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Indiana Public Retirement System

Judges' Retirement System

Actuarial Valuation as of
June 30, 2019





Cavanaugh Macdonald

CONSULTING, LLC

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 Judges' Retirement System (JRS) 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. There have been no changes to the plan provisions, actuarial methods or assumptions from the prior valuation.

In preparing our report, we relied, without audit, on information (some oral and some in writing) supplied by the 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 be sure 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 JRS 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 that 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.

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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 JRS 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. 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,

A handwritten signature in blue ink that reads "Brent A. Banister".

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

A handwritten signature in blue ink that reads "Patrice Beckham".

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



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SECTION 1 – BOARD SUMMARY

This report presents the results of the June 30, 2019 actuarial valuation of the Judges’ Retirement System (JRS). The primary purposes of performing this actuarial valuation are to:

- Determine the contribution amount for the plan year ending June 30, 2021 that will be sufficient to meet the funding policy.
- Disclose asset and liability measurements, as well as the current funded status of the plan, on the valuation date.
- Compare actual and expected experience in the valuation 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

There were no changes to plan provisions, actuarial methods and assumptions, or funding policy between the June 30, 2018 and June 30, 2019 valuations.

The actuarial valuation results provide a “snapshot” view of the plan’s financial condition on June 30, 2019. The plan’s UAAL changed from \$30.9 million last year to \$47.9 million this year and the funded ratio decreased from 94.4% to 91.8%. This change results from actual experience being different from expected, primarily driven by salary increases greater than expected. These increases not only affect the active member liability, but also affect the retiree liability since retirees receive a benefit increase based on pay increases granted to current judges. Also contributing to the increase in UAAL was a smaller than expected return on the actuarial value of assets as a portion of prior losses were realized and much of the current gains were deferred.

A summary of the key results from the June 30, 2019 actuarial valuation compared to the June 30, 2018 valuation is shown in the following table. Further detail on the valuation results can be found in the following sections of this Executive Summary.

Valuation Results	June 30, 2018	June 30, 2019
Unfunded Actuarial Accrued Liability	\$ 30,944,580	\$ 47,898,809
Funded Ratio (Actuarial Assets)	94.35%	91.83%
Normal Cost Rate	33.47%	33.79%
UAAL Amortization Rate	5.88%	8.27%
Actuarially Determined Contribution Rate	39.35%	42.06%
Member Contribution Rate	(6.00%)	(6.00%)
Required State Contribution Rate	33.35%	36.06%

Numerous components, which are 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.



SECTION 1 – BOARD SUMMARY

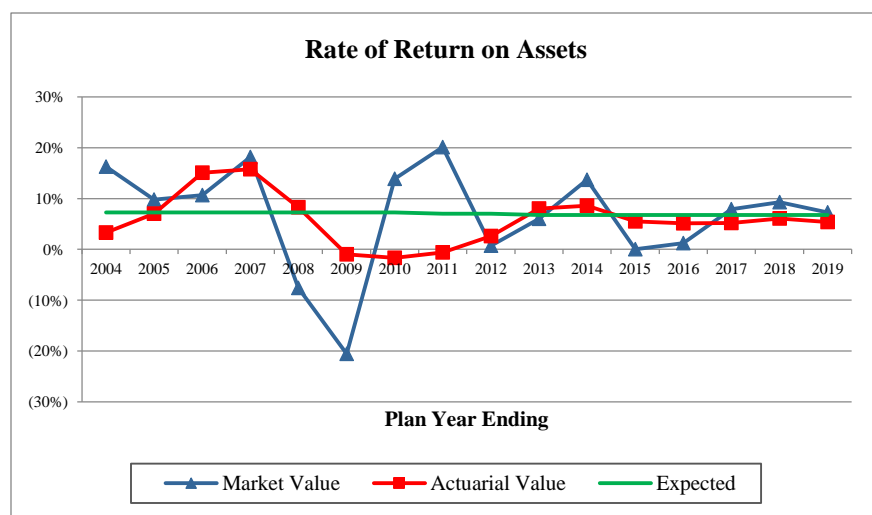
ASSETS

As of June 30, 2019, the plan had net assets of \$545 million, when measured on a market value basis. This was an increase of \$31 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 rate. An asset valuation method, which smoothes the effect of market fluctuations, is applied to determine the value of assets used in the valuation, termed the actuarial value of assets. In this year’s valuation, the actuarial value of assets is \$539 million, an increase of nearly \$22 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	\$ 513,952,408	\$ 516,749,872
- Employer and Member Contributions	+ 19,506,380	+ 19,506,380
- Benefit Payments and Refunds	- 25,391,127	- 25,391,127
- Net Investment Income	+ 37,263,155	+ 27,735,119
Net Assets, June 30, 2019	\$ 545,330,816	\$ 538,600,244
Estimated Rate of Return, Net of Expenses	7.3%	5.4%

The estimated rate of return on the actuarial value of assets was 5.4%, 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 \$6.9 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 \$2.8 million in last year’s valuation to a net deferred investment gain of \$6.7 million in the current valuation. See Table 1 and Table 2 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.



SECTION 1 – BOARD SUMMARY

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 is shown as of June 30, 2019 in the following table:

	Market Value	Actuarial Value
Actuarial Accrued Liability	\$ 586,499,053	\$ 586,499,053
Value of Assets	545,330,816	538,600,244
Unfunded Actuarial Accrued Liability	\$ 41,168,237	\$ 47,898,809
Funded Ratio	92.98%	91.83%

See Table 3 of this report for the development of the unfunded actuarial accrued liability.

The net change in the UAAL from June 30, 2018 to June 30, 2019 was an increase of \$17 million. There was a slight increase in liabilities primarily driven by salary experience, along with a loss on the actuarial value of assets due to the recognition of prior losses. These items are quantified in Table 5 of this report. See Table 6 and Table 7 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 millions).

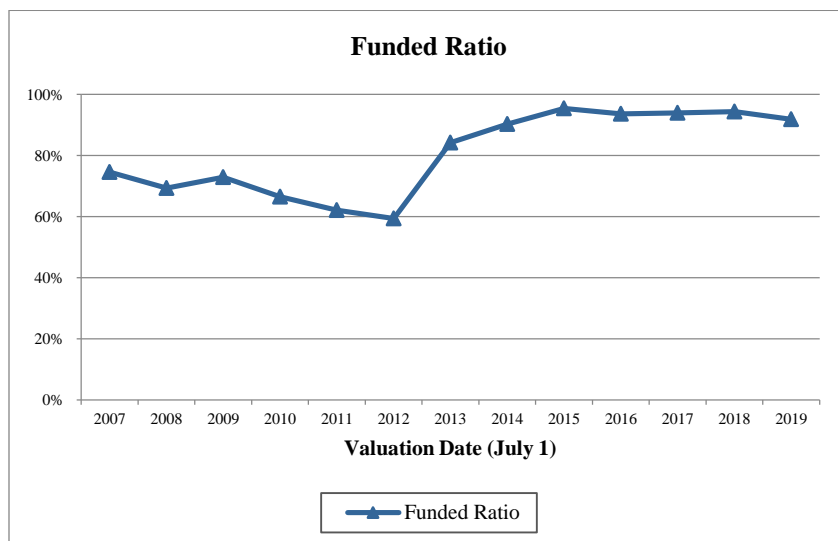
	6/30/2015	6/30/2016	6/30/2017	6/30/2018	6/30/2019
Funded Ratio	95.4%	93.7%	93.9%	94.4%	91.8%
UAAL (in millions)	\$21.4	\$31.7	\$31.7	\$30.9	\$47.9

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.



SECTION 1 – BOARD SUMMARY

As the following graph of historical funded ratios shows, JRS has been reasonably well funded for the last several years.



ACTUARIALLY DETERMINED CONTRIBUTION RATE

The State’s funding policy is to contribute an appropriated amount that is estimated at the start of each biennium. The specific amounts in the appropriation bill are guided by the funding requirements of the Plan from an actuarial perspective. A traditional funding strategy includes:

- A “normal cost” for the portion of projected liabilities allocated by the actuarial cost method to service of members during the year following the valuation date.
- An “unfunded actuarial accrued liability contribution” for the excess of the portion of projected liabilities allocated to service to date over the actuarial value of assets.

The UAAL contribution rate is determined by calculating the amortization payment on the UAAL as a level dollar amount over 20 years for each amortization base. Whenever the JRS funded ratio exceeds 100%, all prior amortization bases are eliminated and the negative UAAL (or “surplus”) is amortized over an open 30-year period, as an offset to other Fund costs.

