.5%     |
| 2043                                | -                                    | 255      | 255        | 100%         | 72%      | -28%       | 4                      | 54       | 50         | 8.5%                       | 109.6%   | 101.1%     |
| 2044                                | -                                    | 219      | 219        | 100%         | 75%      | -25%       | 4                      | 54       | 50         | 8.3%                       | 109.3%   | 101.0%     |
| 2045                                | -                                    | 180      | 180        | 100%         | 79%      | -21%       | 4                      | 52       | 48         | 8.1%                       | 109.3%   | 101.2%     |
| 2046                                | -                                    | 140      | 140        | 100%         | 84%      | -16%       | 4                      | 54       | 50         | 8.0%                       | 112.4%   | 104.4%     |
| 2047                                | -                                    | 97       | 97         | 100%         | 89%      | -11%       | 4                      | 54       | 50         | 7.9%                       | 112.4%   | 104.5%     |
| 2048                                | -                                    | 50       | 50         | 100%         | 94%      | -6%        | 4                      | 54       | 50         | 7.8%                       | 113.0%   | 105.2%     |
| 2049                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 4                      | 4        | -          | 7.7%                       | 7.7%     | 0.0%       |
| 2050                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 4                      | 4        | -          | 7.7%                       | 7.7%     | 0.0%       |
| 2051                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 4                      | 4        | -          | 7.7%                       | 7.7%     | 0.0%       |
| 2052                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 4                      | 4        | -          | 7.7%                       | 7.7%     | 0.0%       |
| 2053                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 4                      | 4        | -          | 7.7%                       | 7.7%     | 0.0%       |

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**Kentucky Retirement Systems**  
**Exhibit 1-6**  
**KERS Non-Hazardous Insurance Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Comparison of Current Plan and Proposed Legislation**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Unfunded Actuarial Accrued Liability |          |            | Funded Ratio |          |            | Employer Contributions |          |            | Employer Contribution Rate |          |            |
|-------------------------------------|--------------------------------------|----------|------------|--------------|----------|------------|------------------------|----------|------------|----------------------------|----------|------------|
|                                     | Current                              | Proposed | Difference | Current      | Proposed | Difference | Current                | Proposed | Difference | Current                    | Proposed | Difference |
| (1)                                 | (2)                                  | (3)      | (4)        | (5)          | (6)      | (7)        | (8)                    | (9)      | (10)       | (11)                       | (12)     | (13)       |
| 2019                                | \$ 1,742                             | \$ 1,742 | \$ -       | 36%          | 36%      | 0%         | \$ 165                 | \$ 165   | \$ -       | 11.5%                      | 11.5%    | 0.0%       |
| 2020                                | 1,718                                | 1,718    | -          | 39%          | 39%      | 0%         | 171                    | 158      | (13)       | 12.0%                      | 11.2%    | -0.8%      |
| 2021                                | 1,673                                | 1,686    | 13         | 42%          | 41%      | -1%        | 170                    | 158      | (12)       | 12.0%                      | 11.2%    | -0.8%      |
| 2022                                | 1,633                                | 1,660    | 27         | 45%          | 44%      | -1%        | 167                    | 154      | (13)       | 11.8%                      | 10.9%    | -0.9%      |
| 2023                                | 1,595                                | 1,636    | 41         | 47%          | 46%      | -1%        | 166                    | 154      | (12)       | 11.8%                      | 10.9%    | -0.9%      |
| 2024                                | 1,550                                | 1,607    | 57         | 50%          | 48%      | -2%        | 163                    | 151      | (12)       | 11.6%                      | 10.7%    | -0.9%      |
| 2025                                | 1,505                                | 1,578    | 73         | 52%          | 49%      | -3%        | 163                    | 150      | (13)       | 11.6%                      | 10.7%    | -0.9%      |
| 2026                                | 1,454                                | 1,544    | 90         | 54%          | 51%      | -3%        | 159                    | 147      | (12)       | 11.4%                      | 10.5%    | -0.9%      |
| 2027                                | 1,403                                | 1,512    | 109        | 56%          | 53%      | -3%        | 159                    | 146      | (13)       | 11.4%                      | 10.5%    | -0.9%      |
| 2028                                | 1,346                                | 1,474    | 128        | 58%          | 54%      | -4%        | 155                    | 143      | (12)       | 11.2%                      | 10.3%    | -0.9%      |
| 2029                                | 1,288                                | 1,437    | 149        | 60%          | 56%      | -4%        | 155                    | 142      | (13)       | 11.2%                      | 10.3%    | -0.9%      |
| 2030                                | 1,225                                | 1,396    | 171        | 62%          | 57%      | -5%        | 151                    | 139      | (12)       | 10.9%                      | 10.0%    | -0.9%      |
| 2031                                | 1,161                                | 1,356    | 195        | 64%          | 58%      | -6%        | 151                    | 139      | (12)       | 10.9%                      | 10.0%    | -0.9%      |
| 2032                                | 1,090                                | 1,310    | 220        | 66%          | 60%      | -6%        | 148                    | 136      | (12)       | 10.7%                      | 9.8%     | -0.9%      |
| 2033                                | 1,018                                | 1,264    | 246        | 68%          | 61%      | -7%        | 148                    | 136      | (12)       | 10.7%                      | 9.8%     | -0.9%      |
| 2034                                | 940                                  | 1,215    | 275        | 71%          | 62%      | -9%        | 146                    | 133      | (13)       | 10.5%                      | 9.6%     | -0.9%      |
| 2035                                | 858                                  | 1,162    | 304        | 73%          | 63%      | -10%       | 146                    | 134      | (12)       | 10.5%                      | 9.6%     | -0.9%      |
| 2036                                | 770                                  | 1,106    | 336        | 76%          | 65%      | -11%       | 144                    | 132      | (12)       | 10.3%                      | 9.5%     | -0.8%      |
| 2037                                | 679                                  | 1,049    | 370        | 78%          | 67%      | -11%       | 145                    | 132      | (13)       | 10.3%                      | 9.5%     | -0.8%      |
| 2038                                | 581                                  | 986      | 405        | 81%          | 68%      | -13%       | 143                    | 131      | (12)       | 10.1%                      | 9.3%     | -0.8%      |
| 2039                                | 478                                  | 921      | 443        | 85%          | 70%      | -15%       | 143                    | 131      | (12)       | 10.1%                      | 9.3%     | -0.8%      |
| 2040                                | 368                                  | 850      | 482        | 88%          | 72%      | -16%       | 141                    | 130      | (11)       | 9.9%                       | 9.1%     | -0.8%      |
| 2041                                | 252                                  | 777      | 525        | 92%          | 74%      | -18%       | 142                    | 130      | (12)       | 9.9%                       | 9.1%     | -0.8%      |
| 2042                                | 128                                  | 697      | 569        | 96%          | 77%      | -19%       | 139                    | 129      | (10)       | 9.7%                       | 9.0%     | -0.7%      |
| 2043                                | -                                    | 615      | 615        | 100%         | 80%      | -20%       | 6                      | 129      | 123        | 0.4%                       | 9.0%     | 8.6%       |
| 2044                                | -                                    | 527      | 527        | 100%         | 82%      | -18%       | 6                      | 128      | 122        | 0.4%                       | 8.9%     | 8.5%       |
| 2045                                | -                                    | 434      | 434        | 100%         | 85%      | -15%       | 6                      | 129      | 123        | 0.4%                       | 8.9%     | 8.5%       |
| 2046                                | -                                    | 334      | 334        | 100%         | 89%      | -11%       | 6                      | 128      | 122        | 0.4%                       | 8.8%     | 8.4%       |
| 2047                                | -                                    | 230      | 230        | 100%         | 92%      | -8%        | 6                      | 128      | 122        | 0.4%                       | 8.8%     | 8.4%       |
| 2048                                | -                                    | 118      | 118        | 100%         | 96%      | -4%        | 5                      | 127      | 122        | 0.4%                       | 8.7%     | 8.3%       |
| 2049                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 5                      | 5        | -          | 0.4%                       | 0.4%     | 0.0%       |
| 2050                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 5                      | 5        | -          | 0.4%                       | 0.4%     | 0.0%       |
| 2051                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 5                      | 5        | -          | 0.3%                       | 0.3%     | 0.0%       |
| 2052                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 5                      | 5        | -          | 0.3%                       | 0.3%     | 0.0%       |
| 2053                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 5                      | 5        | -          | 0.3%                       | 0.3%     | 0.0%       |

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**Kentucky Retirement Systems**  
**Exhibit 1-7**  
**KERS Hazardous Insurance Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Comparison of Current Plan and Proposed Legislation**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Unfunded Actuarial Accrued Liability |          |            | Funded Ratio |          |            | Employer Contributions |          |            | Employer Contribution Rate |          |            |
|-------------------------------------|--------------------------------------|----------|------------|--------------|----------|------------|------------------------|----------|------------|----------------------------|----------|------------|
|                                     | Current                              | Proposed | Difference | Current      | Proposed | Difference | Current                | Proposed | Difference | Current                    | Proposed | Difference |
| (1)                                 | (2)                                  | (3)      | (4)        | (5)          | (6)      | (7)        | (8)                    | (9)      | (10)       | (11)                       | (12)     | (13)       |
| 2019                                | \$ (98)                              | \$ (98)  | \$ -       | 123%         | 123%     | 0%         | \$ 4                   | \$ 4     | \$ -       | 2.5%                       | 2.5%     | 0.0%       |
| 2020                                | (103)                                | (103)    | -          | 123%         | 123%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2021                                | (110)                                | (110)    | -          | 124%         | 124%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2022                                | (113)                                | (113)    | -          | 124%         | 124%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2023                                | (114)                                | (114)    | -          | 124%         | 124%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2024                                | (116)                                | (116)    | -          | 124%         | 124%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2025                                | (119)                                | (119)    | -          | 124%         | 124%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2026                                | (122)                                | (122)    | -          | 125%         | 125%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2027                                | (125)                                | (125)    | -          | 125%         | 125%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2028                                | (129)                                | (129)    | -          | 126%         | 126%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2029                                | (133)                                | (133)    | -          | 127%         | 127%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2030                                | (138)                                | (138)    | -          | 128%         | 128%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2031                                | (143)                                | (143)    | -          | 128%         | 128%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2032                                | (148)                                | (148)    | -          | 129%         | 129%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2033                                | (154)                                | (154)    | -          | 130%         | 130%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2034                                | (160)                                | (160)    | -          | 132%         | 132%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2035                                | (167)                                | (167)    | -          | 133%         | 133%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2036                                | (173)                                | (173)    | -          | 134%         | 134%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2037                                | (181)                                | (181)    | -          | 135%         | 135%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2038                                | (188)                                | (188)    | -          | 136%         | 136%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2039                                | (197)                                | (197)    | -          | 138%         | 138%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2040                                | (205)                                | (205)    | -          | 139%         | 139%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2041                                | (215)                                | (215)    | -          | 141%         | 141%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2042                                | (225)                                | (225)    | -          | 142%         | 142%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2043                                | (236)                                | (236)    | -          | 144%         | 144%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2044                                | (247)                                | (247)    | -          | 145%         | 145%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2045                                | (259)                                | (259)    | -          | 147%         | 147%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2046                                | (272)                                | (272)    | -          | 149%         | 149%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2047                                | (286)                                | (286)    | -          | 151%         | 151%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2048                                | (301)                                | (301)    | -          | 153%         | 153%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2049                                | (317)                                | (317)    | -          | 156%         | 156%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2050                                | (333)                                | (333)    | -          | 158%         | 158%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2051                                | (351)                                | (351)    | -          | 161%         | 161%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2052                                | (369)                                | (369)    | -          | 164%         | 164%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |
| 2053                                | (390)                                | (390)    | -          | 167%         | 167%     | 0%         | -                      | -        | -          | 0.0%                       | 0.0%     | 0.0%       |

**Gabriel Roeder Smith & Company**

**Kentucky Retirement Systems**  
**Exhibit 1-8**  
**CERS Non-Hazardous Insurance Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Comparison of Current Plan and Proposed Legislation**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Unfunded Actuarial Accrued Liability |          |            | Funded Ratio |          |            | Employer Contributions |          |            | Employer Contribution Rate |          |            |
|-------------------------------------|--------------------------------------|----------|------------|--------------|----------|------------|------------------------|----------|------------|----------------------------|----------|------------|
|                                     | Current                              | Proposed | Difference | Current      | Proposed | Difference | Current                | Proposed | Difference | Current                    | Proposed | Difference |
| (1)                                 | (2)                                  | (3)      | (4)        | (5)          | (6)      | (7)        | (8)                    | (9)      | (10)       | (11)                       | (12)     | (13)       |
| 2019                                | \$ 1,045                             | \$ 1,045 | \$ -       | 71%          | 71%      | 0%         | \$ 119                 | \$ 119   | \$ -       | 4.8%                       | 4.8%     | 0.0%       |
| 2020                                | 1,058                                | 1,058    | -          | 72%          | 72%      | 0%         | 136                    | 122      | (14)       | 5.3%                       | 4.8%     | -0.5%      |
| 2021                                | 1,022                                | 1,037    | 15         | 74%          | 73%      | -1%        | 146                    | 138      | (8)        | 5.6%                       | 5.3%     | -0.3%      |
| 2022                                | 997                                  | 1,022    | 25         | 75%          | 75%      | 0%         | 143                    | 134      | (9)        | 5.3%                       | 5.0%     | -0.3%      |
| 2023                                | 987                                  | 1,022    | 35         | 76%          | 76%      | 0%         | 141                    | 132      | (9)        | 5.2%                       | 4.9%     | -0.3%      |
| 2024                                | 972                                  | 1,018    | 46         | 78%          | 77%      | -1%        | 140                    | 131      | (9)        | 5.0%                       | 4.7%     | -0.3%      |
| 2025                                | 955                                  | 1,013    | 58         | 79%          | 77%      | -2%        | 139                    | 130      | (9)        | 4.9%                       | 4.6%     | -0.3%      |
| 2026                                | 935                                  | 1,005    | 70         | 80%          | 78%      | -2%        | 138                    | 129      | (9)        | 4.8%                       | 4.5%     | -0.3%      |
| 2027                                | 913                                  | 997      | 84         | 81%          | 79%      | -2%        | 136                    | 128      | (8)        | 4.6%                       | 4.3%     | -0.3%      |
| 2028                                | 888                                  | 986      | 98         | 82%          | 80%      | -2%        | 136                    | 126      | (10)       | 4.5%                       | 4.2%     | -0.3%      |
| 2029                                | 860                                  | 974      | 114        | 83%          | 80%      | -3%        | 135                    | 125      | (10)       | 4.4%                       | 4.1%     | -0.3%      |
| 2030                                | 829                                  | 961      | 132        | 83%          | 81%      | -2%        | 134                    | 124      | (10)       | 4.3%                       | 4.0%     | -0.3%      |
| 2031                                | 796                                  | 945      | 149        | 84%          | 81%      | -3%        | 134                    | 124      | (10)       | 4.2%                       | 3.9%     | -0.3%      |
| 2032                                | 758                                  | 927      | 169        | 85%          | 82%      | -3%        | 134                    | 123      | (11)       | 4.1%                       | 3.8%     | -0.3%      |
| 2033                                | 717                                  | 907      | 190        | 86%          | 83%      | -3%        | 134                    | 124      | (10)       | 4.0%                       | 3.7%     | -0.3%      |
| 2034                                | 672                                  | 884      | 212        | 87%          | 83%      | -4%        | 135                    | 125      | (10)       | 3.9%                       | 3.6%     | -0.3%      |
| 2035                                | 622                                  | 858      | 236        | 88%          | 84%      | -4%        | 137                    | 126      | (11)       | 3.9%                       | 3.6%     | -0.3%      |
| 2036                                | 567                                  | 829      | 262        | 90%          | 85%      | -5%        | 138                    | 127      | (11)       | 3.9%                       | 3.5%     | -0.4%      |
| 2037                                | 508                                  | 797      | 289        | 91%          | 86%      | -5%        | 140                    | 129      | (11)       | 3.8%                       | 3.5%     | -0.3%      |
| 2038                                | 442                                  | 761      | 319        | 92%          | 86%      | -6%        | 142                    | 130      | (12)       | 3.8%                       | 3.5%     | -0.3%      |
| 2039                                | 370                                  | 721      | 351        | 94%          | 87%      | -7%        | 145                    | 133      | (12)       | 3.8%                       | 3.4%     | -0.4%      |
| 2040                                | 291                                  | 676      | 385        | 95%          | 88%      | -7%        | 148                    | 135      | (13)       | 3.7%                       | 3.4%     | -0.3%      |
| 2041                                | 205                                  | 628      | 423        | 97%          | 89%      | -8%        | 151                    | 137      | (14)       | 3.7%                       | 3.4%     | -0.3%      |
| 2042                                | 109                                  | 573      | 464        | 98%          | 90%      | -8%        | 155                    | 140      | (15)       | 3.8%                       | 3.4%     | -0.4%      |
| 2043                                | -                                    | 513      | 513        | 100%         | 92%      | -8%        | 45                     | 142      | 97         | 1.1%                       | 3.4%     | 2.3%       |
| 2044                                | -                                    | 447      | 447        | 100%         | 93%      | -7%        | 45                     | 145      | 100        | 1.0%                       | 3.3%     | 2.3%       |
| 2045                                | -                                    | 375      | 375        | 100%         | 94%      | -6%        | 45                     | 148      | 103        | 1.0%                       | 3.3%     | 2.3%       |
| 2046                                | -                                    | 296      | 296        | 100%         | 95%      | -5%        | 46                     | 151      | 105        | 1.0%                       | 3.3%     | 2.3%       |
| 2047                                | -                                    | 208      | 208        | 100%         | 97%      | -3%        | 46                     | 154      | 108        | 1.0%                       | 3.3%     | 2.3%       |
| 2048                                | -                                    | 112      | 112        | 100%         | 98%      | -2%        | 46                     | 159      | 113        | 1.0%                       | 3.3%     | 2.3%       |
| 2049                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 47                     | 47       | -          | 1.0%                       | 1.0%     | 0.0%       |
| 2050                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 47                     | 47       | -          | 0.9%                       | 0.9%     | 0.0%       |
| 2051                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 47                     | 47       | -          | 0.9%                       | 0.9%     | 0.0%       |
| 2052                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 47                     | 47       | -          | 0.9%                       | 0.9%     | 0.0%       |
| 2053                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 47                     | 47       | -          | 0.9%                       | 0.9%     | 0.0%       |

**Gabriel Roeder Smith & Company**

**Kentucky Retirement Systems**  
**Exhibit 1-9**  
**CERS Hazardous Insurance Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Comparison of Current Plan and Proposed Legislation**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Unfunded Actuarial Accrued Liability |          |            | Funded Ratio |          |            | Employer Contributions |          |            | Employer Contribution Rate |          |            |
|-------------------------------------|--------------------------------------|----------|------------|--------------|----------|------------|------------------------|----------|------------|----------------------------|----------|------------|
|                                     | Current                              | Proposed | Difference | Current      | Proposed | Difference | Current                | Proposed | Difference | Current                    | Proposed | Difference |
| (1)                                 | (2)                                  | (3)      | (4)        | (5)          | (6)      | (7)        | (8)                    | (9)      | (10)       | (11)                       | (12)     | (13)       |
| 2019                                | \$ 419                               | \$ 419   | \$ -       | 76%          | 76%      | 0%         | \$ 53                  | \$ 53    | \$ -       | 9.5%                       | 9.5%     | 0.0%       |
| 2020                                | 418                                  | 418      | -          | 77%          | 77%      | 0%         | 59                     | 53       | (6)        | 10.5%                      | 9.5%     | -1.0%      |
| 2021                                | 393                                  | 398      | 5          | 79%          | 79%      | 0%         | 56                     | 53       | (3)        | 9.9%                       | 9.3%     | -0.6%      |
| 2022                                | 380                                  | 390      | 10         | 80%          | 79%      | -1%        | 53                     | 50       | (3)        | 9.2%                       | 8.6%     | -0.6%      |
| 2023                                | 375                                  | 388      | 13         | 81%          | 80%      | -1%        | 51                     | 47       | (4)        | 8.6%                       | 8.1%     | -0.5%      |
| 2024                                | 369                                  | 386      | 17         | 81%          | 80%      | -1%        | 49                     | 46       | (3)        | 8.2%                       | 7.7%     | -0.5%      |
| 2025                                | 362                                  | 384      | 22         | 82%          | 81%      | -1%        | 48                     | 45       | (3)        | 7.9%                       | 7.4%     | -0.5%      |
| 2026                                | 354                                  | 381      | 27         | 82%          | 81%      | -1%        | 47                     | 44       | (3)        | 7.6%                       | 7.1%     | -0.5%      |
| 2027                                | 347                                  | 379      | 32         | 83%          | 81%      | -2%        | 47                     | 43       | (4)        | 7.4%                       | 6.8%     | -0.6%      |
| 2028                                | 338                                  | 375      | 37         | 83%          | 82%      | -1%        | 46                     | 43       | (3)        | 7.2%                       | 6.6%     | -0.6%      |
| 2029                                | 328                                  | 371      | 43         | 84%          | 82%      | -2%        | 46                     | 43       | (3)        | 7.0%                       | 6.5%     | -0.5%      |
| 2030                                | 317                                  | 367      | 50         | 85%          | 82%      | -3%        | 47                     | 43       | (4)        | 6.9%                       | 6.3%     | -0.6%      |
| 2031                                | 305                                  | 361      | 56         | 85%          | 82%      | -3%        | 47                     | 43       | (4)        | 6.7%                       | 6.2%     | -0.5%      |
| 2032                                | 291                                  | 355      | 64         | 86%          | 83%      | -3%        | 48                     | 44       | (4)        | 6.7%                       | 6.1%     | -0.6%      |
| 2033                                | 276                                  | 348      | 72         | 87%          | 83%      | -4%        | 48                     | 44       | (4)        | 6.6%                       | 6.0%     | -0.6%      |
| 2034                                | 259                                  | 340      | 81         | 87%          | 83%      | -4%        | 49                     | 45       | (4)        | 6.5%                       | 6.0%     | -0.5%      |
| 2035                                | 240                                  | 330      | 90         | 88%          | 84%      | -4%        | 50                     | 46       | (4)        | 6.5%                       | 5.9%     | -0.6%      |
| 2036                                | 219                                  | 319      | 100        | 89%          | 84%      | -5%        | 51                     | 47       | (4)        | 6.4%                       | 5.9%     | -0.5%      |
| 2037                                | 197                                  | 307      | 110        | 90%          | 85%      | -5%        | 52                     | 48       | (4)        | 6.4%                       | 5.8%     | -0.6%      |
| 2038                                | 172                                  | 294      | 122        | 92%          | 86%      | -6%        | 53                     | 49       | (4)        | 6.4%                       | 5.8%     | -0.6%      |
| 2039                                | 144                                  | 278      | 134        | 93%          | 87%      | -6%        | 55                     | 50       | (5)        | 6.4%                       | 5.8%     | -0.6%      |
| 2040                                | 114                                  | 262      | 148        | 95%          | 88%      | -7%        | 56                     | 51       | (5)        | 6.4%                       | 5.8%     | -0.6%      |
| 2041                                | 80                                   | 243      | 163        | 96%          | 89%      | -7%        | 57                     | 52       | (5)        | 6.4%                       | 5.8%     | -0.6%      |
| 2042                                | 44                                   | 223      | 179        | 98%          | 90%      | -8%        | 60                     | 53       | (7)        | 6.5%                       | 5.8%     | -0.7%      |
| 2043                                | -                                    | 199      | 199        | 100%         | 91%      | -9%        | 16                     | 54       | 38         | 1.7%                       | 5.7%     | 4.0%       |
| 2044                                | -                                    | 174      | 174        | 100%         | 92%      | -8%        | 16                     | 55       | 39         | 1.7%                       | 5.7%     | 4.0%       |
| 2045                                | -                                    | 146      | 146        | 100%         | 94%      | -6%        | 16                     | 56       | 40         | 1.7%                       | 5.8%     | 4.1%       |
| 2046                                | -                                    | 116      | 116        | 100%         | 95%      | -5%        | 16                     | 57       | 41         | 1.7%                       | 5.8%     | 4.1%       |
| 2047                                | -                                    | 83       | 83         | 100%         | 96%      | -4%        | 16                     | 59       | 43         | 1.6%                       | 5.8%     | 4.2%       |
| 2048                                | -                                    | 44       | 44         | 100%         | 98%      | -2%        | 17                     | 61       | 44         | 1.6%                       | 5.9%     | 4.3%       |
| 2049                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 17                     | 17       | -          | 1.6%                       | 1.6%     | 0.0%       |
| 2050                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 17                     | 17       | -          | 1.6%                       | 1.6%     | 0.0%       |
| 2051                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 17                     | 17       | -          | 1.5%                       | 1.5%     | 0.0%       |
| 2052                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 17                     | 17       | -          | 1.5%                       | 1.5%     | 0.0%       |
| 2053                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 17                     | 17       | -          | 1.5%                       | 1.5%     | 0.0%       |

