

nyhart

***Indiana State Teachers'
Retirement Fund
1996 Account***

***Annual Actuarial Valuation
June 30, 2016***

**Indiana State Teachers' Retirement Fund
1996 Account**

Annual Actuarial Valuation as of June 30, 2016

Nyhart

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November 7, 2016

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***The Board of Trustees
Indiana Public Retirement System
Indianapolis, IN***

Dear Board Members:

An actuarial valuation is prepared annually for the Indiana State Teachers' Retirement Fund 1996 Account. Submitted in this report are the results of the June 30, 2016 actuarial valuation.

Census Data and Asset Information

The member census data and the asset information for this valuation were furnished by the Chief Financial Officer and Staff. Their efforts and cooperation in furnishing these materials are acknowledged with appreciation. 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.

Assumptions and Methods

The majority of the actuarial assumptions used in the June 30, 2016 valuation were adopted by the Board pursuant to the Experience Study completed in April 2015, which reflects the experience period from July 1, 2011 to June 30, 2014. The Board adopted changes to the Actuarial Value of Assets smoothing period and to the amortization period for the Calculated Contribution Rate with the June 30, 2016 valuation. Assumptions are summarized in the Assumptions and Methods section of this report. These assumptions and methods have been used to develop the Actuarially Determined Contribution and are consistent with the accounting requirements detailed in GASB Statements No. 67 and No. 68.

Benefit obligations in the June 30, 2016 valuation are determined using June 30, 2015 census data and rolled-forward to the June 30, 2016 measurement date at the valuation interest rate, using actual distributions and ASA account returns during that period. We are not aware of any material events that would require additional adjustments to the benefit obligations for changes to the population not anticipated in the demographic assumptions used in the valuation.

Funding Objective

The funding objective of the Indiana State Teachers' Retirement Fund 1996 Account is to establish and receive contributions that, when invested at the assumed rate of return, will ultimately accumulate assets over each member's working lifetime that will be sufficient to pay expected retirement allowances. As such, an employer contribution rate is calculated each year. That rate is then considered in conjunction with the goal of maintaining a relatively stable contribution over time.

Fund Structure

The Indiana State Teachers' Retirement Fund (TRF) is one fund comprised of a two-account structure in compliance with Indiana Code Section 5-10.4-2-2:

The 1996 Account consists of members who were:

1. hired on or after July 1, 1995; or

2. hired before July 1, 1995, and prior to June 30, 2005:
 - a. were either hired by another school corporation or institution covered by TRF, or
 - b. were re-hired by a covered prior employer.

Characteristics of the 1996 Account

1. As members depart from active service in the Pre-1996 Account, their replacements will become members of the 1996 Account. If the 1996 Account were a stand-alone plan, this pattern of departures and hirings would produce a fairly constant population size.
2. Defined Benefits payable from the 1996 Account are funded by contributions from local school corporations or other institutions that employ covered members. At the time of retirement, ASA benefits payable from the 1996 Account are funded by the annuitization of 1996 Account member contributions.

Funding Arrangements

Defined Benefits payable from the 1996 Account are funded through employer percent-of-pay contributions. The Board of the Indiana Public Retirement System sets this contribution rate after reviewing the most recent actuarial valuation report.

The contribution rate of 7.50% for fiscal year 2017 was set by the Board in fiscal year 2016. The contribution rate of 7.50% for fiscal year 2018 was set by the Board in fiscal year 2017.

Progress Towards Realization of Financing Objectives

The funded ratio (the ratio of the actuarial value of assets to the actuarial accrued liability) is a standard measure of a Plan's funded status. In the absence of benefit improvements, it should increase over time, until it reaches 100%. The funded ratio of the 1996 Account decreased to 91.8% from 92.5% for the preceding year. Based on the actuarial assumptions, it is anticipated that the 1996 Account will attain 100% funded status on 6/30/2035.

Certification

We have included several schedules and exhibits in this report, including the following:

Financial Section

- Note 1 – Tables of Plan Membership
- Note 8 – Net Pension Liability and Actuarial Information – Defined Benefit Plans
- Schedule of Changes in Net Pension Liability and Net Pension Liability
- Schedule of Contributions (Actuarially Determined Contribution)
- Schedule of Notes to Required Supplementary Information

Actuarial Section

- Summary of INPRS Funded Status
- Historical Summary of Actuarial Valuation Results by Retirement Plan (Schedule of Funding Progress)
- Summary of Actuarial Assumptions, Methods and Plan Provisions
- Analysis of Financial Experience (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

To the best of our knowledge, this report presents a fair position of the funded status of the plan in accordance with the Actuarial Standards of Practice as described by the American Academy of Actuaries. In addition, information has been prepared in accordance with applicable government standards of financial reporting for defined benefit pension plans.


The actuarial valuation is prepared using information which has been reconciled and reviewed for reasonableness. We are not aware of any material inadequacy in employee census or asset values. The census information and the asset information have been provided to us by the Chief Financial Officer and Staff. We have not audited the information at the source, and therefore do not accept responsibility for the accuracy or the completeness of the data on which the information is based.

In our opinion, the actuarial assumptions and methods are individually reasonable and in combination represent our best estimate of anticipated experience of the plan.

Neither Nyhart nor any of its employees have any relationship with the plan or its sponsor which could impair or appear to impair the objectivity of this report.

The undersigned are compliant with the continuing education requirements of the Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States.

Respectfully submitted,



Michael Zurek, EA, MAAA



Danielle Winegardner, ASA, EA, MAAA



Tayt V. Odom, FSA, EA, MAAA

Table of Contents

<u>Section</u>	<u>Page</u>
Executive Summary	1
Funding	3
Accounting	12
Member Data	19
Assumptions and Methods	30
Benefit Provisions	37
Appendix: Total Fund Demographic Information	39

Executive Summary

Contribution Rates

The Calculated Contribution Rate section shows the calculated rate for the 1996 Account. That rate is determined for the 1996 Account as a stand-alone plan.

Plan Provisions

There is no ad-hoc COLA on January 1, 2017. Instead, retirees were paid a service-related lump sum (i.e., referred to as 13th check) in September 2016. These changes are reflected in the June 30, 2016 valuation. Any future COLA is estimated by an ongoing assumption of 1.0% annual increases in all pension payments beginning January 1, 2018.

ASA annuitizations are scheduled to be based on a 4.50% conversion rate for the period from June 30, 2016 through March 31, 2017. After April 1, 2017, annuity conversions will occur outside of the plan. Benefit obligations in the June 30, 2016 valuation have been adjusted for the anticipated gains through March 31, 2017 for conversions at interest rates lower than the valuation interest rate of 6.75%.

We are not aware of any other material changes in the plan provisions since the June 30, 2015 actuarial valuation.

Census Data

Census data for the valuation was provided by INPRS. We have thoroughly examined the data for reasonableness and consistency with prior years, but we did not otherwise audit it.

Assumptions and Methods

The actuarial assumptions used in the June 30, 2016 valuation are based on plan experience from July 1, 2011 to June 30, 2014. The Board adopted changes to the Actuarial Value of Assets smoothing period and to the amortization period for the Calculated Contribution Rate with the June 30, 2016 valuation.

Benefit obligations in the June 30, 2016 valuation are determined using June 30, 2015 census data and rolled-forward to the June 30, 2016 measurement date at the valuation interest rate, using actual distributions and ASA account returns during that period. We are not aware of any material events that would require additional adjustments to the benefit obligations for changes to the population not anticipated in the demographic assumptions used in the valuation.

Investment Experience

The investment return for the year ended June 30, 2016 was lower than the assumed 6.75% return. The assets of the TRF 1996 Account are commingled with the assets of other funds administered by INPRS. The TRF money-weighted return was 1.01% during fiscal 2016. Under the asset valuation method, market gains and losses are spread over a five-year period. The Market Value of Assets is currently \$254 million lower than the Actuarial Value of Assets, meaning the plan is currently in a position of having net deferred investment losses to be recognized in future years.

Challenges

The 1996 Account has been steadily funded since its inception. As membership in that portion of the plan increases, the amount of required contributions will increase as a dollar amount, but should remain relatively stable as a percentage of covered payroll with plan experience causing gradual changes.

Summary of Key Valuation Results

	June 30, 2016	June 30, 2015	June 30, 2014	June 30, 2013
Member Information				
Number				
Active Members	55,265	52,424	51,204	51,204
Inactive Vested Members	4,335	4,132	3,103	3,103
Inactive Nonvested Members	12,529	12,292	11,147	11,147
Retired Members and Beneficiaries	<u>4,977</u>	<u>4,136</u>	<u>3,665</u>	<u>3,665</u>
Total	77,106	72,984	69,119	69,119
Valuation Payroll	\$ 3,004,169,194	\$ 2,827,310,987	\$ 2,740,661,321	\$ 2,740,939,967
Projected Payroll for Fiscal Year	\$ 3,127,400,000	\$ 3,078,600,000	\$ 2,987,300,000	
Annual Benefit Payments				
Annuity	\$ 10,255,680	\$ 8,189,292	\$ 7,111,980	\$ 7,111,980
Pension	<u>80,904,120</u>	<u>67,524,240</u>	<u>60,057,396</u>	<u>60,057,396</u>
Total	\$ 91,159,800	\$ 75,713,532	\$ 67,169,376	\$ 67,169,376
Assets and Liabilities				
Accrued Liability				
ASA Account Balance	\$ 1,217,432,610	\$ 1,170,914,523	\$ 1,120,728,729	\$ 991,924,506
ASA Annuities	122,416,233	108,501,422	86,516,737	78,374,599
Pension: Retirees	956,838,640	788,534,587	672,727,439	703,495,761
Pension: Non-retirees	<u>4,095,062,582</u>	<u>3,837,740,501</u>	<u>3,357,020,264</u>	<u>2,975,573,809</u>
Total	\$ 6,391,750,065	\$ 5,905,691,033	\$ 5,236,993,169	\$ 4,749,368,675
Market Value of Assets				
ASA Account Balance	\$ 1,217,432,610	\$ 1,170,914,523	\$ 1,120,728,729	\$ 991,924,506
ASA Annuities	122,416,233	108,501,422	86,516,737	78,374,599
Pension: Retirees	956,838,640	788,534,587	672,727,439	703,495,761
Pension: Non-retirees	<u>3,314,542,211</u>	<u>3,311,162,510</u>	<u>3,309,469,425</u>	<u>2,659,891,307</u>
Total	\$ 5,611,229,694	\$ 5,379,113,042	\$ 5,189,442,330	\$ 4,433,686,173
Actuarial Value of Assets				
ASA Account Balance	\$ 1,217,432,610	\$ 1,170,914,523	\$ 1,120,728,729	\$ 991,924,506
ASA Annuities	122,416,233	108,501,422	86,516,737	78,374,599
Pension: Retirees	956,838,640	788,534,587	672,727,439	703,495,761
Pension: Non-retirees	<u>3,569,041,934</u>	<u>3,393,221,851</u>	<u>3,155,258,596</u>	<u>2,680,033,218</u>
Total	\$ 5,865,729,417	\$ 5,461,172,383	\$ 5,035,231,501	\$ 4,453,828,084
Unfunded Accrued Liability				
ASA Account Balance	\$ 0	\$ 0	\$ 0	\$ 0
ASA Annuities	0	0	0	0
Pension: Retirees	0	0	0	0
Pension: Non-retirees	<u>526,020,648</u>	<u>444,518,650</u>	<u>201,761,668</u>	<u>295,540,591</u>
Total	\$ 526,020,648	\$ 444,518,650	\$ 201,761,668	\$ 295,540,591
Funded Percentage				
ASA Account Balance	100.0%	100.0%	100.0%	100.0%
ASA Annuities	100.0%	100.0%	100.0%	100.0%
Pension: Retirees	100.0%	100.0%	100.0%	100.0%
Pension: Non-retirees	<u>87.2%</u>	<u>88.4%</u>	<u>94.0%</u>	<u>90.1%</u>
Total	91.8%	92.5%	96.1%	93.8%
Pension Normal Cost	\$ 168,650,636	\$ 167,836,193	\$ 170,892,424	\$ 155,314,388
Annual Costs				
	Fiscal 2018	Fiscal 2017	Fiscal 2016	Fiscal 2015
Projected Payroll	\$ 3,244,100,000	\$ 3,294,100,000	\$ 3,226,300,000	\$ 2,987,600,000
Actuarially Determined Contribution (ADC)				
Normal Cost	\$ 174,856,990	\$ 179,528,450	\$ 184,544,360	\$ 169,396,920
Amortization of Unfunded Liability	<u>43,470,940</u>	<u>36,893,920</u>	<u>17,422,020</u>	<u>24,797,080</u>
Total	\$ 218,327,930	\$ 216,422,370	\$ 201,966,380	\$ 194,194,000
Calculated Contribution Rate				
Normal Cost	5.39%	5.45%	5.72%	5.67%
Amortization of Unfunded Liability	<u>1.34%</u>	<u>1.12%</u>	<u>0.54%</u>	<u>0.83%</u>
Total	6.73%	6.57%	6.26%	6.50%
Approved Employer Contribution Rate	7.50%	7.50%	7.50%	7.50%

Valuations on and after June 30, 2014 are based on census data collected at the prior measurement date.

Unfunded Accrued Liability

\$Millions				
June 30	Accrued Liability	Actuarial Value of Assets	Unfunded Accrued Liability	Funded Percentage
1996	\$ 48	\$ 21	\$ 27	43.8%
1997	176	72	104	40.9%
1998	298	136	162	45.6%
1999	498	240	258	48.2%
2000	706	368	338	52.1%
2001	828	447	381	54.0%
2002	1,167	621	546	53.2%
2003	1,392	826	566	59.3%
2004	1,649	1,039	610	63.0%
2005	2,011	1,268	743	63.1%
2006	2,363	2,209	154	93.5%
2007	2,828	2,713	115	95.9%
2008	2,958	3,080	(122)	104.1%
2009	3,136	2,921	215	93.1%
2010	3,615	3,423	192	94.7%
2011	3,997	3,665	332	91.7%
2012	4,338	3,936	402	90.7%
2013	4,750	4,454	296	93.8%
2014	5,237	5,035	202	96.1%
2015	5,906	5,461	445	92.5%
2016	6,392	5,866	526	91.8%

Reconciliation of Market Value of Assets

	June 30, 2015 thru June 30, 2016	June 30, 2014 thru June 30, 2015
Market Value, beginning of year	\$ 5,379,113,042	\$ 5,189,442,330
Member Contributions	\$ 88,386,508	\$ 86,515,294
Employer Contributions	215,625,986	205,763,142
Non-Employer Contributing Entity Contributions	0	0
Benefit Payments	(135,289,991)	(127,898,876)
Net Transfers ¹	<u>4,793,681</u>	<u>5,889,210</u>
Non-Investment Net Cash Flow	\$ 173,516,184	\$ 170,268,770
Administrative Expenses	\$ (5,603,306)	\$ (6,185,233)
Investment Return	<u>64,203,774</u>	<u>25,587,175</u>
Net Investment Return	\$ 58,600,468	\$ 19,401,942
Market Value, end of year	\$ 5,611,229,694	\$ 5,379,113,042
Market Value of Assets Approximate Time-Weighted Annual Rate of Return ²	1.1%	0.4%

¹ Net transfers from June 30, 2015 thru June 30, 2016 include member service credit purchases of \$43,175.

² Consolidated pension and ASA account return, net of investment and administrative expenses, assumes cash flows occur at mid-year.

Development of the Actuarial Value of Assets

	June 30, 2015 thru June 30, 2016
1. Actuarial Value, beginning of year	\$ 5,461,172,383
2. ASA Account Balance, beginning of year	<u>\$ 1,170,914,523</u>
3. Actuarial Value, Net of ASA Account Balance, beginning of year [(1) – (2)]	\$ 4,290,257,860
4. Market Value, Net of ASA Account Balance, beginning of year	\$ 4,208,198,519
5. Market Value, Net of ASA Account Balance, end of year	\$ 4,393,797,084
6. Non-Investment Net Cash Flow	129,437,231
7. Net Investment Return	
a. Expected [.0675 x ((4)+0.5*(6))]	288,421,907
b. Actual [(5) - (4) - (6)]	<u>56,161,334</u>
8. Current Year Market Value Gain/(Loss) [(7b) - (7a)]	\$ (232,260,573)
9. Deferred Recognition of Investment Gain/(Loss)	
a. Current Fiscal Year (80% of (8))	\$ (185,808,458)
b. Current Fiscal Year - 1 (60%)	(173,096,725)
c. Current Fiscal Year - 2 (40%)	107,815,584
d. Current Fiscal Year - 3 (20%)	<u>(3,410,124)</u>
e. Total [(a) + (b) + (c) + (d)]	\$ (254,499,723)
10. Preliminary Actuarial Value, end of year [(5) - (9e)]	\$ 4,648,296,807
a. 80% of Market Value, end of year [80% of (5)]	3,515,037,667
b. 120% of Market Value, end of year [120% of (5)]	5,272,556,501
11. Actuarial Value, end of year [(10), but not Greater than (10b), nor Less than (10a)]	\$ 4,648,296,807
12. Actuarial Value as a % of Market Value [(11) / (5)]	105.79%
13. Net Investment Return on Actuarial Value [(11) - (3) - (6)]	\$ 228,601,716
14. Actuarial Value Net Rate of Return [(13) / ((3) + 0.5*(6))]	5.25%
15. Actuarial Value, Net of ASA Account Balance, end of year	\$ 4,648,296,807
16. ASA Account Balance, end of year	\$ 1,217,432,610
17. Actuarial Value, end of year [(15) + (16)]	\$ 5,865,729,417

Accrued Liability Reconciliation

	June 30, 2015 thru June 30, 2016	June 30, 2014 thru June 30, 2015
Total Accrued Liability, beginning of year	\$ 5,905,691,033	\$ 5,236,993,169
ASA Account Balance, beginning of year	\$ 1,170,914,523	\$ 1,120,728,729
Accrued Liability, Net of ASA Account Balance, beginning of year	\$ 4,734,776,510	\$ 4,116,264,440
Normal Cost	167,836,193	170,892,424
Actual Benefit Payments	(99,506,626)	(90,266,941)
Transfers	13,301,977	27,488,475
Expected Interest	<u>328,016,951</u>	<u>287,264,315</u>
Expected Accrued Liability, Net of ASA Account Balance, end of year	\$ 5,144,425,005	\$ 4,511,642,713
Sources of Change:		
Experience (Gain) or Loss	\$ 40,667,310	\$ (34,483,801)
Mortality Change ¹	0	303,071,328
Other Assumption Changes ²	0	(39,080,278)
Additional Liability due to Cost-of-Living Adjustment ³	(10,774,860)	(6,373,452)
Plan Provision Changes	<u>0</u>	<u>0</u>
Accrued Liability, Net of ASA Account Balance, end of year	\$ 5,174,317,455	\$ 4,734,776,510
ASA Account Balance, end of year	\$ 1,217,432,610	\$ 1,170,914,523
Total Accrued Liability, end of year	\$ 6,391,750,065	\$ 5,905,691,033

¹ The June 30, 2015 mortality assumption was updated to the RP-2014 White Collar mortality table with Social Security Administration improvement scale applied from 2006.

² Assumption changes other than mortality adopted on June 30, 2015 pursuant to the 2015 experience study.

³ 13th check to retirees in lieu of the assumed 2017 and 2016 1.0% COLAs.

