

# Teachers' Retirement System of the State of Illinois

Principal Results of Actuarial Valuation  
as of June 30, 2014

Board of Trustees Meeting  
Larry Langer and Paul Wilkinson

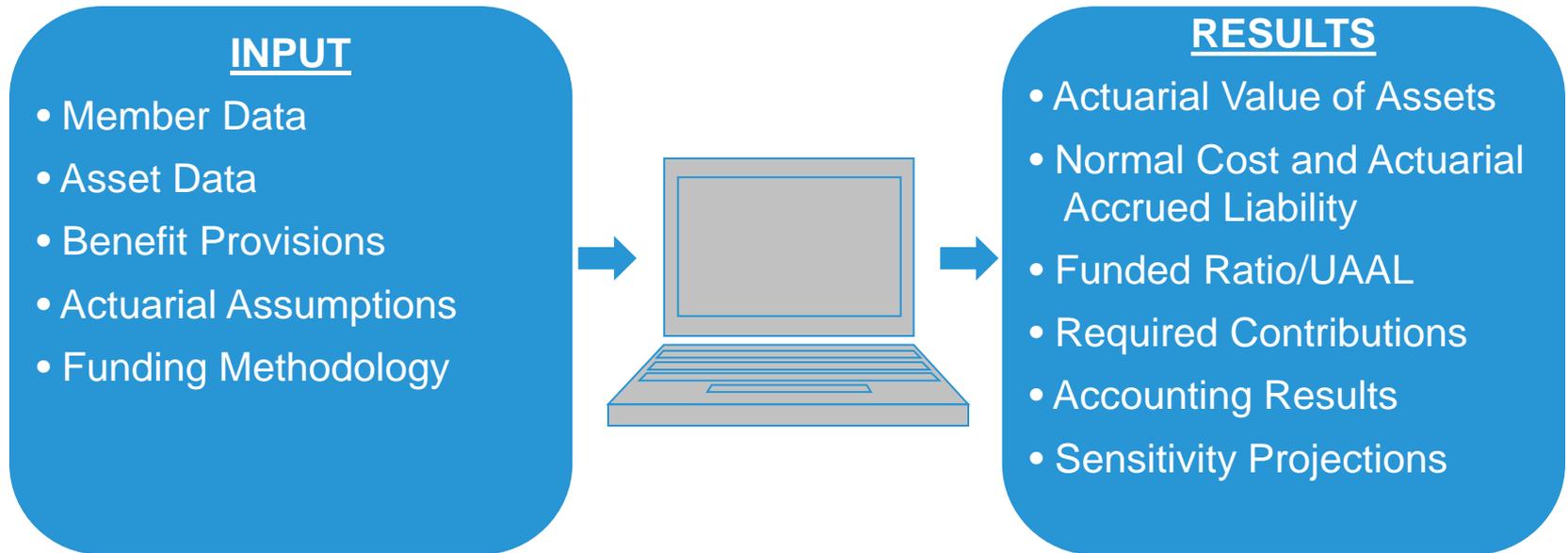
October 31, 2014

# Purpose of the Annual Actuarial Valuation

- Performed by the actuary each June 30 to:
  - determine the amount of employer contributions to be made to TRS during each member's career that, when combined with investment return and member contributions, such contributions are expected to be sufficient to pay for retirement benefits,
  - determine the progress on funding TRS,
  - explore why the results of the current valuation differ from the results of the valuation of the previous year, and
  - satisfy regulatory and accounting requirements.

# The Valuation Process

The following diagram summarizes the inputs and results of the actuarial valuation process.



More detail on the valuation process and a glossary are provided in Sections 6.5 and 6.6 of the actuarial report.

# Key Observations

The actuarial valuation is done each year to replace the estimates the actuary assumed for the prior valuation with the actual events that happened. This past year, as expected, events happened that were not anticipated:

- The contribution made by the State of Illinois to TRS under the Illinois Pension Code was insufficient to keep the unfunded actuarial accrued liability from growing; while this was expected in our projections, it is worthwhile to note that this practice continues.
- Market value returns of 17.19% compared to 8.00% assumed
- Payroll decreased 4.3%, which was less than the assumed increase
- Economic actuarial assumptions changed, including lower salary projections and lower investment return assumption from 8.00% to 7.50%
- The Federal Funds contribution rate was set at the same rate as the State's under Public Act 98-0674 (Senate Bill 220)
- Public Act 98-0599 (Senate Bill 1), a comprehensive plan to overhaul the Illinois Pension Code, was enacted in December 2013 but not reflected in this valuation due to pending lawsuits

# Key Observations (continued)

When compared to the June 30, 2013 valuation results, the events on the previous slide resulted in:

- A lower funded ratio as of June 30, 2014 based on actuarial value of assets:
  - 42.6% was projected in the June 30, 2013 valuation
  - 40.6% is the actual amount determined in this actuarial valuation
- A higher state contribution under the Illinois Pension Code for fiscal year ending June 30, 2016
  - 33.02% of payroll (\$3.58 billion) was projected in the June 30, 2013 valuation
  - 36.06% of payroll (\$3.74 billion) is the actual amount determined in this actuarial valuation
- Lower projected benefit amounts being accrued by active members

# Key Observations (continued)

The funded ratio for TRS is among the worst in the United States. This is due to:

- A lack of commitment from policy makers to keep the Retirement System well-funded
- A history of appropriating and contributing amounts far below that which a prudent actuary would recommend
- A funding policy that systematically underfunds TRS
- Changes in benefits that were unfunded and granted when the funded ratio of TRS is quite low

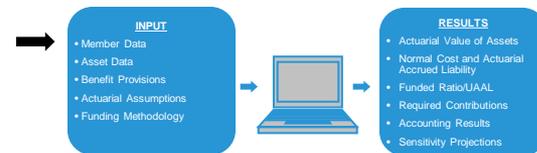
Funding reform needs to occur for TRS or the benefits of its membership could be compromised.

A quote from the 1954 valuation report:

“Although State contributions to the fund were increased substantially over the previous year, the rate of State contributions continues to be inadequate. A general revision of the contribution policy of the State is very desirable.”

# Valuation Input

# Member Data



Data Item	Valuation June 30, 2014	Valuation June 30, 2013	Percentage Change
<b>Active membership:</b>			
• Full-time and regular part-time:			
➤ Number	132,886	132,956	(0.1)
➤ Annual Compensation	\$ 9,193,086,492	\$ 9,601,784,939	(4.3)
➤ Average Compensation	\$ 69,180	\$ 72,218	(4.2)
• Substitute, part-time, hourly paid (limited schedule)			
➤ Number	28,104	29,073	(3.3)
➤ Annual Compensation	\$ 142,822,013	\$ 154,239,957	(7.4)
➤ Average Compensation	\$ 5,082	\$ 5,305	(4.2)
• Total Number	160,990	162,029	(0.6)
<b>Inactive Membership:</b>			
• Eligible for deferred annuities	17,250	16,995	1.5
• Eligible for refunds or single sum benefits only	110,403	108,531	1.7
<b>Annuitants (retirees, disabilitants and survivors):</b>			
• Number	109,448	106,102	3.2
• Annual annuities	\$ 5,204,460,272	\$ 4,811,369,695	8.2
• Average annual annuities	\$ 47,552	\$ 45,347	4.9

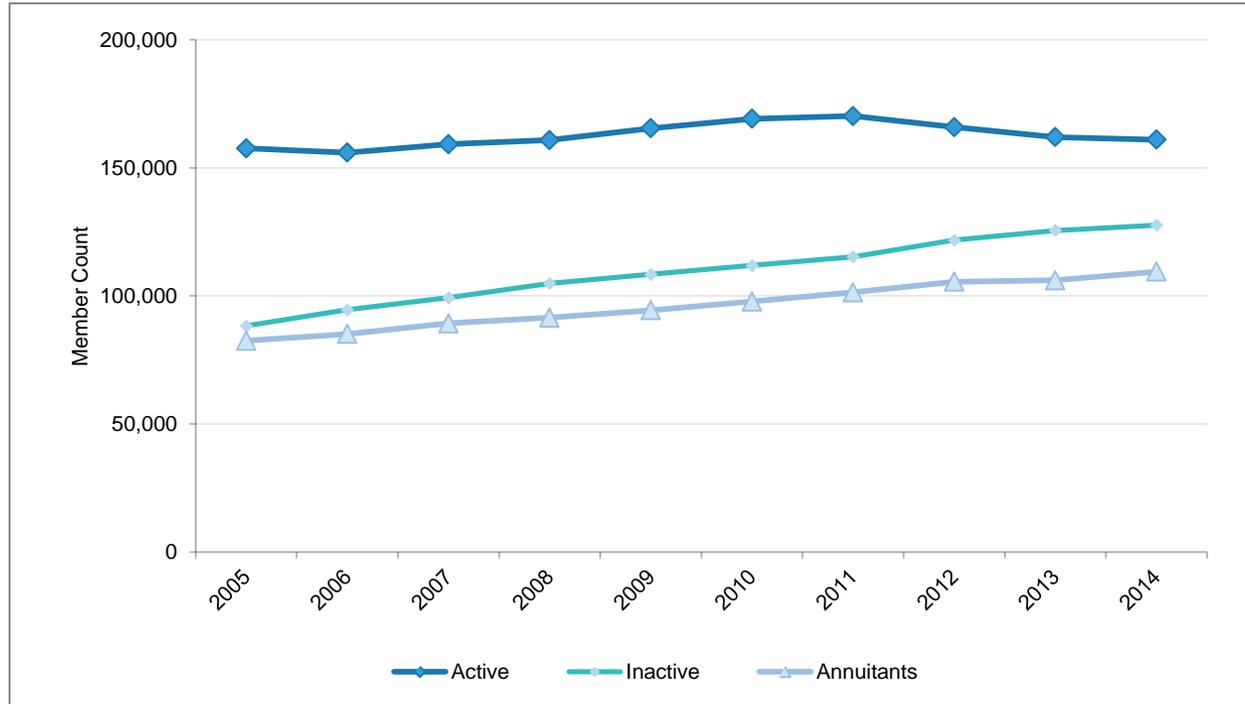
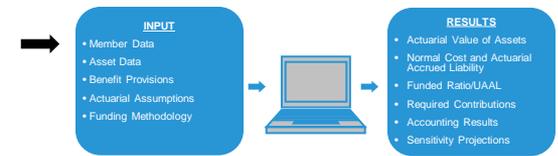
This table provides a summary of the membership data used in this valuation compared to the prior valuation. Note that the data is as of one year before the valuation date – that is the 2014 counts are as of June 30, 2013.

Thank you, TRS Staff, for providing this information.

There were slight declines in the number of active members, and larger declines in the annual compensation. Payroll is expected to increase annually. Over the past several years, salaries have not increased as much as anticipated. As a result, benefits have not increased as much as anticipated over the period, resulting in liability savings (gains). New retirement benefits paid during the year ended June 30, 2014 resulted in an unexpected increase in liabilities. Deaths resulted in less liability than expected.

A detailed summary of the membership data used in this valuation is provided in Section 5 of the actuarial report.

# Member Data

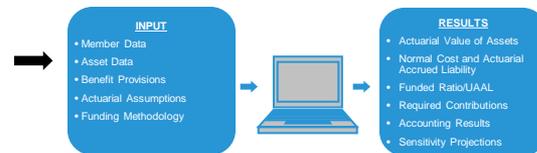


This graph provides a history of membership data submitted for the ten year period ending June 30, 2014.

The number of actives has stayed relatively level over time, with a slight peak in 2011 (June 30, 2010) . The number of annuitants has steadily increased over the period. Both of these trends are in line with expectations.

A detailed summary of the membership data used in this valuation is provided in Section 5 of the actuarial report.

# Asset Data



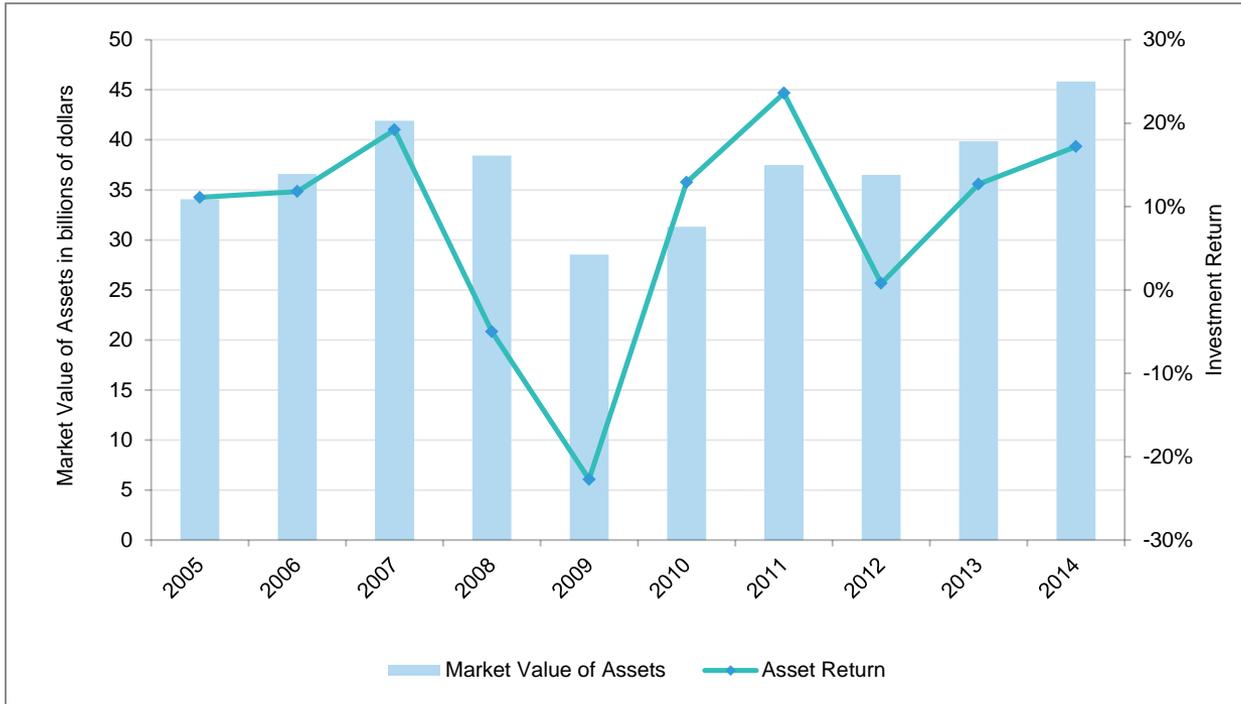
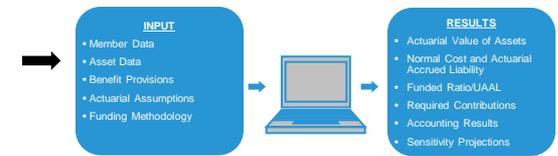
Market Value of Assets Changes from Last Year	Valuation June 30, 2014
(A) Certified Market Value of Assets as of June 30, 2013	\$ 39,858,768,499
(B) Contributions in Fiscal Year 2014	4,524,563,343
(C) Benefit Payments in Fiscal Year 2014	(5,319,762,979)
(D) Administrative Expense in Fiscal Year 2014	(21,218,069)
(E) Actual Return in Fiscal Year 2014**	<u>6,782,031,720</u>
(F) Market Value of Assets as of June 30, 2014	\$ 45,824,382,514
(G) Valuation Interest Rate as of June 30, 2013	8.00%
(H) Expected Market Return on Assets for Fiscal 2014: (G) x [(A)+ .5 x ((B)+(C)+(D))]	\$ 3,156,044,772
(I) 2014 Market Basis Asset Gain / (Loss): (E) - (H)	\$ 3,625,986,948
(J) Market Rate of Return: (E) / [(A) + 0.5 x ((B) + (C) + (D))]	17.19%

This table shows the market value of assets and the additions and subtractions to it from last year.

