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Indiana Public Retirement System

Teachers' Retirement Fund
Pre-1996 Account

Actuarial Valuation as of
June 30, 2019

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The experience and dedication you deserve

November 6, 2019

Board of Trustees
Indiana Public Retirement System
1 North Capitol, Suite 001
Indianapolis, IN 46204

Dear Members of the Board:

At your request, we performed an actuarial valuation of the Teachers' Retirement Fund Pre-1996 Account (TRF Pre-'96) as of June 30, 2019, for the purpose of estimating the actuarial required contribution for the plan year ending June 30, 2021. The major findings of the valuation are contained in this report, which reflects the benefit and funding provisions in place on June 30, 2019, including the expansion of the current pre-retirement death benefit eligibility for members with at least 10 years of service as passed in House Enrolled Act No. 1059. There were no changes to the actuarial methods and assumptions. The Board revised the funding policy as part of accepting the June 30, 2018 valuation report, so this report presents the results under that policy.

In preparing our report, we relied, without audit, on information (some oral and some in writing) supplied by Indiana Public Retirement System (INPRS) staff. This information includes, but is not limited to, statutory provisions, member data and financial information. We did review the data to ensure that it was reasonably consistent and comparable with data from prior years. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete, our results may be different and our calculations may need to be revised.

We certify that all costs and liabilities for TRF Pre-'96 have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the plan and reasonable expectations); and which, in combination, offer the best estimate of anticipated experience affecting the plan. Nevertheless, the emerging costs will vary from those presented in this report to the extent actual experience differs from that projected by the actuarial assumptions.

While the assumptions were generally developed by the prior actuary, we believe they are reasonable. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in Appendix C. Specifically, we presented the proposed assumptions for the 2019 valuations to the Board on February 22, 2019, and the Board subsequently adopted their use. These assumptions are applicable to both the funding and Governmental Accounting Standards Board (GASB) Statement Number 67 valuation calculations, unless otherwise noted.

3802 Raynor Pkwy, Suite 202, Bellevue, NE 68123
Phone (402) 905-4461 • Fax (402) 905-4464
www.CavMacConsulting.com
Offices in Kennesaw, GA • Bellevue, NE

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements.

We prepared a Risk Report for the INPRS Board in August 2019 that contains information which is relevant to TRF Pre-'96 and should be considered part of this valuation report. Although the report was prepared using the data, methods, and assumptions of the June 30, 2018 valuation report, it is our professional opinion that the results of the risk report are substantially applicable to the June 30, 2019 valuation report as well.

Actuarial computations presented in this report are for purposes of determining the funding rates for the Plan. The calculations in the enclosed report have been made on a basis consistent with our understanding of the Plan's funding requirements and goals as adopted by the Board. It should be noted that these calculations were prepared before the Board adopted a revised funding policy at the October 26, 2018 Board meeting. However, since the results presented in this report are shown on both the old and new funding policy basis, there is no need for any revised presentation of the funding requirements. Additionally, we have included actuarial computations for use in preparing certain reporting and disclosure requirements under Governmental Accounting Standards Board Statements Number 67 and Number 68. Determinations for purposes other than meeting these funding and disclosure requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.

The Comprehensive Annual Financial Report (CAFR) for INPRS contains several exhibits that disclose the actuarial position of the System. This report provides data and tables that we prepared for use in the following sections of the CAFR:

Financial Section:

- Note 1 - Tables of Plan Membership
- Note 7 - Net Pension Liability and Actuarial Information - Defined Benefit Plans
- Schedule of Changes in Net Pension Liability and Plan Fiduciary Net Position
- Schedule of Contributions
- Schedule of Notes to Required Supplementary Information

Actuarial Section:

- Summary of INPRS Funded Status (Included in the Executive Summary)
- Historical Summary of Actuarial Valuation Results by Retirement Plan
- Summary of Actuarial Assumptions, Methods and Plan Provisions
- Analysis of Financial Experience (Included in the Unfunded Actuarial Accrued Liability Reconciliation)
- Solvency Test
- Schedule of Active Member Valuation Data
- Schedule of Retirants and Beneficiaries

Statistical Section:

- Membership Data Summary
- Ratio of Active Members to Annuitants
- Schedule of Benefit Recipients by Type of Benefit Option
- Schedule of Average Benefit Payments

The consultants who worked on this assignment are pension actuaries. Cavanaugh Macdonald's advice is not intended to be a substitute for qualified legal or accounting counsel.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and the assumptions and methods used meet the guidance provided in the applicable Actuarial Standards of Practice. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

The calculations were completed in compliance with applicable law and the calculations for GASB disclosure, in our opinion, meet the requirements of GASB 67 and GASB 68. We are available to answer any questions on the material contained in the report, or to provide explanations or further details as may be appropriate.

We respectfully submit the following report and look forward to discussing it with you.

Sincerely,

Brent A. Banister

Patrice Beckham

Brent A. Banister Ph.D., FSA, EA, MAAA, FCA
Chief Actuary

Patrice A. Beckham, FSA, EA, FCA, MAAA
Principal and Consulting Actuary

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This report presents the results of the June 30, 2019 actuarial valuation of the Teachers' Retirement Fund Pre-1996 Account (TRF Pre-'96). The primary purposes of performing this actuarial valuation are to:

- Determine the level of contributions for the plan year ending June 30, 2021 that will be sufficient to meet the funding policy set out by the Board to comply with Indiana statutes.
- Disclose asset and liability measurements as well as the current funded status of the plan on the valuation date.
- Compare actual and expected experience under the plan during the plan year ending June 30, 2019.
- Analyze and report on trends in plan contributions, assets and liabilities over the past several years.

VALUATION RESULTS

Legislation was passed through House Enrolled Act No. 1059 to expand the current pre-retirement death benefit to apply to all active and inactive members who have at least 10 years of service, the current general vesting requirement. This provides new coverage for active and inactive members with 10 to 15 years of service (before age 65) and inactive members who die prior to age 50. Because most members have more than 15 years of service, this change had a negligible impact on the Fund. There were no changes to the actuarial methods and assumptions or the funding policy between the June 30, 2018 and June 30, 2019 valuations. However, it should be noted that the Board updated the funding policy as part of accepting the June 30, 2018 valuation, and so this report is the first report to be prepared under that funding policy.

The actuarial valuation results provide a "snapshot" view of the plan's financial condition on June 30, 2019. The plan's UAAL changed from $10.9 billion last year to $10.7 billion this year and the funded ratio increased from 25.5% to 25.7%, remaining relatively steady year over year.

A summary of the key results from the June 30, 2019 actuarial valuation is shown in the following table. Further detail on the valuation results can be found in the following sections of this Executive Summary. In keeping with the funding policy adopted by the Board at its October 26, 2018 meeting, the results shown herein reflect the funding approach set out in IC-5.10.4-2-5 that the Indiana Legislature has followed in actually appropriating funds.

Valuation Results	June 30, 2018	June 30, 2019
Unfunded Actuarial Accrued Liability	$ 10,861,866,130	$ 10,694,953,003
Funded Ratio (Actuarial Assets)	25.52%	25.67%
Normal Cost	4.75%	4.75%
Actuarially Determined Contribution Rate	118.85%	134.79%
Scheduled Appropriation	$ 892,200,000	$ 919,000,000

Numerous components, as examined in the following discussion, contributed to the change in the plan's assets, liabilities, and actuarial determined contribution rate between June 30, 2018 and June 30, 2019.

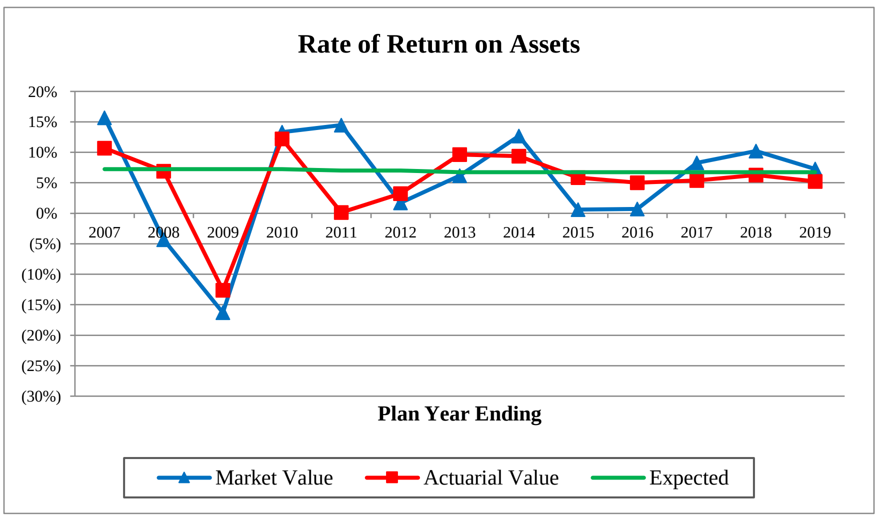
ASSETS

As of June 30, 2019, the plan had net assets of $3.759 billion, when measured on a market value basis. This was an increase of $48 million from the prior year.

The market value of assets is not used directly in the calculation of the unfunded actuarial accrued liability and the actuarial determined contribution. An asset valuation method, which smoothes the effect of market fluctuations, is applied to determine the value of assets used in the valuation. The resulting amount is called the actuarial value of assets. In this year's valuation, the actuarial value of assets is $3.694 billion, a decrease of $27 million from the prior year. The components of change in the asset values are shown in the following table:

		Market Value		Actuarial Value
Net Assets, June 30, 2018	$	3,711,346,539	$	3,721,322,903
- Receipts	+	949,252,121	+	949,252,121
- Expenditures, Net of Administrative Expenses	-	1,165,133,828	-	1,165,133,828
- Net Investment Income	+	263,680,350	+	188,769,905
Net Assets, June 30, 2019	$	3,759,145,182	$	3,694,211,101
Estimated Rate of Return, Net of Expenses		7.3%		5.2%

The estimated rate of return on the actuarial value of assets was 5.2%, which was lower than the 6.75% investment return assumption applicable for the year ended June 30, 2019. As a result, there was an experience loss on assets of $55 million. The estimated investment return on the market value of assets for FY 2019 of 7.3% resulted in a change in the deferred investment experience from a net deferred investment loss of $10 million in last year's valuation to a net deferred investment gain of $65 million in the current valuation. See Tables 1 through 4 of this report for detailed information on the market and actuarial value of assets.



The rate of return of the actuarial value of assets has been less volatile than the market value return, illustrating the benefits of using an asset smoothing method.

LIABILITIES

The actuarial accrued liability is that portion of the present value of future benefits that is allocated to past service. The remaining portion will be paid by future normal costs. The difference between this liability and the actuarial value of assets as of the valuation date is called the unfunded actuarial accrued liability (UAAL). The dollar amount of unfunded actuarial accrued liability is reduced if the contributions to the plan exceed the normal cost for the year plus interest on the prior year's UAAL.

The unfunded actuarial accrued liability, including expected future COLAs, is shown as of June 30, 2019 in the following table:

	Market Value	Actuarial Value
Actuarial Accrued Liability	$ 14,389,164,104	$ 14,389,164,104
Value of Assets	3,759,145,182	3,694,211,101
Unfunded Actuarial Accrued Liability	$ 10,630,018,922	$ 10,694,953,003
Funded Ratio	26.12%	25.67%

See Table 5 of this report for the development of the unfunded actuarial accrued liability.

The net change in the total UAAL from June 30, 2018 to June 30, 2019 was a decrease of $167 million. The components of the change in the base UAAL are quantified in Table 7 of this report. See Table 8 and Table 9 of this report for a breakdown of the components of experience gains/losses for greater detail.

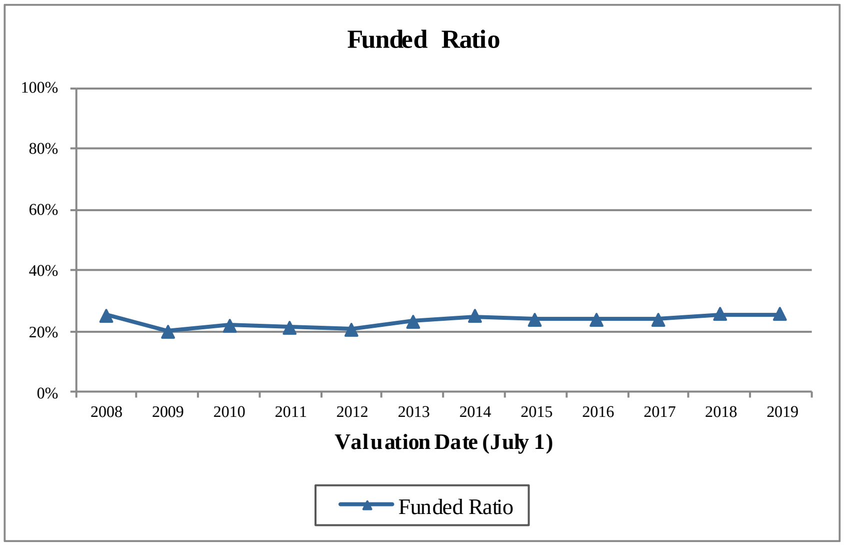
An evaluation of the UAAL on a pure dollar basis may not provide a complete analysis since only the difference between the assets and liabilities (which are both large numbers) is reflected. Another way to evaluate the UAAL and the progress made in its funding is to track the funded ratio, the ratio of the actuarial value of assets to the actuarial accrued liability. The funded status information, which is based on the actuarial value of assets, is shown below (in billions).

