STANISLAUS COUNTY   **Phone (209) 525-6393**
EMPLOYEES' RETIREMENT ASSOCIATION   **Fax (209) 558-5976**
832 12th Street, Suite 600   **www.stancera.org**
Modesto, CA 95354   **e-mail: retirement@stancera.org**
MAIL: P.O. Box 3150 Modesto 95353-3150

AGENDA

DIFFERENT LOCATION

OAKDALE GOLF & COUNTRY CLUB   **November 7, 2012**
243 N. Stearns Road – **Members Lounge**   **9:30 a.m.**
Oakdale, CA 95361

The Board of Retirement welcomes you to its meetings, which are regularly held on the second Wednesday and the fourth Tuesday of each month. Your interest is encouraged and appreciated.

CONSENT ITEMS: These matters include routine administrative actions and are identified under the Consent Items heading.

PUBLIC COMMENT: Matters under jurisdiction of the Board, may be addressed by the general public before or during the regular agenda. However, California law prohibits the Board from taking action on any matter which is not on the posted agenda unless it is determined an emergency by the Board of Retirement. Any member of the public wishing to address the Board during the "Public Comment," period shall be permitted to be heard once up to three minutes. Please complete a Public Comment Form and give it to the Chair of the Board. Any person wishing to make a presentation to the Board must submit the presentation in written form, with copies furnished to all Board members. Presentations are limited to three minutes.

BOARD AGENDAS & MINUTES: Board agendas, Minutes and copies of items to be considered by the Board of Retirement are customarily posted on the Internet by Friday afternoon preceding a meeting at the following website: www.stancera.org.

Materials related to an item on this Agenda submitted to the Board after distribution of the agenda packet are available for public inspection at StanCERA, 832 12th Street, Suite 600, Modesto, CA 95354, during normal business hours.

AUDIO: All Board of Retirement regular meetings are audio recorded. Audio recordings of the meetings are available after the meetings at http://www.stancera.org/sections/aboutus/agendas.

NOTICE REGARDING NON-ENGLISH SPEAKERS: Board of Retirement meetings are conducted in English and translation to other languages is not provided. Please make arrangements for an interpreter if necessary.

REASONABLE ACCOMMODATIONS: In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact the Board Secretary at (209) 525-6393. Notification 72 hours prior to the meeting will enable StanCERA to make reasonable arrangements to ensure accessibility to this meeting.

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1. <u>Meeting Called to Order</u>

2. <u>Roll Call</u>

3. <u>Announcements</u>

4. <u>Public Comment</u>

5. <u>Consent Items</u>

    a. CALAPRS - Election of Members to the Board of Directors   **View**

6. <u>Asset/Liability Study</u> **View**

7. <u>Adjournment</u>

CALAPRS

EDUCATION · COMMUNICATION · NETWORKING

California Association of Public Retirement Systems

OFFICIAL BALLOT

ELECTION OF DIRECTORS

There are five (5) vacancies on the ten-member Board of Directors. These five (5) positions are to be filled for the two-year term that expires December 31, 2014. The nominees each agreed to serve the term for which they are nominated. This election is being conducted in accordance with Section 6.3 of the CALAPRS Bylaws.

To Elect Five Directors for the Two-Year Term ending December 31, 2014

VOTE FOR ALL FIVE (5) NOMINEES CHECK HERE ☐

OR

Vote for individual nominees, check the boxes below:

Name:	System:	Vote:
David Bailey	San Mateo County Employees' Retirement Association	
David Kehler	Tulare County Employees' Retirement Association	
Marilyn Leedom	Contra Costa County Employees' Retirement Association	
Brian White	San Diego County Employees' Retirement Association	
Hugo Wildmann	Alameda-Contra Costa Transit District Retirement Plan	

OR

Write in up to five (5) names of eligible Member System Representatives*

*For CALAPRS' Bylaws definition of Eligible Member System Representative see the reverse of the cover letter.

Name:	System:
2 year:	
2 year:	
2 year:	
2 year:	
2 year:	

The election period ends on November 24, 2012

Please return to CALAPRS office at the address below. An envelope has been enclosed for your convenience.

**STANISLAUS COUNTY
EMPLOYEES' RETIREMENT ASSOCIATION**
832 12th Street, Suite 600
Modesto, CA 95354
P.O. Box 3150 Modesto, CA 95353-3150

Phone (209) 525-6393
Fax (209) 558-4976
www.stancera.org
e-mail: retirement@stancera.org

For the Retirement Board meeting
Held on November 7, 2012

11/07/12

Item #6

TO: Retirement Board

FROM: Rick Santos, Executive Director

I.   SUBJECT: Asset Liability Study and Recommended Assumptions

II.   RECOMMENDATION: Staff recommends the following assumptions:

    a. Price Inflation: 3.25%
    b. Real Wage Inflation: 0.25%
    c. Discount Rate: Within a range of 7.35% and 7.85%, depending on the risk profile chosen and whether a cash flow management plan is implemented
    d. Reassess the economic assumptions and economic environment in 2 years

III.   ANALYSIS:

Price Inflation

Price inflation represents the year over year increase in the price of goods or services produced in an economy. In general, when the growth in the money supply is larger than the supply of goods and services (GDP) being produced, inflation may result.

Since the early 1980's when inflation reached levels of over 15%, price inflation has been trending downward. The following graph shows the 10-year moving average in price inflation since 1979:


10 Year Moving Average Core Inflation

1
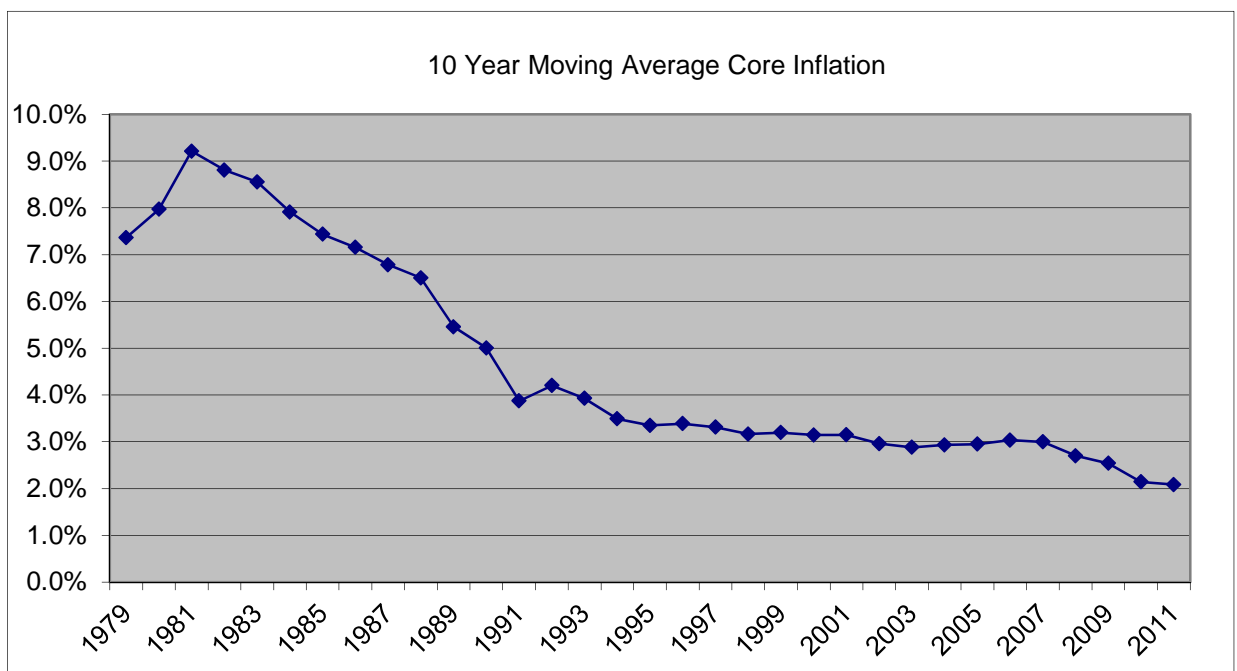
From the graph, it appears that there have been 3 significant levels or "regimes". Between 1979 and the late 1980's, the Federal Reserve (Fed) began and maintained an aggressive policy to lower rates of inflation. For the next 15 years, the Fed was extremely effective in keeping inflation in check and stable at levels between 3% and 4%. During that same period, the domestic economy experienced robust economic growth. However, beginning in late 2007, the world economy suffered severe shocks and economic growth and spending significantly declined. As a result, recent inflation has been trending downward.

One of the tools the Federal Reserve uses to promote economic growth is the supply of money. Over the past 4 years, the Fed has been increasing the money supply or potential flow of capital into the economy through their familiar programs called "Quantitative Easing". As mentioned earlier, generally when the growth in the money supply is larger than the supply of goods and services (GDP) being produced, inflation is a typical result.

Due to de-leveraging and a lack of spending by consumers, in the short-term it does not appear that rising inflation is a major risk. However, as spending and consumer confidence grow so might the risk of inflation. In this context, it is important to realize that our pension liabilities are extremely long-term. The majority of our liabilities won't be have to be paid for at least 12 to 15 years and a significant amount won't be settled for at least 25 to 30 years.

Inflation assumptions for 1937 Act Systems range from a high of 4% down to 3.25%. This information is taken from their most recently published actuarial valuations. It is likely that some of these Systems are currently relooking at this assumption. The following graph shows the inflation assumptions for the twenty 1937 Act Systems as of their last valuation date:
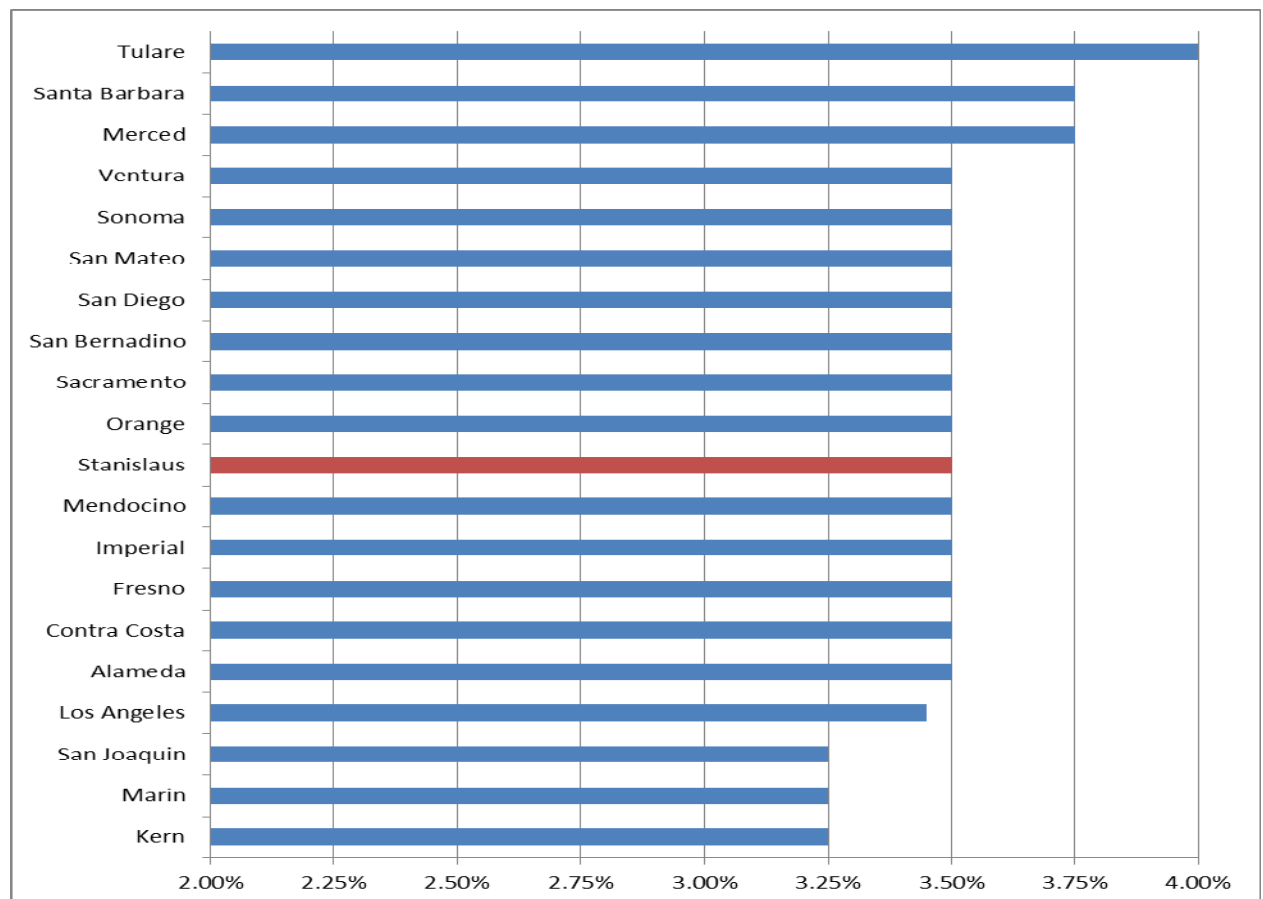
Staff is recommending reducing the inflation assumption from 3.50% to 3.25%. Changing the price inflation assumption will have an effect on employer contribution rates and service buy backs. We are also recommending that we revisit our economic assumptions and reassessment of the economic environment in 2 years, instead of waiting the traditional 3 years. A gradual change in the inflation assumption at this time appears prudent, in light of current economic uncertainty.