Asset and Liability Allocation¹

	June 30, 2016		
	Non-Retired	Retired	Total
Accrued Liability (AL)			
ASA Balance	\$ 1,204,885,475	\$ 12,547,135	\$ 1,217,432,610
ASA Annuities	0	122,416,233	122,416,233
Pension: Retirees	0	956,838,640	956,838,640
Pension: Non-Retirees	4,095,062,582	0	4,095,062,582
Total	\$ 5,299,948,057	\$ 1,091,802,008	\$ 6,391,750,065
Market Assets			
ASA Balance	\$ 1,204,885,475	\$ 12,547,135	\$ 1,217,432,610
ASA Annuities	0	122,416,233	122,416,233
Pension: Retirees	0	956,838,640	956,838,640
Pension: Non-Retirees	3,314,542,211	0	3,314,542,211
Total	\$ 4,519,427,686	\$ 1,091,802,008	\$ 5,611,229,694
Actuarial Assets			
ASA Balance	\$ 1,204,885,475	\$ 12,547,135	\$ 1,217,432,610
ASA Annuities	0	122,416,233	122,416,233
Pension: Retirees	0	956,838,640	956,838,640
Pension: Non-Retirees	3,569,041,934	0	3,569,041,934
Total	\$ 4,773,927,409	\$ 1,091,802,008	\$ 5,865,729,417
Unfunded AL			
ASA Balance	\$ 0	\$ 0	\$ 0
ASA Annuities	0	0	0
Pension: Retirees	0	0	0
Pension: Non-Retirees	526,020,648	0	526,020,648
Total	\$ 526,020,648	\$ 0	\$ 526,020,648

	June 30, 2015		
	Non-Retired	Retired	Total
Accrued Liability (AL)			
ASA Balance	\$ 1,159,597,089	\$ 11,317,434	\$ 1,170,914,523
ASA Annuities	0	108,501,422	108,501,422
Pension: Retirees	0	788,534,587	788,534,587
Pension: Non-Retirees	3,837,740,501	0	3,837,740,501
Total	\$ 4,997,337,590	\$ 908,353,443	\$ 5,905,691,033
Market Assets			
ASA Balance	\$ 1,159,597,089	\$ 11,317,434	\$ 1,170,914,523
ASA Annuities	0	108,501,422	108,501,422
Pension: Retirees	0	788,534,587	788,534,587
Pension: Non-Retirees	3,311,162,510	0	3,311,162,510
Total	\$ 4,470,759,599	\$ 908,353,443	\$ 5,379,113,042
Actuarial Assets			
ASA Balance	\$ 1,159,597,089	\$ 11,317,434	\$ 1,170,914,523
ASA Annuities	0	108,501,422	108,501,422
Pension: Retirees	0	788,534,587	788,534,587
Pension: Non-Retirees	3,393,221,851	0	3,393,221,851
Total	\$ 4,552,818,940	\$ 908,353,443	\$ 5,461,172,383
Unfunded AL			
ASA Balance	\$ 0	\$ 0	\$ 0
ASA Annuities	0	0	0
Pension: Retirees	0	0	0
Pension: Non-Retirees	444,518,650	0	444,518,650
Total	\$ 444,518,650	\$ 0	\$ 444,518,650

¹ Assets are allocated first to member ASA account liabilities, then to ASA annuity liabilities, then to Pension: Retirees liabilities, and finally to Pension: Non-Retirees liabilities to determine unfunded accrued liabilities.

Solvency Test

\$Thousands

Year Ended June 30	Accrued Liability				Portion of Accrued Liability Covered by Assets				
	Active Member Contributions	Retirees and Beneficiaries	Active Member (Employer Financed Portion)	Total	Actuarial Value of Assets	Active Member Contribs.	Retirees and Bfcys	Active Member (Employer Financed Portion)	Total
2005	\$535,179	\$219,722	\$1,255,845	\$2,010,746	\$1,268,575	100.0%	100.0%	40.9%	63.1%
2006	\$602,051	\$282,638	\$1,478,412	\$2,363,101	\$2,209,468	100.0%	100.0%	89.6%	93.5%
2007	\$656,918	\$449,452	\$1,721,184	\$2,827,554	\$2,713,051	100.0%	100.0%	93.3%	95.9%
2008	\$649,840	\$514,933	\$1,792,985	\$2,957,758	\$3,080,057	100.0%	100.0%	100.0%	104.1%
2009	\$655,843	\$432,942	\$2,046,748	\$3,135,533	\$2,920,735	100.0%	100.0%	89.5%	93.1%
2010	\$750,575	\$483,117	\$2,380,867	\$3,614,559	\$3,422,554	100.0%	100.0%	91.9%	94.7%
2011	\$840,341	\$562,445	\$2,594,053	\$3,996,839	\$3,664,657	100.0%	100.0%	87.2%	91.7%
2012	\$882,942	\$662,558	\$2,792,809	\$4,338,309	\$3,936,455	100.0%	100.0%	85.6%	90.7%
2013	\$975,309	\$798,486	\$2,975,573	\$4,749,368	\$4,453,828	100.0%	100.0%	90.1%	93.8%
2014	\$1,102,686	\$777,287	\$3,357,020	\$5,236,993	\$5,035,232	100.0%	100.0%	94.0%	96.1%
2015	\$1,159,597	\$908,353	\$3,837,741	\$5,905,691	\$5,461,172	100.0%	100.0%	88.4%	92.5%
2016	\$1,204,885	\$1,091,802	\$4,095,063	\$6,391,750	\$5,865,729	100.0%	100.0%	87.2%	91.8%

Analysis of Financial Experience¹

\$Thousands	June 30, 2015 thru June 30, 2016	June 30, 2014 thru June 30, 2015
Unfunded Accrued Liability, beginning of year	\$ 444,519	\$ 201,762
(Gain) / Loss:		
Actuarial Value of Assets	\$ 60,156	\$ 36,284
Actuarial Accrued Liabilities	40,667	(34,484)
Amortization of Existing Bases	(15,531)	(16,661)
Mortality Change ²	0	303,071
Other Assumption Changes ³	0	(39,080)
Asset Smoothing Method Change ⁴	6,985	0
Additional Liability due to Cost-of-Living Adjustment ⁵	(10,775)	(6,373)
Plan Provision Change	<u>0</u>	<u>0</u>
Net Change	\$ 81,502	\$ 242,757
Unfunded Accrued Liability, end of year	\$ 526,021	\$ 444,519

¹ Based on pension and ASA annuities only, i.e. net of ASA account balances.

² The June 30, 2015 mortality assumption was updated to the RP-2014 White Collar mortality table with Social Security Administration improvement scale applied from 2006.

³ Assumption changes other than mortality adopted on June 30, 2015 pursuant to the 2015 experience study.

⁴ Change in the asset smoothing period from 4 years to 5 years on June 30, 2016.

⁵ 13th check to retirees in lieu of the assumed 2017 and 2016 1.0% COLAs.

Sensitivity to Changes in Assumed Investment Return / Interest Rate

\$Millions	Assumed Investment Return / Interest Rate				
	5.75%	6.00%	6.25%	6.50%	6.75%
Funded Status					
Actuarial Accrued Liability	\$ 7,348.8	\$ 7,094.2	\$ 6,850.1	\$ 6,616.1	\$ 6,391.7
Actuarial Value of Assets	<u>5,865.7</u>	<u>5,865.7</u>	<u>5,865.7</u>	<u>5,865.7</u>	<u>5,865.7</u>
Unfunded Accrued Liability	\$ 1,483.1	\$ 1,228.5	\$ 984.4	\$ 750.4	\$ 526.0
Funded Ratio	79.8%	82.7%	85.6%	88.7%	91.8%
Actuarially Determined Contribution Rate					
Normal Cost %	7.24%	6.72%	6.25%	5.80%	5.39%
UAL Amortization %	<u>3.71%</u>	<u>3.11%</u>	<u>2.52%</u>	<u>1.93%</u>	<u>1.34%</u>
Actuarially Determined Contribution %	10.95%	9.83%	8.77%	7.73%	6.73%

\$Millions	Assumed Investment Return / Interest Rate				
	7.00%	7.25%	7.50%	7.75%	8.00%
Funded Status					
Actuarial Accrued Liability	\$ 6,188.2	\$ 5,993.2	\$ 5,806.1	\$ 5,626.7	\$ 5,460.1
Actuarial Value of Assets	<u>5,865.7</u>	<u>5,865.7</u>	<u>5,865.7</u>	<u>5,865.7</u>	<u>5,865.7</u>
Unfunded Accrued Liability	\$ 322.5	\$ 127.5	\$ (59.6)	\$ (239.0)	\$ (405.6)
Funded Ratio	94.8%	97.9%	101.0%	104.2%	107.4%
Actuarially Determined Contribution Rate					
Normal Cost %	5.00%	4.64%	4.33%	4.05%	3.77%
UAL Amortization %	<u>0.79%</u>	<u>0.25%</u>	<u>-0.29%</u>	<u>-0.82%</u>	<u>-1.33%</u>
Actuarially Determined Contribution %	5.79%	4.89%	4.04%	3.23%	2.44%

Calculated Employer Contribution Rate

	June 30, 2016	% of Projected Payroll for Fiscal 2017
Normal Cost	\$ 168,650,636	5.39%
Amortization of Unfunded Accrued Liability		
Unfunded Accrued Liability (UAL) ¹	\$ 526,020,648	
Unamortized UAL from Prior Years ²	437,884,995	
Net Unamortized UAL	\$ 88,135,653	
Amortization Factor (20-years, level dollar) ²	11.5322	
Current Year Amortization Payment	\$ 7,642,571	
Payments Established in Prior Years ²	34,321,933	
Total Amortization Payments	\$ 41,964,504	1.34%
Calculated Employer Contribution Rate	\$ 210,615,140	6.73%
Projected Fiscal 2018 Payroll	\$ 3,244,100,000	
Projected Fiscal 2018 ADC	\$ 218,327,930	

¹ Pension and ASA annuity only

² The amortization period was changed from 30 years to 20 years on a prospective basis on 6/30/2016.

Statement of Fiduciary Net Position

	June 30, 2016	June 30, 2015
Assets		
Cash and Cash Equivalents	\$ 1,624,223	\$ 1,082,812
Receivables		
Contributions	\$ 1,657,503	\$ 2,249,757
Miscellaneous	208,832	299,460
Investments	75,813,928	81,431,379
Foreign Exchange Contracts	1,064,393,447	1,002,489,643
Accrued Interest and Dividends	15,340,071	15,335,120
Due from Other Funds	706,866	1,116,070
Total Receivables	<u>\$ 1,158,120,647</u>	<u>\$ 1,102,921,429</u>
Investments		
Short Term	\$ 5,915,199	\$ 9,953,374
Pooled Unit Trust Assets		
Repurchase Agreements	1,142,394	0
Short Term Investments	322,782,362	223,459,504
Fixed Income	2,129,316,197	2,122,904,122
Equities	1,461,265,927	1,397,181,889
Alternatives	1,795,974,206	1,646,501,214
Derivatives	(158,044)	608,228
Securities Lending Collateral	67,393,242	211,163,685
Total Investments	<u>\$ 5,783,631,483</u>	<u>\$ 5,611,772,016</u>
Net Capitalized Assets	<u>\$ 416,777</u>	<u>\$ 717,683</u>
Total Assets	<u>\$ 6,943,793,130</u>	<u>\$ 6,716,493,940</u>
Liabilities		
Accounts Payable	\$ 260,629	\$ 236,622
Retirement Benefits Payable	15,728,116	17,515,010
Salaries and Benefits Payable	0	0
Investments Payable	139,971,744	69,656,855
Foreign Exchange Contracts	1,060,638,685	1,006,080,660
Securities Lending Obligations	67,393,242	211,163,685
Securities Sold Under Agreement to Repurchase	47,651,563	32,099,795
Due to Other Funds	919,457	628,271
Total Liabilities	<u>\$ 1,332,563,436</u>	<u>\$ 1,337,380,898</u>
Net Position Restricted for Pensions	\$ 5,611,229,694	\$ 5,379,113,042

Statement of Changes in Fiduciary Net Position

	June 30, 2016	June 30, 2015
Additions		
Contributions		
Member Contributions	\$ 88,429,683	\$ 86,515,294
Employer Contributions	215,625,986	205,763,142
Nonemployer Contributing Entity Contributions	0	0
Other Contributions	<u>0</u>	<u>0</u>
Total Contributions	\$ 304,055,669	\$ 292,278,436
Investment Income/(Loss)		
Net Appreciation/(Depreciation)		
Fair Value of Investments	\$ 20,334,556	\$ (14,664,501)
Other Net Investment Income	549,215	764,980
Net Interest and Dividends Income	73,863,716	71,351,232
Miscellaneous Income	0	0
Securities Lending Income	<u>722,896</u>	<u>702,276</u>
Total Investment Income/(Loss)	\$ 95,470,383	\$ 58,153,987
Less Direct Investment Expenses		
Investment Management Fees	\$ (28,085,647)	\$ (29,958,051)
Securities Lending Fees	(134,053)	(113,395)
Other Direct Investment Expenses	<u>(3,046,909)</u>	<u>(2,495,365)</u>
Total Direct Investment Expenses	\$ (31,266,609)	\$ (32,566,811)
Net Investment Income/(Loss)	\$ 64,203,774	\$ 25,587,176
Other Additions		
Miscellaneous	\$ 15,894	\$ 24,170
Interfund Transfers	<u>6,586,994</u>	<u>7,133,930</u>
Total Other Additions	\$ 6,602,888	\$ 7,158,100
Total Additions	\$ 374,862,331	\$ 325,023,712
Deductions		
Pension and Disability Benefits	\$ 124,302,337	\$ 116,186,940
Special Death Benefits	0	0
Distributions of Contributions and Interest	10,987,653	11,711,936
Pension Relief Distributions	0	0
Local Unit Withdrawals	0	0
Administrative Expenses	5,603,306	5,602,399
Project Expenses	0	582,834
Interfund Transfers	<u>1,852,383</u>	<u>1,268,891</u>
Total Deductions	\$ 142,745,679	\$ 135,353,000
Net Increase/(Decrease) in Net Position	\$ 232,116,652	\$ 189,670,712
Net Position Restricted for Pensions		
Beginning of Year	\$ 5,379,113,042	\$ 5,189,442,330
End of Year	\$ 5,611,229,694	\$ 5,379,113,042

Schedule of Changes in Net Pension Liability and Related Ratios

	June 30, 2016	June 30, 2015	June 30, 2014
Total Pension Liability			
Total Pension Liability, beginning of year	\$ 5,905,691,033	\$ 5,236,993,169	\$ 4,748,148,931
Annuity Savings Account (ASA), beginning of year	1,170,914,523	1,120,728,729	990,704,762
Excluding ASA, beginning of year	4,734,776,510	4,116,264,440	3,757,444,169
Service Cost	\$ 167,836,193	\$ 170,892,424	\$ 155,314,388
Interest Cost	328,017,487	287,264,315	262,263,149
Experience (Gains)/Losses	29,876,020	(40,857,253)	504,077
Assumption Changes	0	263,991,050	0
Plan Amendments	0	0	(4,504,201)
Benefit Payments	(99,506,626)	(90,266,941)	(77,253,362)
ASA Annuitizations	8,931,954	22,574,841	15,151,081
Net Member Reassignments	4,370,023	4,889,464	6,922,378
Other	15,894	24,170	422,761
Net Change in Total Pension Liability, Excluding ASA	\$ 439,540,945	\$ 618,512,070	\$ 358,820,271
Net Change in Total Pension Liability, ASA	46,518,087	50,185,794	130,023,967
Net Change in Total Pension Liability	486,059,032	668,697,864	488,844,238
Total Pension Liability, Excluding ASA, end of year	\$ 5,174,317,455	\$ 4,734,776,510	\$ 4,116,264,440
Total Pension Liability, ASA, end of year	1,217,432,610	1,170,914,523	1,120,728,729
Total Pension Liability, end of year	6,391,750,065	5,905,691,033	5,236,993,169
Fiduciary Net Position			
Fiduciary Net Position, beginning of year	\$ 5,379,113,042	\$ 5,189,442,330	\$ 4,433,677,345
Employer Contributions	215,625,986	205,763,142	194,750,861
Nonemployer contributing entities contributions	0	0	0
Member Contributions	88,386,508	86,515,294	81,801,667
Net investment income	64,203,774	25,587,176	586,783,647
Benefit Payments	(135,289,991)	(127,898,876)	(108,719,624)
Net Member Reassignments	4,777,787	5,865,039	7,835,271
Administrative Expenses	(5,603,306)	(6,185,233)	(6,707,586)
Other	15,894	24,170	20,749
Net Change in Fiduciary Net Position	\$ 232,116,652	\$ 189,670,712	\$ 755,764,985
Fiduciary Net Position, end of year	\$ 5,611,229,694	\$ 5,379,113,042	\$ 5,189,442,330
Net Pension Liability and Related Ratios			
Net Pension Liability, beginning of year	\$ 526,577,991	\$ 47,550,839	\$ 314,471,586
Net Pension Liability, end of year	\$ 780,520,371	\$ 526,577,991	\$ 47,550,839
Plan's Fiduciary Net Position as a			
Percentage of the Total Pension Liability	87.8%	91.1%	99.1%
Covered Employee Payroll (Actual)	\$ 2,881,397,273	\$ 2,742,186,608	\$ 2,598,115,000
Net Pension Liability as a Percentage of			
Covered Employee Payroll	27.1%	19.2%	1.8%

Schedule of Changes in Net Pension Liability and Related Ratios

	June 30, 2013
Total Pension Liability	
Total Pension Liability, beginning of year	\$ 4,338,309,018
Annuity Savings Account (ASA), beginning of year	899,338,904
Excluding ASA, beginning of year	3,438,970,114
Service Cost	\$ 147,336,605
Interest Cost	240,281,897
Experience (Gains)/Losses	(15,994,636)
Assumption Changes	0
Plan Amendments	0
Benefit Payments	(68,792,905)
ASA Annuitizations	11,621,194
Net Member Reassignments	0
Other	<u>4,021,900</u>
Net Change in Total Pension Liability, Excluding ASA	\$ 318,474,055
Net Change in Total Pension Liability, ASA	91,365,858
Net Change in Total Pension Liability	409,839,913
Total Pension Liability, Excluding ASA, end of year	\$ 3,757,444,169
Total Pension Liability, ASA, end of year	990,704,762
Total Pension Liability, end of year	4,748,148,931
Fiduciary Net Position	
Fiduciary Net Position, beginning of year	\$ 4,018,148,837
Employer Contributions	180,714,567
Nonemployer contributing entities contributions	0
Member Contributions	77,532,304
Net investment income	258,111,000
Benefit Payments	(97,157,000)
Net Member Reassignments	2,806,000
Administrative Expenses	(6,482,000)
Other	<u>3,637</u>
Net Change in Fiduciary Net Position	\$ 415,528,508
Fiduciary Net Position, end of year	\$ 4,433,677,345
Net Pension Liability and Related Ratios	
Net Pension Liability, beginning of year	\$ 320,160,181
Net Pension Liability, end of year	\$ 314,471,586
Plan's Fiduciary Net Position as a	
Percentage of the Total Pension Liability	93.4%
Covered Employee Payroll (Actual)	\$ 2,442,496,000
Net Pension Liability as a Percentage of Covered Employee Payroll	12.9%

Required Supplementary Information under GASB No. 68

	June 30, 2016	June 30, 2015	June 30, 2014	June 30, 2013
Schedule of Contributions				
Actuarially Determined Contribution	\$ 180,375,469	\$ 178,260,000	\$ 177,711,000	\$ 164,400,000
Contributions in Relation to the				
Actuarially Determined Contributions	<u>215,625,986</u>	<u>205,525,842*</u>	<u>194,750,861</u>	<u>180,714,567</u>
Contribution Deficiency/(Excess)	\$ (35,250,517)	\$ (27,265,842)	\$ (17,039,861)	\$ (16,314,567)
Covered Employee Payroll	\$ 2,881,397,273	\$ 2,742,186,608	\$ 2,598,115,000	\$ 2,442,496,000
Contributions as a Percentage of				
Covered Employee Payroll	7.5%	7.5%	7.5%	7.5%

Schedule of Investment Returns

Annual Money-Weighted Rate of Return,				
Net of Investment Expense	1.01%	0.57%	12.71%	5.11%

Sensitivity of the Net Pension Liability to Changes in the Discount Rate

The following presents the net pension liability of the TRF 1996 Account calculated using the discount rate of 6.75%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1% lower (5.75%) or 1% higher (7.75%) than the current rate:

	1% Decrease 5.75%	Current Rate 6.75%	1% Increase 7.75%
Net Pension Liability	\$ 1,737,602,789	\$ 780,520,371	\$ 15,493,517

* Excludes \$237,300 attributable to member service credit purchases.