**Gabriel Roeder Smith & Company**

**Kentucky Retirement Systems**  
**Exhibit 1-10**  
**State Police Retirement System Insurance Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Comparison of Current Plan and Proposed Legislation**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Unfunded Actuarial Accrued Liability |          |            | Funded Ratio |          |            | Employer Contributions |          |            | Employer Contribution Rate |          |            |
|-------------------------------------|--------------------------------------|----------|------------|--------------|----------|------------|------------------------|----------|------------|----------------------------|----------|------------|
|                                     | Current                              | Proposed | Difference | Current      | Proposed | Difference | Current                | Proposed | Difference | Current                    | Proposed | Difference |
| (1)                                 | (2)                                  | (3)      | (4)        | (5)          | (6)      | (7)        | (8)                    | (9)      | (10)       | (11)                       | (12)     | (13)       |
| 2019                                | \$ 80                                | \$ 80    | \$ -       | 71%          | 71%      | 0%         | \$ 13                  | \$ 13    | \$ -       | 27.2%                      | 27.2%    | 0.0%       |
| 2020                                | 74                                   | 74       | -          | 74%          | 74%      | 0%         | 10                     | 9        | (1)        | 20.9%                      | 19.7%    | -1.2%      |
| 2021                                | 70                                   | 70       | -          | 76%          | 76%      | 0%         | 10                     | 9        | (1)        | 20.9%                      | 19.7%    | -1.2%      |
| 2022                                | 67                                   | 68       | 1          | 77%          | 77%      | 0%         | 9                      | 8        | (1)        | 19.0%                      | 17.9%    | -1.1%      |
| 2023                                | 65                                   | 67       | 2          | 78%          | 78%      | 0%         | 9                      | 8        | (1)        | 19.0%                      | 17.9%    | -1.1%      |
| 2024                                | 63                                   | 65       | 2          | 79%          | 79%      | 0%         | 8                      | 8        | -          | 17.5%                      | 16.4%    | -1.1%      |
| 2025                                | 61                                   | 64       | 3          | 80%          | 79%      | -1%        | 8                      | 8        | -          | 17.5%                      | 16.4%    | -1.1%      |
| 2026                                | 59                                   | 63       | 4          | 81%          | 79%      | -2%        | 8                      | 7        | (1)        | 16.5%                      | 15.4%    | -1.1%      |
| 2027                                | 57                                   | 61       | 4          | 81%          | 80%      | -1%        | 8                      | 7        | (1)        | 16.5%                      | 15.4%    | -1.1%      |
| 2028                                | 54                                   | 60       | 6          | 82%          | 80%      | -2%        | 7                      | 7        | -          | 15.7%                      | 14.6%    | -1.1%      |
| 2029                                | 52                                   | 58       | 6          | 83%          | 81%      | -2%        | 7                      | 7        | -          | 15.7%                      | 14.6%    | -1.1%      |
| 2030                                | 50                                   | 57       | 7          | 83%          | 81%      | -2%        | 7                      | 7        | -          | 15.1%                      | 14.1%    | -1.0%      |
| 2031                                | 47                                   | 55       | 8          | 84%          | 82%      | -2%        | 7                      | 7        | -          | 15.1%                      | 14.1%    | -1.0%      |
| 2032                                | 44                                   | 53       | 9          | 85%          | 82%      | -3%        | 7                      | 6        | (1)        | 14.7%                      | 13.6%    | -1.1%      |
| 2033                                | 41                                   | 51       | 10         | 86%          | 83%      | -3%        | 7                      | 7        | -          | 14.7%                      | 13.6%    | -1.1%      |
| 2034                                | 38                                   | 49       | 11         | 87%          | 83%      | -4%        | 7                      | 6        | (1)        | 14.2%                      | 13.2%    | -1.0%      |
| 2035                                | 35                                   | 47       | 12         | 88%          | 84%      | -4%        | 7                      | 6        | (1)        | 14.2%                      | 13.2%    | -1.0%      |
| 2036                                | 31                                   | 45       | 14         | 89%          | 84%      | -5%        | 7                      | 6        | (1)        | 13.9%                      | 13.0%    | -0.9%      |
| 2037                                | 27                                   | 42       | 15         | 90%          | 85%      | -5%        | 7                      | 6        | (1)        | 13.9%                      | 13.0%    | -0.9%      |
| 2038                                | 24                                   | 40       | 16         | 91%          | 86%      | -5%        | 7                      | 6        | (1)        | 13.8%                      | 12.8%    | -1.0%      |
| 2039                                | 19                                   | 37       | 18         | 93%          | 86%      | -7%        | 7                      | 6        | (1)        | 13.8%                      | 12.8%    | -1.0%      |
| 2040                                | 15                                   | 35       | 20         | 94%          | 87%      | -7%        | 7                      | 6        | (1)        | 13.8%                      | 12.8%    | -1.0%      |
| 2041                                | 11                                   | 32       | 21         | 96%          | 88%      | -8%        | 7                      | 6        | (1)        | 13.8%                      | 12.8%    | -1.0%      |
| 2042                                | 5                                    | 28       | 23         | 98%          | 90%      | -8%        | 7                      | 6        | (1)        | 14.3%                      | 12.9%    | -1.4%      |
| 2043                                | -                                    | 26       | 26         | 100%         | 90%      | -10%       | 1                      | 6        | 5          | 2.7%                       | 12.9%    | 10.2%      |
| 2044                                | -                                    | 22       | 22         | 100%         | 92%      | -8%        | 1                      | 6        | 5          | 2.7%                       | 12.9%    | 10.2%      |
| 2045                                | -                                    | 18       | 18         | 100%         | 93%      | -7%        | 1                      | 6        | 5          | 2.6%                       | 12.9%    | 10.3%      |
| 2046                                | -                                    | 14       | 14         | 100%         | 95%      | -5%        | 1                      | 6        | 5          | 2.6%                       | 13.2%    | 10.6%      |
| 2047                                | -                                    | 10       | 10         | 100%         | 96%      | -4%        | 1                      | 6        | 5          | 2.5%                       | 13.2%    | 10.7%      |
| 2048                                | -                                    | 5        | 5          | 100%         | 98%      | -2%        | 1                      | 6        | 5          | 2.5%                       | 13.3%    | 10.8%      |
| 2049                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 1                      | 1        | -          | 2.4%                       | 2.4%     | 0.0%       |
| 2050                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 1                      | 1        | -          | 2.3%                       | 2.3%     | 0.0%       |
| 2051                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 1                      | 1        | -          | 2.3%                       | 2.3%     | 0.0%       |
| 2052                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 1                      | 1        | -          | 2.3%                       | 2.3%     | 0.0%       |
| 2053                                | -                                    | -        | -          | 100%         | 100%     | 0%         | 1                      | 1        | -          | 2.2%                       | 2.2%     | 0.0%       |

Gabriel Roeder Smith & Company

**SB 249**

**Section 2.**

**Projected Cost of the Retirement and Insurance  
Current Plan**

**Kentucky Retirement Systems**  
**Exhibit 2-1**  
**KERS Non-Hazardous Retirement Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Current Plan (Amortization Period = 24 Years at June 30, 2019)**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Actuarial<br>Accrued<br>Liability | Actuarial<br>Value of<br>Assets | Unfunded<br>Actuarial<br>Accrued Liability | Funded<br>Ratio<br>(3) / (2) | Total<br>Employer<br>Contribution | Member<br>Contribution | Covered<br>Payroll | Total<br>Employer<br>Contribution as %<br>of Covered Payroll | Employer<br>Actuarial<br>Determined<br>Contribution Rate | Annual Cash Flow Analysis               |                                     |                              |                      |
|-------------------------------------|-----------------------------------|---------------------------------|--|------------------------------|-----------------------------------|------------------------|--------------------|--|--|---|-------------------------------------|------------------------------|----------------------|
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | Member and<br>Employer<br>Contributions | Benefit<br>Payments<br>and Expenses | Net<br>External<br>Cash Flow | Investment<br>Income |
| (1)                                 | (2)                               | (3)                             | (4)  | (5)                          | (6)                               | (7)                    | (8)                | (9)  | (10)   | (11)                                    | (12)                                | (13)                         | (14)                 |
| 2019                                | \$ 16,466                         | \$ 2,206                        | \$ 14,260                                  | 13%                          | \$ 924                            | \$ 72                  | \$ 1,438           | 64.26%   | 74.54%   | \$ 996                                  | \$ (1,008)                          | \$ (12)                      | \$ 117               |
| 2020                                | 16,493                            | 2,301                           | 14,192                                     | 14%                          | 1,156                             | 71                     | 1,428              | 80.98%   | 80.98%   | 1,227                                   | (1,024)                             | 203                          | 128                  |
| 2021                                | 16,500                            | 2,660                           | 13,840                                     | 16%                          | 1,151                             | 71                     | 1,422              | 80.98%   | 81.27%   | 1,222                                   | (1,038)                             | 184                          | 145                  |
| 2022                                | 16,489                            | 2,999                           | 13,490                                     | 18%                          | 1,150                             | 71                     | 1,417              | 81.21%   | 81.21%   | 1,221                                   | (1,051)                             | 170                          | 162                  |
| 2023                                | 16,459                            | 3,332                           | 13,127                                     | 20%                          | 1,147                             | 71                     | 1,412              | 81.21%   | 81.20%   | 1,218                                   | (1,065)                             | 153                          | 179                  |
| 2024                                | 16,410                            | 3,664                           | 12,746                                     | 22%                          | 1,144                             | 70                     | 1,409              | 81.23%   | 81.23%   | 1,214                                   | (1,077)                             | 137                          | 196                  |
| 2025                                | 16,342                            | 3,997                           | 12,345                                     | 24%                          | 1,142                             | 70                     | 1,406              | 81.23%   | 81.22%   | 1,212                                   | (1,089)                             | 123                          | 213                  |
| 2026                                | 16,255                            | 4,333                           | 11,922                                     | 27%                          | 1,139                             | 70                     | 1,402              | 81.20%   | 81.20%   | 1,209                                   | (1,100)                             | 109                          | 230                  |
| 2027                                | 16,149                            | 4,673                           | 11,476                                     | 29%                          | 1,136                             | 70                     | 1,399              | 81.20%   | 81.19%   | 1,206                                   | (1,110)                             | 96                           | 248                  |
| 2028                                | 16,024                            | 5,017                           | 11,007                                     | 31%                          | 1,134                             | 70                     | 1,396              | 81.20%   | 81.20%   | 1,204                                   | (1,118)                             | 86                           | 266                  |
| 2029                                | 15,880                            | 5,368                           | 10,512                                     | 34%                          | 1,132                             | 70                     | 1,394              | 81.20%   | 81.19%   | 1,202                                   | (1,121)                             | 81                           | 284                  |
| 2030                                | 15,724                            | 5,733                           | 9,991                                      | 36%                          | 1,130                             | 70                     | 1,393              | 81.16%   | 81.16%   | 1,200                                   | (1,126)                             | 74                           | 303                  |
| 2031                                | 15,552                            | 6,110                           | 9,442                                      | 39%                          | 1,130                             | 70                     | 1,393              | 81.16%   | 81.12%   | 1,200                                   | (1,128)                             | 72                           | 323                  |
| 2032                                | 15,366                            | 6,505                           | 8,861                                      | 42%                          | 1,128                             | 70                     | 1,393              | 81.00%   | 81.00%   | 1,198                                   | (1,128)                             | 70                           | 343                  |
| 2033                                | 15,168                            | 6,918                           | 8,250                                      | 46%                          | 1,129                             | 70                     | 1,394              | 81.00%   | 80.88%   | 1,199                                   | (1,127)                             | 72                           | 365                  |
| 2034                                | 14,959                            | 7,354                           | 7,605                                      | 49%                          | 1,126                             | 70                     | 1,395              | 80.72%   | 80.72%   | 1,196                                   | (1,124)                             | 72                           | 388                  |
| 2035                                | 14,740                            | 7,814                           | 6,926                                      | 53%                          | 1,128                             | 70                     | 1,397              | 80.72%   | 80.57%   | 1,198                                   | (1,119)                             | 79                           | 412                  |
| 2036                                | 14,515                            | 8,305                           | 6,210                                      | 57%                          | 1,126                             | 70                     | 1,401              | 80.36%   | 80.36%   | 1,196                                   | (1,109)                             | 87                           | 438                  |
| 2037                                | 14,286                            | 8,829                           | 5,457                                      | 62%                          | 1,130                             | 70                     | 1,406              | 80.36%   | 80.07%   | 1,200                                   | (1,097)                             | 103                          | 466                  |
| 2038                                | 14,056                            | 9,399                           | 4,657                                      | 67%                          | 1,126                             | 71                     | 1,413              | 79.66%   | 79.66%   | 1,197                                   | (1,082)                             | 115                          | 496                  |
| 2039                                | 13,830                            | 10,009                          | 3,821                                      | 72%                          | 1,131                             | 71                     | 1,420              | 79.66%   | 79.26%   | 1,202                                   | (1,067)                             | 135                          | 529                  |
| 2040                                | 13,608                            | 10,674                          | 2,934                                      | 78%                          | 1,123                             | 71                     | 1,426              | 78.73%   | 78.73%   | 1,194                                   | (1,049)                             | 145                          | 564                  |
| 2041                                | 13,392                            | 11,383                          | 2,009                                      | 85%                          | 1,128                             | 72                     | 1,433              | 78.73%   | 78.39%   | 1,200                                   | (1,032)                             | 168                          | 602                  |
| 2042                                | 13,183                            | 12,152                          | 1,031                                      | 92%                          | 1,118                             | 72                     | 1,438              | 77.75%   | 77.75%   | 1,190                                   | (1,014)                             | 176                          | 643                  |
| 2043                                | 12,980                            | 12,980                          | -  | 100%                         | 64                                | 72                     | 1,444              | 4.44%  | 4.44%  | 136                                     | (996)                               | (860)                        | 658                  |
| 2044                                | 12,785                            | 12,785                          | -  | 100%                         | 64                                | 72                     | 1,448              | 4.40%  | 4.40%  | 136                                     | (979)                               | (843)                        | 648                  |
| 2045                                | 12,599                            | 12,599                          | -  | 100%                         | 63                                | 73                     | 1,453              | 4.36%  | 4.36%  | 136                                     | (961)                               | (825)                        | 639                  |
| 2046                                | 12,421                            | 12,421                          | -  | 100%                         | 63                                | 73                     | 1,457              | 4.32%  | 4.32%  | 136                                     | (943)                               | (807)                        | 629                  |
| 2047                                | 12,252                            | 12,252                          | -  | 100%                         | 63                                | 73                     | 1,461              | 4.29%  | 4.29%  | 136                                     | (925)                               | (789)                        | 620                  |
| 2048                                | 12,093                            | 12,093                          | -  | 100%                         | 63                                | 73                     | 1,465              | 4.27%  | 4.27%  | 136                                     | (907)                               | (771)                        | 612                  |
| 2049                                | 11,944                            | 11,944                          | -  | 100%                         | 62                                | 73                     | 1,468              | 4.25%  | 4.25%  | 135                                     | (888)                               | (753)                        | 604                  |
| 2050                                | 11,809                            | 11,809                          | -  | 100%                         | 63                                | 75                     | 1,494              | 4.23%  | 4.23%  | 138                                     | (870)                               | (732)                        | 597                  |
| 2051                                | 11,687                            | 11,687                          | -  | 100%                         | 64                                | 76                     | 1,523              | 4.22%  | 4.22%  | 140                                     | (853)                               | (713)                        | 590                  |
| 2052                                | 11,581                            | 11,581                          | -  | 100%                         | 65                                | 78                     | 1,552              | 4.21%  | 4.21%  | 143                                     | (836)                               | (693)                        | 584                  |
| 2053                                | 11,488                            | 11,488                          | -  | 100%                         | 66                                | 79                     | 1,583              | 4.20%  | 4.20%  | 145                                     | (821)                               | (676)                        | 579                  |

Notes and assumptions:

The projection is based on the results of the June 30, 2019 actuarial valuation and assumes that all actuarial assumptions are realized, including the assumed annual asset return of 5.25%.

New active members are assumed to be hired to replace the current active members as they are assumed to terminate employment or retire, but the total active population is assumed to decrease by 2% each year over the next 30 years.

The contribution rate established in the Commonwealth's biennium budget is based on the calculated actuarially determined contribution rate.

The 64.26% employer contribution rate for FY 2020 is the effective contribution rate after reflecting HB 1 (passed during the 2019 Special Session) which provided that

Regional Mental Health/Mental Retardation Boards, Local and District Health Departments, State Universities, Community Colleges and any other agency eligible to voluntarily cease participating in the KERS to contribute a 41.06% of pay contribution rate for FY 2019. Collectively these entities reflect approximately 23% of the covered payroll in the System.

**Kentucky Retirement Systems**  
**Exhibit 2-2**  
**KERS Hazardous Retirement Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Current Plan (Amortization Period = 24 Years at June 30, 2019)**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Actuarial<br>Accrued<br>Liability | Actuarial<br>Value of<br>Assets | Unfunded<br>Actuarial<br>Accrued Liability | Funded<br>Ratio<br>(3) / (2) | Total<br>Employer<br>Contribution | Member<br>Contribution | Covered<br>Payroll | Total<br>Employer<br>Contribution as %<br>of Covered Payroll | Employer<br>Actuarial<br>Determined<br>Contribution Rate | Annual Cash Flow Analysis               |                                     |                              |                      |
|-------------------------------------|-----------------------------------|---------------------------------|--|------------------------------|-----------------------------------|------------------------|--------------------|--|--|---|-------------------------------------|------------------------------|----------------------|
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | Member and<br>Employer<br>Contributions | Benefit<br>Payments<br>and Expenses | Net<br>External<br>Cash Flow | Investment<br>Income |
| (1)                                 | (2)                               | (3)                             | (4)  | (5)                          | (6)                               | (7)                    | (8)                | (9)  | (10)   | (11)                                    | (12)                                | (13)                         | (14)                 |
| 2019                                | \$ 1,226                          | \$ 672                          | \$ 554                                     | 55%                          | \$ 52                             | \$ 12                  | \$ 150             | 34.39%   | 34.42%   | \$ 64                                   | \$ (74)                             | \$ (10)                      | \$ 42                |
| 2020                                | 1,255                             | 703                             | 552  | 56%                          | 58                                | 12                     | 150                | 38.71%   | 38.71%   | 70                                      | (77)                                | (7)                          | 44                   |
| 2021                                | 1,281                             | 749                             | 532  | 58%                          | 59                                | 12                     | 152                | 38.71%   | 38.35%   | 71                                      | (79)                                | (8)                          | 47                   |
| 2022                                | 1,307                             | 790                             | 517  | 60%                          | 57                                | 12                     | 152                | 37.30%   | 37.30%   | 69                                      | (82)                                | (13)                         | 49                   |
| 2023                                | 1,331                             | 825                             | 506  | 62%                          | 57                                | 12                     | 153                | 37.30%   | 36.77%   | 69                                      | (84)                                | (15)                         | 51                   |
| 2024                                | 1,354                             | 861                             | 493  | 64%                          | 56                                | 12                     | 154                | 36.44%   | 36.44%   | 68                                      | (86)                                | (18)                         | 53                   |
| 2025                                | 1,376                             | 897                             | 479  | 65%                          | 56                                | 12                     | 155                | 36.44%   | 36.07%   | 68                                      | (89)                                | (21)                         | 55                   |
| 2026                                | 1,397                             | 933                             | 464  | 67%                          | 56                                | 12                     | 156                | 35.76%   | 35.76%   | 68                                      | (91)                                | (23)                         | 58                   |
| 2027                                | 1,417                             | 967                             | 450  | 68%                          | 56                                | 12                     | 156                | 35.76%   | 35.46%   | 68                                      | (93)                                | (25)                         | 60                   |
| 2028                                | 1,435                             | 1,002                           | 433  | 70%                          | 55                                | 13                     | 157                | 35.15%   | 35.15%   | 68                                      | (95)                                | (27)                         | 62                   |
| 2029                                | 1,452                             | 1,037                           | 415  | 71%                          | 56                                | 13                     | 158                | 35.15%   | 34.88%   | 69                                      | (95)                                | (26)                         | 64                   |
| 2030                                | 1,471                             | 1,074                           | 397  | 73%                          | 55                                | 13                     | 160                | 34.58%   | 34.58%   | 68                                      | (96)                                | (28)                         | 66                   |
| 2031                                | 1,489                             | 1,113                           | 376  | 75%                          | 56                                | 13                     | 161                | 34.58%   | 34.27%   | 69                                      | (96)                                | (27)                         | 69                   |
| 2032                                | 1,509                             | 1,154                           | 355  | 76%                          | 55                                | 13                     | 163                | 33.94%   | 33.94%   | 68                                      | (97)                                | (29)                         | 71                   |
| 2033                                | 1,529                             | 1,196                           | 333  | 78%                          | 56                                | 13                     | 165                | 33.94%   | 33.64%   | 69                                      | (97)                                | (28)                         | 74                   |
| 2034                                | 1,550                             | 1,242                           | 308  | 80%                          | 56                                | 13                     | 167                | 33.30%   | 33.30%   | 69                                      | (98)                                | (29)                         | 77                   |
| 2035                                | 1,572                             | 1,290                           | 282  | 82%                          | 56                                | 13                     | 168                | 33.30%   | 33.02%   | 69                                      | (99)                                | (30)                         | 80                   |
| 2036                                | 1,595                             | 1,341                           | 254  | 84%                          | 56                                | 14                     | 170                | 32.74%   | 32.74%   | 70                                      | (100)                               | (30)                         | 83                   |
| 2037                                | 1,618                             | 1,393                           | 225  | 86%                          | 56                                | 14                     | 171                | 32.74%   | 32.55%   | 70                                      | (101)                               | (31)                         | 86                   |
| 2038                                | 1,641                             | 1,447                           | 194  | 88%                          | 56                                | 14                     | 172                | 32.35%   | 32.35%   | 70                                      | (103)                               | (33)                         | 89                   |
| 2039                                | 1,664                             | 1,503                           | 161  | 90%                          | 56                                | 14                     | 172                | 32.35%   | 32.25%   | 70                                      | (104)                               | (34)                         | 93                   |
| 2040                                | 1,687                             | 1,562                           | 125  | 93%                          | 56                                | 14                     | 173                | 32.19%   | 32.19%   | 70                                      | (105)                               | (35)                         | 96                   |
| 2041                                | 1,709                             | 1,622                           | 87   | 95%                          | 56                                | 14                     | 174                | 32.19%   | 32.30%   | 70                                      | (107)                               | (37)                         | 100                  |
| 2042                                | 1,732                             | 1,686                           | 46   | 97%                          | 57                                | 14                     | 174                | 32.92%   | 32.92%   | 71                                      | (108)                               | (37)                         | 104                  |
| 2043                                | 1,756                             | 1,756                           | -  | 100%                         | 10                                | 14                     | 175                | 5.87%  | 5.87%  | 24                                      | (109)                               | (85)                         | 107                  |
| 2044                                | 1,779                             | 1,779                           | -  | 100%                         | 10                                | 14                     | 175                | 5.84%  | 5.84%  | 24                                      | (111)                               | (87)                         | 108                  |
| 2045                                | 1,802                             | 1,802                           | -  | 100%                         | 10                                | 14                     | 174                | 5.82%  | 5.82%  | 24                                      | (113)                               | (89)                         | 110                  |
| 2046                                | 1,825                             | 1,825                           | -  | 100%                         | 10                                | 14                     | 174                | 5.81%  | 5.81%  | 24                                      | (115)                               | (91)                         | 111                  |
| 2047                                | 1,846                             | 1,846                           | -  | 100%                         | 10                                | 14                     | 173                | 5.80%  | 5.80%  | 24                                      | (117)                               | (93)                         | 112                  |
| 2048                                | 1,867                             | 1,867                           | -  | 100%                         | 10                                | 14                     | 173                | 5.79%  | 5.79%  | 24                                      | (119)                               | (95)                         | 113                  |
| 2049                                | 1,887                             | 1,887                           | -  | 100%                         | 10                                | 14                     | 173                | 5.79%  | 5.79%  | 24                                      | (121)                               | (97)                         | 114                  |
| 2050                                | 1,906                             | 1,906                           | -  | 100%                         | 10                                | 14                     | 176                | 5.79%  | 5.79%  | 24                                      | (124)                               | (100)                        | 115                  |
| 2051                                | 1,925                             | 1,925                           | -  | 100%                         | 10                                | 14                     | 178                | 5.79%  | 5.79%  | 24                                      | (126)                               | (102)                        | 116                  |
| 2052                                | 1,944                             | 1,944                           | -  | 100%                         | 11                                | 15                     | 182                | 5.79%  | 5.79%  | 26                                      | (128)                               | (102)                        | 117                  |
| 2053                                | 1,961                             | 1,961                           | -  | 100%                         | 11                                | 15                     | 185                | 5.79%  | 5.79%  | 26                                      | (130)                               | (104)                        | 118                  |

Notes and assumptions:

The projection is based on the results of the June 30, 2019 actuarial valuation and assumes that all actuarial assumptions are realized, including the assumed annual asset return of 6.25%.

New active members are assumed to be hired to replace the current active members as they are assumed to terminate employment or retire, but the total active population is assumed to decrease by 2% each year over the next 30 years.

The contribution rate established in the Commonwealth's biennium budget is based on the calculated actuarially determined contribution rate.