The market value of assets increased to \$45.8 billion during the year ended June 30, 2014, higher than the \$42.5 billion anticipated in last year's valuation due to the 17.19% return being greater than the 8.00% expected return during the year ended June 30, 2014. That being said, the \$6.8 billion in returns TRS generated at the 17.19% return is less than the \$7.5 billion in returns that TRS would have generated with a return at the 8% assumption had TRS been fully funded on June 30, 2013. TRS will not invest itself out of its current financial shortfall. More funding is necessary.

The market value of assets is provided in Section 2 of the actuarial report.

# Asset Data (continued)

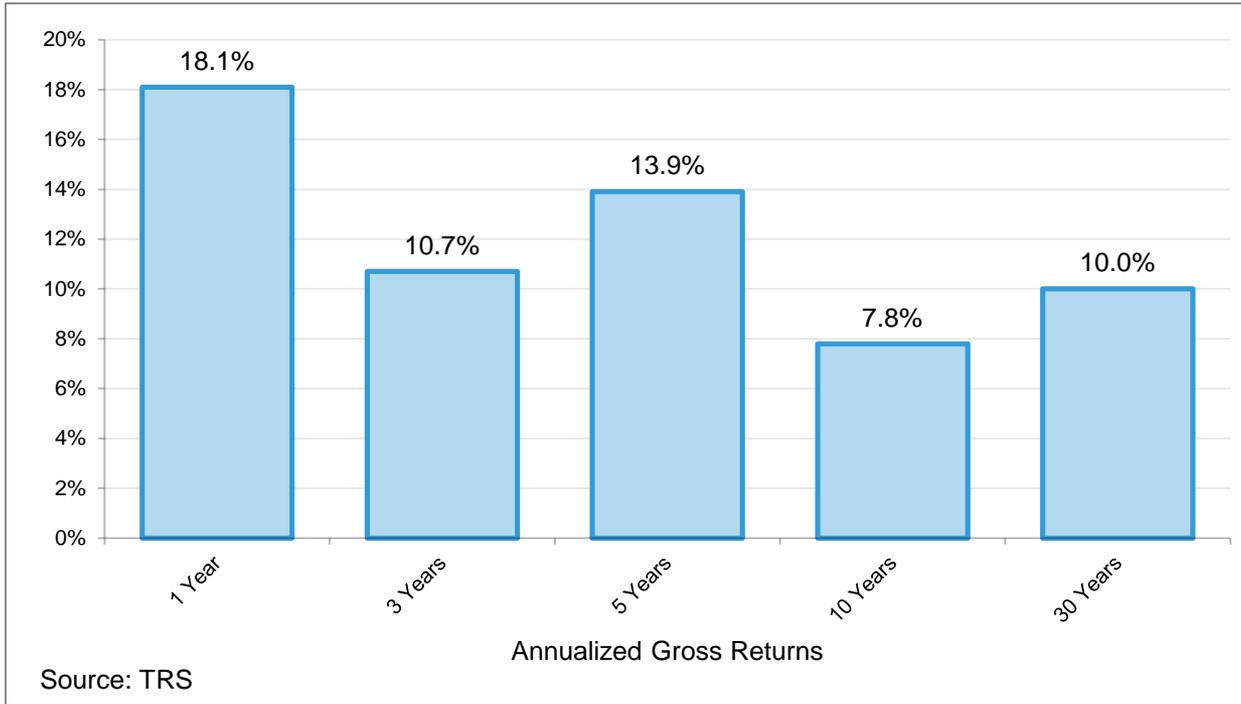
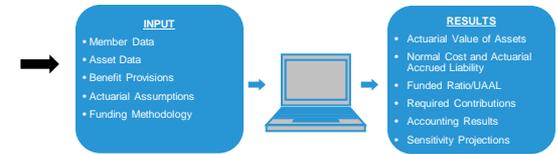


This chart is a history of the market value of assets and the investment return over the last ten years.

Investment returns on a market value basis can be volatile, causing volatility in the funded status and employer contributions from year to year. TRS uses an actuarial asset method that mitigates (smoothes) the market fluctuations, which in turn mitigates fluctuations in funded status and employer contributions.

The market value of assets is provided in Section 2 of the actuarial report.

# Asset Data (continued)

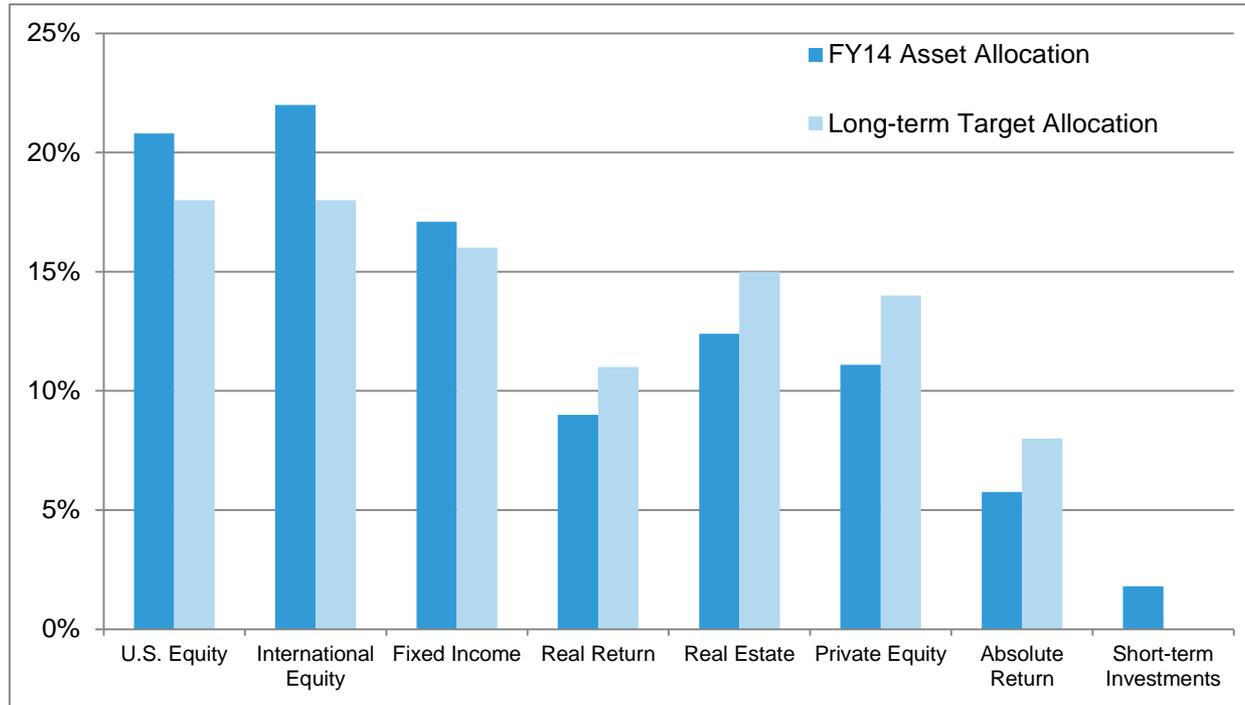
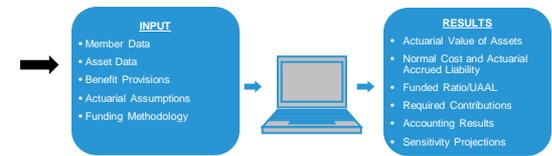


This exhibit contains annualized *gross* returns over various periods of time ending June 30, 2014. These amounts are gross of expenses, while the assumed rate of return used for the valuation is net of expenses.

Annualized gross returns, after adjusting for expenses, have been greater than the assumed rate of return of 8.00% (8.50% prior to 2012) except for the 10 year period where the returns were dominated by the impact of the Great Recession.

A detailed summary of the market value of assets is provided in Section 2 of the actuarial report.

# Asset Data (continued)

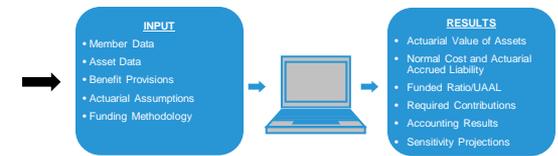


The current and long term target asset allocation is shown here.

The assumed rate of return is based on the target asset allocation and the expectation of future asset returns for each asset class. Based on our review, the 7.50% investment return assumption used in this valuation is reasonable. The return assumption was last reviewed and the current rate adopted at the June 24, 2014 Board of Trustees meeting in conjunction with an asset allocation study.

A detailed summary of the market value of assets is provided in Section 2 of the actuarial report.

# Benefit Provisions



Benefit provisions are described in Article 16 of the Illinois Pension Code. There were no changes in benefit provisions from the prior year’s valuation. The impact of Public Act 98-0599 (Senate Bill 1), a comprehensive plan to overhaul the Illinois Pension Code, was not reflected in this valuation due to pending lawsuits.

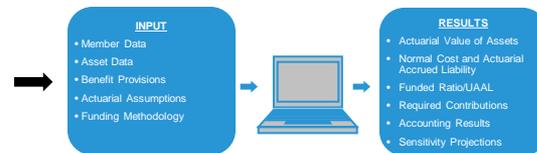
Public Act 96-0889 added a new section to the Pension Code that applied different benefits to anyone who first contributed to TRS on or after Jan. 1, 2011 and does not have any previous service credit with a pension system that has reciprocal rights with TRS. These members are referred to as “Tier II” members. The benefits Tier II members received are generally lower than that of Tier I members, whose benefits were not changed under Public Act 96-0889.

Highlights of the differences in benefit provisions are summarized on the next slide.

Benefit Provisions are a major driver of costs in the actuarial valuation.

A detailed summary of the benefit provisions is provided in Section 6.1 of the actuarial report.

# Benefit Provisions (continued)

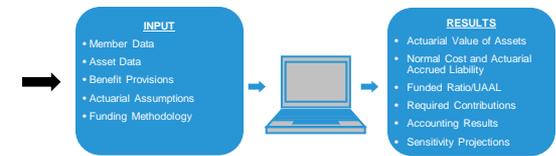


Tier I	Tier II
<b>Benefit Formula</b>	
2.2% multiplied by final average salary multiplied by years of creditable service	
<b>Retirement Eligibility</b>	
<ul style="list-style-type: none"> <li>◦ Age 55 with 35 years of service if member has elected the 2.2% formula</li> <li>◦ Age 55 with 20 years of service for a benefit that is reduced by 6% for every year the member is under 60</li> <li>◦ Age 60 with 10 years of service</li> <li>◦ Age 62 with 5 years of service</li> </ul>	<ul style="list-style-type: none"> <li>◦ Age 67 with 10 years of service</li> <li>◦ Age 62 with 10 years of service for a benefit that is reduced by 6% for every year the member is under 67</li> </ul>
<b>Benefit Caps</b>	
<ul style="list-style-type: none"> <li>◦ Maximum benefit is 75% of final average salary</li> </ul>	<ul style="list-style-type: none"> <li>◦ Maximum benefit is 75% of final average salary</li> <li>◦ In determining final average salary, no member's salary can exceed the Tier II wage cap.</li> </ul>
<b>Final Average Salary</b>	
Based on highest average salary during 4 out of the last 10 years of service	Based on highest average salary during 8 out of the last 10 years of service
<b>Cost-of-living adjustments</b>	
3 percent, compounded annually	Lesser of 3 percent or one-half of the Consumer Price Index, with the adjustment applied to the original benefit, i.e. not compounded
<b>Member Contribution Rate</b>	
9.4% of pay	

Despite having the same benefit formula and member contribution rate, the value of the Tier II benefit is lower than that of Tier I. Later retirement, the Tier II wage cap and the lower COLA provided under Tier II when compared to Tier I are the primary reasons that the Tier II benefit is much less valuable than the Tier I benefit.

A detailed summary of the benefit provisions is provided in Section 6.1 of the actuarial report.