Pension Expense

	June 30, 2016	June 30, 2015
Service Cost	\$ 167,836,193	\$ 170,892,424
Interest on Total Pension Liability	328,017,487	287,264,315
Projected Earnings on Pension Plan Investments	(288,232,795)	(279,255,149)
Changes of Benefit Terms	0	0
Pension Plan Administrative Expenses*	5,488,857	6,068,861
Other Changes	0	0
 Current Period Recognition of Deferred Outflows/(Inflows) of resources:		
Differences between Expected and Actual Experience in Measurement of the Total Pension Liability	(745,599)	(2,879,600)
Changes of Assumptions	18,856,504	18,856,504
Differences between Projected and Actual Earnings on Pension Plan Investments	<u>49,496,400</u>	<u>4,202,769</u>
 Total	 \$ 280,717,047	 \$ 205,150,124

* Administrative expenses are net of INPRS contributions to the plan of \$114,449 in fiscal 2016 and \$116,372 in fiscal 2015.

**Deferred Outflows of Resources and Deferred Inflows of Resources
Related to Pensions**

	Initial Balance	Initial Amortization Period	Annual Recognition	June 30, 2016 Balance
Difference between Expected and Actual Experience in Measurement of the Total Pension Liability				
Base for Year ending June 30, 2016	\$ 29,876,020	14	\$ 2,134,001	\$ 27,742,019
Base for Year ending June 30, 2015	(40,857,253)	14	(2,918,375)	(35,020,503)
Base for Year ending June 30, 2014	504,077	13	38,775	387,752
Change of Assumptions				
Base for Year ending June 30, 2016	\$ 0		\$ 0	\$ 0
Base for Year ending June 30, 2015	263,991,050	14	18,856,504	226,278,042
Base for Year ending June 30, 2014	0		0	0
Differences between Projected and Actual Earnings on Pension Plan Investments				
Base for Year ending June 30, 2016	\$ 226,468,155	5	\$ 45,293,631	\$ 181,174,524
Base for Year ending June 30, 2015	276,569,674	5	55,313,935	165,941,804
Base for Year ending June 30, 2014	(255,555,829)	5	(51,111,166)	(102,222,331)
Changes in State's Proportion and Differences between Actual State Contributions and State's Proportionate Share of Contributions				
Base for Year ending June 30, 2016	\$ 0		\$ 0	\$ 0
Base for Year ending June 30, 2015	0		0	0
Base for Year ending June 30, 2014	0		0	0
Total			\$ 67,607,305	\$ 464,281,307

The balances as of June 30, 2016 of the deferred outflows/(inflows) of resources will be recognized in pension expense as follows:

Year Ended June 30,	
2017	\$ 67,607,305
2018	\$ 67,607,306
2019	\$ 118,718,470
2020	\$ 63,404,536
2021	\$ 18,110,905
Thereafter	\$ 128,832,785

Member Data

The tables below summarize the member data used in the valuation. The June 30, 2016 valuation is based on June 30, 2015 census data, with liabilities rolled-forward to the June 30, 2016 measurement date. The data summarized in this section is as of the June 30, 2015 census collection date. The pages that follow show various distributions of the member groups.

	Males	Females	Total
Number of Actives	14,495	40,770	55,265
Average Age	39.7	39.4	39.5
Average Service	10.7	9.9	10.1
Average Pay	\$ 59,956	\$ 52,370	\$ 54,359
Number of Inactive Vesteds	1,113	3,222	4,335
Average Age	49.3	50.5	50.2
Average Service	15.7	14.8	15.0
Number of Inactive Nonvesteds	2,922	9,607	12,529
Number of Retirees and Beneficiaries	1,608	3,369	4,977
Average Age	67.4	66.7	66.9
Average Years Retired	7.2	5.7	6.2
Average Monthly Annuity ¹	\$ 219	\$ 149	\$ 172
Average Monthly Pension	\$ 1,691	\$ 1,194	\$ 1,355
Total Number of Members	20,138	56,968	77,106

¹ The average monthly annuity above is the average over all retirees and beneficiaries, including those that did not annuitize their ASA balances. The average monthly annuity for the 2,050 retirees and beneficiaries that did annuitize their ASA balances is \$417.

Active Member Data

June 30	Number	Valuation Payroll (\$000s)	Average			
			Age	Service	Pay	Pay Increase %
1996	8,683	\$ 72,506	32.2	1.3	\$ 8,350	
1997	20,686	245,168	33.0	1.8	11,852	41.9%
1998	25,634	395,758	33.6	2.2	15,439	30.3
1999	21,185	538,837	35.3	4.0	25,435	64.7
2000	24,950	631,072	36.4	4.7	25,293	(0.6)
2001	24,846	754,426	36.3	5.5	30,364	20.0
2002	27,873	1,004,515	36.7	6.1	36,039	18.7
2003	29,936	1,136,864	37.0	6.5	37,976	5.4
2004	32,000	1,267,173	37.3	6.9	39,599	4.3
2005	34,826	1,428,604	37.5	7.2	41,021	3.6
2006	36,356	1,565,341	37.7	7.5	43,056	5.0
2007	39,307	1,891,605	38.2	7.8	48,124	11.8
2008	41,628	2,052,719	38.1	8.2	49,311	2.5
2009	45,046	2,308,548	38.3	8.4	51,249	3.9
2010	46,433	2,447,509	38.6	8.8	52,711	2.9
2011	46,633	2,507,193	39.2	9.4	53,764	2.0
2012	47,885	2,594,952	39.4	9.8	54,191	0.8
2013	51,204	2,740,940	39.3	9.8	53,530	(1.2)
2014*	51,204	2,740,940	39.3	9.8	53,530	(1.2)
2015*	52,424	2,827,311	39.4	10.0	53,932	0.8
2016*	55,265	3,004,169	39.5	10.1	54,359	0.8

* Valuations on and after June 30, 2014 are based on census data collected at the prior measurement date.

Active Members

By Attained Age and Years of Service

Attained Age	Years of Service to Valuation Date						Total
	<10	10-14	15-19	20-24	25-29	30+	
15-19							0
20-24	1,475						1,475
25-29	8,438	1					8,439
30-34	8,501	1,670	2				10,173
35-39	3,789	5,084	1,511	2			10,386
40-44	2,417	1,863	4,010	527	3		8,820
45-49	1,801	1,209	1,769	1,212	177	6	6,174
50-54	1,147	867	1,068	516	512	122	4,232
55-59	737	625	935	479	239	289	3,304
60-64	344	322	486	278	128	194	1,752
65-69	138	81	86	56	35	34	430
70-74	29	9	12	2	1	1	54
75-79	11	1					12
80 & over	10	3	1				14
Total	28,837	11,735	9,880	3,072	1,095	646	55,265

Average Age: 39.5
 Average Service: 10.1

Inactive Vested Members

By Attained Age and Years of Service

Attained Age	Years of Service at Termination						Total
	<10	10-14	15-19	20-24	25-29	30+	
30-34		66	1				67
35-39		518	33				551
40-44		526	261	23			810
45-49		360	239	77	11	1	688
50-54		322	174	96	42	11	645
55-59		346	208	107	52	27	740
60-64		322	158	73	33	30	616
65-69		97	46	24	11	15	193
70-74		14	6	1	2	1	24
75-79		1					1
80 & over							
Total		2,572	1,126	401	151	85	4,335

Average Age: 50.2
 Average Service: 15.0

Retired Members

By Attained Age and Completed Years of Retirement

Attained Age	Years of Retirement						Total
	<10	10-14	15-19	20-24	25-29	30+	
Under 40	7						7
40-44	6	2					8
45-49	14	3	1				18
50-54	57	8					65
55-59	316	7	4				327
60-64	1,231	33	5	1	1		1,271
65-69	1,542	293	17	1			1,853
70-74	500	295	110	3			908
75-79	74	136	99	31	5		345
80-84	17	24	38	36	7		122
85-89	2	5	5	15	14	1	42
90 & over			2	2	6	1	11
Total	3,766	806	281	89	33	2	4,977

Average Age: 66.9
 Average Years Retired: 6.2

Retired Members

By Year of Retirement

Year of Retirement As of June 30	Number	Monthly Pension	
		Total	Average
1981	1	\$ 259	\$ 259
1982	1	936	936
1986	2	1,562	781
1987	5	2,954	591
1988	3	1,050	350
1989	5	3,767	753
1990	11	10,617	965
1991	12	10,707	892
1992	11	12,590	1,145
1993	8	7,935	992
1994	17	23,280	1,369
1995	27	31,393	1,163
1996	33	42,329	1,283
1997	31	38,656	1,247
1998	44	53,219	1,210
1999	50	66,228	1,325
2000	79	101,041	1,279
2001	105	138,202	1,316
2002	136	193,184	1,420
2003	165	225,347	1,366
2004	192	262,291	1,366
2005	168	245,315	1,460
2006	168	227,915	1,357
2007	193	242,657	1,257
2008	256	352,675	1,378
2009	234	325,810	1,392
2010	285	392,803	1,378
2011	407	585,173	1,438
2012	516	684,548	1,327
2013	628	820,481	1,307
2014	519	687,068	1,324
2015	665	950,016	1,429
Total	4,977	\$ 6,742,010	\$ 1,355

Retired Members

Reconciliation of Benefit Recipients

	Number of Members	Sum of Annual Allowances*
Benefit Recipient Rolls, July 1, 2007	1,925	\$ 37,012,980
Added to Rolls	255	5,126,028
Removed from Rolls	(21)	(316,275)
Net Transfers to Pre-1996 Account	104	1,762,578
Benefit Changes		<u>(103,335)</u>
End of Year Rolls	2,263	\$ 43,481,976
Percentage Increase in Annual Allowances		17.48%
Average Annual Allowances		<u>\$ 19,214</u>
Benefit Recipient Rolls, July 1, 2008	2,263	\$ 43,481,976
Added to Rolls	270	5,145,053
Removed from Rolls	(10)	(119,161)
Net Transfers to Pre-1996 Account	(579)	(11,768,469)
Benefit Changes		<u>(427,067)</u>
End of Year Rolls	1,944	\$ 36,312,332
Percentage Increase in Annual Allowances		(16.49%)
Average Annual Allowances		<u>\$ 18,679</u>
Benefit Recipient Rolls, July 1, 2009	1,944	\$ 36,312,332
Added to Rolls	249	4,859,402
Removed from Rolls	(12)	(129,306)
Benefit Changes		<u>(341,332)</u>
End of Year Rolls	2,181	\$ 40,701,096
Percentage Increase in Annual Allowances		12.1%
Average Annual Allowances		<u>\$ 18,662</u>
Benefit Recipient Rolls, July 1, 2010	2,181	\$ 40,701,096
Added to Rolls	390	7,665,877
Removed from Rolls	(17)	(253,436)
Benefit Changes		<u>(226,865)</u>
End of Year Rolls	2,554	\$ 47,886,672
Percentage Increase in Annual Allowances		17.65%
Average Annual Allowances		<u>\$ 18,750</u>

* Pension and ASA annuity

Retired Members

Reconciliation of Benefit Recipients

	Number of Members	Sum of Annual Allowances*
Benefit Recipient Rolls, July 1, 2011	2,554	\$ 47,886,672
Added to Rolls	433	8,131,748
Removed from Rolls	(16)	(236,302)
Benefit Changes		(307,450)
End of Year Rolls	2,971	\$ 55,474,668
Percentage Increase in Annual Allowances		15.85%
Average Annual Allowances		\$ 18,672
Benefit Recipient Rolls, July 1, 2012	2,971	\$ 55,474,668
Added to Rolls	712	12,216,094
Removed from Rolls	(18)	(250,893)
Benefit Changes		(270,493)
End of Year Rolls	3,665	\$ 67,169,376
Percentage Increase in Annual Allowances		21.08%
Average Annual Allowances		\$ 18,327
Benefit Recipient Rolls, July 1, 2013	3,665	\$ 67,169,376
Added to Rolls	499	9,100,772
Removed from Rolls	(28)	(353,092)
Benefit Changes		(203,524)
End of Year Rolls	4,136	\$ 75,713,532
Percentage Increase in Annual Allowances		12.72%
Average Annual Allowances		\$ 18,306
Benefit Recipient Rolls, July 1, 2014	4,136	\$ 75,713,532
Added to Rolls	858	16,074,548
Removed from Rolls	(17)	(304,652)
Benefit Changes		(323,628)
End of Year Rolls	4,977	\$ 91,159,800
Percentage Increase in Annual Allowances		20.4%
Average Annual Allowances		\$ 18,316

* Pension and ASA annuity

Retired Members

Number of Benefit Recipients by Benefit Option

Amount of Monthly Benefit	Option A-1	Option A-2	Option A-3	Option B-1	Option B-2	Option B-3	Surv.	Dis.	Total
\$1-\$500	229	138	19	148	28	49	27	65	703
\$501-\$1,000	392	315	51	342	73	149	29	63	1,414
\$1,001-\$1,500	269	249	43	274	79	112	4	20	1,050
\$1,501-\$2,000	194	168	23	223	60	101	7	8	784
\$2,001-\$3,000	154	155	19	264	79	115	4	5	795
Over \$3,000	45	55	1	62	33	33	2	0	231
Total	1,283	1,080	156	1,313	352	559	73	161	4,977

Summary of Benefit Options

- A-1 - Provides a monthly benefit for retiree's life. In the event the retiree dies before receiving five years of payments, the beneficiary receives the remainder of the five years (60 months) of guaranteed Defined Benefit pension payments in a lump sum.
- A-2 - Provides a monthly benefit for retiree's life. The benefit ceases upon the death of the retiree.
- A-3 - Provides a monthly benefit for retiree's life, including monthly annuitization of member's Annuity Savings Account (ASA). In the event the retiree dies before receiving five years of payments, the beneficiary will receive the remainder of the five years of guaranteed pension payments. The ASA is reduced with each monthly benefit paid; if the retiree dies before reducing the balance to \$0.00, the beneficiary will receive a single payment of the amount remaining.
- B-1 - Provides a monthly benefit for retiree's life. Upon the death of the retiree, the qualified designated survivor receives 100% of the member's Defined Benefit for the remainder of the survivor's life.
- B-2 - Provides a monthly benefit for retiree's life. Upon the death of the retiree, the qualified designated survivor receives 66-2/3% of the member's Defined Benefit for the remainder of the survivor's life.
- B-3 - Provides a monthly benefit for retiree's life. Upon the death of the retiree, the qualified designated survivor receives 50% of the member's Defined Benefit for the remainder of the survivor's life.
- Survivors* - Provides a monthly benefit for the surviving spouse's or dependent's life. The benefit ceases upon death of the survivor.
- Disability** - Available to members with five (5) or more years of creditable service who become disabled as determined by the Social Security Administration while teaching in Indiana.

* (of members who die while in service)

** Includes Classroom Disability – Provides a benefit of \$125 per month plus \$5 for each additional year of TRF-covered service over five years

Retired Members

Schedule of Average Benefit Payments by Service at Retirement

	Years of Service at Retirement						Total
	<10	10-14	15-19	20-24	25-29	30+	
Avg. Monthly Defined Benefit Pension	\$403	\$478	\$760	\$1,113	\$1,481	\$2,263	\$1,355
Avg. Monthly Annuity: All Benefit Recipients	\$69	\$75	\$108	\$144	\$218	\$257	\$172
Avg. Monthly Annuity: Benefit Recipients who Annuitized their ASA Balance (2,050 Recipients)	\$162	\$152	\$247	\$346	\$507	\$735	\$417
Avg. Final Avg. Salary at Retirement	\$35,250	\$45,420	\$52,554	\$59,740	\$64,060	\$73,994	\$61,008
Number of Benefit Recipients	59	611	1,267	764	688	1,588	4,977

Reconciliation of Participant Data

	Active	Inactive Vested	Inactive Nonvested	Survivor	Disabled	Retired	Beneficiary	Total
6/30/2014 Census	52,424	4,132	12,292	58	139	3,854	85	72,984
Disabled	(13)	(11)	(2)		26			0
Retired	(353)	(447)	(2)			802		0
Terminated with Vested Benefit	(961)	961						0
Terminated, due a Refund	(1,644)		1,644					0
Died with Survivor	(7)	(6)		13	(5)	(20)	25	0
Died, no Survivor*		(14)	(1)		(3)	(13)	(1)	(32)
Refunded*	(171)	(1)	(677)					(849)
Forfeited*			(444)					(444)
Dropped from Database	(8)	(26)	(5)					(39)
Rehired	1,165	(252)	(913)					0
Status Corrections		(5)	5					0
Data Corrections		4	127	2	4	7	4	148
New Hires	4,833		505					5,338
6/30/2015 Census	55,265	4,335	12,529	73	161	4,630	113	77,106

* No remaining benefit obligation in the plan.

Summary of Actuarial Assumptions and Methods

The assumptions used in this valuation reflect the study of experience covering the period July 1, 2011 through June 30, 2014.

Measurement Date	June 30, 2016
Valuation Date	
Assets	June 30, 2016
Liabilities	June 30, 2015. Member census data as of June 30, 2015 was used in the valuation and adjusted, where appropriate, to reflect changes between June 30, 2015 and June 30, 2016. Standard actuarial roll-forward techniques were then used to project the total pension liability computed as of June 30, 2015 to the June 30, 2016 measurement date.
Interest Rate / Investment Return	6.75% per year, compounded annually (net of administrative and investment expenses).
Pay Increase Assumption	Sample increases are shown in a table on the following pages. The assumption for each year of service consists of a merit and/or seniority increase and 2.25% for price inflation.
Total Active Member Payroll	Assumed to increase 4.1% from Fiscal 2016 to Fiscal 2017, and 3.7% from Fiscal 2017 to Fiscal 2018 for purposes of calculating the projected contribution for the 2017 and 2018 fiscal years.
Price Inflation	2.25% per year. Price inflation is not directly tied to benefits; however, it is a component of the economic model used to determine total wage inflation.
Mortality	
Healthy	RP-2014 White Collar Mortality Table with Social Security generational improvements from 2006 based on the 2014 Social Security Administration Trustees Report.
Disabled	RP-2014 White Collar Mortality Table with Social Security generational improvements from 2006 based on the 2014 Social Security Administration Trustees Report.
Retirement	Rates are shown in tables on the following pages.
Withdrawal	Sample rates are shown in tables on the following pages.
Disability	Sample rates are shown in a table on the following pages.
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.
Actuarial Cost Method	Entry Age Normal (level percent of pay) method, with a 20-year, closed, level dollar amortization of the Unfunded Accrued Liability arising from all sources including actuarial gains and losses. The weighted average amortization period on 6/30/2016 is 24 years.