**Kentucky Retirement Systems**  
**Exhibit 2-3**  
**CERS Non-Hazardous Retirement Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Current Plan (Amortization Period = 24 Years at June 30, 2019)**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Actuarial<br>Accrued<br>Liability | Actuarial<br>Value of<br>Assets | Unfunded<br>Actuarial<br>Accrued Liability | Funded<br>Ratio<br>(3) / (2) | Total<br>Employer<br>Contribution | Member<br>Contribution | Covered<br>Payroll | Total<br>Employer<br>Contribution as %<br>of Covered Payroll | Employer<br>Actuarial<br>Determined<br>Contribution Rate | Annual Cash Flow Analysis               |                                     |                              |                      |
|-------------------------------------|-----------------------------------|---------------------------------|--|------------------------------|-----------------------------------|------------------------|--------------------|--|--|---|-------------------------------------|------------------------------|----------------------|
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | Member and<br>Employer<br>Contributions | Benefit<br>Payments<br>and Expenses | Net<br>External<br>Cash Flow | Investment<br>Income |
| (1)                                 | (2)                               | (3)                             | (4)  | (5)                          | (6)                               | (7)                    | (8)                | (9)  | (10)   | (11)                                    | (12)                                | (13)                         | (14)                 |
| 2019                                | \$ 14,356                         | \$ 7,050                        | \$ 7,306                                   | 49%                          | \$ 487                            | \$ 126                 | \$ 2,522           | 19.30%   | 22.52%   | \$ 613                                  | \$ (818)                            | \$ (205)                     | \$ 441               |
| 2020                                | 14,726                            | 7,281                           | 7,445                                      | 49%                          | 558                               | 129                    | 2,581              | 21.62%   | 26.21%   | 687                                     | (855)                               | (168)                        | 457                  |
| 2021                                | 15,079                            | 7,669                           | 7,410                                      | 51%                          | 648                               | 132                    | 2,638              | 24.58%   | 26.14%   | 780                                     | (890)                               | (110)                        | 477                  |
| 2022                                | 15,418                            | 8,061                           | 7,357                                      | 52%                          | 692                               | 135                    | 2,694              | 25.67%   | 25.67%   | 827                                     | (926)                               | (99)                         | 500                  |
| 2023                                | 15,742                            | 8,454                           | 7,288                                      | 54%                          | 697                               | 138                    | 2,751              | 25.35%   | 25.35%   | 835                                     | (962)                               | (127)                        | 524                  |
| 2024                                | 16,049                            | 8,851                           | 7,198                                      | 55%                          | 707                               | 140                    | 2,809              | 25.16%   | 25.16%   | 847                                     | (999)                               | (152)                        | 548                  |
| 2025                                | 16,339                            | 9,248                           | 7,091                                      | 57%                          | 716                               | 143                    | 2,866              | 24.97%   | 24.97%   | 859                                     | (1,036)                             | (177)                        | 572                  |
| 2026                                | 16,609                            | 9,644                           | 6,965                                      | 58%                          | 725                               | 146                    | 2,924              | 24.80%   | 24.80%   | 871                                     | (1,073)                             | (202)                        | 596                  |
| 2027                                | 16,859                            | 10,039                          | 6,820                                      | 60%                          | 735                               | 149                    | 2,983              | 24.64%   | 24.64%   | 884                                     | (1,109)                             | (225)                        | 620                  |
| 2028                                | 17,088                            | 10,434                          | 6,654                                      | 61%                          | 746                               | 152                    | 3,044              | 24.50%   | 24.50%   | 898                                     | (1,143)                             | (245)                        | 644                  |
| 2029                                | 17,299                            | 10,833                          | 6,466                                      | 63%                          | 758                               | 155                    | 3,107              | 24.39%   | 24.39%   | 913                                     | (1,169)                             | (256)                        | 669                  |
| 2030                                | 17,499                            | 11,246                          | 6,253                                      | 64%                          | 770                               | 159                    | 3,174              | 24.27%   | 24.27%   | 929                                     | (1,198)                             | (269)                        | 694                  |
| 2031                                | 17,685                            | 11,671                          | 6,014                                      | 66%                          | 784                               | 162                    | 3,243              | 24.17%   | 24.17%   | 946                                     | (1,225)                             | (279)                        | 721                  |
| 2032                                | 17,858                            | 12,114                          | 5,744                                      | 68%                          | 798                               | 166                    | 3,315              | 24.07%   | 24.07%   | 964                                     | (1,249)                             | (285)                        | 748                  |
| 2033                                | 18,021                            | 12,577                          | 5,444                                      | 70%                          | 813                               | 169                    | 3,390              | 23.98%   | 23.98%   | 982                                     | (1,271)                             | (289)                        | 777                  |
| 2034                                | 18,176                            | 13,065                          | 5,111                                      | 72%                          | 829                               | 173                    | 3,467              | 23.91%   | 23.91%   | 1,002                                   | (1,291)                             | (289)                        | 808                  |
| 2035                                | 18,326                            | 13,584                          | 4,742                                      | 74%                          | 845                               | 177                    | 3,546              | 23.84%   | 23.84%   | 1,022                                   | (1,308)                             | (286)                        | 840                  |
| 2036                                | 18,473                            | 14,139                          | 4,334                                      | 77%                          | 864                               | 182                    | 3,631              | 23.79%   | 23.79%   | 1,046                                   | (1,321)                             | (275)                        | 875                  |
| 2037                                | 18,622                            | 14,738                          | 3,884                                      | 79%                          | 884                               | 186                    | 3,720              | 23.76%   | 23.76%   | 1,070                                   | (1,330)                             | (260)                        | 913                  |
| 2038                                | 18,778                            | 15,391                          | 3,387                                      | 82%                          | 904                               | 191                    | 3,813              | 23.72%   | 23.72%   | 1,095                                   | (1,336)                             | (241)                        | 954                  |
| 2039                                | 18,946                            | 16,105                          | 2,841                                      | 85%                          | 927                               | 195                    | 3,909              | 23.71%   | 23.71%   | 1,122                                   | (1,340)                             | (218)                        | 1,000                |
| 2040                                | 19,128                            | 16,887                          | 2,241                                      | 88%                          | 951                               | 200                    | 4,007              | 23.74%   | 23.74%   | 1,151                                   | (1,343)                             | (192)                        | 1,049                |
| 2041                                | 19,327                            | 17,745                          | 1,582                                      | 92%                          | 980                               | 205                    | 4,107              | 23.86%   | 23.86%   | 1,185                                   | (1,345)                             | (160)                        | 1,104                |
| 2042                                | 19,545                            | 18,689                          | 856  | 96%                          | 1,020                             | 210                    | 4,209              | 24.22%   | 24.22%   | 1,230                                   | (1,348)                             | (118)                        | 1,164                |
| 2043                                | 19,783                            | 19,783                          | -  | 100%                         | 162                               | 216                    | 4,313              | 3.76%  | 3.76%  | 378                                     | (1,350)                             | (972)                        | 1,203                |
| 2044                                | 20,043                            | 20,043                          | -  | 100%                         | 165                               | 221                    | 4,419              | 3.74%  | 3.74%  | 386                                     | (1,353)                             | (967)                        | 1,218                |
| 2045                                | 20,326                            | 20,326                          | -  | 100%                         | 169                               | 226                    | 4,526              | 3.73%  | 3.73%  | 395                                     | (1,357)                             | (962)                        | 1,234                |
| 2046                                | 20,633                            | 20,633                          | -  | 100%                         | 172                               | 232                    | 4,635              | 3.71%  | 3.71%  | 404                                     | (1,361)                             | (957)                        | 1,251                |
| 2047                                | 20,965                            | 20,965                          | -  | 100%                         | 176                               | 237                    | 4,745              | 3.70%  | 3.70%  | 413                                     | (1,368)                             | (955)                        | 1,269                |
| 2048                                | 21,322                            | 21,322                          | -  | 100%                         | 179                               | 243                    | 4,857              | 3.69%  | 3.69%  | 422                                     | (1,375)                             | (953)                        | 1,289                |
| 2049                                | 21,705                            | 21,705                          | -  | 100%                         | 183                               | 249                    | 4,971              | 3.68%  | 3.68%  | 432                                     | (1,384)                             | (952)                        | 1,310                |
| 2050                                | 22,113                            | 22,113                          | -  | 100%                         | 187                               | 254                    | 5,087              | 3.67%  | 3.67%  | 441                                     | (1,395)                             | (954)                        | 1,332                |
| 2051                                | 22,548                            | 22,548                          | -  | 100%                         | 190                               | 260                    | 5,204              | 3.66%  | 3.66%  | 450                                     | (1,407)                             | (957)                        | 1,356                |
| 2052                                | 23,009                            | 23,009                          | -  | 100%                         | 195                               | 266                    | 5,324              | 3.66%  | 3.66%  | 461                                     | (1,422)                             | (961)                        | 1,380                |
| 2053                                | 23,497                            | 23,497                          | -  | 100%                         | 199                               | 272                    | 5,446              | 3.66%  | 3.66%  | 471                                     | (1,439)                             | (968)                        | 1,406                |

Notes and assumptions:

The projection is based on the results of the June 30, 2019 actuarial valuation and assumes that all actuarial assumptions are realized, including the assumed annual asset return of 6.25%.

New active members are assumed to be hired to replace the current active members as they are assumed to terminate employment or retire.

The total active population is assumed to remain constant through the entire projection.

The Board certified contribution rate paid by employers is based on the calculated actuarially determined contribution rate and reflects House Bill 362 passed during the 2018 legislative session that limits the contribution rate increases up to 12% per year over the prior fiscal year for the period of July 1, 2018 to June 30, 2028.

**Kentucky Retirement Systems**  
**Exhibit 2-4**  
**CERS Hazardous Retirement Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Current Plan (Amortization Period = 24 Years at June 30, 2019)**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Actuarial<br>Accrued<br>Liability | Actuarial<br>Value of<br>Assets | Unfunded<br>Actuarial<br>Accrued Liability | Funded<br>Ratio<br>(3) / (2) | Total<br>Employer<br>Contribution | Member<br>Contribution | Covered<br>Payroll | Total<br>Employer<br>Contribution as %<br>of Covered Payroll | Employer<br>Actuarial<br>Determined<br>Contribution Rate | Annual Cash Flow Analysis               |                                     |                              |                      |
|-------------------------------------|-----------------------------------|---------------------------------|--|------------------------------|-----------------------------------|------------------------|--------------------|--|--|---|-------------------------------------|------------------------------|----------------------|
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | Member and<br>Employer<br>Contributions | Benefit<br>Payments<br>and Expenses | Net<br>External<br>Cash Flow | Investment<br>Income |
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | (1)                                     | (2)                                 | (3)                          | (4)                  |
| 2019                                | \$ 5,245                          | \$ 2,375                        | \$ 2,870                                   | 45%                          | \$ 168                            | \$ 45                  | \$ 559             | 30.06%   | 36.98%   | \$ 213                                  | \$ (275)                            | \$ (62)                      | \$ 149               |
| 2020                                | 5,407                             | 2,462                           | 2,945                                      | 46%                          | 190                               | 45                     | 562                | 33.86%   | 46.31%   | 235                                     | (293)                               | (58)                         | 155                  |
| 2021                                | 5,557                             | 2,592                           | 2,965                                      | 47%                          | 226                               | 46                     | 570                | 39.73%   | 47.18%   | 272                                     | (308)                               | (36)                         | 161                  |
| 2022                                | 5,700                             | 2,726                           | 2,974                                      | 48%                          | 268                               | 46                     | 578                | 46.43%   | 47.06%   | 314                                     | (322)                               | (8)                          | 170                  |
| 2023                                | 5,837                             | 2,885                           | 2,952                                      | 49%                          | 275                               | 47                     | 588                | 46.79%   | 46.79%   | 322                                     | (336)                               | (14)                         | 180                  |
| 2024                                | 5,968                             | 3,052                           | 2,916                                      | 51%                          | 279                               | 48                     | 599                | 46.62%   | 46.62%   | 327                                     | (349)                               | (22)                         | 190                  |
| 2025                                | 6,093                             | 3,220                           | 2,873                                      | 53%                          | 283                               | 49                     | 610                | 46.37%   | 46.37%   | 332                                     | (361)                               | (29)                         | 200                  |
| 2026                                | 6,214                             | 3,391                           | 2,823                                      | 55%                          | 287                               | 50                     | 622                | 46.12%   | 46.12%   | 337                                     | (373)                               | (36)                         | 211                  |
| 2027                                | 6,329                             | 3,565                           | 2,764                                      | 56%                          | 291                               | 51                     | 635                | 45.88%   | 45.88%   | 342                                     | (384)                               | (42)                         | 222                  |
| 2028                                | 6,441                             | 3,745                           | 2,696                                      | 58%                          | 296                               | 52                     | 648                | 45.62%   | 45.62%   | 348                                     | (394)                               | (46)                         | 233                  |
| 2029                                | 6,550                             | 3,930                           | 2,620                                      | 60%                          | 301                               | 53                     | 663                | 45.37%   | 45.37%   | 354                                     | (402)                               | (48)                         | 244                  |
| 2030                                | 6,658                             | 4,126                           | 2,532                                      | 62%                          | 307                               | 54                     | 680                | 45.09%   | 45.09%   | 361                                     | (409)                               | (48)                         | 256                  |
| 2031                                | 6,768                             | 4,335                           | 2,433                                      | 64%                          | 312                               | 56                     | 698                | 44.74%   | 44.74%   | 368                                     | (415)                               | (47)                         | 269                  |
| 2032                                | 6,880                             | 4,557                           | 2,323                                      | 66%                          | 319                               | 57                     | 717                | 44.42%   | 44.42%   | 376                                     | (420)                               | (44)                         | 283                  |
| 2033                                | 6,995                             | 4,796                           | 2,199                                      | 69%                          | 325                               | 59                     | 737                | 44.09%   | 44.09%   | 384                                     | (425)                               | (41)                         | 298                  |
| 2034                                | 7,115                             | 5,053                           | 2,062                                      | 71%                          | 331                               | 61                     | 757                | 43.75%   | 43.75%   | 392                                     | (431)                               | (39)                         | 315                  |
| 2035                                | 7,239                             | 5,328                           | 1,911                                      | 74%                          | 338                               | 62                     | 777                | 43.46%   | 43.46%   | 400                                     | (437)                               | (37)                         | 332                  |
| 2036                                | 7,366                             | 5,623                           | 1,743                                      | 76%                          | 344                               | 64                     | 796                | 43.20%   | 43.20%   | 408                                     | (445)                               | (37)                         | 350                  |
| 2037                                | 7,495                             | 5,936                           | 1,559                                      | 79%                          | 350                               | 65                     | 815                | 42.99%   | 42.99%   | 415                                     | (455)                               | (40)                         | 370                  |
| 2038                                | 7,625                             | 6,266                           | 1,359                                      | 82%                          | 357                               | 67                     | 834                | 42.84%   | 42.84%   | 424                                     | (465)                               | (41)                         | 390                  |
| 2039                                | 7,753                             | 6,615                           | 1,138                                      | 85%                          | 365                               | 68                     | 852                | 42.78%   | 42.78%   | 433                                     | (475)                               | (42)                         | 412                  |
| 2040                                | 7,881                             | 6,985                           | 896  | 89%                          | 373                               | 70                     | 872                | 42.80%   | 42.80%   | 443                                     | (484)                               | (41)                         | 435                  |
| 2041                                | 8,009                             | 7,379                           | 630  | 92%                          | 384                               | 71                     | 892                | 42.99%   | 42.99%   | 455                                     | (492)                               | (37)                         | 460                  |
| 2042                                | 8,141                             | 7,802                           | 339  | 96%                          | 398                               | 73                     | 913                | 43.54%   | 43.54%   | 471                                     | (498)                               | (27)                         | 487                  |
| 2043                                | 8,277                             | 8,277                           | -  | 100%                         | 56                                | 75                     | 935                | 6.03%  | 6.03%  | 131                                     | (505)                               | (374)                        | 505                  |
| 2044                                | 8,417                             | 8,417                           | -  | 100%                         | 57                                | 77                     | 956                | 5.99%  | 5.99%  | 134                                     | (514)                               | (380)                        | 513                  |
| 2045                                | 8,561                             | 8,561                           | -  | 100%                         | 58                                | 78                     | 976                | 5.97%  | 5.97%  | 136                                     | (523)                               | (387)                        | 521                  |
| 2046                                | 8,708                             | 8,708                           | -  | 100%                         | 59                                | 80                     | 996                | 5.95%  | 5.95%  | 139                                     | (533)                               | (394)                        | 529                  |
| 2047                                | 8,856                             | 8,856                           | -  | 100%                         | 60                                | 81                     | 1,017              | 5.94%  | 5.94%  | 141                                     | (544)                               | (403)                        | 537                  |
| 2048                                | 9,006                             | 9,006                           | -  | 100%                         | 62                                | 83                     | 1,038              | 5.93%  | 5.93%  | 145                                     | (554)                               | (409)                        | 545                  |
| 2049                                | 9,159                             | 9,159                           | -  | 100%                         | 63                                | 85                     | 1,062              | 5.93%  | 5.93%  | 148                                     | (565)                               | (417)                        | 553                  |
| 2050                                | 9,314                             | 9,314                           | -  | 100%                         | 64                                | 87                     | 1,082              | 5.93%  | 5.93%  | 151                                     | (577)                               | (426)                        | 562                  |
| 2051                                | 9,470                             | 9,470                           | -  | 100%                         | 66                                | 88                     | 1,105              | 5.93%  | 5.93%  | 154                                     | (589)                               | (435)                        | 570                  |
| 2052                                | 9,626                             | 9,626                           | -  | 100%                         | 67                                | 90                     | 1,128              | 5.93%  | 5.93%  | 157                                     | (601)                               | (444)                        | 578                  |
| 2053                                | 9,784                             | 9,784                           | -  | 100%                         | 68                                | 92                     | 1,152              | 5.93%  | 5.93%  | 160                                     | (613)                               | (453)                        | 586                  |

Notes and assumptions:

The projection is based on the results of the June 30, 2019 actuarial valuation and assumes that all actuarial assumptions are realized, including the assumed annual asset return of 6.25%.

New active members are assumed to be hired to replace the current active members as they are assumed to terminate employment or retire.

The total active population is assumed to remain constant through the entire projection.

The Board certified contribution rate paid by employers is based on the calculated actuarially determined contribution rate and reflects House Bill 362 passed during the 2018 legislative session that limits the contribution rate increases up to 12% per year over the prior fiscal year for the period of July 1, 2018 to June 30, 2028.

**Kentucky Retirement Systems**  
**Exhibit 2-5**  
**State Police Retirement System Retirement Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Current Plan (Amortization Period = 24 Years at June 30, 2019)**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Actuarial<br>Accrued<br>Liability | Actuarial<br>Value of<br>Assets | Unfunded<br>Actuarial<br>Accrued Liability | Funded<br>Ratio<br>(3) / (2) | Total<br>Employer<br>Contribution | Member<br>Contribution | Covered<br>Payroll | Total<br>Employer<br>Contribution as %<br>of Covered Payroll | Employer<br>Actuarial<br>Determined<br>Contribution Rate | Annual Cash Flow Analysis               |                                     |                              |                      |
|-------------------------------------|-----------------------------------|---------------------------------|--|------------------------------|-----------------------------------|------------------------|--------------------|--|--|---|-------------------------------------|------------------------------|----------------------|
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | Member and<br>Employer<br>Contributions | Benefit<br>Payments<br>and Expenses | Net<br>External<br>Cash Flow | Investment<br>Income |
| (1)                                 | (2)                               | (3)                             | (4)  | (5)                          | (6)                               | (7)                    | (8)                | (9)  | (10)   | (11)                                    | (12)                                | (13)                         | (14)                 |
| 2019                                | \$ 1,045                          | \$ 282                          | \$ 763                                     | 27%                          | \$ 57                             | \$ 4                   | \$ 48              | 119.05%  | 120.54%  | \$ 61                                   | \$ (63)                             | \$ (2)                       | \$ 15                |
| 2020                                | 1,050                             | 295                             | 755  | 28%                          | 64                                | 4                      | 47                 | 136.12%  | 136.12%  | 68                                      | (64)                                | 4                            | 16                   |
| 2021                                | 1,052                             | 318                             | 734  | 30%                          | 64                                | 4                      | 47                 | 136.12%  | 137.64%  | 68                                      | (65)                                | 3                            | 17                   |
| 2022                                | 1,053                             | 338                             | 715  | 32%                          | 64                                | 4                      | 47                 | 137.06%  | 137.06%  | 68                                      | (66)                                | 2                            | 18                   |
| 2023                                | 1,053                             | 357                             | 696  | 34%                          | 63                                | 4                      | 46                 | 137.06%  | 136.73%  | 67                                      | (67)                                | -                            | 19                   |
| 2024                                | 1,052                             | 376                             | 676  | 36%                          | 63                                | 4                      | 46                 | 136.63%  | 136.63%  | 67                                      | (68)                                | (1)                          | 20                   |
| 2025                                | 1,049                             | 395                             | 654  | 38%                          | 63                                | 4                      | 46                 | 136.63%  | 136.45%  | 67                                      | (69)                                | (2)                          | 21                   |
| 2026                                | 1,045                             | 414                             | 631  | 40%                          | 63                                | 4                      | 46                 | 136.73%  | 136.73%  | 67                                      | (69)                                | (2)                          | 22                   |
| 2027                                | 1,041                             | 432                             | 609  | 41%                          | 63                                | 4                      | 46                 | 136.73%  | 136.35%  | 67                                      | (69)                                | (2)                          | 23                   |
| 2028                                | 1,035                             | 452                             | 583  | 44%                          | 62                                | 4                      | 46                 | 135.45%  | 135.45%  | 66                                      | (70)                                | (4)                          | 24                   |
| 2029                                | 1,028                             | 472                             | 556  | 46%                          | 62                                | 4                      | 46                 | 135.45%  | 134.79%  | 66                                      | (70)                                | (4)                          | 25                   |
| 2030                                | 1,021                             | 493                             | 528  | 48%                          | 62                                | 4                      | 46                 | 133.84%  | 133.84%  | 66                                      | (70)                                | (4)                          | 26                   |
| 2031                                | 1,013                             | 514                             | 499  | 51%                          | 63                                | 4                      | 47                 | 133.84%  | 132.52%  | 67                                      | (70)                                | (3)                          | 27                   |
| 2032                                | 1,005                             | 538                             | 467  | 54%                          | 62                                | 4                      | 47                 | 130.81%  | 130.81%  | 66                                      | (69)                                | (3)                          | 28                   |
| 2033                                | 996                               | 562                             | 434  | 56%                          | 63                                | 4                      | 48                 | 130.81%  | 129.28%  | 67                                      | (69)                                | (2)                          | 29                   |
| 2034                                | 988                               | 590                             | 398  | 60%                          | 61                                | 4                      | 48                 | 127.16%  | 127.16%  | 65                                      | (68)                                | (3)                          | 31                   |
| 2035                                | 980                               | 617                             | 363  | 63%                          | 62                                | 4                      | 49                 | 127.16%  | 125.63%  | 66                                      | (68)                                | (2)                          | 32                   |
| 2036                                | 971                               | 648                             | 323  | 67%                          | 61                                | 4                      | 49                 | 123.92%  | 123.92%  | 65                                      | (68)                                | (3)                          | 34                   |
| 2037                                | 962                               | 678                             | 284  | 70%                          | 61                                | 4                      | 49                 | 123.92%  | 123.15%  | 65                                      | (67)                                | (2)                          | 36                   |
| 2038                                | 953                               | 711                             | 242  | 75%                          | 60                                | 4                      | 49                 | 121.90%  | 121.90%  | 64                                      | (67)                                | (3)                          | 37                   |
| 2039                                | 944                               | 745                             | 199  | 79%                          | 60                                | 4                      | 49                 | 121.90%  | 121.57%  | 64                                      | (67)                                | (3)                          | 39                   |
| 2040                                | 933                               | 781                             | 152  | 84%                          | 59                                | 4                      | 49                 | 120.67%  | 120.67%  | 63                                      | (67)                                | (4)                          | 41                   |
| 2041                                | 923                               | 818                             | 105  | 89%                          | 59                                | 4                      | 49                 | 120.67%  | 120.92%  | 63                                      | (67)                                | (4)                          | 43                   |
| 2042                                | 912                               | 857                             | 55   | 94%                          | 60                                | 4                      | 49                 | 122.14%  | 122.14%  | 64                                      | (66)                                | (2)                          | 45                   |
| 2043                                | 900                               | 900                             | -  | 100%                         | 4                                 | 4                      | 49                 | 8.51%  | 8.51%  | 8                                       | (66)                                | (58)                         | 46                   |
| 2044                                | 889                               | 889                             | -  | 100%                         | 4                                 | 4                      | 49                 | 8.30%  | 8.30%  | 8                                       | (66)                                | (58)                         | 45                   |
| 2045                                | 877                               | 877                             | -  | 100%                         | 4                                 | 4                      | 48                 | 8.13%  | 8.13%  | 8                                       | (66)                                | (58)                         | 44                   |
| 2046                                | 864                               | 864                             | -  | 100%                         | 4                                 | 4                      | 48                 | 7.97%  | 7.97%  | 8                                       | (65)                                | (57)                         | 44                   |
| 2047                                | 851                               | 851                             | -  | 100%                         | 4                                 | 4                      | 48                 | 7.85%  | 7.85%  | 8                                       | (64)                                | (56)                         | 43                   |
| 2048                                | 837                               | 837                             | -  | 100%                         | 4                                 | 4                      | 48                 | 7.76%  | 7.76%  | 8                                       | (64)                                | (56)                         | 42                   |
| 2049                                | 824                               | 824                             | -  | 100%                         | 4                                 | 4                      | 48                 | 7.70%  | 7.70%  | 8                                       | (64)                                | (56)                         | 42                   |
| 2050                                | 810                               | 810                             | -  | 100%                         | 4                                 | 4                      | 49                 | 7.67%  | 7.67%  | 8                                       | (63)                                | (55)                         | 41                   |
| 2051                                | 797                               | 797                             | -  | 100%                         | 4                                 | 4                      | 49                 | 7.66%  | 7.66%  | 8                                       | (62)                                | (54)                         | 40                   |
| 2052                                | 783                               | 783                             | -  | 100%                         | 4                                 | 4                      | 50                 | 7.66%  | 7.66%  | 8                                       | (62)                                | (54)                         | 39                   |
| 2053                                | 770                               | 770                             | -  | 100%                         | 4                                 | 4                      | 51                 | 7.66%  | 7.66%  | 8                                       | (61)                                | (53)                         | 39                   |

Notes and assumptions:

The projection is based on the results of the June 30, 2019 actuarial valuation and assumes that all actuarial assumptions are realized, including the assumed annual asset return of 5.25%.

New active members are assumed to be hired to replace the current active members as they are assumed to terminate employment or retire, but the total active population is assumed to decrease by 2% each year over the next 30 years.

The contribution rate established in the Commonwealth's biennium budget is based on the calculated actuarially determined contribution rate.

The employer contribution amount shown does not include the \$1.086 million additional contribution budgeted to be paid in fiscal year ending 2020.

