COMMONWEALTH OF PENNSYLVANIA May 17, 2016

PUBLIC EMPLOYEE RETIREMENT COMMISSION

SUMMARY OF HIGH LEVEL REVIEW

House Bill Number 727, Printer's Number 1555,
as amended by Amendment No. 06914:
Public School Employees' Retirement System and State Employees' Retirement System;
Hybrid Retirement Benefit Plan

Summary of the Bill

House Bill Number 727, Printer's Number 1555, as amended by Amendment Number 06914, would amend the Public School Employees' Retirement Code, the State Employees' Retirement Code and the Military Code. The bill would impose a series of retirement benefit changes upon the Public School Employees' Retirement System (PSERS) and the State Employees' Retirement System (SERS) as follows: 1) create new membership classes for PSERS and SERS employees hired after June 30, 2017 and December 31, 2016, respectively; 2) establish defined contribution (DC) plans for new members; 3) change the vesting requirements for certain current PSERS members; and 4) revise certain funding provisions of the retirement systems. More specifically, the amendments would amend the Codes in the following manner.

Amendment Number 06914 would amend the Public School Employees' Retirement Code to:

1) Effective July 1, 2017, establish a hybrid benefit tier, which includes defined benefit and defined contribution components, applicable to all new school employees or employees returning after a break in service. Current members of PSERS returning after a break in service would have a one-time option to become a member of the new hybrid benefit tier.

2) Under the defined benefit component, school employees would become members of "Class T-G" and would earn benefits at a 2% benefit accrual rate. A member would be vested in the defined benefit component after accumulating 5 years of service credit. The benefit formula would be equivalent to 2% multiplied by the member's years of service (maximum of 25 years), multiplied by the member's final average salary (highest five years), with an annual pay limit of $70,000 indexed by the national average wage index. Class T-G members would contribute 4.5 % of compensation for the first $70,000 for the first 25 years of service.

Summary of the Bill (Cont'd)

3) Establish a defined contribution plan under a new chapter of the Code, Chapter 84, called the School Employees' Defined Contribution Plan, for school employees to contribute 3% of compensation of the first $70,000 for the first 25 years of service, and 7.5% of compensation on pay above $70,000 or any service over 25 years. The employer contribution would be 0.5% of the member's first $70,000 of compensation for the first 25 years of service, and 4% of compensation on pay above $70,000 or any service over 25 years.

4) Members of Class T-E and T-F would be eligible to vest after 5 years of service. Currently under Act 120 of 2010, these members are only eligible to vest after 10 years of service.

Amendment Number 06914 would amend the State Employees' Retirement Code to:

1) Effective January 1, 2017, establish a hybrid benefit tier, which includes defined benefit and defined contribution components, applicable to most new State employees or employees returning after a break in service. New members of the Pennsylvania State Police and certain other hazardous duty employees would be exempt from joining the new hybrid benefit tier. Current members of SERS returning after a break in service would have a one-time option to become a member of the new hybrid benefit tier.

2) For the defined benefit portion, most State employees would become members of "Class A-5" and would earn benefits at a 2% benefit accrual rate. A member would be vested in the defined benefit component after accumulating 10 years of service credit. The benefit formula would be equivalent to 2% multiplied by the member's years of service (maximum of 25 years), multiplied by the member's final average salary (highest five years), with an annual pay limit of $70,000 indexed by the national average wage index. Class A-5 members would contribute 0.75% of compensation for the first $70,000 for the first 25 years of service.

3) Establish a defined contribution plan under a new chapter of the Code, Chapter 58, known as the State Employees' Defined Contribution Plan, for most State employees to contribute 5.5% of compensation of the first $70,000 for the first 25 years of service, and 6.25% of compensation on pay above $70,000 or any service over 25 years. The employer contribution would be 0.5% of the member's first $70,000 of compensation for the first 25 years of service, and 4% of compensation on pay above $70,000 or any service over 25 years.

Actuarial Data

If this Amendment is enacted, the following chart shows the expected accumulated nominal dollar cash flow costs/(savings) on the employer contributions for the fiscal years 2016-2017 through 2048-2049 as provided by the System actuaries. It is important to note that Hay displayed contributions through the 2051-2052 fiscal year for SERS and thus, the numbers shown below will differ from those reported by Hay in order to provide costs that are consistent with the period reported by Buck for PSERS.

Impact on Employer Contributions if Amendment A06914
to House Bill 727, PN 1555 is enacted versus Amendment A06888 For
Fiscal Years 2016-2017 through 2048-2049
(Amounts in millions and based on System actuary's projections; any provision for use of plan savings is not included in these projections)

	Cash Flow Costs / (Savings) as determined by System Actuary	
	Amendment A06914 (Markosek)	Amendment A06888 (Tobash & Vereb)
PSERS	$ (294.1)	$(4,025.2)
SERS	5,329.9	(5,734.3)
Total	5,035.8	(9,759.5)

Please note that the chart does <u>not</u> show the present value of the expected cash flow costs/(savings) due to time constraints.

Attachments

High Level Review Letter prepared by Timothy J. Nugent and Scott F. Porter of Milliman, Consulting Actuary of the Public Employee Retirement Commission.

Actuarial cost estimate prepared by Buck Consultants, Consulting Actuary of the Public School Employees' Retirement System.

Actuarial cost estimate prepared by Hay Group, consulting actuary of the State Employees' Retirement System.

Amendment Number 06914.

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May 16, 2016

Mr. Bernard Kozlowski
Acting Executive Director
Public Employee Retirement Commission
P.O. Box 1429
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Re: Amendment A06914 to House Bill 727, Printer's Number 1555

Dear Mr. Kozlowski:

As requested, we have prepared a letter containing a high level review of Amendment A06914 to House Bill 727, Printer's Number.

Due to significant time constraints dictated by the Commission for providing this high level review by May 16, 2016, we are providing this letter on an accelerated basis. We would not constitute this high level review as an actuarial cost note. We note that there appear to be several issues regarding the effective dates incorporated in this Amendment, discrepancies between the Amendment and the Systems' actuaries cost estimates, and the Amendment potentially creates additional differences between benefits and provisions provided to SERS and PSERS members. As such, this letter is prepared as an addendum to the actuarial cost note provided on May 16th for Amendment A06859 to House Bill 727, Printer's Number 1555, and as amended by Amendment A06888. Based on our limited review, this letter summarizes the key differences between Amendment A06914 and Amendment A06888 and offers drafting considerations for review prior to enactment as well as limited commentary on the actuarial cost estimates prepared by the system actuaries.

If additional time was available, a more thorough review of the actuarial cost estimates could have been performed. In addition, some of the issues described in this letter could have been discussed with the Systems' actuaries in more detail, leading to potentially additional and/or different commentary. Additional time may have also afforded the possibility that issues that are not presented in this high level review letter could have been discovered, opined upon, and addressed further.

Summary of the Key changes between Amendment A06914 and A06888

Amendment A06914 and Amendment A06888 to House Bill 727, Printer's Number 1555, would amend both the Public School Employees' Retirement Code and the State Employees' Retirement Code to enact significant reforms applicable to future members of the Public School Employees' Retirement System (PSERS) and the State Employees' Retirement System (SERS).

The primary differences in provisions between Amendment A06914 and A06888 that would impact the actuarial valuations are briefly summarized below. This should not be perceived as an exhaustive list of possible differences between Amendment A06914 and Amendment A06888.

Future members

Defined Benefit Plan for future members (Class T-G for PSERS and Class A-5 for SERS) and Vesting Changes for Classes T-E/T-F for PSERS and Classes A-3/A-4 for SERS

- The initial DB Compensation Limit of $70,000 is higher under Amendment A06914 versus the $50,000 limit specified under Amendment A06888.
- The increase in the limit is based on the percentage growth in the national average wage index each year, which is expected to be higher than the fixed 1% growth rate specified under Amendment A06888.
- Mandatory member contributions to the DB plan would continue to occur based on the compensation up to the DB Compensation Limit for the first 25 years, but the contribution rates would be significantly lower:
  - For PSERS, the contribution rate would be 4.5% of compensation versus 6% under Amendment A06888.
  - For SERS, the contribution rate would be 0.75% of compensation versus 6% under Amendment A06888.
- The vesting period would be 5 years, which is less than the 10 year requirement under Amendment A06888 as well as current law for Act 120 members. Furthermore, the reduced vesting period would apply to all members of the system, including Act 120 (T-E/T-F for PSERS and A-3/A-4 for SERS) members.
- The service criteria to receive a death benefit is 5 years due to the reduction in the vesting requirement. This reduction would apply to all members of the system, including Act 120 members as well.
- Vested Class T-G members would be able to withdraw their accumulated member contributions in lieu of any other benefits whereas Amendment A06888 did not allow this option. This provision is consistent with the current provision for Act 120

members. However we believe under Amendment A06914, vested Class A-5 members are not eligible to withdraw Class A-5 accumulated member contributions.

- Class T-G and A-5 members who terminate with at least 5 years of service would not have to defer until superannuation age to begin receiving benefits whereas only members who completed 25 years of service could receive an annuity prior to superannuation age under Amendment A06888. This provision is consistent with the current provision for Act 120 members.
- Class T-G members would be eligible for the healthcare premium assistance whereas under Amendment A06888 members would not be eligible. This provision is consistent with the current provision for Act 120 members.

<u>Defined Contribution Plan Portion for future participants (Class T-G for PSERS and Class A-5 for SERS)</u>

- Mandatory pre-tax "pick-up" participant contributions would continue to occur with lower amounts up to the DB Compensation Limit for the first 25 years and higher amounts in excess of the limit and upon completion of 25 years of service as follows:
    - For PSERS, the contribution rate would be 3% of compensation up to the DB Compensation Limit for the first 25 years of service versus 1% under Amendment A06888 and 7.5% of compensation in excess of the DB Compensation Limit and after completing 25 years of service versus 7% under Amendment A06888.
    - For SERS, the contribution rate would be 5.5% of compensation up to the DB Compensation Limit for the first 25 years of service versus 1% under Amendment A06888 and 6.25% of compensation in excess of the DB Compensation Limit and after completing 25 years of service versus 7% under Amendment A06888.
    - In total, member contributions would equal 7.5% of compensation for Class T-G members and 6.25% for Class A-5 members versus 7% for both classes under Amendment A06888. The contribution rates under Amendment A06914 are consistent with the current provision for Act 120 members.
    - Please note that the employer contributions are same under both Amendments of 0.5% of compensation up to the DB Compensation Limit for the first 25 years of service and 4.0% of compensation in excess of the DB Compensation Limit and after completing 25 years of service.

Summary of Amendment A06914 drafting considerations

Amendment A06914 contains many areas where a review of the language may be warranted. A brief summary of the areas that we suggest have additional review prior to enactment are summarized below. This should not be perceived as an exhaustive list of potential drafting considerations. If additional time were afforded, additional issues may have been uncovered or some issues listed could have been confirmed as intended by the sponsor of the Amendment.

- There are several instances where the dates included in the Amendment do not reflect an effective date of January 1, 2017 for SERS and July 1, 2017 for PSERS. In most cases, it appears the dates reflect an earlier adoption date, perhaps from a version of the proposal from two years ago. These items include:
  - The applicable DB Compensation Limit of $70,000 starts to begin with the 2016 plan years for each system versus the 2017 fiscal years.
  - The holding vehicle trust appears to be only operational until December 31, 2016 versus December 31, 2017.
  - The determination of accrued liability contribution rate is to be modified effective with fiscal year beginning July 1, 2015 versus July 1, 2016.
  - The change in the actuarial accrued liability arising from this amendment is to be amortized with fiscal year beginning July 1, 2016 versus July 1, 2017.
- The total contribution rate for Class T-G members is stated to be between 6 and 8% although the basic contribution rate is 4.5% up to the DB Compensation Limit for the first 25 years of service and the risk-sharing rate can only be 2% higher.
- There seems to be an implication that the service criteria for a beneficiary of an active SERS member to be able to receive a death benefit is 10 years, although the vesting requirement and eligibility to receive an annuity is 5 years.
- Similar to Amendment A06888, the wording of the DB Compensation Limit definition is slightly different between PSERS and SERS, which could result in slightly different limits in future years due to the interaction of the 1% increases and the rounding to the nearest $100. We recommend that this wording be made consistent between the Systems to avoid different limits in future years.

The Amendment provides for significantly different mandatory member contribution rates to the defined benefit plans for future members of PSERS versus SERS even though the benefit accrual rates, compensation limits, and service limitations are in parallel. Although we note that there is no requirement for equitable member contribution rates, we are unsure if the significant disparity between the two Systems is the drafter's intent.

Discussion of the Amendment

Please refer to our actuarial cost note dated May 16, 2016 related to Amendment A06859 to House Bill 727, Printer's Number 1555, and as amended by Amendment A06888. The discussion points identified in the referenced actuarial note continue to apply to Amendment A06914.

Summary of the actuarial cost estimates prepared by the System Actuaries

You provided us with a copy of the May 13, 2016 estimates by Buck Consultants for PSERS and by Hay Group for SERS with the projected impact of this Amendment. Please note that we were not provided with adequate time or the additional supplementary information that would allow us to provide a more in depth review in time for this letter. If a more in depth review could be conducted, our comments may differ. Please refer to our actuarial cost note date May 16, 2016 related to Amendment A06859 to House Bill 727, Printer's Number 1555, and as amended by Amendment A06888 for a discussion on similar provisions.

We would like to highlight the following with respect to the actuarial cost estimates prepared by the System Actuaries:

- Similar to Amendment A06888, while Amendment A06914 contains effective dates in 2017, the Systems' have indicated that the 2017 effective dates are impractical, and the System actuaries' cost estimates assume the effective dates would be revised to July 1, 2018 and January 1, 2018, respectively, prior to enactment of the Amendment.
- Neither cost note by the system actuaries incorporated the use of savings provision from sections §8406.1 and §5806.1 due to the uncertainty on how the calculation was to be determined.
- Hay did not incorporate the change to 5-year vesting for Class A-5 members nor Class A-3 and A-4 members, which also reduced the eligibility for death benefits to 5 years, nor did they reflect that members who terminate prior to completing 25 years of service may elect an immediate annuity.

If this Amendment is enacted, the following chart shows the expected accumulated nominal dollar cash flow costs/(savings) on the employer contributions for the fiscal years 2016-2017 through 2048-2049 as provided by the System actuaries. It is important to note that Hay displayed contributions through the 2051-2052 fiscal year for SERS and thus, the numbers shown below will differ from those reported by Hay in order to provide costs that are consistent with the period reported by Buck for PSERS.

Please note that the chart does not show the present value of the expected cash flow costs/(savings) due to time constraints.