Summary of Actuarial Assumptions and Methods

Asset Valuation Method	The Actuarial Value of Assets recognizes investment gains and losses in equal installments over five years. However, the Actuarial Value is limited to no more than 20% greater than or 20% less than the Market Value of Assets. Investment experience on ASA account balances is not smoothed.
Marriage Assumption	100% of members are assumed to be married for purposes of valuing death-in-service benefits. Male spouses are assumed to be three years older than female spouses.
Pay Increase Timing	Beginning of (fiscal) year. Payroll amounts stated in the valuation data are amounts projected to be paid during the current year.
Decrement Timing	Decrements are assumed to occur at the beginning of the year.
Other	Disability and withdrawal decrements do not operate after member reaches retirement eligibility. Only the withdrawal and death decrements operate during the first ten years of service.
Miscellaneous Adjustments	The calculated liabilities and normal costs were increased by 1% to account for the inclusion of unused sick leave in the calculation of Average Annual Compensation.
Actuarial Equivalence Basis for Optional Forms of Payment	6.75% interest with a 50% unisex blend of the 2018 IRS combined mortality basis.
Explicit Expense Load	None.
COLA Assumption	1.0% compounded annually on pension portion, with the first COLA credited on January 1, 2018. The January 1, 2017 assumed 1.0% COLA was replaced by a service-related lump sum (a "13 th check") ranging from \$150 to \$450 in September, 2016.
Cost for ASA Conversions	ASA conversions between 6/30/2016 and 3/31/2017 will be based on a 4.50% conversion rate. After 4/1/2017, ASA annuity conversions will occur outside of the plan.
ASA Annuitization	50% of ASA balances are assumed to be converted to annuities at retirement prior to 4/1/2017, 0% thereafter.
Employee Census and Asset Data	The member census data and the asset information for this valuation were furnished by the Chief Financial Officer and Staff. 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.

The actuarial valuation computations were made under the supervision of a Member of the American Academy of Actuaries (MAAA).

Summary of Actuarial Assumptions and Methods

Rates of Age and Service 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		

Rates of Disability

Attained Age	Age-Based	
	Male	Female
25	0.0001	0.0001
30	0.0001	0.0001
35	0.0001	0.0001
40	0.0001	0.0001
45	0.0002	0.0002
50	0.0005	0.0005
55	0.0009	0.0009
60	0.0010	0.0010

Summary of Actuarial Assumptions and Methods

Rates of Withdrawal

Years of Service	Service-Based	
	Male	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	Age-Based*	
	Male	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.*

Summary of Actuarial Assumptions and Methods

Pay Increase Assumption

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%

Definitions of Technical Terms

Accrued Service	Service credited under the system that was rendered before the date of the actuarial valuation.
Accrued Liability	The difference between the actuarial present value of future benefit payments and the actuarial present value of future normal costs. Also referred to as “actuarial accrued liability” or “past service liability”.
Actuarial Assumptions	Estimates of expected future experience with respect to rates of mortality, disability, turnover, retirement, rate of investment return, and pay increases. Decrement assumptions (rates of mortality, disability, turnover, and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (pay increases and investment return) consist of the underlying rates 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 future benefit payments” between future normal costs and actuarial accrued liabilities. Sometimes referred to as the “actuarial funding method”.
Actuarial Equivalent	One series of payments is said to be actuarially equivalent to another series of payments if the two series have the same actuarial present value.
Actuarial Gain / (Loss)	The difference between actual unfunded actuarial accrued liability and anticipated unfunded actuarial accrued liability during the period between two valuation dates. It is a measurement of the difference between actual and expected experience.
Actuarial Present Value	The single amount now that is equal to 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 a present value with periodic payments.
Normal Cost	The portion of the actuarial present value of future benefits that is assigned to the current year by the actuarial cost method. Sometimes referred to as “current cost”.
Unfunded Accrued Liability	The difference between the accrued liability and the actuarial value of assets. Sometimes referred to as “unfunded past service liability” or “unfunded actuarial accrued liability” or simply as “unfunded liability”.

The Actuarial Valuation Process

The **actuarial valuation** is the mathematical process by which a contribution rate is determined. The flow of activity constituting the valuation may be summarized as follows:

Covered Person Data: Furnished by the Plan Administrator

Retired Members and Beneficiaries Now Receiving Benefits
Former Employees with Vested Benefits Not Yet Payable
Active Members

+ **Asset Data (Cash and Investments):** Furnished by the Plan Administrator

+ **Estimates of Future Experience (Actuarial Assumptions):** Established by the Board of Trustees after Consulting with the Actuary

+ **Funding Method:** The Allocation of Employer Costs to Past Service, Current Service, and Future Service

+ **Mathematically Combining the Assumptions, the Funding Method, and the Data**

= **Determination of:**

Plan Funded Status and Employer Contribution Rate

Summary of Benefit Provisions

Changes in Plan Provisions since June 30, 2015

None.

Regular Retirement

Eligibility

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.

Annual Amount

State pension equal to total service times 1.1% of Average Annual Compensation.

Early Retirement

Eligibility

Age 50 with 15 years of service.

Annual Amount

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

Eligibility

Ten years of service. Benefit commences at regular or early retirement eligibility.

Annual Amount

Computed as a regular retirement benefit with state pension based on service and Average Annual Compensation at termination.

Disability Retirement

Regular Disability Benefit:

Eligibility

Five years of service.

Annual Amount

\$125 per month plus \$5 per month for each year of service credit over five years.

Disability Retirement Benefit:

Eligibility

Five years of service and determined to be disabled by the Social Security Administration. Annual verification of Social Security disability is required.

Annual Amount

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.

Summary of Benefit Provisions

Death Before Retirement

Eligibility

15 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.

Annual Amount

Computed as regular retirement benefit but reduced in accordance with a 100% joint and survivor election.

Benefit Increases After Retirement

No automatic increases after retirement are provided. Periodically, unscheduled increases have been made. In September 2016, retirees were paid a service-related lump sum ranging from \$150 to \$450.

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.

Forms of Benefit Payment (Pension)

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.

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.

Optional forms of benefit are calculated based on 6.75% interest with a 50% unisex blend of the IRS 2018 combined mortality basis.

Member Data: Total Fund

The tables below summarize the member data used in the valuation. The June 30, 2016 valuation is based on June 30, 2015 census data, with liabilities rolled-forward to the June 30, 2016 measurement date. The data summarized in this section is as of the June 30, 2015 census collection date. The pages that follow show various distributions of the member groups.

	Males	Females	Total
Number of Actives	18,137	51,455	69,592
Average Age	42.7	42.6	42.6
Average Service	14.3	13.4	13.6
Average Pay	\$ 63,708	\$ 56,220	\$ 58,171
Number of Inactive Vesteds	1,819	5,635	7,454
Average Age	52.4	53.7	53.4
Average Service	18.4	17.5	17.7
Number of Inactive Nonvesteds	2,977	9,946	12,923
Number of Retirees and Beneficiaries	18,769	38,783	57,552
Average Age	72.4	72.0	72.1
Average Years Retired	12.8	12.0	12.2
Average Monthly Annuity ¹	\$ 234	\$ 185	\$ 201
Average Monthly Pension	\$ 1,659	\$ 1,421	\$ 1,499
Total Number of Members	41,702	105,819	147,521

¹ The average monthly annuity above is the average over all retirees and beneficiaries, including those that did not annuitize their ASA balances. The average monthly annuity for the 25,413 retirees and beneficiaries that did annuitize their ASA balances is \$454.

Active Member Data: Total Fund

June 30	Number	Valuation Payroll (\$000s)	Average			
			Age	Service	Pay Increase %	
1975	63,932	\$ 749,200	38.7	10.9	\$ 11,719	
1980	66,575	1,107,699	39.7	11.9	16,638	
1985	62,932	1,519,887	41.5	14.2	24,151	
1987	64,157	1,751,709	42.0	14.5	27,303	
1989	65,986	2,044,797	42.6	14.9	30,988	
1991	63,373	2,278,715	43.0	15.4	35,957	
1992	63,980	2,416,263	43.8	16.0	37,766	5.0%
1993	64,594	2,536,165	44.0	16.1	39,263	4.0
1994	65,209	2,614,915	44.1	16.2	40,101	2.1
1995	66,542	2,728,811	44.2	16.2	41,009	2.3
1996	78,866	2,878,329	42.9	14.1	36,497	(11.0)
1997	84,206	2,984,604	42.4	13.2	35,444	(2.9)
1998	84,664	3,094,941	42.5	13.2	36,556	3.1
1999	77,745	3,294,326	44.1	15.1	42,374	15.9
2000	77,870	3,192,605	44.4	15.2	40,999	(3.2)
2001	75,648	3,318,877	44.6	15.7	43,872	7.0
2002	75,383	3,609,471	44.7	15.8	47,884	9.1
2003	73,641	3,585,135	44.5	15.5	48,684	1.7
2004	73,510	3,651,653	44.5	15.5	49,676	2.0
2005	73,923	3,734,330	44.4	15.4	50,516	1.7
2006	73,350	3,802,721	44.5	15.4	51,844	2.6
2007	75,833	4,267,995	44.9	15.5	56,281	8.6
2008	76,256	4,348,535	44.6	15.6	57,025	1.3
2009	74,343	4,339,032	44.4	15.3	58,365	2.3
2010	72,872	4,312,611	44.2	15.2	59,181	1.4
2011	71,343	4,269,944	44.5	15.5	59,851	1.1
2012	70,573	4,232,018	44.4	15.4	59,967	0.2
2013	70,414	4,124,368	43.5	14.6	58,573	(2.3)
2014*	70,414	4,124,368	43.5	14.6	58,573	(2.3)
2015*	68,734	4,006,157	43.0	14.1	58,285	(0.5)
2016*	69,592	4,048,266	42.6	13.6	58,171	(0.2)

* Valuations on and after June 30, 2014 are based on census data collected at the prior measurement date.

Active Members: Total Fund

By Attained Age and Years of Service

Attained Age	Years of Service to Valuation Date						Total
	<10	10-14	15-19	20-24	25-29	30+	
15-19							
20-24	1,475						1,475
25-29	8,438	1					8,439
30-34	8,501	1,670	2				10,173
35-39	3,789	5,084	1,511	2			10,386
40-44	2,492	1,903	4,099	950	4		9,448
45-49	1,948	1,340	1,931	2,933	776	7	8,935
50-54	1,222	939	1,143	1,203	2,447	920	7,874
55-59	784	668	1,010	1,029	1,171	2,487	7,149
60-64	382	359	524	652	594	2,036	4,547
65-69	165	91	96	109	120	431	1,012
70-74	38	14	17	5	8	36	118
75-79	15	2				3	20
80 & over	10	4	1			1	16
Total	29,259	12,075	10,334	6,883	5,120	5,921	69,592

Average Age: 42.6
Average Service: 13.6

Inactive Vested Members: Total Fund

By Attained Age and Years of Service

Attained Age	Years of Service to Valuation Date						Total
	<10	10-14	15-19	20-24	25-29	30+	
30-34		66	1				67
35-39		518	33				551
40-44		560	282	31			873
45-49		496	329	150	25	2	1,002
50-54		546	306	209	150	30	1,241
55-59		540	368	259	206	198	1,571
60-64		637	258	175	129	323	1,522
65-69		215	77	56	49	144	541
70-74		25	11	7	3	9	55
75-79		1	3				4
80 & over		11	7	3	5	1	27
Total		3,615	1,675	890	567	707	7,454

Average Age: 53.4
Average Service: 17.7

Retired Members: Total Fund

By Attained Age and Completed Years of Retirement

Attained Age	Years of Service to Valuation Date						Total
	<10	10-14	15-19	20-24	25-29	30+	
Under 40	19	15	8	5	5	1	53
40-44	14	5	8	4		1	32
45-49	34	8	6	9			57
50-54	139	26	20	17	4	2	208
55-59	1,728	49	38	17	14	6	1,852
60-64	8,430	232	82	47	32	13	8,836
65-69	11,545	3,762	281	90	51	28	15,757
70-74	3,961	4,341	2,567	317	68	34	11,288
75-79	592	1,810	3,170	1,582	278	78	7,510
80-84	45	349	1,509	2,324	854	270	5,351
85-89	14	68	239	1,305	1,660	705	3,991
90 & over	11	4	33	175	827	1,567	2,617
Total	26,532	10,669	7,961	5,892	3,793	2,705	57,552

Average Age: 72.1
Average Years Retired: 12.2

Retired Members: Total Fund

By Year of Retirement

Year of Retirement As of June 30	Number	Monthly Pension	
		Total	Average
Before 1978	406	\$ 163,745	\$ 403
1978	120	56,482	471
1979	143	75,336	527
1980	198	117,525	594
1981	208	114,395	550
1982	209	118,453	567
1983	291	176,069	605
1984	353	220,606	625
1985	511	345,111	675
1986	489	341,080	698
1987	594	456,922	769
1988	723	591,076	818
1989	622	538,339	865
1990	967	973,485	1,007
1991	977	1,069,560	1,095
1992	927	1,032,833	1,114
1993	987	1,180,267	1,196
1994	1,131	1,384,421	1,224
1995	1,477	1,878,551	1,272
1996	1,490	1,940,142	1,302
1997	1,308	1,691,580	1,293
1998	1,648	2,130,154	1,293
1999	1,551	2,121,930	1,368
2000	1,838	2,585,446	1,407
2001	1,841	2,666,160	1,448
2002	2,189	3,167,105	1,447
2003	1,976	2,907,072	1,471
2004	2,307	3,449,099	1,495
2005	2,203	3,457,307	1,569
2006	2,381	3,778,318	1,587
2007	2,310	3,603,921	1,560
2008	2,786	4,559,263	1,636
2009	2,090	3,571,648	1,709
2010	2,366	4,158,675	1,758
2011	3,233	5,860,647	1,813
2012	3,626	6,664,272	1,838
2013	3,248	6,067,332	1,868
2014	2,670	4,995,701	1,871
2015	3,158	6,032,631	1,910
Total	57,552	\$ 86,242,659	\$ 1,499

Retired Members: Total Fund

Number of Benefit Recipients by Benefit Option

Amount of Monthly Benefit	Option A-1	Option A-2	Option A-3	Option B-1	Option B-2	Option B-3	Surv.	Dis.	Total
\$1-\$500	1,801	885	209	1,264	273	500	464	142	5,538
\$501-\$1,000	2,301	1,538	335	2,302	769	1,156	358	234	8,993
\$1,001-\$1,500	3,391	2,567	454	4,383	1,334	1,537	145	247	14,058
\$1,501-\$2,000	3,360	3,182	367	4,858	1,577	1,941	148	117	15,550
\$2,001-\$3,000	2,583	3,127	274	3,197	1,228	1,582	61	31	12,083
Over \$3,000	304	355	19	323	143	179	7		1,330
Total	13,740	11,654	1,658	16,327	5,324	6,895	1,183	771	57,552

¹Pension only

Summary of Benefit Options

- A-1 - Provides a monthly benefit for retiree's life. In the event the retiree dies before receiving five years of payments, the beneficiary receives the remainder of the five years (60 months) of guaranteed Defined Benefit pension payments in a lump sum.
- A-2 - Provides a monthly benefit for retiree's life. The benefit ceases upon the death of the retiree.
- A-3 - Provides a monthly benefit for retiree's life, including monthly annuitization of member's Annuity Savings Account (ASA). In the event the retiree dies before receiving five years of payments, the beneficiary will receive the remainder of the five years of guaranteed pension payments. The ASA is reduced with each monthly benefit paid; if the retiree dies before reducing the balance to \$0.00, the beneficiary will receive a single payment of the amount remaining.
- B-1 - Provides a monthly benefit for retiree's life. Upon the death of the retiree, the qualified designated survivor receives 100% of the member's Defined Benefit for the remainder of the survivor's life.
- B-2 - Provides a monthly benefit for retiree's life. Upon the death of the retiree, the qualified designated survivor receives 66-2/3% of the member's Defined Benefit for the remainder of the survivor's life.
- B-3 - Provides a monthly benefit for retiree's life. Upon the death of the retiree, the qualified designated survivor receives 50% of the member's Defined Benefit for the remainder of the survivor's life.
- Survivors* - Provides a monthly benefit for the surviving spouse's or dependent's life. The benefit ceases upon death of the survivor.
- Disability** - Available to members with five (5) or more years of creditable service who become disabled as determined by the Social Security Administration while teaching in Indiana.

* (of members who die while in service)

** Includes Classroom Disability – Provides a benefit of \$125 per month plus \$5 for each additional year of TRF-covered service over five years

Retired Members: Total Fund

Schedule of Average Benefit Payments by Service at Retirement

	Years of Service at Retirement						Total
	<10	10-14	15-19	20-24	25-29	30+	
Avg. Monthly Defined Benefit Pension	\$482	\$336	\$595	\$911	\$1,265	\$1,868	\$1,499
Avg. Monthly Annuity: All Benefit Recipients	\$70	\$103	\$110	\$139	\$172	\$239	\$201
Avg. Monthly Annuity: Benefit Recipients who Annuitized their ASA Balance (25,413 Recipients)	\$194	\$179	\$203	\$270	\$367	\$598	\$454
Avg. Final Avg. Salary at Retirement	\$29,961	\$30,540	\$41,376	\$48,033	\$52,623	\$58,744	\$54,051
Number of Benefit Recipients	108	1,890	5,022	6,530	9,228	34,774	57,552

Reconciliation of Participant Data: Total Fund

	Active	Inactive Vested	Inactive Nonvested	Survivor	Disabled	Retired	Beneficiary	Total
6/30/2014 Census	68,734	8,677	12,700	1,173	746	48,506	3,925	144,461
Disabled	(21)	(19)	(2)		42			0
Retired	(1,669)	(2,502)	(2)			4,173		0
Terminated with Vested Benefit	(1,731)	1,731						0
Terminated, due a Refund	(1,672)		1,672					0
Died with Survivor	(27)	(28)		55	(15)	(408)	423	0
Died, no Survivor*		(31)	(3)	(47)	(18)	(773)	(276)	(1,148)
Refunded*	(182)	(2)	(703)					(887)
Forfeited*			(469)					(469)
Dropped from Database	(8)	(51)	(7)			(2)	(6)	(74)
Rehired	1,253	(321)	(932)					0
Status Corrections		(6)	6					0
Data Corrections		6	127	2	12	13	27	187
New Hires	4,915		536					5,451
6/30/2015 Census	69,592	7,454	12,923	1,183	767	51,509	4,093	147,521

* No remaining benefit obligation in the plan.

nyhart

***Indiana State Teachers'
Retirement Fund
Pre-1996 Account***

***Annual Actuarial Valuation
June 30, 2016***

**Indiana State Teachers' Retirement Fund
Pre-1996 Account**

Annual Actuarial Valuation as of June 30, 2016

Nyhart

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November 7, 2016

November 7, 2016

***The Board of Trustees
Indiana Public Retirement System
Indianapolis, IN***

Dear Board Members:

An actuarial valuation is prepared annually for the Indiana State Teachers' Retirement Fund Pre-1996 Account. Submitted in this report are the results of the June 30, 2016 actuarial valuation.

Census Data and Asset Information

The member census data and the asset information for this valuation were furnished by the Chief Financial Officer and Staff. Their efforts and cooperation in furnishing these materials are acknowledged with appreciation. 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.