**Kentucky Retirement Systems**  
**Exhibit 2-6**  
**KERS Non-Hazardous Insurance Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Current Plan (Amortization Period = 24 Years at June 30, 2019)**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Actuarial<br>Accrued<br>Liability | Actuarial<br>Value of<br>Assets | Unfunded<br>Actuarial<br>Accrued Liability | Funded<br>Ratio<br>(3) / (2) | Total<br>Employer<br>Contribution | Member<br>Contribution | Covered<br>Payroll | Total<br>Employer<br>Contribution as %<br>of Covered Payroll | Employer<br>Actuarial<br>Determined<br>Contribution Rate | Annual Cash Flow Analysis               |                                     |                              |                      |
|-------------------------------------|-----------------------------------|---------------------------------|--|------------------------------|-----------------------------------|------------------------|--------------------|--|--|---|-------------------------------------|------------------------------|----------------------|
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | Member and<br>Employer<br>Contributions | Benefit<br>Payments<br>and Expenses | Net<br>External<br>Cash Flow | Investment<br>Income |
| (1)                                 | (2)                               | (3)                             | (4)  | (5)                          | (6)                               | (7)                    | (8)                | (9)  | (10)   | (11)                                    | (12)                                | (13)                         | (14)                 |
| 2019                                | \$ 2,733                          | \$ 991                          | \$ 1,742                                   | 36%                          | \$ 165                            | \$ 6                   | \$ 1,431           | 11.50%   | 10.65%   | \$ 171                                  | \$ (133)                            | \$ 38                        | \$ 63                |
| 2020                                | 2,808                             | 1,090                           | 1,718                                      | 39%                          | 171                               | 6                      | 1,421              | 12.03%   | 12.03%   | 177                                     | (137)                               | 40                           | 70                   |
| 2021                                | 2,882                             | 1,209                           | 1,673                                      | 42%                          | 170                               | 7                      | 1,415              | 12.03%   | 11.99%   | 177                                     | (145)                               | 32                           | 76                   |
| 2022                                | 2,951                             | 1,318                           | 1,633                                      | 45%                          | 167                               | 7                      | 1,410              | 11.83%   | 11.83%   | 174                                     | (153)                               | 21                           | 83                   |
| 2023                                | 3,015                             | 1,420                           | 1,595                                      | 47%                          | 166                               | 8                      | 1,406              | 11.83%   | 11.73%   | 174                                     | (161)                               | 13                           | 89                   |
| 2024                                | 3,072                             | 1,522                           | 1,550                                      | 50%                          | 163                               | 8                      | 1,402              | 11.63%   | 11.63%   | 171                                     | (170)                               | 1                            | 95                   |
| 2025                                | 3,123                             | 1,618                           | 1,505                                      | 52%                          | 163                               | 9                      | 1,399              | 11.63%   | 11.53%   | 172                                     | (180)                               | (8)                          | 101                  |
| 2026                                | 3,165                             | 1,711                           | 1,454                                      | 54%                          | 159                               | 9                      | 1,396              | 11.40%   | 11.40%   | 168                                     | (189)                               | (21)                         | 106                  |
| 2027                                | 3,200                             | 1,797                           | 1,403                                      | 56%                          | 159                               | 10                     | 1,393              | 11.40%   | 11.28%   | 169                                     | (199)                               | (30)                         | 111                  |
| 2028                                | 3,224                             | 1,878                           | 1,346                                      | 58%                          | 155                               | 10                     | 1,390              | 11.15%   | 11.15%   | 165                                     | (208)                               | (43)                         | 116                  |
| 2029                                | 3,239                             | 1,951                           | 1,288                                      | 60%                          | 155                               | 11                     | 1,388              | 11.15%   | 11.03%   | 166                                     | (217)                               | (51)                         | 120                  |
| 2030                                | 3,245                             | 2,020                           | 1,225                                      | 62%                          | 151                               | 11                     | 1,387              | 10.89%   | 10.89%   | 162                                     | (224)                               | (62)                         | 124                  |
| 2031                                | 3,244                             | 2,083                           | 1,161                                      | 64%                          | 151                               | 11                     | 1,387              | 10.89%   | 10.78%   | 162                                     | (229)                               | (67)                         | 128                  |
| 2032                                | 3,235                             | 2,145                           | 1,090                                      | 66%                          | 148                               | 12                     | 1,387              | 10.66%   | 10.66%   | 160                                     | (233)                               | (73)                         | 132                  |
| 2033                                | 3,221                             | 2,203                           | 1,018                                      | 68%                          | 148                               | 12                     | 1,388              | 10.66%   | 10.58%   | 160                                     | (236)                               | (76)                         | 135                  |
| 2034                                | 3,203                             | 2,263                           | 940  | 71%                          | 146                               | 13                     | 1,389              | 10.48%   | 10.48%   | 159                                     | (238)                               | (79)                         | 139                  |
| 2035                                | 3,180                             | 2,322                           | 858  | 73%                          | 146                               | 13                     | 1,391              | 10.48%   | 10.40%   | 159                                     | (238)                               | (79)                         | 143                  |
| 2036                                | 3,156                             | 2,386                           | 770  | 76%                          | 144                               | 13                     | 1,395              | 10.32%   | 10.32%   | 157                                     | (236)                               | (79)                         | 147                  |
| 2037                                | 3,132                             | 2,453                           | 679  | 78%                          | 145                               | 13                     | 1,401              | 10.32%   | 10.23%   | 158                                     | (234)                               | (76)                         | 151                  |
| 2038                                | 3,108                             | 2,527                           | 581  | 81%                          | 143                               | 14                     | 1,407              | 10.13%   | 10.13%   | 157                                     | (232)                               | (75)                         | 156                  |
| 2039                                | 3,085                             | 2,607                           | 478  | 85%                          | 143                               | 14                     | 1,414              | 10.13%   | 10.05%   | 157                                     | (229)                               | (72)                         | 161                  |
| 2040                                | 3,063                             | 2,695                           | 368  | 88%                          | 141                               | 14                     | 1,421              | 9.93%  | 9.93%  | 155                                     | (226)                               | (71)                         | 166                  |
| 2041                                | 3,043                             | 2,791                           | 252  | 92%                          | 142                               | 14                     | 1,427              | 9.93%  | 9.87%  | 156                                     | (223)                               | (67)                         | 172                  |
| 2042                                | 3,024                             | 2,896                           | 128  | 96%                          | 139                               | 14                     | 1,433              | 9.67%  | 9.67%  | 153                                     | (219)                               | (66)                         | 179                  |
| 2043                                | 3,009                             | 3,009                           | -  | 100%                         | 6                                 | 14                     | 1,438              | 0.42%  | 0.42%  | 20                                      | (216)                               | (196)                        | 182                  |
| 2044                                | 2,995                             | 2,995                           | -  | 100%                         | 6                                 | 14                     | 1,443              | 0.41%  | 0.41%  | 20                                      | (214)                               | (194)                        | 181                  |
| 2045                                | 2,983                             | 2,983                           | -  | 100%                         | 6                                 | 14                     | 1,447              | 0.40%  | 0.40%  | 20                                      | (212)                               | (192)                        | 180                  |
| 2046                                | 2,971                             | 2,971                           | -  | 100%                         | 6                                 | 14                     | 1,451              | 0.38%  | 0.38%  | 20                                      | (212)                               | (192)                        | 180                  |
| 2047                                | 2,960                             | 2,960                           | -  | 100%                         | 6                                 | 15                     | 1,455              | 0.38%  | 0.38%  | 21                                      | (212)                               | (191)                        | 179                  |
| 2048                                | 2,947                             | 2,947                           | -  | 100%                         | 5                                 | 15                     | 1,459              | 0.37%  | 0.37%  | 20                                      | (212)                               | (192)                        | 178                  |
| 2049                                | 2,934                             | 2,934                           | -  | 100%                         | 5                                 | 15                     | 1,463              | 0.36%  | 0.36%  | 20                                      | (213)                               | (193)                        | 177                  |
| 2050                                | 2,919                             | 2,919                           | -  | 100%                         | 5                                 | 15                     | 1,489              | 0.35%  | 0.35%  | 20                                      | (213)                               | (193)                        | 176                  |
| 2051                                | 2,903                             | 2,903                           | -  | 100%                         | 5                                 | 15                     | 1,517              | 0.34%  | 0.34%  | 20                                      | (214)                               | (194)                        | 175                  |
| 2052                                | 2,885                             | 2,885                           | -  | 100%                         | 5                                 | 15                     | 1,546              | 0.32%  | 0.32%  | 20                                      | (214)                               | (194)                        | 174                  |
| 2053                                | 2,867                             | 2,867                           | -  | 100%                         | 5                                 | 16                     | 1,577              | 0.31%  | 0.31%  | 21                                      | (214)                               | (193)                        | 173                  |

Notes and assumptions:

The projection is based on the results of the June 30, 2019 actuarial valuation and assumes that all actuarial assumptions are realized, including the assumed annual asset return of 6.25%.

New active members are assumed to be hired to replace the current active members as they are assumed to terminate employment or retire, but the total active population is assumed to decrease by 2% each year over the next 30 years.

The contribution rate established in the Commonwealth's biennium budget is based on the calculated actuarially determined contribution rate.

The 11.50% employer contribution rate for FY 2020 is the effective contribution rate after reflecting HB 1 (passed during the 2019 Special Session) which provided that

Regional Mental Health/Mental Retardation Boards, Local and District Health Departments, State Universities, Community Colleges and any other agency eligible to voluntarily cease participating in the KERS to contribute a 8.41% of pay contribution rate for FY 2019. Collectively these entities reflect approximately 23% of the covered payroll in the System.

**Kentucky Retirement Systems**  
**Exhibit 2-7**  
**KERS Hazardous Insurance Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Current Plan (Amortization Period = 24 Years at June 30, 2019)**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Actuarial<br>Accrued<br>Liability | Actuarial<br>Value of<br>Assets | Unfunded<br>Actuarial<br>Accrued Liability | Funded<br>Ratio<br>(3) / (2) | Total<br>Employer<br>Contribution | Member<br>Contribution | Covered<br>Payroll | Total<br>Employer<br>Contribution as %<br>of Covered Payroll | Employer<br>Actuarial<br>Determined<br>Contribution Rate | Annual Cash Flow Analysis               |                                     |                              |                      |       |       |    |   |    |      |    |      |    |    |
|-------------------------------------|-----------------------------------|---------------------------------|--|------------------------------|-----------------------------------|------------------------|--------------------|--|--|---|-------------------------------------|------------------------------|----------------------|-------|-------|----|---|----|------|----|------|----|----|
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | Member and<br>Employer<br>Contributions | Benefit<br>Payments<br>and Expenses | Net<br>External<br>Cash Flow | Investment<br>Income |       |       |    |   |    |      |    |      |    |    |
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  |   |                                     |                              |                      |       |       |    |   |    |      |    |      |    |    |
| (1)                                 | (2)                               | (3)                             | (4)  | (5)                          | (6)                               | (7)                    | (8)                | (9)  | (10)   | (11)                                    | (12)                                | (13)                         | (14)                 |       |       |    |   |    |      |    |      |    |    |
| 2019                                | \$                                | 427                             | \$   | 525                          | \$                                | (98)                   | 123%               | \$   | 4  | \$                                      | 1                                   | \$                           | 150                  | 2.46% | 0.00% | \$ | 5 | \$ | (20) | \$ | (15) | \$ | 33 |
| 2020                                |                                   | 440                             |  | 543                          |                                   | (103)                  | 123%               |  | -  |   | 1                                   |                              | 150                  | 0.00% | 0.00% |    | 1 |    | (22) |    | (21) |    | 34 |
| 2021                                |                                   | 453                             |  | 563                          |                                   | (110)                  | 124%               |  | -  |   | 1                                   |                              | 151                  | 0.00% | 0.00% |    | 1 |    | (24) |    | (23) |    | 35 |
| 2022                                |                                   | 464                             |  | 577                          |                                   | (113)                  | 124%               |  | -  |   | 1                                   |                              | 152                  | 0.00% | 0.00% |    | 1 |    | (26) |    | (25) |    | 35 |
| 2023                                |                                   | 473                             |  | 587                          |                                   | (114)                  | 124%               |  | -  |   | 1                                   |                              | 153                  | 0.00% | 0.00% |    | 1 |    | (27) |    | (26) |    | 36 |
| 2024                                |                                   | 480                             |  | 596                          |                                   | (116)                  | 124%               |  | -  |   | 1                                   |                              | 154                  | 0.00% | 0.00% |    | 1 |    | (29) |    | (28) |    | 36 |
| 2025                                |                                   | 486                             |  | 605                          |                                   | (119)                  | 124%               |  | -  |   | 1                                   |                              | 155                  | 0.00% | 0.00% |    | 1 |    | (30) |    | (29) |    | 37 |
| 2026                                |                                   | 491                             |  | 613                          |                                   | (122)                  | 125%               |  | -  |   | 1                                   |                              | 155                  | 0.00% | 0.00% |    | 1 |    | (32) |    | (31) |    | 37 |
| 2027                                |                                   | 495                             |  | 620                          |                                   | (125)                  | 125%               |  | -  |   | 1                                   |                              | 156                  | 0.00% | 0.00% |    | 1 |    | (32) |    | (31) |    | 38 |
| 2028                                |                                   | 498                             |  | 627                          |                                   | (129)                  | 126%               |  | -  |   | 1                                   |                              | 157                  | 0.00% | 0.00% |    | 1 |    | (33) |    | (32) |    | 38 |
| 2029                                |                                   | 500                             |  | 633                          |                                   | (133)                  | 127%               |  | -  |   | 1                                   |                              | 158                  | 0.00% | 0.00% |    | 1 |    | (34) |    | (33) |    | 39 |
| 2030                                |                                   | 501                             |  | 639                          |                                   | (138)                  | 128%               |  | -  |   | 2                                   |                              | 160                  | 0.00% | 0.00% |    | 2 |    | (34) |    | (32) |    | 39 |
| 2031                                |                                   | 502                             |  | 645                          |                                   | (143)                  | 128%               |  | -  |   | 2                                   |                              | 161                  | 0.00% | 0.00% |    | 2 |    | (34) |    | (32) |    | 39 |
| 2032                                |                                   | 504                             |  | 652                          |                                   | (148)                  | 129%               |  | -  |   | 2                                   |                              | 163                  | 0.00% | 0.00% |    | 2 |    | (34) |    | (32) |    | 40 |
| 2033                                |                                   | 505                             |  | 659                          |                                   | (154)                  | 130%               |  | -  |   | 2                                   |                              | 165                  | 0.00% | 0.00% |    | 2 |    | (34) |    | (32) |    | 40 |
| 2034                                |                                   | 507                             |  | 667                          |                                   | (160)                  | 132%               |  | -  |   | 2                                   |                              | 167                  | 0.00% | 0.00% |    | 2 |    | (34) |    | (32) |    | 41 |
| 2035                                |                                   | 508                             |  | 675                          |                                   | (167)                  | 133%               |  | -  |   | 2                                   |                              | 168                  | 0.00% | 0.00% |    | 2 |    | (34) |    | (32) |    | 41 |
| 2036                                |                                   | 511                             |  | 684                          |                                   | (173)                  | 134%               |  | -  |   | 2                                   |                              | 170                  | 0.00% | 0.00% |    | 2 |    | (33) |    | (31) |    | 42 |
| 2037                                |                                   | 513                             |  | 694                          |                                   | (181)                  | 135%               |  | -  |   | 2                                   |                              | 171                  | 0.00% | 0.00% |    | 2 |    | (33) |    | (31) |    | 42 |
| 2038                                |                                   | 517                             |  | 705                          |                                   | (188)                  | 136%               |  | -  |   | 2                                   |                              | 172                  | 0.00% | 0.00% |    | 2 |    | (33) |    | (31) |    | 43 |
| 2039                                |                                   | 520                             |  | 717                          |                                   | (197)                  | 138%               |  | -  |   | 2                                   |                              | 172                  | 0.00% | 0.00% |    | 2 |    | (33) |    | (31) |    | 44 |
| 2040                                |                                   | 525                             |  | 730                          |                                   | (205)                  | 139%               |  | -  |   | 2                                   |                              | 173                  | 0.00% | 0.00% |    | 2 |    | (32) |    | (30) |    | 45 |
| 2041                                |                                   | 529                             |  | 744                          |                                   | (215)                  | 141%               |  | -  |   | 2                                   |                              | 174                  | 0.00% | 0.00% |    | 2 |    | (32) |    | (30) |    | 46 |
| 2042                                |                                   | 535                             |  | 760                          |                                   | (225)                  | 142%               |  | -  |   | 2                                   |                              | 174                  | 0.00% | 0.00% |    | 2 |    | (32) |    | (30) |    | 47 |
| 2043                                |                                   | 540                             |  | 776                          |                                   | (236)                  | 144%               |  | -  |   | 2                                   |                              | 175                  | 0.00% | 0.00% |    | 2 |    | (32) |    | (30) |    | 48 |
| 2044                                |                                   | 546                             |  | 793                          |                                   | (247)                  | 145%               |  | -  |   | 2                                   |                              | 175                  | 0.00% | 0.00% |    | 2 |    | (33) |    | (31) |    | 49 |
| 2045                                |                                   | 552                             |  | 811                          |                                   | (259)                  | 147%               |  | -  |   | 2                                   |                              | 174                  | 0.00% | 0.00% |    | 2 |    | (33) |    | (31) |    | 50 |
| 2046                                |                                   | 557                             |  | 829                          |                                   | (272)                  | 149%               |  | -  |   | 2                                   |                              | 174                  | 0.00% | 0.00% |    | 2 |    | (34) |    | (32) |    | 51 |
| 2047                                |                                   | 562                             |  | 848                          |                                   | (286)                  | 151%               |  | -  |   | 2                                   |                              | 173                  | 0.00% | 0.00% |    | 2 |    | (34) |    | (32) |    | 52 |
| 2048                                |                                   | 567                             |  | 868                          |                                   | (301)                  | 153%               |  | -  |   | 2                                   |                              | 173                  | 0.00% | 0.00% |    | 2 |    | (35) |    | (33) |    | 53 |
| 2049                                |                                   | 571                             |  | 888                          |                                   | (317)                  | 156%               |  | -  |   | 2                                   |                              | 173                  | 0.00% | 0.00% |    | 2 |    | (36) |    | (34) |    | 54 |
| 2050                                |                                   | 575                             |  | 908                          |                                   | (333)                  | 158%               |  | -  |   | 2                                   |                              | 176                  | 0.00% | 0.00% |    | 2 |    | (37) |    | (35) |    | 56 |
| 2051                                |                                   | 578                             |  | 929                          |                                   | (351)                  | 161%               |  | -  |   | 2                                   |                              | 179                  | 0.00% | 0.00% |    | 2 |    | (37) |    | (35) |    | 57 |
| 2052                                |                                   | 581                             |  | 950                          |                                   | (369)                  | 164%               |  | -  |   | 2                                   |                              | 182                  | 0.00% | 0.00% |    | 2 |    | (38) |    | (36) |    | 58 |
| 2053                                |                                   | 583                             |  | 973                          |                                   | (390)                  | 167%               |  | -  |   | 2                                   |                              | 185                  | 0.00% | 0.00% |    | 2 |    | (38) |    | (36) |    | 60 |

Notes and assumptions:

The projection is based on the results of the June 30, 2019 actuarial valuation and assumes that all actuarial assumptions are realized, including the assumed annual asset return of 6.25%.

New active members are assumed to be hired to replace the current active members as they are assumed to terminate employment or retire, but the total active population is assumed to decrease by 2% each year over the next 30 years.

The contribution rate established in the Commonwealth's biennium budget is based on the calculated actuarially determined contribution rate.

**Kentucky Retirement Systems**  
**Exhibit 2-8**  
**CERS Non-Hazardous Insurance Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Current Plan (Amortization Period = 24 Years at June 30, 2019)**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Actuarial<br>Accrued<br>Liability | Actuarial<br>Value of<br>Assets | Unfunded<br>Actuarial<br>Accrued Liability | Funded<br>Ratio<br>(3) / (2) | Total<br>Employer<br>Contribution | Member<br>Contribution | Covered<br>Payroll | Total<br>Employer<br>Contribution as %<br>of Covered Payroll | Employer<br>Actuarial<br>Determined<br>Contribution Rate | Annual Cash Flow Analysis               |                                     |                              |                      |
|-------------------------------------|-----------------------------------|---------------------------------|--|------------------------------|-----------------------------------|------------------------|--------------------|--|--|---|-------------------------------------|------------------------------|----------------------|
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | Member and<br>Employer<br>Contributions | Benefit<br>Payments<br>and Expenses | Net<br>External<br>Cash Flow | Investment<br>Income |
| (1)                                 | (2)                               | (3)                             | (4)  | (5)                          | (6)                               | (7)                    | (8)                | (9)  | (10)   | (11)                                    | (12)                                | (13)                         | (14)                 |
| 2019                                | \$ 3,568                          | \$ 2,523                        | \$ 1,045                                   | 71%                          | \$ 119                            | \$ 12                  | \$ 2,498           | 4.76%  | 4.76%  | \$ 131                                  | \$ (149)                            | \$ (18)                      | \$ 160               |
| 2020                                | 3,728                             | 2,670                           | 1,058                                      | 72%                          | 136                               | 14                     | 2,558              | 5.33%  | 5.78%  | 150                                     | (158)                               | (8)                          | 169                  |
| 2021                                | 3,888                             | 2,866                           | 1,022                                      | 74%                          | 146                               | 15                     | 2,615              | 5.60%  | 5.60%  | 161                                     | (172)                               | (11)                         | 179                  |
| 2022                                | 4,042                             | 3,045                           | 997  | 75%                          | 143                               | 16                     | 2,672              | 5.34%  | 5.34%  | 159                                     | (186)                               | (27)                         | 189                  |
| 2023                                | 4,191                             | 3,204                           | 987  | 76%                          | 141                               | 18                     | 2,728              | 5.16%  | 5.16%  | 159                                     | (201)                               | (42)                         | 199                  |
| 2024                                | 4,332                             | 3,360                           | 972  | 78%                          | 140                               | 19                     | 2,786              | 5.03%  | 5.03%  | 159                                     | (216)                               | (57)                         | 208                  |
| 2025                                | 4,467                             | 3,512                           | 955  | 79%                          | 139                               | 20                     | 2,843              | 4.89%  | 4.89%  | 159                                     | (231)                               | (72)                         | 217                  |
| 2026                                | 4,593                             | 3,658                           | 935  | 80%                          | 138                               | 22                     | 2,901              | 4.76%  | 4.76%  | 160                                     | (246)                               | (86)                         | 226                  |
| 2027                                | 4,711                             | 3,798                           | 913  | 81%                          | 136                               | 23                     | 2,959              | 4.61%  | 4.61%  | 159                                     | (261)                               | (102)                        | 234                  |
| 2028                                | 4,819                             | 3,931                           | 888  | 82%                          | 136                               | 24                     | 3,018              | 4.49%  | 4.49%  | 160                                     | (275)                               | (115)                        | 242                  |
| 2029                                | 4,919                             | 4,059                           | 860  | 83%                          | 135                               | 26                     | 3,080              | 4.37%  | 4.37%  | 161                                     | (287)                               | (126)                        | 250                  |
| 2030                                | 5,011                             | 4,182                           | 829  | 83%                          | 134                               | 27                     | 3,143              | 4.25%  | 4.25%  | 161                                     | (299)                               | (138)                        | 257                  |
| 2031                                | 5,096                             | 4,300                           | 796  | 84%                          | 134                               | 29                     | 3,210              | 4.16%  | 4.16%  | 163                                     | (309)                               | (146)                        | 264                  |
| 2032                                | 5,175                             | 4,417                           | 758  | 85%                          | 134                               | 30                     | 3,280              | 4.07%  | 4.07%  | 164                                     | (318)                               | (154)                        | 271                  |
| 2033                                | 5,251                             | 4,534                           | 717  | 86%                          | 134                               | 31                     | 3,353              | 4.00%  | 4.00%  | 165                                     | (325)                               | (160)                        | 278                  |
| 2034                                | 5,324                             | 4,652                           | 672  | 87%                          | 135                               | 32                     | 3,430              | 3.94%  | 3.94%  | 167                                     | (330)                               | (163)                        | 286                  |
| 2035                                | 5,397                             | 4,775                           | 622  | 88%                          | 137                               | 34                     | 3,509              | 3.89%  | 3.89%  | 171                                     | (334)                               | (163)                        | 293                  |
| 2036                                | 5,472                             | 4,905                           | 567  | 90%                          | 138                               | 35                     | 3,594              | 3.85%  | 3.85%  | 173                                     | (337)                               | (164)                        | 301                  |
| 2037                                | 5,550                             | 5,042                           | 508  | 91%                          | 140                               | 36                     | 3,682              | 3.80%  | 3.80%  | 176                                     | (340)                               | (164)                        | 310                  |
| 2038                                | 5,630                             | 5,188                           | 442  | 92%                          | 142                               | 37                     | 3,771              | 3.77%  | 3.77%  | 179                                     | (344)                               | (165)                        | 319                  |
| 2039                                | 5,712                             | 5,342                           | 370  | 94%                          | 145                               | 38                     | 3,863              | 3.75%  | 3.75%  | 183                                     | (347)                               | (164)                        | 329                  |
| 2040                                | 5,798                             | 5,507                           | 291  | 95%                          | 148                               | 39                     | 3,957              | 3.73%  | 3.73%  | 187                                     | (351)                               | (164)                        | 339                  |
| 2041                                | 5,887                             | 5,682                           | 205  | 97%                          | 151                               | 40                     | 4,049              | 3.74%  | 3.74%  | 191                                     | (355)                               | (164)                        | 350                  |
| 2042                                | 5,978                             | 5,869                           | 109  | 98%                          | 155                               | 41                     | 4,146              | 3.75%  | 3.75%  | 196                                     | (358)                               | (162)                        | 362                  |
| 2043                                | 6,073                             | 6,073                           | -  | 100%                         | 45                                | 42                     | 4,243              | 1.06%  | 1.06%  | 87                                      | (362)                               | (275)                        | 371                  |
| 2044                                | 6,171                             | 6,171                           | -  | 100%                         | 45                                | 43                     | 4,343              | 1.04%  | 1.04%  | 88                                      | (367)                               | (279)                        | 377                  |
| 2045                                | 6,272                             | 6,272                           | -  | 100%                         | 45                                | 44                     | 4,443              | 1.02%  | 1.02%  | 89                                      | (373)                               | (284)                        | 383                  |
| 2046                                | 6,374                             | 6,374                           | -  | 100%                         | 46                                | 45                     | 4,546              | 1.01%  | 1.01%  | 91                                      | (379)                               | (288)                        | 389                  |
| 2047                                | 6,477                             | 6,477                           | -  | 100%                         | 46                                | 46                     | 4,651              | 0.99%  | 0.99%  | 92                                      | (386)                               | (294)                        | 395                  |
| 2048                                | 6,581                             | 6,581                           | -  | 100%                         | 46                                | 48                     | 4,758              | 0.97%  | 0.97%  | 94                                      | (394)                               | (300)                        | 401                  |
| 2049                                | 6,685                             | 6,685                           | -  | 100%                         | 47                                | 49                     | 4,868              | 0.96%  | 0.96%  | 96                                      | (402)                               | (306)                        | 407                  |
| 2050                                | 6,789                             | 6,789                           | -  | 100%                         | 47                                | 50                     | 4,980              | 0.94%  | 0.94%  | 97                                      | (411)                               | (314)                        | 413                  |
| 2051                                | 6,891                             | 6,891                           | -  | 100%                         | 47                                | 51                     | 5,093              | 0.92%  | 0.92%  | 98                                      | (419)                               | (321)                        | 419                  |
| 2052                                | 6,993                             | 6,993                           | -  | 100%                         | 47                                | 52                     | 5,208              | 0.91%  | 0.91%  | 99                                      | (427)                               | (328)                        | 425                  |
| 2053                                | 7,095                             | 7,095                           | -  | 100%                         | 47                                | 53                     | 5,327              | 0.89%  | 0.89%  | 100                                     | (434)                               | (334)                        | 431                  |

Notes and assumptions:

The projection is based on the results of the June 30, 2019 actuarial valuation and assumes that all actuarial assumptions are realized, including the assumed annual asset return of 6.25%.