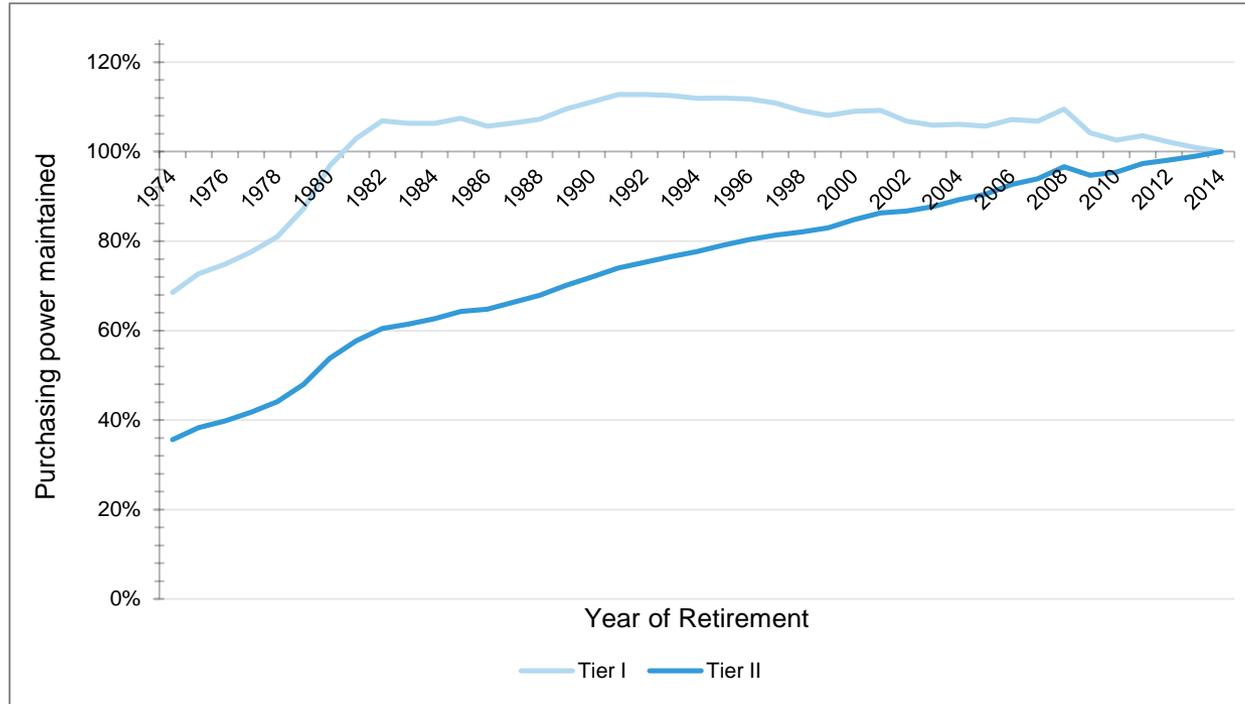
# Benefit Provisions (continued)



- INPUT**
- Member Data
  - Asset Data
  - Benefit Provisions
  - Actuarial Assumptions
  - Funding Methodology



- RESULTS**
- Actuarial Value of Assets
  - Normal Cost and Actuarial Accrued Liability
  - Funded Ratio/UAL
  - Required Contributions
  - Accounting Results
  - Sensitivity Projections

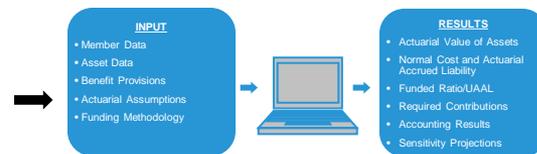


This graph compares the purchasing power of the Tier I and the Tier II COLA had they been in place over the past 40 years.

A purchasing power value of 100% indicates that the COLA results in the pension keeping pace with inflation; values below 100% indicates inflation would have eroded the purchasing power of the pension. The Tier I COLA is more effective against the effects of inflation than the Tier II COLA.

A detailed summary of the benefit provisions is provided in Section 6.1 of the actuarial report.

# Actuarial Assumptions

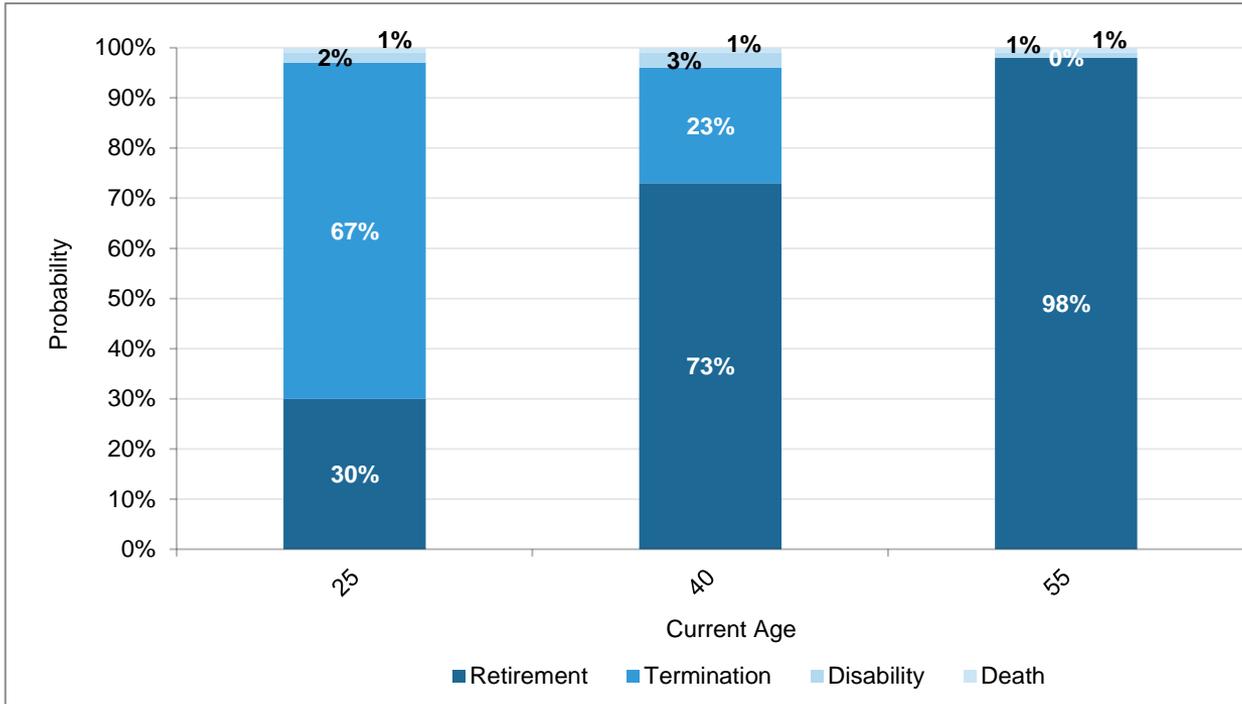
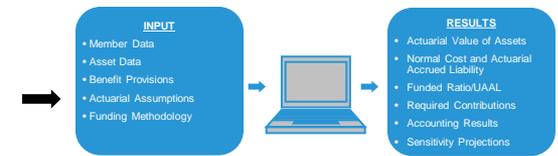


- Actuarial assumptions bridge the gap between the information that we know with certainty as of the valuation date – age, gender, service, pay or benefits of the members – and what may happen in the future.
- In first half of 2014, Buck Consultants prepared an interim review of the assumed interest rate, underlying inflation assumption and other related economic assumptions as a result of a proposed change in investment portfolio by the Board. At the June 24, 2014 Board meeting, the Board of Trustees adopted the following changes recommended by Buck Consultants for the June 30, 2014 valuation:
  - lower investment return from 8.00% to 7.50%
  - lower rate of inflation from 3.25% to 3.00%
  - lower all rates of salary increase by 0.25%
  - lower the Tier II pay cap increases from 1.625% to 1.50%
  - lower the Tier II COLA increases from 1.625% to 1.40%

The actuarial assumptions of TRS are reviewed at least every five years in a process known as an Experience Review. The next experience study will be prepared as of June 30, 2015 and presented to the Board in mid-2015. The results of that review will be used with the June 30, 2015 valuation.

A detailed summary of the actuarial assumptions is provided in Section 6.3 of the actuarial report.

# Actuarial Assumptions (continued)

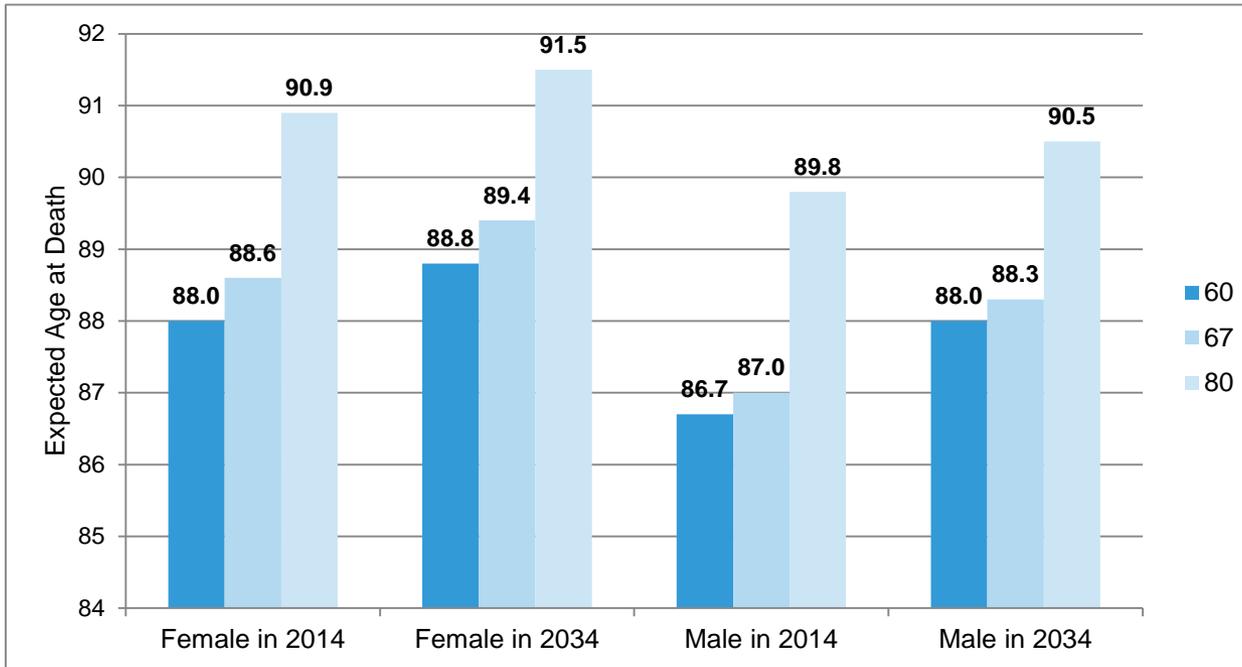
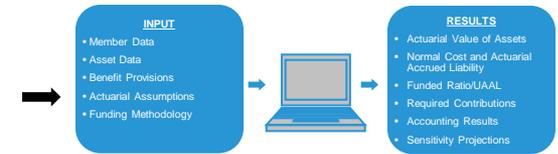


The probability of members retiring, terminating, becoming disabled or dying during their career at illustrative rates is in the exhibit.

Demographic assumptions describe future events that relate to people such as retirement rates, termination rates, disability rates, and mortality rates. Not surprising, as a member ages they are more likely to retire. The rates are developed to model what we expect to occur within TRS.

A detailed summary of the actuarial assumptions is provided in Section 6.3 of the actuarial report.

# Actuarial Assumptions (continued)

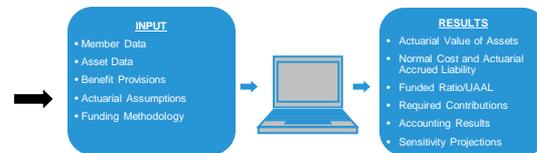


Mortality is a large driver of costs for Retirement Systems. The longer a member is expected to live, the higher the expected costs.

The expected ages at death shown above are based on the assumptions used for this valuation. Note that we show expected age at death in 2014 and 2034 as illustrative values. The valuation uses what is known as generational mortality. Each future generation is expected to live longer than the prior. Finally, females continue to live longer than males, although the gap is shrinking.

A detailed summary of the actuarial assumptions is provided in Section 6.3 of the actuarial report.

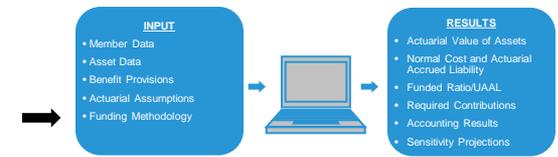
# Actuarial Assumptions (continued)



- Economic assumptions describe future events that relate to money such as the interest rate, salary increases, the real return, and payroll growth.
  - The investment return assumption is 7.50% per year. This assumption was adopted for use beginning with the June 30, 2014 actuarial valuation.
  - Salary increases vary by age. Members at age 25 are expected to receive a pay increase of 9.00%; members from age 50 and beyond are expected to receive a pay increase of 4.75%. This assumption was adopted for use beginning with the June 30, 2014 actuarial valuation.
  - The inflation assumption is 3.00% annually. This assumption was first adopted with the June 30, 2014 actuarial valuation.

A detailed summary of the actuarial assumptions is provided in Section 6.3 of the actuarial report.

# Funding Methodology

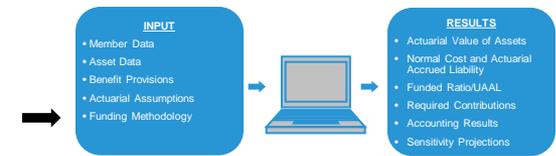


The Funding Methodology is another phrase for the funding policy for a PERS. There are three broad goals when formulating a funding policy for a PERS:

- Sufficiency - the funding target should be the value of benefits based on service accrued to date.
- Intergenerational equity – taxpayers should pay for workers’ pensions while those workers are providing their services – i.e., fund for benefits over the worker’s career.
- Stability of contributions – while stable contributions are easier to budget for, stability should not be achieved at the expense of the first two considerations.