Assumptions and Methods

The majority of the actuarial assumptions used in the June 30, 2016 valuation were adopted by the Board pursuant to the Experience Study completed in April 2015, which reflects the experience period from July 1, 2011 to June 30, 2014. The Board adopted changes to the Actuarial Value of Assets smoothing period and to the amortization period for the Calculated Contribution Rate with the June 30, 2016 valuation. Assumptions are summarized in the Assumptions and Methods section of this report. These assumptions and methods have been used to develop the Actuarially Determined Contribution and are consistent with the accounting requirements detailed in GASB Statements No. 67 and No. 68.

Benefit obligations in the June 30, 2016 valuation are determined using June 30, 2015 census data and rolled-forward to the June 30, 2016 measurement date at the valuation interest rate, using actual distributions and ASA account returns during that period. We are not aware of any material events that would require additional adjustments to the benefit obligations for changes to the population not anticipated in the demographic assumptions used in the valuation.

Funding Objective

The Indiana State Teachers' Retirement Fund Pre-1996 Account is funded on a pay-as-you-go basis from the State of Indiana.

Fund Structure

The Indiana State Teachers' Retirement Fund (TRF) is one fund comprised of a two-account structure in compliance with Indiana Code Section 5-10.4-2-2. The Pre-1996 Account consists of members who were hired prior to July 1, 1995, and who have maintained continuous employment with the same school corporation or covered institution since that date.

Characteristics of the Pre-1996 Account

1. Active membership in the Pre-1996 Account continues to decline as members quit, become disabled, die, or retire.
2. The Defined Benefits from the Pre-1996 Account are funded by State appropriations (including contributions of some revenue from the State Lottery). At the time of retirement, Annuity Savings Account (ASA) benefits payable from the Pre-1996 Account are funded by the annuitization of Pre-1996 Account member contributions.

Funding Arrangements

Prior to the legislation that established the two-account structure of TRF, the Defined Benefits of the Indiana State Teachers' Retirement Fund were funded with a pay-as-you-go method. Under this arrangement, amounts were appropriated to meet the current year's pension payment requirements. Defined Benefits payable from the Pre-1996 Account continue to be funded on this basis.

Progress Towards Realization of Financing Objectives

The funded ratio (the ratio of the actuarial value of assets to the actuarial accrued liability) is a standard measure of a Plan's funded status. In the absence of benefit improvements, it should increase over time, until it reaches 100%. The funded ratio of the Pre-1996 Account (pay-as-you-go) decreased to 29.7% from 30.4% for the preceding year. Based on the actuarial assumptions, it is anticipated that the Pre-1996 Account will attain 100% funded status on 6/30/2039.

Certification

We have included several schedules and exhibits in this report, including the following:

Financial Section

- Note 1 – Tables of Plan Membership
- Note 8 – Net Pension Liability and Actuarial Information – Defined Benefit Plans
- Schedule of Changes in Net Pension Liability and Net Pension Liability
- Schedule of Contributions (Actuarially Determined Contribution)
- Schedule of Notes to Required Supplementary Information

Actuarial Section

- Summary of INPRS Funded Status
- Historical Summary of Actuarial Valuation Results by Retirement Plan (Schedule of Funding Progress)
- Summary of Actuarial Assumptions, Methods and Plan Provisions
- Analysis of Financial Experience (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

To the best of our knowledge, this report presents a fair position of the funded status of the plan in accordance with the Actuarial Standards of Practice as described by the American Academy of Actuaries. In addition, information has been prepared in accordance with applicable government standards of financial reporting for defined benefit pension plans.

The actuarial valuation is prepared using information which has been reconciled and reviewed for reasonableness. We are not aware of any material inadequacy in employee census or asset values. The census information and the asset information have been provided to us by the Chief Financial Officer and Staff. We have not audited the information at the source, and therefore do not accept responsibility for the accuracy or the completeness of the data on which the information is based.

In our opinion, the actuarial assumptions and methods are individually reasonable and in combination represent our best estimate of anticipated experience of the plan.

Neither Nyhart nor any of its employees have any relationship with the plan or its sponsor which could impair or appear to impair the objectivity of this report.

The undersigned are compliant with the continuing education requirements of the Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States.

Respectfully submitted,



Michael Zurek, EA, MAAA



Danielle Winegardner, ASA, EA, MAAA



Tayt V. Odom, FSA, EA, MAAA

Table of Contents

Section	Page
Executive Summary	1
Funding	3
Accounting	12
Member Data	19
Assumptions and Methods	30
Benefit Provisions	37
Appendix: Total Fund Demographic Information	39

Executive Summary

Contribution Rates

The Calculated Contribution Rate section shows the calculated contribution rate for the Pre-1996 Account. Since the Pre-1996 Account is funded on a pay-as-you-go basis, the expected State contribution and the expected benefit payments are also shown in the Calculated Contribution Rate section.

Plan Provisions

There is no ad-hoc COLA on January 1, 2017. Instead, retirees were paid a service-related lump sum (i.e., referred to as 13th check) in September 2016. These changes are reflected in the June 30, 2016 valuation. Any future COLA is estimated by an ongoing assumption of 1.0% annual increases in all pension payments beginning January 1, 2018.

ASA annuitizations are scheduled to be based on a 4.50% conversion rate for the period from June 30, 2016 through March 31, 2017. After April 1, 2017, annuity conversions will occur outside of the plan. Benefit obligations in the June 30, 2016 valuation have been adjusted for the anticipated gains through March 31, 2017 for conversions at interest rates lower than the valuation interest rate of 6.75%.

We are not aware of any other material changes in the plan provisions since the June 30, 2015 actuarial valuation.

Census Data

Census data for the valuation was provided by INPRS. We have thoroughly examined the data for reasonableness and consistency with prior years, but we did not otherwise audit it.

Assumptions and Methods

The actuarial assumptions used in the June 30, 2016 valuation are based on plan experience from July 1, 2011 to June 30, 2014. The Board adopted changes to the Actuarial Value of Assets smoothing period and to the amortization period for the Calculated Contribution Rate with the June 30, 2016 valuation.

Benefit obligations in the June 30, 2016 valuation are determined using June 30, 2015 census data and rolled-forward to the June 30, 2016 measurement date at the valuation interest rate, using actual distributions and ASA account returns during that period. We are not aware of any material events that would require additional adjustments to the benefit obligations for changes to the population not anticipated in the demographic assumptions used in the valuation.

Investment Experience

The investment return for the year ended June 30, 2016 was lower than the assumed 6.75% return. The assets of the TRF Pre-1996 Account are commingled with the assets of other funds administered by INPRS. The TRF money-weighted return was 1.01% during fiscal 2016. Under the asset valuation method, market gains and losses are spread over a five-year period. The Market Value of Assets is currently \$221 million lower than the Actuarial Value of Assets, meaning the plan is currently in a position of having net deferred investment losses to be recognized in future years.

Challenges

A significant funding challenge will be for the State to meet the projected pay-as-you-go obligations as shown in the Payout Projections section for the Pre-1996 Account.

Summary of Key Valuation Results

	June 30, 2016	June 30, 2015	June 30, 2014	June 30, 2013
Member Information				
Number				
Active Members	14,327	16,310	19,210	19,210
Inactive Vested Members	3,119	4,545	3,314	3,314
Inactive Nonvested Members	394	408	546	546
Retired Members and Beneficiaries	<u>52,575</u>	<u>50,214</u>	<u>49,345</u>	<u>49,345</u>
Total	70,415	71,477	72,415	72,415
Valuation Payroll	\$ 1,044,096,459	\$ 1,178,845,758	\$ 1,383,241,991	\$ 1,383,428,013
Projected Payroll	\$ 934,500,000	\$ 1,098,600,000	\$ 1,275,600,000	
Annual Benefit Payments				
Annuity	\$ 128,298,324	\$ 117,298,548	\$ 113,356,896	\$ 113,356,896
Pension	\$ <u>954,007,788</u>	<u>886,611,432</u>	<u>860,278,572</u>	<u>860,278,572</u>
Total	\$ 1,082,306,112	\$ 1,003,909,980	\$ 973,635,468	\$ 973,635,468
Assets and Liabilities				
Accrued Liability				
ASA Account Balance	\$ 1,265,128,371	\$ 1,421,455,452	\$ 1,715,340,174	\$ 1,812,829,927
ASA Annuities	1,274,610,053	1,238,798,290	1,105,546,776	1,082,701,767
Pension: Retirees	10,083,545,681	9,249,267,624	8,580,843,864	8,996,399,426
Pension: Non-retirees	<u>4,216,916,305</u>	<u>5,108,224,963</u>	<u>4,953,485,217</u>	<u>4,570,447,617</u>
Total	\$ 16,840,200,410	\$ 17,017,746,329	\$ 16,355,216,031	\$ 16,462,378,737
Market Value of Assets				
ASA Account Balance	\$ 1,265,128,371	\$ 1,421,455,452	\$ 1,715,340,174	\$ 1,812,829,927
ASA Annuities	1,274,610,053	1,238,798,290	1,105,546,776	1,082,701,767
Pension: Retirees	2,247,790,526	2,439,655,728	2,680,979,925	2,319,660,883
Pension: Non-retirees	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	\$ 4,787,528,950	\$ 5,099,909,470	\$ 5,501,866,875	\$ 5,215,192,577
Actuarial Value of Assets				
ASA Account Balance	\$ 1,265,128,371	\$ 1,421,455,452	\$ 1,715,340,174	\$ 1,812,829,927
ASA Annuities	1,274,610,053	1,238,798,290	1,105,546,776	1,082,701,767
Pension: Retirees	2,469,250,799	2,511,385,118	2,537,464,437	2,339,572,220
Pension: Non-retirees	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	\$ 5,008,989,223	\$ 5,171,638,860	\$ 5,358,351,387	\$ 5,235,103,914
Unfunded Accrued Liability				
ASA Account Balance	\$ 0	\$ 0	\$ 0	\$ 0
ASA Annuities	0	0	0	0
Pension: Retirees	7,614,294,882	6,737,882,506	6,043,379,427	6,656,827,206
Pension: Non-retirees	<u>4,216,916,305</u>	<u>5,108,224,963</u>	<u>4,953,485,217</u>	<u>4,570,447,617</u>
Total	\$ 11,831,211,187	\$ 11,846,107,469	\$ 10,996,864,644	\$ 11,227,274,823
Funded Percentage				
ASA Account Balance	100.0%	100.0%	100.0%	100.0%
ASA Annuities	100.0%	100.0%	100.0%	100.0%
Pension: Retirees	24.5%	27.2%	29.6%	26.0%
Pension: Non-retirees	<u>0.0%</u>	<u>0.0%</u>	<u>0.0%</u>	<u>0.0%</u>
Total	29.7%	30.4%	32.8%	31.8%
Pension Normal Cost	\$ 43,204,075	\$ 46,787,226	\$ 57,750,841	\$ 68,860,011
Annual Costs				
	Fiscal 2018	Fiscal 2017	Fiscal 2016	Fiscal 2015
Actuarially Determined Contribution (ADC)	\$ 902,500,000	\$ 873,400,000	\$ 869,500,000	\$ 851,426,892
Expected Pension Benefit Payments	\$ 1,047,300,000	\$ 1,014,500,000	\$ 960,100,000	\$ 934,300,000
Expected Pension Contributions	\$ 902,500,000	\$ 873,400,000	\$ 869,500,000	\$ 851,426,892

Valuations on and after June 30, 2014 are based on census data collected at the prior measurement date.

The plan is funded on a pay-as-you-go basis and the annual contribution is appropriated by state statute. The Actuarially Determined Contribution is equal to the state appropriation to fund the plan.

Unfunded Accrued Liability

\$Millions				
June 30	Accrued Liability	Actuarial Value of Assets	Unfunded Accrued Liability	Funded Percentage
1975	\$ 1,570	\$ 312	\$ 1,258	19.9%
1980	2,843	539	2,304	19.0%
1985	4,023	1,073	2,950	26.7%
1991	7,182	2,161	5,021	30.1%
1992	7,949	2,376	5,573	29.9%
1993	8,508	2,592	5,916	30.5%
1994	9,087	2,809	6,278	30.9%
1995	9,675	2,984	6,691	30.8%
1996	10,283	3,242	7,041	31.5%
1997	10,868	3,678	7,190	33.8%
1998	11,481	4,130	7,351	36.0%
1999	12,173	4,731	7,442	38.9%
2000	12,409	5,210	7,199	42.0%
2001	12,696	5,363	7,333	42.2%
2002	13,498	5,555	7,943	41.2%
2003	13,355	5,728	7,627	42.9%
2004	13,549	5,765	7,784	42.5%
2005	14,254	5,797	8,457	40.7%
2006	15,003	5,478	9,525	36.5%
2007	15,988	5,764	10,224	36.1%
2008	15,792	5,954	9,838	37.7%
2009	16,027	5,109	10,918	31.9%
2010	16,282	5,382	10,900	33.1%
2011	16,318	5,227	11,091	32.0%
2012	16,522	4,978	11,544	30.1%
2013	16,462	5,235	11,227	31.8%
2014	16,355	5,358	10,997	32.8%
2015	17,018	5,172	11,846	30.4%
2016	16,840	5,009	11,831	29.7%

Reconciliation of Market Value of Assets

	June 30, 2015 thru June 30, 2016	June 30, 2014 thru June 30, 2015
Market Value, beginning of year	\$ 5,099,909,470	\$ 5,501,866,875
Member Contributions	\$ 31,397,664	\$ 41,740,139
Employer Contributions	5,048,222	5,810,942
Non-Employer Contributing Entity Contributions	887,500,000	845,615,950
Benefit Payments	(1,272,953,810)	(1,328,854,709)
Net Transfers ¹	<u>763,303</u>	<u>3,375,277</u>
Non-Investment Net Cash Flow	\$ (348,244,621)	\$ (432,312,401)
Administrative Expenses	\$ (6,564,440)	\$ (6,530,516)
Investment Return	<u>42,428,541</u>	<u>36,885,512</u>
Net Investment Return	\$ 35,864,101	\$ 30,354,996
Market Value, end of year	\$ 4,787,528,950	\$ 5,099,909,470
Market Value of Assets Approximate Time-Weighted Annual Rate of Return ²	0.7%	0.6%

¹ Net transfers from June 30, 2015 thru June 30, 2016 include member service credit purchases of \$131,562.

² Consolidated pension and ASA account return, net of investment and administrative expenses, assumes cash flows occur at mid-year.

Development of the Actuarial Value of Assets

	June 30, 2015 thru June 30, 2016
1. Actuarial Value, beginning of year	\$ 5,171,638,860
2. ASA Account Balance, beginning of year	<u>\$ 1,421,455,452</u>
3. Actuarial Value, Net of ASA Account Balance, beginning of year [(1) – (2)]	\$ 3,750,183,408
4. Market Value, Net of ASA Account Balance, beginning of year	\$ 3,678,454,018
5. Market Value, Net of ASA Account Balance, end of year	\$ 3,522,400,579
6. Non-Investment Net Cash Flow	(189,067,370)
7. Net Investment Return	
a. Expected [.0675 x ((4)+0.5*(6))]	241,914,622
b. Actual [(5) - (4) - (6)]	<u>33,013,931</u>
8. Current Year Market Value Gain/(Loss) [(7b) - (7a)]	\$ (208,900,691)
9. Deferred Recognition of Investment Gain/(Loss)	
a. Current Fiscal Year (80% of (8))	\$ (167,120,553)
b. Current Fiscal Year - 1 (60%)	(151,306,632)
c. Current Fiscal Year - 2 (40%)	100,338,000
d. Current Fiscal Year - 3 (20%)	<u>(3,371,088)</u>
e. Total [(a) + (b) + (c) + (d)]	\$ (221,460,273)
10. Preliminary Actuarial Value, end of year [(5) - (9e)]	\$ 3,743,860,852
a. 80% of Market Value, end of year [80% of (5)]	2,817,920,463
b. 120% of Market Value, end of year [120% of (5)]	4,226,880,695
11. Actuarial Value, end of year [(10), but not Greater than (10b), nor Less than (10a)]	\$ 3,743,860,852
12. Actuarial Value as a % of Market Value [(11) / (5)]	106.29%
13. Net Investment Return on Actuarial Value [(11) - (3) - (6)]	\$ 182,744,814
14. Actuarial Value Net Rate of Return [(13) / ((3) + 0.5*(6))]	5.00%
15. Actuarial Value, Net of ASA Account Balance, end of year	\$ 3,743,860,852
16. ASA Account Balance, end of year	\$ 1,265,128,371
17. Actuarial Value, end of year [(15) + (16)]	\$ 5,008,989,223

Accrued Liability Reconciliation

	June 30, 2015 thru June 30, 2016	June 30, 2014 thru June 30, 2015
Total Accrued Liability, beginning of year	\$ 17,017,746,329	\$ 16,355,216,031
ASA Account Balance, beginning of year	\$ 1,421,455,452	\$ 1,715,340,174
Accrued Liability, Net of ASA Account Balance, beginning of year	\$ 15,596,290,877	\$ 14,639,875,857
Normal Cost	46,787,226	57,750,841
Actual Benefit Payments	(1,118,121,746)	(1,100,434,461)
Transfers	36,506,154	146,512,157
Expected Interest	<u>1,019,403,246</u>	<u>959,894,924</u>
Expected Accrued Liability, Net of ASA Account Balance, end of year	\$ 15,580,865,757	\$ 14,703,599,318
Sources of Change:		
New Entrants	\$ 9,136,688	\$ 20,755,214
Experience (Gain) or Loss	71,828,671	(89,606,920)
Mortality Change ¹	0	939,690,298
Other Assumption Changes ²	0	93,467,075
Additional Liability due to Cost-of-Living Adjustment ³	(86,759,077)	(71,614,108)
Plan Provision Changes	<u>0</u>	<u>0</u>
Accrued Liability, Net of ASA Account Balance, end of year	\$ 15,575,072,039	\$ 15,596,290,877
ASA Account Balance, end of year	\$ 1,265,128,371	\$ 1,421,455,452
Total Accrued Liability, end of year	\$ 16,840,200,410	\$ 17,017,746,329

¹ The June 30, 2015 mortality assumption was updated to the RP-2014 White Collar mortality table with Social Security Administration improvement scale applied from 2006.

² Assumption changes other than mortality adopted on June 30, 2015 pursuant to the 2015 experience study.

³ 13th check to retirees in lieu of the assumed 2017 and 2016 1.0% COLAs.