New active members are assumed to be hired to replace the current active members as they are assumed to terminate employment or retire.

The total active population is assumed to remain constant through the entire projection.

The Board certified contribution rate paid by employers is based on the calculated actuarially determined contribution rate and reflects House Bill 362 passed during the 2018 legislative session that limits the contribution rate increases up to 12% per year over the prior fiscal year for the period of July 1, 2018 to June 30, 2028.

**Kentucky Retirement Systems**  
**Exhibit 2-9**  
**CERS Hazardous Insurance Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Current Plan (Amortization Period = 24 Years at June 30, 2019)**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Actuarial<br>Accrued<br>Liability | Actuarial<br>Value of<br>Assets | Unfunded<br>Actuarial<br>Accrued Liability | Funded<br>Ratio<br>(3) / (2) | Total<br>Employer<br>Contribution | Member<br>Contribution | Covered<br>Payroll | Total<br>Employer<br>Contribution as %<br>of Covered Payroll | Employer<br>Actuarial<br>Determined<br>Contribution Rate | Annual Cash Flow Analysis               |                                     |                              |                      |
|-------------------------------------|-----------------------------------|---------------------------------|--|------------------------------|-----------------------------------|------------------------|--------------------|--|--|---|-------------------------------------|------------------------------|----------------------|
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | Member and<br>Employer<br>Contributions | Benefit<br>Payments<br>and Expenses | Net<br>External<br>Cash Flow | Investment<br>Income |
| (1)                                 | (2)                               | (3)                             | (4)  | (5)                          | (6)                               | (7)                    | (8)                | (9)  | (10)   | (11)                                    | (12)                                | (13)                         | (14)                 |
| 2019                                | \$ 1,733                          | \$ 1,314                        | \$ 419                                     | 76%                          | \$ 53                             | \$ 2                   | \$ 559             | 9.52%  | 9.52%  | \$ 55                                   | \$ (79)                             | \$ (24)                      | \$ 83                |
| 2020                                | 1,795                             | 1,377                           | 418  | 77%                          | 59                                | 3                      | 562                | 10.47%   | 10.47%   | 62                                      | (86)                                | (24)                         | 87                   |
| 2021                                | 1,852                             | 1,459                           | 393  | 79%                          | 56                                | 3                      | 569                | 9.92%  | 9.92%  | 59                                      | (94)                                | (35)                         | 90                   |
| 2022                                | 1,901                             | 1,521                           | 380  | 80%                          | 53                                | 4                      | 578                | 9.18%  | 9.18%  | 57                                      | (103)                               | (46)                         | 94                   |
| 2023                                | 1,941                             | 1,566                           | 375  | 81%                          | 51                                | 4                      | 588                | 8.63%  | 8.63%  | 55                                      | (112)                               | (57)                         | 96                   |
| 2024                                | 1,974                             | 1,605                           | 369  | 81%                          | 49                                | 4                      | 599                | 8.23%  | 8.23%  | 53                                      | (120)                               | (67)                         | 98                   |
| 2025                                | 1,999                             | 1,637                           | 362  | 82%                          | 48                                | 5                      | 610                | 7.90%  | 7.90%  | 53                                      | (126)                               | (73)                         | 100                  |
| 2026                                | 2,018                             | 1,664                           | 354  | 82%                          | 47                                | 5                      | 622                | 7.61%  | 7.61%  | 52                                      | (132)                               | (80)                         | 101                  |
| 2027                                | 2,032                             | 1,685                           | 347  | 83%                          | 47                                | 5                      | 635                | 7.37%  | 7.37%  | 52                                      | (137)                               | (85)                         | 103                  |
| 2028                                | 2,040                             | 1,702                           | 338  | 83%                          | 46                                | 6                      | 648                | 7.17%  | 7.17%  | 52                                      | (141)                               | (89)                         | 104                  |
| 2029                                | 2,045                             | 1,717                           | 328  | 84%                          | 46                                | 6                      | 663                | 7.00%  | 7.00%  | 52                                      | (143)                               | (91)                         | 104                  |
| 2030                                | 2,048                             | 1,731                           | 317  | 85%                          | 47                                | 6                      | 680                | 6.87%  | 6.87%  | 53                                      | (145)                               | (92)                         | 105                  |
| 2031                                | 2,048                             | 1,743                           | 305  | 85%                          | 47                                | 6                      | 698                | 6.74%  | 6.74%  | 53                                      | (146)                               | (93)                         | 106                  |
| 2032                                | 2,048                             | 1,757                           | 291  | 86%                          | 48                                | 7                      | 717                | 6.66%  | 6.66%  | 55                                      | (146)                               | (91)                         | 107                  |
| 2033                                | 2,048                             | 1,772                           | 276  | 87%                          | 48                                | 7                      | 737                | 6.57%  | 6.57%  | 55                                      | (146)                               | (91)                         | 108                  |
| 2034                                | 2,049                             | 1,790                           | 259  | 87%                          | 49                                | 7                      | 757                | 6.51%  | 6.51%  | 56                                      | (145)                               | (89)                         | 109                  |
| 2035                                | 2,051                             | 1,811                           | 240  | 88%                          | 50                                | 8                      | 778                | 6.46%  | 6.46%  | 58                                      | (143)                               | (85)                         | 111                  |
| 2036                                | 2,056                             | 1,837                           | 219  | 89%                          | 51                                | 8                      | 798                | 6.41%  | 6.41%  | 59                                      | (140)                               | (81)                         | 112                  |
| 2037                                | 2,065                             | 1,868                           | 197  | 90%                          | 52                                | 8                      | 818                | 6.37%  | 6.37%  | 60                                      | (138)                               | (78)                         | 114                  |
| 2038                                | 2,077                             | 1,905                           | 172  | 92%                          | 53                                | 8                      | 838                | 6.37%  | 6.37%  | 61                                      | (136)                               | (75)                         | 117                  |
| 2039                                | 2,092                             | 1,948                           | 144  | 93%                          | 55                                | 9                      | 858                | 6.36%  | 6.36%  | 64                                      | (133)                               | (69)                         | 120                  |
| 2040                                | 2,112                             | 1,998                           | 114  | 95%                          | 56                                | 9                      | 878                | 6.37%  | 6.37%  | 65                                      | (131)                               | (66)                         | 123                  |
| 2041                                | 2,135                             | 2,055                           | 80   | 96%                          | 57                                | 9                      | 898                | 6.39%  | 6.39%  | 66                                      | (129)                               | (63)                         | 126                  |
| 2042                                | 2,162                             | 2,118                           | 44   | 98%                          | 60                                | 9                      | 918                | 6.51%  | 6.51%  | 69                                      | (128)                               | (59)                         | 131                  |
| 2043                                | 2,192                             | 2,192                           | -  | 100%                         | 16                                | 9                      | 939                | 1.72%  | 1.72%  | 25                                      | (127)                               | (102)                        | 134                  |
| 2044                                | 2,226                             | 2,226                           | -  | 100%                         | 16                                | 10                     | 959                | 1.70%  | 1.70%  | 26                                      | (127)                               | (101)                        | 136                  |
| 2045                                | 2,262                             | 2,262                           | -  | 100%                         | 16                                | 10                     | 977                | 1.68%  | 1.68%  | 26                                      | (128)                               | (102)                        | 138                  |
| 2046                                | 2,300                             | 2,300                           | -  | 100%                         | 16                                | 10                     | 996                | 1.65%  | 1.65%  | 26                                      | (130)                               | (104)                        | 140                  |
| 2047                                | 2,339                             | 2,339                           | -  | 100%                         | 16                                | 10                     | 1,016              | 1.62%  | 1.62%  | 26                                      | (132)                               | (106)                        | 142                  |
| 2048                                | 2,377                             | 2,377                           | -  | 100%                         | 17                                | 10                     | 1,037              | 1.60%  | 1.60%  | 27                                      | (135)                               | (108)                        | 145                  |
| 2049                                | 2,416                             | 2,416                           | -  | 100%                         | 17                                | 11                     | 1,060              | 1.57%  | 1.57%  | 28                                      | (139)                               | (111)                        | 147                  |
| 2050                                | 2,453                             | 2,453                           | -  | 100%                         | 17                                | 11                     | 1,081              | 1.55%  | 1.55%  | 28                                      | (143)                               | (115)                        | 149                  |
| 2051                                | 2,489                             | 2,489                           | -  | 100%                         | 17                                | 11                     | 1,103              | 1.52%  | 1.52%  | 28                                      | (147)                               | (119)                        | 151                  |
| 2052                                | 2,524                             | 2,524                           | -  | 100%                         | 17                                | 11                     | 1,127              | 1.50%  | 1.50%  | 28                                      | (150)                               | (122)                        | 153                  |
| 2053                                | 2,556                             | 2,556                           | -  | 100%                         | 17                                | 12                     | 1,151              | 1.48%  | 1.48%  | 29                                      | (154)                               | (125)                        | 155                  |

Notes and assumptions:

The projection is based on the results of the June 30, 2019 actuarial valuation and assumes that all actuarial assumptions are realized, including the assumed annual asset return of 6.25%.

New active members are assumed to be hired to replace the current active members as they are assumed to terminate employment or retire.

The total active population is assumed to remain constant through the entire projection.

The Board certified contribution rate paid by employers is based on the calculated actuarially determined contribution rate and reflects House Bill 362 passed during the 2018 legislative session that limits the contribution rate increases up to 12% per year over the prior fiscal year for the period of July 1, 2018 to June 30, 2028.

**Kentucky Retirement Systems**  
**Exhibit 2-10**  
**State Police Retirement System Insurance Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Current Plan (Amortization Period = 24 Years at June 30, 2019)**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Actuarial<br>Accrued<br>Liability | Actuarial<br>Value of<br>Assets | Unfunded<br>Actuarial<br>Accrued Liability | Funded<br>Ratio<br>(3) / (2) | Total<br>Employer<br>Contribution | Member<br>Contribution | Covered<br>Payroll | Total<br>Employer<br>Contribution as %<br>of Covered Payroll | Employer<br>Actuarial<br>Determined<br>Contribution Rate | Annual Cash Flow Analysis               |                                     |                              |                      |
|-------------------------------------|-----------------------------------|---------------------------------|--|------------------------------|-----------------------------------|------------------------|--------------------|--|--|---|-------------------------------------|------------------------------|----------------------|
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | Member and<br>Employer<br>Contributions | Benefit<br>Payments<br>and Expenses | Net<br>External<br>Cash Flow | Investment<br>Income |
| (1)                                 | (2)                               | (3)                             | (4)  | (5)                          | (6)                               | (7)                    | (8)                | (9)  | (10)   | (11)                                    | (12)                                | (13)                         | (14)                 |
| 2019                                | \$ 277                            | \$ 197                          | \$ 80                                      | 71%                          | \$ 13                             | \$ -                   | \$ 48              | 27.23%   | 19.50%   | \$ 13                                   | \$ (14)                             | \$ (1)                       | \$ 13                |
| 2020                                | 284                               | 210                             | 74   | 74%                          | 10                                | -                      | 47                 | 20.85%   | 20.85%   | 10                                      | (15)                                | (5)                          | 13                   |
| 2021                                | 291                               | 221                             | 70   | 76%                          | 10                                | -                      | 47                 | 20.85%   | 20.19%   | 10                                      | (16)                                | (6)                          | 14                   |
| 2022                                | 297                               | 230                             | 67   | 77%                          | 9                                 | -                      | 46                 | 18.96%   | 18.96%   | 9                                       | (17)                                | (8)                          | 14                   |
| 2023                                | 301                               | 236                             | 65   | 78%                          | 9                                 | -                      | 46                 | 18.96%   | 18.16%   | 9                                       | (18)                                | (9)                          | 14                   |
| 2024                                | 304                               | 241                             | 63   | 79%                          | 8                                 | -                      | 46                 | 17.47%   | 17.47%   | 8                                       | (19)                                | (11)                         | 15                   |
| 2025                                | 306                               | 245                             | 61   | 80%                          | 8                                 | -                      | 46                 | 17.47%   | 16.94%   | 8                                       | (20)                                | (12)                         | 15                   |
| 2026                                | 307                               | 248                             | 59   | 81%                          | 8                                 | -                      | 46                 | 16.49%   | 16.49%   | 8                                       | (21)                                | (13)                         | 15                   |
| 2027                                | 307                               | 250                             | 57   | 81%                          | 8                                 | -                      | 46                 | 16.49%   | 16.09%   | 8                                       | (22)                                | (14)                         | 15                   |
| 2028                                | 306                               | 252                             | 54   | 82%                          | 7                                 | -                      | 46                 | 15.70%   | 15.70%   | 7                                       | (22)                                | (15)                         | 15                   |
| 2029                                | 304                               | 252                             | 52   | 83%                          | 7                                 | -                      | 46                 | 15.70%   | 15.42%   | 7                                       | (23)                                | (16)                         | 15                   |
| 2030                                | 302                               | 252                             | 50   | 83%                          | 7                                 | -                      | 46                 | 15.14%   | 15.14%   | 7                                       | (23)                                | (16)                         | 15                   |
| 2031                                | 299                               | 252                             | 47   | 84%                          | 7                                 | -                      | 47                 | 15.14%   | 14.90%   | 7                                       | (23)                                | (16)                         | 15                   |
| 2032                                | 295                               | 251                             | 44   | 85%                          | 7                                 | -                      | 47                 | 14.65%   | 14.65%   | 7                                       | (23)                                | (16)                         | 15                   |
| 2033                                | 292                               | 251                             | 41   | 86%                          | 7                                 | -                      | 48                 | 14.65%   | 14.45%   | 7                                       | (23)                                | (16)                         | 15                   |
| 2034                                | 288                               | 250                             | 38   | 87%                          | 7                                 | -                      | 49                 | 14.21%   | 14.21%   | 7                                       | (23)                                | (16)                         | 15                   |
| 2035                                | 285                               | 250                             | 35   | 88%                          | 7                                 | -                      | 49                 | 14.21%   | 14.06%   | 7                                       | (22)                                | (15)                         | 15                   |
| 2036                                | 281                               | 250                             | 31   | 89%                          | 7                                 | -                      | 49                 | 13.92%   | 13.92%   | 7                                       | (22)                                | (15)                         | 15                   |
| 2037                                | 278                               | 251                             | 27   | 90%                          | 7                                 | -                      | 50                 | 13.92%   | 13.87%   | 7                                       | (21)                                | (14)                         | 15                   |
| 2038                                | 276                               | 252                             | 24   | 91%                          | 7                                 | -                      | 50                 | 13.80%   | 13.80%   | 7                                       | (21)                                | (14)                         | 15                   |
| 2039                                | 273                               | 254                             | 19   | 93%                          | 7                                 | -                      | 50                 | 13.80%   | 13.82%   | 7                                       | (20)                                | (13)                         | 15                   |
| 2040                                | 271                               | 256                             | 15   | 94%                          | 7                                 | -                      | 50                 | 13.82%   | 13.82%   | 7                                       | (20)                                | (13)                         | 16                   |
| 2041                                | 270                               | 259                             | 11   | 96%                          | 7                                 | -                      | 50                 | 13.82%   | 13.94%   | 7                                       | (19)                                | (12)                         | 16                   |
| 2042                                | 268                               | 263                             | 5  | 98%                          | 7                                 | -                      | 50                 | 14.28%   | 14.28%   | 7                                       | (19)                                | (12)                         | 16                   |
| 2043                                | 268                               | 268                             | -  | 100%                         | 1                                 | -                      | 50                 | 2.68%  | 2.68%  | 1                                       | (18)                                | (17)                         | 16                   |
| 2044                                | 267                               | 267                             | -  | 100%                         | 1                                 | -                      | 50                 | 2.65%  | 2.65%  | 1                                       | (18)                                | (17)                         | 16                   |
| 2045                                | 267                               | 267                             | -  | 100%                         | 1                                 | -                      | 49                 | 2.61%  | 2.61%  | 1                                       | (18)                                | (17)                         | 16                   |
| 2046                                | 267                               | 267                             | -  | 100%                         | 1                                 | -                      | 49                 | 2.56%  | 2.56%  | 1                                       | (18)                                | (17)                         | 16                   |
| 2047                                | 268                               | 268                             | -  | 100%                         | 1                                 | -                      | 49                 | 2.52%  | 2.52%  | 1                                       | (18)                                | (17)                         | 16                   |
| 2048                                | 268                               | 268                             | -  | 100%                         | 1                                 | -                      | 49                 | 2.48%  | 2.48%  | 1                                       | (18)                                | (17)                         | 16                   |
| 2049                                | 269                               | 269                             | -  | 100%                         | 1                                 | -                      | 49                 | 2.41%  | 2.41%  | 1                                       | (18)                                | (17)                         | 16                   |
| 2050                                | 269                               | 269                             | -  | 100%                         | 1                                 | -                      | 49                 | 2.34%  | 2.34%  | 1                                       | (18)                                | (17)                         | 16                   |
| 2051                                | 268                               | 268                             | -  | 100%                         | 1                                 | 1                      | 50                 | 2.30%  | 2.30%  | 2                                       | (19)                                | (17)                         | 16                   |
| 2052                                | 268                               | 268                             | -  | 100%                         | 1                                 | 1                      | 51                 | 2.26%  | 2.26%  | 2                                       | (19)                                | (17)                         | 16                   |
| 2053                                | 267                               | 267                             | -  | 100%                         | 1                                 | 1                      | 52                 | 2.23%  | 2.23%  | 2                                       | (19)                                | (17)                         | 16                   |

Notes and assumptions:

The projection is based on the results of the June 30, 2019 actuarial valuation and assumes that all actuarial assumptions are realized, including the assumed annual asset return of 6.25%.

New active members are assumed to be hired to replace the current active members as they are assumed to terminate employment or retire, but the total active population is assumed to decrease by 2% each year over the next 30 years.

The contribution rate established in the Commonwealth's biennium budget is based on the calculated actuarially determined contribution rate.

**SB 249**

**Section 3.**

**Projected Cost of the Retirement and Insurance  
Proposed Legislation**

**Kentucky Retirement Systems**  
**Exhibit 3-1**  
**KERS Non-Hazardous Retirement Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Proposed Plan (Amortization Period = 30 Years at June 30, 2019)**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Actuarial<br>Accrued<br>Liability | Actuarial<br>Value of<br>Assets | Unfunded<br>Actuarial<br>Accrued Liability | Funded<br>Ratio<br>(3) / (2) | Total<br>Employer<br>Contribution | Member<br>Contribution | Covered<br>Payroll | Total<br>Employer<br>Contribution as %<br>of Covered Payroll | Employer<br>Actuarial<br>Determined<br>Contribution Rate | Annual Cash Flow Analysis               |                                     |                              |                      |
|-------------------------------------|-----------------------------------|---------------------------------|--|------------------------------|-----------------------------------|------------------------|--------------------|--|--|---|-------------------------------------|------------------------------|----------------------|
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | Member and<br>Employer<br>Contributions | Benefit<br>Payments<br>and Expenses | Net<br>External<br>Cash Flow | Investment<br>Income |
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  |   |                                     |                              |                      |
| (1)                                 | (2)                               | (3)                             | (4)  | (5)                          | (6)                               | (7)                    | (8)                | (9)  | (10)   | (11)                                    | (12)                                | (13)                         | (14)                 |
| 2019                                | \$ 16,466                         | \$ 2,206                        | \$ 14,260                                  | 13%                          | \$ 924                            | \$ 72                  | \$ 1,438           | 64.26%   | 74.54%   | \$ 996                                  | \$ (1,008)                          | \$ (12)                      | \$ 117               |
| 2020                                | 16,493                            | 2,301                           | 14,192                                     | 14%                          | 1,046                             | 71                     | 1,428              | 73.28%   | 73.28%   | 1,117                                   | (1,024)                             | 93                           | 125                  |
| 2021                                | 16,500                            | 2,548                           | 13,952                                     | 15%                          | 1,042                             | 71                     | 1,422              | 73.28%   | 73.51%   | 1,113                                   | (1,038)                             | 75                           | 136                  |
| 2022                                | 16,489                            | 2,768                           | 13,721                                     | 17%                          | 1,040                             | 71                     | 1,417              | 73.43%   | 73.43%   | 1,111                                   | (1,051)                             | 60                           | 147                  |
| 2023                                | 16,459                            | 2,976                           | 13,483                                     | 18%                          | 1,037                             | 71                     | 1,412              | 73.43%   | 73.40%   | 1,108                                   | (1,065)                             | 43                           | 157                  |
| 2024                                | 16,410                            | 3,176                           | 13,234                                     | 19%                          | 1,034                             | 70                     | 1,409              | 73.39%   | 73.39%   | 1,104                                   | (1,077)                             | 27                           | 167                  |
| 2025                                | 16,342                            | 3,370                           | 12,972                                     | 21%                          | 1,032                             | 70                     | 1,406              | 73.39%   | 73.36%   | 1,102                                   | (1,089)                             | 13                           | 177                  |
| 2026                                | 16,255                            | 3,561                           | 12,694                                     | 22%                          | 1,028                             | 70                     | 1,402              | 73.31%   | 73.31%   | 1,098                                   | (1,100)                             | (2)                          | 187                  |
| 2027                                | 16,149                            | 3,746                           | 12,403                                     | 23%                          | 1,026                             | 70                     | 1,399              | 73.31%   | 73.28%   | 1,096                                   | (1,110)                             | (14)                         | 196                  |
| 2028                                | 16,024                            | 3,929                           | 12,095                                     | 25%                          | 1,023                             | 70                     | 1,396              | 73.26%   | 73.26%   | 1,093                                   | (1,118)                             | (25)                         | 206                  |
| 2029                                | 15,880                            | 4,109                           | 11,771                                     | 26%                          | 1,021                             | 70                     | 1,394              | 73.26%   | 73.23%   | 1,091                                   | (1,121)                             | (30)                         | 215                  |
| 2030                                | 15,724                            | 4,294                           | 11,430                                     | 27%                          | 1,019                             | 70                     | 1,393              | 73.17%   | 73.17%   | 1,089                                   | (1,126)                             | (37)                         | 224                  |
| 2031                                | 15,552                            | 4,481                           | 11,071                                     | 29%                          | 1,019                             | 70                     | 1,393              | 73.17%   | 73.11%   | 1,089                                   | (1,128)                             | (39)                         | 234                  |
| 2032                                | 15,366                            | 4,676                           | 10,690                                     | 30%                          | 1,016                             | 70                     | 1,393              | 72.97%   | 72.97%   | 1,086                                   | (1,128)                             | (42)                         | 244                  |
| 2033                                | 15,168                            | 4,878                           | 10,290                                     | 32%                          | 1,017                             | 70                     | 1,394              | 72.97%   | 72.84%   | 1,087                                   | (1,127)                             | (40)                         | 255                  |
| 2034                                | 14,959                            | 5,093                           | 9,866                                      | 34%                          | 1,014                             | 70                     | 1,395              | 72.68%   | 72.68%   | 1,084                                   | (1,124)                             | (40)                         | 266                  |
| 2035                                | 14,740                            | 5,318                           | 9,422                                      | 36%                          | 1,015                             | 70                     | 1,397              | 72.68%   | 72.52%   | 1,085                                   | (1,119)                             | (34)                         | 278                  |
| 2036                                | 14,515                            | 5,563                           | 8,952                                      | 38%                          | 1,013                             | 70                     | 1,401              | 72.32%   | 72.32%   | 1,083                                   | (1,109)                             | (26)                         | 291                  |
| 2037                                | 14,286                            | 5,828                           | 8,458                                      | 41%                          | 1,017                             | 70                     | 1,406              | 72.32%   | 72.05%   | 1,087                                   | (1,097)                             | (10)                         | 306                  |
| 2038                                | 14,056                            | 6,124                           | 7,932                                      | 44%                          | 1,013                             | 71                     | 1,413              | 71.70%   | 71.70%   | 1,084                                   | (1,082)                             | 2                            | 322                  |
| 2039                                | 13,830                            | 6,447                           | 7,383                                      | 47%                          | 1,018                             | 71                     | 1,420              | 71.70%   | 71.33%   | 1,089                                   | (1,067)                             | 22                           | 339                  |
| 2040                                | 13,608                            | 6,808                           | 6,800                                      | 50%                          | 1,012                             | 71                     | 1,426              | 70.93%   | 70.93%   | 1,083                                   | (1,049)                             | 34                           | 358                  |
| 2041                                | 13,392                            | 7,200                           | 6,192                                      | 54%                          | 1,016                             | 72                     | 1,433              | 70.93%   | 70.59%   | 1,088                                   | (1,032)                             | 56                           | 379                  |
| 2042                                | 13,183                            | 7,636                           | 5,547                                      | 58%                          | 1,010                             | 72                     | 1,438              | 70.21%   | 70.21%   | 1,082                                   | (1,014)                             | 68                           | 403                  |
| 2043                                | 12,980                            | 8,106                           | 4,874                                      | 62%                          | 1,014                             | 72                     | 1,444              | 70.21%   | 69.94%   | 1,086                                   | (996)                               | 90                           | 428                  |
| 2044                                | 12,785                            | 8,623                           | 4,162                                      | 67%                          | 1,009                             | 72                     | 1,448              | 69.64%   | 69.64%   | 1,081                                   | (979)                               | 102                          | 455                  |
| 2045                                | 12,599                            | 9,181                           | 3,418                                      | 73%                          | 1,012                             | 73                     | 1,453              | 69.64%   | 69.46%   | 1,085                                   | (961)                               | 124                          | 485                  |
| 2046                                | 12,421                            | 9,790                           | 2,631                                      | 79%                          | 1,009                             | 73                     | 1,457              | 69.26%   | 69.26%   | 1,082                                   | (943)                               | 139                          | 518                  |
| 2047                                | 12,252                            | 10,447                          | 1,805                                      | 85%                          | 1,012                             | 73                     | 1,461              | 69.26%   | 69.21%   | 1,085                                   | (925)                               | 160                          | 553                  |
| 2048                                | 12,093                            | 11,160                          | 933  | 92%                          | 1,015                             | 73                     | 1,465              | 69.29%   | 69.29%   | 1,088                                   | (907)                               | 181                          | 591                  |
| 2049                                | 11,944                            | 11,944                          | -  | 100%                         | 62                                | 73                     | 1,468              | 4.25%  | 4.25%  | 135                                     | (888)                               | (753)                        | 607                  |
| 2050                                | 11,809                            | 11,809                          | -  | 100%                         | 63                                | 75                     | 1,494              | 4.23%  | 4.23%  | 138                                     | (870)                               | (732)                        | 600                  |
| 2051                                | 11,687                            | 11,687                          | -  | 100%                         | 64                                | 76                     | 1,523              | 4.22%  | 4.22%  | 140                                     | (853)                               | (713)                        | 593                  |
| 2052                                | 11,581                            | 11,581                          | -  | 100%                         | 65                                | 78                     | 1,552              | 4.21%  | 4.21%  | 143                                     | (836)                               | (693)                        | 587                  |
| 2053                                | 11,488                            | 11,488                          | -  | 100%                         | 66                                | 79                     | 1,583              | 4.20%  | 4.20%  | 145                                     | (821)                               | (676)                        | 582                  |

Notes and assumptions:

The projection is based on the same methods and assumptions as the projection under the Current Plan, except that the funding period is 30 years at June 30, 2019 (rather than the current funding period of 24 years at June 30, 2019).