	6/30/2015	6/30/2016	6/30/2017	6/30/2018	6/30/2019
Funded Ratio	24.0%	24.0%	23.9%	25.5%	25.7%
UAAL (in billions)	$11.8	$11.8	$11.8	$10.9	$10.7

Note: Results before 2018 restated to exclude the DC assets in the funded ratio calculation.

Note that the funded ratio does not indicate whether or not the plan assets are sufficient to settle benefits earned to date. The funded ratio, by itself, also may not be indicative of future funding requirements. In addition, if the funded ratios were shown using the market value of assets, the results would differ.

The funded ratio over a longer period of years is shown in the following graph. Because the Pre-1996 Account is intended to be funded on a "pay-as-you-go" basis, there is no expectation that the funded ratio improve significantly for many years.



Note: Funded ratios exclude DC account balances.

ACTUARIALLY DETERMINED CONTRIBUTION AMOUNT

The Plan's actuarially determined contribution is based on the approach set out in IC-5.10.4-2-5 that the Indiana Legislature has followed in actually appropriating funds. The basic contribution is the lesser of 3% above the prior year's basic contribution and the anticipated benefit payments for the year. However, the contributed funds should not result in the funded ratio exceeding 100%. For fiscal years 2020 and 2021, the State will also contribute funds to pay for the scheduled 13th checks.

In addition to the structure above that is designed to fund the guaranteed base benefit, the Board is responsible for determining the allocation of lottery proceeds to fund future COLAs and/or 13th checks. Because there are five plans that must, by law, provide the same COLA or 13th check each year, the funding strategy needs to consider the overall funding needs of the System as well as the specific Fund. The long-term assumption is that a COLA of 0.4% will be granted starting in 2022, 0.5% starting in 2034, and then 0.6% in 2039 and beyond. Considering the biennial budgeting cycle in Indiana, the near-term goal is to accumulate funds by June 30, 2021 to fund the two COLAs in the following biennium (January, 2022 and January, 2023). The $30 million annual allocation from lottery proceeds is expected to provide the needed funds for the next biennium and allow for a sufficient reserve to provide the accumulations in subsequent biennial periods. See Table 11 for further details.

See Table 12 of this report for the detailed development of the contribution amounts which are summarized in the following table:

	June 30, 2018	June 30, 2019
Normal Cost	4.75%	4.75%
Scheduled Appropriation	$ 892,200,000	$ 919,000,000
Estimated Payroll	$ 750,690,959	$ 681,805,830
Actuarially Determined Contribution Rate	118.85%	134.79%
Lottery Proceeds Needed for Anticipated COLA	$ 23,502,683	$ 16,589,976

The actuarial required contribution, based on the funding policy, is expected to increase 3% for the next fiscal year. In addition, the State will be adding funds to pay for the scheduled 13th checks to be paid in late 2019 and 2020.

SUMMARY OF PRINCIPAL RESULTS

	June 30, 2017	June 30, 2018	June 30, 2019
MEMBERSHIP			
Active Members	13,128	11,710	10,497
Retired Members and Beneficiaries	53,240	53,227	53,498
Inactive Vested Members	2,504	2,635	2,382
Total Members	68,872	67,572	66,377
Projected Annual Salaries of Active Members	$ 831,100,000	$ 750,690,959	$ 681,805,830
Annual Retirement Payments for Retired Members, Disabled Members and Beneficiaries	$ 1,106,961,432	$ 1,117,463,235	$ 1,133,527,800
ASSETS AND LIABILITIES			
Net Assets			
Market Value of Assets (MVA)	$ 4,817,629,523	$ 3,711,346,539	$ 3,759,145,182
Actuarial Value of Assets (AVA)	4,951,100,101	3,721,322,903	3,694,211,101
Actuarial Accrued Liability (AAL)	16,736,769,005	14,583,189,033	14,389,164,104
Unfunded Actuarial Accrued Liability (UAAL): AAL - AVA	$ 11,785,668,904	$ 10,861,866,130	$ 10,694,953,003
Funded Ratios			
AVA / AAL	29.58%	25.52%	25.67%
MVA / AAL	28.78%	25.45%	26.12%
CONTRIBUTIONS			
Normal Cost	5.37%	4.75%	4.75%
Amortization of UAAL	378.28%		
Actuarially Determined Contribution Rate	383.65%	118.85%	134.79%
Estimated Contribution Amount	$ 3,188,508,363	$ 892,200,000	$ 919,000,000

Note: Liability and funded ratio results for 2018 and 2019 include both the base benefits and the supplemental benefits. These two years also reflect the updated funding policy adopted by the Board in October 2018.

This report presents the actuarial valuation results of the Teachers' Retirement Fund Pre-1996 Account as of June 30, 2019. This valuation was prepared at the request of the Indiana Public Retirement System.

Please pay particular attention to our actuarial certification letter, where the guidelines employed in the preparation of this report are outlined. We also comment on the sources and reliability of both the data and the actuarial assumptions upon which our findings are based. Those comments are the basis for our certification that this report is complete and accurate to the best of our knowledge and belief.

A summary of the findings which result from this valuation is presented in the previous section. Section 3 describes the assets and investment experience of the plan. Sections 4 and 5 describe how the obligations of the plan are to be met under the actuarial cost method in use. Section 6 provides information required by the Governmental Accounting Standards Board (GASB) for reporting and disclosure under GASB 67 and GASB 68.

This report includes several appendices:

- Appendix A — Schedules of valuation data classified by various categories of members.
- Appendix B — A summary of the current benefit structure, as determined by the provisions of governing law on June 30, 2019.
- Appendix C — A summary of the actuarial methods and assumptions used to estimate liabilities and determine contribution rates.
- Appendix D — A glossary of actuarial terms.

In many respects, an actuarial valuation can be thought of as an inventory process. The inventory is taken as of the actuarial valuation date, which for this valuation is June 30, 2019. On that date, the assets available for the payment of benefits are appraised. The assets are compared with the liabilities of the plan, which are generally in excess of assets. The actuarial process then leads to a method of determining the contributions needed by members and the employer in the future to balance the plan assets and liabilities.

Market Value of Assets

The current market value represents the "snapshot" or "cash-out" value of plan assets as of the valuation date. In addition, the market value of assets provides a basis for measuring investment performance from time to time.

Table 1 summarizes the changes in the market value of assets for the last two years for the base benefits, whereas Table 2 shows the changes for the supplemental benefit reserve account. Table 14 (in the GASB section) provides detail regarding the allocation of investments in the trust.

Actuarial Value of Assets

The market value of assets, representing a "cash-out" value of plan assets, may not be the best measure of the plan's ongoing ability to meet its obligations. To arrive at a suitable value of assets for the actuarial valuation, a technique for determining the actuarial value of assets is used which dampens swings in the market value while still indirectly recognizing market values. Under the asset smoothing methodology, the difference between the actual and assumed investment return on the market value of assets is recognized evenly over a five-year period.

Table 3 shows the development of the actuarial value of assets (AVA) as of the valuation date for the base benefits and Table 4 shows the information for the supplemental benefits.

TABLE 1

DEVELOPMENT OF MARKET VALUE OF ASSETS
(Base Benefits)

	June 30, 2018	June 30, 2019
1. Market Value of Assets, Beginning of Year	$ 4,817,629,523	$ 3,711,346,539
2. Receipts		
a. Member (Includes Purchased Service) [1]	$ 12,765,451	$ 36,437
b. Employer (Includes Purchased Service) [2]	4,168,409	3,504,801
c. Non-Employer Entity Contributions	917,900,000	913,900,000
d. Member Reassignment Transfers	1,428,141	1,493,825
e. Miscellaneous Income	228,825	317,058
f. Total	$ 936,490,826	$ 919,252,121
3. Expenditures		
a. Benefit Payments	$ 1,249,120,312	$ 1,165,133,828
b. Refund of Contributions	3,403,651	0
c. Administrative Expense	5,385,350	5,329,271
d. Transfer to Defined Contribution	1,205,276,351	0
e. Miscellaneous Expenditures	115,773	0
f. Total	$ 2,463,301,437	$ 1,170,463,099
4. Investment Return		
a. Investment Income	$ 420,005,967	$ 266,773,770
b. Securities Lending Income	521,660	319,656
c. Total	$ 420,527,627	$ 267,093,426
5. Market Value of Assets, End of Year: (1) + (2f) - (3f) + (4c)	$ 3,711,346,539	$ 3,727,228,987
6. Rate of Return on Market Value of Assets, Net of Expenses [3]	10.23%	7.29%

[1] Includes $0 of member service purchases during fiscal year 2018 and $36,437 of employer service purchases during fiscal year 2019.
[2] Includes $24,517 of employer service purchases during fiscal year 2018 and $0 of employer service purchases during fiscal year 2019.
[3] Based on individual fund experience. Assumes cash flows occur at mid-year.

TABLE 2

DEVELOPMENT OF MARKET VALUE OF ASSETS
(Supplemental Benefits)

	June 30, 2018	June 30, 2019
1. Market Value of Assets, Beginning of Year	$ 0	$ 0
2. Receipts		
a. Employer Surcharge	$ 0	$ 0
b. Lottery Allocation	0	30,000,000
c. Miscellaneous	0	0
d. Total	$ 0	$ 30,000,000
3. Expenditures		
a. Benefit Payments	$ 0	$ 0
b. Administrative Expense	0	0
c. Miscellaneous Expenditures	0	0
d. Total	$ 0	$ 0
4. Investment Return		
a. Investment Income	$ 0	$ 1,915,424
b. Securities Lending Income	0	771
c. Total Investment Return	$ 0	$ 1,916,195
5. Market Value of Assets, End of Year: (1) + (2d) - (3d) + (4c)	$ 0	$ 31,916,195
6. Rate of Return on Market Value of Assets, Net of Expenses [1]	N/A	12.77%

[1] Based on individual fund experience. Assumes cash flows occur at mid-year.

TABLE 3

DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS
(Base Benefits)

					For Plan Year Ending June 30, 2019
1. Market Value, as of June 30, 2018				$	3,711,346,539
2. Receipts [1]				$	919,252,121
3. Expenditures, Net of Administrative Expenses [2]				$	(1,165,133,828)
4. Expected Return on Assets [3]				$	242,217,384
5. Expected Market Value as of June 30, 2019: (1) + (2) + (3) + (4)				$	3,707,682,216
6. Actual Market Value as of June 30, 2019				$	3,727,228,987
7. Year end 2019 asset gain/(loss): (6) - (5)				$	19,546,771
8. Deferred Investment Gains and Losses					
Year Ended June 30:		Gain/(Loss)	Factor		Deferred Amount
a. 2016	$	(208,900,691)	20%	$	(41,780,138)
b. 2017		53,214,906	40%		21,285,962
c. 2018		115,113,140	60%		69,067,884
d. 2019		19,546,771	80%		15,637,417
e. Total				$	64,211,125
9. Initial Actuarial Value as of June 30, 2019: (6) - (8e)				$	3,663,017,862
10. Constraining Values					
a. 80% of Market Value: (6) x 0.8				$	2,981,783,190
b. 120% of Market Value: (6) x 1.2				$	4,472,674,784
11. Actuarial Value as of June 30, 2019				$	3,663,017,862
12. Actuarial Rate of Return, Net of Expenses [4]					5.21%
13. Actuarial Value of Assets as a Percent of Market Value: (11) / (6)					98.3%
14. Actuarial Value of Assets					
a. Base Benefits				$	3,663,017,862
b. Supplemental Benefits				$	31,193,239
c. Total				$	3,694,211,101

[1] Includes Employer Contributions, Employee Service Purchases, and Miscellaneous Receipts.
[2] Includes DB Benefit Payments, Member Reassignment Transfers, and Miscellaneous Expenses.
[3] Assumes cash flows occur at mid-year and a return assumption of 6.75%.
[4] Assumes cash flows occur at mid-year.

TABLE 4

DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS
(Supplemental Benefits)

		For Plan Year Ending June 30, 2019
1. Market Value, as of June 30, 2018	$	0
2. Receipts	$	30,000,000
3. Expenditures, Net of Administrative Expenses	$	0
4. Expected Return on Assets [1]	$	1,012,500
5. Expected Market Value as of June 30, 2019: (1) + (2) + (3) + (4)	$	31,012,500
6. Actual Market Value as of June 30, 2019	$	31,916,195
7. Year end 2019 asset gain/(loss): (6) - (5)	$	903,695

8. Deferred Investment Gains and Losses

	Year Ended June 30:		Gain/(Loss)	Factor		Deferred Amount
a.	2016	$	0	20%	$	0
b.	2017		0	40%		0
c.	2018		0	60%		0
d.	2019		903,695	80%		722,956
e.	Total				$	722,956

9. Initial Actuarial Value as of June 30, 2019: (6) - (8e)	$	31,193,239
10. Constraining Values		
a. 80% of Market Value: (6) x 0.8	$	25,532,956
b. 120% of Market Value: (6) x 1.2	$	38,299,434
11. Actuarial Value as of June 30, 2019	$	31,193,239
12. Actuarial Rate of Return, Net of Expenses [2]		7.95%
13. Actuarial Value of Assets as a Percent of Market Value: (11) / (6)		97.7%

[1] Assumes cash flows occur at mid-year and a return assumption of 6.75%.
[2] Assumes cash flows occur at mid-year.

In the previous section, an actuarial valuation was compared with an inventory process, and an analysis was given of the inventory of assets of the Teachers' Retirement Fund Pre-1996 Account as of the valuation date, June 30, 2018. In this section, the discussion will focus on the commitments (future benefit payments) of the plan, which are referred to as its liabilities.