A detailed summary of the actuarial methods is provided in Section 6.2 of the actuarial report.

# Funding Methodology (continued)

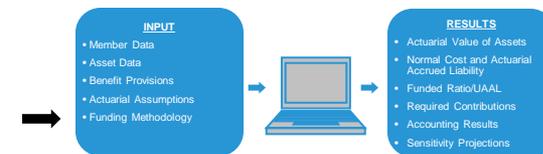


Actuarial Methods describe the funding policy for the PERS in actuarial terms. Actuarial Methods generally are comprised of the three components below:

- *Actuarial Cost Methods* allocate costs to the actuarial accrued liability (i.e. the amount of money that should be in the PERS fund) for past service and normal cost (i.e. the cost of benefits accruing during the year) for current service to allow for systematic payment of the costs over a member's career.
- *Amortization Methods* determine the payment schedule for unfunded actuarial accrued liability (UAAL).
- *Asset Valuation Methods* smooth or average the market value returns over time to alleviate contribution volatility that results from market returns that differ from the investment return assumption used in the actuarial valuation.

A detailed summary of the actuarial methods is provided in Section 6.2 of the actuarial report.

# Funding Methodology (continued)



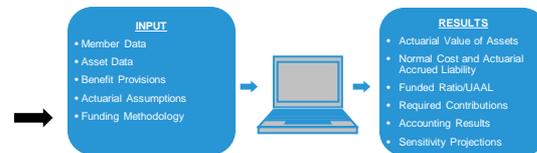
We have broadly referred to funding of a PERS outlined on the previous two slides as “Actuarial Math.” We refer to the current funding policy under the Illinois Pension Code as “Illinois Math,” which does not achieve the three broad goals of an actuarial funding policy. We have shown two versions of Actuarial Math in the past several years:

- *Contribution based on Minimum Generally Accepted Actuarial Standards* – since the inception of GASB 25 and 27 in the mid-1990s, the minimum annual required contribution (ARC) contained in those standards has served as the de facto minimum funding standard for a PERS. The basis for this version of Actuarial math is the projected unit credit cost method, with a 30-year open level percent of pay amortization.
- *Contribution based on keeping the unfunded actuarial accrued liability (UAAL) from growing* – recognizing that the contribution based on Generally Accepted Actuarial Standards is not sufficient to reduce the unfunded liability from year to year, we have shown this amount. This policy is an improvement over the above for the next several years.

While these are improvements over Illinois Math, neither of these Actuarial Math policies is optimal, primarily because they are not projected to either fully fund the UAAL or keep it from growing. That being said, had the first policy been in place since GASB 25 was adopted 20 years ago, the UAAL would be over \$16 billion lower.

A detailed summary of the actuarial methods is provided in Section 6.2 of the actuarial report.

# Funding Methodology (continued)



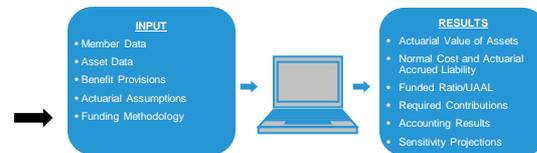
The de facto funding policy under GASB 25 and 27 was effectively eliminated with the introduction of GASB 67 and 68 two years ago. In the interim, public sector actuaries have reviewed funding of public sector pensions. While the framework remains the same, the parameters have been narrowed and refined.

- *Actuarial Cost Method* based on the entry age normal cost method
- *Amortization Method* which at a minimum pays down the unfunded actuarial accrued liability each year. A closed, layered, level percent of pay amortization of 15 to 20 years or a closed level dollar amortization of no more than 25 years achieves this.
- *Asset Valuation Method* which smoothes returns over a five year period without a corridor

The above policy is an improvement over the actuarial math discussed previously. In particular, the above is projected to fully fund benefits in a shorter period of time without increasing the unfunded actuarial accrued liability. We will explore this policy in the near future with the Board.

A detailed summary of the actuarial assumptions is provided in Section 6.2 of the actuarial report.

# Funding Methodology (continued)



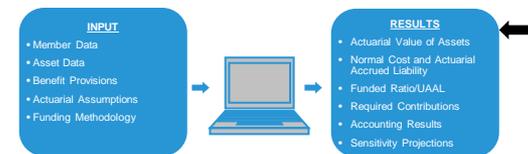
The funding of TRS by the State of Illinois does not follow even the minimum Actuarial Math. The State has systematically underfunded TRS using Illinois Math by:

- Initially selecting a 50 year period over which to pay down unfunded actuarial accrued liability
- Back loading the 50 year plan by using a 15 year period to ramp up contributions to the ultimate level
- Establishing 90% of the actuarial accrued liability as the funding target
- Using the projected unit credit cost method which understates the funding target compared to the more common entry age normal cost method
- Imposing a maximum contribution based on POB debt payments; while contributions are potentially reduced by the full value of the debt payments, not all of the POB proceeds were directly deposited
- Reducing contributions for fiscal year ended June 30, 2006 and 2007
- Reducing contributions in fiscal year ended June 30, 2011 by introducing an actuarial value of assets
- Reducing contributions for fiscal year ended June 30, 2011 by fully reflecting the impact of Tier II provisions before the reduction in benefit accruals occurred

A detailed summary of the actuarial methods is provided in Section 6.2 of the actuarial report.

# Valuation Results

# Summary of Funding Results



Summary of Funding Valuation Results with Last Year's Results for Comparison	June 30, 2014 Valuation	June 30, 2013 Valuation
<b>Results as of Valuation Date</b>	<b>June 30, 2014</b>	<b>June 30, 2013</b>
<b>Funded Status</b>		
1. Actuarial Accrued Liability	\$ 103,740,377,267	\$ 93,886,988,785
2. Actuarial Value of Assets (AVA)	<u>42,150,765,261</u>	<u>38,155,191,497</u>
3. Unfunded Actuarial Accrued Liability (AVA basis) (1. - 2.)	\$ 61,589,612,006	\$ 55,731,797,288
4. Funded Ratio (AVA basis): (2. / 1.)	40.6%	40.6%
5. Market Value of Assets (MVA)	45,824,382,514	39,858,768,499
6. Unfunded Actuarial Accrued Liability (MVA basis) (1. - 5.)	\$ 57,915,994,753	\$ 54,028,220,286
7. Funded Ratio (MVA basis): (5. / 1.)	44.2%	42.5%
<b>Actuarial Accrued Liability</b>		
1. Active Members	\$ 35,622,053,592	\$ 30,748,827,886
2. Retired Members and Beneficiaries Receiving Benefits	65,614,627,003	61,254,334,295
3. Inactive Members with Deferred Benefits	<u>2,503,696,672</u>	<u>1,883,826,604</u>
4. Total Actuarial Accrued Liability (1. + 2. + 3.)	\$ 103,740,377,267	\$ 93,886,988,785
<b>Results as of Fiscal Year Ending</b>	<b>June 30, 2016</b>	<b>June 30, 2015</b>
<b>Certified State Contribution under Illinois Pension Code</b> (includes amount to Guaranteed Minimum Annuity Reserve)	\$ 3,742,702,194	\$ 3,412,877,953
<b>Normal Cost</b>		
1. Total Normal Cost	\$ 2,010,002,760	\$ 1,859,287,118
2. Administrative Expenses	24,294,066	22,519,334
3. Expected Member Contribution	<u>1,041,807,455</u>	<u>1,045,996,125</u>
4. Total Employer Normal Cost (1. + 2. - 3.)	\$ 992,489,371	\$ 835,810,327

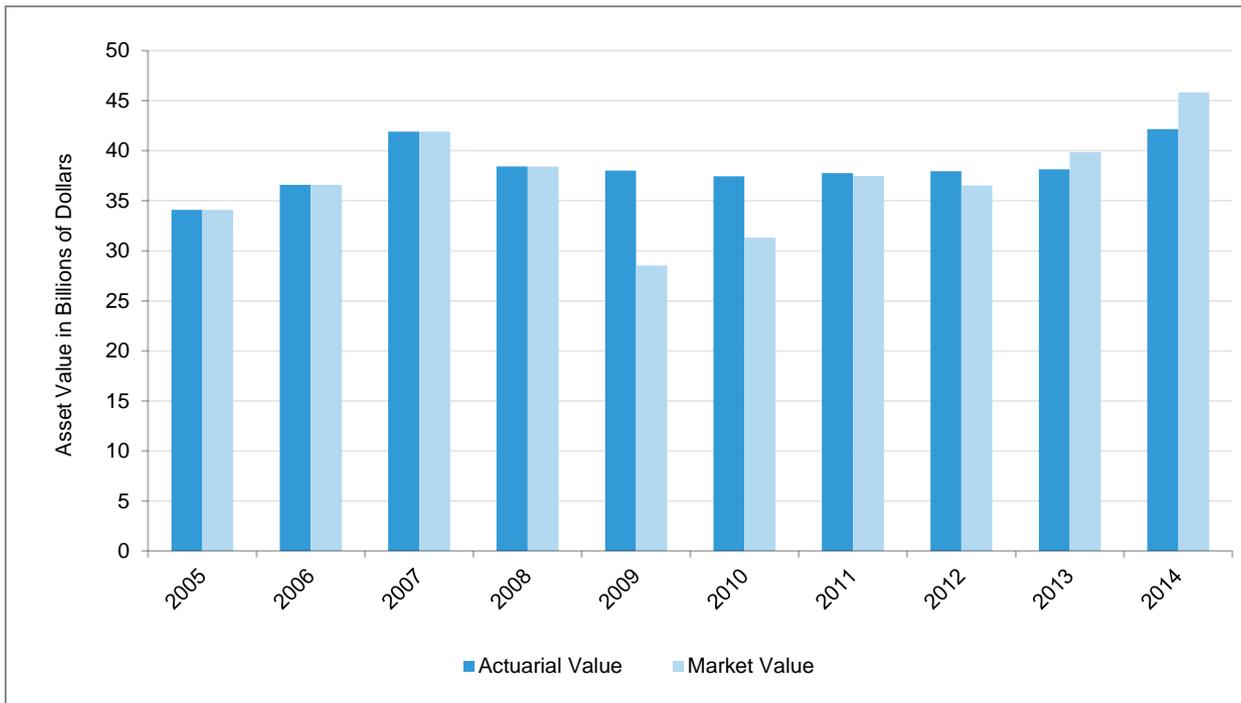
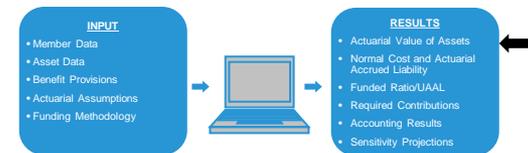
This table summarizes many of the key results of the current funding valuation.

Comparable results from last year's valuation are shown for comparison.

We will discuss these results in more detail in the following slides.

The summary of funding results is provided in Section 1 of the actuarial report.

# Actuarial Value of Assets

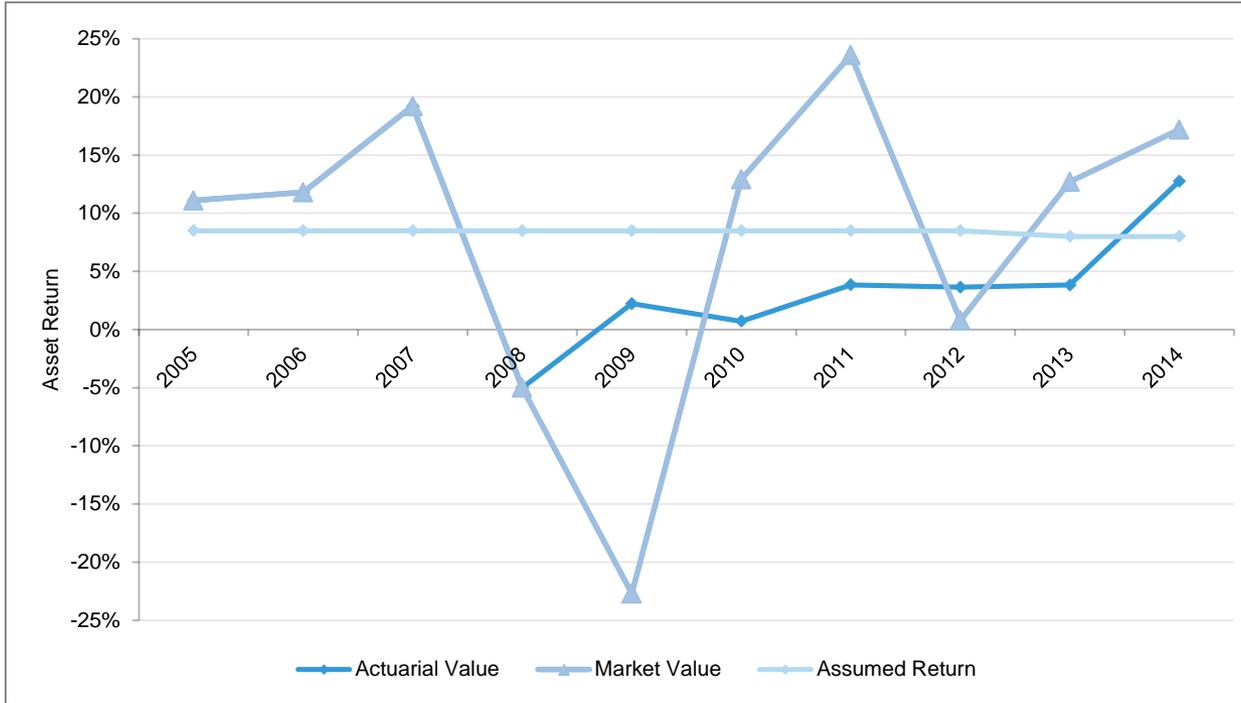
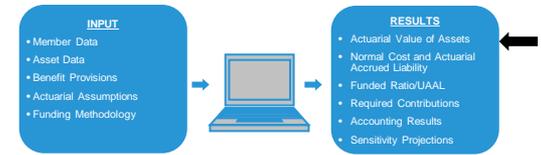


This graph provides a history of the market value and actuarial value of assets *amounts* over the past ten years. Before 2009, the amounts were the same.