Impact on Employer Contributions if Amendment A06914 to House Bill 727, PN 1555 is enacted versus Amendment A06888 For Fiscal Years 2016-2017 through 2048-2049

(Amounts in millions and based on System actuary's projections; any provision for use of plan savings is not included in these projections)

	Cash Flow Costs / (Savings) as determined by System Actuary	
	Amendment A06914 (Markosek)	Amendment A06888 (Tobash & Vereb)
PSERS	$ (294.1)	$(4,025.2)
SERS	5,329.9	(5,734.3)
Total	5,035.8	(9,759.5)

Please note that we have performed a very limited review of the costs prepared by the System actuaries. In comparing the results to Amendment A06888, we offer the following commentary:

- Buck determined the normal cost under each Amendment as a level percent of DB pay over the member's entire working career rather than over the first 25 years. This produces similar normal cost rates in total as a percent of DB pay between the two Amendments, with the employer and employee allocation varying based on the different member contribution rates. Lower member contribution rates under Amendment A06914 will lead to higher employer costs and thus lower projected savings.
- Buck's analysis also reflects a cost for 5-year vesting for T-E/T-F members as well as T-G members increasing the cost of Amendment A06914 relative to Amendment A06888.
- Amendment A06914 also maintains the premium assistance benefit for T-G members which increases the cost relative to Amendment A06888.
- Hay determined the normal cost under each Amendment as a level percent of DB pay over the first 25 years. This produces a higher normal cost rate and

contributions during the first 25 years of a member's career as all benefit increases anticipated to occur after completion of 25 years are fully accrued at the end of the 25-year period. Under Amendment A06914, the benefit increases after completion of 25 years are expected to be much larger than Amendment A06888 resulting in a higher normal cost rate. Furthermore, the significant decrease in employee contributions further increases the employer normal cost to 7.98% under Amendment A06914 versus 1.14% under Amendment A06888. In fact, the employer normal cost under Amendment A06914 significantly exceeds the current employer normal cost of 4.52%. This increase in normal cost leads to higher expected contributions than the current plan resulting in an increase in costs.

- Another difference in the approach taken by the actuaries is the assumption used for increases in the national average wage index. Hay assumed the index would increase 3.9% per year whereas Buck assumed the index would increase 3%. The larger the assumed increase, the higher the expected costs. Since the same index would apply to each system in practice, we believe such a large disparity in this assumption should be reviewed for purposes of these projections, in order to allow comparability of the results.

For the projections of the Amendment's impact, the actuaries of both systems continued to use the same actuarial assumptions adopted for use in the latest valuations unless noted differently. Please refer to our actuarial cost note dated May 16, 2016 related to Amendment A06859 to House Bill 727, Printer's Number 1555, and as amended by Amendment A06888, for discussion of this point, particularly as related to assumed investment return and projected mortality improvement.

Please note that the actual cost of this Amendment, if enacted, would depend on the actual experience for the new Class T-G in PSERS and the new Class A-5 in SERS. The actual costs could be higher or lower. It may be appropriate to review alternative assumptions for the new benefit classes.

Each of the system's assets is assumed to earn 7.5% each year of the projection. To the extent adverse (favorable) investment returns are experienced, the contribution rates would be higher (lower).

Basis for Analysis

In performing this analysis, we have relied on the information provided by the Commission, PSERS, SERS, Buck Consultants, and Hay Group. We have not audited or verified this data and other information. If the data or information is inaccurate or incomplete, the results of this analysis may likewise be inaccurate or incomplete.

We performed a limited review of the projections prepared by Buck Consultants and Hay Group as provided by the Commission, PSERS, and SERS for reasonableness and consistency and, except as described above, have not found material defects. If there are material defects, it is possible that they would be uncovered by a detailed, systematic review and comparison to search for values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of our assignment.

Future actuarial measurements may differ significantly from the current measurements presented in this analysis due to actual plan experience deviating from the actuarial assumptions, the natural operation of the plan's actuarial cost method, and changes in plan provisions, actuarial assumptions, actuarial methods, and applicable law. An assessment of the potential range and cost effect of such differences is beyond the scope of this analysis.

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The consultants who worked on this assignment are pension actuaries. We have not explored any legal issues with respect to the proposed plan changes. We are not attorneys and cannot give legal advice on such issues. We suggest that you review this proposal with counsel.

We are members of the American Academy of Actuaries and meet its Qualification Standards to render this actuarial opinion.

Please let us know if we can provide any additional information regarding this Amendment.

Sincerely,

Timothy J. Nugent

Scott F. Porter

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May 13, 2016

Mr. Glen R. Grell
Executive Director
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5 North 5th Street
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Dear Glen:

Re: House Bill No. 727 as amended by A06914 (Printer's No. 1555)

As requested, we have examined the provisions of House Bill No. 727 as amended by A06914, Printer's Number 1555 (hereafter simply referred to as HB-727 as amended), which would create a new Class T-G membership under the Pennsylvania Public School Employees' Retirement System (PSERS) for employees hired after June 30, 2018. In addition, the bill would establish a defined contribution (DC) plan for Class T-G members effective July 1, 2018, change the vesting requirements for Class T-E and T-F members and would revise certain PSERS funding provisions effective July 1, 2016. At the direction of PSERS' staff, the effective date of the Class T-G membership for this cost note has been changed from July 1, 2017 to July 1, 2018 to reflect the staff's concern of the administrative difficulties of establishing the new class membership as of July 1, 2017.

PSERS provisions applicable to Class T-G members

- Compensation considered for benefit determination would be limited to the first $70,000 of pay each year. The $70,000 pay limit would be increased/indexed by the national average wage index (rounded to the nearest $100). Compensation for both part-time service and partial years of service will be annualized for purposes of application of the limit. The $70,000 pay limit would first be effective July 1, 2018.

- Members would contribute 4.5% of pay (limited as described above) each year in their first 25 years of service.

- Members would be subject to "shared-risk" contributions if investment returns do not meet certain thresholds. These are similar to the Act 2010-120 "shared-risk" provisions, but the total member contribution rate for Class T-G members would not be less than 4.5% or more than 6.5%. In making the projections shown in the attached Table 1 and Exhibit V, Class T-G members were assumed to have the same "shared-risk" obligations as Class T-E and T-F members effective for the period beginning 7/1/2020.

- The annual benefit at retirement would be 2% of the highest five-year average pay multiplied by the number of years of service, which would be limited to 25 years.

- Eligibility for unreduced retirement benefits would be reached upon attainment of age 65 with three years of service.

- Members would vest after 5 years of service. Benefits payable prior to Superannuation would be actuarially reduced to the commencement date.

- Members would be eligible to withdraw their contributions with interest in lieu of receiving a pension.

- Members with five years of service would be eligible for disability benefits.

- Survivors of members with 5 years of service would be eligible to receive death benefits.

- Members would not be eligible to elect an Option 4 lump sum distribution at retirement.

- Members would be eligible for the Health Care Premium assistance program.

PSERS provisions applicable to Class T-E and T-F members

- T-E and T-F members would vest after 5 or more years of service.

- Survivors of T-E and T-F members with 5 or more years of service would be eligible to receive death benefits.

DC Plan provisions

- School employees who begin school service on or after July 1, 2018, would be enrolled in the DC plan.

- School employees who return to school service on or after July 1, 2018 would have a one-time option to elect Class T-G membership.

- DC plan mandatory participant contributions would be:

  - 3.0% of the capped pay used to determine PSERS benefits for the first 25 years of service, plus
  - 7.5% of pay in excess of the capped pay used to determine PSERS benefits and/or for service over 25 years.

  Mandatory participant contributions are intended to be pre-tax "pickup" contributions.

- The DC plan employer contribution would be:

  - 0.5% of the capped pay used to determine PSERS benefits for the first 25 years of service, plus

- 4.0% of pay in excess of the capped pay used to determine PSERS benefits and/or for service over 25 years.

- Participant contributions to the DC plan would vest immediately. Employer contributions would vest after completion of three years of service.

- Each DC participant will have an individual investment account where all participant and employer contributions are accumulated and investment experience, fees and costs are credited or charged.

The results reported in this cost note are based on the assumption that the DC plan will cover only employees hired on or after July 1, 2018, and do not take into consideration former PSERS members returning to active service and electing Class T-G membership. In addition, the employer contribution under the DC plan does not reflect an offset for forfeitures from participants who terminate prior to completing three years of service.

It should be noted that under HB-727 as amended, the portion of the benefits provided to Class T-G members by the DC plan is subject to investment risk that would be fully borne by participants. Under PSERS, only Class T-E, T-F and, now, T-G members share responsibility for the fund's investment risk through the Act 2010-120 and HB-727 as amended "shared-risk" additional member contributions (as Class T-C and T-D members are not subject to the "shared-risk" contributions). Additionally, participants would bear the full cost associated with "longevity risk" (i.e., the chance of running out of money in retirement) for benefits provided by the DC plan, while under PSERS, longevity risk is assumed by the System.

PSERS funding provisions

- The accrued liability contribution rate would be computed as a level percentage of total compensation of all active PSERS members and active DC participants using an amortization period of 24 years.

- The experience adjustment factor would be calculated as a level percentage of the total compensation of all active PSERS members and active DC participants using a 24-year amortization period.

- Changes in the accrued liability of PSERS resulting from legislation are to be funded as a level percentage of the total compensation of all active PSERS members and active DC participants using a 10-year amortization period.

- DC participant employers would be surcharged the PSERS accrued liability contribution rate in addition to the employer defined-contribution payments made to the DC plan.

- The normal contribution rate would be determined as a level percentage of total compensation of active PSERS members other than Class T-G members and for Class T-G members' compensation limited by the defined benefit compensation limit and compensation for Class T-G members with less than 25 years of service. The employer normal cost shall not be less than zero.

- The Premium Assistance contribution rate would be determined as a level percentage of total compensation of active PSERS members other than Class T-G members and for Class T-G members' compensation limited by the defined benefit compensation limit and compensation for Class T-G members with less than 25 years of service.

- The results of the 10-year asset-averaging method would be constrained to remain within 30% of the market value of assets.

- Section 8406.1of HB-727 as amended, "Use of plan savings", requires any savings due to the provisions of HB-727 as amended to be contributed to the System in order to pay off the System's unfunded accrued liability (UAL). However, HB-727 as amended does not clearly provide for its calculation. Consequently, the projected contributions and cost savings presented in Table 1 do not reflect the provisions of Section 8406.1. In any event, additional employer contributions, as intended by Section 8406.1, to the System over the recommended amounts under the proposed legislation would reduce the System's UAL at a quicker pace than the current funding requirements of the UAL and the total employer cost savings presented in Table 1 would be different.

Estimates of the potential financial impact of HB-727 as amended are presented in the attached tables. These results may be used as estimates of the likely pattern of emerging costs and liabilities resulting from the proposed changes but should not be viewed as a guarantee of actual costs. Actual future funding obligations will be determined by actuarial valuations made on future valuation dates and will likely differ from the estimates provided in these analyses.

Where presented, references to "funded ratio" and "unfunded accrued liability" are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

The attached Table 1 illustrates the potential expected savings through the 2049 fiscal year. Table 1 compares projected employer contribution obligations under the current benefit and funding provisions of PSERS with those projected to arise under the provisions of HB-727 as amended. We note that the PSERS normal contribution and Premium Assistance employer contribution rates under HB-727 as amended are to be determined as a level percentage of compensation of active PSERS members. However, to provide consistency in the comparison made, the results are shown as a percentage of total compensation of all active PSERS members and active DC participants.

We note that Table 1 shows a decreasing projected cost savings towards the end of the projection period, which is explained by the following aspects of the proposed changes:

a. As more employees receive compensation exceeding the indexed $70,000 cap, more employer contributions are made to the DC plan at the 4% rate.

b. The 4% DC plan employer rate is greater than the Class T-E or T-F current System normal cost rate.

Consequently, the total employer contribution trend of decreasing (savings)/increasing costs would be expected to continue beyond 2049.

Table 2 allocates the total projected cost/(savings) between the pension reforms for Class T-E and Class T-F members and Class T-G members. Table 2 also provides the estimated effect of risk sharing on the plan under a 6.5% annual investment return scenario for all years of the projection.

Table 3 presents comparisons of the estimated current benefits provided under PSERS for Class T-E members to those that would be provided under HB-727 as amended for the following seven cases: three hypothetical Class T-G members based on retirement at age 65 with 20 years of service, three hypothetical Class T-G members based on retirement at age 65 with 35 years of service and one hypothetical Class T-G member based on an early retirement at age 60 with 30 years of service. In four of the seven comparisons presented, benefits under HB-727 as amended are projected to be lower than those provided by current law while three of the benefit comparisons presented show benefits under HB-727 as amended greater than benefits under current law.

Also included are Exhibits, which contain four graphs comparing projected contribution amounts, contribution rates, unfunded accrued liabilities and funded percentages under the current plan provisions to those projected under HB-727 as amended.

Proposed Class T-G members, along with members of Classes T-E and T-F, would share responsibility for the fund's investment risk through the Act 2010-120 and HB-727 as amended "shared-risk" additional member contributions. The purpose of the shared-risk provision is to offset employer contribution requirements during extended periods of unfavorable investment experience, in effect requiring PSERS members to "share the risk" of investment experience with the employer. Table 2 and Exhibit V show the projected impact of the shared-risk provision if annual investment returns on the System's assets throughout the projection period were 6.5%, which is 1% less than the System's current 7.5% return assumption.

Exhibit V shows a comparison of projected employer costs and member shared-risk contributions under the current PSERS system and those arising from HB-727 as amended under the assumption that the return on assets is 6.50% for all years of the projection. As outlined in the note at the bottom of Exhibit V and on Table 2, there is a slight decrease in total employer contributions due to the Class T-G members' DB/DC plan design under HB-727 as amended assuming an annual return on assets of 6.50% when compared to current law. The decrease in employer contributions reflects the reduction in expected Class T-G member risk share contributions due to the proposed $70,000 (indexed) cap on pay. The other assumptions used in these projections are those upon which the June 30, 2015, actuarial valuation of the System was based. The rate-of-return scenarios upon which these projections are based are not ones that are likely to develop over the projection period, and accordingly these projections must be viewed as an indication of the range of possible outcomes rather than as predictions that are likely to be fulfilled.

The calculations presented here are based on the data, methods and assumptions used in the June 30, 2015 actuarial valuation of PSERS as well as the following assumptions for the projected actuarial valuations:

- The workforce size is assumed to remain constant over the projection period; and

- Future new employees are assumed to have similar demographic characteristics (age/gender/salary) to those of new members who entered PSERS for in the period July 1, 2012 through June 30, 2015.

It should be noted that one difficulty in the estimation of liabilities arising under HB-727 as amended is that we would expect a change in retirement patterns to result if benefit entitlements are reduced. In general, decreasing benefits may lead to postponed retirements among affected members, who may need to remain in service longer than would have previously been necessary to earn sufficient benefits to meet their financial needs in retirement. However, the nature and extent of such postponements will not be identified until affected members retire under the new benefit design and a formal experience study is prepared. Therefore, in our cost estimates, we have assumed that there would be no immediate changes in members' retirement patterns.