The liability calculations for the June 30, 2019 Teachers' Retirement Fund Pre-1996 Account valuation are based on census data collected as of June 30, 2018. Standard actuarial techniques are used to adjust these results from June 30, 2018 to June 30, 2019. While these roll-forward techniques are based on the expectation that all actuarial assumptions are met during the intervening year, there will, of course, be many of the assumptions that are not met exactly. In general, this does not materially affect the resulting calculations or conclusions in this report. Should there be a year in which significant events that would affect the results occur, we would make adjustments in the roll-forward methods to compensate.

All liabilities reflect the benefit provisions and actuarial assumptions in place as of June 30, 2019.

Actuarial Accrued Liability

A fundamental principle in financing the liabilities of a retirement program is that the cost of its benefits should be related to the period in which benefits are earned, rather than to the period of benefit distribution. An actuarial cost method is a mathematical technique that allocates the present value of future benefits into annual costs. In order to do this allocation, it is necessary for the funding method to "breakdown" the present value of future benefits into two components:

(1) that which is attributable to the past and

(2) that which is attributable to the future.

Actuarial terminology calls the part attributable to the past the "past service liability" or the "actuarial accrued liability." The portion allocated to the future is known as the present value of future normal costs, with the specific piece of it allocated to the current year being called the "normal cost."

Table 5 contains the calculation of actuarial accrued liability for the Plan under the Entry Age Normal actuarial cost. This amount is split between the base benefit and the supplemental COLA benefit. Once permanent COLAs have been granted, the obligation for future payments will also be included.

TABLE 5

ACTUARIAL ACCRUED LIABILITY
(Base and Supplemental Benefits)

		Supplemental Benefits		
As of June 30, 2019	**Base Benefits**	***Granted***	***Future***	**Total**
1. Actuarial Accrued Liability				
a. Active & Inactive Members	$ 3,016,010,256	$ 0	$ 127,234,992	$ 3,143,245,248
b. In-pay Members	10,977,963,339	0	267,955,517	11,245,918,856
c. Total	$ 13,993,973,595	$ 0	$ 395,190,509	$ 14,389,164,104
2. Actuarial Value of Assets	$ 3,663,017,862	$ 0	$ 31,193,239	$ 3,694,211,101
3. Unfunded Actuarial Accrued Liability: (1c) - (2)	$ 10,330,955,733	$ 0	$ 363,997,270	$ 10,694,953,003
4. Funded Ratio: (2) / (1c)	26.2%	N/A	7.9%	25.7%

TABLE 6

SOLVENCY TEST
(Base and Supplemental Benefits)

	Actuarial Accrued Liabilities (AAL)					Portion of AAL Covered by Assets			
Actuarial Valuation as of June 30	Active Member Contributions	Retirees and Beneficiaries	Active Member (Employer Financed Portion)	Total Actuarial Accrued Liabilities	Actuarial Value of Assets	Active Member Contributions	Retirees and Beneficiaries	Active Member (Employer Financed Portion)	Total Actuarial Accrued Liabilities
2019	$0	$11,245,919	$3,143,245	$14,389,164	$3,694,211	N/A	32.8%	0.0%	25.7%
2018	0	11,160,975	3,422,214	14,583,189	3,721,323	N/A	33.3%	0.0%	25.5
2017	1,242,230	11,653,674	3,840,865	16,736,769	4,951,100	100.0	31.8%	0.0%	29.6
2016	1,161,803	11,461,481	4,216,916	16,840,200	5,008,989	100.0	33.6%	0.0%	29.7
2015	1,303,468	10,606,053	5,108,225	17,017,746	5,171,639	100.0	36.5%	0.0%	30.4
2014	1,525,192	9,876,539	4,953,485	16,355,216	5,358,351	100.0	38.8%	0.0%	32.8
2013	1,636,978	10,254,953	4,570,448	16,462,379	5,235,104	100.0	35.1%	0.0%	31.8
2012	1,782,353	9,451,792	5,287,870	16,522,015	4,978,107	100.0	33.8%	0.0%	30.1
2011	2,015,580	8,776,916	5,525,908	16,318,404	5,227,402	100.0	36.6%	0.0%	32.0
2010	2,353,715	8,153,240	5,775,111	16,282,066	5,382,410	100.0	37.1%	0.0%	33.1

Note: Dollar amounts are in thousands of dollars. Amounts before 2018 reflect the inclusion of DC balances in both the active member contributions and the assets.

TABLE 7

RECONCILIATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY
(Base Benefits)

		For Year Ending June 30, 2019
1. Unfunded Actuarial Accrued Liability as of June 30, 2018	$	10,453,245,662
2. Normal Cost		35,657,821
3. Actuarially Determined Contribution		(892,200,000)
4. Interest		647,777,485
5. Expected Unfunded Actuarial Accrued Liability as of June 30, 2019	$	10,244,480,968
6. Actuarial Value of Asset Changes		
a. Investment Experience (Gain)/Loss	$	55,314,122
b. Other Experience [1]	$	4,148,634
7. Actuarial Accrued Liability Changes		
a. Actuarial Accrued Liability Experience (Gain)/Loss	$	27,196,696
b. Additional Liability Due to Benefit Changes		(184,687)
c. Additional Liability Due to Assumption Changes		0
8. Total Experience (Gain)/Loss	$	86,474,765
9. Unfunded Actuarial Accrued Liability as of June 30, 2019: (5) + (8)	$	10,330,955,733

[1]Includes deposits for such things as service purchases or 13th checks that differ from the actual liability incurred.

TABLE 8

ACTUARIAL GAIN/(LOSS)
(Base Benefits)

Liabilities		
1. Actuarial Accrued Liability as of June 30, 2018	$	14,174,568,565
2. Normal Cost for Plan Year Ending June 30, 2019		35,657,821
3. Benefit Payments During Plan Year[1]		(1,164,727,438)
4. Service Purchases (employee and employer)		36,437
5. Member Reassignment Transfers		1,493,825
6. Interest at 6.75%		919,932,376
7. Change Due to Benefit Changes[2]		(184,687)
8. Change Due to Assumption Changes		0
9. Expected Actuarial Accrued Liability as of June 30, 2019	$	13,966,776,899
10. Actuarial Accrued Liability as of June 30, 2019	$	13,993,973,595
Assets		
11. Actuarial Value of Assets as of June 30, 2018	$	3,721,322,903
12. Receipts During Plan Year		919,252,121
13. Expenditures, Excluding Expenses, During Plan Year		(1,165,133,828)
14. Interest at 6.75%		242,890,788
15. Expected Actuarial Value of Assets as of June 30, 2019	$	3,718,331,984
16. Actuarial Value of Assets as of June 30, 2019	$	3,663,017,862
Experience Gain / (Loss)		
17. Liability Actuarial Experience Gain/(Loss): (10) - (11)	$	(27,196,696)
18. Asset Actuarial Experience Gain/(Loss): (17) - (16)		(55,314,122)
19. Total Actuarial Experience Gain/(Loss): (18) + (19)	$	(82,510,818)

[1] Does not include miscellaneous expenses or benefit overpayments.
[2] House Enrolled Act No. 1059 expanded eligibility of the preretirement death benefit for members with 10 years of service.

TABLE 9

EXPERIENCE GAIN/(LOSS) ANALYSIS BY SOURCE
(Base Benefits)

Liability Sources		Gain/(Loss)
Retirement	$	(806,000)
Termination		(19,788,000)
Disability		(232,000)
Mortality		43,000
Salary		15,129,000
New Entrants/Rehires		(18,493,000)
Miscellaneous/COLA		(3,050,000)
Total Liability Experience Gain/(Loss)	$	(27,197,000)
as a % of AAL		(0.2%)
Asset Experience Gain/(Loss)	$	(55,314,000)
Net Actuarial Experience Gain/(Loss)	$	(82,511,000)

TABLE 10

PROJECTED BENEFIT PAYMENTS
(Base and Supplemental Benefits)

Plan Year Ending June 30	Benefit Amount
2020	$ 1,215,734,139
2021	1,225,881,020
2022	1,211,641,655
2023	1,217,535,860
2024	1,219,337,662
2025	1,218,505,315
2026	1,214,598,430
2027	1,207,436,702
2028	1,196,840,108
2029	1,182,467,758
2030	1,164,844,990
2031	1,143,531,723
2032	1,118,697,773
2033	1,090,154,828
2034	1,058,537,889
2035	1,024,101,659
2036	986,663,622
2037	946,551,430
2038	904,134,468
2039	860,232,122
2040	815,226,147
2041	769,122,448
2042	722,333,891
2043	675,272,785
2044	628,366,436
2045	582,033,573
2046	536,668,591
2047	492,637,449
2048	450,264,010
2049	409,817,746

Note: Payouts reflect nominal payouts for current members, assuming that all future assumptions are met.

The previous two sections were devoted to a discussion of the assets and liabilities of the plan. We now turn to considering how the benefits will be funded. The method used to determine the incidence of the contributions in various years is called the actuarial cost method. Under a typical actuarial cost method, the contributions required to meet the difference between current assets and current liabilities are allocated each year between two elements: (1) the normal cost rate and (2) the unfunded actuarial accrued liability contribution rate.

The term "fully funded" is often applied to a plan in which contributions at the normal cost rate are sufficient to pay for the benefits of existing employees as well as for those of new employees. More often than not, plans are not fully funded, either because of past benefit improvements that have not been completely funded, contribution levels, or because of actuarial deficiencies that have occurred because experience has not been as favorable as anticipated by the actuarial assumptions. Under these circumstances, an unfunded actuarial accrued liability (UAAL) exists. Likewise, when the actuarial value of assets is greater than the actuarial accrued liability, a surplus exists.

Description of Contribution Components

The Entry Age Normal (EAN) actuarial cost method is used for the valuation. Under that method, the normal cost for each year from entry age to assumed exit age is a constant percentage of the member's year by year projected compensation. The portion of the present value of future benefits not provided by the present value of future normal costs is the actuarial accrued liability. The unfunded actuarial accrued liability/(surplus) represents the difference between the actuarial accrued liability and the actuarial value of assets as of the valuation date.

TRF Pre-'96 does not follow a traditional funding model as described above. This is partially because the benefits have been historically provided through a pay-as-you-go strategy with some accumulated assets. As the Fund moves toward pre-funding the remaining benefits, a contribution allocation strategy has been developed. The Fund's actuarially determined contribution is based on the approach set out in IC-5.10.4-2-5 that the Indiana Legislature has followed in actually appropriating funds. The basic contribution is the lesser of 3% above the prior year's basic contribution and the anticipated base benefit payments for the year. However, the contributed funds should not result in the funded ratio exceeding 100%. For fiscal years 2020 and 2021, the State will also contribute funds to pay for the scheduled 13th checks.

Contribution Summary

Unlike other Funds in INPRS, the funding policy for TRF Pre-'96 does not require a directly calculated amortization payment related to the unfunded actuarial accrued liability/(surplus). The portion of the lottery proceeds needed to fund the assumed COLAs is developed in Table 11. Table 12 develops the actuarially determined contribution for the Plan. The contribution amount shown in this report are based on the actuarial assumptions and cost methods described in Appendix C. Additionally, in Table 13 the funded status and normal cost under alternative discount rates are provided to illustrate the sensitivity of these items relative to the selection of the investment return assumption.

TABLE 11

DEVELOPMENT OF SUPPLEMENTAL RESERVE FUNDING
(Supplemental Benefits)

Projected COLAs in Next Biennium Beginning July 1, 2021		
First Anticipated COLA		
1. Date of COLA commencement		January 1, 2022
2. Rate of COLA		0.4%
3. Value as of July 1, 2021 of COLA	$	40,718,968
Second Anticipated COLA		
4. Date of COLA commencement		January 1, 2023
5. Rate of COLA		0.4%
6. Value as of July 1, 2021 of COLA		37,954,256
7. Total COLA Funding Requirement as of July 1, 2021: (3) + (6)	$	78,673,223
Funding Sources for Projected COLAs		
8. Assets as of June 30, 2019 Available for Future COLAs	$	31,193,239
9. Projected Contributions from 7/1/19 to 12/31/19		15,000,000
10. Expected Earnings through July 1, 2021		6,176,344
11. Projected Available Assets at July 1, 2021	$	52,369,583
12. Required Additional Funding for Anticipated COLAs: (7) - (11)	$	26,303,640
Minimum Lottery Allocation Amount		
13. Remaining Payment for FYE 2020	$	8,294,988
14. Annual Payment for FYE 2021		16,589,976

TABLE 12

ACTUARIALLY DETERMINED CONTRIBUTION
(Base and Supplemental Benefits)

	Base Benefits	Supplemental Benefits	Total
1. Projected Payroll for FY 2020	$ 681,805,830		
2. Normal Cost Rate as of June 30, 2018	4.75%	0.20%	4.95%
3. Scheduled Contribution for FYE June 30, 2019	$ 892,200,000		
4. Scheduled Contribution for FYE June 30, 2020			
a. Prior year increased by 3%	$ 919,000,000		
b. Expected benefit payments for FYE June 30, 2020	1,215,734,139		
5. Actuarially Determined Contribution Amount: Lesser of (4a) and (4b)	$ 919,000,000		
6. Supplemental Benefits Lottery Proceeds		$ 16,589,976	
7. Estimated Actuarially Determined Contribution Amount	$ 919,000,000	$ 16,589,976	$ 935,589,976

Note: Appropriations provided $21.7 million in FY 2019 and $22.1 million in FY 2020 to provide for the 13th checks payable in those years. There will also be additional contributions related to teachers paid by grant money. Additionally, $30 million is expected to be allocated from lottery proceeds.