The actuarial value of assets smoothes investment gains/losses, resulting in less volatility in the employer contribution. The point of using an actuarial value of assets is to develop employer contributions that are more stable than if the contributions were based solely on market. That being said, when the actuarial value of assets was implemented, the impact was to reduce the year ended June 30, 2011 contribution by \$400 million.

The Actuarial Value of Assets is provided in Section 2 of the actuarial report.

# Actuarial Value of Assets

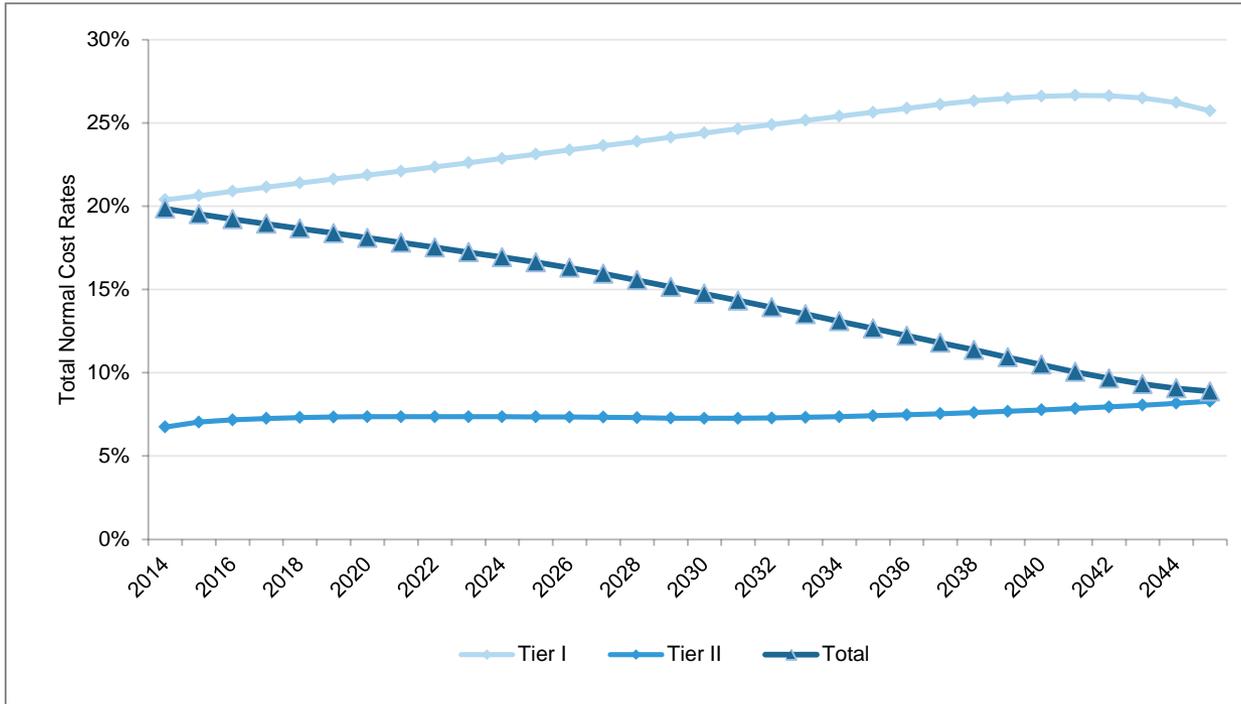
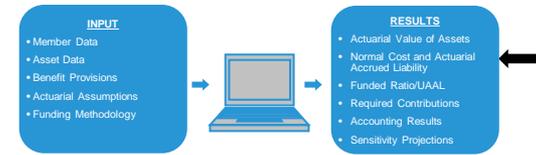


This graph provides a history of the market value and actuarial value of asset returns over the past ten years, as well as the assumed return. Before 2009, the amounts were the same.

The returns under the actuarial value of assets do not deviate as much from the assumed rates of returns over the period when compared to the market return. This results in less employer contribution volatility.

The Actuarial Value of Assets is provided in Section 2 of the actuarial report.

# Total Normal Cost

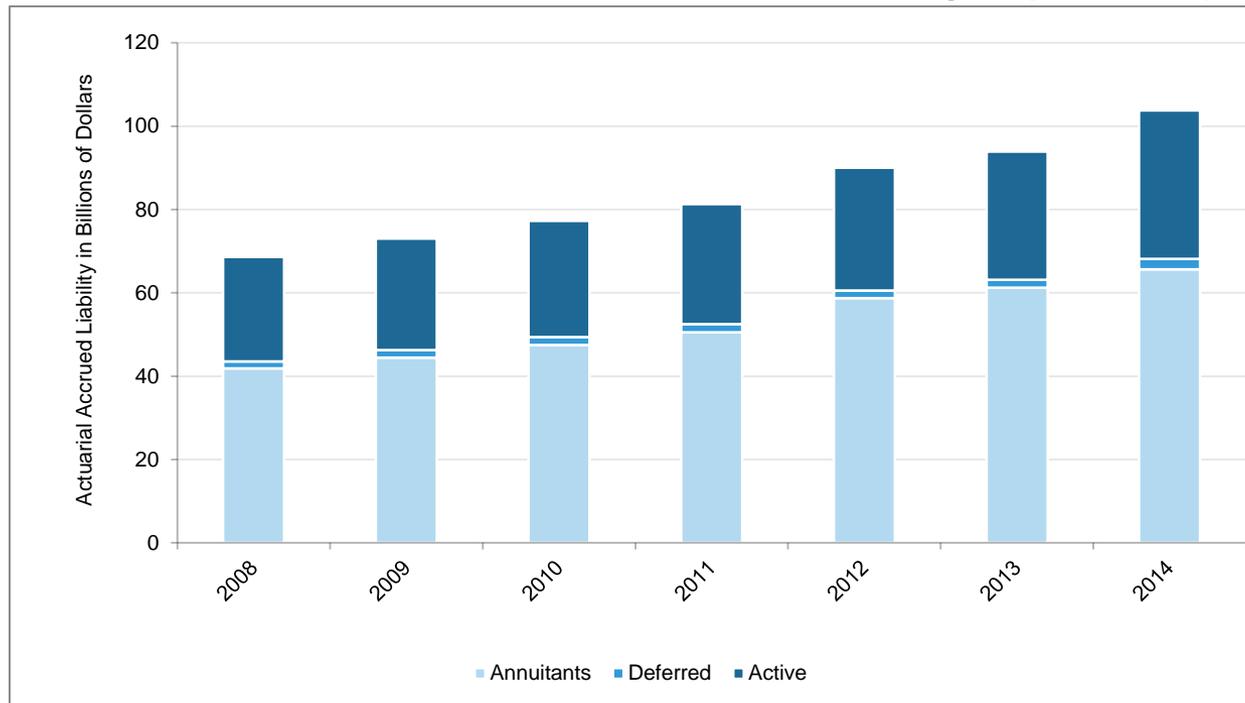
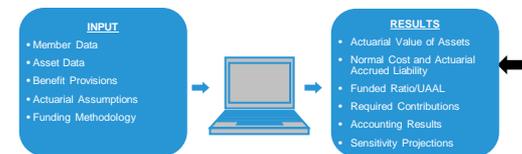


This graph provides a projection of the normal cost as a percent of pensionable payroll, both in total and split by tier. The normal cost is the cost of benefits accruing during the year.

The normal cost for Tier I is over double that of Tier II. Also, the amounts increase due to the back loading inherent in the projected unit credit cost method mandated by the state as well as future mortality improvements projected in the valuation. Had these rates been based on the more common entry age normal cost method, the normal costs would be lower and not back loaded, and the actuarial accrued liability would be higher.

Details about the normal cost are provided in Section 1 and the projected normal cost in Section 4.

# Actuarial Accrued Liability (AAL)

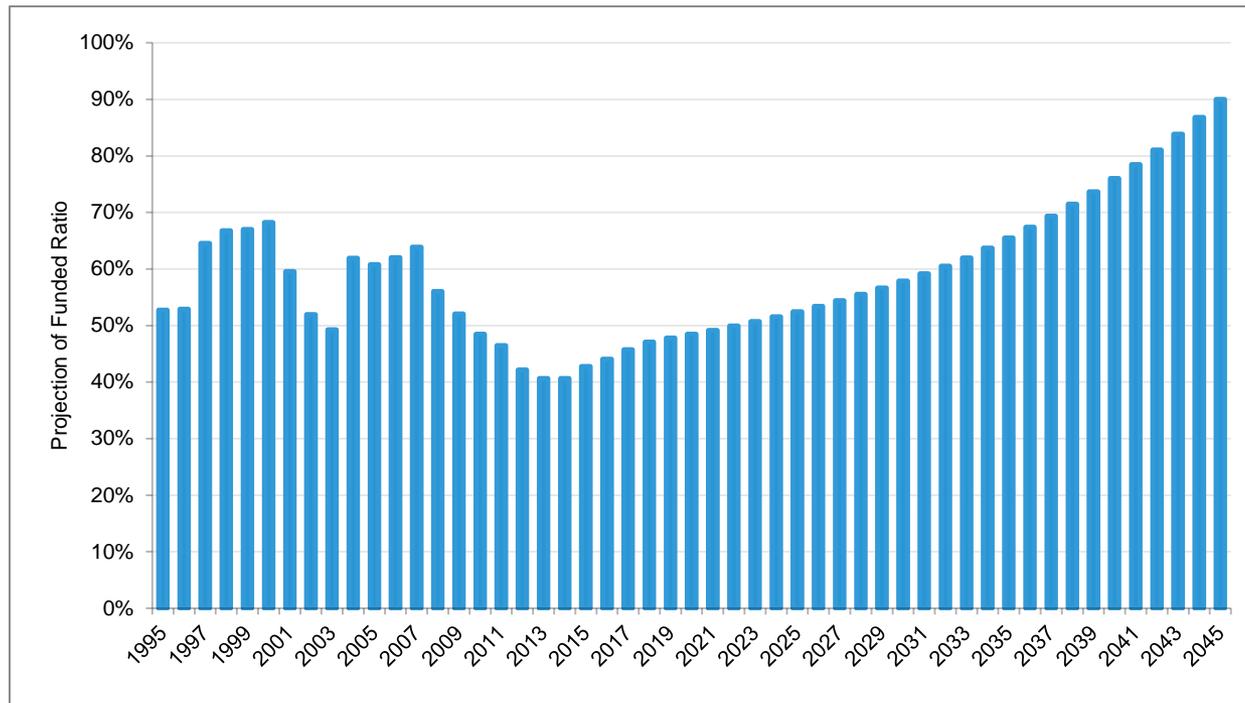
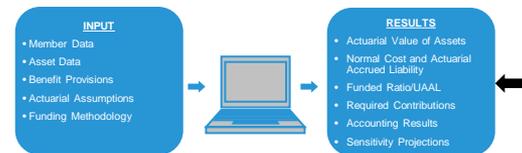


This graph provides a history of the actuarial accrued liability, or AAL. The AAL is the funding target, or the amount of assets TRS should have in the trust as of the valuation date.

In a plan open to new hires such as TRS, the AAL will grow even in the absence of changes to the assumptions, methods and benefit provisions. While the AAL for TRS has grown somewhat steadily over the past several years, 50 bp decreases in the assumed rate of return in 2012 and 2014 resulted in higher than anticipated increases. It is worthwhile to note that over two-thirds of the AAL is for annuitants.

A detailed summary of the AAL is provided in Section 1 of the actuarial report.

# Funded Ratio

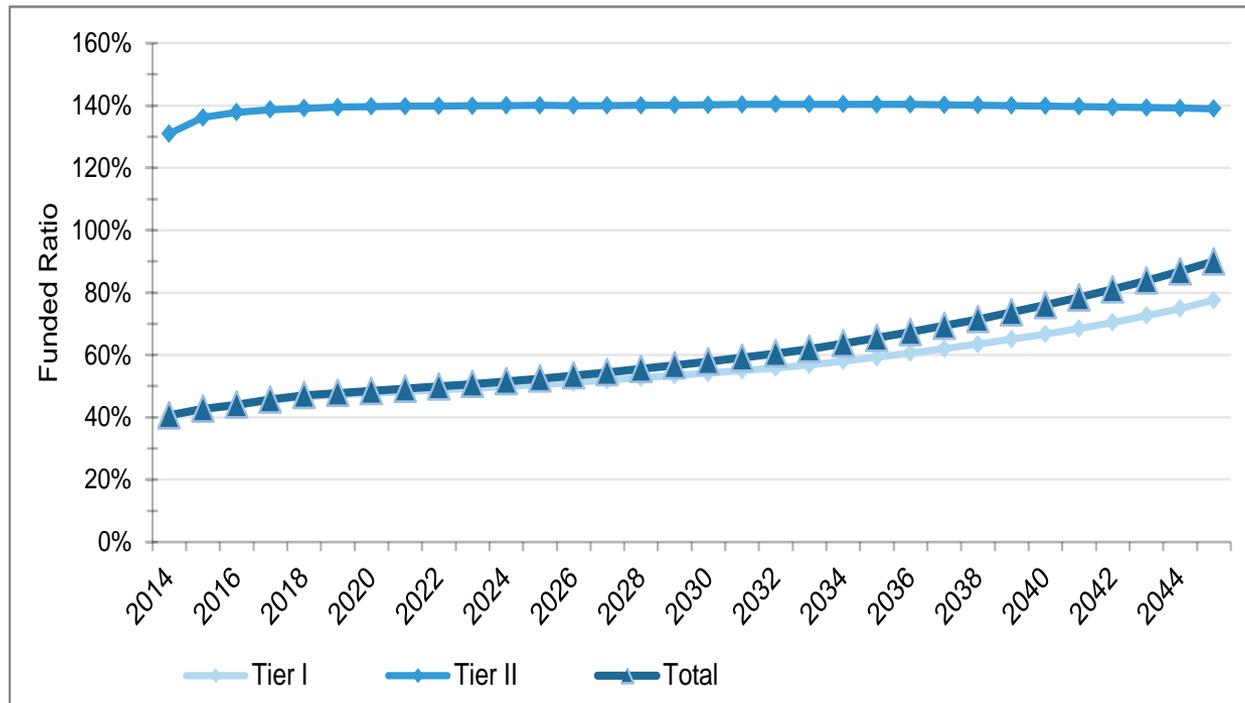
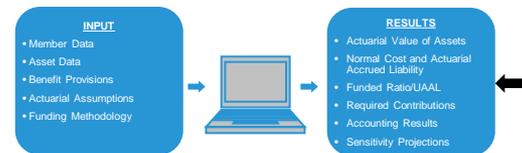


This graph provides a history and a projection of the funded ratio for TRS over the 50 year funding period. The funded ratio is the actuarial value of assets divided by the actuarial accrued liability, or it is the ratio of how much money TRS has in the fund to how much it should have in the fund.