**Kentucky Retirement Systems**  
**Exhibit 3-2**  
**KERS Hazardous Retirement Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Proposed Plan (Amortization Period = 30 Years at June 30, 2019)**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Actuarial<br>Accrued<br>Liability | Actuarial<br>Value of<br>Assets | Unfunded<br>Actuarial<br>Accrued Liability | Funded<br>Ratio<br>(3) / (2) | Total<br>Employer<br>Contribution | Member<br>Contribution | Covered<br>Payroll | Total<br>Employer<br>Contribution as %<br>of Covered Payroll | Employer<br>Actuarial<br>Determined<br>Contribution Rate | Annual Cash Flow Analysis               |                                     |                              |                      |
|-------------------------------------|-----------------------------------|---------------------------------|--|------------------------------|-----------------------------------|------------------------|--------------------|--|--|---|-------------------------------------|------------------------------|----------------------|
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | Member and<br>Employer<br>Contributions | Benefit<br>Payments<br>and Expenses | Net<br>External<br>Cash Flow | Investment<br>Income |
| (1)                                 | (2)                               | (3)                             | (4)  | (5)                          | (6)                               | (7)                    | (8)                | (9)  | (10)   | (11)                                    | (12)                                | (13)                         | (14)                 |
| 2019                                | \$ 1,226                          | \$ 672                          | \$ 554                                     | 55%                          | \$ 52                             | \$ 12                  | \$ 150             | 34.39%   | 34.42%   | \$ 64                                   | \$ (74)                             | \$ (10)                      | \$ 42                |
| 2020                                | 1,255                             | 703                             | 552  | 56%                          | 54                                | 12                     | 150                | 36.00%   | 36.00%   | 66                                      | (77)                                | (11)                         | 44                   |
| 2021                                | 1,281                             | 745                             | 536  | 58%                          | 55                                | 12                     | 152                | 36.00%   | 35.65%   | 67                                      | (79)                                | (12)                         | 46                   |
| 2022                                | 1,307                             | 781                             | 526  | 60%                          | 53                                | 12                     | 152                | 34.69%   | 34.69%   | 65                                      | (82)                                | (17)                         | 48                   |
| 2023                                | 1,331                             | 812                             | 519  | 61%                          | 53                                | 12                     | 153                | 34.69%   | 34.18%   | 65                                      | (84)                                | (19)                         | 50                   |
| 2024                                | 1,354                             | 843                             | 511  | 62%                          | 52                                | 12                     | 154                | 33.85%   | 33.85%   | 64                                      | (86)                                | (22)                         | 52                   |
| 2025                                | 1,376                             | 873                             | 503  | 63%                          | 52                                | 12                     | 155                | 33.85%   | 33.50%   | 64                                      | (89)                                | (25)                         | 54                   |
| 2026                                | 1,397                             | 903                             | 494  | 65%                          | 52                                | 12                     | 156                | 33.20%   | 33.20%   | 64                                      | (91)                                | (27)                         | 56                   |
| 2027                                | 1,417                             | 932                             | 485  | 66%                          | 52                                | 12                     | 156                | 33.20%   | 32.90%   | 64                                      | (93)                                | (29)                         | 57                   |
| 2028                                | 1,435                             | 961                             | 474  | 67%                          | 51                                | 13                     | 157                | 32.60%   | 32.60%   | 64                                      | (95)                                | (31)                         | 59                   |
| 2029                                | 1,452                             | 989                             | 463  | 68%                          | 52                                | 13                     | 158                | 32.60%   | 32.33%   | 65                                      | (95)                                | (30)                         | 61                   |
| 2030                                | 1,471                             | 1,019                           | 452  | 69%                          | 51                                | 13                     | 160                | 32.05%   | 32.05%   | 64                                      | (96)                                | (32)                         | 63                   |
| 2031                                | 1,489                             | 1,050                           | 439  | 71%                          | 52                                | 13                     | 161                | 32.05%   | 31.75%   | 65                                      | (96)                                | (31)                         | 65                   |
| 2032                                | 1,509                             | 1,083                           | 426  | 72%                          | 51                                | 13                     | 163                | 31.45%   | 31.45%   | 64                                      | (97)                                | (33)                         | 67                   |
| 2033                                | 1,529                             | 1,117                           | 412  | 73%                          | 52                                | 13                     | 165                | 31.45%   | 31.16%   | 65                                      | (97)                                | (32)                         | 69                   |
| 2034                                | 1,550                             | 1,153                           | 397  | 74%                          | 51                                | 13                     | 167                | 30.85%   | 30.85%   | 64                                      | (98)                                | (34)                         | 71                   |
| 2035                                | 1,572                             | 1,191                           | 381  | 76%                          | 52                                | 13                     | 168                | 30.85%   | 30.58%   | 65                                      | (99)                                | (34)                         | 73                   |
| 2036                                | 1,595                             | 1,231                           | 364  | 77%                          | 51                                | 14                     | 170                | 30.32%   | 30.32%   | 65                                      | (100)                               | (35)                         | 76                   |
| 2037                                | 1,618                             | 1,273                           | 345  | 79%                          | 52                                | 14                     | 171                | 30.32%   | 30.10%   | 66                                      | (101)                               | (35)                         | 78                   |
| 2038                                | 1,641                             | 1,315                           | 326  | 80%                          | 51                                | 14                     | 172                | 29.89%   | 29.89%   | 65                                      | (103)                               | (38)                         | 81                   |
| 2039                                | 1,664                             | 1,359                           | 305  | 82%                          | 52                                | 14                     | 172                | 29.89%   | 29.73%   | 66                                      | (104)                               | (38)                         | 84                   |
| 2040                                | 1,687                             | 1,404                           | 283  | 83%                          | 51                                | 14                     | 173                | 29.59%   | 29.59%   | 65                                      | (105)                               | (40)                         | 86                   |
| 2041                                | 1,709                             | 1,450                           | 259  | 85%                          | 51                                | 14                     | 174                | 29.59%   | 29.49%   | 65                                      | (107)                               | (42)                         | 89                   |
| 2042                                | 1,732                             | 1,498                           | 234  | 86%                          | 51                                | 14                     | 174                | 29.44%   | 29.44%   | 65                                      | (108)                               | (43)                         | 92                   |
| 2043                                | 1,756                             | 1,547                           | 209  | 88%                          | 51                                | 14                     | 175                | 29.44%   | 29.48%   | 65                                      | (109)                               | (44)                         | 95                   |
| 2044                                | 1,779                             | 1,599                           | 180  | 90%                          | 52                                | 14                     | 175                | 29.58%   | 29.58%   | 66                                      | (111)                               | (45)                         | 99                   |
| 2045                                | 1,802                             | 1,652                           | 150  | 92%                          | 52                                | 14                     | 174                | 29.58%   | 29.79%   | 66                                      | (113)                               | (47)                         | 102                  |
| 2046                                | 1,825                             | 1,706                           | 119  | 93%                          | 53                                | 14                     | 174                | 30.27%   | 30.27%   | 67                                      | (115)                               | (48)                         | 105                  |
| 2047                                | 1,846                             | 1,763                           | 83   | 96%                          | 52                                | 14                     | 173                | 30.27%   | 30.83%   | 66                                      | (117)                               | (51)                         | 109                  |
| 2048                                | 1,867                             | 1,820                           | 47   | 97%                          | 56                                | 14                     | 173                | 32.58%   | 32.58%   | 70                                      | (119)                               | (49)                         | 112                  |
| 2049                                | 1,887                             | 1,887                           | -  | 100%                         | 10                                | 14                     | 173                | 5.79%  | 5.79%  | 24                                      | (121)                               | (97)                         | 115                  |
| 2050                                | 1,906                             | 1,906                           | -  | 100%                         | 10                                | 14                     | 176                | 5.79%  | 5.79%  | 24                                      | (124)                               | (100)                        | 116                  |
| 2051                                | 1,925                             | 1,925                           | -  | 100%                         | 10                                | 14                     | 178                | 5.79%  | 5.79%  | 24                                      | (126)                               | (102)                        | 117                  |
| 2052                                | 1,944                             | 1,944                           | -  | 100%                         | 11                                | 15                     | 182                | 5.79%  | 5.79%  | 26                                      | (128)                               | (102)                        | 118                  |
| 2053                                | 1,961                             | 1,961                           | -  | 100%                         | 11                                | 15                     | 185                | 5.79%  | 5.79%  | 26                                      | (130)                               | (104)                        | 118                  |

Notes and assumptions:

The projection is based on the same methods and assumptions as the projection under the Current Plan, except that the funding period is 30 years at June 30, 2019 (rather than the current funding period of 24 years at June 30, 2019).

**Kentucky Retirement Systems**  
**Exhibit 3-3**  
**CERS Non-Hazardous Retirement Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Proposed Plan (Amortization Period = 30 Years at June 30, 2019)**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Actuarial<br>Accrued<br>Liability | Actuarial<br>Value of<br>Assets | Unfunded<br>Actuarial<br>Accrued Liability | Funded<br>Ratio<br>(3) / (2) | Total<br>Employer<br>Contribution | Member<br>Contribution | Covered<br>Payroll | Total<br>Employer<br>Contribution as %<br>of Covered Payroll | Employer<br>Actuarial<br>Determined<br>Contribution Rate | Annual Cash Flow Analysis               |                                     |                              |                      |
|-------------------------------------|-----------------------------------|---------------------------------|--|------------------------------|-----------------------------------|------------------------|--------------------|--|--|---|-------------------------------------|------------------------------|----------------------|
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | Member and<br>Employer<br>Contributions | Benefit<br>Payments<br>and Expenses | Net<br>External<br>Cash Flow | Investment<br>Income |
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | (11)                                    | (12)                                | (13)                         | (14)                 |
| (1)                                 | (2)                               | (3)                             | (4)  | (5)                          | (6)                               | (7)                    | (8)                | (9)  | (10)   | (11)                                    | (12)                                | (13)                         | (14)                 |
| 2019                                | \$ 14,356                         | \$ 7,050                        | \$ 7,306                                   | 49%                          | \$ 487                            | \$ 126                 | \$ 2,522           | 19.30%   | 22.52%   | \$ 613                                  | \$ (818)                            | \$ (205)                     | \$ 441               |
| 2020                                | 14,726                            | 7,281                           | 7,445                                      | 49%                          | 498                               | 129                    | 2,581              | 19.30%   | 23.81%   | 627                                     | (855)                               | (228)                        | 455                  |
| 2021                                | 15,079                            | 7,607                           | 7,472                                      | 50%                          | 572                               | 132                    | 2,638              | 21.68%   | 23.70%   | 704                                     | (890)                               | (186)                        | 471                  |
| 2022                                | 15,418                            | 7,916                           | 7,502                                      | 51%                          | 628                               | 135                    | 2,694              | 23.29%   | 23.29%   | 763                                     | (926)                               | (163)                        | 489                  |
| 2023                                | 15,742                            | 8,234                           | 7,508                                      | 52%                          | 632                               | 138                    | 2,751              | 22.99%   | 22.99%   | 770                                     | (962)                               | (192)                        | 509                  |
| 2024                                | 16,049                            | 8,551                           | 7,498                                      | 53%                          | 640                               | 140                    | 2,809              | 22.79%   | 22.79%   | 780                                     | (999)                               | (219)                        | 528                  |
| 2025                                | 16,339                            | 8,860                           | 7,479                                      | 54%                          | 648                               | 143                    | 2,866              | 22.60%   | 22.60%   | 791                                     | (1,036)                             | (245)                        | 546                  |
| 2026                                | 16,609                            | 9,162                           | 7,447                                      | 55%                          | 656                               | 146                    | 2,924              | 22.42%   | 22.42%   | 802                                     | (1,073)                             | (271)                        | 564                  |
| 2027                                | 16,859                            | 9,455                           | 7,404                                      | 56%                          | 664                               | 149                    | 2,983              | 22.26%   | 22.26%   | 813                                     | (1,109)                             | (296)                        | 582                  |
| 2028                                | 17,088                            | 9,740                           | 7,348                                      | 57%                          | 673                               | 152                    | 3,044              | 22.12%   | 22.12%   | 825                                     | (1,143)                             | (318)                        | 599                  |
| 2029                                | 17,299                            | 10,021                          | 7,278                                      | 58%                          | 683                               | 155                    | 3,107              | 21.99%   | 21.99%   | 838                                     | (1,169)                             | (331)                        | 616                  |
| 2030                                | 17,499                            | 10,307                          | 7,192                                      | 59%                          | 694                               | 159                    | 3,174              | 21.87%   | 21.87%   | 853                                     | (1,198)                             | (345)                        | 633                  |
| 2031                                | 17,685                            | 10,595                          | 7,090                                      | 60%                          | 706                               | 162                    | 3,243              | 21.76%   | 21.76%   | 868                                     | (1,225)                             | (357)                        | 651                  |
| 2032                                | 17,858                            | 10,889                          | 6,969                                      | 61%                          | 718                               | 166                    | 3,315              | 21.65%   | 21.65%   | 884                                     | (1,249)                             | (365)                        | 669                  |
| 2033                                | 18,021                            | 11,193                          | 6,828                                      | 62%                          | 730                               | 169                    | 3,390              | 21.55%   | 21.55%   | 899                                     | (1,271)                             | (372)                        | 688                  |
| 2034                                | 18,176                            | 11,510                          | 6,666                                      | 63%                          | 744                               | 173                    | 3,467              | 21.47%   | 21.47%   | 917                                     | (1,291)                             | (374)                        | 708                  |
| 2035                                | 18,326                            | 11,844                          | 6,482                                      | 65%                          | 759                               | 177                    | 3,546              | 21.39%   | 21.39%   | 936                                     | (1,308)                             | (372)                        | 729                  |
| 2036                                | 18,473                            | 12,201                          | 6,272                                      | 66%                          | 774                               | 182                    | 3,631              | 21.31%   | 21.31%   | 956                                     | (1,321)                             | (365)                        | 751                  |
| 2037                                | 18,622                            | 12,586                          | 6,036                                      | 68%                          | 790                               | 186                    | 3,720              | 21.25%   | 21.25%   | 976                                     | (1,330)                             | (354)                        | 776                  |
| 2038                                | 18,778                            | 13,009                          | 5,769                                      | 69%                          | 808                               | 191                    | 3,813              | 21.18%   | 21.18%   | 999                                     | (1,336)                             | (337)                        | 803                  |
| 2039                                | 18,946                            | 13,474                          | 5,472                                      | 71%                          | 825                               | 195                    | 3,909              | 21.11%   | 21.11%   | 1,020                                   | (1,340)                             | (320)                        | 832                  |
| 2040                                | 19,128                            | 13,986                          | 5,142                                      | 73%                          | 844                               | 200                    | 4,007              | 21.06%   | 21.06%   | 1,044                                   | (1,343)                             | (299)                        | 865                  |
| 2041                                | 19,327                            | 14,553                          | 4,774                                      | 75%                          | 863                               | 205                    | 4,107              | 21.01%   | 21.01%   | 1,068                                   | (1,345)                             | (277)                        | 901                  |
| 2042                                | 19,545                            | 15,176                          | 4,369                                      | 78%                          | 883                               | 210                    | 4,209              | 20.98%   | 20.98%   | 1,093                                   | (1,348)                             | (255)                        | 941                  |
| 2043                                | 19,783                            | 15,863                          | 3,920                                      | 80%                          | 905                               | 216                    | 4,313              | 20.97%   | 20.97%   | 1,121                                   | (1,350)                             | (229)                        | 984                  |
| 2044                                | 20,043                            | 16,618                          | 3,425                                      | 83%                          | 928                               | 221                    | 4,419              | 20.99%   | 20.99%   | 1,149                                   | (1,353)                             | (204)                        | 1,032                |
| 2045                                | 20,326                            | 17,445                          | 2,881                                      | 86%                          | 953                               | 226                    | 4,526              | 21.05%   | 21.05%   | 1,179                                   | (1,357)                             | (178)                        | 1,085                |
| 2046                                | 20,633                            | 18,353                          | 2,280                                      | 89%                          | 981                               | 232                    | 4,635              | 21.16%   | 21.16%   | 1,213                                   | (1,361)                             | (148)                        | 1,142                |
| 2047                                | 20,965                            | 19,346                          | 1,619                                      | 92%                          | 1,015                             | 237                    | 4,745              | 21.38%   | 21.38%   | 1,252                                   | (1,368)                             | (116)                        | 1,206                |
| 2048                                | 21,322                            | 20,436                          | 886  | 96%                          | 1,065                             | 243                    | 4,857              | 21.92%   | 21.92%   | 1,308                                   | (1,375)                             | (67)                         | 1,275                |
| 2049                                | 21,705                            | 21,705                          | -  | 100%                         | 183                               | 249                    | 4,971              | 3.68%  | 3.68%  | 432                                     | (1,384)                             | (952)                        | 1,323                |
| 2050                                | 22,113                            | 22,113                          | -  | 100%                         | 187                               | 254                    | 5,087              | 3.67%  | 3.67%  | 441                                     | (1,395)                             | (954)                        | 1,346                |
| 2051                                | 22,548                            | 22,548                          | -  | 100%                         | 190                               | 260                    | 5,204              | 3.66%  | 3.66%  | 450                                     | (1,407)                             | (957)                        | 1,370                |
| 2052                                | 23,009                            | 23,009                          | -  | 100%                         | 195                               | 266                    | 5,324              | 3.66%  | 3.66%  | 461                                     | (1,422)                             | (961)                        | 1,396                |
| 2053                                | 23,497                            | 23,497                          | -  | 100%                         | 199                               | 272                    | 5,446              | 3.66%  | 3.66%  | 471                                     | (1,439)                             | (968)                        | 1,423                |

Notes and assumptions:

The projection is based on the same methods and assumptions as the projection under the Current Plan, except that the funding period is 30 years at June 30, 2019 (rather than the current funding period of 24 years at June 30, 2019) and the employer contribution rate for FY 2020/2021 is assumed to remain at 19.30% of pay.

**Kentucky Retirement Systems**  
**Exhibit 3-4**  
**CERS Hazardous Retirement Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Proposed Plan (Amortization Period = 30 Years at June 30, 2019)**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Actuarial<br>Accrued<br>Liability | Actuarial<br>Value of<br>Assets | Unfunded<br>Actuarial<br>Accrued Liability | Funded<br>Ratio<br>(3) / (2) | Total<br>Employer<br>Contribution | Member<br>Contribution | Covered<br>Payroll | Total<br>Employer<br>Contribution as %<br>of Covered Payroll | Employer<br>Actuarial<br>Determined<br>Contribution Rate | Annual Cash Flow Analysis               |                                     |                              |                      |
|-------------------------------------|-----------------------------------|---------------------------------|--|------------------------------|-----------------------------------|------------------------|--------------------|--|--|---|-------------------------------------|------------------------------|----------------------|
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | Member and<br>Employer<br>Contributions | Benefit<br>Payments<br>and Expenses | Net<br>External<br>Cash Flow | Investment<br>Income |
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | (11)                                    | (12)                                | (13)                         | (14)                 |
| (1)                                 | (2)                               | (3)                             | (4)  | (5)                          | (6)                               | (7)                    | (8)                | (9)  | (10)   | (11)                                    | (12)                                | (13)                         | (14)                 |
| 2019                                | \$ 5,245                          | \$ 2,375                        | \$ 2,870                                   | 45%                          | \$ 168                            | \$ 45                  | \$ 559             | 30.06%   | 36.98%   | \$ 213                                  | \$ (275)                            | \$ (62)                      | \$ 149               |
| 2020                                | 5,407                             | 2,462                           | 2,945                                      | 46%                          | 169                               | 45                     | 562                | 30.06%   | 42.02%   | 214                                     | (293)                               | (79)                         | 154                  |
| 2021                                | 5,557                             | 2,570                           | 2,987                                      | 46%                          | 199                               | 46                     | 570                | 35.00%   | 42.68%   | 245                                     | (308)                               | (63)                         | 159                  |
| 2022                                | 5,700                             | 2,674                           | 3,026                                      | 47%                          | 237                               | 46                     | 578                | 41.02%   | 42.54%   | 283                                     | (322)                               | (39)                         | 166                  |
| 2023                                | 5,837                             | 2,799                           | 3,038                                      | 48%                          | 249                               | 47                     | 588                | 42.31%   | 42.31%   | 296                                     | (336)                               | (40)                         | 174                  |
| 2024                                | 5,968                             | 2,932                           | 3,036                                      | 49%                          | 252                               | 48                     | 599                | 42.10%   | 42.10%   | 300                                     | (349)                               | (49)                         | 182                  |
| 2025                                | 6,093                             | 3,066                           | 3,027                                      | 50%                          | 255                               | 49                     | 610                | 41.84%   | 41.84%   | 304                                     | (361)                               | (57)                         | 190                  |
| 2026                                | 6,214                             | 3,198                           | 3,016                                      | 51%                          | 259                               | 50                     | 622                | 41.57%   | 41.57%   | 309                                     | (373)                               | (64)                         | 198                  |
| 2027                                | 6,329                             | 3,331                           | 2,998                                      | 53%                          | 262                               | 51                     | 635                | 41.32%   | 41.32%   | 313                                     | (384)                               | (71)                         | 206                  |
| 2028                                | 6,441                             | 3,466                           | 2,975                                      | 54%                          | 266                               | 52                     | 648                | 41.05%   | 41.05%   | 318                                     | (394)                               | (76)                         | 214                  |
| 2029                                | 6,550                             | 3,604                           | 2,946                                      | 55%                          | 270                               | 53                     | 663                | 40.79%   | 40.79%   | 323                                     | (402)                               | (79)                         | 223                  |
| 2030                                | 6,658                             | 3,748                           | 2,910                                      | 56%                          | 275                               | 54                     | 680                | 40.50%   | 40.50%   | 329                                     | (409)                               | (80)                         | 232                  |
| 2031                                | 6,768                             | 3,901                           | 2,867                                      | 58%                          | 280                               | 56                     | 698                | 40.18%   | 40.18%   | 336                                     | (415)                               | (79)                         | 241                  |
| 2032                                | 6,880                             | 4,063                           | 2,817                                      | 59%                          | 286                               | 57                     | 717                | 39.87%   | 39.87%   | 343                                     | (420)                               | (77)                         | 252                  |
| 2033                                | 6,995                             | 4,238                           | 2,757                                      | 61%                          | 292                               | 59                     | 737                | 39.55%   | 39.55%   | 351                                     | (425)                               | (74)                         | 263                  |
| 2034                                | 7,115                             | 4,425                           | 2,690                                      | 62%                          | 297                               | 61                     | 757                | 39.22%   | 39.22%   | 358                                     | (431)                               | (73)                         | 274                  |
| 2035                                | 7,239                             | 4,626                           | 2,613                                      | 64%                          | 302                               | 62                     | 777                | 38.94%   | 38.94%   | 364                                     | (437)                               | (73)                         | 287                  |
| 2036                                | 7,366                             | 4,840                           | 2,526                                      | 66%                          | 308                               | 64                     | 796                | 38.67%   | 38.67%   | 372                                     | (445)                               | (73)                         | 300                  |
| 2037                                | 7,495                             | 5,067                           | 2,428                                      | 68%                          | 313                               | 65                     | 815                | 38.44%   | 38.44%   | 378                                     | (455)                               | (77)                         | 314                  |
| 2038                                | 7,625                             | 5,305                           | 2,320                                      | 70%                          | 319                               | 67                     | 834                | 38.25%   | 38.25%   | 386                                     | (465)                               | (79)                         | 329                  |
| 2039                                | 7,753                             | 5,555                           | 2,198                                      | 72%                          | 325                               | 68                     | 852                | 38.10%   | 38.10%   | 393                                     | (475)                               | (82)                         | 345                  |
| 2040                                | 7,881                             | 5,817                           | 2,064                                      | 74%                          | 331                               | 70                     | 872                | 37.98%   | 37.98%   | 401                                     | (484)                               | (83)                         | 361                  |
| 2041                                | 8,009                             | 6,095                           | 1,914                                      | 76%                          | 338                               | 71                     | 892                | 37.91%   | 37.91%   | 409                                     | (492)                               | (83)                         | 378                  |
| 2042                                | 8,141                             | 6,391                           | 1,750                                      | 79%                          | 346                               | 73                     | 913                | 37.84%   | 37.84%   | 419                                     | (498)                               | (79)                         | 397                  |
| 2043                                | 8,277                             | 6,708                           | 1,569                                      | 81%                          | 354                               | 75                     | 935                | 37.82%   | 37.82%   | 429                                     | (505)                               | (76)                         | 417                  |
| 2044                                | 8,417                             | 7,048                           | 1,369                                      | 84%                          | 362                               | 77                     | 956                | 37.84%   | 37.84%   | 439                                     | (514)                               | (75)                         | 438                  |
| 2045                                | 8,561                             | 7,411                           | 1,150                                      | 87%                          | 370                               | 78                     | 976                | 37.97%   | 37.97%   | 448                                     | (523)                               | (75)                         | 461                  |
| 2046                                | 8,708                             | 7,797                           | 911  | 90%                          | 382                               | 80                     | 996                | 38.31%   | 38.31%   | 462                                     | (533)                               | (71)                         | 485                  |
| 2047                                | 8,856                             | 8,210                           | 646  | 93%                          | 395                               | 81                     | 1,017              | 38.82%   | 38.82%   | 476                                     | (544)                               | (68)                         | 511                  |
| 2048                                | 9,006                             | 8,653                           | 353  | 96%                          | 414                               | 83                     | 1,038              | 39.89%   | 39.89%   | 497                                     | (554)                               | (57)                         | 539                  |
| 2049                                | 9,159                             | 9,159                           | -  | 100%                         | 63                                | 85                     | 1,062              | 5.93%  | 5.93%  | 148                                     | (565)                               | (417)                        | 558                  |
| 2050                                | 9,314                             | 9,314                           | -  | 100%                         | 64                                | 87                     | 1,082              | 5.93%  | 5.93%  | 151                                     | (577)                               | (426)                        | 566                  |
| 2051                                | 9,470                             | 9,470                           | -  | 100%                         | 66                                | 88                     | 1,105              | 5.93%  | 5.93%  | 154                                     | (589)                               | (435)                        | 575                  |
| 2052                                | 9,626                             | 9,626                           | -  | 100%                         | 67                                | 90                     | 1,128              | 5.93%  | 5.93%  | 157                                     | (601)                               | (444)                        | 583                  |
| 2053                                | 9,784                             | 9,784                           | -  | 100%                         | 68                                | 92                     | 1,152              | 5.93%  | 5.93%  | 160                                     | (613)                               | (453)                        | 592                  |

Notes and assumptions:

The projection is based on the same methods and assumptions as the projection under the Current Plan, except that the funding period is 30 years at June 30, 2019 (rather than the current funding period of 24 years at June 30, 2019) and the employer contribution rate for FY 2020/2021 is assumed to remain at 30.06% of pay.