The actuarially determined contribution amount for the Fund includes a normal cost which is theoretically based on all judges’ payroll. However, member contributions are only made on payroll of judges with less than 22 years of service, while the employer contributions are based upon a direct legislative allocation determined from estimated total payroll. **Consequently, the actual funding requirements are adjusted to reflect only the pay upon which member contributions are made.** While this approach may make the presentation of results more complicated and not directly comparable to other plans, it nonetheless produces an amount that will, if contributed, systematically fund the Plan through time.



SECTION 1 – BOARD SUMMARY

See Table 10 of this report for the detailed development of the contribution rates which are summarized in the following table:

Contribution Rates	June 30, 2018	June 30, 2019
Normal Cost Rate	33.47%	33.79%
UAAL Amortization Rate	5.88%	8.27%
Actuarially Determined Contribution Rate	39.35%	42.06%
Member Contribution Rate	(6.00%)	(6.00%)
Required State Contribution Rate	33.35%	36.06%
Estimated Payroll	\$ 54,470,388	\$ 57,902,162
Actuarially Determined Contribution	\$ 18,165,874	\$ 20,879,520

Because the funding of the plan is largely based on payroll, the Actuarially Determined Contribution for FY 2022 can be assumed to be 2.5% higher than the FY 2021 rate shown above in the June 30, 2019 valuation, or \$21,401,508.

**SECTION 1 – BOARD SUMMARY****SUMMARY OF PRINCIPAL RESULTS**

	June 30, 2017	June 30, 2018	June 30, 2019
MEMBERSHIP			
Active Members	402	439	453
Retired Members and Beneficiaries	348	363	373
Disabled Members	2	2	2
Inactive Members	67	68	58
Total Members	819	872	886
Projected Annual Salaries of Active Members	\$ 55,850,310	\$ 54,470,388	\$ 57,902,162
Annual Retirement Payments for Retired Members, Disabled Members and Beneficiaries	\$ 21,465,258	\$ 22,637,102	\$ 23,793,872
ASSETS AND LIABILITIES			
Net Assets			
Market Value of Assets (MVA)	\$ 475,054,556	\$ 513,952,408	\$ 545,330,816
Actuarial Value of Assets (AVA)	492,013,421	516,749,872	538,600,244
Actuarial Accrued Liability (AAL)	523,735,050	547,694,452	586,499,053
Unfunded Actuarial Accrued Liability (UAAL): AAL - AVA	\$ 31,721,629	\$ 30,944,580	\$ 47,898,809
Funded Ratios			
AVA / AAL	93.94%	94.35%	91.83%
MVA / AAL	90.71%	93.84%	92.98%
CONTRIBUTIONS			
Normal Cost Rate	26.65%	33.47%	33.79%
UAAL Rate	5.66%	5.88%	8.27%
Total Recommended Contribution Rate	32.31%	39.35%	42.06%
Member Contribution Rate ¹	(5.95%)	(6.00%)	(6.00%)
Actuarially Determined Contribution Rate	26.36%	33.35%	36.06%
Estimated Contribution Amount	\$ 15,090,195	\$ 18,165,874	\$ 20,879,520

¹Only active members with less than 22 years of service make contributions to the plan.



SECTION 2 – SCOPE OF THE REPORT

This report presents the actuarial valuation results of the Judges' Retirement System 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.



SECTION 3 – ASSETS

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. Table 12 (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 2 shows the development of the actuarial value of assets (AVA) as of the valuation date.



TABLE 1
DEVELOPMENT OF MARKET VALUE OF ASSETS

	June 30, 2018	June 30, 2019
1. Market Value of Assets, Beginning of Year	\$ 475,054,556	\$ 513,952,408
2. Receipts		
a. Member (Includes Purchased Service) ¹	\$ 3,417,904	\$ 3,475,575
b. Employer	15,117,494	16,030,805
c. Total	\$ 18,535,398	\$ 19,506,380
3. Expenditures		
a. Benefit Payments	\$ 23,363,312	\$ 25,236,546
b. Refund of Contributions	258,941	154,581
c. Administrative Expense	119,122	107,806
d. Total	\$ 23,741,375	\$ 25,498,933
4. Investment Return		
a. Investment Income	\$ 44,037,294	\$ 37,329,496
b. Securities Lending Income	66,535	41,465
c. Total Investment Return	\$ 44,103,829	\$ 37,370,961
5. Market Value of Assets, End of Year: (1) + (2c) - (3d) + (4c)	\$ 513,952,408	\$ 545,330,816
6. Rate of Return, Net of Expenses ²	9.31%	7.29%

¹ Includes member service purchases of \$219,240 during fiscal year 2018 and \$92,783 during fiscal year 2019.

² Based on individual fund experience. Assumes cash flows occur at mid-year.



TABLE 2

DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

					For Plan Year Ending June 30, 2019
1. Market Value as of June 30, 2018					\$ 513,952,408
2. Receipts					\$ 19,506,380
3. Expenditures, Net of Administrative Expenses					\$ (25,391,127)
4. Expected Return on Assets ¹					\$ 34,493,177
5. Expected Market Value as of June 30, 2019: (1) + (2) + (3) + (4)					\$ 542,560,838
6. Actual Market Value as of June 30, 2019					\$ 545,330,816
7. Year End 2019 Asset Gain/(Loss): (6) - (5)					\$ 2,769,978
8. Deferred Investment Gains and Losses					
	Year Ended June 30:	Gain/(Loss)	Factor		Deferred Amount
a.	2016	\$ (24,322,444)	20%	\$	(4,864,489)
b.	2017	5,312,387	40%		2,124,955
c.	2018	12,090,206	60%		7,254,124
d.	2019	2,769,978	80%		2,215,982
e.	Total			\$	6,730,572
9. Initial Actuarial Value as of June 30, 2019: (6) - (8e)					\$ 538,600,244
10. Constraining Values					
a. 80% of Market Value: (6) x 0.8				\$	436,264,653
b. 120% of Market Value: (6) x 1.2				\$	654,396,979
11. Actuarial Value as of June 30, 2019					\$ 538,600,244
12. Actuarial Rate of Return, Net of Expenses ²					5.40%
13. Actuarial Value of Assets as a Percent of Market Value: (11) / (6)					98.8%

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



SECTION 4 – PLAN LIABILITIES

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 Judges' Retirement System as of the valuation date, June 30, 2019. 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 Judges' Retirement System 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 events, such as plan changes, occur that would affect the results, adjustments in the roll-forward methods would be made to appropriately reflect the events.

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 perform 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 3 contains the calculation of actuarial accrued liability for the plan. The Entry Age Normal actuarial cost method is used to develop the actuarial accrued liability.



TABLE 3
ACTUARIAL ACCRUED LIABILITY

	As of June 30, 2019
1. Actuarial Accrued Liability	
a. Member Contribution Balances	\$ 38,164,785
b. Active & Inactive Members	278,448,323
c. In-pay Members	<u>269,885,945</u>
d. Total	586,499,053
2. Actuarial Value of Assets	538,600,244
3. Unfunded Actuarial Accrued Liability: (1d) – (2)	47,898,809
4. Funded Ratio: (2)/(1d)	91.83%



SECTION 4 – PLAN LIABILITIES

**TABLE 4
SOLVENCY TEST**

Actuarial Valuation as of June 30	Actuarial Accrued Liabilities (AAL)				Actuarial Value of Assets	Portion of AAL Covered by Assets			
	Active Member Contributions	Retirees and Beneficiaries	Active Member (Employer Financed Portion)	Total Actuarial Accrued Liabilities		Active Member Contributions	Retirees and Beneficiaries	Active Member (Employer Financed Portion)	Total Actuarial Accrued Liabilities
2019	\$38,165	\$269,886	\$278,448	\$586,499	\$538,600	100.0%	100.0%	82.8%	91.8%
2018	38,541	258,255	250,898	547,694	516,750	100.0	100.0	87.7	94.4
2017	36,385	245,177	242,173	523,735	492,013	100.0	100.0	86.9	93.9
2016	34,804	244,484	221,838	501,126	469,378	100.0	100.0	85.7	93.7
2015	32,383	210,020	226,542	468,945	447,514	100.0	100.0	90.5	95.4
2014	32,060	216,044	216,751	464,855	419,568	100.0	100.0	79.1	90.3
2013	29,060	224,132	199,918	453,110	381,240	100.0	100.0	64.1	84.1
2012	27,699	205,341	204,814	437,854	260,096	100.0	100.0	13.2	59.4
2011	24,359	198,797	177,118	400,274	248,623	100.0	100.0	14.4	62.1
2010	23,138	182,023	158,962	364,123	242,143	100.0	100.0	23.3	66.5

Note: All of the dollar amounts are in thousands of dollars.