TABLE 13

INVESTMENT RETURN SENSITIVITY
(Base and Supplemental Benefits)

	1.00% Decrease: (5.75%)	0.75% Decrease: (6.00%)	0.50% Decrease: (6.25%)	0.25% Decrease: (6.50%)	Current Assumption: (6.75%)
Funded Status					
Actuarial Accrued Liability	$15,708,178,274	$15,359,144,327	$15,023,390,249	$14,700,267,270	$14,389,164,104
Actuarial Value of Assets	3,694,211,101	3,694,211,101	3,694,211,101	3,694,211,101	3,694,211,101
Unfunded Actuarial Accrued Liability	$12,013,967,173	$11,664,933,226	$11,329,179,148	$11,006,056,169	$10,694,953,003
Funded Ratio	23.5%	24.1%	24.6%	25.1%	25.7%
Actuarially Determined Contribution Amount					
Normal Cost	$45,625,844	$42,295,330	$39,218,825	$36,376,310	$33,749,389

	0.25% Increase: (7.00%)	0.50% Increase: (7.25%)	0.75% Increase: (7.50%)	1.00% Increase: (7.75%)	1.25% Increase: (8.00%)
Funded Status					
Actuarial Accrued Liability	$14,089,504,468	$13,800,744,804	$13,522,372,155	$13,253,902,196	$12,994,877,415
Actuarial Value of Assets	3,694,211,101	3,694,211,101	3,694,211,101	3,694,211,101	3,694,211,101
Unfunded Actuarial Accrued Liability	$10,395,293,367	$10,106,533,703	$9,828,161,054	$9,559,691,095	$9,300,666,314
Funded Ratio	26.2%	26.8%	27.3%	27.9%	28.4%
Actuarially Determined Contribution Amount					
Normal Cost	$31,321,151	$29,076,051	$26,999,789	$25,079,217	$23,302,238

Note: Comparisons are based on funding the COLA in the same method as the base benefit, rather than with lottery proceeds. Consequently, these results are for comparative purposes only and will not match the actual results under the funding policy.

GASB NO. 67 AND GASB NO. 68

The Governmental Accounting Standards Board issued Statement No. 67 (GASB 67), "Financial Reporting for Pension Plans" and Statement No. 68 (GASB 68), "Accounting and Financial Reporting for Pensions" in June 2012. The effective date for reporting under GASB 67 for the INPRS Plans was the fiscal year ending June 30, 2014. GASB 68's effective date for employers is the first fiscal year beginning after June 15, 2014.

The sections that follow provide the results of all the required calculations, presented in the order set out in GASB 68 for note disclosure and Required Supplementary Information (RSI). Some of this information was provided by the INPRS for use in this report.

The discount rate used for these disclosures is the assumed return on assets of 6.75%. We have verified that the current assets in conjunction with future contributions made on behalf of current members (including all contributions to fund any past service liability) will be sufficient to make the anticipated benefit payments to be provided to the current members.

To the best of our knowledge, the information contained in this report is complete and accurate. The calculations were performed by qualified actuaries according to generally accepted actuarial principles and practices, as well as in conformity with Actuarial Standards of Practice issued by the Actuarial Standards Board. The calculations are based on the current provisions of the plan, and on actuarial assumptions that are internally consistent and individually reasonable based on the actual experience of the plan. In addition, the calculations were completed in compliance with applicable law and, in our opinion, meet the requirements of GASB 67 and GASB 68.

TABLE 14

STATEMENT OF FIDUCIARY NET POSITION

			June 30, 2019
1. Assets			
a. Cash		$	1,079
b. Receivables			
i.	Contributions and Miscellaneous Receivables	$	2,557,387
ii.	Investments Receivable		39,822,002
iii.	Foreign Exchange Contracts Receivable		1,062,216,466
iv.	Interest and Dividends		9,964,882
v.	Receivables Due From Other Funds		0
vi.	Total Receivables	$	1,114,560,737
c. Investments			
i.	Short-Term Investments	$	0
ii.	Pooled Repurchase Agreements		742,830
iii.	Pooled Short-Term Investments		210,842,164
iv.	Pooled Fixed Income		1,302,400,015
v.	Pooled Equity		837,566,937
vi.	Pooled Alternative Investments		1,600,630,793
vii.	Pooled Derivatives		2,215,205
viii.	Pooled Investments		0
ix.	Securities Lending Collateral		12,988,479
x.	Total Investments	$	3,967,386,423
d. Net Capital Assets			0
e. Other Assets			0
f. Total Assets: a + b(vi) + c(x) + d + e		$	5,081,948,239
2. Liabilities			
a. Administrative Payable		$	22,533
b. Retirement Benefits Payable			94,416,609
c. Investments Payable			66,832,916
d. Foreign Exchange Contracts Payable			1,067,714,234
e. Securities Lending Obligations			12,988,479
f. Securities Sold Under Agreement to Repurchase			80,474,377
g. Due To Other Funds			353,909
h. Due to Other Governments			0
i. Total Liabilities: a + b + c + d + e + f + g + h		$	1,322,803,057
3. Fiduciary Net Position Restricted for Pensions: (1)(f) - (2)(i)		**$**	**3,759,145,182**

TABLE 15

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

		For Fiscal Year Ending June 30, 2019
1. Fiduciary Net Position as of June 30, 2018	**$**	**3,711,346,539**
2. Additions		
a. Contributions		
i. Member Contributions		0
ii. Employer Contributions		3,504,801
iii. Service Purchases (Employer and Member) [1]		36,437
iv. Non-Employer Contributing Entity Contributions		943,900,000
v. Total Contributions	$	947,441,238
b. Investment Income/(Loss)		
i. Net Appreciation/(Depreciation)	$	236,214,406
ii. Net Interest and Dividend Income		59,269,013
iii. Securities Lending Income		402,700
iv. Other Net Investment Income		158,022
v. Investment Management Expenses		(25,442,143)
vi. Direct Investment Expenses		(1,510,104)
vii. Securities Lending Expenses		(82,273)
viii. Total Investment Income/(Loss)	$	269,009,621
c. Other Additions		
i. Member Reassignments		2,930,605
ii. Miscellaneous Receipts		317,058
iii. Total Other Additions	$	3,247,663
d. Total Revenue (Additions): a(v) + b(viii) + c(iii)	$	1,219,698,522
3. Deductions		
a. Pension, Survivor and Disability Benefits	$	1,165,133,828
b. Death and Funeral Benefits		0
c. Distributions of Contributions and Interest		0
d. Administrative Expenses		5,329,271
e. Member Reassignments		1,436,780
f. Miscellaneous Expenses		0
g. Total Expenses (Deductions)	$	1,171,899,879
4. Net Increase (Decrease) in Fiduciary Net Position: (2)(d) - (3)(g)	**$**	**47,798,643**
5. Fiduciary Net Position as of June 30, 2019: (1) + (4)	**$**	**3,759,145,182**

[1] Service purchases paid by employer of $0 and employee of $36,437.

TABLE 16

SCHEDULE OF CHANGES IN NET PENSION LIABILITY

	For Fiscal Year Ending June 30, 2019		
	Total Pension Liability (a)	**Plan Fiduciary Net Position (b)**	**Net Pension Liability (a) – (b)**
1. Balance at June 30, 2018	$ 14,583,189,033	$ 3,711,346,539	$ 10,871,842,494
2. Changes for the Year:			
Service Cost (SC) [1]	37,234,272		37,234,272
Interest Cost	947,606,953		947,606,953
Experience (Gains)/Losses	(15,072,685)		(15,072,685)
Assumption Changes	0		0
Plan Amendments	(189,903)		(189,903)
Benefit Payments	(1,165,133,828)	(1,165,133,828)	0
Service Purchases			
Employer Contributions	0	0	0
Employee Contributions	36,437	36,437	0
Member Reassignments [2]	1,493,825	1,493,825	0
Employer Contributions		3,504,801	(3,504,801)
Non-employer Contributions		943,900,000	(943,900,000)
Employee Contributions		0	0
Net Investment Income		269,009,621	(269,009,621)
Administrative Expenses		(5,329,271)	5,329,271
Other		317,058	(317,058)
Net Changes	$ (194,024,929)	$ 47,798,643	$ (241,823,572)
3. Balance at June 30, 2019	$ 14,389,164,104	$ 3,759,145,182	$ 10,630,018,922

[1] Service cost provided as of beginning of year. Interest to end of year is included in the interest cost.

[2] Includes net interfund transfers of employer contributed amounts.

TABLE 17

DEFERRED OUTFLOWS OF RESOURCES

	June 30, 2018	Remaining Period	Recognition	June 30, 2019
1. Liability Experience				
June 30, 2019 Loss	$ 0	1.00	$ 0	$ 0
June 30, 2018 Loss	0	0.00	0	0
June 30, 2017 Loss	0	0.00	0	0
June 30, 2016 Loss	0	0.00	0	0
June 30, 2015 Loss	0	0.00	0	0
June 30, 2014 Loss	0	0.00	0	0
2. Assumption Changes				
June 30, 2019 Loss	$ 0	1.00	$ 0	$ 0
June 30, 2018 Loss	0	0.00	0	0
June 30, 2017 Loss	0	0.00	0	0
June 30, 2016 Loss	0	0.00	0	0
June 30, 2015 Loss	0	0.00	0	0
June 30, 2014 Loss	0	0.00	0	0
3. Investment Experience				
June 30, 2019 Loss	$ 0	5.00	$ 0	$ 0
June 30, 2018 Loss	0	4.00	0	0
June 30, 2017 Loss	0	3.00	0	0
June 30, 2016 Loss	80,845,882	2.00	40,422,940	40,422,942
June 30, 2015 Loss	50,191,538	1.00	50,191,538	0
Total Outflows: (1)+(2)+(3)	**$ 131,037,420**		**$ 90,614,478**	**$ 40,422,942**

Information was provided prospectively from June 30, 2013 for GASB No. 68 purposes. Results prior to 2018 were produced by the prior actuary.

In accordance with GASB, the original amortization period for liability experience and assumption changes are amortized over the expected future working lifetime of all members, whereas the investment experience is amortized over five years.

TABLE 18

DEFERRED INFLOWS OF RESOURCES

	June 30, 2018	Remaining Period	Recognition	June 30, 2019
1. Liability Experience				
June 30, 2019 Gain	$ 15,072,685	1.00	$ 15,072,685	$ 0
June 30, 2018 Gain	0	0.00	0	0
June 30, 2017 Gain	0	0.00	0	0
June 30, 2016 Gain	0	0.00	0	0
June 30, 2015 Gain	0	0.00	0	0
June 30, 2014 Gain	0	0.00	0	0
2. Assumption Changes				
June 30, 2019 Gain	$ 0	1.00	$ 0	$ 0
June 30, 2018 Gain	0	0.00	0	0
June 30, 2017 Gain	0	0.00	0	0
June 30, 2016 Gain	0	0.00	0	0
June 30, 2015 Gain	0	0.00	0	0
June 30, 2014 Gain	0	0.00	0	0
3. Investment Experience				
June 30, 2019 Gain	$ 25,959,600	5.00	$ 5,191,920	$ 20,767,680
June 30, 2018 Gain	96,544,196	4.00	24,136,050	72,408,146
June 30, 2017 Gain	35,790,632	3.00	11,930,211	23,860,421
June 30, 2016 Gain	0	2.00	0	0
June 30, 2015 Gain	0	1.00	0	0
Total Inflows: (1)+(2)+(3)	**$ 173,367,113**		**$ 56,330,866**	**$ 117,036,247**

Information was provided prospectively from June 30, 2013 for GASB No. 68 purposes. Results prior to 2018 were produced by the prior actuary.

In accordance with GASB, the original amortization period for liability experience and assumption changes are amortized over the expected future working lifetime of all members, whereas the investment experience is amortized over five years.

TABLE 19

DEFERRED INFLOWS / OUTFLOWS TO BE RECOGNIZED IN PENSION EXPENSE

Fiscal Year Ending June 30	Deferred Outflows	Deferred Inflows	Net Deferred Outflows/(Inflows)
Current Year:			
2019	$ 90,614,478	$ 56,330,866	$ 34,283,612
Future Years:			
2020	$ 40,422,942	$ 41,258,181	$ (835,239)
2021	0	41,258,180	(41,258,180)
2022	0	29,327,966	(29,327,966)
2023	0	5,191,920	(5,191,920)
2024	0	0	0
Thereafter	0	0	0

TABLE 20

PENSION EXPENSE UNDER GASB NO. 68

		For Fiscal Year Ending June 30, 2019
1. Service Cost, beginning of year		$ 37,234,272
2. Interest Cost, including interest on service cost		947,606,953
3. Member Contributions [1]		0
4. Administrative Expenses		5,329,271
5. Expected Return on Assets [2]		(243,050,021)
6. Plan Amendments		(189,903)
7. Recognition of Deferred Inflows / Outflows of Resources Related to:		
a. Liability Experience (Gains) / Losses	(15,072,685)	
b. Assumption Change (Gains) / Losses	0	
c. Investment Experience (Gains) / Losses	49,356,297	
d. Total: (7a)+(7b)+(7c)		34,283,612
8. Miscellaneous (Income) / Expense		(317,058)
9. Total Collective Pension Expense: (1)+(2)+(3)+(4)+(5)+(6)+(7d)+(8)		780,897,126
10. Employer Service Purchases		0
Pension Expense / (Income): (9) + (10)		**$ 780,897,126**

[1] Excludes member paid service purchases of $36,437.

[2] Cash flows assumed to occur mid-year.

GASB NO. 67 and GASB NO. 68
NOTES TO THE FINANCIAL STATEMENTS

The material presented herein is a subset of the information requested as Notes to the Financial Statements. Required information not provided herein is to be supplied by the plan.