The funded ratio is a measure of the funding progress of TRS. The funded ratio should trend to 100% over a reasonably short period of time – say 15 to 25 years. The 90% target and the 50 year period used by Illinois Math, while an improvement over funding before 1995, are inadequate. We recommend Illinois Math be replaced with Actuarial Math.

A detailed summary of the funded ratio is provided in Section 1 and a projection in Section 4 of the actuarial report.

# Funded Ratio

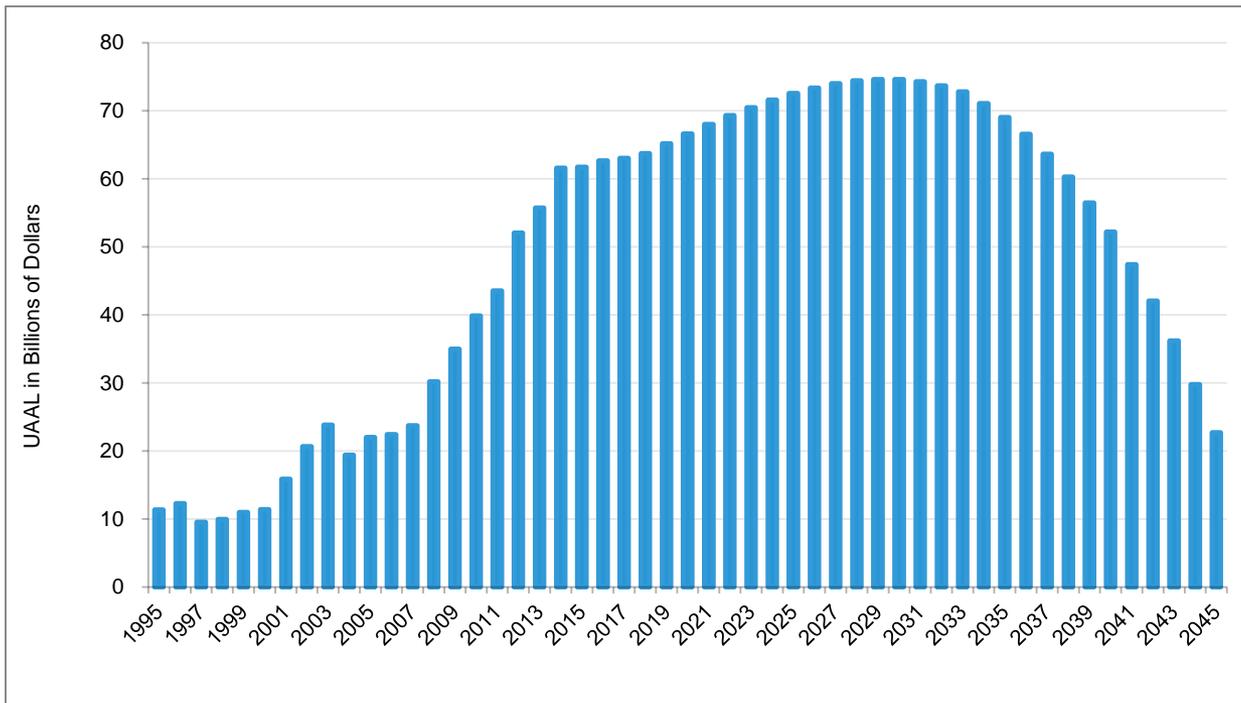
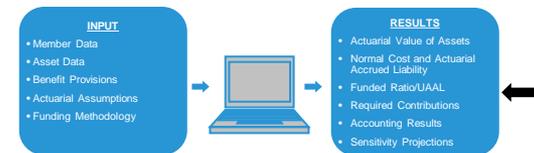


This graph provides a projection of the funded ratio both in total and split by tier.

While Tier I and Tier II assets are comingled within TRS to determine the funding requirements and funded ratio, this chart projects the funded ratio based on allocating only Tier II member contributions with projected investment returns to the Tier II assets and the remaining contributions – Tier I member, all State, all School District and all Federal Funds – with projected investment returns to the Tier I assets. The bottom line is that Tier II members are subsidizing the State contributions to TRS.

A detailed summary of the projected funded ratio is provided in Section 4 of the actuarial report.

## UAAL (Unfunded Actuarial Accrued Liability)

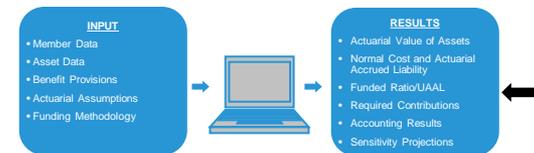


This graph provides a history and a projection of the unfunded actuarial accrued liability, or UAAL, for TRS over the 50 year funding period. The UAAL is the difference between the actuarial value of assets (AVA) and the actuarial accrued liability (AAL), or the pension debt.

The UAAL before the current valuation date has generally increased annually. While System experience has resulted in some of the increases and decreases in UAAL, the State contributions mandated under the Illinois Pension Code were designed to allow the UAAL to grow for more than three decades when the 50 year plan was put in place in 1995. The first year the UAAL is projected to decrease is the year ending June 30, 2031.

A detailed summary of the UAAL is provided in Section 1 and a projection in Section 4 of the actuarial report.

# UAAL Reconciliation



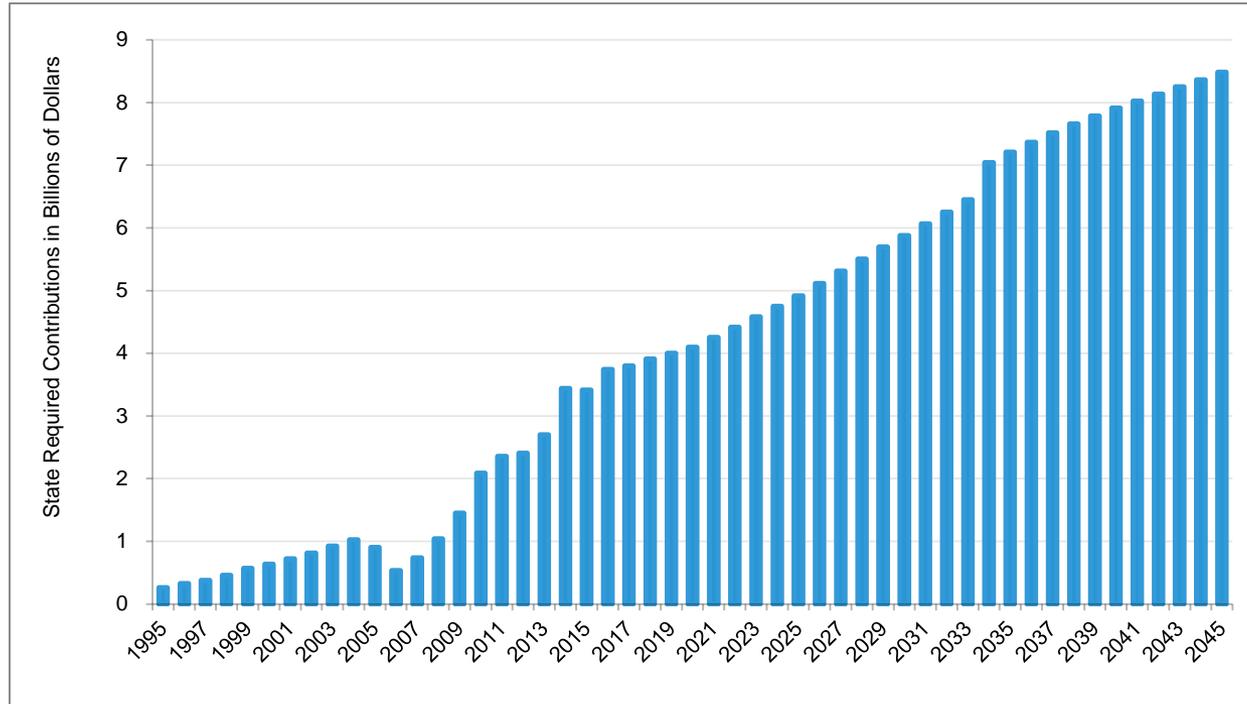
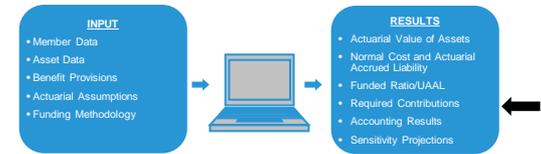
Reconciliation of Unfunded Actuarial Accrued Liability	Year Ended June 30	
	2014	2013
<b>Unfunded Actuarial Accrued Liability at beginning of year</b>	<b>\$ 55,731,797,288</b>	<b>\$ 52,079,548,158</b>
<b>Additions (deductions)</b>		
- Employer cost in excess of contributions	\$ 1,648,042,240	\$ 2,125,731,840
- Change in actuarial assumptions and methods	6,403,256,969	-
<b>Net additions (deductions)</b>	<b>\$ 8,051,299,209</b>	<b>\$ 2,125,731,840</b>
<b>Actuarial losses (gains) compared to assumptions</b>		
- Salary increases for continuing active members	\$ (474,190,195)	\$ (412,776,000)
- Asset loss (gain) on actuarial value of assets	(1,791,604,611)	1,557,219,259
- New entrant loss	(315,731)	12,677,870
- Mortality other than expected	(74,308,199)	7,355,374
- Retirements other than expected	119,675,346	65,579,020
- Disabilities other than expected	(3,237,170)	(6,120,537)
- Terminations other than expected	(4,442,984)	22,925,587
- Rehires	37,754,909	-
- Repayments of refunded member contributions	-	25,733,387
- Delayed reporting of retirements (effect on assets)	-	2,302,527
- Other	(2,815,856)	251,620,803
<b>Net actuarial loss (gain)</b>	<b>\$ (2,193,484,491)</b>	<b>\$ 1,526,517,290</b>
<b>Unfunded Actuarial Accrued Liability at end of year</b>	<b>\$ 61,589,612,006</b>	<b>\$ 55,731,797,288</b>

This table shows the key reasons for the change in the UAAL from last year's valuation to this year.

At the level of state contributions made for 2014, the UAAL increased as expected by \$1.6 billion. Other key factors were the change in assumptions effective June 30, 2014, which increased the UAAL by \$6.4 billion. These "losses" were partially offset by experience "gains" including salary increases less than assumed and favorable investment returns on the actuarial value of assets.

A detailed summary of the changes in UAAL is provided in Section 1 of the actuarial report.

# Required Contributions

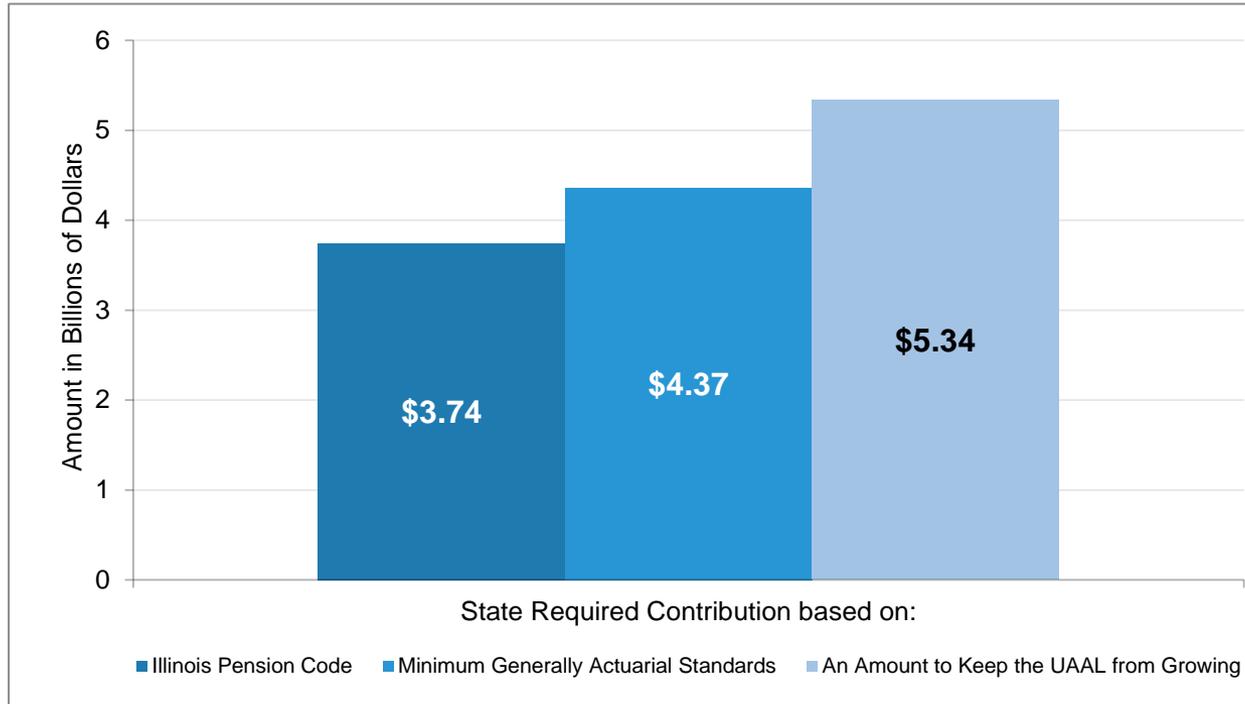
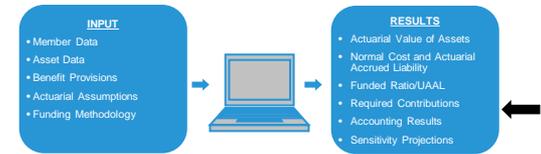


This graph provides a history and projection of the State Required Contribution under the Illinois Pension Code.