Asset and Liability Allocation¹

	June 30, 2016		
	Non-Retired	Retired	Total
Accrued Liability (AL)			
ASA Balance	\$ 1,161,802,875	\$ 103,325,496	\$ 1,265,128,371
ASA Annuities	0	1,274,610,053	1,274,610,053
Pension: Retirees	0	10,083,545,681	10,083,545,681
Pension: Non-Retirees	4,216,916,305	0	4,216,916,305
Total	\$ 5,378,719,180	\$11,461,481,230	\$ 16,840,200,410
Market Assets			
ASA Balance	\$ 1,161,802,875	\$ 103,325,496	\$ 1,265,128,371
ASA Annuities	0	1,274,610,053	1,274,610,053
Pension: Retirees	0	2,247,790,526	2,247,790,526
Pension: Non-Retirees	0	0	0
Total	\$ 1,161,802,875	\$ 3,625,726,075	\$ 4,787,528,950
Actuarial Assets			
ASA Balance	\$ 1,161,802,875	\$ 103,325,496	\$ 1,265,128,371
ASA Annuities	0	1,274,610,053	1,274,610,053
Pension: Retirees	0	2,469,250,799	2,469,250,799
Pension: Non-Retirees	0	0	0
Total	\$ 1,161,802,875	\$ 3,847,186,348	\$ 5,008,989,223
Unfunded AL			
ASA Balance	\$ 0	\$ 0	\$ 0
ASA Annuities	0	0	0
Pension: Retirees	0	7,614,294,882	7,614,294,882
Pension: Non-Retirees	4,216,916,305	0	4,216,916,305
Total	\$ 4,216,916,305	\$ 7,614,294,882	\$ 11,831,221,187

	June 30, 2015		
	Non-Retired	Retired	Total
Accrued Liability (AL)			
ASA Balance	\$ 1,303,468,191	\$ 117,987,261	\$ 1,421,455,452
ASA Annuities	0	1,238,798,290	1,238,798,290
Pension: Retirees	0	9,249,267,624	9,249,267,624
Pension: Non-Retirees	5,108,224,963	0	5,108,224,963
Total	\$ 6,411,693,154	\$10,606,053,175	\$ 17,017,746,329
Market Assets			
ASA Balance	\$ 1,303,468,191	\$ 117,987,261	\$ 1,421,455,452
ASA Annuities	0	1,238,798,290	1,238,798,290
Pension: Retirees	0	2,439,655,728	2,439,655,728
Pension: Non-Retirees	0	0	0
Total	\$ 1,303,468,191	\$3,796,441,279	\$ 5,099,909,470
Actuarial Assets			
ASA Balance	\$ 1,303,468,191	\$ 117,987,261	\$ 1,421,455,452
ASA Annuities	0	1,238,798,290	1,238,798,290
Pension: Retirees	0	2,511,385,118	2,511,385,118
Pension: Non-Retirees	0	0	0
Total	\$ 1,303,468,191	\$3,868,170,669	\$ 5,171,638,860
Unfunded AL			
ASA Balance	\$ 0	\$ 0	\$ 0
ASA Annuities	0	0	0
Pension: Retirees	0	6,737,882,506	6,737,882,506
Pension: Non-Retirees	5,108,224,963	0	5,108,224,963
Total	\$ 5,108,224,963	\$ 6,737,882,506	\$ 11,846,107,469

¹ Assets are allocated first to member ASA account liabilities, then to ASA annuity liabilities, then to Pension: Retirees liabilities, and finally to Pension: Non-Retirees liabilities to determine unfunded accrued liabilities.

Solvency Test

\$Thousands

Year Ended June 30	Accrued Liability				Actuarial Value of Assets	Portion of Accrued Liability Covered by Assets			
	Active Member Contributions	Retirees and Beneficiaries	Active Member (Employer Financed Portion)	Total		Active Member Contribs.	Retirees and Bfcys	Active Member (Employer Financed Portion)	Total
2005	\$2,925,367	\$5,653,502	\$5,675,278	\$14,254,147	\$5,796,724	100.0%	50.8%	0.0%	40.7%
2006	\$2,898,891	\$6,238,115	\$5,865,465	\$15,002,471	\$5,477,221	100.0%	41.3%	0.0%	36.5%
2007	\$3,016,052	\$7,063,889	\$5,908,318	\$15,988,259	\$5,763,508	100.0%	38.9%	0.0%	36.1%
2008	\$2,613,138	\$7,244,422	\$5,934,745	\$15,792,305	\$5,953,991	100.0%	46.1%	0.0%	37.7%
2009	\$2,389,886	\$7,891,346	\$5,745,861	\$16,027,093	\$5,109,086	100.0%	34.5%	0.0%	31.9%
2010	\$2,353,715	\$8,153,240	\$5,775,111	\$16,282,066	\$5,382,410	100.0%	37.1%	0.0%	33.1%
2011	\$2,015,580	\$8,776,916	\$5,525,908	\$16,318,404	\$5,227,402	100.0%	36.6%	0.0%	32.0%
2012	\$1,782,353	\$9,451,792	\$5,287,870	\$16,522,015	\$4,978,107	100.0%	33.8%	0.0%	30.1%
2013	\$1,636,978	\$10,254,953	\$4,570,448	\$16,462,379	\$5,235,104	100.0%	35.1%	0.0%	31.8%
2014	\$1,525,192	\$9,876,539	\$4,953,485	\$16,355,216	\$5,358,351	100.0%	38.8%	0.0%	32.8%
2015	\$1,303,468	\$10,606,053	\$5,108,225	\$17,017,746	\$5,171,639	100.0%	36.5%	0.0%	30.4%
2016	\$1,161,803	\$11,461,481	\$4,216,916	\$16,840,200	\$5,008,989	100.0%	33.6%	0.0%	29.7%

Analysis of Financial Experience¹

\$Thousands	June 30, 2015 thru June 30, 2016	June 30, 2014 thru June 30, 2015
Unfunded Accrued Liability, beginning of year	\$ 11,846,107	\$ 10,996,865
(Gain) / Loss:		
Actuarial Value of Assets	\$ 75,846	\$ 32,776
Actuarial Accrued Liabilities	80,965	(68,852)
Amortization of Existing Bases	(73,114)	(76,225)
Mortality Change ²	0	939,690
Other Assumption Changes ³	0	93,467
Change in Asset Smoothing Method ⁴	(11,834)	0
Additional Liability due to Cost-of-Living Adjustment ⁵	(86,759)	(71,614)
Plan Provision Changes	<u>0</u>	<u>0</u>
Net Change	\$ (14,896)	\$ 849,242
Unfunded Accrued Liability, end of year	\$ 11,831,211	\$ 11,846,107

¹ Based on pension and ASA annuities only, i.e. net of ASA account balances.

² The June 30, 2015 mortality assumption was updated to the RP-2014 White Collar mortality table with Social Security Administration improvement scale applied from 2006.

³ Assumption changes other than mortality adopted on June 30, 2015 pursuant to the 2015 experience study.

⁴ Change in the asset smoothing period from 4 years to 5 years on June 30, 2016.

⁵ 13th check to retirees in lieu of the assumed 2017 and 2016 1.0% COLAs.

Sensitivity to Changes in Assumed Investment Return / Interest Rate

\$Millions	Assumed Investment Return / Interest Rate				
	5.75%	6.00%	6.25%	6.50%	6.75%
Funded Status					
Actuarial Accrued Liability	\$ 18,418.3	\$ 18,010.4	\$ 17,611.5	\$ 17,221.6	\$ 16,840.2
Actuarial Value of Assets	<u>5,009.0</u>	<u>5,009.0</u>	<u>5,009.0</u>	<u>5,009.0</u>	<u>5,009.0</u>
Unfunded Accrued Liability	\$ 13,409.3	\$ 13,001.4	\$ 12,602.5	\$ 12,212.6	\$ 11,831.2
Funded Ratio	27.2%	27.8%	28.4%	29.1%	29.7%
Actuarially Determined Contribution Rate					
Normal Cost %	6.27%	5.81%	5.38%	4.99%	4.62%
UAL Amortization %	<u>319.94%</u>	<u>311.59%</u>	<u>303.37%</u>	<u>295.28%</u>	<u>287.32%</u>
Actuarially Determined Contribution %	326.21%	317.40%	308.75%	300.27%	291.94%

\$Millions	Assumed Investment Return / Interest Rate				
	7.00%	7.25%	7.50%	7.75%	8.00%
Funded Status					
Actuarial Accrued Liability	\$ 16,493.3	\$ 16,153.7	\$ 15,821.0	\$ 15,495.3	\$ 15,190.3
Actuarial Value of Assets	<u>5,009.0</u>	<u>5,009.0</u>	<u>5,009.0</u>	<u>5,009.0</u>	<u>5,009.0</u>
Unfunded Accrued Liability	\$ 11,484.3	\$ 11,144.7	\$ 10,812.0	\$ 10,486.3	\$ 10,181.3
Funded Ratio	30.4%	31.0%	31.7%	32.3%	33.0%
Actuarially Determined Contribution Rate					
Normal Cost %	4.28%	3.97%	3.68%	3.43%	3.18%
UAL Amortization %	<u>280.12%</u>	<u>273.01%</u>	<u>266.02%</u>	<u>259.12%</u>	<u>252.66%</u>
Actuarially Determined Contribution %	284.40%	276.98%	269.70%	262.55%	255.84%

Calculated Employer Contribution Rate

	June 30, 2016	% of Projected Payroll for Fiscal 2017
Normal Cost	\$ 43,204,075	4.62%
Amortization of Unfunded Accrued Liability		
Unfunded Accrued Liability (UAL) ¹	\$ 11,831,211,187	
Unamortized UAL from Prior Years ²	0	
Net Unamortized UAL	\$ 11,831,211,187	
Amortization Factor (5-years, level dollar) ²	4.4064	
Current Year Amortization Payment	\$ 2,685,006,170	
Payments Established in Prior Years ²	0	
Total Amortization Payments	\$ 2,685,006,170	287.32%
Calculated Employer Contribution Rate	\$ 2,728,210,245	291.94%
	<u>Fiscal 2017</u>	<u>Fiscal 2018</u>
Expected Pension Benefit Payments ³	\$ 1,042,900,000	\$ 1,047,300,000
Expected Pension Contributions	\$ 873,400,000	\$ 902,500,000

The Pre-1996 Account is funded on a pay-as-you-go basis. The figures shown above reflect the expected defined benefit pension payments (excluding ASA annuities) and contributions to be made during fiscal year 2017 and fiscal year 2018.

¹ Pension and ASA annuity only

² The amortization period was changed from 30 years to 5 years on a retroactive basis on 6/30/2016.

³ Fiscal 2017 expected pension benefit payments are based on 6/30/2015 census data used in the 6/30/2016 valuation and will not necessarily match the entry on page 2, which is based on 6/30/2014 census data used in the 6/30/2015 valuation.

Statement of Fiduciary Net Position

	June 30, 2016	June 30, 2015
Assets		
Cash and Cash Equivalents	\$ 662,489	\$ 479,403
Receivables		
Contributions	\$ 2,702,069	\$ 2,797,643
Miscellaneous	753,761	253,148
Investments	63,876,444	77,640,404
Foreign Exchange Contracts	875,926,513	906,640,727
Accrued Interest and Dividends	13,606,126	15,153,413
Due from Other Funds	625,443	538,345
Total Receivables	\$ 957,490,356	\$ 1,003,023,680
Investments		
Short Term	\$ 10,777,932	\$ 21,025,563
Pooled Unit Trust Assets		
Repurchase Agreements	937,151	0
Short Term Investments	271,426,327	208,731,187
Fixed Income	1,911,240,435	2,115,466,032
Equities	1,306,266,586	1,397,754,361
Alternatives	1,473,309,507	1,471,880,722
Derivatives	(120,743)	687,795
Securities Lending Collateral	55,285,373	188,768,617
Total Investments	\$ 5,029,122,568	\$ 5,404,314,277
Net Capitalized Assets	\$ 456,868	\$ 788,317
Total Assets	\$ 5,987,732,281	\$ 6,408,605,677
Liabilities		
Accounts Payable	\$ 327,954	\$ 246,280
Retirement Benefits Payable	113,659,683	110,840,618
Salaries and Benefits Payable	0	0
Investments Payable	117,665,842	69,205,640
Foreign Exchange Contracts	872,852,435	909,778,255
Securities Lending Obligations	55,285,373	188,768,616
Securities Sold Under Agreement to Repurchase	39,090,484	28,695,436
Due to Other Funds	1,321,560	1,161,362
Total Liabilities	\$ 1,200,203,331	\$ 1,308,696,207
Net Position Restricted for Pensions	\$ 4,787,528,950	\$ 5,099,909,470

Statement of Changes in Fiduciary Net Position

	June 30, 2016	June 30, 2015
Additions		
Contributions		
Member Contributions	\$ 31,529,227	\$ 41,740,139
Employer Contributions	5,048,222	5,810,942
Nonemployer Contributing Entity Contributions	887,500,000	845,615,950
Other Contributions	<u>0</u>	<u>0</u>
Total Contributions	\$ 924,077,449	\$ 893,167,031
Investment Income/(Loss)		
Net Appreciation/(Depreciation)		
Fair Value of Investments	\$ (466,156)	\$ (4,437,202)
Other Net Investment Income	497,750	737,013
Net Interest and Dividends Income	69,208,548	71,769,372
Miscellaneous Income	0	0
Securities Lending Income	<u>644,513</u>	<u>673,451</u>
Total Investment Income/(Loss)	\$ 69,884,655	\$ 68,742,634
Less Direct Investment Expenses		
Investment Management Fees	\$ (25,258,802)	\$ (29,162,593)
Securities Lending Fees	(118,975)	(109,098)
Other Direct Investment Expenses	<u>(2,078,339)</u>	<u>(2,585,432)</u>
Total Direct Investment Expenses	\$ (27,456,116)	\$ (31,857,123)
Net Investment Income/(Loss)	\$ 42,428,539	\$ 36,885,511
Other Additions		
Miscellaneous	\$ 0	\$ 21,387
Interfund Transfers	<u>4,057,252</u>	<u>6,272,693</u>
Total Other Additions	\$ 4,057,252	\$ 6,294,080
Total Additions	\$ 970,563,240	\$ 936,346,622
Deductions		
Pension and Disability Benefits	\$ 1,266,950,042	\$ 1,321,709,860
Special Death Benefits	0	0
Distributions of Contributions and Interest	6,003,767	7,144,849
Pension Relief Distributions	0	0
Local Unit Withdrawals	0	0
Administrative Expenses	6,564,440	5,919,903
Project Expenses	0	610,613
Interfund Transfers	<u>3,425,511</u>	<u>2,918,802</u>
Total Deductions	\$ 1,282,943,760	\$ 1,338,304,027
Net Increase/(Decrease) in Net Position	\$ (312,380,520)	\$ (401,957,405)
Net Position Restricted for Pensions		
Beginning of Year	\$ 5,099,909,470	\$ 5,501,866,875
End of Year	\$ 4,787,528,950	\$ 5,099,909,470

Schedule of Changes in Net Pension Liability and Related Ratios

	June 30, 2016	June 30, 2015	June 30, 2014
Total Pension Liability			
Total Pension Liability, beginning of year	\$ 17,017,746,329	\$ 16,355,216,031	\$ 16,463,598,481
Annuity Savings Account (ASA), beginning of year	1,421,455,452	1,715,340,174	1,814,049,671
Excluding ASA, beginning of year	15,596,290,877	14,639,875,857	14,649,548,810
Service Cost	\$ 46,787,226	\$ 57,750,841	\$ 68,860,011
Interest Cost	1,019,403,246	959,894,924	961,628,534
Experience (Gains)/Losses	(5,793,718)	(140,465,814)	(70,517,351)
Assumption Changes	0	1,033,157,373	0
Plan Amendments	0	0	(25,523,806)
Benefit Payments	(1,118,121,746)	(1,100,434,461)	(1,034,563,166)
ASA Annuity Payments	35,185,531	143,225,034	93,981,713
Net Member Reassignments	0	3,265,736	(3,801,799)
Other	1,320,623	21,387	262,911
Net Change in Total Pension Liability, Excluding ASA	\$ (21,218,838)	\$ 956,415,020	\$ (9,672,953)
Net Change in Total Pension Liability, ASA	(156,327,081)	(293,884,722)	(98,709,497)
Net Change in Total Pension Liability	(177,545,919)	662,530,298	(108,382,450)
Total Pension Liability, Excluding ASA, end of year	\$ 15,575,072,039	\$ 15,596,290,877	\$ 14,639,875,857
Total Pension Liability, ASA, end of year	1,265,128,371	1,421,455,452	1,715,340,174
Total Pension Liability, end of year	16,840,200,410	17,017,746,329	16,355,216,031
Fiduciary Net Position			
Fiduciary Net Position, beginning of year	\$ 5,099,909,470	\$ 5,501,866,875	\$ 5,215,201,405
Employer Contributions	5,048,222	5,810,942	6,325,502
Nonemployer contributing entities contributions	887,500,000	845,615,950	825,616,000
Member Contributions	31,397,664	41,740,139	47,027,857
Net investment income	42,428,541	36,885,511	647,581,967
Benefit Payments	(1,272,953,810)	(1,328,854,709)	(1,229,300,965)
Net Member Reassignments	763,303	3,353,891	(3,593,066)
Administrative Expenses	(6,564,440)	(6,530,516)	(7,010,723)
Other	0	21,387	18,898
Net Change in Fiduciary Net Position	\$ (312,380,520)	\$ (401,957,405)	\$ 286,665,470
Fiduciary Net Position, end of year	\$ 4,787,528,950	\$ 5,099,909,470	\$ 5,501,866,875
Net Pension Liability and Related Ratios			
Net Pension Liability, beginning of year	\$ 11,917,836,859	\$ 10,853,349,156	\$ 11,248,397,076
Net Pension Liability, end of year	\$ 12,052,671,460	\$ 11,917,836,859	\$ 10,853,349,156
Plan's Fiduciary Net Position as a			
Percentage of the Total Pension Liability	28.4%	30.0%	33.6%
Covered Employee Payroll (Actual)	\$ 989,093,421	\$ 1,074,826,991	\$ 1,262,828,000
Net Pension Liability as a Percentage of			
Covered Employee Payroll	1218.6%	1108.8%	859.4%

Schedule of Changes in Net Pension Liability and Related Ratios

	June 30, 2013
Total Pension Liability	
Total Pension Liability, beginning of year	\$ 16,522,014,519
Annuity Savings Account (ASA), beginning of year	1,974,075,962
Excluding ASA, beginning of year	14,547,938,557
Service Cost	\$ 81,343,107
Interest Cost	957,228,337
Experience (Gains)/Losses	(40,718,985)
Assumption Changes	0
Plan Amendments	0
Benefit Payments	(988,335,242)
ASA Annuityizations	86,941,060
Net Member Reassignments	0
Other	<u>5,151,976</u>
Net Change in Total Pension Liability, Excluding ASA	\$ 101,610,253
Net Change in Total Pension Liability, ASA	(160,026,291)
Net Change in Total Pension Liability	(58,416,038)
Total Pension Liability, Excluding ASA, end of year	\$ 14,649,548,810
Total Pension Liability, ASA, end of year	1,814,049,671
Total Pension Liability, end of year	16,463,598,481
Fiduciary Net Position	
Fiduciary Net Position, beginning of year	\$ 5,058,910,388
Employer Contributions	9,483,547
Nonemployer contributing entities contributions	1,003,596,233
Member Contributions	45,420,617
Net investment income	315,598,000
Benefit Payments	(1,212,945,000)
Net Member Reassignments	3,059,000
Administrative Expenses	(7,926,000)
Other	<u>4,620</u>
Net Change in Fiduciary Net Position	\$ 156,291,017
Fiduciary Net Position, end of year	\$ 5,215,201,405
Net Pension Liability and Related Ratios	
Net Pension Liability, beginning of year	\$ 11,463,104,131
Net Pension Liability, end of year	\$ 11,248,397,076
Plan's Fiduciary Net Position as a Percentage of the Total Pension Liability	31.7%
Covered Employee Payroll (Actual)	\$ 1,383,428,000
Net Pension Liability as a Percentage of Covered Employee Payroll	813.1%

Required Supplementary Information under GASB No. 68

	June 30, 2016	June 30, 2015	June 30, 2014	June 30, 2013
Schedule of Contributions				
Actuarially Determined Contribution*	\$ 892,548,222	\$ 851,426,892	\$ 831,941,502	\$ 1,013,079,780
Contributions in Relation to the Actuarially Determined Contributions	<u>892,548,222</u>	<u>851,426,892</u>	<u>831,941,502</u>	<u>1,013,079,780</u>
Contribution Deficiency/(Excess)	\$ 0	\$ 0	\$ 0	\$ 0
Covered Employee Payroll	\$ 989,093,421	\$ 1,074,826,991	\$ 1,262,828,000	\$ 1,383,428,000
Contributions as a Percentage of Covered Employee Payroll	90.2%	79.2%	65.9%	73.2%