Real Wage Inflation

Wage inflation net of price inflation is generally considered the real increase in an individual's wages. The higher the wage inflation assumption, the higher a member's salary increases are over his or her career and their projected retirement benefit as well. Real wage inflation does affect employer contribution rates, but does not have an effect on the discount rate.

Currently, StanCERA's wage inflation is 3.75% for a real wage assumption of 0.25%. Staff is not recommending a change in the real wage assumption at this time. Public sector hiring and salaries suggest that this assumption would not be trending upwards. However, since staff is recommending a decrease in the price wage assumption, the overall wage inflation would naturally decrease to 3.50% (3.25% + 0.25%). As with price inflation, staff would also recommend revisiting this assumption in 2 years.

The Discount Rate

The discount rate or nominal rate of return a portfolio earns can be broken down into two components. Since the portfolio must earn a return greater than inflation to add value, the overall return to the plan is comprised of a real return and a return to compensate for inflation. Currently, StanCERA's discount rate assumption is comprised of a price inflation component of 3.5% and a real return of 4.5%.

If the Board accepts staff's recommendation for a price inflation assumption of 3.25%, the decision on the discount rate need only focus on the real return inherent in the portfolios under consideration. Consequently then, the discussion regarding the discount rate is, for all intents and purposes, a discussion concerning the level of portfolio risk the Board wishes to assume.

Choosing a portfolio is a balance between different interests. While the primary responsibility of the Board is to ensure payment of all benefits, they must also balance that responsibility with the impact contribution rates have on our plan sponsors.

Today, staff is presenting 4 scenarios of asset allocations, each of which focus on a different premise. The premises can best be described by their allocation to alternative investments. The alternative classes up for discussion today include commodities, infrastructure, direct lending and real estate. The following describes the differences across each scenario:

1. Scenario A: Allows up to 5% to all alternative classes
2. Scenario B: Allows up to 5% to alternative classes, excluding commodities
3. Scenario C: Allows up to 7.5% to alternative classes, excluding commodities
4. Scenario D: No allocation to alternative classes

Given the long-term nature of our liabilities and a desire to minimize risk for given levels of return, staff recommends focusing on Scenario C. Scenario C potentially allocates up to 7.5% to each alternative asset class, excluding commodities. The addition of commodities does not appear to add significant diversification value to the portfolio. Additionally, Scenario C maximizes the risk/reward ratio across the recommended mixes compared to Scenario's A, B and D.

Within each scenario are 9 mixes. Each mix has a specific expected return associated with it. The expected returns associated with the 9 mixes range between 6.85% and 8.87%. The program that

derives the results you see today takes each mix's expected return and solves for asset class weights that minimize the risk.

Staff is recommending either Mix 3, 4 or 5 within each scenario. Mixes 1 and 2 appear to allocate too much to fixed income at this point. While a move over time to more fixed income is certainly desirable, the current level of interest rates makes this an expensive proposition. Mixes above Mix 5 appear to take too much from fixed income and raises the risk level considerably. Additionally, mixes 3 and 4 still allow flexibility should the Board choose to implement a cash flow management plan (discussed next).

Cash flow management

Cash flow management is a balanced approached to risk taking. The concept recognizes when our cash flows come due and takes risk where risk is rewarded and eliminates risk where it is not. Specifically, for cash flows required to be paid in the near-term, risk is not efficiently or economically rewarded by investing in riskier assets. The idea can be likened to the risk a retiree takes by investing in equities to fund his or her income.

On the other hand, those cash flows that will not have to be paid until well into the future, offer an opportunity to fund those flows using higher yielding, less liquid assets. In this case, risk taking should be rewarded because of the commitment and ability to tie up capital for longer periods of time.

Staff has consulted with our fixed income manager and has been informed that with our current allocation to fixed income (around 37%), only slight changes to that part of the portfolio would need to be made to implement a plan that would cover 5 to 7 years of our cash flows no loss in yield. Afterwards, the number of cash flow years to insure could be revisited annually and that decision would necessarily be a function of the effect on employer contribution rates and the economic environment. If interest rates eventually start to increase, the incentive to insure would increase as the cost would decrease.

Currently, Mix 3 offers the best opportunity for cash flow management. Mix 4 will still allow the same opportunity, but will require a small reallocation within the fixed income portfolio to maintain yield. The concept could be implemented with Mix 5, however, the fixed income portfolio would require a larger reallocation and may have to assume a higher level of risk to maintain its current yield.

Asset allocation without regard to cash flow management

Without regard to a cash flow management plan, the more traditional approach to selecting the asset allocation would be in order. Specifically, the Board would decide on the return they seek to achieve, and then choose that mix which provides the lowest level of risk. If the Board chooses the more traditional approach, asset mixes 4 and 5 would seem most appropriate. Most likely, this would lead to a discount rate at the upper end of that recommended by staff, somewhere within the range of 7.60% to 7.85%.

The difference between a cash flow management plan and the traditional approach leads to a difference in the expected return that is attributable to potential changes in the resulting allocation to fixed income. Our actuary will be able to discuss the impact on employer contribution rates for the different allocations under consideration.

The discount rate of other 1937 Act Systems

The following graph depicts other Systems' discount rate as of their most recent valuation date (2011):

County	Discount Rate
Ventura	8.00%
Stanislaus	8.00%
San Diego	8.00%
Alameda	7.90%
Tulare	7.75%
Sonoma	7.75%
Santa Barbara	7.75%
San Mateo	7.75%
San Joaquin	7.75%
San Bernadino	7.75%
Sacramento	7.75%
Orange	7.75%
Merced	7.75%
Mendocino	7.75%
Kern	7.75%
Imperial	7.75%
Fresno	7.75%
Contra Costa	7.75%
Los Angeles	7.70%
Marin	7.50%
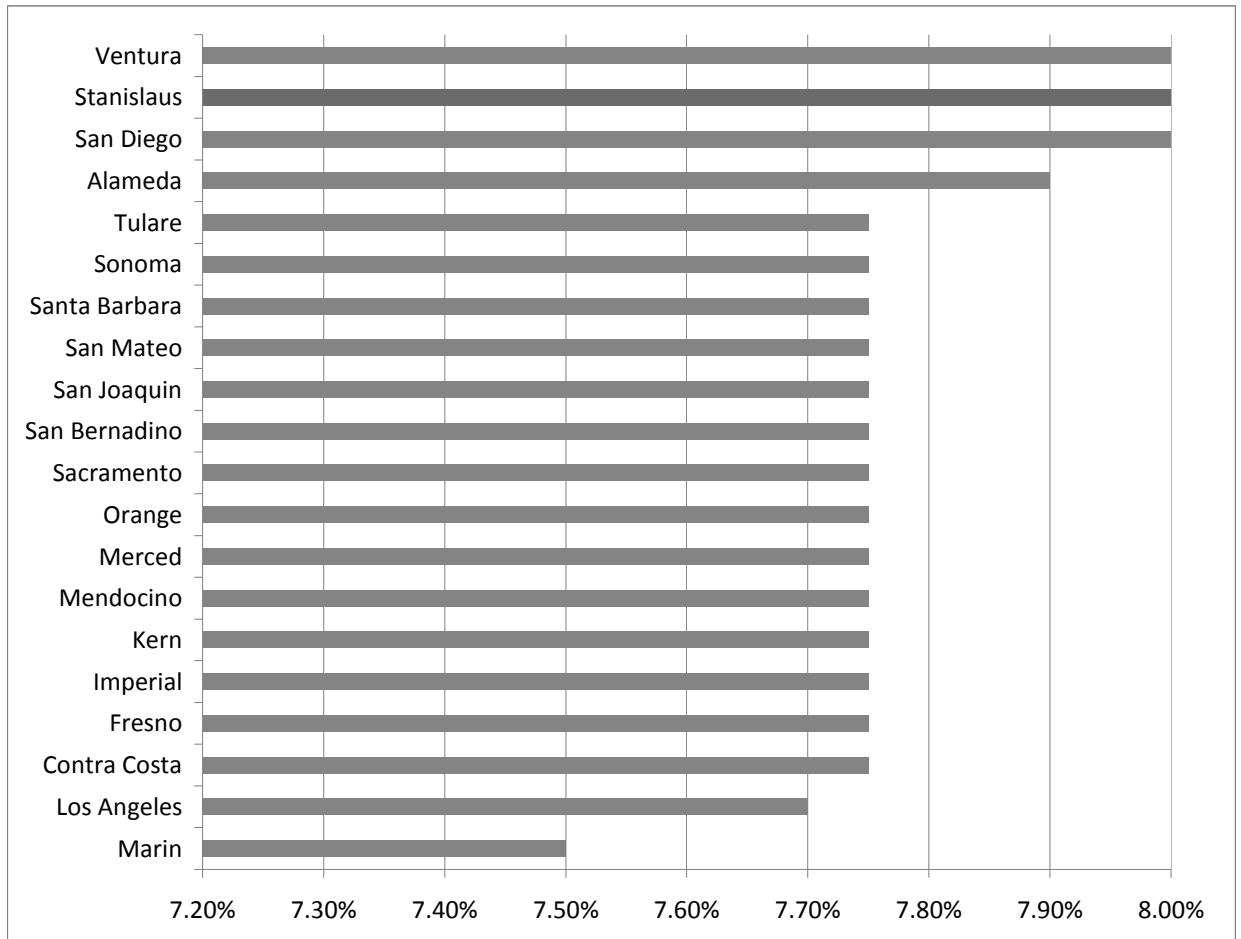
The allocation to alternative investments by other 1937 Act Systems