There are some additional funding concerns that would have to be addressed if HB-727 as amended were to move forward:

1. This analysis is based on an assumed 7.50% annual discount rate. However, under HB-727 as amended, it is possible that liquidity issues may arise due to the shift in liability towards retirees and that the PSERS Board may change the asset allocation to reduce the risk of the portfolio and reflect the need to hold a growing proportion of its assets in more liquid, less volatile asset classes. In general, lowering the risk of the portfolio lowers the discount rate used in the System's valuation. This increases the accrued liabilities and contribution requirements of the System. The cost impact of HB-727 as amended could thus change, potentially significantly, if there is a change in the asset allocation and expected asset return. We recommend that an analysis be performed by PSERS' investment consultant using projected cash flows of the System based on the provisions of HB-727 as amended to determine whether such a reduction in the future assumed long-term rate of return on assets may be

warranted. If so, the projections shown on the attachments should be recalculated accordingly.

2. The projected contributions for future fiscal years may differ from those to be determined in actual future actuarial valuations due to demographic and financial experience different from those assumed. This will certainly be the case if the workforce and/or payroll continue to decrease over the next few years. In addition, it is outside the scope of this assignment to determine if the assumptions used in the June 30, 2015, actuarial valuation will remain reasonable for use in future valuations. Accordingly, these results should not be used for any purpose other than providing an estimate of future employer pension cost obligations under HB-727 as amended.

This analysis only provides information with regard to future funding contributions of the System. It does not provide any information with regard to the impact any changes may have on financial disclosures under applicable GASB standards.

This analysis was prepared under my supervision. I am a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. I meet the Academy's qualification Standards to issue this Statement of Actuarial Opinion. This report has been prepared in accordance with all applicable Actuarial Standards of Practice and I am available to answer questions about it.

Finally, care should be exercised in using the projections and communicating any results to third parties to ensure that the above caveats and underlying bases of the projections are clearly communicated to any possible recipients.

Please let me know if you have any questions.

Very truly yours,

David L. Driscoll

David L. Driscoll, FSA, MAAA, EA, FCA
Principal, Consulting Actuary

Enc.
Pc: Brian Carl

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TABLE 1
Pennsylvania Public School Employees' Retirement System
Projection of Contribution Rates and Funded Ratios As of June 30, 2015
PSERS (Current) vs. House Bill 727 Printer's Number 1555 as amended by A06914 (HB 727)

Fiscal Year Ending June	Appropriation Payroll (thousands)	Members Enrolled in HB 727 DC Plan (thousands): DB Payroll: Below $70,000 (indexed) & up to 25 Years of Service	Members Enrolled in HB 727 DC Plan (thousands): Excess of $70,000 (indexed) and/or after 25 Years of CS	Fiscal Year Market Rate of Return	Pension Rate Floor: Current	Pension Rate Floor: HB 727 DB	Employee Contribution Rate: Current	Employee Contribution Rate: HB 727 DB	Employer Normal Cost Rate: Current	Employer Normal Cost Rate: HB 727 DB	Employer Normal Cost Rate: HB 727 DC
2014	$ 13,720,000			14.91 %	4.00 %	4.00 %	7.43 %	7.43 %	8.57 %	8.57 %	
2015	13,482,000			3.04	4.00	4.00	7.46	7.46	8.46	8.46	
2016	13,375,000			7.50	4.00	4.00	7.49	7.49	8.38	8.38	
2017	13,549,000			7.50	8.31	8.31	7.52	7.52	8.31	8.31	
2018	13,658,010			7.50	8.14	8.17	7.52	7.52	8.14	8.17	
2019	14,012,675	$ 553,562	$ 0	7.50	7.98	8.02	7.52	7.52	7.98	8.02	0.02 %
2020	14,385,408	1,098,647	0	7.50	7.81	7.85	7.53	7.53	7.81	7.85	0.04
2021	14,775,522	1,653,267	0	7.50	7.66	7.68	7.53	7.41	7.66	7.68	0.06
2022	15,161,732	2,221,156	0	7.50	7.51	7.50	7.53	7.31	7.51	7.50	0.07
2023	15,592,952	2,786,442	0	7.50	7.36	7.34	7.53	7.20	7.36	7.34	0.09
2024	16,006,876	3,350,539	0	7.50	7.21	7.17	7.53	7.10	7.21	7.17	0.10
2025	16,425,303	3,910,874	0	7.50	7.06	6.99	7.53	7.01	7.06	6.99	0.12
2026	16,849,867	4,499,512	0	7.50	6.90	6.80	7.53	6.92	6.90	6.80	0.13
2027	17,269,991	5,113,694	0	7.50	6.74	6.62	7.53	6.83	6.74	6.62	0.15
2028	17,684,009	5,755,087	0	7.50	6.56	6.42	7.54	6.75	6.56	6.42	0.16
2029	18,092,525	6,423,261	2,159	7.50	6.40	6.22	7.54	6.66	6.40	6.22	0.18
2030	18,496,390	7,111,567	13,580	7.50	6.22	6.01	7.54	6.57	6.22	6.01	0.20
2031	18,901,232	7,818,298	40,274	7.50	6.04	5.79	7.54	6.48	6.04	5.79	0.22
2032	19,306,605	8,538,508	86,428	7.50	5.86	5.57	7.54	6.38	5.86	5.57	0.24
2033	19,711,447	9,273,136	155,357	7.50	5.67	5.34	7.54	6.28	5.67	5.34	0.27
2034	20,119,213	10,017,305	252,372	7.50	5.48	5.09	7.54	6.18	5.48	5.09	0.30
2035	20,534,465	10,768,395	382,757	7.50	5.28	4.84	7.54	6.07	5.28	4.84	0.34
2036	20,959,917	11,523,706	550,322	7.50	5.08	4.59	7.54	5.95	5.08	4.59	0.38
2037	21,392,675	12,278,877	757,364	7.50	4.87	4.33	7.54	5.82	4.87	4.33	0.43
2038	21,836,128	13,035,571	1,004,053	7.50	4.67	4.06	7.54	5.69	4.67	4.06	0.48
2039	22,293,310	13,794,244	1,293,797	7.50	4.46	3.80	7.54	5.54	4.46	3.80	0.54
2040	22,765,638	14,552,180	1,628,650	7.50	4.26	3.53	7.54	5.39	4.26	3.53	0.61
2041	23,256,592	15,302,852	2,010,356	7.50	4.05	3.26	7.54	5.23	4.05	3.26	0.67
2042	23,771,462	16,034,982	2,442,688	7.50	3.86	2.98	7.54	5.07	3.86	2.98	0.75
2043	24,320,134	16,744,900	2,927,457	7.50	3.67	2.72	7.54	4.90	3.67	2.72	0.83
2044	24,918,450	17,431,263	3,466,674	7.50	3.50	2.48	7.54	4.73	3.50	2.46	0.91
2045	25,575,198	18,103,151	4,054,445	7.50	3.34	2.24	7.54	4.57	3.34	2.24	0.99
2046	26,301,180	18,729,871	4,724,917	7.50	3.22	2.05	7.53	4.40	3.22	2.05	1.07
2047	27,097,844	19,288,575	5,500,237	7.50	3.11	1.87	7.53	4.24	3.11	1.87	1.17
2048	27,966,454	19,741,701	6,399,804	7.50	3.02	1.71	7.53	4.09	3.02	1.71	1.27
2049	28,911,941	20,122,834	7,391,169	7.50	2.97	1.61	7.52	3.92	2.97	1.61	1.37

Fiscal Year Ending June	Employer Unfunded Liability Rate: Current	Employer Unfunded Liability Rate: HB 727 DB	Preliminary Employer Pension Rate: Current	Preliminary Employer Pension Rate: HB 727 DB	Health Care Contribution: Current	Health Care Contribution: HB 727 DB	Total Employer Contribution Rate: Current	Total Employer Contribution Rate: HB 727 DB + DC	Total Employer Contribution (thousands): Current	Total Employer Contribution (thousands): HB 727 DB + DC	Cost/(Savings): Cash Flow Basis	Cost/(Savings): Present Value as of June 30, 2015	Funded Ratio (Actuarial Value of Assets basis): Current	Funded Ratio (Actuarial Value of Assets basis): HB 727 DB	Unfunded Accrued Liability (Actuarial Value of Assets basis and in millions): Current	Unfunded Accrued Liability (Actuarial Value of Assets basis and in millions): HB 727 DB
2014	15.25 %	15.25 %	23.82 %	23.82 %	0.93 %	0.93 %	16.93 %	16.93 %					62.0 %	62.0 %	$ 35,121.2	$ 35,121.2
2015	17.51	17.51	25.97	25.97	0.90	0.90	21.40	21.40					60.6	60.6	37,335.8	37,335.8
2016	19.44	19.44	27.82	27.82	0.84	0.84	25.84	25.84	$ 3,456,100	$ 3,456,100	$ 0	$ 0	58.2	58.2	40,620.5	40,631.1
2017	20.89	20.89	29.20	29.20	0.83	0.83	30.03	30.03	4,068,765	4,068,765	0	0	56.8	56.8	43,159.9	43,171.3
2018	23.07	23.08	31.21	31.25	0.83	0.83	32.04	32.08	4,376,026	4,381,490	5,463	4,727	56.1	56.1	45,087.7	45,098.5
2019	24.47	24.48	32.45	32.50	0.82	0.82	33.27	33.34	4,662,017	4,671,791	9,774	7,868	58.6	58.6	43,551.4	43,561.6
2020	25.59	25.60	33.40	33.45	0.80	0.80	34.20	34.29	4,919,810	4,932,495	12,686	9,499	60.1	60.1	43,104.1	43,113.5
2021	25.06	25.07	32.72	32.75	0.79	0.79	33.51	33.60	4,951,277	4,963,976	12,699	8,846	61.2	61.2	43,070.0	43,078.4
2022	25.23	25.24	32.74	32.74	0.77	0.77	33.51	33.58	5,087,398	5,098,504	11,106	7,198	62.6	62.6	42,587.3	42,594.7
2023	25.63	25.64	32.99	32.98	0.76	0.76	33.75	33.83	5,262,621	5,274,994	12,373	7,456	64.1	64.1	41,893.2	41,899.4
2024	25.89	25.90	33.10	33.07	0.74	0.74	33.84	33.91	5,416,727	5,428,677	11,951	6,701	65.5	65.5	41,290.2	41,295.1
2025	26.16	26.17	33.22	33.16	0.72	0.72	33.94	34.00	5,574,748	5,584,447	9,699	5,059	67.3	67.2	40,199.8	40,203.3
2026	26.56	26.58	33.46	33.38	0.72	0.72	34.18	34.23	5,759,285	5,768,302	9,018	4,375	69.2	69.1	38,808.0	38,809.9
2027	26.87	26.88	33.61	33.50	0.69	0.69	34.30	34.34	5,923,607	5,930,178	6,571	2,966	71.2	71.2	37,123.3	37,123.3
2028	27.19	27.19	33.75	33.61	0.69	0.69	34.44	34.46	6,090,373	6,094,391	4,018	1,667	73.4	73.3	35,136.3	35,136.3
2029	27.52	27.52	33.92	33.74	0.69	0.69	34.61	34.61	6,261,823	6,261,459	(364)	(142)	75.7	75.6	32,832.9	32,832.9
2030	27.88	27.88	34.10	33.89	0.69	0.69	34.79	34.78	6,434,894	6,432,153	(2,741)	(996)	78.2	78.1	30,172.9	30,172.9
2031	28.25	28.25	34.29	34.04	0.69	0.69	34.98	34.95	6,611,651	6,605,090	(6,561)	(2,217)	80.8	80.7	27,122.1	27,122.1
2032	28.64	28.64	34.50	34.21	0.69	0.69	35.19	35.14	6,793,994	6,784,155	(9,839)	(3,093)	83.6	83.5	23,647.6	23,647.6
2033	29.04	29.04	34.71	34.38	0.69	0.69	35.40	35.34	6,977,852	6,965,384	(12,468)	(3,646)	86.6	86.5	19,712.1	19,712.1
2034	29.46	29.46	34.94	34.55	0.69	0.69	35.63	35.54	7,168,476	7,150,192	(18,284)	(4,974)	89.8	89.7	15,274.8	15,274.8
2035	29.88	29.88	35.16	34.72	0.69	0.69	35.85	35.75	7,361,606	7,340,406	(21,199)	(5,365)	93.3	93.2	10,293.8	10,293.8
2036	14.66	14.66	19.74	19.25	0.69	0.69	20.43	20.32	4,282,111	4,259,039	(23,072)	(5,431)	94.9	94.8	8,000.0	8,000.0
2037	10.91	10.91	15.78	15.24	0.69	0.69	16.47	16.36	3,523,374	3,499,542	(23,832)	(5,219)	96.1	96.0	6,272.1	6,272.1
2038	9.28	9.28	13.95	13.34	0.69	0.69	14.64	14.51	3,196,809	3,168,949	(27,860)	(5,675)	97.1	97.0	4,721.2	4,721.2
2039	7.41	7.41	11.87	11.21	0.69	0.69	12.56	12.44	2,800,040	2,773,627	(26,413)	(5,005)	97.9	97.8	3,426.6	3,426.6
2040	5.95	5.95	10.21	9.46	0.69	0.69	10.90	10.78	2,481,455	2,453,172	(28,282)	(4,986)	98.6	98.5	2,332.7	2,332.7
2041	4.65	4.65	8.70	7.91	0.69	0.69	9.39	9.27	2,183,794	2,156,995	(26,799)	(4,394)	99.2	99.1	1,427.6	1,427.6
2042	2.58	2.58	6.44	5.56	0.69	0.69	7.13	7.00	1,694,905	1,663,599	(31,306)	(4,775)	99.5	99.4	922.8	922.8
2043	1.04	1.04	4.71	3.76	0.69	0.69	5.40	5.28	1,313,287	1,283,069	(30,218)	(4,288)	99.6	99.5	740.0	740.0
2044	(0.16)	(0.16)	3.34	2.32	0.69	0.69	4.19	4.08	1,044,083	1,015,738	(28,345)	(3,741)	99.6	99.5	795.6	795.6
2045	0.79	0.79	4.13	3.03	0.69	0.69	4.82	4.71	1,232,725	1,204,091	(28,634)	(3,516)	99.6	99.6	653.2	653.2
2046	0.81	0.81	4.03	2.86	0.69	0.69	4.72	4.62	1,241,416	1,216,338	(25,078)	(2,864)	99.7	99.7	490.4	490.4
2047	0.55	0.55	3.66	2.42	0.69	0.69	4.35	4.28	1,178,756	1,159,185	(19,571)	(2,079)	99.8	99.8	379.5	379.5
2048	0.48	0.48	3.50	2.19	0.69	0.69	4.19	4.15	1,171,794	1,160,135	(11,660)	(1,152)	99.9	99.8	274.2	274.2
2049	0.42	0.42	3.39	2.03	0.69	0.69	4.08	4.09	1,179,607	1,182,666	3,059	281	99.9	99.9	174.0	174.0
							Total:		$ 141,683,205	$ 141,389,095	$ (294,110)	$ (6,899)				

This is an attachment to Buck's May 13, 2015 cost note on HB 727 as amended. Please refer to that cost note for more information.