TABLE 5
RECONCILIATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY

	For Year Ending June 30, 2019
1. Unfunded Actuarial Accrued Liability as of June 30, 2018	\$ 30,944,580
2. Normal Cost	18,229,583
3. Actuarially Determined Contribution	(21,432,494)
4. Interest	<u>1,872,563</u>
5. Expected Unfunded Actuarial Accrued Liability as of June 30, 2019	\$ 29,614,232
6. Actuarial Value of Asset Changes	
a. Investment Experience (Gain)/Loss	\$ 6,946,887
b. Contributions (Above)/Below the Actuarially Determined Contribution	\$ 2,806,915
7. Actuarial Accrued Liability Changes	
a. Actuarial Accrued Liability Experience (Gain)/Loss	\$ 8,530,775
b. Additional Liability Due to Benefit Changes	0
c. Additional Liability Due to Assumption Changes	<u>0</u>
8. Total Experience (Gain)/Loss	\$ 18,284,577
9. Unfunded Actuarial Accrued Liability as of June 30, 2019: (5) + (8)	\$ 47,898,809



TABLE 6
ACTUARIAL GAIN/(LOSS)

Liabilities		
1. Actuarial Accrued Liability as of June 30, 2018	\$	547,694,452
2. Normal Cost for Plan Year Ending June 30, 2019		18,229,583
3. Benefit Payments During Plan Year ¹		(25,394,480)
4. Service Purchases (employee and employer)		92,783
5. Interest at 6.75%		37,345,940
6. Change Due to Benefit Changes		0
7. Change Due to Assumption Changes		0
8. Expected Actuarial Accrued Liability as of June 30, 2019	\$	577,968,278
9. Actuarial Accrued Liability as of June 30, 2019	\$	586,499,053
Assets		
10. Actuarial Value of Assets as of June 30, 2018	\$	516,749,872
11. Receipts During Plan Year		19,506,380
12. Expenditures, Excluding Expenses, During Plan Year		(25,391,127)
13. Interest at 6.75%		34,682,006
14. Expected Actuarial Value of Assets as of June 30, 2019	\$	545,547,131
15. Actuarial Value of Assets as of June 30, 2019	\$	538,600,244
Experience Gain / (Loss)		
16. Liability Actuarial Experience Gain/(Loss): (8) - (9)	\$	(8,530,775)
17. Asset Actuarial Experience Gain/(Loss): (15) - (14)		(6,946,887)
18. Total Actuarial Experience Gain/(Loss): (16) + (17)	\$	(15,477,662)

¹ Does not include miscellaneous expenses or benefit overpayments.



TABLE 7
EXPERIENCE GAIN/(LOSS) ANALYSIS BY SOURCE

Liability Sources	Gain/(Loss)
Retirement	\$ 8,082,000
Termination	(941,000)
Disability	1,624,000
Mortality	1,982,000
Salary	(12,020,000)
New Entrants/Rehires	(4,630,000)
Miscellaneous/COLA	(2,628,000)
Total Liability Experience Gain/(Loss)	\$ (8,531,000)
as a % of AAL	(1.5%)
Asset Experience Gain/(Loss)	\$ (6,947,000)
Total Actuarial Experience Gain/(Loss)	\$ (15,478,000)



TABLE 8
PROJECTED BENEFIT PAYMENTS

<u>Plan Year Ending June 30</u>	<u>Benefit Amount</u>
2020	\$ 32,975,454
2021	35,691,511
2022	37,884,446
2023	39,951,116
2024	41,730,567
2025	43,420,376
2026	45,206,294
2027	46,755,544
2028	48,193,961
2029	49,774,979
2030	51,186,588
2031	52,508,749
2032	53,864,447
2033	55,173,505
2034	56,511,293
2035	57,326,867
2036	57,909,373
2037	58,669,448
2038	59,141,981
2039	59,138,924
2040	58,818,398
2041	58,049,602
2042	57,134,043
2043	56,059,278
2044	54,767,903
2045	53,324,704
2046	51,808,070
2047	50,225,291
2048	48,506,007
2049	46,773,178

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



SECTION 5 – EMPLOYER CONTRIBUTIONS

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 an 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 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. The unfunded actuarial accrued liability is calculated each year and reflects experience gains and losses.

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. Based on the June 30, 2018 actuarial valuation, the Board requested appropriations from the State for fiscal years 2020 and 2021. This June 30, 2019 valuation will not be directly used for determining contributions. Due to the biennial cycle used to set appropriations, the contribution amount for the plan years ending June 30, 2022 and June 30, 2023 will rely on the most up-to-date plan status at that time, which is the June 30, 2020 valuation.

Contribution Summary

In Table 9, the amortization payment related to the unfunded actuarial accrued liability/(surplus), as of June 30, 2019, is developed. Table 10 develops the actuarial determined contribution rate for the Plan. The contribution rates shown in this report are based on the actuarial assumptions and cost methods described in Appendix C. Additionally, in Table 11 the contribution rates under alternative discount rates are provided to illustrate the sensitivity of the contribution requirements to the selection of the investment return assumption.



SECTION 5 – EMPLOYER CONTRIBUTIONS

TABLE 9
SCHEDULE OF AMORTIZATION BASES

Table with 6 columns: Amortization Bases, Original Amount, June 30, 2019 Remaining Payments, Date of Last Payment, Outstanding Balance as of June 30, 2019, Annual Contribution. Rows include 2009-2019 UAAL Base, Total, and summary items 1-4.

1 The original amounts from 2017 to 2013 were provided by the prior actuary. Amounts prior to that were estimated by INPRS.
2 The weighted average remaining UAAL amortization period is calculated by weighting the remaining amortization period of each base by the amortization amount of each base.



TABLE 10
ACTUARIAL REQUIRED CONTRIBUTION RATE

1. Projected Covered Payroll for FY 2020	\$ 57,902,162
2. Normal Cost as of June 30, 2017	
a. Dollar Amount	\$ 19,566,868
b. Percent of Total Pay	29.44%
c. Percent of Covered Pay ¹	33.79%
3. Amortization of UAAL as of June 30, 2018	
a. Dollar Amount	\$ 4,788,431
b. Percent of Covered Pay ¹	8.27%
4. Total Recommended Contribution Rate: (2c) + (3b)	42.06%
5. Expected Employee Contributions	
a. Dollar Amount	\$ 3,474,130
b. Percent of Covered Pay ¹	6.00%
6. Actuarially Determined Contribution Rate: (4) - (5)	36.06%
7. Estimated Actuarially Determined Contribution Amount ² : (1) x (6)	\$ 20,879,520
8. Approved Funding Amount for FY 2020	\$ 18,166,479
9. Expected Percentage of Actuarially Determined Contribution Contributed	87.01%

¹ Active members with less than 22 years of service make 6% contributions.

² Due to the biennial appropriations cycle, this will not directly impact the funding of the plan. Next year, this will be used to assist with the determination of the FY 2022 and FY 2023 approved funding amounts.