Schedule of Investment Returns

Annual Money-Weighted Rate of Return, Net of Investment Expense	1.01%	0.57%	12.71%	5.11%
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Sensitivity of the Net Pension Liability to Changes in the Discount Rate

The following presents the net pension liability of the TRF Pre-1996 Account calculated using the discount rate of 6.75%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1% lower (5.75%) or 1% higher (7.75%) than the current rate:

	1% Decrease 5.75%	Current Rate 6.75%	1% Increase 7.75%
Net Pension Liability	\$ 13,630,766,650	\$ 12,052,671,460	\$ 10,707,809,071

**The plan is funded on a pay-as-you-go basis and the annual contribution is appropriated by state statute. The Actuarially Determined Contribution is equal to the state appropriation to fund the plan.*

Pension Expense

	June 30, 2016	June 30, 2015
Service Cost	\$ 46,787,226	\$ 57,750,841
Interest on Total Pension Liability	1,019,403,246	959,894,924
Projected Earnings on Pension Plan Investments	(241,693,073)	(251,910,927)
Changes of Benefit Terms	0	0
Pension Plan Administrative Expenses	6,564,440	6,530,516
Other Changes	0	0
Current Period Recognition of Deferred Outflows/(Inflows) of resources:		
Differences between Expected and Actual Experience in Measurement of the Total Pension Liability	(5,793,718)	(175,724,489)
Changes of Assumptions	0	1,033,157,373
Differences between Projected and Actual Earnings on Pension Plan Investments	<u>34,812,589</u>	<u>(5,610,351)</u>
Total	\$ 860,080,710	\$ 1,624,087,887

**Deferred Outflows of Resources and Deferred Inflows of Resources
Related to Pensions**

	Initial Balance	Initial Amortization Period	Annual Recognition	June 30, 2016 Balance
Difference between Expected and Actual Experience in Measurement of the Total Pension Liability				
Base for Year ending June 30, 2016	\$ (5,793,718)	1	\$ (5,793,718)	\$ 0
Base for Year ending June 30, 2015	(140,465,814)	1	0	0
Base for Year ending June 30, 2014	(70,517,351)	2	0	0
Change of Assumptions				
Base for Year ending June 30, 2016	\$ 0		\$ 0	\$ 0
Base for Year ending June 30, 2015	1,033,157,373	1	0	0
Base for Year ending June 30, 2014	0		0	0
Differences between Projected and Actual Earnings on Pension Plan Investments				
Base for Year ending June 30, 2016	\$ 202,114,702	5	\$ 40,422,940	\$ 161,691,762
Base for Year ending June 30, 2015	250,957,682	5	50,191,536	150,574,610
Base for Year ending June 30, 2014	(279,009,435)	5	(55,801,887)	(111,603,774)
Changes in State's Proportion and Differences between Actual State Contributions and State's Proportionate Share of Contributions				
Base for Year ending June 30, 2016	\$ 0		\$ 0	\$ 0
Base for Year ending June 30, 2015	0		0	0
Base for Year ending June 30, 2014	0		0	0
Total			\$ 29,018,871	\$ 200,662,598

The balances as of June 30, 2016 of the deferred outflows/(inflows) of resources will be recognized in pension expense as follows:

<u>Year Ended June 30,</u>	
2017	\$ 34,812,589
2018	\$ 34,812,589
2019	\$ 90,614,480
2020	\$ 40,422,940
2021	\$ 0
Thereafter	\$ 0

Member Data

The tables below summarize the member data used in the valuation. The June 30, 2016 valuation is based on June 30, 2015 census data, with liabilities rolled-forward to the June 30, 2016 measurement date. The data summarized in this section is as of the June 30, 2015 census collection date. The pages that follow show various distributions of the member groups.

	Males	Females	Total
Number of Actives	3,642	10,685	14,327
Average Age	54.8	54.5	54.6
Average Service	28.5	26.9	27.3
Average Pay	\$ 78,638	\$ 70,912	\$ 72,876
Number of Inactive Vesteds	706	2,413	3,119
Average Age	57.4	57.9	57.8
Average Service	22.8	20.7	21.2
Number of Inactive Nonvesteds	75	319	394
Number of Retirees and Beneficiaries	17,161	35,414	52,575
Average Age	72.9	72.5	72.6
Average Years Retired	13.3	12.6	12.8
Average Monthly Annuity ¹	\$ 235	\$ 187	\$ 203
Average Monthly Pension	\$ 1,656	\$ 1,442	\$ 1,512
Total Number of Members	21,584	48,831	70,415

¹ The average monthly annuity above is the average over all retirees and beneficiaries, including those that did not annuitize their ASA balances. The average monthly annuity for the 23,363 retirees and beneficiaries that did annuitize their ASA balances is \$458.

Active Member Data

June 30	Number	Valuation Payroll (\$000s)	Average			
			Age	Service	Pay Increase %	
1975	63,932	\$ 749,200	38.7	10.9	\$ 11,719	
1980	66,575	1,107,699	39.7	11.9	16,638	
1985	62,932	1,519,887	41.5	14.2	24,151	
1987	64,157	1,751,709	42.0	14.5	27,303	
1989	65,986	2,044,797	42.6	14.9	30,988	
1991	63,373	2,278,715	43.0	15.4	35,957	
1992	63,980	2,416,263	43.8	16.0	37,766	5.0%
1993	64,594	2,536,165	44.0	16.1	39,263	4.0
1994	65,209	2,614,915	44.1	16.2	40,101	2.1
1995	66,542	2,728,811	44.2	16.2	41,009	2.3
1996	70,183	2,805,823	44.2	15.7	39,979	(2.5)
1997	63,520	2,739,436	45.4	16.9	43,127	7.9
1998	59,030	2,699,183	46.4	18.0	45,726	6.0
1999	56,560	2,755,489	47.4	19.3	48,718	6.5
2000	52,920	2,561,533	48.2	20.1	48,404	(0.6)
2001	50,802	2,564,451	48.7	20.7	50,479	4.3
2002	47,510	2,604,956	49.4	21.5	54,830	8.6
2003	43,705	2,448,271	49.6	21.7	56,018	2.2
2004	41,510	2,384,480	50.1	22.2	57,444	2.5
2005	39,097	2,305,726	50.6	22.7	58,974	2.7
2006	36,994	2,237,380	51.1	23.2	60,480	2.6
2007	36,526	2,376,390	52.1	23.8	65,060	7.6
2008	34,628	2,295,816	52.5	24.6	66,299	1.9
2009	29,297	2,030,484	53.7	26.0	69,307	4.5
2010	26,439	1,865,102	53.9	26.3	70,544	1.8
2011	24,710	1,762,750	54.5	26.9	71,338	1.1
2012	22,688	1,637,066	54.9	27.4	72,156	1.1
2013	19,210	1,383,428	54.7	27.2	72,016	(0.2)
2014*	19,210	1,383,428	54.7	27.2	72,016	(0.2)
2015*	16,310	1,178,846	54.6	27.2	72,277	0.4
2016*	14,327	1,044,096	54.6	27.3	72,876	0.8

* Valuations on and after June 30, 2014 are based on census data collected at the prior measurement date.

Active Members

By Attained Age and Years of Service

Attained Age	Years of Service to Valuation Date						Total
	<10	10-14	15-19	20-24	25-29	30+	
15-19							
20-24							
25-29							
30-34							
35-39							
40-44	75	40	89	423	1		628
45-49	147	131	162	1,721	599	1	2,761
50-54	75	72	75	687	1,935	798	3,642
55-59	47	43	75	550	932	2,198	3,845
60-64	38	37	38	374	466	1,842	2,795
65-69	27	10	10	53	85	397	582
70-74	9	5	5	3	7	35	64
75-79	4	1				3	8
80 & over		1				1	2
Total	422	340	454	3,811	4,025	5,275	14,327

Average Age: 54.6
 Average Service: 27.3

Inactive Vested Members

By Attained Age and Years of Service

Attained Age	Years of Service at Termination						Total
	<10	10-14	15-19	20-24	25-29	30+	
30-34							
35-39							
40-44		34	21	8			63
45-49		136	90	73	14	1	314
50-54		224	132	113	108	19	596
55-59		194	160	152	154	171	831
60-64		315	100	102	96	293	906
65-69		118	31	32	38	129	348
70-74		11	5	6	1	8	31
75-79			3				3
80 & over		11	7	3	5	1	27
Total		1,043	549	489	416	622	3,119

Average Age: 57.8
 Average Service: 21.2

Retired Members

By Attained Age and Completed Years of Retirement

Attained Age	Years of Retirement						Total
	<10	10-14	15-19	20-24	25-29	30+	
Under 40	12	15	8	5	5	1	46
40-44	8	3	8	4		1	24
45-49	20	5	5	9			39
50-54	82	18	20	17	4	2	143
55-59	1,412	42	34	17	14	6	1,525
60-64	7,199	199	77	46	31	13	7,565
65-69	10,003	3,469	264	89	51	28	13,904
70-74	3,461	4,046	2,457	314	68	34	10,380
75-79	518	1,674	3,071	1,551	273	78	7,165
80-84	28	325	1,471	2,288	847	270	5,229
85-89	12	63	234	1,290	1,646	704	3,949
90 & Over	11	4	31	173	821	1,566	2,606
Total	22,766	9,863	7,680	5,803	3,760	2,703	52,575

Average Age: 72.6
 Average Years Retired: 12.8

Retired Members

By Year of Retirement

Year of Retirement As of June 30	Number	Monthly Pension	
		Total	Average
Before 1978	406	\$ 163,745	\$ 403
1978	120	56,482	471
1979	143	75,336	527
1980	198	117,525	594
1981	207	114,136	551
1982	208	117,517	565
1983	291	176,069	605
1984	353	220,606	625
1985	511	345,111	675
1986	487	339,518	697
1987	589	453,967	771
1988	720	590,026	819
1989	617	534,572	866
1990	956	962,867	1,007
1991	965	1,058,853	1,097
1992	916	1,020,244	1,114
1993	979	1,172,332	1,197
1994	1,114	1,361,141	1,222
1995	1,450	1,847,157	1,274
1996	1,457	1,897,813	1,303
1997	1,277	1,652,924	1,294
1998	1,604	2,076,936	1,295
1999	1,501	2,055,701	1,370
2000	1,759	2,484,405	1,412
2001	1,736	2,527,959	1,456
2002	2,053	2,973,921	1,449
2003	1,811	2,681,725	1,481
2004	2,115	3,186,807	1,507
2005	2,035	3,211,992	1,578
2006	2,213	3,550,403	1,604
2007	2,117	3,361,264	1,588
2008	2,530	4,206,588	1,663
2009	1,856	3,245,839	1,749
2010	2,081	3,765,873	1,810
2011	2,826	5,275,473	1,867
2012	3,110	5,979,724	1,923
2013	2,620	5,246,850	2,003
2014	2,151	4,308,632	2,003
2015	2,493	5,082,616	2,039
Total	52,575	\$ 79,500,649	\$ 1,512

Retired Members

Reconciliation of Benefit Recipients

	Number of Members	Sum of Annual Allowances*
Benefit Recipient Rolls, July 1, 2007	39,328	\$ 658,296,600
Added to Rolls	2,296	52,166,844
Removed from Rolls	(966)	(11,025,463)
Net Transfers to 1996 Account	(104)	(1,762,578)
Benefit Changes		<u>3,479,833</u>
End of Year Rolls	40,554	\$ 701,155,236
Percentage Increase in Annual Allowances		6.51%
Average Annual Allowances		<u>\$ 17,289</u>
Benefit Recipient Rolls, July 1, 2008	40,554	\$ 701,155,236
Added to Rolls	2,344	56,818,750
Removed from Rolls	(929)	(11,062,410)
Net Transfers to 1996 Account	579	11,768,469
Benefit Changes		<u>3,386,613</u>
End of Year Rolls	42,548	\$ 762,066,658
Percentage Increase in Annual Allowances		8.69%
Average Annual Allowances		<u>\$ 17,911</u>
Benefit Recipient Rolls, July 1, 2009	42,548	\$ 762,066,658
Added to Rolls	1,940	47,657,283
Removed from Rolls	(1,010)	(11,982,276)
Benefit Changes		<u>(6,968,893)</u>
End of Year Rolls	43,478	\$ 790,772,772
Percentage Increase in Annual Allowances		3.77%
Average Annual Allowances		<u>\$ 18,188</u>
Benefit Recipient Rolls, July 1, 2010	43,478	\$ 790,772,772
Added to Rolls	3,003	77,289,770
Removed from Rolls	(1,060)	(13,120,581)
Benefit Changes		<u>(4,230,857)</u>
End of Year Rolls	45,421	\$ 850,711,104
Percentage Increase in Annual Allowances		7.58%
Average Annual Allowances		<u>\$ 18,729</u>

* Pension and ASA annuity

Retired Members

Reconciliation of Benefit Recipients

	Number of Members	Sum of Annual Allowances*
Benefit Recipient Rolls, July 1, 2011	45,421	\$ 850,711,104
Added to Rolls	2,541	63,922,594
Removed from Rolls	(962)	(12,215,851)
Benefit Changes		(4,412,187)
End of Year Rolls	47,000	\$ 898,005,660
Percentage Increase in Annual Allowances		5.56%
Average Annual Allowances		\$ 19,107
Benefit Recipient Rolls, July 1, 2012	47,000	\$ 898,005,660
Added to Rolls	3,422	93,604,576
Removed from Rolls	(1,077)	(14,523,735)
Benefit Changes		(3,451,033)
End of Year Rolls	49,345	\$ 973,635,468
Percentage Increase in Annual Allowances		8.42%
Average Annual Allowances		\$ 19,731
Benefit Recipient Rolls, July 1, 2013	49,345	\$ 973,635,468
Added to Rolls	1,886	50,261,127
Removed from Rolls	(1,017)	(14,292,559)
Benefit Changes		(5,694,056)
End of Year Rolls	50,214	\$ 1,003,909,980
Percentage Increase in Annual Allowances		3.11%
Average Annual Allowances		\$ 19,993
Benefit Recipient Rolls, July 1, 2014	50,214	\$ 1,003,909,980
Added to Rolls	3,466	95,994,117
Removed from Rolls	(1,105)	(14,677,424)
Benefit Changes		(2,920,561)
End of Year Rolls	52,575	\$ 1,082,306,112
Percentage Increase in Annual Allowances		7.8%
Average Annual Allowances		\$ 20,586

* Pension and ASA annuity

Retired Members

Number of Benefit Recipients by Benefit Option

Amount of Monthly Benefit	Option A-1	Option A-2	Option A-3	Option B-1	Option B-2	Option B-3	Surv.	Dis.	Total
\$1-\$500	1,572	747	190	1,116	245	451	437	77	4,835
\$501-\$1,000	1,909	1,223	284	1,960	696	1,007	329	171	7,579
\$1,001-\$1,500	3,122	2,318	411	4,109	1,255	1,425	141	227	13,008
\$1,501-\$2,000	3,166	3,014	344	4,635	1,517	1,840	141	109	14,766
\$2,001-\$3,000	2,429	2,972	255	2,933	1,149	1,467	57	26	11,288
Over \$3,000	259	300	18	261	110	146	5	0	1,099
Total	12,457	10,574	1,502	15,014	4,972	6,336	1,110	610	52,575

Summary of Benefit Options

- A-1 - Provides a monthly benefit for retiree's life. In the event the retiree dies before receiving five years of payments, the beneficiary receives the remainder of the five years (60 months) of guaranteed Defined Benefit pension payments in a lump sum.
- A-2 - Provides a monthly benefit for retiree's life. The benefit ceases upon the death of the retiree.
- A-3 - Provides a monthly benefit for retiree's life, including monthly annuitization of member's Annuity Savings Account (ASA). In the event the retiree dies before receiving five years of payments, the beneficiary will receive the remainder of the five years of guaranteed pension payments. The ASA is reduced with each monthly benefit paid; if the retiree dies before reducing the balance to \$0.00, the beneficiary will receive a single payment of the amount remaining.
- B-1 - Provides a monthly benefit for retiree's life. Upon the death of the retiree, the qualified designated survivor receives 100% of the member's Defined Benefit for the remainder of the survivor's life.
- B-2 - Provides a monthly benefit for retiree's life. Upon the death of the retiree, the qualified designated survivor receives 66-2/3% of the member's Defined Benefit for the remainder of the survivor's life.
- B-3 - Provides a monthly benefit for retiree's life. Upon the death of the retiree, the qualified designated survivor receives 50% of the member's Defined Benefit for the remainder of the survivor's life.
- Survivors* - Provides a monthly benefit for the surviving spouse's or dependent's life. The benefit ceases upon death of the survivor.
- Disability** - Available to members with five (5) or more years of creditable service who become disabled as determined by the Social Security Administration while teaching in Indiana.

* (of members who die while in service)

** Includes Classroom Disability – Provides a benefit of \$125 per month plus \$5 for each additional year of TRF-covered service over five years

Retired Members

Schedule of Average Benefit Payments by Service at Retirement

	Years of Service at Retirement						Total
	<10	10-14	15-19	20-24	25-29	30+	
Avg. Monthly Defined Benefit Pension	\$577	\$268	\$539	\$884	\$1,247	\$1,849	\$1,512
Avg. Monthly Annuity: All Benefit Recipients	\$71	\$116	\$110	\$139	\$168	\$238	\$203
Avg. Monthly Annuity: Benefit Recipients who Annuitized their ASA Balance (23,363 Recipients)	\$249	\$190	\$191	\$263	\$357	\$592	\$458
Avg. Final Avg. Salary at Retirement	\$23,593	\$23,432	\$37,605	\$46,482	\$51,701	\$58,014	\$53,393
Number of Benefit Recipients	49	1,279	3,755	5,766	8,540	33,186	52,575

Reconciliation of Participant Data

	Active	Inactive Vested	Inactive Nonvested	Survivor	Disabled	Retired	Beneficiary	Total
6/30/2014 Census	16,310	4,545	408	1,115	607	44,652	3,840	71,477
Disabled	(8)	(8)			16			0
Retired	(1,316)	(2,055)				3,371		0
Terminated with Vested Benefit	(770)	770						0
Terminated, due a Refund	(28)		28					0
Died with Survivor	(20)	(22)		42	(10)	(388)	398	0
Died, no Survivor*		(17)	(2)	(47)	(15)	(760)	(275)	(1,116)
Refunded*	(11)	(1)	(26)					(38)
Forfeited*			(25)					(25)
Dropped from Database		(25)	(2)			(2)	(6)	(35)
Rehired	88	(69)	(19)					0
Status Corrections		(1)	1					0
Data Corrections		2			8	6	23	39
New Hires	82		31					113
6/30/2015 Census	14,327	3,119	394	1,110	606	46,879	3,980	70,415

* No remaining benefit obligation in the plan.

Summary of Actuarial Assumptions and Methods

The assumptions used in this valuation reflect the study of experience covering the period July 1, 2011 through June 30, 2014.