Table 2

Pennsylvania Public School Employees' Retirement System

A. Cost/(Savings) Allocation of Table 1 - Total Potential Projected Cost/(Savings) Due to House Bill 727 Printer's Number 1555 as amended by A06914

	Amounts in millions*			
		Cash Flow Basis		Present Value As of June 30, 2016
Benefit Reforms				
Members as of June 30, 2018				
5 year vesting for T-E and T-F members	$	130	$	57
Employees who first become a member on or after July 1, 2018				
Defined Benefit reforms as outlined on page 1 of cost note	$	(3,815)	$	(636)
Defined Contribution reforms as outlined on page 2 of cost note		3,391		572
Sub-total	$	(424)	$	(64)
Total House Bill 727 as amended Cost/(Savings)	$	(294)	$	(7)
Cost due to shift from Defined Benefit to Defined Contribution		**		**

* Estimated cost/(savings) are presented on two bases: a cash flow basis and a present value basis. Cost/(savings) shown on a cash flow basis are the sums of the dollar amounts of (reductions)/increases in the projected contributions the employers would have to make in future years if the proposed changes in System provisions are enacted. The calculation of cost/(savings) on this basis makes no distinction between a dollar of projected cost/(savings) in one future year and a dollar of cost/(savings) in some other year in the nearer or more distant future. The calculation of cost/(savings) on a present value basis, on the other hand, involves discounting projected reductions in contributions from the times they are expected to occur to June 30, 2015, at a rate of 7.50% (the assumed interest rate presently used in the annual actuarial valuations of the System) to reflect the time value of money. It is useful to compare cost/(savings) measured on a present value basis with those measured on a cash flow basis because a dollar of cost/(savings) in future years has a lower value in today's dollars than a dollar that must be paid today.

** Please refer to Item 1 on page 6 of the cost note. This cost note does not include an analysis of the potential costs to the System due to the shift of assets and liabilities from the defined benefit plan to a defined contribution plan.

B. Risk-Sharing Analysis assuming a 6.5% annual investment return

		$ Millions
a. Reduction in cumulative Employer contributions due to HB 727 as amended assuming a 6.50% return (see Exhibit V)	$	(415)
b. Cumulative Employer cost/(savings) under HB 727 as amended assuming a 7.50% return (see Table 1)		(294)
c. Net reduction in cumulative Employer contributions due to Class T-G members' DB/DC plan design = a - b	$	(121)

The effect of a 6.50% return on System assets results in insignificant changes to the comparison of total employer contributions between the current law and those arising from HB 727 as amended over the examination period.

The net reduction in cumulative Employer contributions, as presented above in (c), due to Class T-G members' DB/DC plan design reflects the following reduction in expected Class T-G member risk share contributions, assuming a 6.50% investment return, due to the proposed $70,000 (indexed) cap on pay.

Reduction in cumulative member risk-share contributions due to HB 727 as amended assuming a 6.50% return (see Exhibit V)	$	(656)

This is an attachment to Buck's May 13, 2016 cost note on HB 727 as amended. Please refer to that cost note for more information.

TABLE 3

Pennsylvania Public School Employees' Retirement System

Comparison of Benefits
PSERS Class T-E members vs. T-G Stacked Hybrid Member- $70,000 pay limit indexed

Employee	A	B	C	D	E	F	G
Age at Hire	30	30	30	45	45	45	30
Age at Termination	65	65	65	65	65	65	60
Retirement Age	65	65	65	65	65	65	60
Salary at Termination	$ 61,967	$ 82,622	$ 103,278	$ 35,753	$ 47,671	$ 59,588	$ 79,679
PSERS Benefit	$ 41,828	$ 55,770	$ 69,713	$ 13,791	$ 18,387	$ 22,984	$ 39,185
Stacked Hybrid Proposal: DB	$ 28,823	$ 32,058	$ 32,058	$ 13,304	$ 17,739	$ 22,173	$ 22,869
Stacked Hybrid Proposal: DC	$ 9,377	$ 12,925	$ 18,140	$ 1,880	$ 2,507	$ 3,133	$ 7,436
Stacked Hybrid Proposal: Total	$ 38,200	$ 44,983	$ 50,198	$ 15,184	$ 20,246	$ 25,306	$ 30,305
Stacked Hybrid Proposal / PSERS Benefit	91%	81%	72%	110%	110%	110%	77%

Defined Benefit Design	
Pay Limit	**$70,000 indexed by 3% in the future (assumed increase in national average wage index)**
Credited Service Limit	**25 years**
Benefit Accrual Rate	**2.00%**
Member DB Contribution	**4.5% for pay below limit, 0.0% for pay above limit and for pay after 25 years**
Final Average Salary	**5 years based on limited pay**
Vesting	**5 years**
Defined Contribution Design	
Pay limit	**$70,000 indexed by 3% in the future (assumed increase in national average wage index)**
Participant DC Contribution	**3.0% for pay below limit, 7.5% for pay above limit and for pay after 25 years**
Employer DC Contributions	**.5% for pay below limit and 4.0% for pay above limit and for pay after 25 years**
Assumed Rate of Return	**6.00%**
Assumed Conversion Rate	**3.00%**
Mortality Table for Conversion	**RP-2014 White Collar (75% female, 25% male)**

* Hypothetical members A and D receive a $30,000 starting salary, hypothetical members B , E and G receive a starting salary of $40,000 and hypothetical members C and F receive a $50,000 starting salary. The projected salary level at termination as well as the projected benefit amounts have been adjusted to show them on a basis of equivalent "2016 dollars" by adjusting for inflationary increases expected over the participant's working lifetime. Thus, the amounts have been adjusted to reflect the impact associated with the 3% inflation assumption inherent in the current economic assumptions.

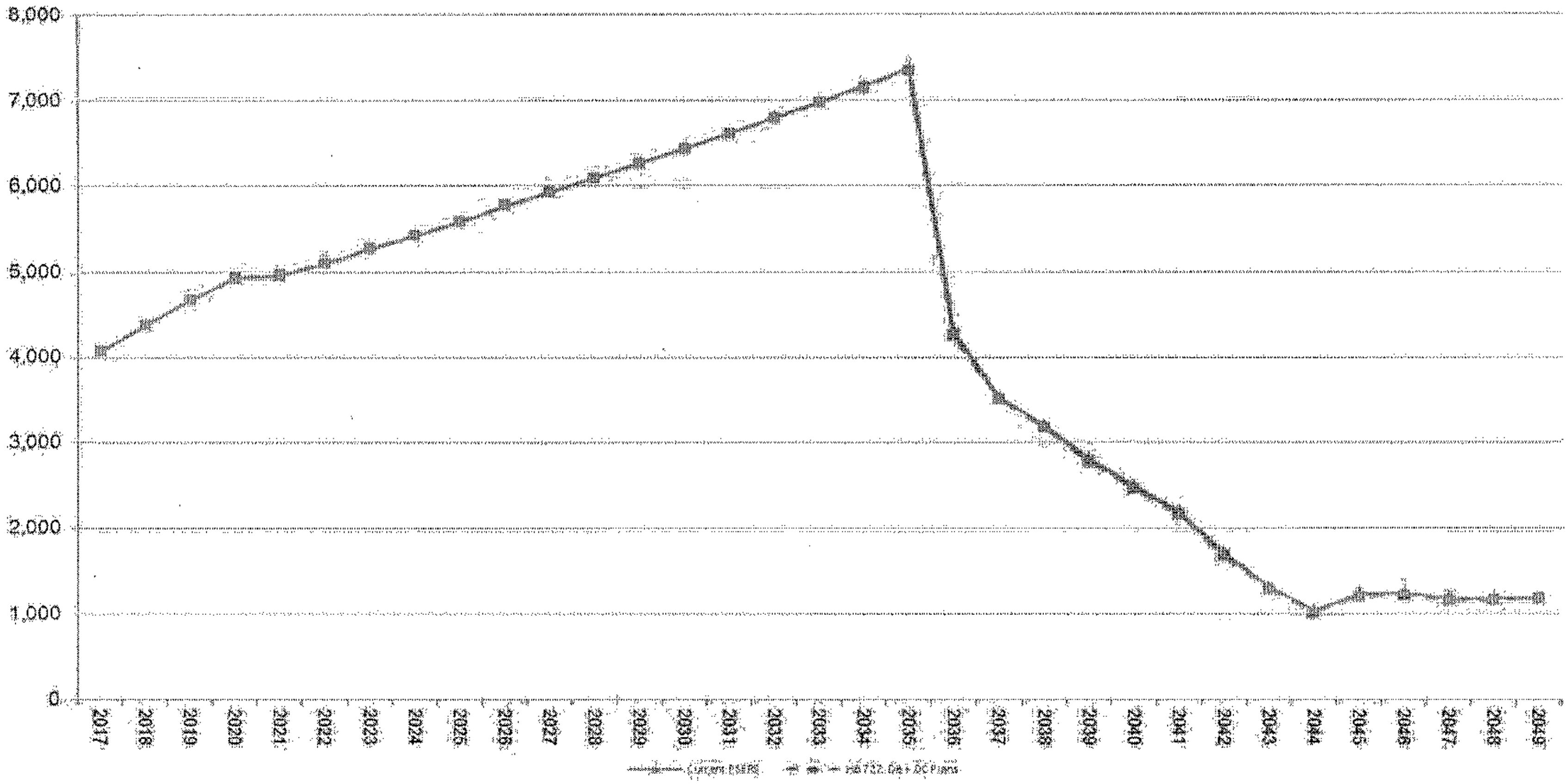
This is an attachment to Buck's May 13, 2016 cost note on HB 727 as amended. Please refer to that cost note for more information.

EXHIBIT I

Pennsylvania Public School Employees' Retirement System

PSERS (Current) vs. House Bill 727 Printer's Number 1555 as amended by A06914 (HB 727)

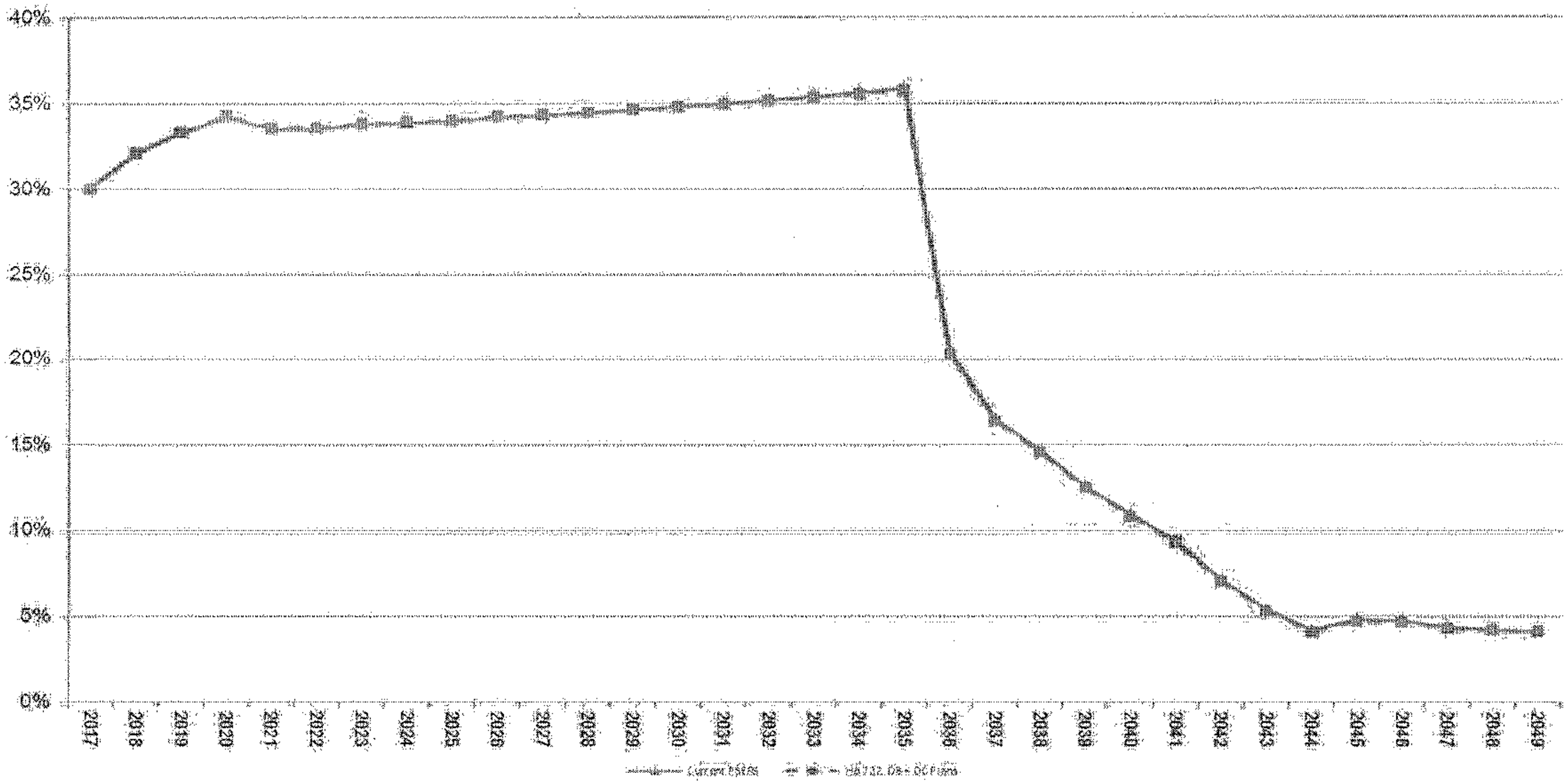
<u>Projection of Employer Contribution Dollars (in Millions)</u>



This is an attachment to Buck's May 13, 2016 cost note on HB 727 as amended. Please refer to that cost note for more information.