Actuarial Assumptions and Inputs

Significant actuarial assumptions and other inputs used to measure the total pension liability:

Type of Plan	The Teachers' Retirement Fund Pre-1996 Account is a cost-sharing multiple-employer plan for GASB accounting purposes.
Measurement Date	June 30, 2019
Valuation Date	
Assets:	June 30, 2019
Liabilities:	June 30, 2018 – The TPL as of June 30, 2019 was determined based on an actuarial valuation prepared as of June 30, 2018 rolled forward one year to June 30, 2019, using the following key actuarial assumptions and other inputs, such as benefit accruals and actual benefit payments during that time period.
Inflation	2.25%
Future Salary Increases	2.50% - 12.50% based on service
Cost-of-Living Increases	As of June 30, 2019: In lieu of a COLA on January 1, 2020 and January 1, 2021, members in pay were provided a 13th check on October 1, 2019 and October 1, 2020. Thereafter, the following COLAs, compounded annually, were assumed: 0.4% beginning on January 1, 2022 0.5% beginning on January 1, 2034 0.6% beginning on January 1, 2039 As of June 30, 2018: In lieu of a COLA on January 1, 2019, members in pay were provided a 13th check on October 1, 2018. It is assumed a 13th check would continue for the 2020 and 2021 fiscal years. Thereafter, the following COLAs, compounded annually, were assumed: 0.4% beginning on January 1, 2022 0.5% beginning on January 1, 2034 0.6% beginning on January 1, 2039

Mortality Assumption (Healthy)	RP-2014 (with MP-2014 improvement removed) White Collar mortality tables, with future mortality improvement projected generationally using future mortality improvement inherent in the Social Security Administration's 2014 Trustee report.
Mortality Assumption (Disabled)	RP-2014 (with MP-2014 improvement removed) Disability mortality tables, with future mortality improvement projected generationally using future mortality improvement inherent in the Social Security Administration's 2014 Trustee report.
Experience Study	The most recent comprehensive experience study was completed in April 2015 and was based on member experience between June 30, 2011 and June 30, 2014. The demographic assumptions were updated as needed for the June 30, 2015 actuarial valuation based on the results of the study.
Discount Rate	6.75%, net of investment expenses

The discount rate is equal to the expected long-term rate of return on plan investments, net of investment expense and including price inflation. There was no change in the discount rate from the prior measurement date.

The plan is funded on a pay-as-you-go basis where the INPRS Board of Trustees has established a funding policy of requesting appropriations from the State in an amount equal to the actuarially determined contribution, which is based on the assumptions and methods selected by the Board for the annual actuarial valuations and projected covered member payroll. The June 30, 2019 actuarial valuation assumes a long-term rate of return on assets of 6.75%, a 5-year level dollar closed method for amortizing the unfunded actuarial accrued liability (since the plan is closed to new entrants and the active population continues to decline this was changed retroactively as of June 30, 2016), and a 5-year smoothing method for recognizing investment gains and losses in the actuarial value of assets.

In the past several years, the Board has followed its current funding policy and the State has complied in its contributions to the plan. While the expected benefit payments are currently greater than the contributions, the State is anticipated to increase their contributions at a steady level of 3% per year until they are fully funding the benefit payments, ensuring the plan maintains it path towards full funding based on the Board’s funding policy. As a result, it is presumed that the projected plan assets will be sufficient to cover the future benefit payments for current members and a detailed projection of plan assets and cash flows has not been prepared.

Discount Rate Sensitivity

	1% Decrease 5.75%	Current Rate 6.75%	1% Increase 7.75%
Net Pension Liability	$11,949,033,092	$10,630,018,922	$9,494,757,014

Classes of Plan Members Covered

The June 30, 2019 valuation was performed using census data provided by INPRS as of June 30, 2018. Standard actuarial techniques were used to roll forward the total pension liability computed as of June 30, 2018 to the June 30, 2019 measurement date using actual benefit payments during that period of time.

Number as of June 30, 2018	
1. Currently Receiving Benefits:	
Retired Members, Disabled Members, and Beneficiaries	53,498
2. Inactive Members Entitled To But Not Yet Receiving Benefits	2,382
3. Inactive Non-vested Members Entitled to a Refund of Member Contributions	0
4. Active Members	10,497
Total Covered Plan Members: (1)+(2)+(3)+(4)	66,377

Money-Weighted Rate of Return

The money-weighted rate of return equals investment performance, net of pension plan investment expense, adjusted for the changing amounts actually invested. For the fiscal year ending June 30, 2018, the money-weighted return on the plan assets is 7.6%.

Components of Net Pension Liability

As of June 30, 2019	
Total Pension Liability	$ 14,389,164,104
Fiduciary Net Position	3,759,145,182
Net Pension Liability	$ 10,630,018,922
Ratio of Fiduciary Net Position to Total Pension Liability	26.12%

GASB NO. 67 AND GASB NO. 68: REQUIRED SUPPLEMENTAL INFORMATION
SCHEDULE OF CHANGES IN THE TOTAL PENSION LIABILITY AND PLAN FIDUCIARY NET POSITION

Fiscal Year Ending June 30	2013	2014	2015	2016	2017	2018	2019
Total Pension Liability							
Total Pension Liability - beginning	$16,522,014,519	$16,463,598,481	$16,355,216,031	$17,017,746,329	$16,840,200,410	$16,736,769,005	$14,583,189,033
DC Account Balances - beginning [1]	1,974,075,962	1,814,049,671	1,715,340,174	1,421,455,452	1,265,128,371	1,242,229,627	0
DB Pension Liability - beginning	$14,547,938,557	$14,649,548,810	$14,639,875,857	$15,596,290,877	$15,575,072,039	$15,494,539,378	$14,583,189,033
Service Cost (SC), beginning-of-year	81,343,107	68,860,011	57,750,841	46,787,226	43,204,075	44,602,627	37,234,272
Interest Cost, including interest on SC	957,228,337	961,628,534	959,894,924	1,019,403,246	1,016,915,164	1,010,564,919	947,606,953
Experience (Gains)/Losses	(40,718,985)	(70,517,351)	(140,465,814)	(5,793,718)	22,415,814	(162,413,866)	(15,072,685)
Assumption Changes	0	0	1,033,157,373	0	(61,548,006)	(668,484,272)	0
Plan Amendments	0	(25,523,806)	0	0	4,212,840	0	(189,903)
DC Annuitizations	86,941,060	93,981,713	143,225,034	35,185,531	30,502,555	16,301,373	0
Actual Benefit Payments	(988,335,242)	(1,034,563,166)	(1,100,434,461)	(1,118,121,746)	(1,135,661,960)	(1,153,373,784)	(1,165,133,828)
Member Reassignments	0	(3,801,799)	3,265,736	1,320,623	(573,143)	1,428,141	1,493,825
Service Purchases	5,151,976	262,911	21,387	0	0	24,517	36,437
Net Change in Total Pension Liability	101,610,253	(9,672,953)	956,415,020	(21,218,838)	(80,532,661)	(911,350,345)	(194,024,929)
DB Pension Liability - ending	$14,649,548,810	$14,639,875,857	$15,596,290,877	$15,575,072,039	$15,494,539,378	$14,583,189,033	$14,389,164,104
DC Account Balances - ending [1]	1,814,049,671	1,715,340,174	1,421,455,452	1,265,128,371	1,242,229,627	0	0
(a) Total Pension Liability - ending	$16,463,598,481	$16,355,216,031	$17,017,746,329	$16,840,200,410	$16,736,769,005	$14,583,189,033	$14,389,164,104
Plan Fiduciary Net Position							
Plan Fiduciary Net Position – beginning	$5,058,910,388	$5,215,201,405	$5,501,866,875	$5,099,909,470	$4,787,528,950	$4,817,629,523	$3,711,346,539
DC Account Balances - beginning [1]	1,974,075,962	1,814,049,671	1,715,340,174	1,421,455,452	1,265,128,371	1,242,229,627	0
DB Plan Fiduciary Net Position – beginning	$3,084,834,426	$3,401,151,734	$3,786,526,701	$3,678,454,018	$3,522,400,579	$3,575,399,896	$3,711,346,539
Contributions – employer	9,484,114	6,325,502	5,810,942	5,048,222	4,524,443	4,168,409	3,504,801
Contributions – non-employer	1,003,596,233	825,616,000	845,615,950	887,500,000	871,000,000	917,900,000	943,900,000
Contributions – member	0	5,486	0	131,562	9,951	155,926	36,437
Net investment income	212,553,417	504,802,035	953,124	40,767,462	288,850,452	354,638,876	269,009,621
Actual benefit payments	(988,335,491)	(1,034,563,166)	(1,100,434,460)	(1,118,121,745)	(1,135,661,960)	(1,153,373,784)	(1,165,133,828)
Net member reassignments	(384)	(3,801,516)	3,265,890	0	0	1,428,141	1,493,825
DC Annuitizations	86,940,500	93,982,450	143,225,000	35,185,500	30,502,450	16,301,373	0
Administrative expense	(7,926,278)	(7,010,722)	(6,530,516)	(6,564,440)	(6,226,019)	(5,385,350)	(5,329,271)
Other	5,197	18,898	21,387	0	0	113,052	317,058
Net change in Plan Fiduciary Net Position	316,317,308	385,374,967	(108,072,683)	(156,053,439)	52,999,317	135,946,643	47,798,643
DB Plan Fiduciary Net Position – ending	$3,401,151,734	$3,786,526,701	$3,678,454,018	$3,522,400,579	$3,575,399,896	$3,711,346,539	$3,759,145,182
DC Account Balances - ending [1]	1,814,049,671	1,715,340,174	1,421,455,452	1,265,128,371	1,242,229,627	0	0
(b) Plan Fiduciary Net Position - ending	$5,215,201,405	$5,501,866,875	$5,099,909,470	$4,787,528,950	$4,817,629,523	$3,711,346,539	$3,759,145,182
Net Pension Liability - ending, (a) - (b)	$11,248,397,076	$10,853,349,156	$11,917,836,859	$12,052,671,460	$11,919,139,482	$10,871,842,494	$10,630,018,922

[1] Effective January 1, 2018, DC account balances are handled by a third party annuity provider and are treated as a separate defined contribution plan.
Information was provided prospectively from June 30, 2013 for GASB No. 67 and GASB No. 68 purposes. Results prior to 2018 were produced by the prior actuary.

GASB NO. 67 AND GASB NO. 68: REQUIRED SUPPLEMENTAL INFORMATION

SCHEDULE OF THE NET PENSION LIABILITY

Fiscal Year Ending June 30	2013	2014	2015	2016	2017	2018	2019
Total Pension Liability	$16,463,598,481	$16,355,216,031	$17,017,746,329	$16,840,200,410	$16,736,769,005	$14,583,189,033	$14,389,164,104
Plan Fiduciary Net Position	5,215,201,405	5,501,866,875	5,099,909,470	4,787,528,950	4,817,629,523	3,711,346,539	3,759,145,182
Net Pension Liability	$11,248,397,076	$10,853,349,156	$11,917,836,859	$12,052,671,460	$11,919,139,482	$10,871,842,494	$10,630,018,922
Ratio of Plan Fiduciary Net Position to Total Pension Liability	31.68%	33.64%	29.97%	28.43%	28.78%	25.45%	26.12%
Covered-employee payroll [1]	$1,383,428,000	$1,262,828,000	$1,074,826,991	$989,093,421	$912,684,850	$824,769,947	$753,354,999
Net Pension Liability as a percentage of covered-employee payroll	813.08%	859.45%	1,108.81%	1,218.56%	1,305.94%	1,318.17%	1,411.02%

[1] As provided by INPRS.

Information was provided prospectively from June 30, 2013 for GASB No. 67 and GASB No. 68 purposes. Results prior to 2018 were produced by the prior actuary.

GASB NO. 67 AND GASB NO. 68: REQUIRED SUPPLEMENTAL INFORMATION

SCHEDULE OF EMPLOYER CONTRIBUTIONS

Fiscal Year Ending June 30	2013	2014	2015	2016	2017	2018	2019
Actuarially Determined Contribution [1]	$1,013,079,780	$831,941,502	$851,426,892	$892,548,222	$875,524,443	$922,068,409	$947,404,801
Actual employer contributions	$1,013,079,780	$831,941,502	$851,426,892	$892,548,222	$875,524,443	$922,068,409	$947,404,801
Annual contribution (deficiency) / excess	$0	$0	$0	$0	$0	$0	$0
Covered-employee payroll [2]	$1,383,428,000	$1,262,828,000	$1,074,826,991	$989,093,421	$912,684,850	$824,769,947	$753,354,999
Actual contributions as a percentage of covered-employee payroll	73.23%	65.88%	79.22%	90.24%	95.93%	111.80%	125.76%

[1] The plan is funded on a pay-as-you-go basis, therefore the actuarially determined contribution was set equal to the state appropriation to fund the plan.

[2] As provided by INPRS.

Information was provided prospectively from June 30, 2013 for GASB No. 67 and GASB No. 68 purposes. Results prior to 2018 were produced by the prior actuary.

GASB NO. 67 AND GASB NO. 68: REQUIRED SUPPLEMENTAL INFORMATION

SCHEDULE OF MONEY-WEIGHTED RETURNS

For Fiscal Year Ending June 30	Money-Weighted Return
2019	7.6%
2018	9.5%
2017	8.1%
2016	1.0%
2015	0.6%
2014	12.7%
2013	5.1%

Information was provided prospectively from June 30, 2013 for GASB No. 67 and GASB No. 68 purposes. Returns provided by INPRS.