SECTION 5 – EMPLOYER CONTRIBUTIONS

**TABLE 11
INVESTMENT RETURN SENSITIVITY**

	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	\$653,423,769	\$635,556,127	\$618,474,725	\$602,135,957	\$586,499,053
Actuarial Value of Assets	538,600,244	538,600,244	538,600,244	538,600,244	538,600,244
Unfunded Actuarial Accrued Liability	\$114,823,525	\$96,955,883	\$79,874,481	\$63,535,713	\$47,898,809
Funded Ratio	82.4%	84.7%	87.1%	89.4%	91.8%
Actuarially Determined Contribution Amount					
Normal Cost	\$23,891,071	\$22,707,177	\$21,595,107	\$20,549,871	\$19,566,868
UAAL Amortization	9,939,277	8,631,516	7,337,568	6,056,752	4,787,435
Expected Member Contributions	(3,474,130)	(3,474,130)	(3,474,130)	(3,474,130)	(3,474,130)
Actuarially Determined Contribution Amount	\$30,356,218	\$27,864,563	\$25,458,545	\$23,132,493	\$20,880,173
Actuarially Determined Contribution Rate	52.40%	48.10%	44.00%	40.00%	36.06%
	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	\$571,525,858	\$557,180,656	\$543,429,988	\$530,242,489	\$517,588,744
Actuarial Value of Assets	538,600,244	538,600,244	538,600,244	538,600,244	538,600,244
Unfunded Actuarial Accrued Liability	\$32,925,614	\$18,580,412	\$4,829,744	(\$8,357,755)	(\$21,011,500)
Funded Ratio	94.2%	96.7%	99.1%	101.6%	104.1%
Actuarially Determined Contribution Amount					
Normal Cost	\$18,641,844	\$17,770,874	\$16,950,324	\$16,176,833	\$15,447,292
UAAL Amortization	3,532,004	2,286,915	1,052,632	(171,327)	(1,385,430)
Expected Member Contributions	(3,474,130)	(3,474,130)	(3,474,130)	(3,474,130)	(3,474,130)
Actuarially Determined Contribution Amount	\$18,699,718	\$16,583,659	\$14,528,826	\$12,531,376	\$10,587,732
Actuarially Determined Contribution Rate	32.30%	28.60%	25.10%	21.60%	18.30%



SECTION 6 – GASB INFORMATION

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 the required actuarial calculations set out in GASB 67 and 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 12
STATEMENT OF FIDUCIARY NET POSITION

	June 30, 2019
1. Assets	
a. Cash	\$ 0
b. Receivables	
i. Contributions and Miscellaneous Receivables	\$ 3,610,164
ii. Investments Receivable	5,602,134
iii. Foreign Exchange Contracts Receivable	149,431,934
iv. Interest and Dividends	1,401,853
v. Receivables Due From Other Funds	0
vi. Total Receivables	\$ 160,046,085
c. Investments	
i. Short-Term Investments	\$ 0
ii. Pooled Repurchase Agreements	104,501
iii. Pooled Short-Term Investments	29,661,141
iv. Pooled Fixed Income	183,220,802
v. Pooled Equity	117,828,382
vi. Pooled Alternative Investments	225,123,450
vii. Pooled Derivatives	311,634
viii. Pooled Investments	0
ix. Securities Lending Collateral	1,827,211
x. Total Investments	\$ 558,077,121
d. Net Capital Assets	0
e. Other Assets	0
f. Total Assets: a + b(vi) + c(x) + d + e	\$ 718,123,206
2. Liabilities	
a. Administrative Payable	\$ 11,491
b. Retirement Benefits Payable	0
c. Investments Payable	9,402,012
d. Foreign Exchange Contracts Payable	150,205,356
e. Securities Lending Obligations	1,827,211
f. Securities Sold Under Agreement to Repurchase	11,321,084
g. Due To Other Funds	25,236
h. Due to Other Governments	0
i. Total Liabilities: a + b + c + d + e + f + g + h	\$ 172,792,390
3. Fiduciary Net Position Restricted for Pensions: (1)(f) - (2)(i)	\$ 545,330,816



TABLE 13

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

		For Fiscal Year Ending June 30, 2019	
1. Fiduciary Net Position as of June 30, 2018		\$	513,952,408
2. Additions			
a. Contributions			
i. Member Contributions			3,382,792
ii. Employer Contributions			16,030,805
iii. Service Purchases (Employer and Member) ¹			92,783
iv. Non-Employer Contributing Entity Contributions			0
v. Total Contributions		<u>\$</u>	<u>19,506,380</u>
b. Investment Income/(Loss)			
i. Net Appreciation/(Depreciation)		\$	32,880,818
ii. Net Interest and Dividend Income			7,870,326
iii. Securities Lending Income			52,261
iv. Other Net Investment Income			20,390
v. Investment Management Expenses			(3,364,454)
vi. Direct Investment Expenses			(77,584)
vii. Securities Lending Expenses			(10,796)
viii. Total Investment Income/(Loss)		<u>\$</u>	<u>37,370,961</u>
c. Other Additions			
i. Member Reassignments			0
ii. Miscellaneous Receipts			0
iii. Total Other Additions		<u>\$</u>	<u>0</u>
d. Total Revenue (Additions): a(v) + b(viii) + c(iii)		\$	56,877,341
3. Deductions			
a. Pension, Survivor and Disability Benefits		\$	25,236,546
b. Death and Funeral Benefits			0
c. Distributions of Contributions and Interest			154,581
d. Administrative Expenses			107,806
e. Member Reassignments			0
f. Miscellaneous Expenses			0
g. Total Expenses (Deductions)		<u>\$</u>	<u>25,498,933</u>
4. Net Increase (Decrease) in Fiduciary Net Position: (2)(d) - (3)(g)		\$	31,378,408
5. Fiduciary Net Position as of June 30, 2019: (1) + (4)		\$	545,330,816

¹ Service purchases paid by employer of \$0 and employee of \$92,783.



TABLE 14
SCHEDULE OF CHANGES IN NET PENSION LIABILITY

	For Fiscal Year Ending June 30, 2019		
	Total Pension Liability	Plan Fiduciary Net Position	Net Pension Liability
	(a)	(b)	(a) – (b)
1. Balance at June 30, 2018	\$ 547,694,452	\$ 513,952,408	\$ 33,742,044
2. Changes for the Year:			
Service Cost (SC) ¹	18,229,583		18,229,583
Interest Cost	37,346,053		37,346,053
Experience (Gains)/Losses	8,527,309		8,527,309
Assumption Changes	0		0
Plan Amendments	0		0
Benefit Payments ²	(25,391,127)	(25,391,127)	0
Service Purchases			
Employer Contributions	0	0	0
Employee Contributions	92,783	92,783	0
Member Reassignments	0	0	0
Employer Contributions		16,030,805	(16,030,805)
Non-employer Contributions		0	0
Employee Contributions		3,382,792	(3,382,792)
Net Investment Income		37,370,961	(37,370,961)
Administrative Expenses		(107,806)	107,806
Other		0	0
Net Changes	\$ 38,804,601	\$ 31,378,408	\$ 7,426,193
3. Balance at June 30, 2019	\$ 586,499,053	\$ 545,330,816	\$ 41,168,237

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

² Includes refund of member contributions of \$154,581.



TABLE 15
DEFERRED OUTFLOWS OF RESOURCES

	June 30, 2018	Remaining Period	Recognition	June 30, 2019
1. Liability Experience				
June 30, 2019 Loss	\$ 8,527,309	3.36	\$ 2,537,890	\$ 5,989,419
June 30, 2018 Loss	0	2.38	0	0
June 30, 2017 Loss	0	1.50	0	0
June 30, 2016 Loss	1,112,692	0.55	1,112,692	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	3.36	\$ 0	\$ 0
June 30, 2018 Loss	0	2.38	0	0
June 30, 2017 Loss	0	1.50	0	0
June 30, 2016 Loss	0	0.55	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	9,669,605	2.00	4,834,804	4,834,801
June 30, 2015 Loss	6,527,384	1.00	6,527,384	0
Total Outflows:				
(1)+(2)+(3)	\$ 25,836,990		\$ 15,012,770	\$ 10,824,220

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 16
DEFERRED INFLOWS OF RESOURCES

	June 30, 2018	Remaining Period	Recognition	June 30, 2019
1. Liability Experience				
June 30, 2019 Gain	\$ 0	3.36	\$ 0	\$ 0
June 30, 2018 Gain	2,175,974	2.38	914,276	1,261,698
June 30, 2017 Gain	1,331,366	1.50	887,579	443,787
June 30, 2016 Gain	0	0.55	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	3.36	\$ 0	\$ 0
June 30, 2018 Gain	0	2.38	0	0
June 30, 2017 Gain	519,826	1.50	346,552	173,274
June 30, 2016 Gain	0	0.55	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	\$ 2,881,422	5.00	\$ 576,285	\$ 2,305,137
June 30, 2018 Gain	9,770,678	4.00	2,442,670	7,328,008
June 30, 2017 Gain	3,261,632	3.00	1,087,212	2,174,420
June 30, 2016 Gain	0	2.00	0	0
June 30, 2015 Gain	0	1.00	0	0
Total Inflows:				
(1)+(2)+(3)	\$ 19,940,898		\$ 6,254,574	\$ 13,686,324

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 17

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	\$ 15,012,770	\$ 6,254,574	\$ 8,758,196
Future Years:			
2020	\$ 7,372,691	\$ 5,637,504	\$ 1,735,187
2021	2,537,890	4,453,585	(1,915,695)
2022	913,639	3,018,953	(2,105,314)
2023	0	576,282	(576,282)
2024	0	0	0
Thereafter	0	0	0



TABLE 18
PENSION EXPENSE UNDER GASB NO. 68

For Fiscal Year Ending June 30, 2019		
1. Service Cost, beginning of year	\$	18,229,583
2. Interest Cost, including interest on service cost		37,346,053
3. Member Contributions ¹		(3,382,792)
4. Administrative Expenses		107,806
5. Expected Return on Assets ²		(34,489,539)
6. Plan Amendments		0
7. Recognition of Deferred Inflows / Outflows of Resources Related to:		
a. Liability Experience (Gains) / Losses	1,848,727	
b. Assumption Change (Gains) / Losses	(346,552)	
c. Investment Experience (Gains) / Losses	<u>7,256,021</u>	
d. Total: (7a)+(7b)+(7c)		8,758,196
8. Miscellaneous (Income) / Expense		0
9. Total Collective Pension Expense: (1)+(2)+(3)+(4)+(5)+(6)+(7d)+(8)		26,569,307
10. Employer Service Purchases		0
Pension Expense / (Income): (9) + (10)	\$	26,569,307

¹ Excludes member paid service purchases of \$92,783.