EXHIBIT II
Pennsylvania Public School Employees' Retirement System
PSERS (Current) vs. House Bill 727 Printer's Number 1555 as amended by A06914 (HB 727)

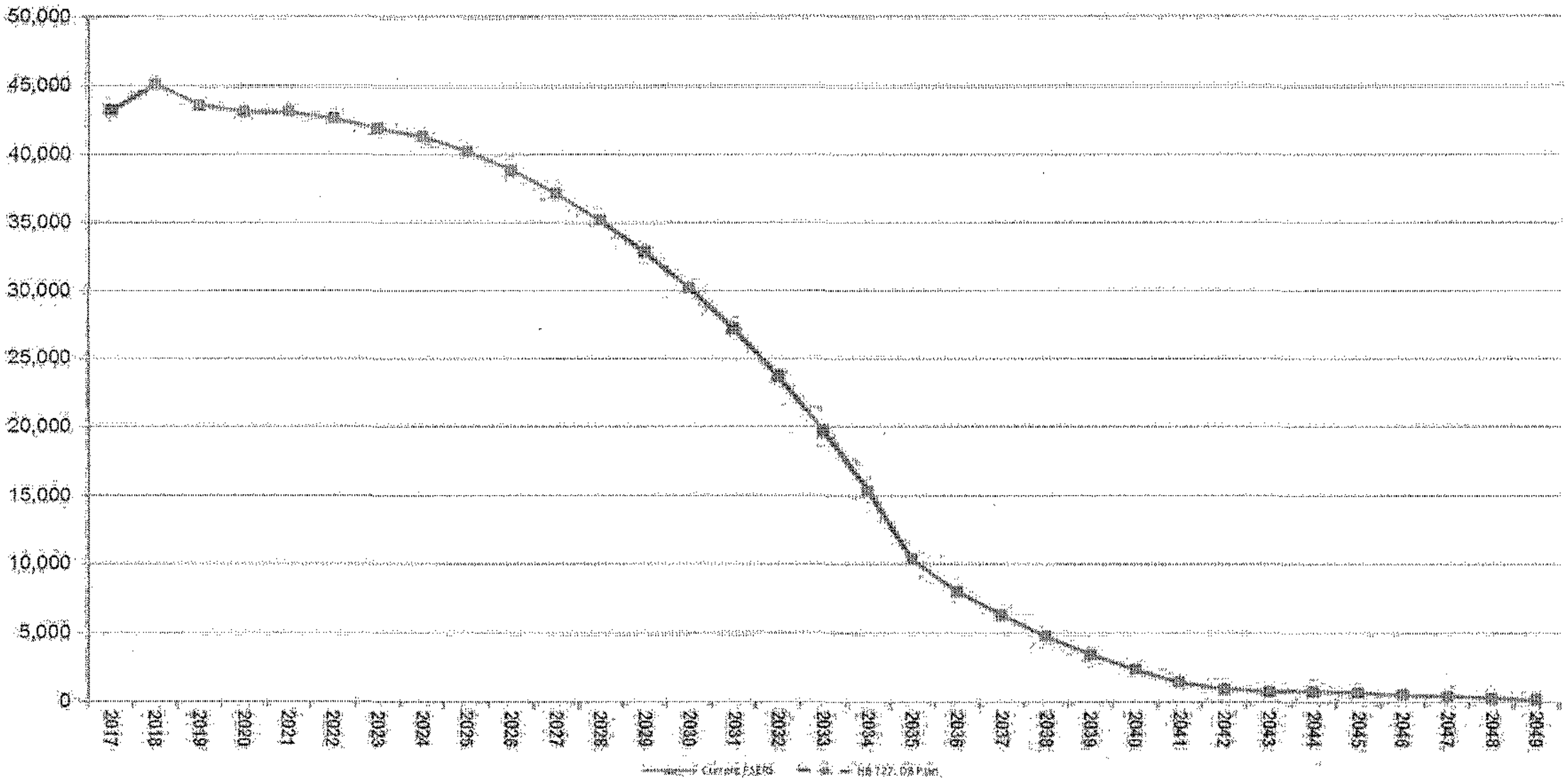
Projection of Total Employer Contribution Rate



This is an attachment to Buck's May 13, 2016 cost note on HB 727 as amended. Please refer to that cost note for more information.

EXHIBIT III
Pennsylvania Public School Employees' Retirement System
PSERS (Current) vs. House Bill 727 Printer's Number 1555 as amended by A06914 (HB 727)

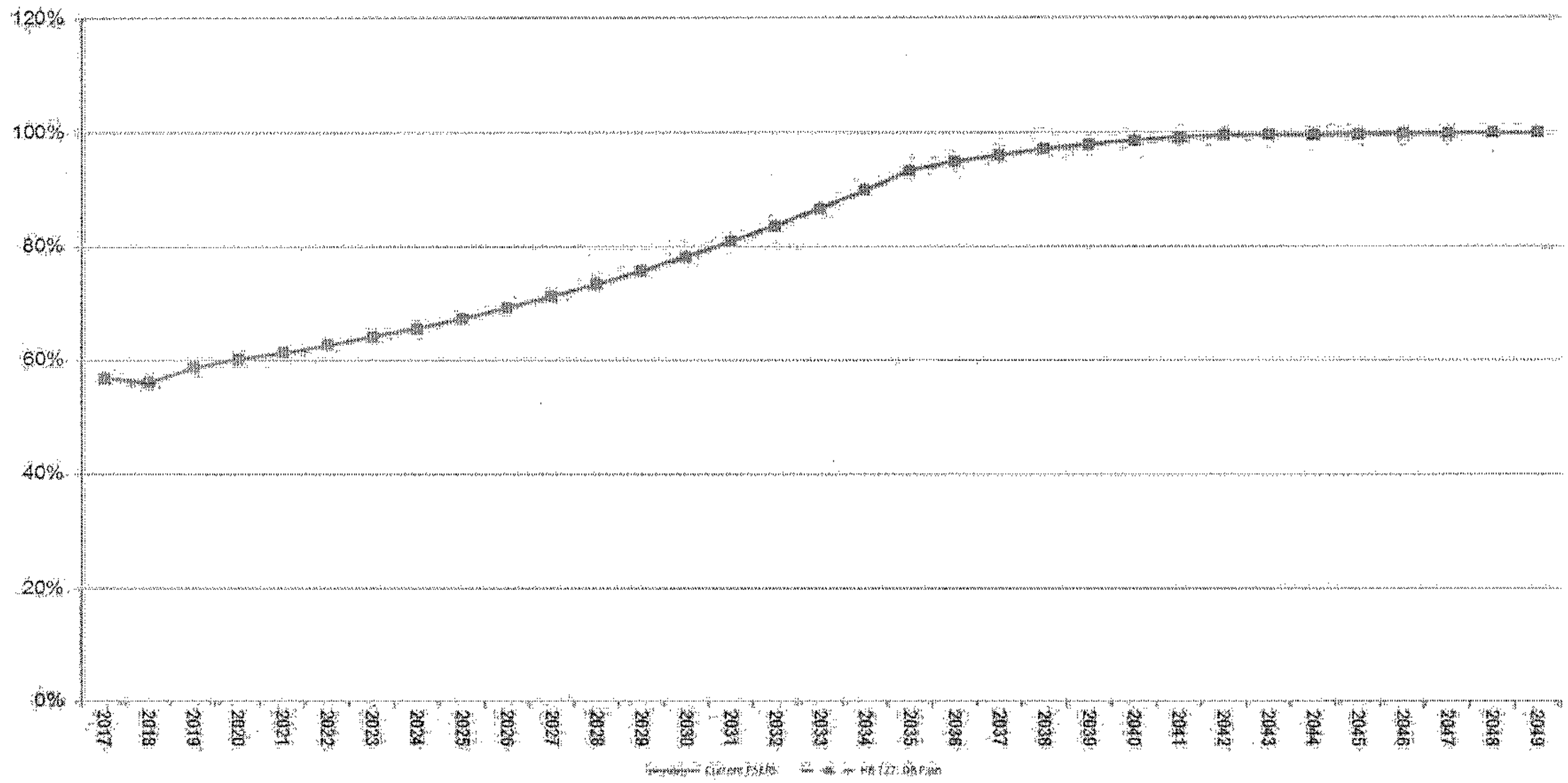
<u>**Projection of Unfunded Liability (Actuarial Value of Assets basis and in millions)**</u>



This is an attachment to Buck's May 13, 2016 cost note on HB 727 as amended. Please refer to that cost note for more information.

EXHIBIT IV
Pennsylvania Public School Employees' Retirement System
PSERS (Current) vs. House Bill 727 Printer's Number 1555 as amended by A06914 (HB 727)

Projection of System Funded Ratio (Actuarial Value of Assets basis)



This is an attachment to Buck's May 13, 2016 cost note on HB 727 as amended. Please refer to that cost note for more information.

Exhibit V

Pennsylvania Public School Employees' Retirement System

Additional Member and Employer Contributions Assuming a 6.50% Investment Return (1.00% below the assumed annual discount rate)

Fiscal Year	(x1,000) Current Plan Employer Contributions @ 6.5%	(x1,000) HB 727 as amended Employer Contributions @6.5% return	(x1,000) Total Additional Employer Contributions	(x1,000) Additional T-E/T-F Act 120 Member Risk Share Contributions	(x1,000) Additional T-E/T-F/T-G HB 727 as amended Member Risk Share Contributions	(x1,000) Total Additional Member Contributions
2016	$ 3,456,100	$ 3,456,100	$ -	$ -	$ -	$ -
2017	4,068,765	4,068,765	-	-	-	-
2018	4,380,124	4,385,587	5,463	-	-	-
2019	4,673,227	4,683,001	9,774	-	-	-
2020	4,944,265	4,956,951	12,686	-	-	-
2021	4,992,649	5,005,348	12,699	-	-	-
2022	5,151,162	5,162,267	11,106	-	-	-
2023	5,356,179	5,368,552	12,373	-	-	-
2024	5,546,383	5,559,934	13,551	-	-	-
2025	5,748,856	5,758,555	9,699	-	-	-
2026	5,986,758	5,994,090	7,333	-	-	-
2027	6,212,016	6,218,587	6,571	-	-	-
2028	6,444,053	6,448,071	4,018	35,758	35,758	-
2029	6,688,806	6,688,443	(364)	39,167	39,167	-
2030	6,937,996	6,935,255	(2,741)	42,732	42,732	-
2031	7,199,479	7,192,919	(6,561)	92,953	92,931	(22)
2032	7,469,725	7,459,886	(9,839)	100,811	100,668	(143)
2033	7,746,599	7,734,131	(12,468)	109,045	108,621	(424)
2034	8,035,614	8,017,330	(18,284)	176,490	175,125	(1,365)
2035	8,336,993	8,313,740	(23,253)	189,966	187,512	(2,454)
2036	5,367,835	5,342,667	(25,168)	203,994	200,008	(3,986)
2037	4,725,642	4,699,671	(25,971)	291,475	283,414	(8,061)
2038	4,524,446	4,494,402	(30,044)	311,716	300,127	(11,589)
2039	4,255,793	4,227,151	(28,642)	332,603	316,654	(15,949)
2040	4,072,773	4,039,937	(32,835)	354,110	332,965	(21,145)
2041	3,921,061	3,889,612	(31,450)	376,191	348,945	(27,246)
2042	3,577,605	3,539,167	(38,438)	398,855	364,557	(34,298)
2043	3,339,154	3,299,208	(39,947)	422,124	379,788	(42,336)
2044	3,169,627	3,131,315	(38,312)	445,872	394,431	(51,441)
2045	3,537,050	3,495,629	(41,421)	469,970	408,320	(61,650)
2046	3,679,535	3,641,307	(38,228)	494,205	421,200	(73,005)
2047	3,742,212	3,709,092	(33,120)	518,319	432,936	(85,383)
2048	3,853,777	3,828,134	(25,643)	542,367	442,864	(99,503)
2049	3,972,501	3,955,321	(17,180)	566,090	450,260	(115,830)
Total	**$ 175,114,758**	**$ 174,700,123**	**$ (414,635)**	**$ 6,514,813**	**$ 5,858,983**	**$ (655,830)**

Note:		x $1,000
a. Cumulative Employer contributions under HB 727 as amended assuming a 6.50% return	$	174,700,123
b. Cumulative Employer contributions under the current PSERS plan assuming a 6.50% return		175,114,758
c. Reduction in cumulative Employer contributions due to HB 727 as amended assuming a 6.50% return = a - b	$	(414,635)
d. Cumulative Employer cost/(savings) under HB 727 as amended assuming a 7.50% return = Table 1		(294,110)
e. Net reduction in cumulative Employer contributions due to Class T-G members' DB/DC plan design = c - d	$	(120,526)

This is an attachment to Buck's May 13, 2016 cost note on HB 727 as amended. Please refer to that cost note for more information.

Actuarial Cost Note Requested by Representative Markosek - Projected Impact of Legislation Related to a SERS Hybrid Defined Benefit (DB)/Defined Contribution (DC) Plan Design – HB 727, PN 1555, As Amended by A06914

Hay Group has prepared this cost note, as requested by Representative Joseph Markosek, in connection with the draft legislative language provided to us that sets forth a hybrid defined benefit (DB)/defined contribution (DC) plan design, as proposed under HB 727, PN 1555, as amended by A06914. Under this proposal, most employees who join SERS on or after January 1, 2017 would no longer be covered by SERS' current benefits, but rather would be covered by a hybrid DB/DC plan design including key features as described below. It is SERS' understanding that a corrective amendment is in the process of being introduced that will change the effective date to January 1, 2018 for new SERS members. This corrective amendment will provide the system ample time to implement a new defined contribution component. Please note that the new effective date has been referenced throughout this document, and all cost projections herein reflect an anticipated January 1, 2018 implementation.

Exemption for Pennsylvania State Police and Certain Other Hazardous Duty Employees

This proposal exempts the Pennsylvania State Police and certain other hazardous duty employees (identified specifically below) from the proposed new plan design. That is, under this proposal (hereafter, "HB 727, A06914"), the Pennsylvania State Police and certain other hazardous duty employees would continue their SERS benefits as-is, except for several relatively minor changes. References hereafter in this note to "all employees hired or rehired after the hybrid plan start date" being subject to the proposed new DB/DC plan provisions should be understood, if not specifically excepted, to exclude Pennsylvania State Police and certain other hazardous duty employees.

For purposes of this actuarial cost note, "certain other hazardous duty employees" includes any employee who is:

- An enforcement officer,
- A Delaware River Port Authority policeman,
- A park ranger,
- A Capitol Police officer,
- A campus police officer employed by a State-owned educational institution, community college or The Pennsylvania State University and
- A police officer employed by Fort Indiantown Gap or other designated Commonwealth military installation or facility.

Note that the number of current active SERS members who are "certain other hazardous duty employees", as described above, is approximately 1,550 (or about 1.5% of all active members).

Hay Group has performed cost projections to approximate the impact on future SERS funding if HB 727, A06914 were to become law. In this cost note and the attached schedules, we are presenting a summary of the key provisions of HB 727, A06914 and the results of our cost projections and analyses.

More on HB 727, A06914

HB 727, A06914 would mandate that, with limited exceptions noted herein, all employees hired after the hybrid plan start date of January 1, 2018 would be covered by the proposed new hybrid DB/DC plan. Therefore, they would become participants in a new SERS hybrid DC plan, which would be separate from the SERS DB system. Each hybrid DC participant would have established for him/her an individual investment account within the SERS hybrid DC trust fund, which would be separate from the SERS DB fund.

Certain Educational Employees

We understand that the availability of the option of certain educational employees to elect membership in either SERS, PSERS or an independent retirement program approved by the employer (such as TIAA-CREF) would continue if HB 727, A06914 were enacted. Absent information that would indicate otherwise, Hay Group has performed our cost analysis of this proposal assuming that future (post-HB 727, A06914) hires will opt to join SERS at approximately the same rate (i.e., with about the same likelihood) as past (pre-HB 727, A06914) hires.