**Kentucky Retirement Systems**  
**Exhibit 3-5**  
**State Police Retirement System Retirement Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Proposed Plan (Amortization Period = 30 Years at June 30, 2019)**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Actuarial<br>Accrued<br>Liability | Actuarial<br>Value of<br>Assets | Unfunded<br>Actuarial<br>Accrued Liability | Funded<br>Ratio<br>(3) / (2) | Total<br>Employer<br>Contribution | Member<br>Contribution | Covered<br>Payroll | Total<br>Employer<br>Contribution as %<br>of Covered Payroll | Employer<br>Actuarial<br>Determined<br>Contribution Rate | Annual Cash Flow Analysis               |                                     |                              |                      |
|-------------------------------------|-----------------------------------|---------------------------------|--|------------------------------|-----------------------------------|------------------------|--------------------|--|--|---|-------------------------------------|------------------------------|----------------------|
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | Member and<br>Employer<br>Contributions | Benefit<br>Payments<br>and Expenses | Net<br>External<br>Cash Flow | Investment<br>Income |
| (1)                                 | (2)                               | (3)                             | (4)  | (5)                          | (6)                               | (7)                    | (8)                | (9)  | (10)   | (11)                                    | (12)                                | (13)                         | (14)                 |
| 2019                                | \$ 1,045                          | \$ 282                          | \$ 763                                     | 27%                          | \$ 57                             | \$ 4                   | \$ 48              | 119.05%  | 120.54%  | \$ 61                                   | \$ (63)                             | \$ (2)                       | \$ 15                |
| 2020                                | 1,050                             | 295                             | 755  | 28%                          | 58                                | 4                      | 47                 | 123.79%  | 123.79%  | 62                                      | (64)                                | (2)                          | 16                   |
| 2021                                | 1,052                             | 312                             | 740  | 30%                          | 58                                | 4                      | 47                 | 123.79%  | 125.08%  | 62                                      | (65)                                | (3)                          | 16                   |
| 2022                                | 1,053                             | 326                             | 727  | 31%                          | 58                                | 4                      | 47                 | 124.48%  | 124.48%  | 62                                      | (66)                                | (4)                          | 17                   |
| 2023                                | 1,053                             | 339                             | 714  | 32%                          | 58                                | 4                      | 46                 | 124.48%  | 124.12%  | 62                                      | (67)                                | (5)                          | 18                   |
| 2024                                | 1,052                             | 351                             | 701  | 33%                          | 57                                | 4                      | 46                 | 123.96%  | 123.96%  | 61                                      | (68)                                | (7)                          | 18                   |
| 2025                                | 1,049                             | 362                             | 687  | 35%                          | 57                                | 4                      | 46                 | 123.96%  | 123.72%  | 61                                      | (69)                                | (8)                          | 19                   |
| 2026                                | 1,045                             | 373                             | 672  | 36%                          | 57                                | 4                      | 46                 | 123.88%  | 123.88%  | 61                                      | (69)                                | (8)                          | 19                   |
| 2027                                | 1,041                             | 383                             | 658  | 37%                          | 57                                | 4                      | 46                 | 123.88%  | 123.46%  | 61                                      | (69)                                | (8)                          | 20                   |
| 2028                                | 1,035                             | 394                             | 641  | 38%                          | 56                                | 4                      | 46                 | 122.60%  | 122.60%  | 60                                      | (70)                                | (10)                         | 20                   |
| 2029                                | 1,028                             | 405                             | 623  | 39%                          | 56                                | 4                      | 46                 | 122.60%  | 121.94%  | 60                                      | (70)                                | (10)                         | 21                   |
| 2030                                | 1,021                             | 416                             | 605  | 41%                          | 56                                | 4                      | 46                 | 121.05%  | 121.05%  | 60                                      | (70)                                | (10)                         | 22                   |
| 2031                                | 1,013                             | 428                             | 585  | 42%                          | 57                                | 4                      | 47                 | 121.05%  | 119.84%  | 61                                      | (70)                                | (9)                          | 22                   |
| 2032                                | 1,005                             | 441                             | 564  | 44%                          | 56                                | 4                      | 47                 | 118.34%  | 118.34%  | 60                                      | (69)                                | (9)                          | 23                   |
| 2033                                | 996                               | 454                             | 542  | 46%                          | 57                                | 4                      | 48                 | 118.34%  | 116.97%  | 61                                      | (69)                                | (8)                          | 24                   |
| 2034                                | 988                               | 470                             | 518  | 48%                          | 56                                | 4                      | 48                 | 115.16%  | 115.16%  | 60                                      | (68)                                | (8)                          | 24                   |
| 2035                                | 980                               | 485                             | 495  | 49%                          | 56                                | 4                      | 49                 | 115.16%  | 113.79%  | 60                                      | (68)                                | (8)                          | 25                   |
| 2036                                | 971                               | 503                             | 468  | 52%                          | 55                                | 4                      | 49                 | 112.37%  | 112.37%  | 59                                      | (68)                                | (9)                          | 26                   |
| 2037                                | 962                               | 520                             | 442  | 54%                          | 55                                | 4                      | 49                 | 112.37%  | 111.65%  | 59                                      | (67)                                | (8)                          | 27                   |
| 2038                                | 953                               | 539                             | 414  | 57%                          | 54                                | 4                      | 49                 | 110.60%  | 110.60%  | 58                                      | (67)                                | (9)                          | 28                   |
| 2039                                | 944                               | 557                             | 387  | 59%                          | 54                                | 4                      | 49                 | 110.60%  | 110.22%  | 58                                      | (67)                                | (9)                          | 29                   |
| 2040                                | 933                               | 578                             | 355  | 62%                          | 54                                | 4                      | 49                 | 109.45%  | 109.45%  | 58                                      | (67)                                | (9)                          | 30                   |
| 2041                                | 923                               | 599                             | 324  | 65%                          | 54                                | 4                      | 49                 | 109.45%  | 109.42%  | 58                                      | (67)                                | (9)                          | 31                   |
| 2042                                | 912                               | 621                             | 291  | 68%                          | 54                                | 4                      | 49                 | 109.59%  | 109.59%  | 58                                      | (66)                                | (8)                          | 32                   |
| 2043                                | 900                               | 645                             | 255  | 72%                          | 54                                | 4                      | 49                 | 109.59%  | 109.22%  | 58                                      | (66)                                | (8)                          | 34                   |
| 2044                                | 889                               | 670                             | 219  | 75%                          | 54                                | 4                      | 49                 | 109.27%  | 109.27%  | 58                                      | (66)                                | (8)                          | 35                   |
| 2045                                | 877                               | 697                             | 180  | 79%                          | 52                                | 4                      | 48                 | 109.27%  | 109.27%  | 56                                      | (66)                                | (10)                         | 36                   |
| 2046                                | 864                               | 724                             | 140  | 84%                          | 54                                | 4                      | 48                 | 112.37%  | 112.37%  | 58                                      | (65)                                | (7)                          | 38                   |
| 2047                                | 851                               | 754                             | 97   | 89%                          | 54                                | 4                      | 48                 | 112.37%  | 112.90%  | 58                                      | (64)                                | (6)                          | 39                   |
| 2048                                | 837                               | 787                             | 50   | 94%                          | 54                                | 4                      | 48                 | 112.99%  | 112.99%  | 58                                      | (64)                                | (6)                          | 41                   |
| 2049                                | 824                               | 824                             | -  | 100%                         | 4                                 | 4                      | 48                 | 7.70%  | 7.70%  | 8                                       | (64)                                | (56)                         | 42                   |
| 2050                                | 810                               | 810                             | -  | 100%                         | 4                                 | 4                      | 49                 | 7.67%  | 7.67%  | 8                                       | (63)                                | (55)                         | 41                   |
| 2051                                | 797                               | 797                             | -  | 100%                         | 4                                 | 4                      | 49                 | 7.66%  | 7.66%  | 8                                       | (62)                                | (54)                         | 40                   |
| 2052                                | 783                               | 783                             | -  | 100%                         | 4                                 | 4                      | 50                 | 7.66%  | 7.66%  | 8                                       | (62)                                | (54)                         | 40                   |
| 2053                                | 770                               | 770                             | -  | 100%                         | 4                                 | 4                      | 51                 | 7.66%  | 7.66%  | 8                                       | (61)                                | (53)                         | 39                   |

Notes and assumptions:

The projection is based on the same methods and assumptions as the projection under the Current Plan, except that the funding period is 30 years at June 30, 2019 (rather than the current funding period of 24 years at June 30, 2019).

**Kentucky Retirement Systems**  
**Exhibit 3-6**  
**KERS Non-Hazardous Insurance Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Proposed Plan (Amortization Period = 30 Years at June 30, 2019)**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Actuarial<br>Accrued<br>Liability | Actuarial<br>Value of<br>Assets | Unfunded<br>Actuarial<br>Accrued Liability | Funded<br>Ratio<br>(3) / (2) | Total<br>Employer<br>Contribution | Member<br>Contribution | Covered<br>Payroll | Total<br>Employer<br>Contribution as %<br>of Covered Payroll | Employer<br>Actuarial<br>Determined<br>Contribution Rate | Annual Cash Flow Analysis               |                                     |                              |                      |
|-------------------------------------|-----------------------------------|---------------------------------|--|------------------------------|-----------------------------------|------------------------|--------------------|--|--|---|-------------------------------------|------------------------------|----------------------|
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | Member and<br>Employer<br>Contributions | Benefit<br>Payments<br>and Expenses | Net<br>External<br>Cash Flow | Investment<br>Income |
| (1)                                 | (2)                               | (3)                             | (4)  | (5)                          | (6)                               | (7)                    | (8)                | (9)  | (10)   | (11)                                    | (12)                                | (13)                         | (14)                 |
| 2019                                | \$ 2,733                          | \$ 991                          | \$ 1,742                                   | 36%                          | \$ 165                            | \$ 6                   | \$ 1,431           | 11.50%   | 10.65%   | \$ 171                                  | \$ (133)                            | \$ 38                        | \$ 63                |
| 2020                                | 2,808                             | 1,090                           | 1,718                                      | 39%                          | 158                               | 6                      | 1,421              | 11.15%   | 11.15%   | 164                                     | (137)                               | 27                           | 69                   |
| 2021                                | 2,882                             | 1,196                           | 1,686                                      | 41%                          | 158                               | 7                      | 1,415              | 11.15%   | 11.09%   | 165                                     | (145)                               | 20                           | 75                   |
| 2022                                | 2,951                             | 1,291                           | 1,660                                      | 44%                          | 154                               | 7                      | 1,410              | 10.94%   | 10.94%   | 161                                     | (153)                               | 8                            | 81                   |
| 2023                                | 3,015                             | 1,379                           | 1,636                                      | 46%                          | 154                               | 8                      | 1,406              | 10.94%   | 10.84%   | 162                                     | (161)                               | 1                            | 86                   |
| 2024                                | 3,072                             | 1,465                           | 1,607                                      | 48%                          | 151                               | 8                      | 1,402              | 10.74%   | 10.74%   | 159                                     | (170)                               | (11)                         | 91                   |
| 2025                                | 3,123                             | 1,545                           | 1,578                                      | 49%                          | 150                               | 9                      | 1,399              | 10.74%   | 10.64%   | 159                                     | (180)                               | (21)                         | 96                   |
| 2026                                | 3,165                             | 1,621                           | 1,544                                      | 51%                          | 147                               | 9                      | 1,396              | 10.51%   | 10.51%   | 156                                     | (189)                               | (33)                         | 100                  |
| 2027                                | 3,200                             | 1,688                           | 1,512                                      | 53%                          | 146                               | 10                     | 1,393              | 10.51%   | 10.38%   | 156                                     | (199)                               | (43)                         | 104                  |
| 2028                                | 3,224                             | 1,750                           | 1,474                                      | 54%                          | 143                               | 10                     | 1,390              | 10.25%   | 10.25%   | 153                                     | (208)                               | (55)                         | 108                  |
| 2029                                | 3,239                             | 1,802                           | 1,437                                      | 56%                          | 142                               | 11                     | 1,388              | 10.25%   | 10.13%   | 153                                     | (217)                               | (64)                         | 111                  |
| 2030                                | 3,245                             | 1,849                           | 1,396                                      | 57%                          | 139                               | 11                     | 1,387              | 10.00%   | 10.00%   | 150                                     | (224)                               | (74)                         | 113                  |
| 2031                                | 3,244                             | 1,888                           | 1,356                                      | 58%                          | 139                               | 11                     | 1,387              | 10.00%   | 9.89%  | 150                                     | (229)                               | (79)                         | 116                  |
| 2032                                | 3,235                             | 1,925                           | 1,310                                      | 60%                          | 136                               | 12                     | 1,387              | 9.77%  | 9.77%  | 148                                     | (233)                               | (85)                         | 118                  |
| 2033                                | 3,221                             | 1,957                           | 1,264                                      | 61%                          | 136                               | 12                     | 1,388              | 9.77%  | 9.70%  | 148                                     | (236)                               | (88)                         | 120                  |
| 2034                                | 3,203                             | 1,988                           | 1,215                                      | 62%                          | 133                               | 13                     | 1,389              | 9.60%  | 9.60%  | 146                                     | (238)                               | (92)                         | 121                  |
| 2035                                | 3,180                             | 2,018                           | 1,162                                      | 63%                          | 134                               | 13                     | 1,391              | 9.60%  | 9.53%  | 147                                     | (238)                               | (91)                         | 123                  |
| 2036                                | 3,156                             | 2,050                           | 1,106                                      | 65%                          | 132                               | 13                     | 1,395              | 9.45%  | 9.45%  | 145                                     | (236)                               | (91)                         | 125                  |
| 2037                                | 3,132                             | 2,083                           | 1,049                                      | 67%                          | 132                               | 13                     | 1,401              | 9.45%  | 9.37%  | 145                                     | (234)                               | (89)                         | 127                  |
| 2038                                | 3,108                             | 2,122                           | 986  | 68%                          | 131                               | 14                     | 1,407              | 9.29%  | 9.29%  | 145                                     | (232)                               | (87)                         | 130                  |
| 2039                                | 3,085                             | 2,164                           | 921  | 70%                          | 131                               | 14                     | 1,414              | 9.29%  | 9.22%  | 145                                     | (229)                               | (84)                         | 133                  |
| 2040                                | 3,063                             | 2,213                           | 850  | 72%                          | 130                               | 14                     | 1,421              | 9.13%  | 9.13%  | 144                                     | (226)                               | (82)                         | 136                  |
| 2041                                | 3,043                             | 2,266                           | 777  | 74%                          | 130                               | 14                     | 1,427              | 9.13%  | 9.08%  | 144                                     | (223)                               | (79)                         | 139                  |
| 2042                                | 3,024                             | 2,327                           | 697  | 77%                          | 129                               | 14                     | 1,433              | 9.00%  | 9.00%  | 143                                     | (219)                               | (76)                         | 143                  |
| 2043                                | 3,009                             | 2,394                           | 615  | 80%                          | 129                               | 14                     | 1,438              | 9.00%  | 8.95%  | 143                                     | (216)                               | (73)                         | 147                  |
| 2044                                | 2,995                             | 2,468                           | 527  | 82%                          | 128                               | 14                     | 1,443              | 8.90%  | 8.90%  | 142                                     | (214)                               | (72)                         | 152                  |
| 2045                                | 2,983                             | 2,549                           | 434  | 85%                          | 129                               | 14                     | 1,447              | 8.90%  | 8.86%  | 143                                     | (212)                               | (69)                         | 157                  |
| 2046                                | 2,971                             | 2,637                           | 334  | 89%                          | 128                               | 14                     | 1,451              | 8.79%  | 8.79%  | 142                                     | (212)                               | (70)                         | 163                  |
| 2047                                | 2,960                             | 2,730                           | 230  | 92%                          | 128                               | 15                     | 1,455              | 8.79%  | 8.77%  | 143                                     | (212)                               | (69)                         | 168                  |
| 2048                                | 2,947                             | 2,829                           | 118  | 96%                          | 127                               | 15                     | 1,459              | 8.71%  | 8.71%  | 142                                     | (212)                               | (70)                         | 175                  |
| 2049                                | 2,934                             | 2,934                           | -  | 100%                         | 5                                 | 15                     | 1,463              | 0.36%  | 0.36%  | 20                                      | (213)                               | (193)                        | 177                  |
| 2050                                | 2,919                             | 2,919                           | -  | 100%                         | 5                                 | 15                     | 1,489              | 0.35%  | 0.35%  | 20                                      | (213)                               | (193)                        | 176                  |
| 2051                                | 2,903                             | 2,903                           | -  | 100%                         | 5                                 | 15                     | 1,517              | 0.34%  | 0.34%  | 20                                      | (214)                               | (194)                        | 175                  |
| 2052                                | 2,885                             | 2,885                           | -  | 100%                         | 5                                 | 15                     | 1,546              | 0.32%  | 0.32%  | 20                                      | (214)                               | (194)                        | 174                  |
| 2053                                | 2,867                             | 2,867                           | -  | 100%                         | 5                                 | 16                     | 1,577              | 0.31%  | 0.31%  | 21                                      | (214)                               | (193)                        | 173                  |

Notes and assumptions:

The projection is based on the same methods and assumptions as the projection under the Current Plan, except that the funding period is 30 years at June 30, 2019 (rather than the current funding period of 24 years at June 30, 2019).

**Kentucky Retirement Systems**  
**Exhibit 3-7**  
**KERS Hazardous Insurance Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Proposed Plan (Amortization Period = 30 Years at June 30, 2019)**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Actuarial<br>Accrued<br>Liability | Actuarial<br>Value of<br>Assets | Unfunded<br>Actuarial<br>Accrued Liability | Funded<br>Ratio<br>(3) / (2) | Total<br>Employer<br>Contribution | Member<br>Contribution | Covered<br>Payroll | Total<br>Employer<br>Contribution as %<br>of Covered Payroll | Employer<br>Actuarial<br>Determined<br>Contribution Rate | Annual Cash Flow Analysis               |                                     |                              |                      |
|-------------------------------------|-----------------------------------|---------------------------------|--|------------------------------|-----------------------------------|------------------------|--------------------|--|--|---|-------------------------------------|------------------------------|----------------------|
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | Member and<br>Employer<br>Contributions | Benefit<br>Payments<br>and Expenses | Net<br>External<br>Cash Flow | Investment<br>Income |
| (1)                                 | (2)                               | (3)                             | (4)  | (5)                          | (6)                               | (7)                    | (8)                | (9)  | (10)   | (11)                                    | (12)                                | (13)                         | (14)                 |
| 2019                                | \$ 427                            | \$ 525                          | \$ (98)                                    | 123%                         | \$ 4                              | \$ 1                   | \$ 150             | 2.46%  | 0.00%  | \$ 5                                    | \$ (20)                             | \$ (15)                      | \$ 33                |
| 2020                                | 440                               | 543                             | (103)                                      | 123%                         | -                                 | 1                      | 150                | 0.00%  | 0.00%  | 1                                       | (22)                                | (21)                         | 34                   |
| 2021                                | 453                               | 563                             | (110)                                      | 124%                         | -                                 | 1                      | 151                | 0.00%  | 0.00%  | 1                                       | (24)                                | (23)                         | 35                   |
| 2022                                | 464                               | 577                             | (113)                                      | 124%                         | -                                 | 1                      | 152                | 0.00%  | 0.00%  | 1                                       | (26)                                | (25)                         | 35                   |
| 2023                                | 473                               | 587                             | (114)                                      | 124%                         | -                                 | 1                      | 153                | 0.00%  | 0.00%  | 1                                       | (27)                                | (26)                         | 36                   |
| 2024                                | 480                               | 596                             | (116)                                      | 124%                         | -                                 | 1                      | 154                | 0.00%  | 0.00%  | 1                                       | (29)                                | (28)                         | 36                   |
| 2025                                | 486                               | 605                             | (119)                                      | 124%                         | -                                 | 1                      | 155                | 0.00%  | 0.00%  | 1                                       | (30)                                | (29)                         | 37                   |
| 2026                                | 491                               | 613                             | (122)                                      | 125%                         | -                                 | 1                      | 155                | 0.00%  | 0.00%  | 1                                       | (32)                                | (31)                         | 37                   |
| 2027                                | 495                               | 620                             | (125)                                      | 125%                         | -                                 | 1                      | 156                | 0.00%  | 0.00%  | 1                                       | (32)                                | (31)                         | 38                   |
| 2028                                | 498                               | 627                             | (129)                                      | 126%                         | -                                 | 1                      | 157                | 0.00%  | 0.00%  | 1                                       | (33)                                | (32)                         | 38                   |
| 2029                                | 500                               | 633                             | (133)                                      | 127%                         | -                                 | 1                      | 158                | 0.00%  | 0.00%  | 1                                       | (34)                                | (33)                         | 39                   |
| 2030                                | 501                               | 639                             | (138)                                      | 128%                         | -                                 | 2                      | 160                | 0.00%  | 0.00%  | 2                                       | (34)                                | (32)                         | 39                   |
| 2031                                | 502                               | 645                             | (143)                                      | 128%                         | -                                 | 2                      | 161                | 0.00%  | 0.00%  | 2                                       | (34)                                | (32)                         | 39                   |
| 2032                                | 504                               | 652                             | (148)                                      | 129%                         | -                                 | 2                      | 163                | 0.00%  | 0.00%  | 2                                       | (34)                                | (32)                         | 40                   |
| 2033                                | 505                               | 659                             | (154)                                      | 130%                         | -                                 | 2                      | 165                | 0.00%  | 0.00%  | 2                                       | (34)                                | (32)                         | 40                   |
| 2034                                | 507                               | 667                             | (160)                                      | 132%                         | -                                 | 2                      | 167                | 0.00%  | 0.00%  | 2                                       | (34)                                | (32)                         | 41                   |
| 2035                                | 508                               | 675                             | (167)                                      | 133%                         | -                                 | 2                      | 168                | 0.00%  | 0.00%  | 2                                       | (34)                                | (32)                         | 41                   |
| 2036                                | 511                               | 684                             | (173)                                      | 134%                         | -                                 | 2                      | 170                | 0.00%  | 0.00%  | 2                                       | (33)                                | (31)                         | 42                   |
| 2037                                | 513                               | 694                             | (181)                                      | 135%                         | -                                 | 2                      | 171                | 0.00%  | 0.00%  | 2                                       | (33)                                | (31)                         | 42                   |
| 2038                                | 517                               | 705                             | (188)                                      | 136%                         | -                                 | 2                      | 172                | 0.00%  | 0.00%  | 2                                       | (33)                                | (31)                         | 43                   |
| 2039                                | 520                               | 717                             | (197)                                      | 138%                         | -                                 | 2                      | 172                | 0.00%  | 0.00%  | 2                                       | (33)                                | (31)                         | 44                   |
| 2040                                | 525                               | 730                             | (205)                                      | 139%                         | -                                 | 2                      | 173                | 0.00%  | 0.00%  | 2                                       | (32)                                | (30)                         | 45                   |
| 2041                                | 529                               | 744                             | (215)                                      | 141%                         | -                                 | 2                      | 174                | 0.00%  | 0.00%  | 2                                       | (32)                                | (30)                         | 46                   |
| 2042                                | 535                               | 760                             | (225)                                      | 142%                         | -                                 | 2                      | 174                | 0.00%  | 0.00%  | 2                                       | (32)                                | (30)                         | 47                   |
| 2043                                | 540                               | 776                             | (236)                                      | 144%                         | -                                 | 2                      | 175                | 0.00%  | 0.00%  | 2                                       | (32)                                | (30)                         | 48                   |
| 2044                                | 546                               | 793                             | (247)                                      | 145%                         | -                                 | 2                      | 175                | 0.00%  | 0.00%  | 2                                       | (33)                                | (31)                         | 49                   |
| 2045                                | 552                               | 811                             | (259)                                      | 147%                         | -                                 | 2                      | 174                | 0.00%  | 0.00%  | 2                                       | (33)                                | (31)                         | 50                   |
| 2046                                | 557                               | 829                             | (272)                                      | 149%                         | -                                 | 2                      | 174                | 0.00%  | 0.00%  | 2                                       | (34)                                | (32)                         | 51                   |
| 2047                                | 562                               | 848                             | (286)                                      | 151%                         | -                                 | 2                      | 173                | 0.00%  | 0.00%  | 2                                       | (34)                                | (32)                         | 52                   |
| 2048                                | 567                               | 868                             | (301)                                      | 153%                         | -                                 | 2                      | 173                | 0.00%  | 0.00%  | 2                                       | (35)                                | (33)                         | 53                   |
| 2049                                | 571                               | 888                             | (317)                                      | 156%                         | -                                 | 2                      | 173                | 0.00%  | 0.00%  | 2                                       | (36)                                | (34)                         | 54                   |
| 2050                                | 575                               | 908                             | (333)                                      | 158%                         | -                                 | 2                      | 176                | 0.00%  | 0.00%  | 2                                       | (37)                                | (35)                         | 56                   |
| 2051                                | 578                               | 929                             | (351)                                      | 161%                         | -                                 | 2                      | 179                | 0.00%  | 0.00%  | 2                                       | (37)                                | (35)                         | 57                   |
| 2052                                | 581                               | 950                             | (369)                                      | 164%                         | -                                 | 2                      | 182                | 0.00%  | 0.00%  | 2                                       | (38)                                | (36)                         | 58                   |
| 2053                                | 583                               | 973                             | (390)                                      | 167%                         | -                                 | 2                      | 185                | 0.00%  | 0.00%  | 2                                       | (38)                                | (36)                         | 60                   |

Notes and assumptions:

The projection is based on the same methods and assumptions as the projection under the Current Plan, except that the funding period is 30 years at June 30, 2019 (rather than the current funding period of 24 years at June 30, 2019).