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 Judges' Retirement System is a single-employer plan for GASB accounting purposes.
Measurement Date	June 30, 2019
Valuation Date	June 30, 2019
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% per year beginning July 1, 2020. Actual salary increases on July 1, 2018 (2.1%) and July 1, 2019 (2.7%) are reflected in the in the liability valuation at June 30, 2017.
Cost-of-Living Increases	As of June 30, 2019: 2.5% compounded annually, beginning July 1, 2020. Actual COLA increases at July 1, 2018 (2.1%) and July 1, 2019 (2.7%) are reflected in the valuation. As of June 30, 2018: 2.5% compounded annually, beginning July 1, 2019. Actual COLA increases at July 1, 2017 (2.0%) and July 1, 2018 (2.1%) are reflected in the valuation.



SECTION 6 – GASB INFORMATION

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, 2010 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	<p>6.75%, net of investment expenses</p> <p>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.</p> <p>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 20-year level dollar closed method for amortizing the future layers of unfunded actuarial accrued liability (30 years for amortization layers established prior to June 30, 2016), and a 5-year smoothing method for recognizing investment gains and losses in the actuarial value of assets.</p>



SECTION 6 – GASB INFORMATION

Discount Rate Sensitivity

	1% Decrease 5.75%	Current Rate 6.75%	1% Increase 7.75%
Net Pension Liability	\$108,092,953	\$41,168,237	(\$15,088,327)

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	375
2. Inactive Members Entitled To But Not Yet Receiving Benefits	22
3. Inactive Non-vested Members Entitled to a Refund of Member Contributions	36
4. Active Members	453
Total Covered Plan Members: (1)+(2)+(3)+(4)	886

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, 2019, the money-weighted return on the plan assets is 7.3%.

Components of Net Pension Liability

As of June 30, 2019	
Total Pension Liability	\$ 586,499,053
Fiduciary Net Position	545,330,816
Net Pension Liability	\$ 41,168,237
Ratio of Fiduciary Net Position to Total Pension Liability	92.98%



SECTION 6 – GASB INFORMATION

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	\$437,854,459	\$453,109,893	\$464,854,573	\$468,944,751	\$501,125,713	\$523,735,050	\$547,694,452
Service Cost (SC), beginning-of-year	16,084,589	15,301,638	15,283,088	13,869,891	14,762,102	14,885,621	18,229,583
Interest Cost, including interest on SC	30,047,576	30,992,602	31,753,468	31,889,331	34,082,760	35,567,044	37,346,053
Experience (Gains)/Losses	(13,602,915)	(16,025,822)	8,410,750	7,181,935	(3,106,524)	(3,090,250)	8,527,309
Assumption Changes	185,587	0	(31,925,306)	0	(1,212,930)	0	0
Plan Amendments	0	0	0	0	0	0	0
Actual Benefit Payments	(17,579,537)	(18,527,788)	(19,431,822)	(20,921,745)	(22,099,240)	(23,622,253)	(25,391,127)
Member Reassignments	120,134	4,050	0	0	0	0	0
Service Purchases	0	0	0	161,550	183,169	219,240	92,783
Net Change in Total Pension Liability	15,255,434	11,744,680	4,090,178	32,180,962	22,609,337	23,959,402	38,804,601
(a) Total Pension Liability - ending	\$453,109,893	\$464,854,573	\$468,944,751	\$501,125,713	\$523,735,050	\$547,694,452	\$586,499,053
Plan Fiduciary Net Position							
Plan Fiduciary Net Position – beginning	\$262,325,682	\$375,752,562	\$432,729,729	\$437,352,498	\$441,790,144	\$475,054,556	\$513,952,408
Contributions – employer	111,417,613	20,894,700	21,020,000	16,946,301	16,823,600	15,117,494	16,030,805
Contributions – non-employer	0	0	0	0	0	0	0
Contributions – member	2,631,374	2,855,956	3,292,222	3,239,092	3,467,843	3,417,904	3,475,575
Net investment income	16,963,156	51,896,235	(93,406)	5,322,425	35,195,878	44,103,829	37,388,685
Actual benefit payments	(17,579,537)	(18,527,788)	(19,431,822)	(20,921,745)	(22,099,240)	(23,622,253)	(25,391,127)
Net member reassignments	120,134	4,050	0	0	0	0	0
Administrative expense	(125,860)	(145,986)	(164,225)	(148,427)	(123,669)	(119,122)	(107,806)
Other	0	0	0	0	0	0	0
Net change in Plan Fiduciary Net Position	113,426,880	56,977,167	4,622,769	4,437,646	33,264,412	38,897,852	31,378,408
(b) Plan Fiduciary Net Position - ending	\$375,752,562	\$432,729,729	\$437,352,498	\$441,790,144	\$475,054,556	\$513,952,408	\$545,330,816
Net Pension Liability - ending, (a) - (b)	\$77,357,331	\$32,124,844	\$31,592,253	\$59,335,569	\$48,680,494	\$33,742,044	\$41,168,237

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.



SECTION 6 – GASB INFORMATION

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	\$453,109,893	\$464,854,573	\$468,944,751	\$501,125,713	\$523,735,050	\$547,694,452	\$586,499,053
Plan Fiduciary Net Position	<u>375,752,562</u>	<u>432,729,729</u>	<u>437,352,498</u>	<u>441,790,144</u>	<u>475,054,556</u>	<u>513,952,408</u>	<u>545,330,816</u>
Net Pension Liability	\$77,357,331	\$32,124,844	\$31,592,253	\$59,335,569	\$48,680,494	\$33,742,044	\$41,168,237
Ratio of Plan Fiduciary Net Position to Total Pension Liability	82.93%	93.09%	93.26%	88.16%	90.71%	93.84%	92.98%
Covered-employee payroll ¹	\$47,594,849	\$46,041,085	\$48,582,165	\$51,381,964	\$54,755,206	\$53,350,037	\$56,379,905
Net Pension Liability as a percentage of covered-employee payroll	162.53%	69.77%	65.03%	115.48%	88.91%	63.25%	73.02%

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.



SECTION 6 – GASB INFORMATION

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	\$25,458,485	\$27,647,672	\$18,864,455	\$17,485,282	\$14,334,913	\$14,852,650	\$14,861,743
Actual employer contributions	\$111,417,613	\$20,894,700	\$21,020,000	\$16,946,301	\$16,823,600	\$15,117,494	\$16,030,805
Annual contribution (deficiency) / excess	\$85,959,128	(\$6,752,972)	\$2,155,545	(\$538,981)	\$2,488,687	\$264,844	\$1,169,062
Covered-employee payroll ²	\$47,594,849	\$46,041,085	\$48,582,165	\$51,381,964	\$54,755,206	\$53,350,037	\$56,379,905
Actual contributions as a percentage of covered-employee payroll	234.10%	45.38%	43.27%	32.98%	30.73%	28.34%	28.43%

¹ Actuarially determined contribution rate was developed in the actuarial funding valuation completed one year prior to the fiscal year. This rate was applied to the actual covered employee payroll for the fiscal year to determine the contribution amount.