In the first several years of the 50 year plan, the State contributions were lower as the contribution ramped up from 1995 through 2010. In the future, the increases will continue as payroll increases. A larger increase of almost 10% occurs in 2034 as the constraint of the POB maximum is lifted. More details are contained on slide 25. The contributions above are a primary driver of the increasing UAAL on the previous two slides.

A detailed summary of the employer required contribution rates is provided in Section 1 of the actuarial report.

# Required Contributions

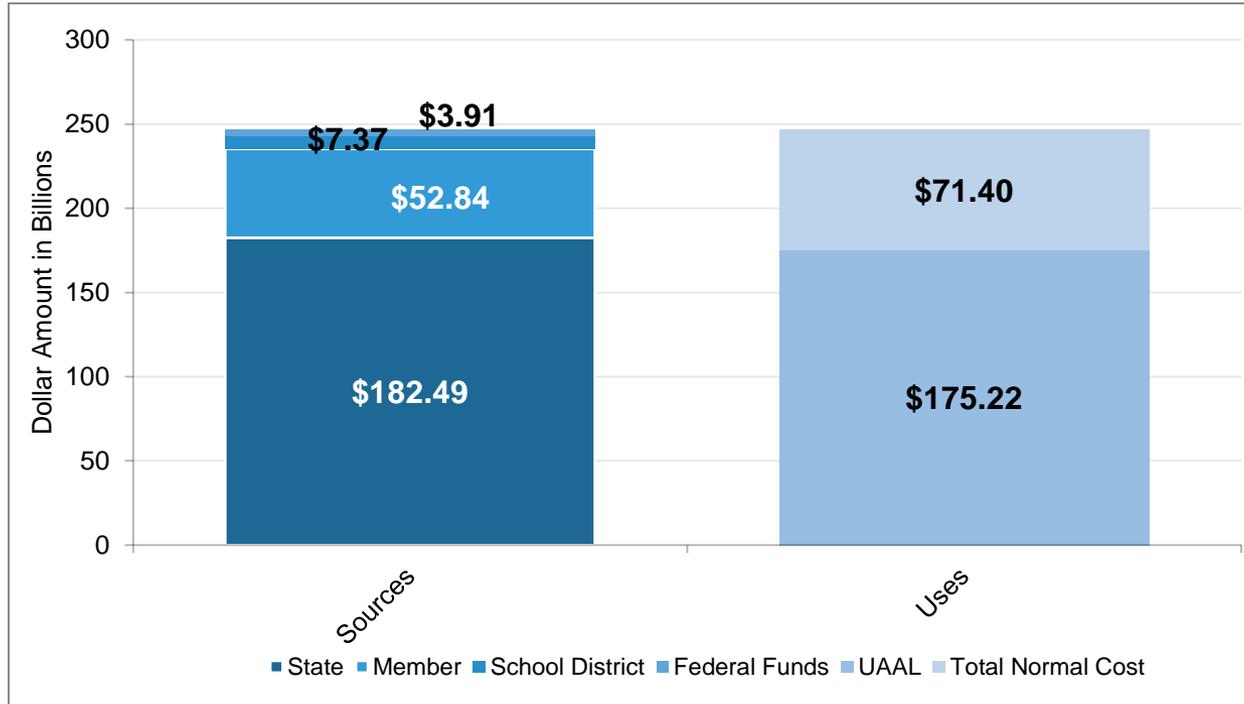
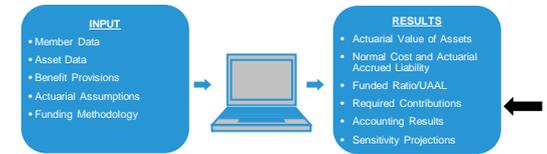


This graph provides the year ended June 30, 2016 State Required Contribution under the Illinois Pension Code, as well as two higher thresholds. The Board includes these two higher thresholds in the certification in recognition of the inadequacy of the State contribution requirements under the Illinois Pension Code.

The contribution amount to keep the UAAL from growing should be regarded as the minimum contribution requirement. We will continue to discuss funding policy with the Board.

The employer required contribution rates are provided in Section 1 of the actuarial report.

# Required Contributions

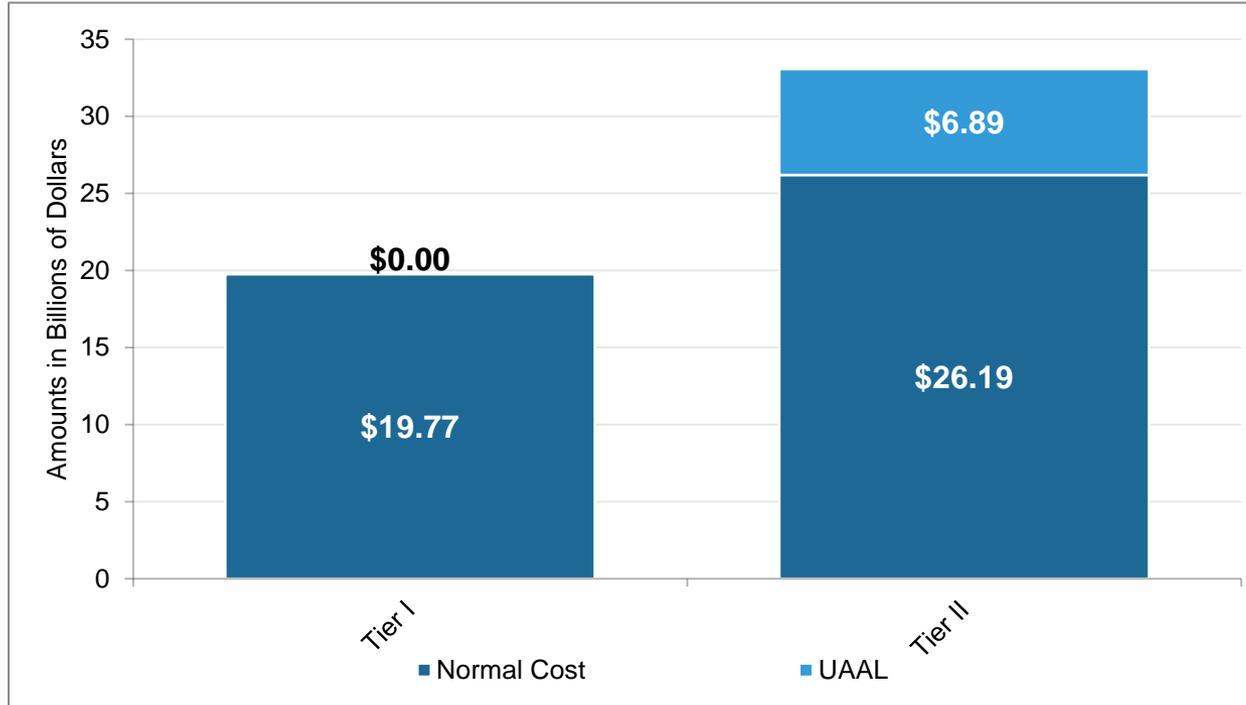
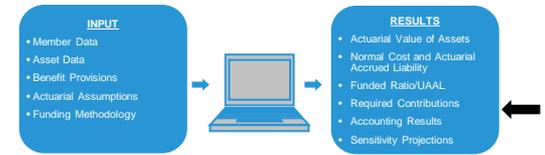


This graph provides a comparison of the Sources and Uses of the \$246.62 billion in contributions projected to be made from year ended June 30, 2016 through the end of the 50-year funding period of June 30, 2045.

Over 70% of the projected total contributions are being provided by the state and over 20% is being provided by teachers. In aggregate, teachers pay for the cost of benefits accruing, and the State pays for the pension debt that has accrued as a result of following inadequate funding policies since the inception of TRS. Much of the contributions over the next 30 years are used to pay down pension debt.

The projected contributions are provided in Section 4 of the actuarial report.

# Required Contributions

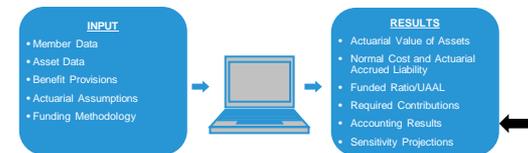


This graph provides a comparison of the Sources and Uses of teacher contributions split by tier projected to be made from year ended June 30, 2016 through the end of the 50-year funding period of June 30, 2045.

Tier II member contributions are more than sufficient to fund Tier II benefits, and the excess is used to increase the overall funded ratio of TRS. These Tier II excess contributions increase the June 30, 2045 TRS funded ratio from 80% to the 90% target under the Illinois Pension Code. Tier II members are assisting the State by paying for part of the UAAL in addition to paying for all of their benefits.

The projected contributions are provided in Section 4 of the actuarial report.

# Accounting GASB 25/27



GASB 27 Disclosure (\$ in thousands)		
Development of Net Pension Obligations		6/30/2014
Item		
1.	Net Pension Obligation at 6/30/2013	\$ 15,740,028
2.	Employer Normal Cost	787,230
3.	Amortization of Unfunded AAL	3,304,748
4.	Annual Required Contribution (ARC) (2. + 3.)	4,091,978
5.	Interest on the NPO at 6/30/2013	1,259,203
6.	Adjustment to the ARC	928,457
7.	Pension Cost (4. + 5. - 6.)	4,422,724
8.	Total Employer Contribution	3,594,706
9.	Percent of Pension Cost Contributed (8. / 7.)	81.3%
10.	Change in NPO (7. - 8.)	828,018
11.	Net Pension Obligation at 6/30/2014 (1. + 10.)	\$ 16,568,046

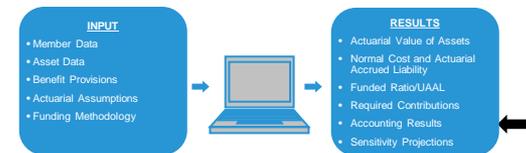
This exhibit shows the derivation of the Net Pension Obligation, which is the cumulative shortfall of the contributions actually made compared to the contributions under the minimum generally accepted actuarial contribution since 1995.

The cumulative shortfall is now over \$16 billion, another indication that Illinois Math should be replaced by Actuarial Math.

GASB 25 has been replaced by GASB 67 effective for TRS FYE June 30, 2014. GASB 27 is replaced by GASB 68 for employers' FYE June 30, 2015.

The accounting information is provided in Section 3 of the actuarial report.

# Accounting GASB 67/68



Net Pension Liability (Asset)	June 30, 2014	June 30, 2013
Total Pension Liability	\$ 106,682,654,886	\$ 102,507,911,628
less Plan Fiduciary Net Position	<u>45,824,382,514</u>	<u>39,858,768,499</u>
Net Pension Liability (Asset)	\$ 60,858,272,372	\$ 62,649,143,129
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability (Asset)	42.95%	38.88%

Schedule of Changes in Net Pension Liability as of June 30, 2014	
<b>Total Pension Liability</b>	
Service Cost	\$ 1,894,351,211
Interest	7,561,104,814
Changes of Benefit Terms	-
Difference between Expected and Actual Experience	39,050,212
Change of Assumptions	-
Benefit Payments, including Refund of Member Contributions	<u>(5,319,762,979)</u>
Net Change in Total Pension Liability	4,174,743,258

Sensitivity of the Net Pension Liability to Changes in the Discount Rate			
	1% Decrease	Current	1% Increase
Discount Rate	6.50%	7.50%	8.50%
Net Pension Liability (Asset)	\$ 75,156,979,079	\$ 60,858,272,372	\$ 49,017,312,800

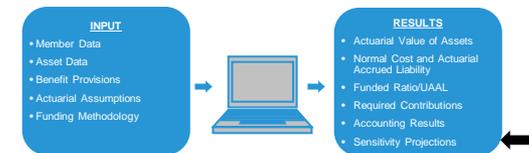
Now for something new, including new terminology.

This exhibit shows TRS's balance sheet and other disclosure information under GASB 67, effective for FYE June 30, 2014.

Unlike GASB 25, GASB 67 is purely accounting and is not intended to represent a funding policy. GASB 67 prescribes the actuarial cost method, which is entry age normal, and asset method, which is the fair market value (no smoothing). The assumptions are the same for funding except the discount rate (interest rate) may fluctuate annually. As of June 30, 2014, the discount rate is 7.50%, same as funding. NPL is \$60.9 billion. (UAAAL is \$61.6 billion)

The accounting information is provided in Section 3 of the actuarial report.