The following graph displays how other 1937 Act Systems deploy assets across the alternative investment space as a percentage of their total portfolios:
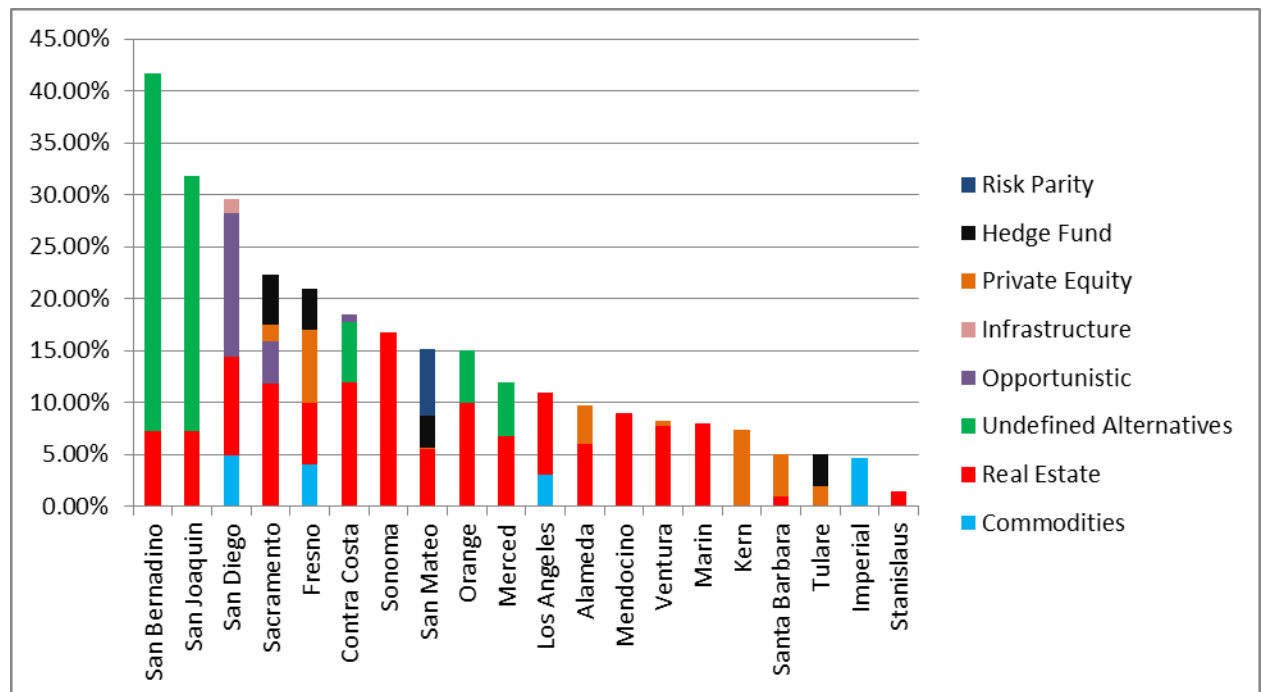
The next graph shows aggregate 1937 Act Systems' alternative dollars allocated across each class:

Other considerations

GASB

New GASB rules will require pension systems to report enhanced financial information as of June 30, 2014. This is for accounting purposes only and does not require StanCERA to change any of its funding methods to calculate contributions. However, there has been discussion and consideration regarding the use of the required GASB reporting method for actual funding. In the past, our actuary has estimated the change would increase employer contributions between 1% and 2.5%.

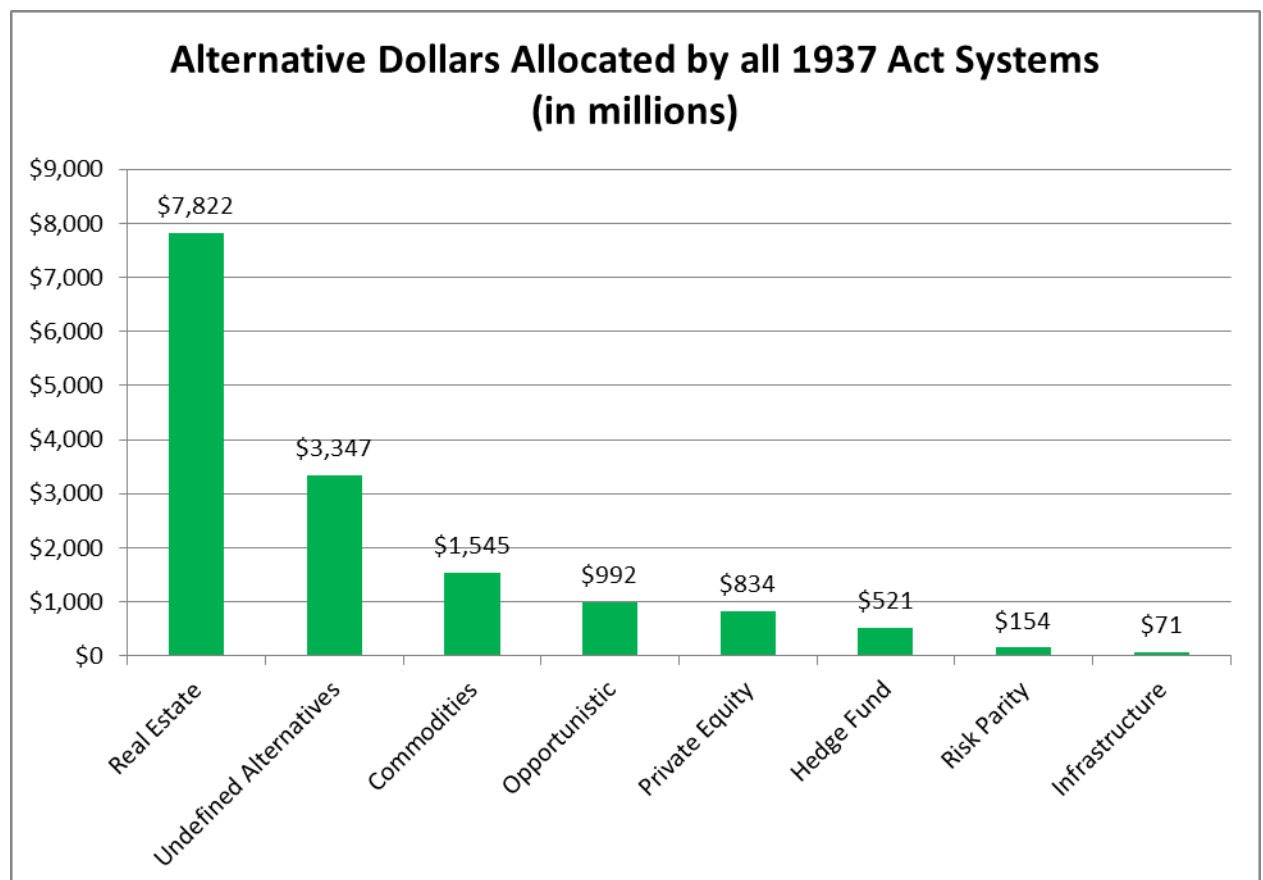With potential changes to the discount rate, the investment losses of 2011-2012 and an experience study just around the corner, the decision to switch doesn't need to be made at this time. However, staff will be addressing this at some point in the future.

Peer Comparison

Should the Board choose an allocation closer to the lower range of staff's recommendation, total return peer comparison would normally tend to be below the average in the long run. However, recent trends indicate that most Systems are considering lowering their discount rate below those reported in their most recent actuarial valuation (see graph on page 5).

IV.   RISK: The risk measure that most pension systems use to report and understand the uncertainty in portfolio returns is the standard deviation of the portfolio's expected return. The lower the standard deviation, the less variability or uncertainty surrounding the portfolio's actual return.

A portfolio that's expected to earn 8% with a standard deviation of 10% expects to see about 2/3's (or 67%) of its actual returns fall somewhere between -2% and 18%. By simply adding and subtracting the standard deviation from the expected return produces this range of uncertainty. Of course, 1/3 (or 33%) of the portfolio's actual returns will be either greater than 18% or less than -2%.

Standard deviations across all scenarios and mixes being presented today range from 8.8% to 15.3%. StanCERA's current standard deviation measure is around 11.3%. Standard deviation measures associated with staff's recommended discount rate range lie between 10.2% and 11.7%.

V.   STRATEGIC PLAN: Goal 1, Strategy C. Review investment decisions regularly and ensure that the Board has a full range of information to make informed decisions regarding investment policy

VI.   BUDGET IMPACT: There are no additional costs to StanCERA's annual budget. However, should there be any changes to the asset allocation there will be transition costs and fees involved. The calculation and expected cost of a transition is a complex subject. In addition to explicit fees and transaction costs there are also opportunity costs which can be significant. Opportunity costs include the timing of trades and market movements against the fund as it attempts to liquidate its portfolio in a short period of time.

StanCERA's most recent manager transition cost approximately 35.1 basis points in opportunity cost and 4.3 basis points in transaction cost of the $20.7 million portfolio. The cost in basis points for this example most likely lies at the upper boundary, since the transition in question involved buying and selling international real estate equities.

_____

Rick Santos, Executive Director

STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

ASSET/LIABILITY SIMULATION

ASSET MIXES FOR INVESTMENT CONSIDERATION

November 7, 2012

STRATEGIC INVESTMENT SOLUTIONS, INC.

333 Bush Street, Suite 2000
San Francisco, CA 94104
(415) 362-3484

Paul S. Harte
Vice President

StanCERA Target Portfolio Expectations – Scenario A

Projected StanCERA Asset Allocation
Scenario A- Alternative Asset Classes up to 5%
Fall 2012

Optimal Portfolios

Asset	Expected Return	Expected Std. Dev.	Limits Min	Limits Max	Current Mix
US Large Cap	8.0%	18.0%	0.0%	100.0%	33.1%
US Small Cap	8.3%	21.0%	0.0%	100.0%	8.3%
Int'l Stock	8.0%	18.5%	0.0%	100.0%	15.0%
EM Stock	8.5%	27.5%	0.0%	100.0%	5.0%
US Fixed Income	2.8%	4.5%	0.0%	100.0%	37.1%
Real Estate	6.6%	18.5%	0.0%	5.0%	1.5%
Direct Lending	8.3%	17.6%	0.0%	5.0%	0.0%
Commodities	4.3%	30.0%	0.0%	5.0%	0.0%
Infrastructure	6.6%	18.5%	0.0%	5.0%	0.0%
Totals					100.0%
Gm Mean Return					6.63%
Std. Deviation					11.30%

Constraints:
- Real Estate, Direct Lending, Commodities & Infrastructure each @ maximum of 5%
- US Small Cap maximum of 20% of US Equity
- EM Stock maximum of 25% of Non-US Equity (ACWI ex-US)
- Non-US Equity maximum of 33% of Total Public Equity (as per current)
- Direct Lending modeled HY (5.3%) return +300 bps illiquidity premium at 17.6% Risk (same Sharpe Ratio as HY)

Comments
- Introduces Direct Lending, Commodities and Infrastructure up to a maximum 5% allocation
- Real Estate up to a maximum 5% allocation
- Models Direct Lending at a higher standard deviation. Only change from previous modeling is raising the risk level of Direct Lending from 10.0% to 17.6% (that corresponds to the same Sharpe ratio as High Yield).
- There is a minimal effect of raising the risk (Standard Deviation) by 20-30 bps at the total plan level vs. Direct Lending at a 10% Standard Deviation.