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

<u>For Fiscal Year Ending June 30</u>	<u>Money-Weighted Return</u>
2019	7.3%
2018	9.3%
2017	8.0%
2016	1.2%
2015	(0.1%)
2014	13.7%
2013	5.2%

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



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APPENDIX A – MEMBERSHIP DATA

MEMBER DATA RECONCILIATION
For June 30, 2018 Data used in the June 30, 2019 Valuation

Table with 8 columns: Active Members, Inactive Vested, Inactive Nonvested, Disabled, Retired, Beneficiary, Total. Rows include: 1. As of June 30, 2017 (Total 872); 2. Data Adjustments (Net Change 14); 3. As of June 30, 2018 (Total 886).

1 The valuation results were calculated using the prior year's census data and were adjusted for certain activity during fiscal year.

**APPENDIX A – MEMBERSHIP DATA****SUMMARY OF MEMBERSHIP DATA**

Valuation Date	June 30, 2018	June 30, 2019	% Change
Date of Membership Data ¹	July 1, 2017	July 1, 2018	
ACTIVE MEMBERS			
Number of Active Members	439	453	3.2%
Annual Membership Data Salary ²	\$ 57,446,198	\$ 63,387,240	10.3%
Anticipated Covered Pay for Next Fiscal Year ³	\$ 54,470,388	\$ 57,902,162	6.3%
Active Member Averages			
Age	56.0	56.3	0.6%
Service	10.4	10.2	(2.0%)
Annual Membership Data Salary	\$ 130,857	\$ 139,928	6.9%
INACTIVE MEMBERS			
Number of Members			
Inactive Vested	26	22	(15.4%)
Inactive Non-Vested	42	36	(14.3%)
Total	68	58	(14.7%)
Inactive Vested Member Averages			
Age	57.7	57.7	0.0%
Service	14.7	12.9	(12.2%)
RETIREES, DISABLEDS, AND BENEFICIARIES			
Number of Members			
Retired	260	265	1.9%
Disabled	2	2	0.0%
Beneficiaries	103	108	4.9%
Total	365	375	2.7%
Annual Benefits			
Retired	\$ 19,722,653	\$ 20,577,617	4.3%
Disabled	123,612	126,085	2.0%
Beneficiaries	2,790,837	3,090,170	10.7%
Total	\$ 22,637,102	\$ 23,793,872	5.1%

¹The valuation results were calculated using the prior year's census data and were adjusted for certain activity during fiscal year.

² Annualized for actives with less than a year of service. Actives with no salary provided are defaulted to the state provided salary for their job title.

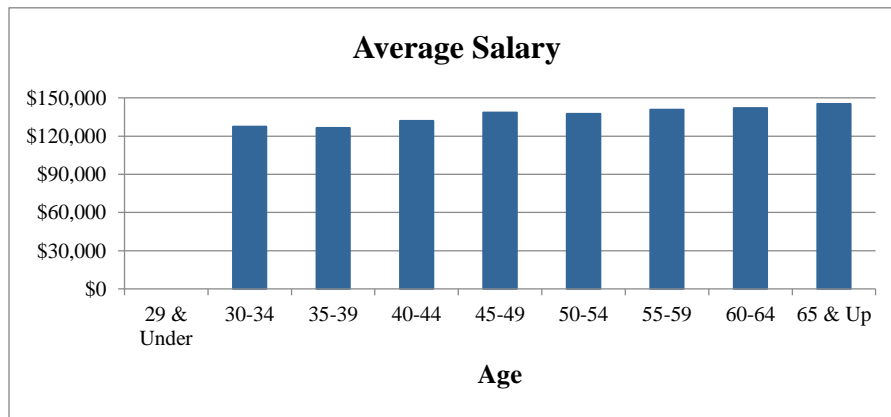
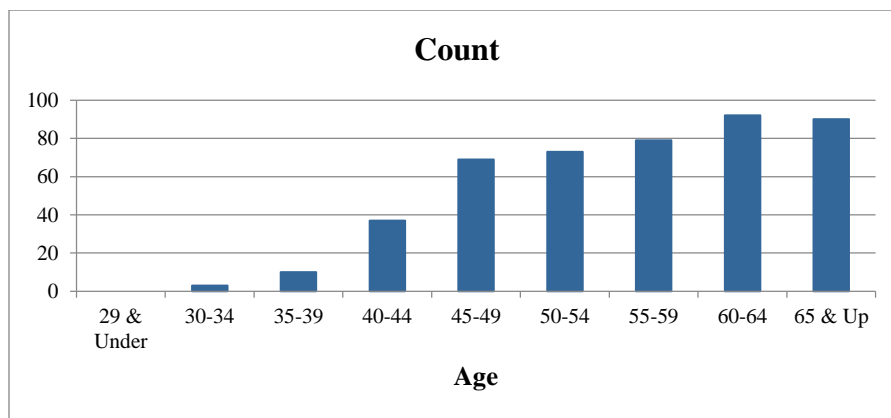
³ Actual pay for contributing members with less than 22 years of service for the fiscal year ending on the valuation date, rolled forward at the known pay increase of 2.7%.



APPENDIX A – MEMBERSHIP DATA

**ACTIVE MEMBERS
As of June 30, 2018 for the June 30, 2019 Valuation**

<u>Age</u>	<u>Count of Members</u>			<u>FY 2018 Annual Membership Data Salary</u>		
	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>
29 & Under	0	0	0	0	0	0
30-34	1	2	3	117,731	264,895	382,626
35-39	5	5	10	618,088	647,521	1,265,609
40-44	17	20	37	2,295,757	2,590,084	4,885,841
45-49	45	24	69	6,353,182	3,208,173	9,561,355
50-54	48	25	73	6,681,243	3,355,337	10,036,580
55-59	60	19	79	8,646,581	2,472,353	11,118,934
60-64	64	28	92	9,065,300	3,990,604	13,055,904
65 & Up	<u>67</u>	<u>23</u>	<u>90</u>	<u>9,792,520</u>	<u>3,287,871</u>	<u>13,080,391</u>
Total	307	146	453	\$ 43,570,402	\$ 19,816,838	\$ 63,387,240





APPENDIX A – MEMBERSHIP DATA

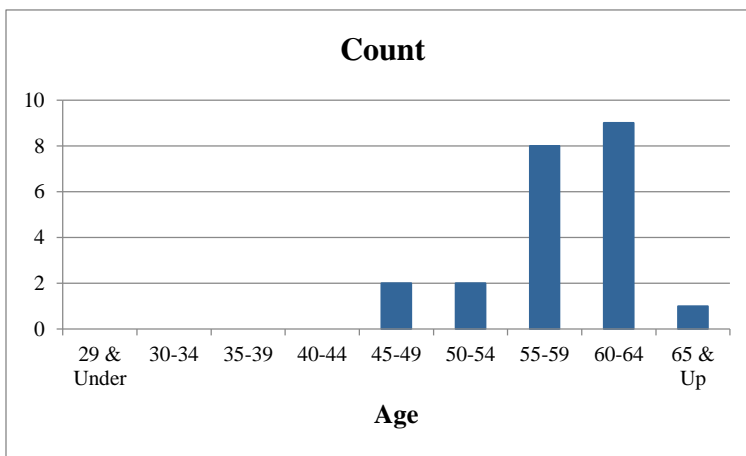
**AGE AND SERVICE DISTRIBUTION
As of June 30, 2018 for the June 30, 2019 Valuation**