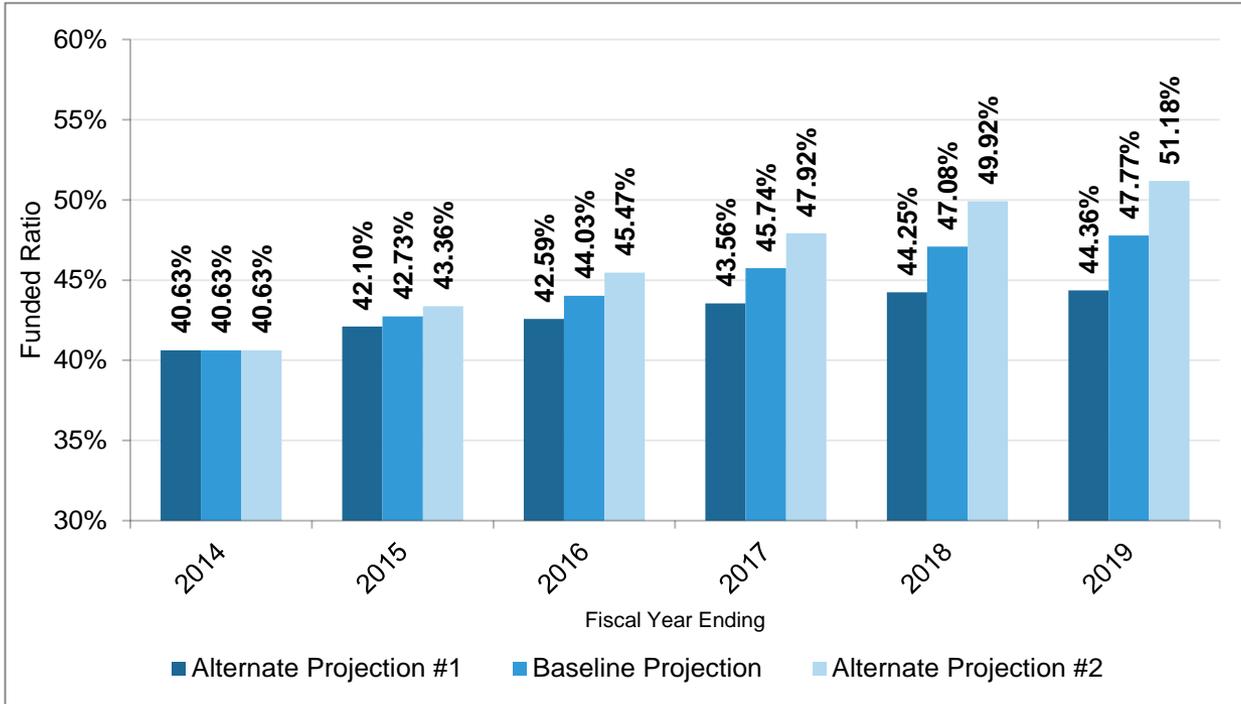
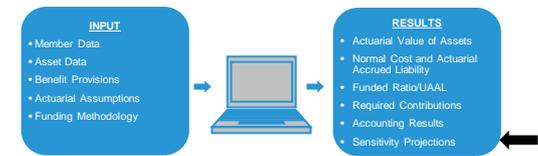
# Sensitivity Projections



- Projections of employer contribution requirements and funded status into the future can be helpful planning tools for stakeholders.
- Projections of the actuarial valuation are known as deterministic projections. Deterministic projections are based on one set of assumptions in the future.
- The baseline deterministic projection is based on the valuation assumptions, including the use of an assumed rate of return of 7.50% for all years.
- Two alternate deterministic projections based on the same assumptions as the baseline deterministic projection, except for the following fiscal year ending June 30, 2015 return:
  - 0% asset return for FYE 2015 under Alternate Projection #1
  - 15% asset return for FYE 2015 under Alternate Projection #2

One of the truths of the Actuarial Valuation is that the assumptions rarely are realized from year to year – particularly the assumed asset return. Sensitivity projections can be used to give stakeholders a sense of the range of outcomes that can occur from year to year.

# Sensitivity Projections

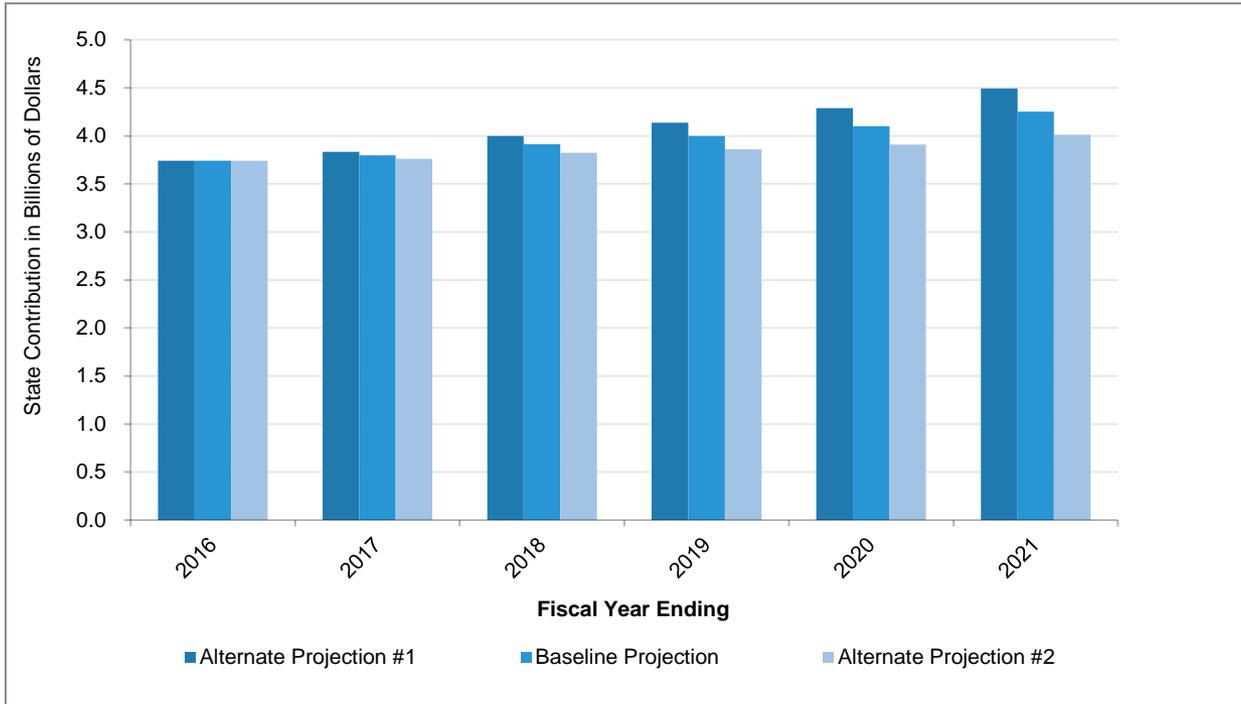
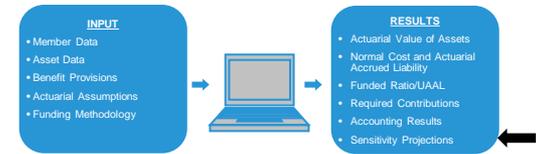


This graph provides a projection of the funded ratio based on the baseline valuation and the two alternate deterministic scenarios discussed on the previous slide.

The impact of investment returns on the valuation results can be significant. The impact in the first year is rather modest because only 20% of the alternate returns are reflected in the actuarial value of assets each valuation. By the fifth year, the returns are fully reflected in the valuation. On the next page we see the impact that these alternate scenarios have on employer contributions.

A summary of the deterministic projections is provided in Section 4 and the Executive Summary of the actuarial report.

# Sensitivity Projections

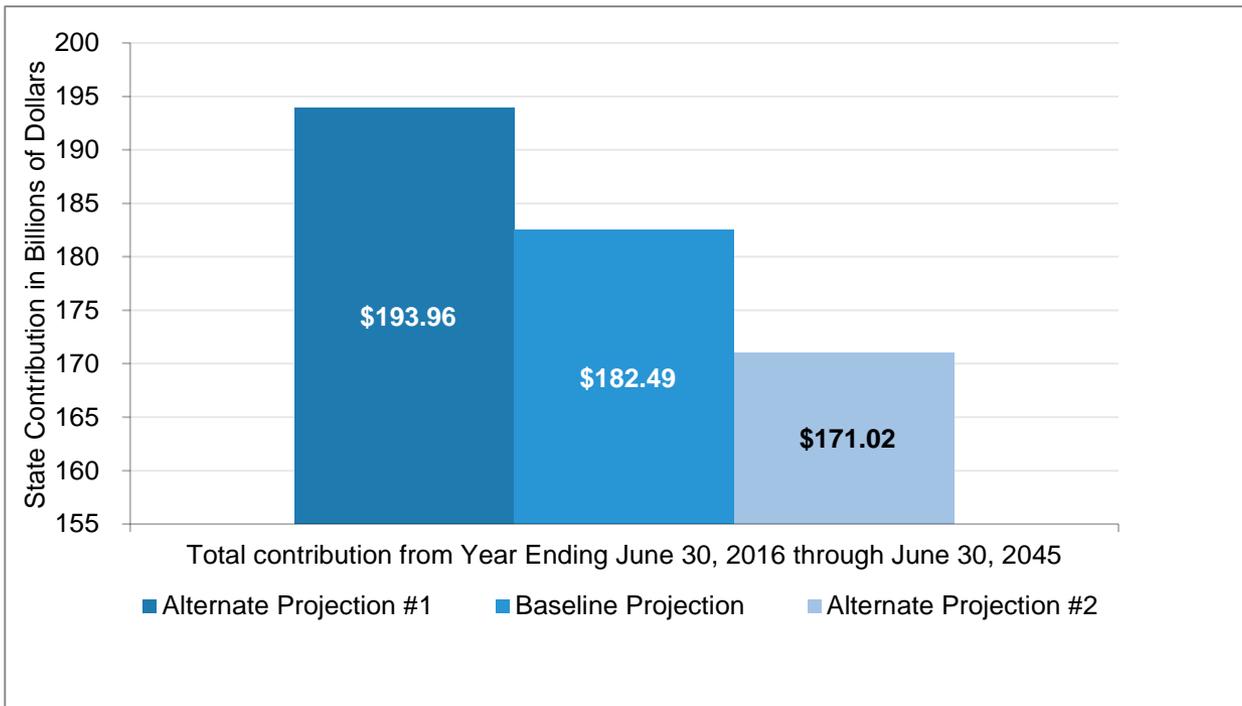
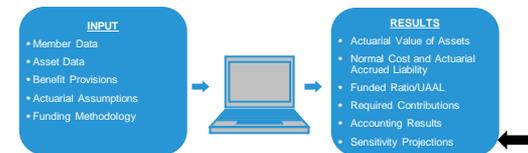


This graph provides a projection of the state required contributions on the baseline valuation and the two alternate deterministic scenarios discussed on the previous slides.

Similar to the impact on the funded ratio, the impact in the first year is rather modest because only 20% of the alternate returns are reflected in the actuarial value of assets each valuation. By the fifth year, the returns are fully reflected in the valuation. On the next page we see that the impact on contributions over the funding period under these alternate return scenarios.

A summary of the deterministic projections is provided in Section 4 and the Executive Summary of the actuarial report.

# Sensitivity Projections



This graph provides the total state required contributions from the year ending June 30, 2016 through June 30, 2045 on the baseline valuation and the two alternate deterministic scenarios on the previous slides.

The total impact on contributions over the funding period is significant. The change in returns in alternative scenarios #1 and #2 is \$3.4 billion less or \$3.4 billion more than the baseline, respectively, yet the impact over time on contributions is over three times those amounts because of the long period of time that this change is funded under Illinois Math.

A summary of the deterministic projections is provided in Section 4 and the Executive Summary of the actuarial report.

# Key Takeaways

- The annual cost of benefits earned by active teachers in TRS is \$2.0 billion, 19% of pay in FY 2016. This is the total normal cost.
- Teachers contribute about half of this through member contributions.
- Of the total employer contribution of \$3.9 billion for FY 2016 (\$3.7 billion of which is for the State), \$2.9 billion is for UAAL, and the other \$1.0 billion is for the employers' share of the normal cost and expenses.
- Because the employer contribution for UAAL will be less than the \$4.5 billion interest payment, the UAAL is projected to grow. The UAAL is expected to grow until 2031.
- While the 50 year plan was an improvement over the funding policy prior to 1995, it has increased the UAAL as of June 30, 2014 by over \$16 billion more than if a 30 year amortization was followed.
- New hires after January 1, 2011 will fully fund the cost of their benefit accruals, and excess contributions reduce the State's contributions toward the UAAL.
- Current funding problems are due to historic noncompliance with generally accepted actuarially principles and standards for determining State contributions.

# Key Takeaways (continued)

- The funded ratio for TRS is among the worst in the United States. This is due to:
  - A lack of commitment from policy makers to keep TRS well-funded
  - A history of appropriating and contributing amounts far below that which a prudent actuary would recommend
  - A funding policy that systematically underfunds TRS
  - Changes in benefits that were unfunded and granted when the funded ratio of TRS was quite low
- Funding reform needs to occur for TRS or the benefits of its membership could be compromised.

A quote from the 2014 valuation report:

“By funding based on Illinois Math instead of Actuarial Math, the State has put the retirement security for the 390,000 current and former educators in the State of Illinois at risk. Meaningful funding reform should be implemented now.”

# Certification

The results were prepared under the direction of Larry Langer and Paul Wilkinson who meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. These results have been prepared in accordance with all applicable Actuarial Standards of Practice, and we are available to answer questions about them.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law.

Larry Langer, FCA, ASA, EA, MAAA  
Principal, Consulting Actuary

Paul Wilkinson, ASA, EA, MAAA  
Director, Consulting Actuary

# Disclosures

- Buck's work product contained herein was prepared exclusively for the Board of Trustees and Staff of TRS. It is a complex, technical analysis that assumes a high level of knowledge concerning the operations of TRS.
- No third party recipient of Buck's work product should rely upon Buck's work product absent involvement of Buck or without our approval. Furthermore, because of past experience with previous work we have prepared for TRS, we feel obliged to strongly discourage third party recipients from misstating the results set forth in this work product. Third parties recipients inclined to present our work product should engage TRS and Buck during the presentation process to ensure that this work product is appropriately represented. If this is not desirable, such recipients should engage qualified professionals for advice appropriate to their own specific needs.
- The consultants who worked on this assignment are pension actuaries with significant experience in public funds like TRS. Buck's advice is not intended to be a substitute for qualified legal or accounting counsel.

# Questions?

# Thank You



Ready For Real Business