Appendix	**Page**

MEMBER DATA RECONCILIATION

	Active Members	Inactive Vested	Inactive Deceased	Disabled	Retired	Beneficiary	Total
1. As of June 30, 2017 [1]	**11,710**	**2,591**	**44**	**557**	**47,532**	**5,138**	**67,572**
2. Data Adjustments							
New Participants	50	0	0	0	0	0	50
Rehires	175	(175)	0	0	0	0	0
Terminations:							
Not Vested	(62)	0	0	0	0	0	(62)
Deferred Vested	(538)	538	0	0	0	0	0
Disability	(3)	0	0	3	0	0	0
Retirements	(815)	(635)	0	0	1,450	0	0
Refund / Benefits Ended	0	(8)	0	0	0	(35)	(43)
Transfer / Millie Morgan	(1)	(35)	0	0	0	0	(36)
Deaths:							
With Beneficiary	(12)	(6)	(3)	(13)	(368)	402	0
Without Beneficiary	(5)	(13)	(2)	(18)	(888)	(302)	(1,228)
Entitled to Future Pension Benefit	(2)	(13)	15	0	0	0	0
Data Corrections [2]	0	76	8	(386)	399	27	124
Net Change	(1,213)	(271)	18	(414)	593	92	(1,195)
3. As of June 30, 2018 [3]	**10,497**	**2,320**	**62**	**143**	**48,125**	**5,230**	**66,377**

[1] Effective January 1, 2018, DC accounts are treated as a separate defined contribution plan, thus the counts provided exclude members with nonvested pension benefits.
[2] Valuation results as of June 30, 2019 were calculated using June 30, 2018 census data, adjusted for certain activity before the valuation date. Headcounts may include multiple records for individuals, such as members with multiple periods of service.

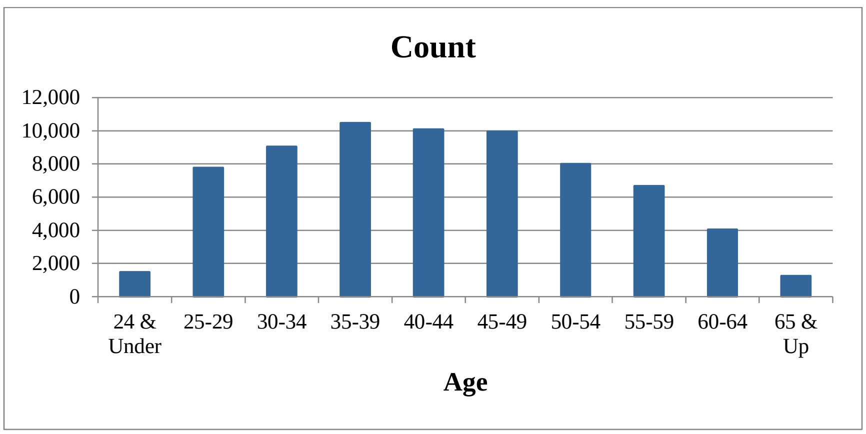
SUMMARY OF MEMBERSHIP DATA

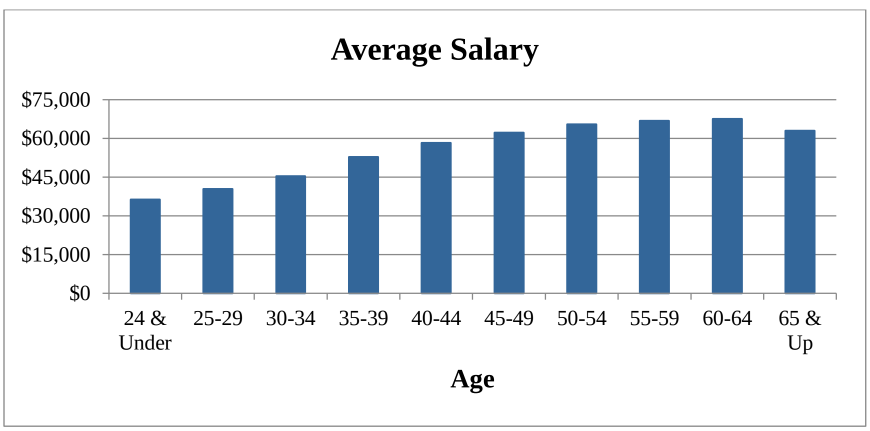
	Combined TRF Plans		Pre-1996 Account
Valuation Date	**June 30, 2018**	**June 30, 2019**	**June 30, 2019**
Date of Membership Data [1]	June 30, 2017	June 30, 2018	June 30, 2018
ACTIVE MEMBERS			
Number of Active Members	71,706	68,805	10,497
Annual Membership Data Salary [2]	$ 3,869,532,988	$ 3,864,744,006	$ 755,934,806
Anticipated Payroll for Next Fiscal Year	$ 4,125,634,441	$ 4,133,536,916	$ 681,805,830
Active Member Averages			
Age	42.5	42.8	55.7
Service	13.0	13.4	28.4
Annual Membership Data Salary	$ 53,964	$ 56,170	$ 72,014
INACTIVE MEMBERS			
Number of Inactive Members	7,631	8,160	2,382
Inactive Member Averages			
Age	52.9	52.3	59.4
Service	14.8	14.1	17.8
RETIREES, DISABLEDS, AND BENEFICIARIES			
Number of Members			
Retired	53,389	54,737	48,125
Disabled	736	294	143
Beneficiaries	5,391	5,508	5,230
Total	59,516	60,539	53,498
Annual Benefits			
Retired	$ 1,140,223,085	$ 1,172,722,455	$ 1,054,608,420
Disabled	10,259,964	3,097,793	1,781,769
Beneficiaries	77,403,509	80,642,697	77,137,611
Total	$ 1,227,886,558	$ 1,256,462,945	$ 1,133,527,800
Annual Benefits			
Pension	$ 1,089,268,981	$ 1,119,445,742	$ 1,008,202,700
DC Plan Annuities	138,617,577	137,017,203	125,325,100
Total	$ 1,227,886,558	$ 1,256,462,945	$ 1,133,527,800

[1] The valuation results were calculated using the prior year's census data and were adjusted for certain activity during fiscal year.
[2] The 2018 amount for the combined TRF Plans includes 287 records from the 1996 Account with less than a year of service who are missing a salary. Their salaries were defaulted to the average salary of $50,727. The 2019 amount for the combined TRF Plans includes 97 records from the 1996 Account with less than a year of service who are missing a salary. Their salaries were defaulted to the average salary of $53,317.

ACTIVE MEMBERS[1]
As of June 30, 2018 for the June 30, 2019 Valuation
Combined TRF Plans

	Count of Members			FY 2018 Annual Membership Data Salary		
Age	Male	Female	Total	Male	Female	Total
24 & Under	259	1,222	1,481	$ 9,607,903	$ 44,304,742	$ 53,912,645
25-29	1,790	5,976	7,766	74,895,134	238,915,756	313,810,890
30-34	2,380	6,675	9,055	117,246,867	294,398,056	411,644,923
35-39	2,837	7,645	10,482	164,458,234	388,977,814	553,436,048
40-44	2,750	7,347	10,097	178,280,644	410,857,807	589,138,451
45-49	2,668	7,279	9,947	186,142,067	433,540,286	619,682,353
50-54	2,115	5,883	7,998	154,208,302	369,966,134	524,174,436
55-59	1,713	4,961	6,674	124,980,616	320,927,924	445,908,540
60-64	1,061	2,989	4,050	77,448,971	196,536,247	273,985,218
65 & Up	348	907	1,255	22,689,179	56,361,323	79,050,502
Total	17,921	50,884	68,805	$ 1,109,957,917	$ 2,754,786,089	$ 3,864,744,006





[1] Includes 97 records from the 1996 Account with less than a year of service who are missing a salary. Their salaries were defaulted to the average salary of $53,317.

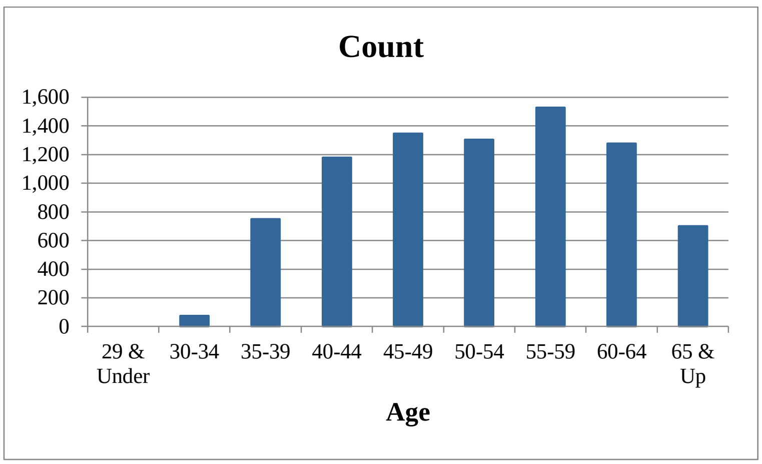
AGE AND SERVICE DISTRIBUTION[1]
As of June 30, 2018 for the June 30, 2019 Valuation
Combined TRF Plans

Age		0-4	5-9	10-14	15-19	20-24	25-29	30-34	Over 34	Total
24 & Under	Number	1,481	0	0	0	0	0	0	0	1,481
	Total Salary	$ 53,912,645	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 53,912,645
	Average Sal.	$ 36,403	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 36,403
25-29	Number	6,003	1,762	1	0	0	0	0	0	7,766
	Total Salary	$ 236,353,796	$ 77,406,981	$ 50,113	$ 0	$ 0	$ 0	$ 0	$ 0	$ 313,810,890
	Average Sal.	$ 39,373	$ 43,931	$ 50,113	$ 0	$ 0	$ 0	$ 0	$ 0	$ 40,408
30-34	Number	2,735	4,873	1,447	0	0	0	0	0	9,055
	Total Salary	$ 110,110,451	$ 224,828,615	$ 76,705,857	$ 0	$ 0	$ 0	$ 0	$ 0	$ 411,644,923
	Average Sal.	$ 40,260	$ 46,138	$ 53,010	$ 0	$ 0	$ 0	$ 0	$ 0	$ 45,461
35-39	Number	1,779	2,196	5,122	1,385	0	0	0	0	10,482
	Total Salary	$ 73,920,113	$ 104,467,254	$ 287,490,080	$ 87,558,601	$ 0	$ 0	$ 0	$ 0	$ 553,436,048
	Average Sal.	$ 41,551	$ 47,572	$ 56,128	$ 63,219	$ 0	$ 0	$ 0	$ 0	$ 52,799
40-44	Number	1,334	1,337	2,090	4,302	1,030	4	0	0	10,097
	Total Salary	$ 55,381,382	$ 64,119,097	$ 117,045,436	$ 279,361,575	$ 72,988,683	$ 242,278	$ 0	$ 0	$ 589,138,451
	Average Sal.	$ 41,515	$ 47,957	$ 56,003	$ 64,938	$ 70,863	$ 60,570	$ 0	$ 0	$ 58,348
45-49	Number	1,165	1,117	1,403	1,905	3,600	756	1	0	9,947
	Total Salary	$ 47,967,649	$ 53,608,617	$ 78,129,924	$ 121,459,876	$ 260,157,466	$ 58,318,069	$ 40,752	$ 0	$ 619,682,353
	Average Sal.	$ 41,174	$ 47,993	$ 55,688	$ 63,758	$ 72,266	$ 77,140	$ 40,752	$ 0	$ 62,298
50-54	Number	677	706	980	1,154	1,499	2,239	741	2	7,998
	Total Salary	$ 28,362,432	$ 33,239,435	$ 54,182,682	$ 73,548,085	$ 106,623,263	$ 171,024,996	$ 57,045,189	$ 148,354	$ 524,174,436
	Average Sal.	$ 41,894	$ 47,081	$ 55,288	$ 63,733	$ 71,130	$ 76,385	$ 76,984	$ 74,177	$ 65,538
55-59	Number	413	434	680	846	983	975	1,907	436	6,674
	Total Salary	$ 15,567,407	$ 19,792,501	$ 37,150,348	$ 52,514,310	$ 67,389,430	$ 72,670,816	$ 146,264,797	$ 34,558,931	$ 445,908,540
	Average Sal.	$ 37,693	$ 45,605	$ 54,633	$ 62,074	$ 68,555	$ 74,534	$ 76,699	$ 79,264	$ 66,813
60-64	Number	211	217	386	477	586	486	498	1,189	4,050
	Total Salary	$ 7,251,920	$ 9,746,721	$ 20,265,017	$ 29,302,126	$ 40,100,678	$ 35,589,593	$ 38,165,215	$ 93,563,948	$ 273,985,218
	Average Sal.	$ 34,369	$ 44,916	$ 52,500	$ 61,430	$ 68,431	$ 73,230	$ 76,637	$ 78,691	$ 67,651
65 & Up	Number	125	106	121	138	127	132	99	407	1,255
	Total Salary	$ 2,798,355	$ 3,695,541	$ 5,714,098	$ 8,262,718	$ 8,767,123	$ 9,703,713	$ 7,475,942	$ 32,633,012	$ 79,050,502
	Average Sal.	$ 22,387	$ 34,864	$ 47,224	$ 59,875	$ 69,032	$ 73,513	$ 75,515	$ 80,179	$ 62,988
Total	Number	15,923	12,748	12,230	10,207	7,825	4,592	3,246	2,034	68,805
	Total Salary	$ 631,626,150	$ 590,904,762	$ 676,733,555	$ 652,007,291	$ 556,026,643	$ 347,549,465	$ 248,991,895	$ 160,904,245	$ 3,864,744,006
	Average Sal.	$ 39,668	$ 46,353	$ 55,334	$ 63,878	$ 71,058	$ 75,686	$ 76,707	$ 79,107	$ 56,170

[1] Includes 97 records from the 1996 Account with less than a year of service who are missing a salary. Their salaries were defaulted to the average salary of $53,317.