Impact on Current SERS Members

HB 727, A06914 would not change benefit provisions applicable to current SERS members or to members who join SERS prior to the hybrid plan start date, so long as such members remain continuously employed.

Current SERS members would not have an option to leave their existing classes of service and join the hybrid plan.

In general, the "footprint rule" will apply. That is, legacy SERS members who have a break in service and return to employment after the hybrid plan start date would return to their former class of service; however, they would also have a 45-day period after their return within which they could waive their prior class of service and join the hybrid plan prospectively.

New SERS Defined Benefit (DB) Class

HB 727, A06914 would create "Class A-5," a new class of DB membership applicable to all SERS employees who are hired after the hybrid plan start date.

Class A-5 would be a new tier within the existent SERS DB system; the new structure would not be a separate plan and would not have a separate fund. Under this proposal, SERS would not be closed to new members; SERS would remain open to Class A-5 members into the future.

Although most existing SERS funding provisions would continue to apply, HB 727, A06914 would enact legislation-related funding approaches that deviate somewhat from current State Employees' Retirement Code (SERC) rules. These provisions are discussed later in this note.

Proposed Hybrid DB/DC Design

This summarizes our understanding of key features of this proposed hybrid DB/DC design:

1. Formula for Single Life Annuity at Superannuation for Class A-5 members: 2% X 5-Year Final Average Salary X Total Credited Service, not > 25 years

   No "buy-up" to 2.5% accrual rate would be available, as it has been under Act 120.

   The Final Average Salary (FAS) would generally be calculated by averaging the five highest calendar years of compensation, not to exceed the "Class A-5 Annual Compensation Limit" as defined below.

2. Class A-5 Annual Compensation Limit (ACL): All employees who are first hired after the hybrid plan start date would become members of the hybrid DB system and participants of the hybrid DC plan.

   As such, they would be subject to benefit provisions that are, in part, defined by this new term introduced under HB 727, A06914, which plays a significant role in the coordination of the proposed hybrid DB and DC components.

   a. HB 727, A06914 would define ACL in the SERC as follows: "For calendar year 2018, the amount of $70,000. For each subsequent calendar year, the limit shall be the percentage growth in the national average wage index greater than the previous year's amount, rounded to the nearest hundred dollars." For purposes of this cost note and our HB 727, A06914 cost projections, Hay Group is assuming that the national average wage index (AWI) will grow at an annual rate of 3.9%. This assumption is consistent with the ultimate assumption used by the Social Security Administration actuaries for purposes of projecting future national AWI levels under the intermediate set of assumptions (as published in their 2015 Trustees Report).

   b. With respect to the hybrid DB component, the ACL:
      i. Limits the amount of compensation each calendar year that would be used to determine a member's five-year FAS, and

ii. Limits the amount of compensation upon which employee and employer normal contributions would be based for each calendar year during the member's first 25 years of service. (Compensation used for employer UAL amortization contributions is not limited.)

c. With respect to the hybrid DC component, the ACL would serve as the "breakpoint" for purposes of determining employee/employer contribution rates applicable each calendar year during the participant's first 25 years of service.

3. Class A-5 Service Limit: A second new limit which would play a significant role in coordination of the proposed hybrid DB and DC components is a maximum of 25 years of service credit (or attainment of 25 eligibility points, to use SERC terminology) for purposes of hybrid DB plan participation. That is, when determining participation and annuity benefits payable under the hybrid DB system, credited service for Class A-5 members would be limited to 25 years.

    a. With respect to the hybrid DB component, reaching the 25-year service limit would mark the point at which employee and employer contributions to fund the hybrid DB benefit cease. (Employer UAL amortization contributions, however, would continue.)

    b. With respect to the hybrid DC component, reaching the 25-year service limit would mark the point at which employee and employer contribution rates relative to salary below the ACL increase.

4. Potential Increase in Hybrid DB Annuity After Reaching Service Limit: A Class A-5 member who reaches the 25-year service limit and continues active employment thereafter could experience an increase in his/her accrued benefit as a result of increases in the five-year FAS which occur after reaching the service limit, as follows:

    a. Annual compensation, subject to the ACL, earned after reaching the 25-year service limit would be included among the calendar years of compensation eligible for inclusion in the FAS determination, and

    b. Annual indexing of 1% per calendar year in the ACL could result in higher salaries being factored into the FAS determination.

5. Contribution Rates under Proposed Hybrid Plan Design: See table that follows.

Proposed Hybrid Defined Benefit (DB)/Defined Contribution (DC) Plan Contribution Rates				
	First 25 Years of Service		After 25 Years of Service	
	Salary Up To Class A-5 ACL	Salary Over Class A-5 ACL	Salary Up To Class A-5 ACL	Salary Over Class A-5 ACL
Defined Benefit (DB)				
Employee, Applicable to All	0.75%	Not Applicable	Not Applicable	Not Applicable
Employer, Applicable to All	Actuarially Determined	Actuarially Determined	Actuarially Determined	Actuarially Determined
Defined Contribution (DC)				
Employee, Applicable to All	5.5%	6.25%	6.25%	6.25%
Employer, Applicable to All	0.5%	4%	4%	4%

6. Hybrid DB Superannuation (i.e., Normal Retirement Age): Age 65, with at least three years of credited service. No superannuation for anyone as a result of 35 years of service or Rule of 92.

7. Hybrid DB Early Retirement: If 25 years of service, eligible for early retirement, actuarially reduced from normal retirement age.

8. Hybrid DB Vesting: 10-year cliff. Refund of accumulated deductions (member contributions + 4% statutory interest) payable upon non-vested termination. Upon vested termination before 25 years of service, a deferred annuity commencing at age 65 superannuation is available. In general, members would be guaranteed to receive payments at least equal to their accumulated deductions.

9. Hybrid DB Disability and Death Benefits: Eligibility and benefits would generally be consistent with Act 120, adjusted for Class A-5 limits.

10. Hybrid DB Shared Risk Provision: If DB fund investment returns are low relative to actuarial assumptions, Class A-5 members could be subject to higher employee contribution rates. Projections attached to this note anticipate that the actuarially assumed investment returns are earned in all future years; therefore, for purposes of this cost note, this provision would not impact future SERS costs.

11. Hybrid DC Vesting: Immediate vesting for employee contributions and related earnings/losses; 3-year cliff for employer contributions and related earnings/losses.

12. Hybrid DC Disability and Death Benefits: Vested account balances would generally be available.

Proposed Changes to Current SERS Funding Provisions

As noted previously, under HB 727, A06914, most existing funding provisions would be unaffected, including the Act 2010-120 employer contribution rate collars which would continue, as applicable; however, HB 727, A06914 does include some new legislation-related funding provisions (described in Item 1 below) that deviate from current SERC funding. Also, HB 727, A06914 would fund the unfunded accrued liability (UAL) over total (DB + DC) payroll (as described in Item 2 below).

1. Funding of Liabilities Arising from Legislation: With respect to changes in SERS' UAL that would arise from this legislation:

    a. the change in liability would be funded using a 20-year, level-dollar amortization starting July 1, 2018, and

    b. the cost of such amortization would be included in the SERS employer cost determination prior to, not after, applying the contribution rate collars, if they are still applicable.

2. Funding the Existing UAL and Future Gains/Losses: Current SERS amortization methods would continue to apply; however, the UAL contribution rate would be based upon total payroll, i.e., DB + DC payroll. More specifically, it would be the sum of total DB payroll (existing classes of service + Class A-5) plus the hybrid DC-only payroll, which includes all active pay under the combined DB system and DC plan.

Hybrid DB Plan – Employer Normal Cost and UAL

Hybrid DB Plan Employer Normal Cost

Based on the employer normal cost calculation mandated by the SERC, Hay Group has determined that the net employer normal cost for the hybrid DB tier expected to join SERS in 2018 (all Class A-5 new entrants) would be approximately 7.98 percent of payroll below the ACL.

This hybrid DB normal cost is significantly higher than the current normal cost of 4.52 percent of payroll primarily due to the change in the employee contribution requirement to the DB plan. Currently, Class A-3 members must make a contribution of 6.25% of their pay; however, Class A-5 members will only be required to contribute 0.75% of their pay. This causes a significant shifting of costs from the employee to the employer in the DB plan. This increase in employer

DB costs more than offsets any savings that arise from the final average salary change or the introduction of compensation and service limits.

After the initial employer normal cost rate determination (which we expect would occur as a part of the December 31, 2016 actuarial valuation), the normal cost would be redetermined with each subsequent annual actuarial valuation, and would reflect changes that occur from year to year in (i) the demographic characteristics of each year's new entrant population, (ii) the ACL and (iii) the applicable actuarial assumptions.

It is our expectation that, over time, the rate of increase in the average salary (up to the ACL) for the annual new entrant cohort would be about 3.05 percent per year, consistent with annual salary schedule increases assumed in our valuations. Because the ACL would be scheduled to increase by 3.9 percent per year, over time, the actuarial present value of future *benefits* for the new entrant cohort would increase more rapidly than the actuarial present value of future *compensation* for the new entrant cohort. Thus, spreading a higher normal cost over a relatively larger payroll base that did not increase as rapidly as the increase in normal cost would translate into a gradual increase in the hybrid DB total normal cost rate as a percentage of covered payroll.

In order to properly allocate future employer funding of the SERS DB system between the employer normal cost and the UAL, we have projected future normal cost levels to estimate the impact of this gradual change. Based upon our hybrid plan funding projections, the employer normal cost rate (shown in the "Floor Contribution" column of the attached projections) starts at about 7.98 percent of payroll in fiscal 2017/2018 and increases by about 0.0038 percent of payroll per year to reach a level of about 8.11 percent of payroll in fiscal 2051/2052, the end of our projection period.

Hybrid DB Plan UAL

If HB 727, A06914 would become law, effective in fiscal 2017/2018, the SERS employer normal cost rate would increase from the current 4.52 percent of payroll based upon Class A-3 new entrants to about 7.98 percent of payroll based on Class A-5 new entrants. At the same time, approximately $2.1 billion in liabilities that were previously scheduled to be funded via UAL amortizations will now be funded by future employer normal cost payments, thereby decreasing the amount of annual funding required to amortize the UAL and causing SERS' funded status to increase by about 2.7 percent.

Due to expected increases in the employer normal cost rate (from about 7.98 percent of payroll initially to about 8.11 percent in fiscal 2051/2052, as discussed above), the gradual shifting from UAL amortization to future employer normal costs would continue over the projection period. With each passing year, the amount of liability shifted would be deemed to be a liability gain (and a decrement to the projected UAL), which would be recognized like other projected actuarial gains and losses, using 30-year, level-dollar amortization. This aspect, though a relatively minor refinement, is included in the hybrid DB plan funding projections attached.

Projection of Future Costs for HB 727, A06914

Based upon census data, asset data and actuarial assumptions underlying the SERS December 31, 2015 actuarial valuation (including an assumed investment return of 7.5 percent per year, compounded annually) and incorporating the proposed new hybrid plan design outlined above and reflecting funding provision changes as described, Hay Group has projected the future employer contributions required under HB 727, A06914.

For purposes of these projections—which include three separate, distinct, and mutually exclusive future payroll streams to which employer funding rates will be applied—we have segmented the aggregate expected future SERS payroll into three projected sub-payrolls:

- Legacy DB Payroll: This is the projected future payroll attributable to current SERS members, members who join SERS prior to the hybrid plan start date and Pennsylvania State Police and certain other hazardous duty employees (as identified specifically above) hired after the hybrid plan start date, because the State Police and certain other hazardous duty employees will retain their current SERS benefit design (with one minor exception, namely, new State Police officers on or after July 1, 2018 will have voluntary overtime pay in excess of 10% of their base salary excluded from their covered compensation). Future employer cost rates to be spread over (applied to) this future payroll stream would be:
    - Hybrid DB employer normal cost, and
    - UAL amortization.

- Hybrid DB/DC Payroll: This is the projected future payroll attributable to Class A-5 members, with the ACL and 25-year service limit applied. Future employer cost rates to be spread over (applied to) this future payroll stream would be:
    - Hybrid DB employer normal cost,
    - UAL amortization, and
    - Hybrid DC employer contributions on DB/DC payroll (based on the "below limit" rate of 0.5% of pay).

- Hybrid DC-Only Payroll: This is the projected future payroll attributable to Class A-5 participants recognizing (i) only pay in excess of the ACL during the first 25 years of credited service and (ii) all pay after 25 years of credited service. Future employer cost rates to be spread over (applied to) this future payroll stream would be:
    - UAL amortization, and
    - Hybrid DC employer contributions on DC-only payroll (based on the "above limit" rate of 4% of pay).

Based upon these projected payroll streams and the employer cost rates described above, the hybrid plan schedules attached project the following future employer costs/contributions by fiscal year:

- Expected Fiscal Year DB Contribution = [(Hybrid DB Employer Normal Cost Rate) X (Legacy DB Payroll + Hybrid DB/DC Payroll)] + [(UAL Amortization Rate) X (Legacy DB Payroll + Hybrid DB/DC Payroll + Hybrid DC-Only Payroll)]

- Expected Fiscal Year DC Contribution = [(Hybrid DC Employer "Below Limit" Contribution Rate) X (Hybrid DB/DC Payroll)] + [(Hybrid DC Employer "Above Limit" Contribution Rate) X (Hybrid DC-Only Payroll)]

Schedules Attached to This Cost Note

We have attached to this note the results of our funding projections, as follows:

- **HB 727, A06914 – Hybrid DB/DC Plan Design**: Hybrid Plan For Post-2017 New Entrants, Other than State Police and Certain Other Hazardous Duty Employees; Current SERS Benefit Provisions for Pre-2018 Hires; Continuing Current SERS Funding Provisions, Except as Stated in Items 1 and 2 on page 5: This table presents our projection of future SERS funding through fiscal year 2051/2052 and reflects the impact of (i) the proposed change to a hybrid plan design (as outlined in pages 1-4) for new entrants, other than State Police and certain hazardous duty employees, on or after January 1, 2018 and (ii) revisions, though limited, to current SERS funding provisions (as described in Items 1 and 2 on page 5).

- **Baseline Projection:** This table presents, for purposes of comparison, the results of our December 31, 2015 actuarial valuation and our projection of future funding through fiscal year 2051/2052, assuming no changes to any of the current SERS benefit provisions or funding methodologies.

Results in Brief

Despite the fact that the HB 727, A06914 hybrid DB + DC plan design generally provides less favorable overall retirement benefits than provided under current law (whereas somewhat more favorable benefits are provided for those at lower pay levels), due to the minimal DB plan employee contribution rate (0.75%) being proposed, if HB 727, A06914 would be enacted, it would result in significant additional cumulative budgetary costs. Specifically, the projections show estimated cumulative budgetary costs relative to the current SERS baseline through fiscal year 2051/2052 of approximately $6.4 billion.