StanCERA Target Portfolio Expectations – Scenario A Mixes

Scenario A
Optimal Portfolios

	Current									
		Asset Mix Alternatives								
Asset	Mix	1	2	3	4	5	6	7	8	9
US Lrg Cap	33.1%	22.2%	24.2%	26.2%	28.2%	30.0%	31.9%	34.3%	36.8%	39.3%
US Sml Cap	8.3%	5.5%	6.1%	6.5%	7.0%	7.5%	8.0%	8.6%	9.2%	9.6%
US Fixed	37.1%	48.0%	43.4%	38.8%	34.2%	29.4%	24.2%	19.1%	13.8%	8.2%
Intl Stock	15.0%	9.8%	10.7%	11.6%	12.4%	13.3%	14.1%	15.1%	16.2%	17.3%
EM Stock	5.0%	3.3%	3.6%	3.9%	4.1%	4.4%	4.7%	5.0%	5.4%	5.8%
Real Est	1.5%	1.3%	1.5%	1.7%	2.0%	2.0%	2.8%	2.8%	3.7%	4.9%
Dir Lend	0.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Commod	0.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Infrast	0.0%	0.0%	0.5%	1.3%	2.2%	3.3%	4.3%	5.0%	5.0%	5.0%
Totals	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Gm Mean	6.63%	6.00%	6.26%	6.51%	6.76%	7.01%	7.27%	7.52%	7.77%	8.02%
Std Dev	11.30%	9.12%	9.82%	10.53%	11.25%	12.00%	12.79%	13.60%	14.44%	15.30%
SIS Infl	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%
SIS Real	4.23%	3.60%	3.86%	4.11%	4.36%	4.61%	4.87%	5.12%	5.37%	5.62%
Inflation	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%
Return	7.48%	6.85%	7.11%	7.36%	7.61%	7.86%	8.12%	8.37%	8.62%	8.87%

Assumed optimization time period is 10 years.

Comments

▪ Mixes increase returns by about 25 bps from 6.0% to 8.0%. Mix 3 has a similar level of FI vs. current mix and Equities go down to 48.2% from 61.4%. RE stays about the same and introduces Direct Lending (5%), Commodities (5%) and Infrastructure (1.3%). In Mix 4, FI is lowered by about 3% and Equities go down to 51.7%. SIS Real Return is introduced along with Inflation at 3.25% and an Expected Return based upon 3.25% inflation. Mix 5 has an Expected Return of 7.86% at the 3.25% inflation level.

StanCERA Target Portfolio Expectations – Scenario B

Projected StanCERA Asset Allocation

Scenario B - Alternative Asset Classes up to 5% excluding Commodities

Fall 2012

- Scenario B removes Commodities from consideration as an alternative asset class.
- The overall effect to the total plan is a slightly higher risk level (+20 bps) compared to the mixes in Scenario A.

Optimal Portfolios

Asset	Expected Return	Expected Std. Dev.	Limits Min	Limits Max	Current Mix
US Large Cap	8.0%	18.0%	0.0%	100.0%	33.1%
US Small Cap	8.3%	21.0%	0.0%	100.0%	8.3%
Int'l Stock	8.0%	18.5%	0.0%	100.0%	15.0%
EM Stock	8.5%	27.5%	0.0%	100.0%	5.0%
US Fixed Income	2.8%	4.5%	0.0%	100.0%	37.1%
Real Estate	6.6%	18.5%	0.0%	5.0%	1.5%
Direct Lending	8.3%	**17.6%**	0.0%	5.0%	0.0%
Infrastructure	6.6%	18.5%	0.0%	5.0%	0.0%
Totals					100.0%
Gm Mean Return					6.63%
Std. Deviation					11.30%

Constraints:

- Real Estate, Direct Lending & Infrastructure each @ maximum of 5%, **with No Commodities**
- US Small Cap maximum of 20% of US Equity
- EM Stock maximum of 25% of Non-US Equity (ACWI ex-US)
- Non-US Equity maximum of 33% of Total Public Equity (as per current)
- Direct Lending modeled HY (5.3%) return +300 bps illiquidity premium at 17.6% Risk

StanCERA Target Portfolio Expectations – Scenario B Mixes

Scenario B
Optimal Portfolios

	Current	Asset Mix Alternatives								
Asset	Mix	1	2	3	4	5	6	7	8	9
US Lrg Cap	33.1%	24.1%	25.8%	27.9%	29.7%	31.5%	33.1%	36.0%	38.1%	40.7%
US Sml Cap	8.3%	6.0%	6.5%	7.0%	7.4%	7.8%	8.3%	9.0%	9.5%	10.2%
US Fixed	37.1%	48.7%	44.2%	39.7%	35.1%	30.4%	25.5%	20.6%	15.5%	10.2%
Intl Stock	15.0%	10.6%	11.4%	12.3%	13.1%	13.9%	14.6%	15.9%	16.8%	18.0%
EM Stock	5.0%	3.5%	3.8%	4.1%	4.4%	4.6%	4.9%	5.3%	5.6%	6.0%
Real Est	1.5%	2.1%	2.7%	2.6%	2.8%	3.5%	4.4%	4.0%	4.4%	5.0%
Dir Lend	0.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Infrast	0.0%	0.0%	0.6%	1.4%	2.4%	3.4%	4.4%	4.2%	5.0%	5.0%
Totals	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Gm Mean	6.63%	6.00%	6.25%	6.49%	6.74%	6.98%	7.22%	7.47%	7.72%	7.96%
Std Dev	11.30%	9.31%	9.99%	10.68%	11.40%	12.12%	12.87%	13.65%	14.46%	15.30%
SIS Infl	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%
SIS Real	4.23%	3.60%	3.85%	4.09%	4.34%	4.58%	4.82%	5.07%	5.32%	5.56%
Inflation	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%
Return	7.48%	6.85%	7.10%	7.34%	7.59%	7.83%	8.07%	8.32%	8.57%	8.81%

Assumed optimization time period is 10 years.

Comments

- Scenario B (without Commodities) compared to Scenario A has a similar return/risk profile with about 15 bps higher Standard Deviation. Mix 3 has a higher FI allocation of 2% vs. current mix and Equities go down to 51.3% from 61.4%. RE goes up by about 1% and introduces Direct Lending (5%) and Infrastructure(1.4%). In Mix 4, FI is lowered by 2% and Equities go down to 54.6%. SIS Real Return is introduced along with Inflation at 3.25% and Expected Return forecast based upon 3.25% inflation level. Mix 5 has an Expected Return of 7.83% at the 3.25% inflation level.

StanCERA Target Portfolio Expectations – Scenario C

Projected StanCERA Asset Allocation
Scenario C - Alternative Asset Classes up to 7.5% excluding Commodities
Fall 2012

Optimal Portfolios

Asset	Expected Return	Expected Std. Dev.	Limits Min	Limits Max	Current Mix
US Large Cap	8.0%	18.0%	0.0%	100.0%	33.1%
US Small Cap	8.3%	21.0%	0.0%	100.0%	8.3%
Int'l Stock	8.0%	18.5%	0.0%	100.0%	15.0%
EM Stock	8.5%	27.5%	0.0%	100.0%	5.0%
US Fixed Income	2.8%	4.5%	0.0%	100.0%	37.1%
Real Estate	6.6%	18.5%	0.0%	**7.5%**	1.5%
Direct Lending	8.3%	**17.6%**	0.0%	**7.5%**	0.0%
Infrastructure	6.6%	18.5%	0.0%	**7.5%**	0.0%
Totals					100.0%
Gm Mean Return					6.63%
Std. Deviation					11.30%

Comments

- Scenario C removes Commodities from consideration as an alternative asset class.
- Scenario C models alternative asset classes up to 7.5% instead of 5.0% in Scenario B.

Constraints:
- Real Estate, Direct Lending & Infrastructure each @ maximum of 7.5%
- US Small Cap maximum of 20% of US Equity
- EM Stock maximum of 25% of Non-US Equity (ACWI ex-US)
- Non-US Equity maximum of 33% of Total Public Equity (as per current)
- Direct Lending modeled HY (5.3%) return +300 bps illiquidity premium at 17.6% Risk

StanCERA Target Portfolio Expectations – Scenario C Mixes

Scenario C
Optimal Portfolios

Asset	Current Mix				Asset Mix Alternatives					
		1	2	3	4	5	6	7	8	9
US Lrg Cap	33.1%	22.9%	24.9%	26.8%	28.6%	30.5%	32.4%	34.4%	36.2%	38.5%
US Sml Cap	8.3%	5.7%	6.2%	6.7%	7.2%	7.6%	8.1%	8.6%	9.0%	9.5%
US Fixed	37.1%	48.2%	43.7%	39.1%	34.5%	29.8%	25.0%	20.2%	15.1%	10.0%
Intl Stock	15.0%	10.1%	11.0%	11.8%	12.6%	13.5%	14.3%	15.1%	16.0%	16.9%
EM Stock	5.0%	3.4%	3.7%	3.9%	4.2%	4.5%	4.8%	5.0%	5.3%	5.6%
Real Est	1.5%	2.3%	2.7%	3.0%	3.3%	3.5%	3.6%	3.7%	3.8%	4.5%
Dir Lend	0.0%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%
Infrast	0.0%	0.0%	0.2%	1.2%	2.0%	3.0%	4.3%	5.5%	7.1%	7.5%
Totals	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Gm Mean	6.63%	6.00%	6.25%	6.50%	6.75%	7.00%	7.25%	7.50%	7.75%	7.99%
Std Dev	11.30%	8.83%	9.50%	10.20%	10.92%	11.65%	12.41%	13.18%	13.99%	14.80%
SIS Infl	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%
SIS Real	4.23%	3.60%	3.85%	4.10%	4.35%	4.60%	4.85%	5.10%	5.35%	5.59%
Inflation	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%
Return	7.48%	6.85%	7.10%	7.35%	7.60%	7.85%	8.10%	8.35%	8.60%	8.84%

Comments

- Scenario C (no Commodities) ,with up to a 7.5% maximum allocation to alternatives compared to 5% in Scenario B, has a similar return profile with about 50 bps lower Standard Deviation. Mix 3 has a higher FI allocation of 2% and Equities go down to 49.2% from 61.4%. RE goes up by about 1%, Direct Lending at 7.5%, and Infrastructure at 2%. In Mix 4, FI is lowered by 2.6% and Public Equities go down to 52.6%. SIS Real Return is introduced along with Inflation at 3.25% and Expected Return based upon 3.25% inflation.. Mix 5 has an Expected Return of 7.85% at the 3.25% inflation level.