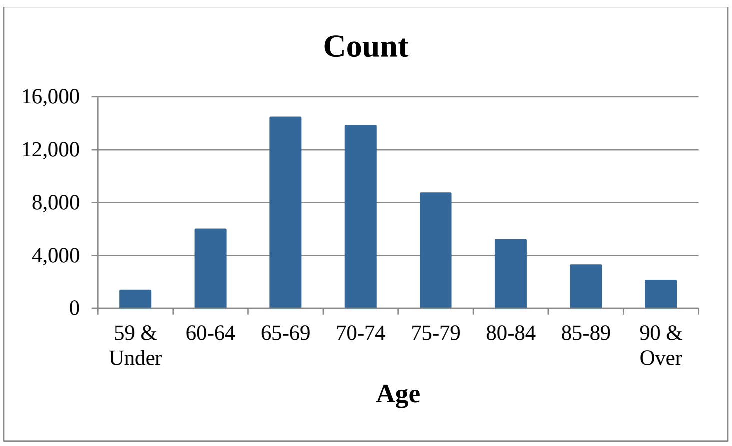
INACTIVE VESTED MEMBERS
As of June 30, 2018 for the June 30, 2019 Valuation
Combined TRF Plans

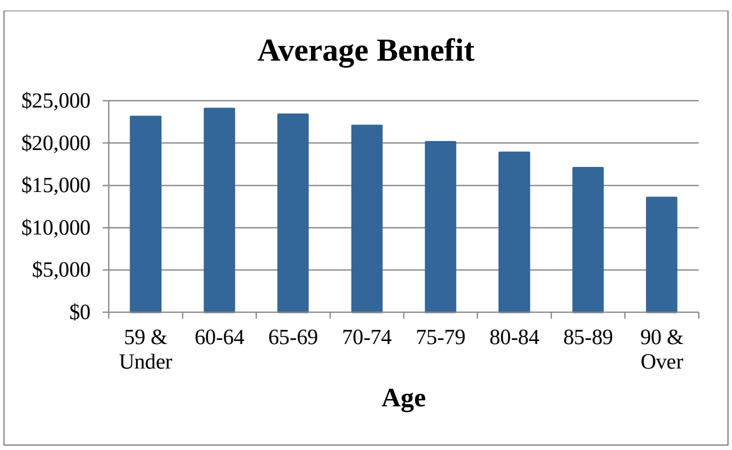
	Count of Members		
Age	Male	Female	Total
29 & Under	0	0	0
30-34	17	57	74
35-39	185	566	751
40-44	329	849	1,178
45-49	417	929	1,346
50-54	364	941	1,305
55-59	349	1,179	1,528
60-64	258	1,019	1,277
65 & Up	160	541	701
Total	2,079	6,081	8,160



RETIRED MEMBERS
As of June 30, 2018 for the June 30, 2019 Valuation
Combined TRF Plans

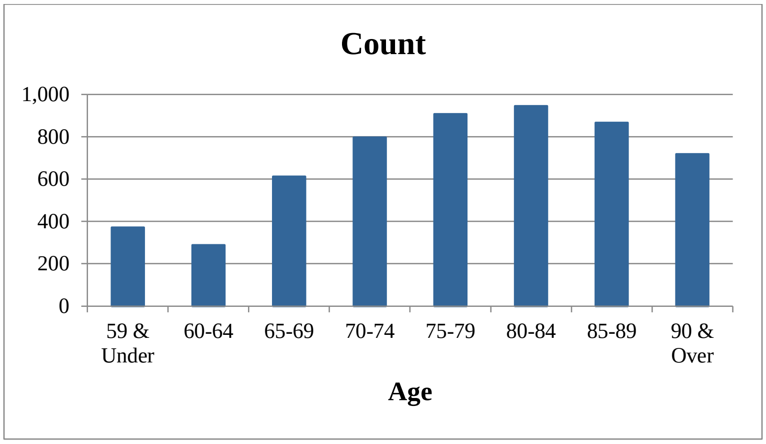
	Count of Members			Annual Benefits		
Age	Male	Female	Total	Male	Female	Total
59 & Under	364	978	1,342	$ 8,671,069	$ 22,371,780	$ 31,042,849
60-64	1,524	4,434	5,958	40,448,151	103,031,659	143,479,810
65-69	3,842	10,587	14,429	99,977,683	237,310,540	337,288,223
70-74	4,538	9,275	13,813	112,893,479	191,688,946	304,582,425
75-79	3,269	5,438	8,707	74,416,602	100,808,068	175,224,670
80-84	2,041	3,120	5,161	44,355,719	53,163,738	97,519,457
85-89	1,233	2,015	3,248	24,804,689	30,642,909	55,447,598
90 & Over	607	1,472	2,079	10,660,044	17,477,380	28,137,424
Total	17,418	37,319	54,737	$ 416,227,436	$ 756,495,020	$ 1,172,722,456

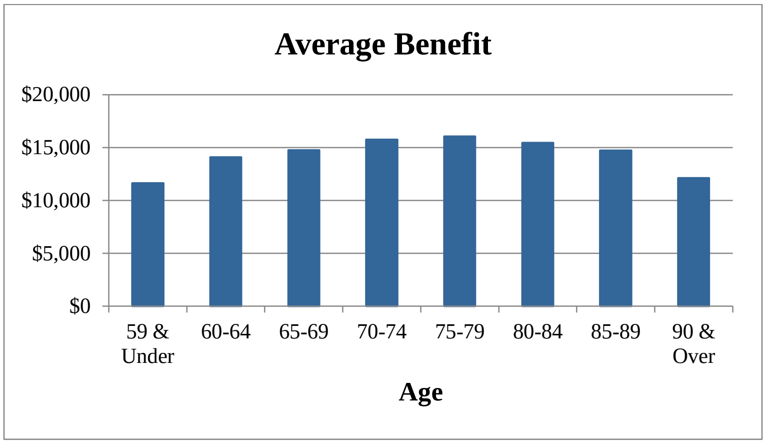




BENEFICIARIES RECEIVING BENEFITS
As of June 30, 2018 for the June 30, 2019 Valuation
Combined TRF Plans

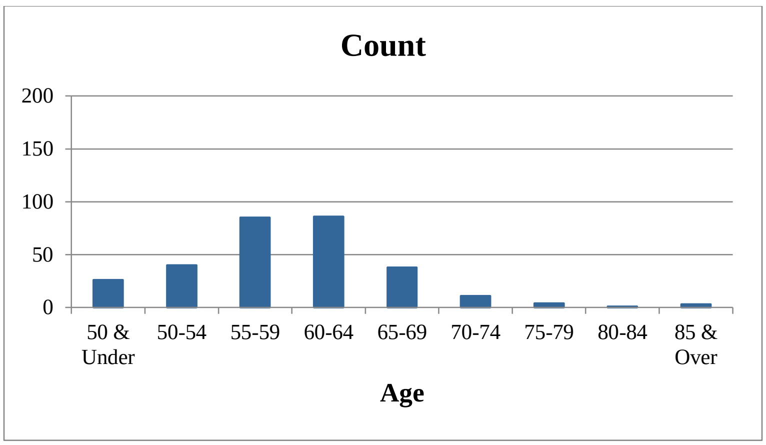
	Count of Members			Annual Benefits		
Age	Male	Female	Total	Male	Female	Total
59 & Under	162	210	372	$ 1,810,403	$ 2,515,364	$ 4,325,767
60-64	115	174	289	1,426,633	2,641,104	4,067,737
65-69	247	365	612	3,363,641	5,661,914	9,025,555
70-74	286	511	797	4,153,277	8,408,978	12,562,255
75-79	223	685	908	2,908,670	11,682,332	14,591,002
80-84	192	754	946	2,519,641	12,104,496	14,624,137
85-89	156	710	866	1,800,087	10,942,332	12,742,419
90 & Over	83	635	718	680,487	8,023,337	8,703,824
Total	1,464	4,044	5,508	$ 18,662,839	$ 61,979,857	$ 80,642,696

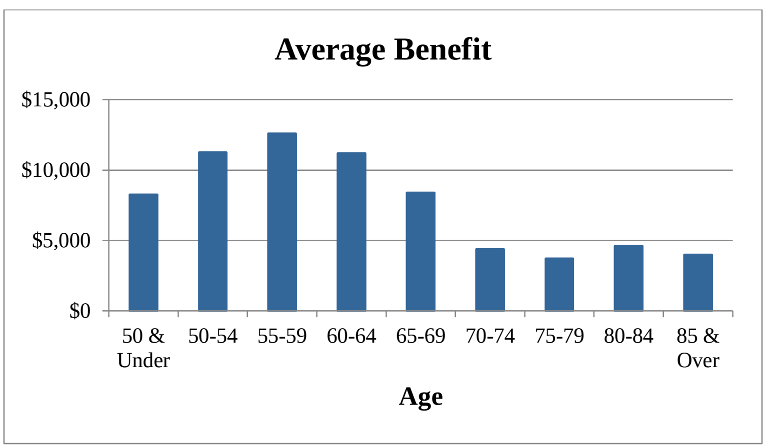




DISABLED MEMBERS
As of June 30, 2018 for the June 30, 2019 Valuation
Combined TRF Plans

	Count of Members			Annual Benefits		
Age	Male	Female	Total	Male	Female	Total
50 & Under	1	25	26	$ 5,081	$ 209,837	$ 214,918
50-54	12	28	40	107,419	343,251	450,670
55-59	14	71	85	169,248	902,249	1,071,497
60-64	19	67	86	292,763	669,255	962,018
65-69	11	27	38	107,167	211,746	318,913
70-74	4	7	11	20,528	27,771	48,299
75-79	0	4	4	0	14,880	14,880
80-84	0	1	1	0	4,598	4,598
85 & Over	0	3	3	0	12,000	12,000
Total	61	233	294	$ 702,206	$ 2,395,587	$ 3,097,793





MEMBERS AND BENEFICIARIES RECEIVING BENEFITS
As of June 30, 2018 for the June 30, 2019 Valuation
Pre-1996 Account

Schedule of Average Benefit Payments [1,2]

	Years of Credited Service						
For the Year Ended June 30, 2019	< 10	10 - 14	15 - 19	20 - 24	25 - 29	30 +	Total
Average Monthly Defined Benefit	$136	$388	$556	$922	$1,306	$1,901	$1,571
Average Monthly DC Annuity [3]	$23	$210	$208	$284	$382	$624	$488
Average Final Average Salary [4]	$31,009	$25,539	$39,796	$49,609	$55,172	$60,697	$56,339
Number of Benefit Recipients	154	1,379	3,474	5,621	8,636	34,234	53,498

[1] Calculated using the prior year census data, adjusted for certain activity during the fiscal year.
[2] Members with less than 10 years of service are primarily members receiving a disability benefit.
[3] This represents those retirees who elected to receive their ASA as a supplemental monthly payment in addition to the monthly Defined Benefit payment.
[4] Excludes the 323 in-pay members who are missing a final average salary in the data.

MEMBERS AND BENEFICIARIES RECEIVING BENEFITS
As of June 30, 2018 for the June 30, 2019 Valuation
Pre-1996 Account

Schedule of Benefit Recipients by Type of Benefit Option [1,2]

Amount of Monthly Benefit (in dollars)	Number of Recipients by Benefit Option: 5-Year Certain & Life	Straight Life	Joint with 100% Survivor Benefits	Joint with Two-Thirds Survivor Benefits	Joint with One-Half Survivor Benefits	Survivors	Disability	Total Benefit Recipients
1 - 500	1,126	571	563	64	125	792	38	3,279
501 - 1,000	1,662	1,007	1,119	256	385	1,436	31	5,896
1,001 - 1,500	2,894	1,927	2,639	744	1,063	1,323	39	10,629
1,501 - 2,000	3,521	2,991	3,818	1,385	1,644	988	27	14,374
2,001 - 2,500	2,460	2,648	2,788	1,043	1,381	458	7	10,785
2,501 - 3,000	1,123	1,380	1,171	454	613	136	1	4,878
Over 3,000	789	1,046	873	398	454	97	0	3,657
Total	13,575	11,570	12,971	4,344	5,665	5,230	143	53,498

[1] Calculated using the prior year census data, adjusted for certain activity during the fiscal year.
[2] Members who elected Social Security Integration were included in their selected benefit option of either 5-Year Certain & Life, Straight Life, Modified Cash Refund Plus 5-Year Certain & Life, Joint With 100% Survivor Benefits, Joint With Two-Thirds Survivor Benefits, or Joint With One-Half Survivor Benefits.

MEMBERS AND BENEFICIARIES RECEIVING BENEFITS
As of June 30, 2018 for the June 30, 2019 Valuation
Pre-1996 Account

Schedule of Retirees and Beneficiaries [1]

	Added to Rolls		Removed from Rolls		Rolls - End of Year				
	Number	Annual Benefits [2]	Number	Annual Benefits [2]	Number	Total Annual Benefits [2]	Percent Change In Total Annual Benefits	Average Annual Benefit	Percent Change In Average Annual Benefit
2019 [3]	1,514	$37,102	1,243	$19,005	53,498	1,133,528	1.4%	21,188	0.9%
2018 [3]	1,483	33,330	1,496	20,240	53,227	1,117,463	0.9	20,994	1.0
2017 [3]	1,953	47,305	1,288	18,257	53,240	1,106,961	2.3	20,792	1.0
2016 [3]	3,466	95,994	1,105	14,677	52,575	1,082,306	7.8	20,586	3.0
2015 [3]	1,886	50,261	1,017	14,293	50,214	1,003,910	3.1	19,993	1.3
2014 [3]	0	93,605	0	14,524	49,345	973,635	0.0	19,731	0.0
2013	3,422	93,605	1,077	14,524	49,345	973,635	8.4	19,731	3.3
2012	2,541	63,923	962	12,216	47,000	898,006	5.6	19,107	2.0
2011	3,003	77,290	1,060	13,121	45,421	850,711	7.6	18,729	3.0
2010	1,940	47,657	1,010	11,982	43,478	790,773	3.8	18,188	1.5

[1] Dollar amounts are in thousands except for the average annual benefit.
[2] Annual benefits includes members selecting an annuity for their ASA. End of year annual benefits are not equal to prior end of year annual benefits plus additions less removals due to beneficiary benefit changes, data changes, and COLA increases.
[3] The valuation results were calculated using the prior year census data, adjusted for certain activity during the fiscal year.