**Kentucky Retirement Systems**  
**Exhibit 3-8**  
**CERS Non-Hazardous Insurance Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Proposed Plan (Amortization Period = 30 Years at June 30, 2019)**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Actuarial<br>Accrued<br>Liability | Actuarial<br>Value of<br>Assets | Unfunded<br>Actuarial<br>Accrued Liability | Funded<br>Ratio<br>(3) / (2) | Total<br>Employer<br>Contribution | Member<br>Contribution | Covered<br>Payroll | Total<br>Employer<br>Contribution as %<br>of Covered Payroll | Employer<br>Actuarial<br>Determined<br>Contribution Rate | Annual Cash Flow Analysis               |                                     |                              |                      |
|-------------------------------------|-----------------------------------|---------------------------------|--|------------------------------|-----------------------------------|------------------------|--------------------|--|--|---|-------------------------------------|------------------------------|----------------------|
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | Member and<br>Employer<br>Contributions | Benefit<br>Payments<br>and Expenses | Net<br>External<br>Cash Flow | Investment<br>Income |
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  |   |                                     |                              |                      |
| (1)                                 | (2)                               | (3)                             | (4)  | (5)                          | (6)                               | (7)                    | (8)                | (9)  | (10)   | (11)                                    | (12)                                | (13)                         | (14)                 |
| 2019                                | \$ 3,568                          | \$ 2,523                        | \$ 1,045                                   | 71%                          | \$ 119                            | \$ 12                  | \$ 2,498           | 4.76%  | 4.76%  | \$ 131                                  | \$ (149)                            | \$ (18)                      | \$ 160               |
| 2020                                | 3,728                             | 2,670                           | 1,058                                      | 72%                          | 122                               | 14                     | 2,558              | 4.76%  | 5.43%  | 136                                     | (158)                               | (22)                         | 169                  |
| 2021                                | 3,888                             | 2,851                           | 1,037                                      | 73%                          | 138                               | 15                     | 2,615              | 5.27%  | 5.27%  | 153                                     | (172)                               | (19)                         | 178                  |
| 2022                                | 4,042                             | 3,020                           | 1,022                                      | 75%                          | 134                               | 16                     | 2,672              | 5.03%  | 5.03%  | 150                                     | (186)                               | (36)                         | 187                  |
| 2023                                | 4,191                             | 3,169                           | 1,022                                      | 76%                          | 132                               | 18                     | 2,728              | 4.85%  | 4.85%  | 150                                     | (201)                               | (51)                         | 196                  |
| 2024                                | 4,332                             | 3,314                           | 1,018                                      | 77%                          | 131                               | 19                     | 2,786              | 4.72%  | 4.72%  | 150                                     | (216)                               | (66)                         | 205                  |
| 2025                                | 4,467                             | 3,454                           | 1,013                                      | 77%                          | 130                               | 20                     | 2,843              | 4.58%  | 4.58%  | 150                                     | (231)                               | (81)                         | 213                  |
| 2026                                | 4,593                             | 3,588                           | 1,005                                      | 78%                          | 129                               | 22                     | 2,901              | 4.45%  | 4.45%  | 151                                     | (246)                               | (95)                         | 221                  |
| 2027                                | 4,711                             | 3,714                           | 997  | 79%                          | 128                               | 23                     | 2,959              | 4.31%  | 4.31%  | 151                                     | (261)                               | (110)                        | 229                  |
| 2028                                | 4,819                             | 3,833                           | 986  | 80%                          | 126                               | 24                     | 3,018              | 4.18%  | 4.18%  | 150                                     | (275)                               | (125)                        | 236                  |
| 2029                                | 4,919                             | 3,945                           | 974  | 80%                          | 125                               | 26                     | 3,080              | 4.06%  | 4.06%  | 151                                     | (287)                               | (136)                        | 242                  |
| 2030                                | 5,011                             | 4,050                           | 961  | 81%                          | 124                               | 27                     | 3,143              | 3.95%  | 3.95%  | 151                                     | (299)                               | (148)                        | 249                  |
| 2031                                | 5,096                             | 4,151                           | 945  | 81%                          | 124                               | 29                     | 3,210              | 3.86%  | 3.86%  | 153                                     | (309)                               | (156)                        | 255                  |
| 2032                                | 5,175                             | 4,248                           | 927  | 82%                          | 123                               | 30                     | 3,280              | 3.76%  | 3.76%  | 153                                     | (318)                               | (165)                        | 260                  |
| 2033                                | 5,251                             | 4,344                           | 907  | 83%                          | 124                               | 31                     | 3,353              | 3.69%  | 3.69%  | 155                                     | (325)                               | (170)                        | 266                  |
| 2034                                | 5,324                             | 4,440                           | 884  | 83%                          | 125                               | 32                     | 3,430              | 3.64%  | 3.64%  | 157                                     | (330)                               | (173)                        | 272                  |
| 2035                                | 5,397                             | 4,539                           | 858  | 84%                          | 126                               | 34                     | 3,509              | 3.59%  | 3.59%  | 160                                     | (334)                               | (174)                        | 278                  |
| 2036                                | 5,472                             | 4,643                           | 829  | 85%                          | 127                               | 35                     | 3,594              | 3.54%  | 3.54%  | 162                                     | (337)                               | (175)                        | 285                  |
| 2037                                | 5,550                             | 4,753                           | 797  | 86%                          | 129                               | 36                     | 3,682              | 3.50%  | 3.50%  | 165                                     | (340)                               | (175)                        | 292                  |
| 2038                                | 5,630                             | 4,869                           | 761  | 86%                          | 130                               | 37                     | 3,771              | 3.46%  | 3.46%  | 167                                     | (344)                               | (177)                        | 299                  |
| 2039                                | 5,712                             | 4,991                           | 721  | 87%                          | 133                               | 38                     | 3,863              | 3.44%  | 3.44%  | 171                                     | (347)                               | (176)                        | 306                  |
| 2040                                | 5,798                             | 5,122                           | 676  | 88%                          | 135                               | 39                     | 3,957              | 3.40%  | 3.40%  | 174                                     | (351)                               | (177)                        | 315                  |
| 2041                                | 5,887                             | 5,259                           | 628  | 89%                          | 137                               | 40                     | 4,049              | 3.39%  | 3.39%  | 177                                     | (355)                               | (178)                        | 323                  |
| 2042                                | 5,978                             | 5,405                           | 573  | 90%                          | 140                               | 41                     | 4,146              | 3.37%  | 3.37%  | 181                                     | (358)                               | (177)                        | 332                  |
| 2043                                | 6,073                             | 5,560                           | 513  | 92%                          | 142                               | 42                     | 4,243              | 3.35%  | 3.35%  | 184                                     | (362)                               | (178)                        | 342                  |
| 2044                                | 6,171                             | 5,724                           | 447  | 93%                          | 145                               | 43                     | 4,343              | 3.33%  | 3.33%  | 188                                     | (367)                               | (179)                        | 352                  |
| 2045                                | 6,272                             | 5,897                           | 375  | 94%                          | 148                               | 44                     | 4,443              | 3.32%  | 3.32%  | 192                                     | (373)                               | (181)                        | 363                  |
| 2046                                | 6,374                             | 6,078                           | 296  | 95%                          | 151                               | 45                     | 4,546              | 3.32%  | 3.32%  | 196                                     | (379)                               | (183)                        | 374                  |
| 2047                                | 6,477                             | 6,269                           | 208  | 97%                          | 154                               | 46                     | 4,651              | 3.31%  | 3.31%  | 200                                     | (386)                               | (186)                        | 386                  |
| 2048                                | 6,581                             | 6,469                           | 112  | 98%                          | 159                               | 48                     | 4,758              | 3.34%  | 3.34%  | 207                                     | (394)                               | (187)                        | 398                  |
| 2049                                | 6,685                             | 6,685                           | -  | 100%                         | 47                                | 49                     | 4,868              | 0.96%  | 0.96%  | 96                                      | (402)                               | (306)                        | 408                  |
| 2050                                | 6,789                             | 6,789                           | -  | 100%                         | 47                                | 50                     | 4,980              | 0.94%  | 0.94%  | 97                                      | (411)                               | (314)                        | 414                  |
| 2051                                | 6,891                             | 6,891                           | -  | 100%                         | 47                                | 51                     | 5,093              | 0.92%  | 0.92%  | 98                                      | (419)                               | (321)                        | 420                  |
| 2052                                | 6,993                             | 6,993                           | -  | 100%                         | 47                                | 52                     | 5,208              | 0.91%  | 0.91%  | 99                                      | (427)                               | (328)                        | 426                  |
| 2053                                | 7,095                             | 7,095                           | -  | 100%                         | 47                                | 53                     | 5,327              | 0.89%  | 0.89%  | 100                                     | (434)                               | (334)                        | 432                  |

Notes and assumptions:

The projection is based on the same methods and assumptions as the projection under the Current Plan, except that the funding period is 30 years at June 30, 2019 (rather than the current funding period of 24 years at June 30, 2019) and

**Kentucky Retirement Systems**  
**Exhibit 3-9**  
**CERS Hazardous Insurance Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Proposed Plan (Amortization Period = 30 Years at June 30, 2019)**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Actuarial<br>Accrued<br>Liability | Actuarial<br>Value of<br>Assets | Unfunded<br>Actuarial<br>Accrued Liability | Funded<br>Ratio<br>(3) / (2) | Total<br>Employer<br>Contribution | Member<br>Contribution | Covered<br>Payroll | Total<br>Employer<br>Contribution as %<br>of Covered Payroll | Employer<br>Actuarial<br>Determined<br>Contribution Rate | Annual Cash Flow Analysis               |                                     |                              |                      |
|-------------------------------------|-----------------------------------|---------------------------------|--|------------------------------|-----------------------------------|------------------------|--------------------|--|--|---|-------------------------------------|------------------------------|----------------------|
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | Member and<br>Employer<br>Contributions | Benefit<br>Payments<br>and Expenses | Net<br>External<br>Cash Flow | Investment<br>Income |
| (1)                                 | (2)                               | (3)                             | (4)  | (5)                          | (6)                               | (7)                    | (8)                | (9)  | (10)   | (11)                                    | (12)                                | (13)                         | (14)                 |
| 2019                                | \$ 1,733                          | \$ 1,314                        | \$ 419                                     | 76%                          | \$ 53                             | \$ 2                   | \$ 559             | 9.52%  | 9.52%  | \$ 55                                   | \$ (79)                             | \$ (24)                      | \$ 83                |
| 2020                                | 1,795                             | 1,377                           | 418  | 77%                          | 53                                | 3                      | 562                | 9.52%  | 9.86%  | 56                                      | (86)                                | (30)                         | 87                   |
| 2021                                | 1,852                             | 1,454                           | 398  | 79%                          | 53                                | 3                      | 569                | 9.33%  | 9.33%  | 56                                      | (94)                                | (38)                         | 90                   |
| 2022                                | 1,901                             | 1,511                           | 390  | 79%                          | 50                                | 4                      | 578                | 8.63%  | 8.63%  | 54                                      | (103)                               | (49)                         | 93                   |
| 2023                                | 1,941                             | 1,553                           | 388  | 80%                          | 47                                | 4                      | 588                | 8.08%  | 8.08%  | 51                                      | (112)                               | (61)                         | 95                   |
| 2024                                | 1,974                             | 1,588                           | 386  | 80%                          | 46                                | 4                      | 599                | 7.69%  | 7.69%  | 50                                      | (120)                               | (70)                         | 97                   |
| 2025                                | 1,999                             | 1,615                           | 384  | 81%                          | 45                                | 5                      | 610                | 7.36%  | 7.36%  | 50                                      | (126)                               | (76)                         | 99                   |
| 2026                                | 2,018                             | 1,637                           | 381  | 81%                          | 44                                | 5                      | 622                | 7.07%  | 7.07%  | 49                                      | (132)                               | (83)                         | 100                  |
| 2027                                | 2,032                             | 1,653                           | 379  | 81%                          | 43                                | 5                      | 635                | 6.83%  | 6.83%  | 48                                      | (137)                               | (89)                         | 101                  |
| 2028                                | 2,040                             | 1,665                           | 375  | 82%                          | 43                                | 6                      | 648                | 6.63%  | 6.63%  | 49                                      | (141)                               | (92)                         | 101                  |
| 2029                                | 2,045                             | 1,674                           | 371  | 82%                          | 43                                | 6                      | 663                | 6.45%  | 6.45%  | 49                                      | (143)                               | (94)                         | 102                  |
| 2030                                | 2,048                             | 1,681                           | 367  | 82%                          | 43                                | 6                      | 680                | 6.33%  | 6.33%  | 49                                      | (145)                               | (96)                         | 102                  |
| 2031                                | 2,048                             | 1,687                           | 361  | 82%                          | 43                                | 6                      | 698                | 6.20%  | 6.20%  | 49                                      | (146)                               | (97)                         | 102                  |
| 2032                                | 2,048                             | 1,693                           | 355  | 83%                          | 44                                | 7                      | 717                | 6.11%  | 6.11%  | 51                                      | (146)                               | (95)                         | 103                  |
| 2033                                | 2,048                             | 1,700                           | 348  | 83%                          | 44                                | 7                      | 737                | 6.03%  | 6.03%  | 51                                      | (146)                               | (95)                         | 103                  |
| 2034                                | 2,049                             | 1,709                           | 340  | 83%                          | 45                                | 7                      | 757                | 5.97%  | 5.97%  | 52                                      | (145)                               | (93)                         | 104                  |
| 2035                                | 2,051                             | 1,721                           | 330  | 84%                          | 46                                | 8                      | 778                | 5.91%  | 5.91%  | 54                                      | (143)                               | (89)                         | 105                  |
| 2036                                | 2,056                             | 1,737                           | 319  | 84%                          | 47                                | 8                      | 798                | 5.86%  | 5.86%  | 55                                      | (140)                               | (85)                         | 106                  |
| 2037                                | 2,065                             | 1,758                           | 307  | 85%                          | 48                                | 8                      | 818                | 5.82%  | 5.82%  | 56                                      | (138)                               | (82)                         | 107                  |
| 2038                                | 2,077                             | 1,783                           | 294  | 86%                          | 49                                | 8                      | 838                | 5.80%  | 5.80%  | 57                                      | (136)                               | (79)                         | 109                  |
| 2039                                | 2,092                             | 1,814                           | 278  | 87%                          | 50                                | 9                      | 858                | 5.78%  | 5.78%  | 59                                      | (133)                               | (74)                         | 111                  |
| 2040                                | 2,112                             | 1,850                           | 262  | 88%                          | 51                                | 9                      | 878                | 5.76%  | 5.76%  | 60                                      | (131)                               | (71)                         | 113                  |
| 2041                                | 2,135                             | 1,892                           | 243  | 89%                          | 52                                | 9                      | 898                | 5.75%  | 5.75%  | 61                                      | (129)                               | (68)                         | 116                  |
| 2042                                | 2,162                             | 1,939                           | 223  | 90%                          | 53                                | 9                      | 918                | 5.75%  | 5.75%  | 62                                      | (128)                               | (66)                         | 119                  |
| 2043                                | 2,192                             | 1,993                           | 199  | 91%                          | 54                                | 9                      | 939                | 5.74%  | 5.74%  | 63                                      | (127)                               | (64)                         | 123                  |
| 2044                                | 2,226                             | 2,052                           | 174  | 92%                          | 55                                | 10                     | 959                | 5.74%  | 5.74%  | 65                                      | (127)                               | (62)                         | 126                  |
| 2045                                | 2,262                             | 2,116                           | 146  | 94%                          | 56                                | 10                     | 977                | 5.75%  | 5.75%  | 66                                      | (128)                               | (62)                         | 130                  |
| 2046                                | 2,300                             | 2,184                           | 116  | 95%                          | 57                                | 10                     | 996                | 5.76%  | 5.76%  | 67                                      | (130)                               | (63)                         | 135                  |
| 2047                                | 2,339                             | 2,256                           | 83   | 96%                          | 59                                | 10                     | 1,016              | 5.80%  | 5.80%  | 69                                      | (132)                               | (63)                         | 139                  |
| 2048                                | 2,377                             | 2,333                           | 44   | 98%                          | 61                                | 10                     | 1,037              | 5.92%  | 5.92%  | 71                                      | (135)                               | (64)                         | 144                  |
| 2049                                | 2,416                             | 2,416                           | -  | 100%                         | 17                                | 11                     | 1,060              | 1.57%  | 1.57%  | 28                                      | (139)                               | (111)                        | 147                  |
| 2050                                | 2,453                             | 2,453                           | -  | 100%                         | 17                                | 11                     | 1,081              | 1.55%  | 1.55%  | 28                                      | (143)                               | (115)                        | 149                  |
| 2051                                | 2,489                             | 2,489                           | -  | 100%                         | 17                                | 11                     | 1,103              | 1.52%  | 1.52%  | 28                                      | (147)                               | (119)                        | 152                  |
| 2052                                | 2,524                             | 2,524                           | -  | 100%                         | 17                                | 11                     | 1,127              | 1.50%  | 1.50%  | 28                                      | (150)                               | (122)                        | 153                  |
| 2053                                | 2,556                             | 2,556                           | -  | 100%                         | 17                                | 12                     | 1,151              | 1.48%  | 1.48%  | 29                                      | (154)                               | (125)                        | 155                  |

Notes and assumptions:

The projection is based on the same methods and assumptions as the projection under the Current Plan, except that the funding period is 30 years at June 30, 2019 (rather than the current funding period of 24 years at June 30, 2019) and

**Kentucky Retirement Systems**  
**Exhibit 3-10**  
**State Police Retirement System Insurance Fund**  
**Actuarial Analysis of Proposed Legislation SB 249**  
**Proposed Plan (Amortization Period = 30 Years at June 30, 2019)**  
**(\$ in Millions)**

| Fiscal Year<br>Beginning<br>July 1, | Actuarial<br>Accrued<br>Liability | Actuarial<br>Value of<br>Assets | Unfunded<br>Actuarial<br>Accrued Liability | Funded<br>Ratio<br>(3) / (2) | Total<br>Employer<br>Contribution | Member<br>Contribution | Covered<br>Payroll | Total<br>Employer<br>Contribution as %<br>of Covered Payroll | Employer<br>Actuarial<br>Determined<br>Contribution Rate | Annual Cash Flow Analysis               |                                     |                              |                      |
|-------------------------------------|-----------------------------------|---------------------------------|--|------------------------------|-----------------------------------|------------------------|--------------------|--|--|---|-------------------------------------|------------------------------|----------------------|
|                                     |                                   |                                 |  |                              |                                   |                        |                    |  |  | Member and<br>Employer<br>Contributions | Benefit<br>Payments<br>and Expenses | Net<br>External<br>Cash Flow | Investment<br>Income |
| (1)                                 | (2)                               | (3)                             | (4)  | (5)                          | (6)                               | (7)                    | (8)                | (9)  | (10)   | (11)                                    | (12)                                | (13)                         | (14)                 |
| 2019                                | \$ 277                            | \$ 197                          | \$ 80                                      | 71%                          | \$ 13                             | \$ -                   | \$ 48              | 27.23%   | 19.50%   | \$ 13                                   | \$ (14)                             | \$ (1)                       | \$ 13                |
| 2020                                | 284                               | 210                             | 74   | 74%                          | 9                                 | -                      | 47                 | 19.69%   | 19.69%   | 9                                       | (15)                                | (6)                          | 13                   |
| 2021                                | 291                               | 221                             | 70   | 76%                          | 9                                 | -                      | 47                 | 19.69%   | 19.03%   | 9                                       | (16)                                | (7)                          | 14                   |
| 2022                                | 297                               | 229                             | 68   | 77%                          | 8                                 | -                      | 46                 | 17.86%   | 17.86%   | 8                                       | (17)                                | (9)                          | 14                   |
| 2023                                | 301                               | 234                             | 67   | 78%                          | 8                                 | -                      | 46                 | 17.86%   | 17.07%   | 8                                       | (18)                                | (10)                         | 14                   |
| 2024                                | 304                               | 239                             | 65   | 79%                          | 8                                 | -                      | 46                 | 16.39%   | 16.39%   | 8                                       | (19)                                | (11)                         | 15                   |
| 2025                                | 306                               | 242                             | 64   | 79%                          | 8                                 | -                      | 46                 | 16.39%   | 15.86%   | 8                                       | (20)                                | (12)                         | 15                   |
| 2026                                | 307                               | 244                             | 63   | 79%                          | 7                                 | -                      | 46                 | 15.41%   | 15.41%   | 7                                       | (21)                                | (14)                         | 15                   |
| 2027                                | 307                               | 246                             | 61   | 80%                          | 7                                 | -                      | 46                 | 15.41%   | 15.01%   | 7                                       | (22)                                | (15)                         | 15                   |
| 2028                                | 306                               | 246                             | 60   | 80%                          | 7                                 | -                      | 46                 | 14.63%   | 14.63%   | 7                                       | (22)                                | (15)                         | 15                   |
| 2029                                | 304                               | 246                             | 58   | 81%                          | 7                                 | -                      | 46                 | 14.63%   | 14.35%   | 7                                       | (23)                                | (16)                         | 15                   |
| 2030                                | 302                               | 245                             | 57   | 81%                          | 7                                 | -                      | 46                 | 14.08%   | 14.08%   | 7                                       | (23)                                | (16)                         | 15                   |
| 2031                                | 299                               | 244                             | 55   | 82%                          | 7                                 | -                      | 47                 | 14.08%   | 13.85%   | 7                                       | (23)                                | (16)                         | 15                   |
| 2032                                | 295                               | 242                             | 53   | 82%                          | 6                                 | -                      | 47                 | 13.62%   | 13.62%   | 6                                       | (23)                                | (17)                         | 15                   |
| 2033                                | 292                               | 241                             | 51   | 83%                          | 7                                 | -                      | 48                 | 13.62%   | 13.43%   | 7                                       | (23)                                | (16)                         | 15                   |
| 2034                                | 288                               | 239                             | 49   | 83%                          | 6                                 | -                      | 49                 | 13.21%   | 13.21%   | 6                                       | (23)                                | (17)                         | 14                   |
| 2035                                | 285                               | 238                             | 47   | 84%                          | 6                                 | -                      | 49                 | 13.21%   | 13.08%   | 6                                       | (22)                                | (16)                         | 14                   |
| 2036                                | 281                               | 236                             | 45   | 84%                          | 6                                 | -                      | 49                 | 12.95%   | 12.95%   | 6                                       | (22)                                | (16)                         | 14                   |
| 2037                                | 278                               | 236                             | 42   | 85%                          | 6                                 | -                      | 50                 | 12.95%   | 12.89%   | 6                                       | (21)                                | (15)                         | 14                   |
| 2038                                | 276                               | 236                             | 40   | 86%                          | 6                                 | -                      | 50                 | 12.83%   | 12.83%   | 6                                       | (21)                                | (15)                         | 14                   |
| 2039                                | 273                               | 236                             | 37   | 86%                          | 6                                 | -                      | 50                 | 12.83%   | 12.82%   | 6                                       | (20)                                | (14)                         | 14                   |
| 2040                                | 271                               | 236                             | 35   | 87%                          | 6                                 | -                      | 50                 | 12.79%   | 12.79%   | 6                                       | (20)                                | (14)                         | 14                   |
| 2041                                | 270                               | 238                             | 32   | 88%                          | 6                                 | -                      | 50                 | 12.79%   | 12.83%   | 6                                       | (19)                                | (13)                         | 14                   |
| 2042                                | 268                               | 240                             | 28   | 90%                          | 6                                 | -                      | 50                 | 12.86%   | 12.86%   | 6                                       | (19)                                | (13)                         | 15                   |
| 2043                                | 268                               | 242                             | 26   | 90%                          | 6                                 | -                      | 50                 | 12.86%   | 12.86%   | 6                                       | (18)                                | (12)                         | 15                   |
| 2044                                | 267                               | 245                             | 22   | 92%                          | 6                                 | -                      | 50                 | 12.88%   | 12.88%   | 6                                       | (18)                                | (12)                         | 15                   |
| 2045                                | 267                               | 249                             | 18   | 93%                          | 6                                 | -                      | 49                 | 12.88%   | 12.88%   | 6                                       | (18)                                | (12)                         | 15                   |
| 2046                                | 267                               | 253                             | 14   | 95%                          | 6                                 | -                      | 49                 | 13.17%   | 13.17%   | 6                                       | (18)                                | (12)                         | 15                   |
| 2047                                | 268                               | 258                             | 10   | 96%                          | 6                                 | -                      | 49                 | 13.17%   | 13.24%   | 6                                       | (18)                                | (12)                         | 16                   |
| 2048                                | 268                               | 263                             | 5  | 98%                          | 6                                 | -                      | 49                 | 13.32%   | 13.32%   | 6                                       | (18)                                | (12)                         | 16                   |
| 2049                                | 269                               | 269                             | -  | 100%                         | 1                                 | -                      | 49                 | 2.41%  | 2.41%  | 1                                       | (18)                                | (17)                         | 16                   |
| 2050                                | 269                               | 269                             | -  | 100%                         | 1                                 | -                      | 49                 | 2.34%  | 2.34%  | 1                                       | (18)                                | (17)                         | 16                   |
| 2051                                | 268                               | 268                             | -  | 100%                         | 1                                 | 1                      | 50                 | 2.30%  | 2.30%  | 2                                       | (19)                                | (17)                         | 16                   |
| 2052                                | 268                               | 268                             | -  | 100%                         | 1                                 | 1                      | 51                 | 2.26%  | 2.26%  | 2                                       | (19)                                | (17)                         | 16                   |
| 2053                                | 267                               | 267                             | -  | 100%                         | 1                                 | 1                      | 52                 | 2.23%  | 2.23%  | 2                                       | (19)                                | (17)                         | 16                   |

Notes and assumptions:

The projection is based on the same methods and assumptions as the projection under the Current Plan, except that the funding period is 30 years at June 30, 2019 (rather than the current funding period of 24 years at June 30, 2019).