Age		0-4	5-9	10-14	15-19	20-24	25-29	30-34	Over 34	Total
29 & Under	Number	0	0	0	0	0	0	0	0	0
	Total Salary	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
	Average Sal.	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
30-34	Number	3	0	0	0	0	0	0	0	3
	Total Salary	\$ 382,626	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 382,626
	Average Sal.	\$ 127,542	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 127,542
35-39	Number	8	1	1	0	0	0	0	0	10
	Total Salary	\$ 1,000,714	\$ 147,164	\$ 117,731	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 1,265,609
	Average Sal.	\$ 125,089	\$ 147,164	\$ 117,731	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 126,561
40-44	Number	24	9	4	0	0	0	0	0	37
	Total Salary	\$ 3,119,874	\$ 1,206,744	\$ 559,223	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 4,885,841
	Average Sal.	\$ 129,995	\$ 134,083	\$ 139,806	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 132,050
45-49	Number	32	27	7	3	0	0	0	0	69
	Total Salary	\$ 4,385,485	\$ 3,792,529	\$ 971,282	\$ 412,059	\$ 0	\$ 0	\$ 0	\$ 0	\$ 9,561,355
	Average Sal.	\$ 137,046	\$ 140,464	\$ 138,755	\$ 137,353	\$ 0	\$ 0	\$ 0	\$ 0	\$ 138,570
50-54	Number	28	22	13	7	3	0	0	0	73
	Total Salary	\$ 3,708,530	\$ 3,061,010	\$ 1,824,833	\$ 1,000,715	\$ 441,492	\$ 0	\$ 0	\$ 0	\$ 10,036,580
	Average Sal.	\$ 132,448	\$ 139,137	\$ 140,372	\$ 142,959	\$ 147,164	\$ 0	\$ 0	\$ 0	\$ 137,487
55-59	Number	22	21	14	16	6	0	0	0	79
	Total Salary	\$ 3,120,523	\$ 2,737,895	\$ 1,971,997	\$ 2,380,403	\$ 908,116	\$ 0	\$ 0	\$ 0	\$ 11,118,934
	Average Sal.	\$ 141,842	\$ 130,376	\$ 140,857	\$ 148,775	\$ 151,353	\$ 0	\$ 0	\$ 0	\$ 140,746
60-64	Number	11	24	16	14	27	0	0	0	92
	Total Salary	\$ 1,471,639	\$ 3,325,905	\$ 2,178,026	\$ 2,031,510	\$ 4,048,824	\$ 0	\$ 0	\$ 0	\$ 13,055,904
	Average Sal.	\$ 133,785	\$ 138,579	\$ 136,127	\$ 145,108	\$ 149,956	\$ 0	\$ 0	\$ 0	\$ 141,912
65 & Up	Number	9	13	15	16	37	0	0	0	90
	Total Salary	\$ 1,206,744	\$ 1,879,398	\$ 2,178,027	\$ 2,325,191	\$ 5,491,031	\$ 0	\$ 0	\$ 0	\$ 13,080,391
	Average Sal.	\$ 134,083	\$ 144,569	\$ 145,202	\$ 145,324	\$ 148,406	\$ 0	\$ 0	\$ 0	\$ 145,338
Total	Number	137	117	70	56	73	0	0	0	453
	Total Salary	\$ 18,396,135	\$ 16,150,645	\$ 9,801,119	\$ 8,149,878	\$ 10,889,463	\$ 0	\$ 0	\$ 0	\$ 63,387,240
	Average Sal.	\$ 134,278	\$ 138,040	\$ 140,016	\$ 145,534	\$ 149,171	\$ 0	\$ 0	\$ 0	\$ 139,928



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

<u>Age</u>	<u>Count of Members</u>		
	<u>Male</u>	<u>Female</u>	<u>Total</u>
29 & Under	0	0	0
30-34	0	0	0
35-39	0	0	0
40-44	0	0	0
45-49	1	1	2
50-54	0	2	2
55-59	3	5	8
60-64	5	4	9
65 & Up	<u>1</u>	<u>0</u>	<u>1</u>
Total	10	12	22

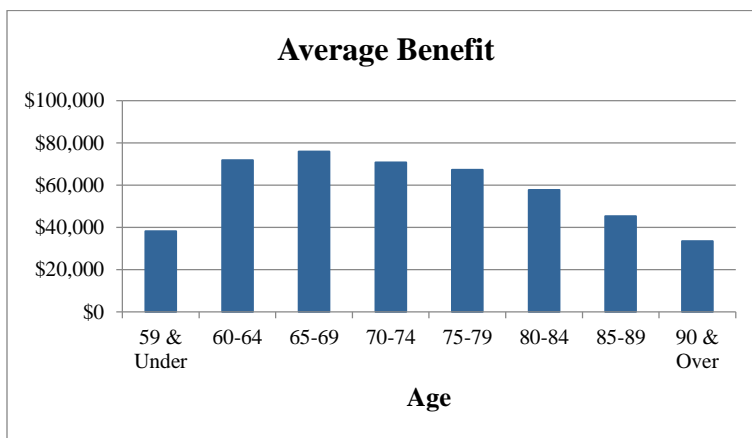
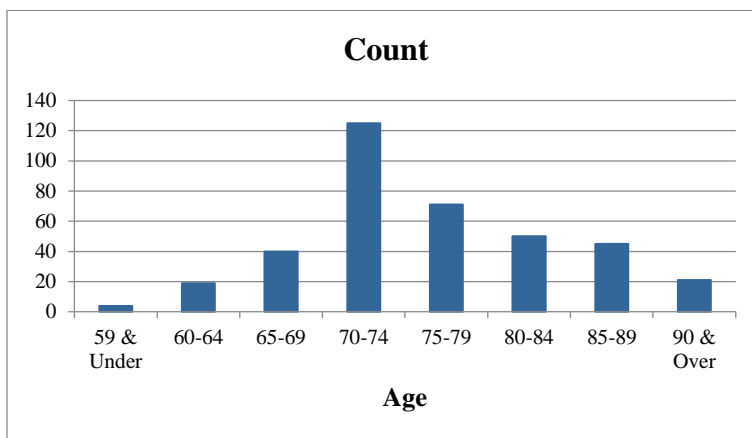




APPENDIX A – MEMBERSHIP DATA

**MEMBERS AND BENEFICIARIES RECEIVING BENEFITS
As of June 30, 2018 for the June 30, 2019 Valuation**

Age	Count of Members			Annual Benefits		
	Male	Female	Total	Male	Female	Total
59 & Under	0	4	4	\$ 0	\$ 153,070	\$ 153,070
60-64	12	7	19	970,512	394,070	1,364,582
65-69	35	5	40	2,709,406	324,386	3,033,792
70-74	96	29	125	7,430,966	1,407,323	8,838,289
75-79	45	26	71	3,673,996	1,102,319	4,776,315
80-84	30	20	50	2,238,267	647,560	2,885,827
85-89	20	25	45	1,393,882	645,445	2,039,327
90 & Over	<u>3</u>	<u>18</u>	<u>21</u>	<u>189,306</u>	<u>513,364</u>	<u>702,670</u>
Total	241	134	375	\$ 18,606,335	\$ 5,187,537	\$ 23,793,872





**MEMBERS AND BENEFICIARIES RECEIVING BENEFITS
As of June 30, 2018 for the June 30, 2019 Valuation**

Schedule of Average Benefit Payments ¹

For the Year Ended June 30, 2019	Years of Credited Service						Total
	< 10	10 - 14	15 - 19	20 - 24	25 - 29	30 +	
Average Monthly Defined Benefit	\$2,017	\$4,500	\$5,619	\$6,279	\$6,775	\$6,541	\$5,288
Average Final Average Salary ²	\$107,961	\$122,249	\$126,629	\$128,644	\$117,627	\$125,976	\$123,747
Number of Benefit Recipients	44	90	79	92	41	29	375

Schedule of Benefit Recipients by Type of Benefit Option ¹

Amount of Monthly Benefit (in dollars)	Number of Recipients by Benefit Option			Total Benefit Recipients
	Joint with 50% Survivor Benefits	Survivors	Disability	
1 - 500	0	0	0	0
501 - 1,000	0	0	0	0
1,001 - 1,500	0	25	0	25
1,501 - 2,000	0	15	0	15
2,001 - 2,500	3	12	0	15
2,501 - 3,000	9	20	0	29
Over 3,000	253	36	2	291
Total	265	108	2	375

¹ Calculated using the prior year census data, adjusted for certain activity during the fiscal year.

² Excludes the 124 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

Schedule of Retirants and Beneficiaries

	<u>Added to Rolls</u>		<u>Removed from Rolls</u>		<u>Rolls - End of Year</u>		Percent Change In Total Annual Benefits	Average Annual Benefit	Percent Change In Average Annual Benefit
	Number	Annual Benefits ¹	Number	Annual Benefits ¹	Number	Total Annual Benefits ^{1,2}			
2019 ³	18	\$1,340	8	\$191	375	23,794	5.1%	63,450	2.3%
2018 ³	22	1,723	7	309	365	22,637	5.5	62,019	1.1
2017 ³	9	696	10	509	350	21,465	2.4	61,329	2.7
2016 ³	34	2,520	9	340	351	20,959	12.8	59,714	4.8
2015 ³	10	494	5	195	326	18,578	0.6	56,987	(1.0)
2014 ³	0	0	0	0	321	18,474	0.0	57,551	0.0
2013	24	1,798	14	442	321	18,474	8.5	57,551	5.1
2012	7	444	6	194	311	17,028	1.4	54,751	1.1
2011	21	1,452	9	200	310	16,787	9.1	54,152	4.9
2010	11	627	6	339	298	15,390	1.1	51,644	(0.6)

¹Dollar amounts are in thousands except for the average annual benefit.