Measurement Date	June 30, 2016
Valuation Date	
Assets	June 30, 2016
Liabilities	June 30, 2015. Member census data as of June 30, 2015 was used in the valuation and adjusted, where appropriate, to reflect changes between June 30, 2015 and June 30, 2016. Standard actuarial roll-forward techniques were then used to project the total pension liability computed as of June 30, 2015 to the June 30, 2016 measurement date.
Interest Rate / Investment Return	6.75% per year, compounded annually (net of administrative and investment expenses).
Pay Increase Assumption	Sample increases are shown in a table on the following pages. The assumption for each year of service consists of a merit and/or seniority increase and 2.25% for price inflation.
Total Active Member Payroll	Assumed to decrease based on a demographic projection for the Pre-1996 Account for purposes of calculating the projected contribution for the 2017 and 2018 fiscal years.
Price Inflation	2.25% per year. Price inflation is not directly tied to benefits; however, it is a component of the economic model used to determine total wage inflation.
Mortality	
Healthy	RP-2014 White Collar Mortality Table with Social Security generational improvements from 2006 based on the 2014 Social Security Administration Trustees Report.
Disabled	RP-2014 White Collar Mortality Table with Social Security generational improvements from 2006 based on the 2014 Social Security Administration Trustees Report.
Retirement	Rates are shown in tables on the following pages.
Withdrawal	Sample rates are shown in tables on the following pages.
Disability	Sample rates are shown in a table on the following pages.
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.
Actuarial Cost Method	Entry Age Normal (level percent of pay) method, with a 5-year, closed, level dollar amortization of the Unfunded Accrued Liability arising from all sources including actuarial gains and losses. The weighted average amortization period on 6/30/2016 is 5 years.

Summary of Actuarial Assumptions and Methods

Asset Valuation Method	The Actuarial Value of Assets recognizes investment gains and losses in equal installments over five years. However, the Actuarial Value is limited to no more than 20% greater than or 20% less than the Market Value of Assets. Investment experience on ASA account balances is not smoothed.
Marriage Assumption	100% of members are assumed to be married for purposes of valuing death-in-service benefits. Male spouses are assumed to be three years older than female spouses.
Pay Increase Timing	Beginning of (fiscal) year. Payroll amounts stated in the valuation data are amounts projected to be paid during the current year.
Decrement Timing	Decrements are assumed to occur at the beginning of the year.
Other	Disability and withdrawal decrements do not operate after member reaches retirement eligibility. Only the withdrawal and death decrements operate during the first ten years of service.
Miscellaneous Adjustments	The calculated liabilities and normal costs were increased by 1% to account for the inclusion of unused sick leave in the calculation of Average Annual Compensation.
Actuarial Equivalence Basis for Optional Forms of Payment	6.75% interest with a 50% unisex blend of the 2018 IRS combined mortality bass.
Explicit Expense Load	None.
COLA Assumption	1.0% compounded annually on pension portion, with the first COLA credited on January 1, 2018. The January 1, 2017 assumed 1.0% COLA was replaced by a service-related lump sum (a "13 th check") ranging from \$150 to \$450 in September, 2016.
Cost for ASA Conversions	ASA conversions between 6/30/2016 and 3/31/2017 will be based on a 4.50% conversion rate. After 4/1/2017, ASA annuity conversions will occur outside of the plan.
ASA Annuitization	50% of ASA balances are assumed to be converted to annuities at retirement prior to 4/1/2017, 0% thereafter.
Employee Census and Asset Data	The member census data and the asset information for this valuation were furnished by the Chief Financial Officer and Staff. 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.

The actuarial valuation computations were made under the supervision of a Member of the American Academy of Actuaries (MAAA).

Summary of Actuarial Assumptions and Methods

Rates of Age and Service 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		

Rates of Disability

Attained Age	Age-Based	
	Male	Female
25	0.0001	0.0001
30	0.0001	0.0001
35	0.0001	0.0001
40	0.0001	0.0001
45	0.0002	0.0002
50	0.0005	0.0005
55	0.0009	0.0009
60	0.0010	0.0010

Summary of Actuarial Assumptions and Methods

Rates of Withdrawal

Years of Service	Service-Based	
	Male	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	Age-Based*	
	Male	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.*

Summary of Actuarial Assumptions and Methods

Pay Increase Assumption

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%

Definitions of Technical Terms

Accrued Service	Service credited under the system that was rendered before the date of the actuarial valuation.
Accrued Liability	The difference between the actuarial present value of future benefit payments and the actuarial present value of future normal costs. Also referred to as “actuarial accrued liability” or “past service liability”.
Actuarial Assumptions	Estimates of expected future experience with respect to rates of mortality, disability, turnover, retirement, rate of investment return, and pay increases. Decrement assumptions (rates of mortality, disability, turnover, and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (pay increases and investment return) consist of the underlying rates 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 future benefit payments” between future normal costs and actuarial accrued liabilities. Sometimes referred to as the “actuarial funding method”.
Actuarial Equivalent	One series of payments is said to be actuarially equivalent to another series of payments if the two series have the same actuarial present value.
Actuarial Gain / (Loss)	The difference between actual unfunded actuarial accrued liability and anticipated unfunded actuarial accrued liability during the period between two valuation dates. It is a measurement of the difference between actual and expected experience.
Actuarial Present Value	The single amount now that is equal to 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 a present value with periodic payments.
Normal Cost	The portion of the actuarial present value of future benefits that is assigned to the current year by the actuarial cost method. Sometimes referred to as “current cost”.
Unfunded Accrued Liability	The difference between the accrued liability and the actuarial value of assets. Sometimes referred to as “unfunded past service liability” or “unfunded actuarial accrued liability” or simply as “unfunded liability”.

The Actuarial Valuation Process

The **actuarial valuation** is the mathematical process by which a contribution rate is determined. The flow of activity constituting the valuation may be summarized as follows:

Covered Person Data: Furnished by the Plan Administrator

Retired Members and Beneficiaries Now Receiving Benefits
Former Employees with Vested Benefits Not Yet Payable
Active Members

+ **Asset Data (Cash and Investments):** Furnished by the Plan Administrator

+ **Estimates of Future Experience (Actuarial Assumptions):** Established by the Board of Trustees after Consulting with the Actuary

+ **Funding Method:** The Allocation of Employer Costs to Past Service, Current Service, and Future Service

+ **Mathematically Combining the Assumptions, the Funding Method, and the Data**

= **Determination of:**

Plan Funded Status and Employer Contribution Rate

Summary of Benefit Provisions

Changes in Plan Provisions since June 30, 2015

None.

Regular Retirement

Eligibility

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.

Annual Amount

State pension equal to total service times 1.1% of Average Annual Compensation.

Early Retirement

Eligibility

Age 50 with 15 years of service.

Annual Amount

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

Eligibility

Ten years of service. Benefit commences at regular or early retirement eligibility.

Annual Amount

Computed as a regular retirement benefit with state pension based on service and Average Annual Compensation at termination.

Disability Retirement

Regular Disability Benefit:

Eligibility

Five years of service.

Annual Amount

\$125 per month plus \$5 per month for each year of service credit over five years.

Disability Retirement Benefit:

Eligibility

Five years of service and determined to be disabled by the Social Security Administration. Annual verification of Social Security disability is required.

Annual Amount

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.

Summary of Benefit Provisions

Death Before Retirement

Eligibility

15 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.

Annual Amount

Computed as regular retirement benefit but reduced in accordance with a 100% joint and survivor election.

Benefit Increases After Retirement

No automatic increases after retirement are provided. Periodically, unscheduled increases have been made. In September 2016, retirees were paid a service-related lump sum ranging from \$150 to \$450.

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.

Forms of Benefit Payment (Pension)

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.

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.

Optional forms of benefit are calculated based on 6.75% interest with a 50% unisex blend of the IRS 2018 combined mortality basis.

Member Data: Total Fund

The tables below summarize the member data used in the valuation. The June 30, 2016 valuation is based on June 30, 2015 census data, with liabilities rolled-forward to the June 30, 2016 measurement date. The data summarized in this section is as of the June 30, 2015 census collection date. The pages that follow show various distributions of the member groups.

	Males	Females	Total
Number of Actives	18,137	51,455	69,592
Average Age	42.7	42.6	42.6
Average Service	14.3	13.4	13.6
Average Pay	\$ 63,708	\$ 56,220	\$ 58,171
Number of Inactive Vesteds	1,819	5,635	7,454
Average Age	52.4	53.7	53.4
Average Service	18.4	17.5	17.7
Number of Inactive Nonvesteds	2,977	9,946	12,923
Number of Retirees and Beneficiaries	18,769	38,783	57,552
Average Age	72.4	72.0	72.1
Average Years Retired	12.8	12.0	12.2
Average Monthly Annuity ¹	\$ 234	\$ 185	\$ 201
Average Monthly Pension	\$ 1,659	\$ 1,421	\$ 1,499
Total Number of Members	41,702	105,819	147,521

¹ The average monthly annuity above is the average over all retirees and beneficiaries, including those that did not annuitize their ASA balances. The average monthly annuity for the 25,413 retirees and beneficiaries that did annuitize their ASA balances is \$454.

Active Member Data: Total Fund

June 30	Number	Valuation Payroll (\$000s)	Average			
			Age	Service	Pay Increase %	
1975	63,932	\$ 749,200	38.7	10.9	\$ 11,719	
1980	66,575	1,107,699	39.7	11.9	16,638	
1985	62,932	1,519,887	41.5	14.2	24,151	
1987	64,157	1,751,709	42.0	14.5	27,303	
1989	65,986	2,044,797	42.6	14.9	30,988	
1991	63,373	2,278,715	43.0	15.4	35,957	
1992	63,980	2,416,263	43.8	16.0	37,766	5.0%
1993	64,594	2,536,165	44.0	16.1	39,263	4.0
1994	65,209	2,614,915	44.1	16.2	40,101	2.1
1995	66,542	2,728,811	44.2	16.2	41,009	2.3
1996	78,866	2,878,329	42.9	14.1	36,497	(11.0)
1997	84,206	2,984,604	42.4	13.2	35,444	(2.9)
1998	84,664	3,094,941	42.5	13.2	36,556	3.1
1999	77,745	3,294,326	44.1	15.1	42,374	15.9
2000	77,870	3,192,605	44.4	15.2	40,999	(3.2)
2001	75,648	3,318,877	44.6	15.7	43,872	7.0
2002	75,383	3,609,471	44.7	15.8	47,884	9.1
2003	73,641	3,585,135	44.5	15.5	48,684	1.7
2004	73,510	3,651,653	44.5	15.5	49,676	2.0
2005	73,923	3,734,330	44.4	15.4	50,516	1.7
2006	73,350	3,802,721	44.5	15.4	51,844	2.6
2007	75,833	4,267,995	44.9	15.5	56,281	8.6
2008	76,256	4,348,535	44.6	15.6	57,025	1.3
2009	74,343	4,339,032	44.4	15.3	58,365	2.3
2010	72,872	4,312,611	44.2	15.2	59,181	1.4
2011	71,343	4,269,944	44.5	15.5	59,851	1.1
2012	70,573	4,232,018	44.4	15.4	59,967	0.2
2013	70,414	4,124,368	43.5	14.6	58,573	(2.3)
2014*	70,414	4,124,368	43.5	14.6	58,573	(2.3)
2015*	68,734	4,006,157	43.0	14.1	58,285	(0.5)
2016*	69,592	4,048,266	42.6	13.6	58,171	(0.2)

* Valuations on and after June 30, 2014 are based on census data collected at the prior measurement date.

Active Members: Total Fund

By Attained Age and Years of Service

Attained Age	Years of Service to Valuation Date						Total
	<10	10-14	15-19	20-24	25-29	30+	
15-19							
20-24	1,475						1,475
25-29	8,438	1					8,439
30-34	8,501	1,670	2				10,173
35-39	3,789	5,084	1,511	2			10,386
40-44	2,492	1,903	4,099	950	4		9,448
45-49	1,948	1,340	1,931	2,933	776	7	8,935
50-54	1,222	939	1,143	1,203	2,447	920	7,874
55-59	784	668	1,010	1,029	1,171	2,487	7,149
60-64	382	359	524	652	594	2,036	4,547
65-69	165	91	96	109	120	431	1,012
70-74	38	14	17	5	8	36	118
75-79	15	2				3	20
80 & over	10	4	1			1	16
Total	29,259	12,075	10,334	6,883	5,120	5,921	69,592

Average Age: 42.6
Average Service: 13.6

Inactive Vested Members: Total Fund

By Attained Age and Years of Service

Attained Age	Years of Service to Valuation Date						Total
	<10	10-14	15-19	20-24	25-29	30+	
30-34		66	1				67
35-39		518	33				551
40-44		560	282	31			873
45-49		496	329	150	25	2	1,002
50-54		546	306	209	150	30	1,241
55-59		540	368	259	206	198	1,571
60-64		637	258	175	129	323	1,522
65-69		215	77	56	49	144	541
70-74		25	11	7	3	9	55
75-79		1	3				4
80 & over		11	7	3	5	1	27
Total		3,615	1,675	890	567	707	7,454

Average Age: 53.4
Average Service: 17.7

Retired Members: Total Fund

By Attained Age and Completed Years of Retirement

Attained Age	Years of Service to Valuation Date						Total
	<10	10-14	15-19	20-24	25-29	30+	
Under 40	19	15	8	5	5	1	53
40-44	14	5	8	4		1	32
45-49	34	8	6	9			57
50-54	139	26	20	17	4	2	208
55-59	1,728	49	38	17	14	6	1,852
60-64	8,430	232	82	47	32	13	8,836
65-69	11,545	3,762	281	90	51	28	15,757
70-74	3,961	4,341	2,567	317	68	34	11,288
75-79	592	1,810	3,170	1,582	278	78	7,510
80-84	45	349	1,509	2,324	854	270	5,351
85-89	14	68	239	1,305	1,660	705	3,991
90 & over	11	4	33	175	827	1,567	2,617
Total	26,532	10,669	7,961	5,892	3,793	2,705	57,552

Average Age: 72.1
Average Years Retired: 12.2

Retired Members: Total Fund

By Year of Retirement

Year of Retirement As of June 30	Number	Monthly Pension	
		Total	Average
Before 1978	406	\$ 163,745	\$ 403
1978	120	56,482	471
1979	143	75,336	527
1980	198	117,525	594
1981	208	114,395	550
1982	209	118,453	567
1983	291	176,069	605
1984	353	220,606	625
1985	511	345,111	675
1986	489	341,080	698
1987	594	456,922	769
1988	723	591,076	818
1989	622	538,339	865
1990	967	973,485	1,007
1991	977	1,069,560	1,095
1992	927	1,032,833	1,114
1993	987	1,180,267	1,196
1994	1,131	1,384,421	1,224
1995	1,477	1,878,551	1,272
1996	1,490	1,940,142	1,302
1997	1,308	1,691,580	1,293
1998	1,648	2,130,154	1,293
1999	1,551	2,121,930	1,368
2000	1,838	2,585,446	1,407
2001	1,841	2,666,160	1,448
2002	2,189	3,167,105	1,447
2003	1,976	2,907,072	1,471
2004	2,307	3,449,099	1,495
2005	2,203	3,457,307	1,569
2006	2,381	3,778,318	1,587
2007	2,310	3,603,921	1,560
2008	2,786	4,559,263	1,636
2009	2,090	3,571,648	1,709
2010	2,366	4,158,675	1,758
2011	3,233	5,860,647	1,813
2012	3,626	6,664,272	1,838
2013	3,248	6,067,332	1,868
2014	2,670	4,995,701	1,871
2015	3,158	6,032,631	1,910
Total	57,552	\$ 86,242,659	\$ 1,499

Retired Members: Total Fund

Number of Benefit Recipients by Benefit Option

Amount of Monthly Benefit	Option A-1	Option A-2	Option A-3	Option B-1	Option B-2	Option B-3	Surv.	Dis.	Total
\$1-\$500	1,801	885	209	1,264	273	500	464	142	5,538
\$501-\$1,000	2,301	1,538	335	2,302	769	1,156	358	234	8,993
\$1,001-\$1,500	3,391	2,567	454	4,383	1,334	1,537	145	247	14,058
\$1,501-\$2,000	3,360	3,182	367	4,858	1,577	1,941	148	117	15,550
\$2,001-\$3,000	2,583	3,127	274	3,197	1,228	1,582	61	31	12,083
Over \$3,000	304	355	19	323	143	179	7		1,330
Total	13,740	11,654	1,658	16,327	5,324	6,895	1,183	771	57,552

¹Pension only

Summary of Benefit Options

- A-1 - Provides a monthly benefit for retiree's life. In the event the retiree dies before receiving five years of payments, the beneficiary receives the remainder of the five years (60 months) of guaranteed Defined Benefit pension payments in a lump sum.
- A-2 - Provides a monthly benefit for retiree's life. The benefit ceases upon the death of the retiree.
- A-3 - Provides a monthly benefit for retiree's life, including monthly annuitization of member's Annuity Savings Account (ASA). In the event the retiree dies before receiving five years of payments, the beneficiary will receive the remainder of the five years of guaranteed pension payments. The ASA is reduced with each monthly benefit paid; if the retiree dies before reducing the balance to \$0.00, the beneficiary will receive a single payment of the amount remaining.
- B-1 - Provides a monthly benefit for retiree's life. Upon the death of the retiree, the qualified designated survivor receives 100% of the member's Defined Benefit for the remainder of the survivor's life.
- B-2 - Provides a monthly benefit for retiree's life. Upon the death of the retiree, the qualified designated survivor receives 66-2/3% of the member's Defined Benefit for the remainder of the survivor's life.
- B-3 - Provides a monthly benefit for retiree's life. Upon the death of the retiree, the qualified designated survivor receives 50% of the member's Defined Benefit for the remainder of the survivor's life.
- Survivors* - Provides a monthly benefit for the surviving spouse's or dependent's life. The benefit ceases upon death of the survivor.
- Disability** - Available to members with five (5) or more years of creditable service who become disabled as determined by the Social Security Administration while teaching in Indiana.

* (of members who die while in service)

** Includes Classroom Disability – Provides a benefit of \$125 per month plus \$5 for each additional year of TRF-covered service over five years

Retired Members: Total Fund

Schedule of Average Benefit Payments by Service at Retirement

	Years of Service at Retirement						Total
	<10	10-14	15-19	20-24	25-29	30+	
Avg. Monthly Defined Benefit Pension	\$482	\$336	\$595	\$911	\$1,265	\$1,868	\$1,499
Avg. Monthly Annuity: All Benefit Recipients	\$70	\$103	\$110	\$139	\$172	\$239	\$201
Avg. Monthly Annuity: Benefit Recipients who Annuitized their ASA Balance (25,413 Recipients)	\$194	\$179	\$203	\$270	\$367	\$598	\$454
Avg. Final Avg. Salary at Retirement	\$29,961	\$30,540	\$41,376	\$48,033	\$52,623	\$58,744	\$54,051
Number of Benefit Recipients	108	1,890	5,022	6,530	9,228	34,774	57,552

Reconciliation of Participant Data: Total Fund

	Active	Inactive Vested	Inactive Nonvested	Survivor	Disabled	Retired	Beneficiary	Total
6/30/2014 Census	68,734	8,677	12,700	1,173	746	48,506	3,925	144,461
Disabled	(21)	(19)	(2)		42			0
Retired	(1,669)	(2,502)	(2)			4,173		0
Terminated with Vested Benefit	(1,731)	1,731						0
Terminated, due a Refund	(1,672)		1,672					0
Died with Survivor	(27)	(28)		55	(15)	(408)	423	0
Died, no Survivor*		(31)	(3)	(47)	(18)	(773)	(276)	(1,148)
Refunded*	(182)	(2)	(703)					(887)
Forfeited*			(469)					(469)
Dropped from Database	(8)	(51)	(7)			(2)	(6)	(74)
Rehired	1,253	(321)	(932)					0
Status Corrections		(6)	6					0
Data Corrections		6	127	2	12	13	27	187
New Hires	4,915		536					5,451
6/30/2015 Census	69,592	7,454	12,923	1,183	767	51,509	4,093	147,521

* No remaining benefit obligation in the plan.