StanCERA Target Portfolio Expectations – Scenario D

Projected StanCERA Asset Allocation

Scenario D - No New Asset Classes

Fall 2012

Optimal Portfolios

Efficient Frontier
No new asset classes

Asset	Expected Return	Expected Std. Dev.	Limits Min	Limits Max	Current Mix	Asset Mix Alternatives: 1	2	3	4	5
US Large Cap	8.0%	18.0%	0.0%	100.0%	33.1%	26.0%	31.0%	36.0%	42.0%	47.0%
US Small Cap	8.3%	21.0%	0.0%	100.0%	8.3%	6.0%	7.0%	9.0%	10.0%	12.0%
Int'l Stock	8.5%	27.5%	0.0%	100.0%	15.0%	12.0%	14.0%	16.0%	18.0%	21.0%
EM Stock	8.0%	18.5%	0.0%	100.0%	5.0%	4.0%	4.5%	5.0%	6.0%	7.0%
US Fixed Income	2.8%	4.5%	0.0%	100.0%	37.1%	48.5%	38.5%	29.0%	19.0%	8.0%
Real Estate	6.6%	18.5%	0.0%	5.0%	1.5%	3.5%	5.0%	5.0%	5.0%	5.0%
Totals					100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Gm Mean Return					**6.6%**	**6.0%**	**6.5%**	**7.0%**	**7.5%**	**8.0%**
Std. Deviation					**11.3%**	**9.5%**	**10.9%**	**12.4%**	**14.1%**	**15.9%**

Constraints:

Real Estate maximum of 5%

US Small Cap maximum of 20% of US Equity

EM Stock maximum of 25% of Non-US Equity (ACWI ex-US)

Non-US Equity maximum of 33% of Total Public Equity (as per current)

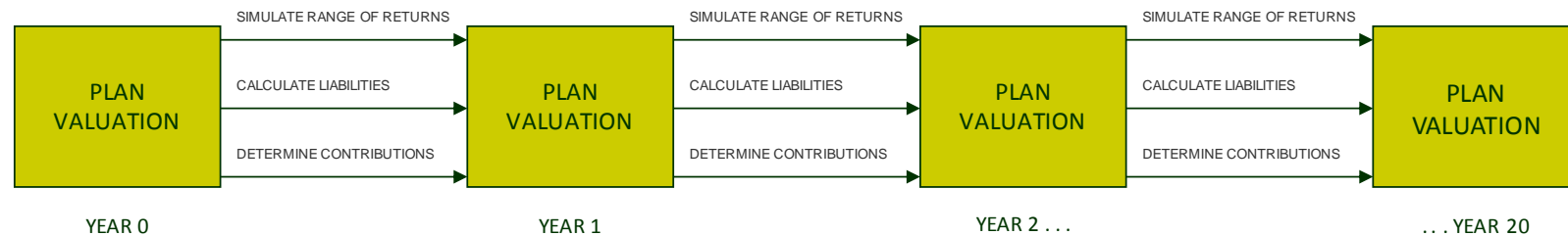6.0% < Expected (return) < 8.0%
actuarial interest rate

Current Mix
Real Return = 4.2% (6.6% - 2.4% Inflation)
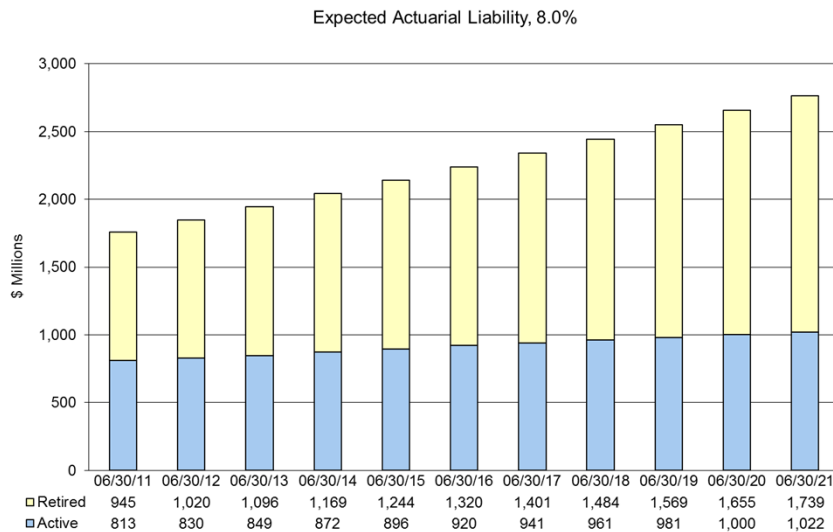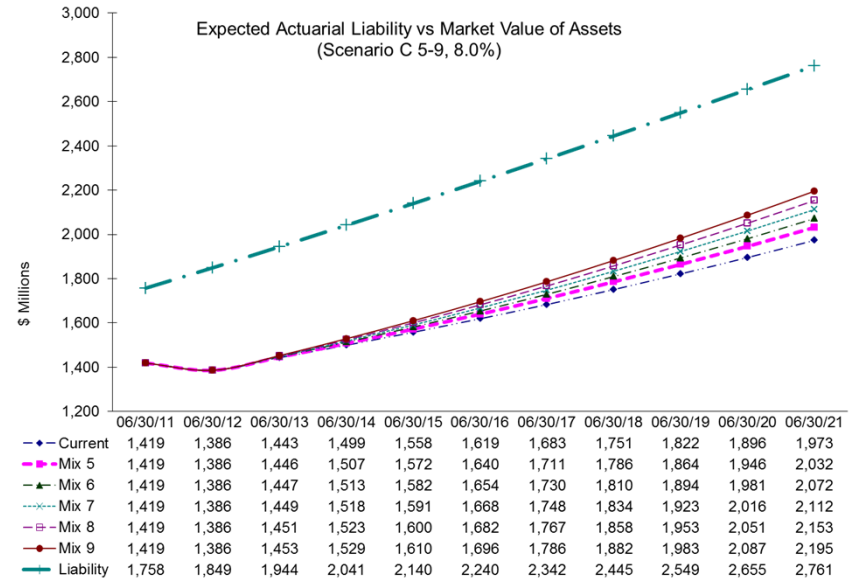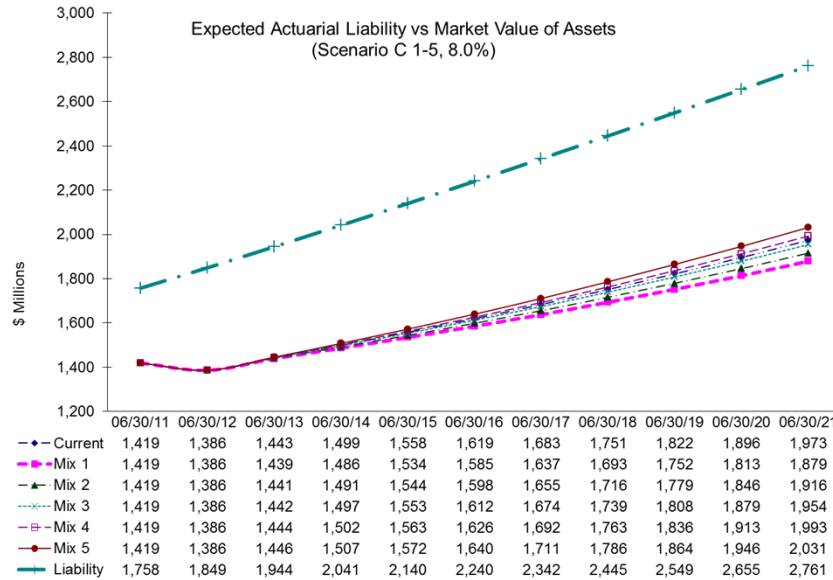
Asset Allocation Mixes Observations

- Scenario A – Introduces Direct Lending, Commodities and Infrastructure up to a maximum 5% allocation. Real Estate also has a maximum 5% allocation. Models Direct Lending at a higher standard deviation for comparison.

  ☐ Alternatives goes up and public markets equities go down in asset allocation mixes 1-6 vs. Current

- Scenario B – same as Scenario A with the difference of no Commodities

  ☐ Mixes 3-5 in Scenario B is almost identical to Scenario A with a slightly higher level of total plan risk

- Scenario C – same as Scenario B (no commodities) with the alternative asset classes maximum increased to a 7.5% allocation

  ☐ Lowers standard deviation of total plan risk by about 50 bps vs. Scenario B

  ☐ Lowers public markets equity allocation vs. Scenario B

  ☐ Direct Lending taken at a full 7.5% weight

Simulating the Performance of Current & Alternative Asset Mixes

| PLAN VALUATION	SIMULATE RANGE OF RETURNS → CALCULATE LIABILITIES → DETERMINE CONTRIBUTIONS →	PLAN VALUATION	SIMULATE RANGE OF RETURNS → CALCULATE LIABILITIES → DETERMINE CONTRIBUTIONS →	PLAN VALUATION	SIMULATE RANGE OF RETURNS → CALCULATE LIABILITIES → DETERMINE CONTRIBUTIONS →	PLAN VALUATION
YEAR 0		YEAR 1		YEAR 2 . . .		. . . YEAR 20

- Monte Carlo – 5000 "random" multi-year outcomes

- Starts with June 30, 2011 actuarial valuation

- Includes June 30, 2012 fund value

- Liability & cost calibrated to EFI projections

- Focus on outcomes at five-year planning horizon (June 30, 2017)

- Results for asset mix scenario C shown on following slides

Constant-Return Projections w/ Current 8.0% Interest Rate

Expected Actuarial Liability vs Market Value of Assets
(Scenario C 1-5, 8.0%)

	06/30/11	06/30/12	06/30/13	06/30/14	06/30/15	06/30/16	06/30/17	06/30/18	06/30/19	06/30/20	06/30/21
Current	1,419	1,386	1,443	1,499	1,558	1,619	1,683	1,751	1,822	1,896	1,973
Mix 1	1,419	1,386	1,439	1,486	1,534	1,585	1,637	1,693	1,752	1,813	1,879
Mix 2	1,419	1,386	1,441	1,491	1,544	1,598	1,655	1,716	1,779	1,846	1,916
Mix 3	1,419	1,386	1,442	1,497	1,553	1,612	1,674	1,739	1,808	1,879	1,954
Mix 4	1,419	1,386	1,444	1,502	1,563	1,626	1,692	1,763	1,836	1,913	1,993
Mix 5	1,419	1,386	1,446	1,507	1,572	1,640	1,711	1,786	1,864	1,946	2,031
Liability	1,758	1,849	1,944	2,041	2,140	2,240	2,342	2,445	2,549	2,655	2,761

Expected Actuarial Liability vs Market Value of Assets
(Scenario C 5-9, 8.0%)

	06/30/11	06/30/12	06/30/13	06/30/14	06/30/15	06/30/16	06/30/17	06/30/18	06/30/19	06/30/20	06/30/21
Current	1,419	1,386	1,443	1,499	1,558	1,619	1,683	1,751	1,822	1,896	1,973
Mix 5	1,419	1,386	1,446	1,507	1,572	1,640	1,711	1,786	1,864	1,946	2,032
Mix 6	1,419	1,386	1,447	1,513	1,582	1,654	1,730	1,810	1,894	1,981	2,072
Mix 7	1,419	1,386	1,449	1,518	1,591	1,668	1,748	1,834	1,923	2,016	2,112
Mix 8	1,419	1,386	1,451	1,523	1,600	1,682	1,767	1,858	1,953	2,051	2,153
Mix 9	1,419	1,386	1,453	1,529	1,610	1,696	1,786	1,882	1,983	2,087	2,195
Liability	1,758	1,849	1,944	2,041	2,140	2,240	2,342	2,445	2,549	2,655	2,761

Expected Actuarial Liability, 8.0%

	06/30/11	06/30/12	06/30/13	06/30/14	06/30/15	06/30/16	06/30/17	06/30/18	06/30/19	06/30/20	06/30/21
Retired	945	1,020	1,096	1,169	1,244	1,320	1,401	1,484	1,569	1,655	1,739
Active	813	830	849	872	896	920	941	961	981	1,000	1,022

Expected Employer Contribution as % of Pay
(Current Mix, 8.0%)