²End 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.

³The valuation results were calculated using the prior year census data, adjusted for certain activity during the fiscal year.



APPENDIX B – SUMMARY OF PLAN PROVISIONS

Definitions

Fiscal year	Twelve month period ending June 30.
Participation	All individuals serving as a judge or justice in Indiana as defined in IC 33-38-6-7. A judge who begins service before September 1, 1985 shall be a participant of the 1977 Plan (IC 33-38-7) and a judge who begins service after August 31, 1985 shall be a participant of the 1985 Plan (IC 33-38-8).
Member contributions	Each participant contributes 6% of his total salary until completion of 22 years of service. Beginning in 2013, the employee contributions are picked up by the employer as pre-tax money which are also included in annual salary.
Earnings	Earnings is the annual salary being paid for the office which the participant held at the time of separation from service effective January 1, 2010.

Eligibility for Benefits

Deferred vested	8 or more years of creditable service and no longer active.
Disability retirement	A participant is considered disabled if two (2) physicians certify that the participant is totally incapacitated from earning a livelihood and that the condition is likely to be permanent.
Early retirement	Age 62 with 8 or more years of creditable service.
Normal retirement	Earliest of: <ul style="list-style-type: none">- Age 65 with 8 or more years of creditable service- Age 55 with sum of age and creditable service equal to 85 or more
Pre-retirement death	8 or more years of creditable service entitled to a future benefit.



APPENDIX B – SUMMARY OF PLAN PROVISIONS

Monthly Benefits Payable

Normal retirement

The normal retirement benefit is a monthly annuity payable for life with a 50% continuation (or \$12,000 annually, if greater) to a surviving spouse or surviving dependent children. The benefit is equal to a percentage of earnings in accordance with the following table:

Years of Service	Percentage
7 or less	0%
8	24%
9	27%
10	30%
11	33%
12	50%
13	51%
14	52%
15	53%
16	54%
17	55%
18	56%
19	57%
20	58%
21	59%
22 or more	60%

An additional percentage shall be calculated by prorating between applicable percentages, based on the number of months in a partial year of service.

Early retirement

The early retirement benefit is the accrued retirement benefit determined as of the early retirement date and payable commencing at the normal retirement date. A participant may elect to have the benefit commence prior to age 65 provided the benefit is reduced by 0.1% for each month that the benefit commencement date precedes age 65.

Deferred retirement

The termination benefit is the accrued retirement benefit determined as of the termination date and payable commencing as of the normal retirement date. The participant may elect to receive a reduced early retirement benefit.



APPENDIX B – SUMMARY OF PLAN PROVISIONS

Disability

The disability retirement benefit is payable for the duration of the disability commencing the month following disability date. The amount of monthly benefit shall be equal to a percentage of: (1) for the 1977 JRS Plan – the salary paid for the office the member held at the time of separation; (2) for the 1985 Plan - salary paid to the member at the time of separation. The percentages are in accordance with the following table:

Years of Service	Percentage
12 or less	50%
13	51%
14	52%
15	53%
16	54%
17	55%
18	56%
19	57%
20	58%
21	59%
22 or more	60%

An additional percentage shall be calculated by prorating between applicable percentages, based on the number of months in a partial year of service.

Pre-retirement death

If death occurs (a) while receiving benefits, (b) while in service as a judge with 8 or more years of service, or (c) while permanently disabled, the spouse or family of dependent children shall be eligible for a benefit equal to the greater of \$12,000 (effective July 1, 1977) annually or 50% of the benefit the participant was receiving or was entitled to receive at the time of death.

Spousal benefits are payable as a lifetime monthly pension.

Post-retirement benefit increases

Participant benefits in the Judges’ 1977 Retirement, Disability, and Death Plan increase in the same ratio as the salary being paid for the office a participant held at the time of separation from service increases. Effective January 1, 2010, the Judges’ 1985 Retirement, Disability, and Death Plan will also have benefits increase in the same manner, on a prospective basis only.



APPENDIX B – SUMMARY OF PLAN PROVISIONS

Cost-of-Living-Adjustments	Benefits for retired members (does not include disabled members or surviving spouses) increase automatically based on the annual pay increase granted for the position the member held at the time of retirement. The annual cost-of-living assumption for the valuation is 2.5%, which is the same as the salary increase assumption for active members.
Forms of payment	
a. Single life annuity	Member will receive a monthly benefit for life, but there are no monthly payments to anyone after death.
b. Joint with one-half survivor benefits	Member will be paid a monthly benefit for life. After death, one-half (1/2) of the benefit will be paid to the spouse for their lifetime or the dependent until age 18 unless disabled. If the dependent child was named the beneficiary, once they are no longer entitled to the benefit, the spouse would receive the benefit for life.

Changes in Plan Provisions since the Prior Year

None.



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.

For funding, gains and losses occurring from census experience different than assumed, assumption changes, and benefit changes are amortized over a 20-year period with level payments each year. A new gain or loss base is established each year based on the additional gain or loss during that year and that base is amortized over a new 20-year period (gain or loss bases established prior to June 30, 2016 were amortized over 30 years and will continue to be amortized over 30 -year period). However, when the plan is at or above 100% funded (based on Actuarial Value of Assets), the past amortization bases are considered fully amortized and a single amortization base equal to the surplus is amortized over a 30-year period with level payments each year. The purpose of the method is to give a smooth progression of the costs from year to year and, at the same time, provide for an orderly funding of the unfunded liabilities.

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 from 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. Asset Valuation Method

The Actuarial Value of Assets smoothes the recognition of gains and losses on the Market Value of Assets over five years, subject to a 20% corridor.

3. 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.



4. Anticipated Payroll

The anticipated payroll for the fiscal year following the valuation date is equal to the actual payroll during the year ending on the valuation date, increased with the actual pay adjustment as of the valuation date. The proportion of pay attributable to active members with more than 22 years of service is presumed constant.

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 2.50% per year beginning July 1, 2020. Actual salary increases on July 1, 2018 (2.1%) and July 1, 2019 (2.7%) are reflected in the in the liability valuation at June 30, 2018.
4. Interest on member balances 3.50% per year
5. Cost-of-Living Adjustment (COLA) 2.5% compounded annually, beginning July 1, 2020. Actual COLA increases at July 1, 2018 (2.1%) and July 1, 2019 (2.7%) are reflected in the valuation.

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, with future mortality improvement projected generationally using future mortality improvement inherent in the Social Security Administration's 2014 Trustee report.
 - b. Disabled mortality 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.



APPENDIX C – SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

2. Disability

Age	Sample Rates
20	0.060%
25	0.085%
30	0.110%
35	0.147%
40	0.220%
45	0.360%
50	0.606%
55	1.009%
60	1.627%
65+	0.000%

3. Retirement

Age	Service <22
62	25%
63	15%
64	10%
65	50%
66-74	30%
75+	100%

Age	Service >=22
55-74	70%
75+	100%

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

4. Termination

3% per year for all members prior to retirement eligibility.

Other Assumptions

1. Form of payment

Members are assumed to elect either a single life annuity or a 50% joint survivor benefit based on the marriage assumptions below.

2. Marital status

a. Percent married

90% of members are assumed to be married or to have a dependent beneficiary.

b. Spouse's age

Male members are assumed to be three (3) years older than their spouses and female members are assumed to be two (2) years younger than their 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.



APPENDIX C – SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

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. Standard actuarial roll-forward techniques were then used to project the liability computed as of June 30, 2018 to the June 30, 2019 valuation date. The normal cost rate is assumed to remain unchanged between June 30, 2018 and June 30, 2019.

The member total payroll and the asset information for this valuation were furnished as of June 30, 2019. Total payroll in FYE 2020 is assumed to increase by the actual salary increase as of the valuation date over the total payroll observed for FYE 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.

Other Technical Valuation Procedures

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.



APPENDIX D – GLOSSARY OF ACTUARIAL TERMS

Accrued Service	Service credited under the plan 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 plan 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 plan 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 plan benefits allocated to the current year by the actuarial cost method.
Unfunded Actuarial Accrued Liability	<p>The difference between actuarial liability and the actuarial value of assets. Sometimes referred to as “unfunded accrued liability” or “unfunded liability.”</p> <p>Most retirement plans have unfunded actuarial liability. They arise anytime new benefits are added and anytime an actuarial loss is realized.</p>