Definitions

Fiscal year	Twelve month period ending June 30.
Participation	Any full-time Indiana teachers in a public school corporation, certain INPRS employees, and some employees in charter schools, innovation schools, turnaround schools and public universities who were hired on or before June 30, 1995.
Average annual compensation	Average of highest five years of compensation. Years do not need to be consecutive.
Member contributions	All Fund members are required by state law to contribute 3% of salary contributions to their Annuity Savings Account. These 3% contributions are generally "picked up" by the employer and contributed on a pre-tax basis on behalf of the employee. Extra voluntary contributions by the member are also possible, but on a post-tax basis. At retirement, there are six alternatives for receiving the proceeds of this account, including lump sums, full and partial rollovers, full and partial annuitization of the balance, and deferred distribution.
Minimum pension benefit	The minimum pension benefit paid to a regularly retired member receiving an unreduced pension benefit is $185 per month effective July 1, 2017 per SEA 46.

Eligibility for Benefits

Deferred vested	Ten years of service. Benefit commences at regular or early retirement eligibility.
Disability retirement	
Regular disability benefit	Five years of service.
Disability retirement benefit	Five years of service and determined to be disabled by the Social Security Administration. Annual verification of Social Security disability is required.
Early retirement	Age 50 with 15 years of service.
Normal retirement	Age 65 with ten years of service, or age 60 with 15 years of service, or if age is at least 55 and the sum of age plus credited service is at least 85.
Pre-retirement death	10 years of service. Spouse to whom member had been married for two or more years is automatically eligible, or a dependent may be designated as beneficiary.

Monthly Benefits Payable

Normal retirement	State pension equal to total service times 1.1% of Average Annual Compensation. Beginning July 1, 2017, the minimum pension benefit is $185 per month.
Early retirement	State pension is computed as regular retirement benefit, but reduced for each month between age at early retirement and attainment of age 65. The age reduction factor is calculated as the sum of the following: • 1/10 of 1% for each month from age 60 to 65. • 5/12 of 1% for each month from age at early retirement to 60.
Deferred retirement	Computed as a regular retirement benefit with state pension based on service and Average Annual Compensation at termination.
Disability	
Regular disability benefit	$125 per month plus $5 per month for each year of service credit over five years.
Disability retirement benefit	Computed as a regular retirement benefit using creditable service to the date of disability and without reduction for early retirement. The minimum benefit is $180 per month.
Pre-retirement death	The spouse or dependent beneficiary is entitled to receive the monthly life benefit payable immediately under the assumption that the member retired on the later of age 50 or the date before the date of death and elected the joint and full survivor option. If eligible for normal retirement at death, the minimum pension benefit is $185 per month.
Cost-of-Living-Adjustments	The employer-funded monthly pension benefits for members in pay status are increased periodically to preserve purchasing power that is diminished due to inflation. Such increases are not guaranteed by Statute and will only be provided by legislative action. A "13th check" was paid to each member in pay status during fiscal year 2018, 2019, 2020 and 2021. The amount of the 13th check varied based on the years of creditable service the member had earned prior to retirement. Legislation passed in the 2018 legislative session creates a funding mechanism to provide for future benefit increases or 13th checks. Under the law, the INPRS Board may designate a portion of the proceeds from lottery revenues into TRF Pre-

	'96. Increases or payments are made upon passed legislation subject to the availability of funds to provide the benefit.
Forms of payment	The normal form of benefit payment (Option A-1) is a single life annuity with a five-year certain period. There are five optional forms of payment available, as listed below. Additionally, members retiring between ages 50 and 62 may integrate their pension benefit with their Social Security benefit by choosing Social Security Integration (Option A-4) in conjunction with the normal form or any other optional form selected. Optional forms of payment are calculated on an actuarially equivalent basis.
Additional Forms of Payment	
Option A-2:	Straight Life benefit with no certain period
Option A-3:	Modified Cash Refund Annuity (operates in conjunction with the Annuity Savings Account)
Option B-1:	100% Survivorship
Option B-2:	66 2/3% Survivorship
Option B-3:	50% Survivorship
	State law provides for actuarially-adjusted and re-calculated benefits based on a new optional form election in the event of the death of the member's spouse after retirement.

Changes in Plan Provisions since the Prior Year

Legislation was passed through House Enrolled Act No. 1059 to expand the current pre-retirement death benefit to apply to all active and inactive members who have at least 10 years of service, the current general vesting requirement. This provides new coverage for active and inactive members with 10 to 15 years of service (before age 65) and inactive members who die prior to age 50.

ACTUARIAL METHODS

1. Actuarial Cost Method

The actuarial cost method is Entry Age Normal - Level Percent of Payroll.

The normal cost is calculated separately for each active member and is equal to the level percentage of payroll needed as an annual contribution from entry age to retirement age to fund projected benefits. The actuarial accrued liability on any valuation date is the accumulated value of such normal costs from entry age to the valuation date.

The Fund's actuarially determined contribution is based on the approach set out in IC-5.10.4-2-5 that the Indiana Legislature has followed in actually appropriating funds. The basic contribution is the lesser of 3% above the prior year's basic contribution and the anticipated base benefit payments for the year. However, the contributed funds should not result in the funded ratio exceeding 100%. For fiscal years 2020 and 2021, the State will also contribute funds to pay for the scheduled 13^{th} checks.

For accounting, gains and losses occurring from census experience different than assumed and assumption changes are amortized into expense over the average expected future service of all plan participants. Gains and losses occurring from investment experience different than assumed are amortized into expense over a 5-year period. The effect of plan changes on the plan liability are fully recognized in expense in the year in which they occur.

Member census data as of June 30, 2018 was used in the valuation and adjusted, where appropriate, to reflect changes between June 30, 2018 and June 30, 2019. The valuation results from June 30, 2018 were rolled-forward to June 30, 2019 to reflect benefit accruals during the year less benefits paid.

2. COLA Funding Amount

The COLA Funding Amount is developed by determining the assets needed at the start of the next biennium to fund the post-retirement benefit increases anticipated to be granted in that biennium. This amount is divided by a present value factor to determine the needed annual amount needed.

3. Asset Valuation Method

Actuarial Value of Assets is equal to a five-year smoothing of gains and losses on the Market Value of Assets subject to a 20% corridor.

4. Anticipated Payroll

The Anticipated Payroll for the fiscal year beginning July 1, 2019 is equal to the actual payroll during the year ending June 30, 2019, increased with one year of salary scale.

5. State Appropriations

Based on the assumptions and methods previously described, an actuarially determined contribution amount is computed. The Board considers this information when requesting funds from the State.

Changes in Methods since the Prior Year

None.

ACTUARIAL ASSUMPTIONS

Valuation Date — June 30, 2019

Economic Assumptions

1. Investment return — 6.75% per year, compounded annually (net of administrative and investment expenses)

2. Inflation — 2.25% per year

3. Salary increase

Sample Rates			
Years of Service	Merit & Seniority	Inflation	Total
1	10.25%	2.25%	12.50%
5	2.75%	2.25%	5.00%
10	2.75%	2.25%	5.00%
15	1.50%	2.25%	3.75%
20	0.25%	2.25%	2.50%
25	0.25%	2.25%	2.50%
30	0.25%	2.25%	2.50%
35	0.25%	2.25%	2.50%
40	0.25%	2.25%	2.50%

4. Cost-of-Living Adjustment (COLA) — In lieu of a COLA on January 1, 2020 and January 1, 2021, members in pay were provided a 13th check on October 1, 2019 and October 1, 2020. Thereafter, the following COLAs, compounded annually, were assumed:

0.4% beginning on January 1, 2022
0.5% beginning on January 1, 2034
0.6% beginning on January 1, 2039

Demographic Assumptions

1. Mortality — The mortality assumption includes an appropriate level of conservatism that reflects expected future mortality improvement.

   a. Healthy mortality — RP-2014 (with MP-2014 improvement removed) White Collar Mortality Tables projected on a fully generational basis using the future mortality improvement scale inherent in the mortality projection included in the Social Security Administration's 2014 Trustee Report.

   b. Disabled mortality — RP-2014 (with MP-2014 improvement removed) Disability Mortality Tables projected on a fully generational basis using the future mortality improvement scale inherent in the mortality projection included in the Social Security Administration's 2014 Trustee Report.

2. Disability

Attained Age	Sample Rates
25	0.0001
30	0.0001
35	0.0001
40	0.0001
45	0.0002
50	0.0005
55	0.0009
60	0.0010

3. Retirement

Regular Retirement		Rule of 85 Retirement		Early Retirement	
Age	Probability	Age	Probability	Age	Probability
				50-53	0.020
				54	0.050
		55	0.150	55	0.050
		56	0.150	56	0.050
		57	0.150	57	0.065
		58	0.150	58	0.080
		59	0.200	59	0.120
60	0.200	60	0.200		
61	0.250	61	0.250		
62	0.300	62	0.300		
63	0.350	63	0.350		
64	0.400	64	0.400		
65	0.450	65	0.450		
66	0.450	66	0.450		
67	0.450	67	0.450		
68	0.450	68	0.450		
69	0.450	69	0.450		
70	1.000	70	1.000		

Inactive vested members are assumed to commence their retirement benefit at their earliest normal retirement date.

4. Termination

Years of Service	Service-Based Male	Service-Based Female
0	0.3500	0.3500
1	0.1400	0.1400
2	0.1100	0.1100
3	0.0900	0.0900
4	0.0800	0.0800
5	0.0700	0.0700
6	0.0600	0.0600
7	0.0500	0.0550
8	0.0450	0.0500
9	0.0450	0.0450

Attained Age	Sample Age-Based* Male	Sample Age-Based* Female
30	0.0225	0.0300
35	0.0225	0.0300
40	0.0225	0.0200
45	0.0225	0.0200
50	0.0225	0.0200
55	0.0225	0.0200
60	0.0225	0.0200

*Age-Based rates apply only if 10 or more years of service.

Other Assumptions

1. Form of payment

100% of members are assumed to elect the normal form of benefit payment (Option A-1), a single life annuity with a five-year certain period.

2. Marital status

a. Percent married

100% of members are assumed to be married for purposes of valuing death-in-service benefits.

b. Spouse's age

Male spouses are assumed to be three years older than female spouses.

3. Pay increase timing

Beginning of (fiscal) year. Payroll amounts stated in the valuation data are amounts projected to be paid during the current year.

4. Decrement timing

Decrements are assumed to occur at the beginning of the year.

5. Actuarial equivalence basis for optional forms of payment

6.75% interest with a 50% unisex blend of the 2013 IRS combined mortality basis projected to 2018.

6. Miscellaneous adjustments	The Average Annual Compensation was increased by $400 to account for the inclusion of unused sick leave in the calculation of Average Annual Compensation.

Changes in Assumptions since the Prior Year

None.

Data Adjustments

Active and retired member data is reported as of June 30. Member census data as of June 30, 2018 was used in the valuation and adjusted, where appropriate, to reflect changes between June 30, 2018 and June 30, 2019. Standard actuarial roll-forward techniques were then used to project the total pension liability computed as of June 30, 2018 to the June 30, 2019 measurement date.

The member census data and the asset information for this valuation were furnished as of June 30, 2019. We did not audit the information provided, but we did review it thoroughly for reasonableness and compared it with the prior year's submission for consistency.

For members reported with no gender, the member is assumed to be female. Additionally, active members missing a salary are assumed to have earned the average salary.

<u>Other Technical Valuation Procedures</u>

Salary increases are assumed to apply to annual amounts.

Decrements are assumed to occur at the beginning of the year. Standard adjustments are made for multiple decrements.

No actuarial liability is included for participants who terminated without being vested prior to the valuation date, except those due a refund of contributions.

Accrued Service	Service credited under the system that was rendered before the date of the actuarial valuation.
Actuarial Assumptions	Estimates of future experience with respect to demographic or economic events. Demographic assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.
Actuarial Cost Method	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of retirement system benefits between future normal cost and actuarial accrued liability. Sometimes referred to as the "actuarial funding method."
Actuarial Equivalent	A single amount or series of amounts of equal value to another single amount or series of amounts computed on the basis of a given set of actuarial assumptions.
Actuarial Accrued Liability	The difference between the actuarial present value of system benefits and the actuarial value of future normal costs. Also referred to as "accrued liability" or "actuarial liability."
Actuarial Present Value	The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest and by probabilities of payment.
Amortization	Paying off an interest-discounted amount with periodic payments of interest and principal, as opposed to paying off with lump sum payment.
Experience Gain (Loss)	The difference between actual experience and actuarial assumptions anticipated experience during the period between two actuarial valuation dates.
Normal Cost	The actuarial present value of retirement system benefits allocated to the current year by the actuarial cost method.
Unfunded Actuarial Accrued Liability	The difference between actuarial liability and the actuarial value of assets. Sometimes referred to as "unfunded accrued liability" or "unfunded liability". Most retirement systems have unfunded actuarial liability. They arise anytime new benefits are added and anytime an actuarial loss is realized.