Although this proposal results in significant additional costs, as described above, it is important to note the eventual "transfer of risk" that would occur if HB 727, A06914 were to become law. That is, the conversion of SERS from the pure DB system that it is today to a hybrid design with an ever-growing DC component, including participant-directed investments, would result in a gradual transfer of investment risk from SERS' employers to SERS' members (employees). By the end of the projection period (fiscal 2052), this DB/DC design would result in a substantial reduction of investment risk being borne by SERS employers, relative to the level of risk they currently bear.

Important Notes

Please note the following regarding our handling of the attached funding projections:

1. In performing our cost analyses and preparing this cost note and the attachments hereto, Hay Group has applied the proposed changes to current law as presented to us. We have not reviewed or opined on the legality of any aspect of this proposal.

2. Hay Group's past convention of showing results for employer cost projections such as these as percentages of payroll to two decimal places may be somewhat misleading. This level of precision is not really possible for estimates of this nature.

3. All of these projections are based upon the expectation that (i) for all years after 2015, the actual economic and demographic experience of SERS will be consistent with the underlying actuarial valuation assumptions and (ii) all employer contribution amounts shown in the "Expected FY Contribution" columns will, in fact, be contributed.

4. The attached projection schedules include a particularly important column of information that may warrant further explanation: "Cumulative (Savings) / Cost Relative to Baseline" shows the projected cumulative cost or savings in employer contributions (in millions of dollars) that would result under the HB 727, A06914 hybrid DB/DC plan design versus under the current law (Baseline). In general, projected future savings, if any, are not assumed to be used to accelerate the pay down of subsequent SERS funding costs/liabilities. That is, under Hay Group's cost projection approach, in future years in which we project savings (i.e., we project employer costs to fund the proposal under consideration to be lower than projected Baseline costs), we do not assume that such projected savings will be used to increase the levels of subsequent SERS employer contributions to fund SERS.

5. The cost estimates included herein were based upon our December 31, 2015 actuarial valuation results, including the underlying census data, assets and actuarial assumptions.

Actuarial Certification

To the best of our knowledge, the information we are presenting herein is complete and accurate and all costs and liabilities have been determined in conformance with generally accepted actuarial principles and on the basis of actuarial assumptions and methods which are reasonable (taking into account the past experience of SERS and reasonable expectations) and which represent our best estimate of anticipated experience under the plan.

The actuaries certifying to this valuation are members of the Society of Actuaries or other professional actuarial organizations, and meet the General Qualification Standards of the American Academy of Actuaries for purposes of issuing Statements of Actuarial Opinion.

Respectfully submitted,
Korn Ferry Hay Group, Inc.

By: ______	By: ______
Brent M. Mowery, F.S.A.	Craig R. Graby
Member American Academy of Actuaries	Member American Academy of Actuaries
Enrolled Actuary No. 14-3885	Enrolled Actuary No. 14-7319

May 13, 2016

SERS Projected Employer Contributions
(Based Upon Final December 31, 2015 Valuation)

5/13/2016

HB 727: A06914 - Exempting State Police and Other Hazardous Duty Employees - Hybrid DB/DC Plan Design - Compensation Limit Indexed by National Average Wage Index

Year	Investment Return	Fiscal Year	Floor Contribution	Projected DB Percent Contribution	Legacy DB Payroll ($ in millions)	Hybrid DB/DC Payroll ($ in millions)	Hybrid DC-Only Payroll ($ in millions)	Total Payroll ($ in millions)	Expected FY DB Contribution ($ in millions)	Expected FY DC Contribution ($ in millions)	Total DB+DC Contribution ($ in millions)	Total DB+DC Contribution as a % of DB+DC Pay	Annual (Savings) / Cost Relative to Baseline	Cumulative (Savings) / Cost Relative to Baseline	Funded Ratio (AV%)	UAL ($ in billions)	Funded Ratio (MV%)
2013	13.60%	2014/2015	5.00%	20.50	5,897.6	-	-	5,897.6	1,209.0	-	1,209.0	20.50	-	-	59.2	17.90	62.4
2014	6.40%	2015/2016	4.95%	25.00	6,021.7	-	-	6,021.7	1,505.4	-	1,505.4	25.00	-	-	59.4	18.17	61.1
2015	0.40%	2016/2017	4.52%	29.50	6,255.2	-	-	6,255.2	1,845.3	-	1,845.3	29.50	-	-	58.0	19.45	56.2
2016	7.50%	2017/2018	7.98%	31.92	6,307.0	131.7	7.3	6,446.0	2,057.0	1.0	2,058.0	31.93	14.7	14.7	61.5	17.33	59.4
2017	7.50%	2018/2019	7.98%	31.48	6,183.1	433.9	25.6	6,642.6	2,088.9	3.2	2,092.1	31.50	18.9	33.5	62.4	17.29	60.4
2018	7.50%	2019/2020	7.99%	31.42	6,068.3	729.3	47.5	6,845.2	2,146.9	5.5	2,152.4	31.44	23.1	56.7	62.5	17.54	61.5
2019	7.50%	2020/2021	7.99%	31.25	5,953.9	1,026.9	73.2	7,054.0	2,198.4	8.1	2,206.5	31.28	27.3	84.0	62.9	17.68	62.6
2020	7.50%	2021/2022	8.00%	30.64	5,837.2	1,331.1	100.8	7,269.1	2,219.1	10.7	2,229.8	30.67	31.5	115.4	64.0	17.43	63.8
2021	7.50%	2022/2023	8.00%	30.03	5,719.3	1,641.8	129.7	7,490.8	2,239.3	13.4	2,252.7	30.07	35.8	151.2	65.1	17.15	65.0
2022	7.50%	2023/2024	8.00%	29.43	5,593.1	1,965.9	160.3	7,719.3	2,258.9	16.2	2,275.1	29.47	40.3	191.6	66.3	16.83	66.2
2023	7.50%	2024/2025	8.01%	28.83	5,463.9	2,298.5	192.3	7,954.7	2,277.7	19.2	2,296.9	28.87	44.9	236.5	67.4	16.46	67.4
2024	7.50%	2025/2026	8.01%	28.24	5,334.2	2,637.6	225.5	8,197.3	2,296.5	22.2	2,318.7	28.29	49.5	286.0	68.6	16.06	68.6
2025	7.50%	2026/2027	8.01%	27.66	5,202.7	2,984.7	260.0	8,447.3	2,315.7	25.3	2,341.0	27.71	54.3	340.3	69.8	15.63	69.8
2026	7.50%	2027/2028	8.02%	27.10	5,073.4	3,336.1	295.5	8,705.0	2,335.5	28.5	2,364.0	27.16	59.3	399.6	71.1	15.16	71.1
2027	7.50%	2028/2029	8.02%	26.56	4,943.8	3,694.6	332.1	8,970.5	2,355.8	31.8	2,387.6	26.62	64.4	464.0	72.4	14.65	72.4
2028	7.50%	2029/2030	8.03%	26.03	4,807.7	4,066.3	370.1	9,244.1	2,376.6	35.1	2,411.7	26.09	69.4	533.4	73.7	14.11	73.7
2029	7.50%	2030/2031	8.03%	25.52	4,666.7	4,449.8	409.6	9,526.0	2,398.1	38.6	2,436.7	25.58	74.8	608.2	75.0	13.52	75.0
2030	7.50%	2031/2032	8.03%	25.02	4,520.3	4,845.7	450.6	9,816.6	2,420.3	42.3	2,462.6	25.09	80.4	688.6	76.4	12.89	76.4
2031	7.50%	2032/2033	8.04%	24.54	4,369.6	5,253.5	493.0	10,116.0	2,443.1	46.0	2,489.1	24.61	86.0	774.6	77.9	12.21	77.9
2032	7.50%	2033/2034	8.04%	24.08	4,213.5	5,674.6	536.4	10,424.5	2,466.6	49.8	2,516.4	24.14	91.8	866.4	79.4	11.48	79.4
2033	7.50%	2034/2035	8.05%	23.62	4,063.0	6,099.7	579.7	10,742.5	2,491.0	53.7	2,544.7	23.69	97.8	964.2	81.0	10.69	81.0
2034	7.50%	2035/2036	8.05%	23.18	3,917.1	6,530.1	622.9	11,070.1	2,516.3	57.6	2,573.8	23.25	104.1	1,068.2	82.6	9.84	82.6
2035	7.50%	2036/2037	8.05%	22.76	3,775.5	6,966.2	666.0	11,407.8	2,542.5	61.5	2,604.0	22.83	110.5	1,178.7	84.4	8.93	84.4
2036	7.50%	2037/2038	8.06%	24.09	3,634.4	7,412.2	709.1	11,755.7	2,775.1	65.4	2,840.5	24.16	322.6	1,501.3	86.3	7.94	86.3
2037	7.50%	2038/2039	8.06%	23.64	3,495.5	7,866.7	752.1	12,114.2	2,803.2	69.4	2,872.6	23.71	329.6	1,831.0	88.5	6.68	88.5
2038	7.50%	2039/2040	8.06%	23.20	3,359.6	8,329.1	795.0	12,483.7	2,832.2	73.4	2,905.6	23.28	336.6	2,167.6	91.0	5.32	91.0
2039	7.50%	2040/2041	8.07%	19.09	3,226.6	8,800.2	837.7	12,864.5	2,388.0	77.5	2,465.5	19.17	344.1	2,511.7	93.5	3.86	93.5
2040	7.50%	2041/2042	8.07%	16.10	3,096.3	9,258.4	902.2	13,256.8	2,062.1	82.4	2,144.5	16.18	350.8	2,862.5	95.4	2.76	95.4
2041	7.50%	2042/2043	8.08%	12.78	2,968.9	9,626.9	1,065.4	13,661.2	1,659.7	90.7	1,750.4	12.81	353.1	3,215.6	96.9	1.93	96.9
2042	7.50%	2043/2044	8.08%	10.71	2,844.7	9,913.3	1,319.8	14,077.8	1,401.2	102.4	1,503.6	10.68	351.7	3,567.3	97.6	1.47	97.6
2043	7.50%	2044/2045	8.08%	10.45	2,724.4	10,212.4	1,570.4	14,507.2	1,389.7	113.9	1,503.6	10.36	350.5	3,917.8	98.0	1.24	98.0
2044	7.50%	2045/2046	8.09%	10.13	2,609.2	10,524.7	1,815.8	14,949.7	1,368.1	125.3	1,493.4	9.99	349.9	4,267.6	98.4	1.02	98.4
2045	7.50%	2046/2047	8.09%	9.26	2,501.2	10,850.4	2,054.1	15,405.7	1,260.2	136.4	1,396.6	9.07	349.8	4,617.4	98.7	0.82	98.7
2046	7.50%	2047/2048	8.10%	9.12	2,400.4	11,192.3	2,282.9	15,875.5	1,262.7	147.3	1,410.0	8.88	353.8	4,971.2	98.9	0.74	98.9
2047	7.50%	2048/2049	8.10%	9.00	2,310.9	11,544.9	2,503.9	16,359.7	1,270.2	157.9	1,428.1	8.73	358.7	5,329.9	99.0	0.67	99.0
2048	7.50%	2049/2050	8.10%	8.74	2,233.9	11,909.9	2,714.9	16,858.7	1,254.0	168.1	1,422.1	8.44	364.3	5,694.2	99.1	0.61	99.1
2049	7.50%	2050/2051	8.11%	8.54	2,168.8	12,289.7	2,914.4	17,372.9	1,246.7	178.0	1,424.7	8.20	370.9	6,065.2	99.2	0.59	99.2
2050	7.50%	2051/2052	8.11%	8.52	2,115.3	12,685.6	3,101.9	17,902.8	1,273.1	187.5	1,460.6	8.16	378.5	6,443.7	99.2	0.60	99.2

SERS Projected Employer Contributions
(Based Upon Final December 31, 2015 Valuation)

5/11/2016

Baseline: December 31, 2015 Data and Assets; Current Entry Age Funding Method; Level Dollar Amortization; 5-Year Smoothing of Assets; 4.50% FY 16 Collar; 4.50% FY 17 Collar; 4.50% FY 18 Collar; 4.50% FY 19 Collar; 4.50% FY 20 Collar; 4.50% FY 21+ Collar; No Asset Fresh Start; Act 120 Benefit Provisions; 7.50% Liability Interest Rate Assumption; No Liability Fresh Start