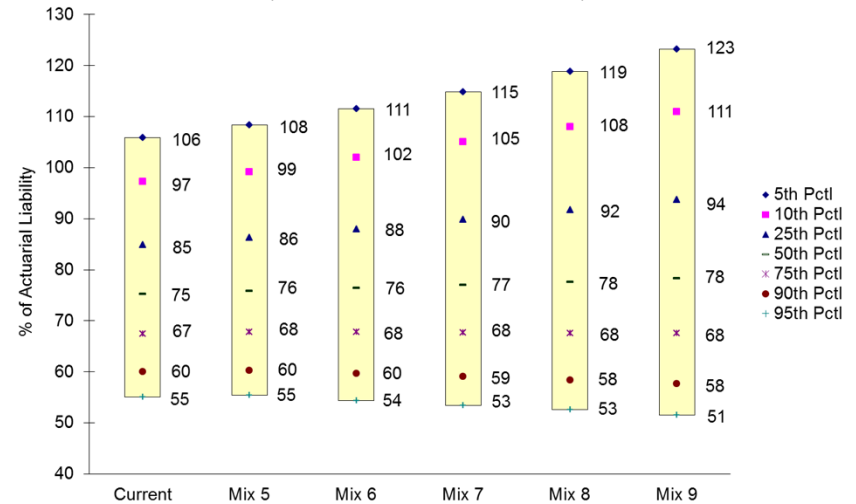|	06/30/11	06/30/12	06/30/13	06/30/14	06/30/15	06/30/16	06/30/17	06/30/18	06/30/19	06/30/20	06/30/21
Contrib %		18.8	19.5	21.2	22.8	24.7	26.8	28.3	29.8	31.3	32.9

Range of Funded Status & Contributions w/ Current 8.0% Interest Rate
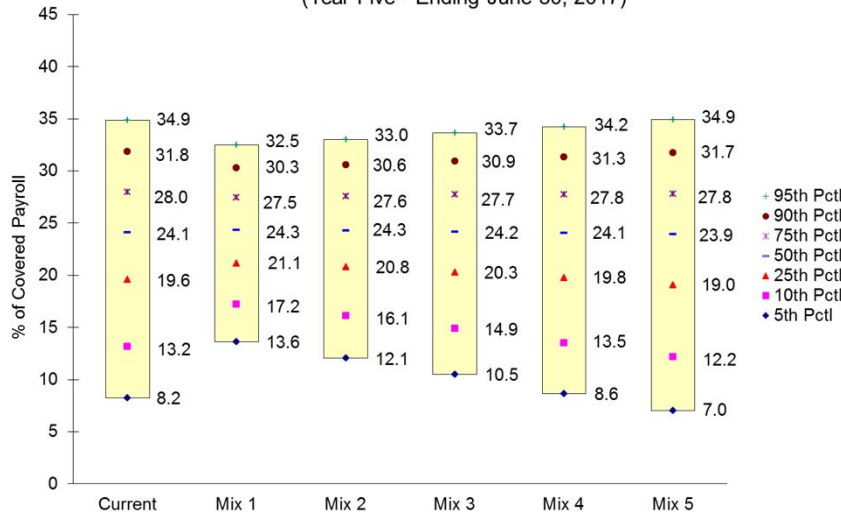

Range of Actuarial Value Funded Status – Scenario C 1-5, 8.0%
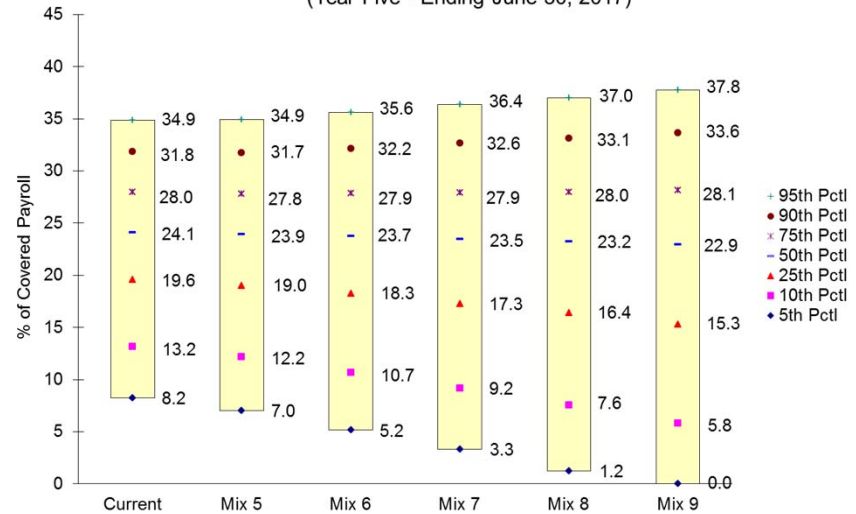(End of Year Five - June 30, 2017)
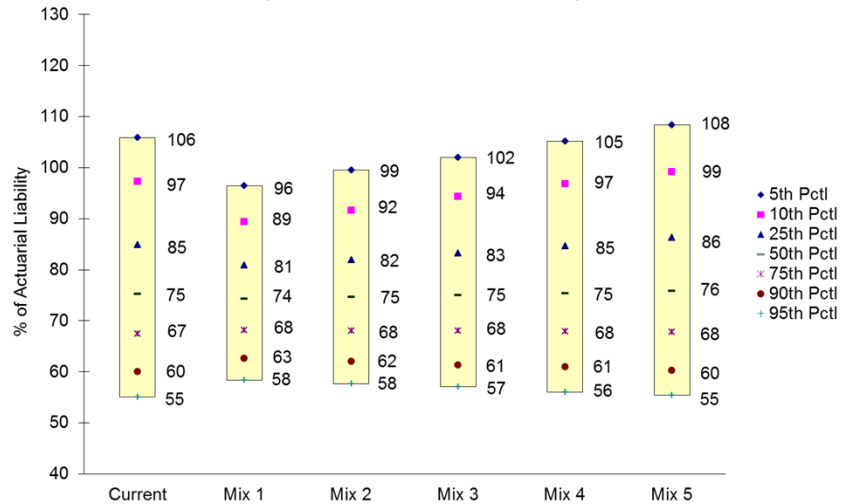
Range of Actuarial Value Funded Status – Scenario C 5-9, 8.0%
(End of Year Five - June 30, 2017)

Range of Employer Contributions as % of Pay – Scenario C 1-5, 8.0%
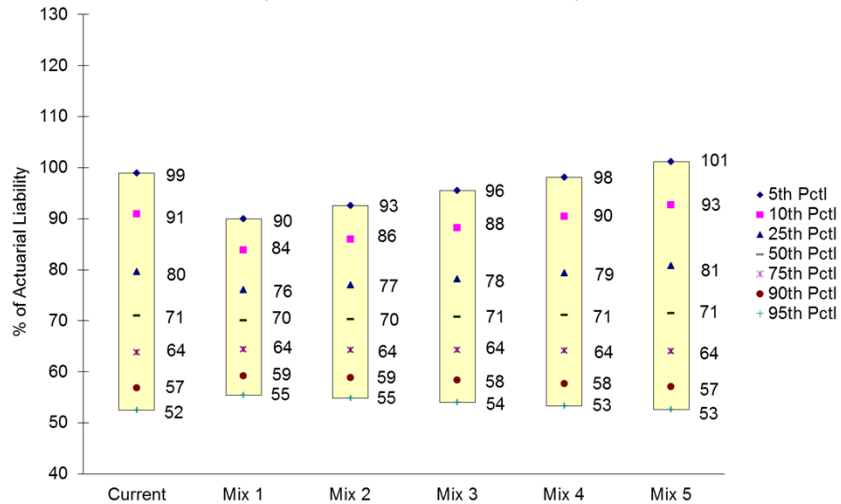(Year Five - Ending June 30, 2017)

Range of Employer Contributions as % of Pay – Scenario C 5-9, 8.0%
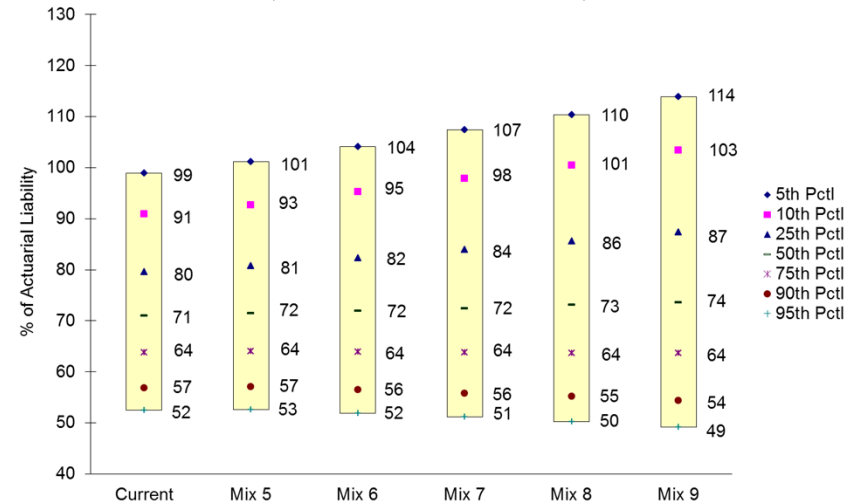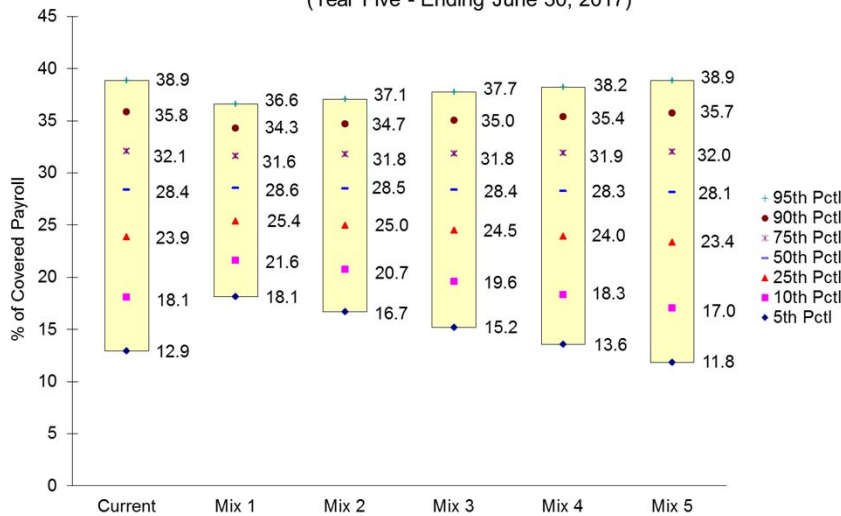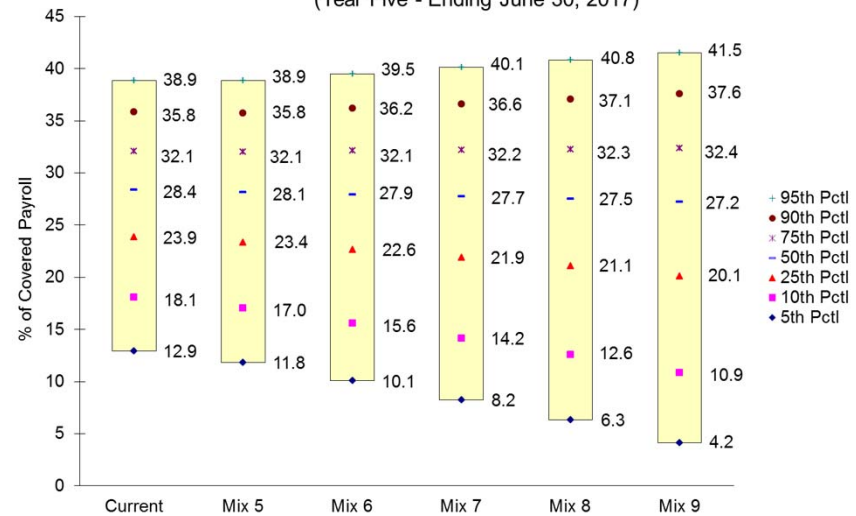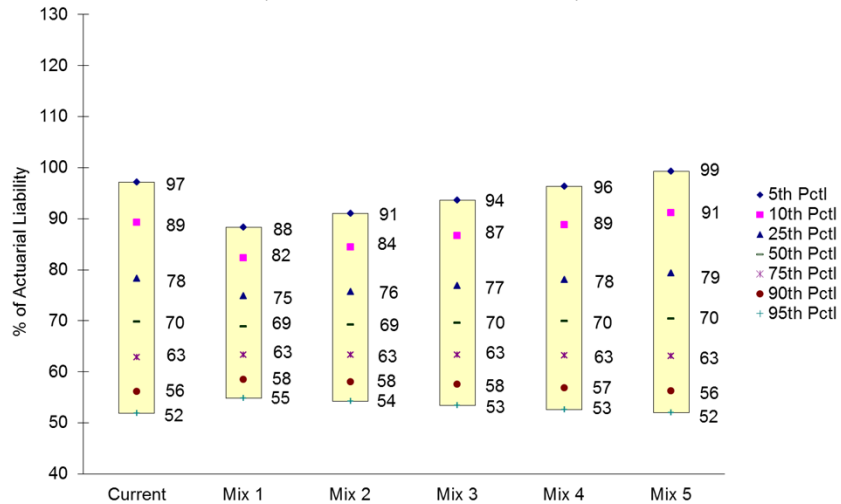(Year Five - Ending June 30, 2017)

STRATEGIC INVESTMENT SOLUTIONS, INC.

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Funded Status & Contributions with 7.75% Rate on 6/30/2012

Range of Actuarial Value Funded Status – Scenario C 1-5, 7.75%
(End of Year Five - June 30, 2017)

Range of Actuarial Value Funded Status – Scenario C 5-9, 7.75%
(End of Year Five - June 30, 2017)

Range of Employer Contributions as % of Pay – Scenario C 1-5, 7.75%
(Year Five - Ending June 30, 2017)

Range of Employer Contributions as % of Pay – Scenario C 5-9, 7.75%
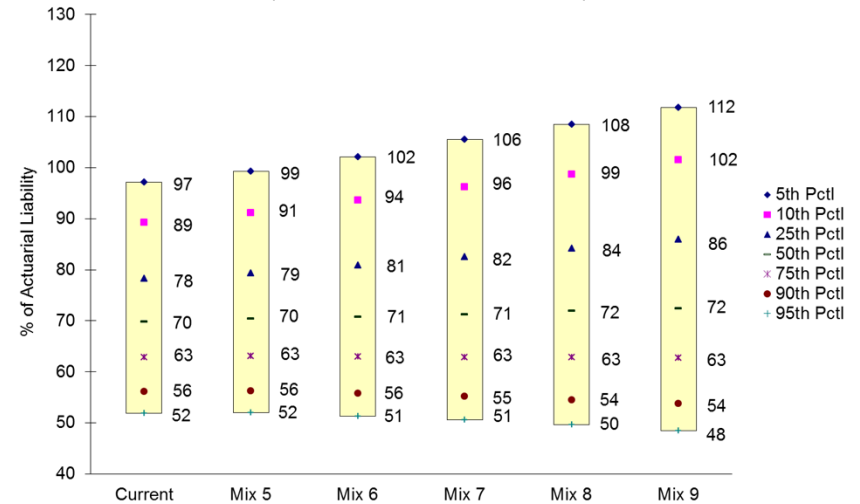(Year Five - Ending June 30, 2017)

STRATEGIC INVESTMENT SOLUTIONS, INC.

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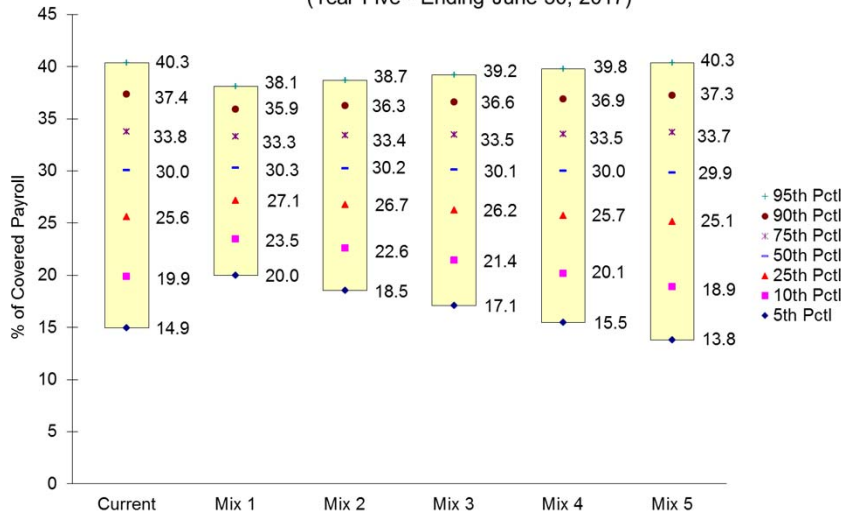# Funded Status & Contributions with 7.50% Rate on 6/30/2012

Range of Actuarial Value Funded Status – Scenario C 1-5, 7.50%
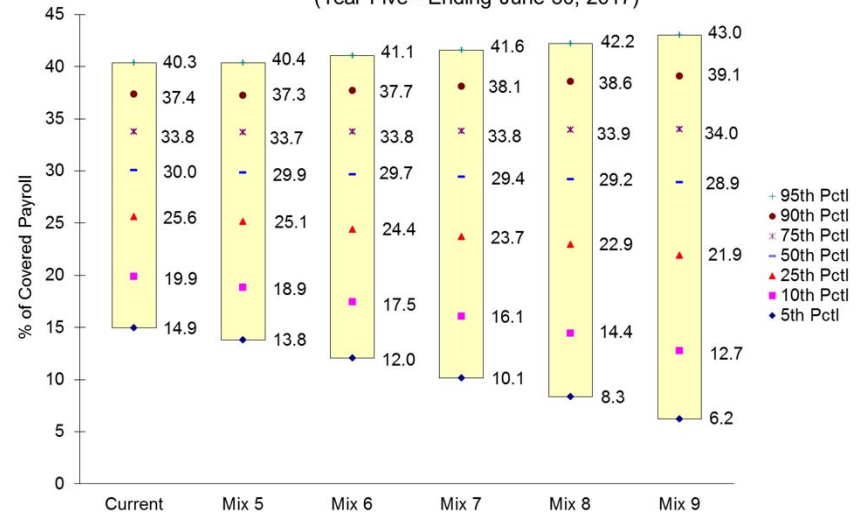(End of Year Five - June 30, 2017)

Range of Actuarial Value Funded Status – Scenario C 5-9, 7.50%
(End of Year Five - June 30, 2017)

Range of Employer Contributions as % of Pay – Scenario C 1-5, 7.50%
(Year Five - Ending June 30, 2017)

Range of Employer Contributions as % of Pay – Scenario C 5-9, 7.50%
(Year Five - Ending June 30, 2017)

STRATEGIC INVESTMENT SOLUTIONS, INC.

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Recommendations

1) Scenario B without Commodities has a minimal effect on total plan risk vs. Scenario A with Commodities (Scenario B has about 20 bps higher standard deviation vs. Scenario A)

2) The model takes Direct Lending up to its maximum weight in all Scenarios

3) Recommend not adding Commodities at this point in time given low expected return and high risk of asset class (low Sharpe Ratio).

4) Recommend consideration of Scenario C allowing alternatives to go up to a maximum of 7.5% with No Commodities

5) Scenario C, Mixes 3-5 is our recommendation for consideration given:

   a) Mixes 1-2 returns are too low with Fixed Income allocation too high

   b) Mixes 6-8 risks are too high with Equity allocation too high

   c) Expected Real Return of 4.10% (Mix 3) up to 4.60% (Mix 5)

   d) Expected Risk of 10.20% (Mix 3) up to 11.65% (Mix 5)

   e) Fixed Income allocation kept at or close to Current Mix level which allows income to help pay retiree benefits

APPENDIX

STRATEGIC INVESTMENT
SOLUTIONS, INC.

Asset Classes for Consideration – Real Estate

- Real Estate Investment Trust (REIT) company, usually traded publicly, that manages a portfolio of real estate to earn profits for shareholders. REITs make investments in a diverse array of real estate. To avoid taxation at the corporate level, 75% or more of the REIT's income must be from real property and 95% in net earnings must be distributed to shareholders annually. REITs tend to pay yields of 5% to 10%.

- Real Estate Limited Partnership (Private RE) buys properties and passes rental income to limited partners. If the properties appreciate in value over time, they can be sold and the profit passed to limited partners.

- Private RE tends to have a higher fee structure

   - Up to 2% management fee and 20% carry; illiquid in nature.

- Private RE can be divided into Core, Value-added and Opportunistic.

Asset Classes for Consideration – Real Estate

- Expected Return = 6.6% (REITs)

- Expected Risk = 18.5%

- Sharpe Ratio = 0.249

Correlations	Real Estate
US Lg. Cap Equities	0.63
U.S. Sm. Cap Equities	0.61
U.S. Fixed Income	0.17
Int'l Stocks	0.58
EM Stocks	0.52
High Yield FI	0.65
Private Equity	0.46
Absolute Ret. HF	0.65
U.S. TIPS	0.28
Commodities	0.65
Infrastructure	0.55

Asset Classes for Consideration – Real Estate

- No liquidity premium as REITs are public market instruments. A liquidity premium should exist for Private Real Estate although it is hard to quantify

- Private RE Core attempts to gain exposure and replicate the NCREIF Index or ODCE Core.

  □ Private RE Value Added should conservatively add 150-200 bps above Core

  □ Private Opportunistic RE should add 300-400 bps above Core

- There are capital calls for Private Real Estate investments, however none for REITs

- Real Estate returns, as measured by equity REITs, have consistently provided returns above U.S. Fixed Income and below U.S. Equity. The forecast inputs:

  □ Current capitalization rates used for appraisals adjusted for fees and give-ups

  □ Equity REITs beta relative to the S&P 500 (currently 0.55) multiplied by the U.S. equity expected return

- Real Estate performs well in stable and/or rising interest rate environments

- Real Estate performs well in steady and/or above-average economic growth environments

Asset Classes for Consideration – Real Estate

Projected StanCERA Results
Fall 2012

Asset	Expected Return	Expected St. Dev.	Current StanCERA Mix	increase RE to 5.0%	increase RE to 7.5%
US Large Cap	8.00%	18.00%	33.10%	33.10%	33.10%
US Small Cap	8.30%	21.00%	8.30%	8.30%	8.30%
US Fixed Income	2.80%	4.50%	37.10%	33.60%	31.10%
Int'l Stock	8.00%	18.50%	15.00%	15.00%	15.00%
EM Stock	8.50%	27.50%	5.00%	5.00%	5.00%
Real Estate	6.60%	18.50%	1.50%	5.00%	7.50%
Totals			100.00%	100.00%	100.00%
Gm. Mean Return			**6.63%**	**6.75%**	**6.85%**
Standard Deviation			**11.30%**	**11.75%**	**12.06%**

New Asset Classes for Consideration – Commodities

- Definition: bulk goods such as grains, metals, foods and energy (oil, natural gas) traded on exchanges or spot market.

- Commodities are thought to be inflation-hedging instruments. Should perform well in rising inflation/growth type of environments.

  - Note: recent years commodities have performed more in line with equities (part of the "risk-on" trade)

- Return from commodities generally is comprised of three parts: the underlying spot price of the commodity, the rolling of futures associated with the underlying commodity, and the underlying cash spot price

- Commodities can be invested in four primary ways: passive index return (beta), active management (beta 0-100% long); long-short strategy; and, rolling management of futures.