Year	Investment Return	Fiscal Year	Ceiling Contribution	Floor Contribution	Projected Percent Contribution	Expected FY Payroll ($ in millions)	Expected FY Contribution ($ in millions)	(Savings) / Cost Relative to Current Law Contribution	GASB Compliant (Fiscal Year Contribution)	Funded Ratio (AV%)	UAL ($ in billions)	Funded Ratio (MV%)
2013	13.60%	2014/2015	NA	5.00%	20.50	5,897.6	1,209.0	-	N	59.2	17.90	62.4
2014	6.40%	2015/2016	NA	4.95%	25.00	6,021.7	1,505.4	-	Y	59.4	18.17	61.1
2015	0.40%	2016/2017	NA	4.52%	29.50	6,255.2	1,845.3	-	Y	58.0	19.45	56.2
2016	7.50%	2017/2018	NA	4.52%	31.70	6,446.0	2,043.3	-	Y	58.8	19.46	56.7
2017	7.50%	2018/2019	NA	4.52%	31.21	6,642.6	2,073.2	-	Y	59.6	19.42	57.7
2018	7.50%	2019/2020	NA	4.52%	31.11	6,845.2	2,129.3	-	Y	59.8	19.66	58.8
2019	7.50%	2020/2021	NA	4.52%	30.89	7,054.0	2,179.2	-	Y	60.2	19.79	60.0
2020	7.50%	2021/2022	NA	4.52%	30.24	7,269.1	2,198.3	-	Y	61.4	19.52	61.2
2021	7.50%	2022/2023	NA	4.52%	29.59	7,490.8	2,216.9	-	Y	62.6	19.22	62.5
2022	7.50%	2023/2024	NA	4.52%	28.95	7,719.3	2,234.8	-	Y	63.8	18.87	63.8
2023	7.50%	2024/2025	NA	4.52%	28.31	7,954.7	2,252.0	-	Y	65.1	18.48	65.0
2024	7.50%	2025/2026	NA	4.52%	27.68	8,197.3	2,269.2	-	Y	66.4	18.05	66.4
2025	7.50%	2026/2027	NA	4.52%	27.07	8,447.3	2,286.7	-	Y	67.7	17.58	67.7
2026	7.50%	2027/2028	NA	4.52%	26.48	8,705.0	2,304.7	-	Y	69.1	17.06	69.1
2027	7.50%	2028/2029	NA	4.52%	25.90	8,970.5	2,323.2	-	Y	70.5	16.51	70.5
2028	7.50%	2029/2030	NA	4.52%	25.34	9,244.1	2,342.3	-	Y	72.0	15.91	72.0
2029	7.50%	2030/2031	NA	4.52%	24.79	9,526.0	2,361.9	-	Y	73.5	15.26	73.5
2030	7.50%	2031/2032	NA	4.52%	24.27	9,816.6	2,382.2	-	Y	75.0	14.56	75.0
2031	7.50%	2032/2033	NA	4.52%	23.76	10,116.0	2,403.1	-	Y	76.7	13.80	76.7
2032	7.50%	2033/2034	NA	4.52%	23.26	10,424.5	2,424.6	-	Y	78.4	12.98	78.4
2033	7.50%	2034/2035	NA	4.52%	22.78	10,742.5	2,446.9	-	Y	80.2	12.09	80.2
2034	7.50%	2035/2036	NA	4.52%	22.31	11,070.1	2,469.8	-	Y	82.0	11.13	82.0
2035	7.50%	2036/2037	NA	4.52%	21.86	11,407.8	2,493.5	-	Y	84.0	10.09	84.0
2036	7.50%	2037/2038	NA	4.52%	21.42	11,755.7	2,517.9	-	Y	86.0	8.97	86.0
2037	7.50%	2038/2039	NA	4.52%	20.99	12,114.2	2,543.0	-	Y	88.1	7.77	88.1
2038	7.50%	2039/2040	NA	4.52%	20.58	12,483.7	2,569.0	-	Y	90.3	6.46	90.3
2039	7.50%	2040/2041	NA	4.52%	16.49	12,864.5	2,121.4	-	Y	92.5	5.06	92.5
2040	7.50%	2041/2042	NA	4.52%	13.53	13,256.8	1,793.7	-	Y	94.2	4.01	94.2
2041	7.50%	2042/2043	NA	4.52%	10.23	13,661.2	1,397.3	-	Y	95.4	3.24	95.4
2042	7.50%	2043/2044	NA	4.52%	8.18	14,077.8	1,151.9	-	Y	96.1	2.83	96.1
2043	7.50%	2044/2045	NA	4.52%	7.95	14,507.2	1,153.1	-	Y	96.5	2.65	96.5
2044	7.50%	2045/2046	NA	4.52%	7.65	14,949.7	1,143.5	-	Y	96.8	2.49	96.8
2045	7.50%	2046/2047	NA	4.52%	6.79	15,405.7	1,046.8	-	Y	97.0	2.34	97.0
2046	7.50%	2047/2048	NA	4.52%	6.65	15,875.5	1,056.2	-	Y	97.2	2.31	97.2
2047	7.50%	2048/2049	NA	4.52%	6.54	16,359.7	1,069.4	-	Y	97.3	2.29	97.3
2048	7.50%	2049/2050	NA	4.52%	6.27	16,858.7	1,057.8	-	Y	97.4	2.28	97.4
2049	7.50%	2050/2051	NA	4.52%	6.07	17,372.9	1,053.8	-	Y	97.4	2.31	97.4
2050	7.50%	2051/2052	NA	4.52%	6.04	17,902.8	1,082.1	-	Y	97.4	2.38	97.4

Pennsylvania State Employees' Retirement System (SERS)

Annual Annuity Estimates–Current Law Vs. HB 727, A06914 Hybrid Design

(See the following page for supporting details and related clarifications.)

Class AA, Category 0 - Assumed Retirement Age is 60 (or Age 65 for Class A5), Pay in Final Year is $50,000 NOTE: This First Table is Purely Hypothetical, Since Class AA Members With Age 60 Superannuation Will Not Be Joining the Proposed Hybrid Plan			
	10 Years of Service	20 Years of Service	30 Years of Service
Current Plan (2.5% Accrual Rate)	$11,818	$23,825	$36,104
HB 727, A06914 Hybrid: Hybrid DB (2% Accrual Rate), No Opt 4 Withdrawal + Hybrid DC Plan Annuity	11,173	22,902	31,912

Class A3, Category 0 - Assumed Retirement Age is 65, Pay in Final Year is $50,000			
	10 Years of Service	20 Years of Service	30 Years of Service
Current Plan	$9,455	$19,060	$28,884
HB 727, A06914 Hybrid: Hybrid DB + Hybrid DC Plan Annuity	11,173	22,902	31,912

Class A3, Category 1 - Assumed Retirement Age is 55 (or Age 65 for Class A5), Pay in Final Year is $50,000			
	10 Years of Service	20 Years of Service	30 Years of Service
Current Plan	$9,455	$19,060	$28,884
HB 727, A06914 Hybrid: Hybrid DB + Hybrid DC Plan Annuity	11,173	22,902	31,912

Judges - Assumed Retirement Age is 70, Pay in Final Year is $150,000			
	10 Years of Service	20 Years of Service	30 Years of Service
Current Plan (Assuming Class E-1)	$58,242	$101,923	$145,604
HB 727, A06914 (Assuming Class A-5): Hybrid DB + Hybrid DC Plan Annuity	23,347	47,605	70,038

State Police - Assumed Retirement Age is 55, Pay in Final Year is $50,000		
	20 Years of Service	25 Years of Service
Current Plan	$25,000	$37,500
EXEMPT from HB 727, A06914 Hybrid DB & Hybrid DC	25,000	37,500

Pennsylvania State Employees' Retirement System (SERS)

Annual Annuity Estimates--Current Law Vs. HB 727, A06914 Hybrid Design

Basis for Determination of Annual Annuity Estimates & Related Clarifications

- Pay in the final year before retirement was assumed to be $50,000 for all except Judges; Judges final year pay assumed to be $150,000. Pay was projected backward using valuation salary scale assumptions.
- Hybrid Defined Benefit (DB) Plan same as Current DB Plan, except that retirement covered compensation will be limited to a "DB Compensation Limit", as follows: DB Compensation Limit = $70,000 in 2018, adjusted annually thereafter by 3.9% per year
- Hybrid Defined Contribution (DC) Plan applies to compensation that exceeds the DB Compensation Limit.
- Contribution assumptions included:
    - Hybrid DB Plan: 0.75% employee contributions on pay up to the DB Compensation Limit for 25 years.
    - Hybrid DC Plan: (5.50% employee contributions and 0.5% employer contributions on pay up to the DB Compensation Limit for service less than 25 years) + (6.25% employee contributions and 4.00% employer contributions on pay above DB Compensation limit before 25 years and on all salary after attaining 25 years of service)

  Note: Under this HB 727, A06914 Hybrid Design, State Police officers are exempt (with respect to State Police service) and select other Hazardous Duty employees are exempt from both the Hybrid DB and the Hybrid DC Plans.
- It was assumed that annuities would become an available form of DC Plan distribution, and DC account balances were annuitized using the following conversion basis: 4% interest and RP-2014 unisex mortality.
- To determine how much the above annual annuities replace as a percentage of final pay, divide the benefit amount by the pay level assumed in the final year (either $50,000 or $150,000). This result is the replacement ratio, the portion of final income replaced by the plan benefit.
- Figures above are neither audited nor certified. Calculations reflect certain assumptions and are not based on any existing legislative language. Final actuarial results will vary from these estimates based on actual final legislative outcomes and underlying details.

Pennsylvania State Employees' Retirement System (SERS)

Annual Annuity Estimates–Current Law Vs. HB 727, A06914 Hybrid Design

(See the following page for supporting details and related clarifications.)

Class AA, Category 0 - Assumed Retirement Age is 60 (or Age 65 for Class A5), Pay in Final Year is $100,000 NOTE: This First Table is Purely Hypothetical, Since Class AA Members With Age 60 Superannuation Will Not Be Joining the Proposed Hybrid Plan			
	10 Years of Service	20 Years of Service	30 Years of Service
Current Plan (2.5% Accrual Rate)	$23,637	$47,650	$72,209
HB 727, A06914 Hybrid: Hybrid DB (2% Accrual Rate), No Opt 4 Withdrawal + Hybrid DC Plan Annuity	18,163	36,679	51,600

Class A3, Category 0 - Assumed Retirement Age is 65, Pay in Final Year is $100,000			
	10 Years of Service	20 Years of Service	30 Years of Service
Current Plan	$18,909	$38,120	$57,767
HB 727, A06914 Hybrid: Hybrid DB + Hybrid DC Plan Annuity	18,163	36,679	51,600

Class A3, Category 1 - Assumed Retirement Age is 55 (or Age 65 for Class A5), Pay in Final Year is $100,000			
	10 Years of Service	20 Years of Service	30 Years of Service
Current Plan	$18,909	$38,120	$57,767
HB 727, A06914 Hybrid: Hybrid DB + Hybrid DC Plan Annuity	18,163	36,679	51,600

Judges - Assumed Retirement Age is 70, Pay in Final Year is $150,000			
	10 Years of Service	20 Years of Service	30 Years of Service
Current Plan (Assuming Class E-1)	$58,242	$101,923	$145,604
HB 727, A06914 (Assuming Class A-5): Hybrid DB + Hybrid DC Plan Annuity	23,347	47,605	70,038

State Police - Assumed Retirement Age is 55, Pay in Final Year is $100,000		
	20 Years of Service	25 Years of Service
Current Plan	$50,000	$75,000
EXEMPT from HB 727, A06914 Hybrid DB & Hybrid DC	50,000	75,000

Pennsylvania State Employees' Retirement System (SERS)

Annual Annuity Estimates--Current Law Vs. HB 727, A06914 Hybrid Design

Basis for Determination of Annual Annuity Estimates & Related Clarifications

- Pay in the final year before retirement was assumed to be $100,000 for all except Judges; Judges final year pay assumed to be $150,000. Pay was projected backward using valuation salary scale assumptions.
- Hybrid Defined Benefit (DB) Plan same as Current DB Plan, except that retirement covered compensation will be limited to a "DB Compensation Limit", as follows:
  DB Compensation Limit = $70,000 in 2018, adjusted annually thereafter by 3.9% per year
- Hybrid Defined Contribution (DC) Plan applies to compensation that exceeds the DB Compensation Limit.
- Contribution assumptions included:
  - <u>Hybrid DB Plan:</u> 0.75% employee contributions on pay up to the DB Compensation Limit for 25 years.
  - <u>Hybrid DC Plan:</u> (5.50% employee contributions and 0.5% employer contributions on pay up to the DB Compensation Limit for service less than 25 years) + (6.25% employee contributions and 4.00% employer contributions on pay above DB Compensation limit before 25 years and on all salary after attaining 25 years of service)

  <u>Note:</u> Under this HB 727, A06914 Hybrid Design, State Police officers are exempt (with respect to State Police service) and select other Hazardous Duty employees are exempt from both the Hybrid DB and the Hybrid DC Plans.
- Annual investment return assumption: DC – 6% per year
- It was assumed that annuities would become an available form of DC Plan distribution, and DC account balances were annuitized using the following conversion basis: 4% interest and RP-2014 unisex mortality.
- To determine how much the above annual annuities replace as a percentage of final pay, divide the benefit amount by the pay level assumed in the final year (either $100,000 or $150,000). This result is the <u>replacement ratio</u>, the portion of final income replaced by the plan benefit.
- Figures above are neither audited nor certified. Calculations reflect certain assumptions and are not based on any existing legislative language. Final actuarial results will vary from these estimates based on actual final legislative outcomes and underlying details.

Pennsylvania State Employees' Retirement System (SERS)

Annual Annuity Estimates–Current Law Vs. HB 727, A06914 Hybrid Design

(See the following page for supporting details and related clarifications.)

Class AA, Category 0 - Assumed Retirement Age is 60 (or Age 65 for Class A5), Pay in Final Year is $150,000 NOTE: This First Table is Purely Hypothetical, Since Class AA Members With Age 60 Superannuation Will Not Be Joining the Proposed Hybrid Plan			
	10 Years of Service	20 Years of Service	30 Years of Service
Current Plan (2.5% Accrual Rate)	$35,455	$71,474	$108,313
HB 727, A06914 Hybrid: Hybrid DB (2% Accrual Rate), No Opt 4 Withdrawal + Hybrid DC Plan Annuity	21,983	44,758	65,093

Class A3, Category 0 - Assumed Retirement Age is 65, Pay in Final Year is $150,000			
	10 Years of Service	20 Years of Service	30 Years of Service
Current Plan	$28,364	$57,180	$86,651
HB 727, A06914 Hybrid: Hybrid DB + Hybrid DC Plan Annuity	21,983	44,758	65,093

Class A3, Category 1 - Assumed Retirement Age is 55 (or Age 65 for Class A5), Pay in Final Year is $150,000			
	10 Years of Service	20 Years of Service	30 Years of Service
Current Plan	$28,364	$57,180	$86,651
HB 727, A06914 Hybrid: Hybrid DB + Hybrid DC Plan Annuity	21,983	44,758	65,093

Judges - Assumed Retirement Age is 70, Pay in Final Year is $150,000			
	10 Years of Service	20 Years of Service	30 Years of Service
Current Plan (Assuming Class E-1)	$58,242	$101,923	$145,604
HB 727, A06914 (Assuming Class A-5): Hybrid DB + Hybrid DC Plan Annuity	23,347	47,605	70,038

State Police - Assumed Retirement Age is 55, Pay in Final Year is $150,000		
	20 Years of Service	25 Years of Service
Current Plan	$75,000	$112,500
EXEMPT from HB 727, A06914 Hybrid DB & Hybrid DC	75,000	112,500

Pennsylvania State Employees' Retirement System (SERS)

Annual Annuity Estimates--Current Law Vs. HB 727, A06914 Hybrid Design

Basis for Determination of Annual Annuity Estimates & Related Clarifications

- Pay in the final year before retirement was assumed to be $150,000 for all. Pay was projected backward using valuation salary scale assumptions.
- Hybrid Defined Benefit (DB) Plan same as Current DB Plan, except that retirement covered compensation will be limited to a "DB Compensation Limit", as follows:
  DB Compensation Limit = $70,000 in 2018, adjusted annually thereafter by 3.9% per year
- Hybrid Defined Contribution (DC) Plan applies to compensation that exceeds the DB Compensation Limit.
- Contribution assumptions included:
  - Hybrid DB Plan: 0.75% employee contributions on pay up to the DB Compensation Limit for 25 years.
  - Hybrid DC Plan: (5.50% employee contributions and 0.5% employer contributions on pay up to the DB Compensation Limit for service less than 25 years) + (6.25% employee contributions and 4.00% employer contributions on pay above DB Compensation limit before 25 years and on all salary after attaining 25 years of service)

  Note: Under this HB 727, A06914 Hybrid Design, State Police officers are exempt (with respect to State Police service) and select other Hazardous Duty employees are exempt from both the Hybrid DB and the Hybrid DC Plans.
- Annual investment return assumption: DC – 6% per year
- It was assumed that annuities would become an available form of DC Plan distribution, and DC account balances were annuitized using the following conversion basis: 4% interest and RP-2014 unisex mortality.
- To determine how much the above annual annuities replace as a percentage of final pay, divide the benefit amount by the pay level assumed in the final year ($150,000). This result is the replacement ratio, the portion of final income replaced by the plan benefit.
- Figures above are neither audited nor certified. Calculations reflect certain assumptions and are not based on any existing legislative language. Final actuarial results will vary from these estimates based on actual final legislative outcomes and underlying details.