  - Active management can include: fundamental analysis, quantitative analysis, technical analysis, sentiment analysis and market forecasts

New Asset Classes for Consideration – Commodities

- Expected Return = 4.3%

- Expected Risk = 30.0%

- Sharpe Ratio = 0.077

Correlations	Commodities
US Lg. Cap Equities	0.27
U.S. Sm. Cap Equities	0.28
U.S. Fixed Income	-0.07
Int'l Stocks	0.29
EM Stocks	0.37
High Yield FI	0.13
Real Estate	0.28
Absolute Ret. HF	0.49
U.S. TIPS	0.45
Private Equity	0.18
Infrastructure	0.22

New Asset Classes for Consideration – Commodities

- No illiquidity premium – investments are generally made in the futures market

- No capital calls

- Exposures include: Passive index replication, active management, hedge fund long/short strategy, and/or futures rolling

- The expected return to a commodities futures investment is a function of three elements: the expected cash return on the underlying collateral, the expected change in price of the commodities, and the return (positive or negative) associated with the shape of the price curve of future delivery of a commodity. The current expectation for commodities assumes that commodity prices will generally mirror overall inflation and that the structure of futures prices will not provide any additional return. The forecast inputs:
  - Cash expectation
  - Added to inflation expectation

- Performs well in steady and/or above-average economic growth environments

New Asset Classes for Consideration – Commodities

Projected StanCERA Results

Fall 2012

Asset	Expected Return	Expected St. Dev.	Current StanCERA Mix	add Commodities to 5.0%
US Large Cap	8.00%	18.00%	33.10%	33.10%
US Small Cap	8.30%	21.00%	8.30%	8.30%
US Fixed Income	2.80%	4.50%	37.10%	32.10%
Int'l Stock	8.00%	18.50%	15.00%	15.00%
EM Stock	8.50%	27.50%	5.00%	5.00%
Real Estate	6.60%	18.50%	1.50%	1.50%
Commodities	4.50%	30.00%	0.00%	5.00%
Totals			100.00%	100.00%
Gm. Mean Return			**6.63%**	**6.82%**
Standard Deviation			**11.30%**	**11.83%**

New Asset Classes for Consideration – Infrastructure

- Definition: a nation's basic system of transportation, communication, and other aspects of its physical plant. Building and maintaining road, bridge, sewage, and electrical systems. For developing countries, infrastructure advances are important to boarder economic development.

- Sub-categories of Infrastructure include: transportation (bridges, toll roads, airports, railroads and ports); energy, utilities, communication, and social (schools, hospitals, prisons and other public buildings).

- Infrastructure are long-lived assets that are costly and time consuming to replace.

  □ Generate relatively stable cash flows that usually increase with inflation

- Infrastructure does have publicly-traded entities (much like REITs in Real Estate) and private investment vehicles.

- Private investments are illiquid in nature with 60-80% of returns generated from income streams that are often linked to movements in inflation indexes.

New Asset Classes for Consideration – Infrastructure

- Expected Return = 7.1%

- Expected Risk = 25.0%

- Sharpe Ratio = 0.204

Correlations	Infrastructure
US Lg. Cap Equities	0.51
U.S. Sm. Cap Equities	0.51
U.S. Fixed Income	0.42
Int'l Stocks	0.50
EM Stocks	0.45
High Yield FI	0.62
Real Estate	0.64
Absolute Ret. HF	0.55
U.S. TIPS	0.38
Private Equity	0.30
Commodities	0.22

New Asset Classes for Consideration – Infrastructure

- No liquidity premium for public market instruments. A liquidity premium should exist for Private Infrastructure although it is hard to quantify.

  - The majority of the return is made up of the cash flows of the underlying assets

- Capital calls exist for Private Infrastructure investments

  - No capital calls for public market Infrastructure stocks

- The history and experience of infrastructure investments is quite limited. However, there are indexes that track performance of publicly traded securities that own, operate, and develop infrastructure assets. The forecast implies:

  - Multiple regression of Infrastructure proxy relative to the major asset classes to develop multiple betas of infrastructure relative to these asset classes

  - Betas are multiplied by the expected asset class premiums and added to cash expectation

- Performs well in steady and/or above-average economic growth environments and rising inflation environments

New Asset Classes for Consideration – Infrastructure

Projected StanCERA Results
Fall 2012

Asset	Expected Return	Expected St. Dev.	Current StanCERA Mix	add Infrastructure to 5.0%
US Large Cap	8.00%	18.00%	33.10%	33.10%
US Small Cap	8.30%	21.00%	8.30%	8.30%
US Fixed Income	2.80%	4.50%	37.10%	32.10%
Int'l Stock	8.00%	18.50%	15.00%	15.00%
EM Stock	8.50%	27.50%	5.00%	5.00%
Real Estate	6.60%	18.50%	1.50%	1.50%
Infrastructure	7.10%	25.00%	0.00%	5.00%
Totals			100.00%	100.00%
Gm. Mean Return			**6.63%**	**6.87%**
Standard Deviation			**11.30%**	**12.11%**

New Asset Classes for Consideration – Direct Lending

- Definition: a sub-segment of the fixed income asset class that supports the financing of middle-market companies with non-traditional sources of capital, such as pension funds, insurance companies and other institutional investors.

- Private credit has traditionally been supplied by banks, but a variety of factors has left this market segment underserved by the traditional capital providers.

- Private credit strategies provide opportunities for yield enhancement. The illiquidity premium is considerable. Life of funds are generally ten years.

- The return in private credit instruments may be generated from a combination of sources, including: up-front points, current cash yield or coupon, payment-in-kind interest, equity upside or warrants, and other types of servicing fees.

- The risk in corporate lending is typically measured as a percentage of default.

New Asset Classes for Consideration – Direct Lending

- Expected Return = 8.3% (High Yield Return 5.3% + 300 bps illiquidity premium)

- Expected Risk = 17.6%

- Sharpe Ratio = 0.63

Correlations	Direct Lending
US Lg. Cap Equities	0.63
U.S. Sm. Cap Equities	0.62
U.S. Fixed Income	0.15
Int'l Stocks	0.60
EM Stocks	0.57
High Yield FI	0.76
Real Estate	0.65
Absolute Ret. HF	0.49
U.S. TIPS	0.26
Private Equity	0.41
Commodities	0.25

New Asset Classes for Consideration – Direct Lending

- An illiquidity premium exists although it is hard to quantify. Equity like returns with risk profile of secured debt

- Direct Lending set-up in a private equity or hedge fund format. High fees and a slight J-Curve effect are mitigated by interest rate or coupon payments from underlying loans.

- The history and experience of direct lending investments is limited. There are no indexes that track the performance of the direct lending space. The forecast implies:

  □ Returns are estimated based upon the current underlying loan portfolio of the investment managers minus the implied default rate present in the high yield market.

- Performs well in steady and/or above-average economic growth environments

- Typically, the underwriting process will protect the investor from a rising rate environment and also places a floor on how low rates can go

New Asset Classes for Consideration – Direct Lending

Projected StanCERA Results
Fall 2012

Asset	Expected Return	Expected St. Dev.	Current StanCERA Mix	add Direct Lending to 5.0%
US Large Cap	8.00%	18.00%	33.10%	33.10%
US Small Cap	8.30%	21.00%	8.30%	8.30%
US Fixed Income	2.80%	4.50%	37.10%	32.10%
Int'l Stock	8.00%	18.50%	15.00%	15.00%
EM Stock	8.50%	27.50%	5.00%	5.00%
Real Estate	6.60%	18.50%	1.50%	1.50%
Direct Lending	8.30%	17.60%	0.00%	5.00%
Totals			100.00%	100.00%
Gm. Mean Return			**6.63%**	**6.85%**
Standard Deviation			**11.30%**	**11.55%**

Glossary of Terms

- **Asset Allocation** – (1) The way investments are distributed and weighted among different asset classes. (2) The distribution of investments among categories of assets, such as equities, fixed income, cash equivalents, and real estate.

- **CAPM** – Capital Asset Pricing Model. A system of equations that describes the way prices of individual <u>assets</u> are determined in efficient markets, that is, in markets where information is freely available and reflected instantaneously in asset prices. According to this model, prices are determined in such a way that <u>risk premiums</u> are proportional to systematic risk, measured by the <u>beta coefficient</u>, which cannot be eliminated by diversification. CAPM provides an explicit expression of the expected returns for all assets. Basically, the model holds that if investors are risk averse, high-risk stocks must have higher expected returns than low-risk stocks. CAPM maintains that the expected return of a security or a portfolio is equal to the rate on a risk-free investment plus a risk premium.

- **Correlation** – A relationship between two quantities, such that when one changes, the other does. A measure (ranging in value from 1.00 to -1.00) of the association between a dependent variable (fund, portfolio) and one or more independent variables (index). Correlation is a measure, not necessarily of causality, but rather of the strength of a relationship. A <u>correlation coefficient</u> of 1.00 implies that the variables move perfectly in lockstep; a correlation coefficient of -1.00 implies that they move inversely in lockstep; and a coefficient of 0.00 implies that the variables as calibrated are uncorrelated. A <u>correlation half-life</u> is the amount of time it takes for the amount of the measured time period to diminish by half exponentially.

- **Efficient Frontier** – A set of optimal portfolios, one for each level of expected return, with minimum risk.

- **Expected Return** -- Estimate of the return of an investment or portfolio from a probability distribution curve of all possible rates of return; statistically, it is the mean (ether geometric mean or arithmetic mean) of the distribution or the "most likely" outcome.

- **Factor Model** – Regression-based mathematical calculation used to determine the extent to which macroeconomic factors or other explanatory variables affect the value or price movement of a specific security or portfolio.

Glossary of Terms

- **Geometric Return** – Similar to the arithmetic mean, which is what most people think of with the word "average", except that instead of adding the set of returns and then dividing the sum by the number of return observations (N), the numbers are multiplied and then the Nth root of the resulting product is taken. Also known as compound return.

- **Mean Reversion** – Statistical phenomenon stating that the greater the deviation of a given observation (e.g. a quarterly or annual return) from its mean, the greater the probability that the next measured observation will deviate less far. In other words, an extreme event is likely to be followed by a less extreme event.

- **Optimization** – Process of determining the portfolio composition such that expected return is maximized for a given risk level, or risk is minimized for a given expected return level. Other optimizations could target risk of shortfall, maximization of Sharpe ratio, or minimization of tracking error.

- **Sharpe Ratio** – A ratio of return to volatility, useful in comparing two portfolios or stocks in terms of risk-adjusted return. The higher the Sharpe Ratio, the more sufficient are returns for each unit of risk. It is calculated by first subtracting the risk free rate from the return of the portfolio, then dividing by the standard deviation of the portfolio.

- **Stochastic Simulation** – Uses random processes to simulate the various sources of uncertainty that affect the value of the instrument, portfolio or investment in question, and calculates a representative value or distribution of possible outcomes given the simulated values of the underlying inputs.

- **Treasury Inflation-Protected Securities (TIPS) –** Inflation-indexed bonds issued by the U.S. Treasury. The principal is adjusted to the Consumer Price Index (CPI), the commonly used measure of inflation. The coupon rate is constant, but generates a different amount of interest when multiplied by the inflation-adjusted principal, thus protecting the holder against inflation. TIPS are currently offered in 5-year, 10-year and 20-year maturities. Beginning in February 2010, the U.S. Treasury will once again offer 30-year TIPS bonds.

Direct Lending – Market Characteristics

Return Breakdown

Current Pay Interest	8%-10%+
PIK Interest	2%-4%
Origination/Other Fees *	2%-3%
Warrant/ Equity Upside	2%-5%+

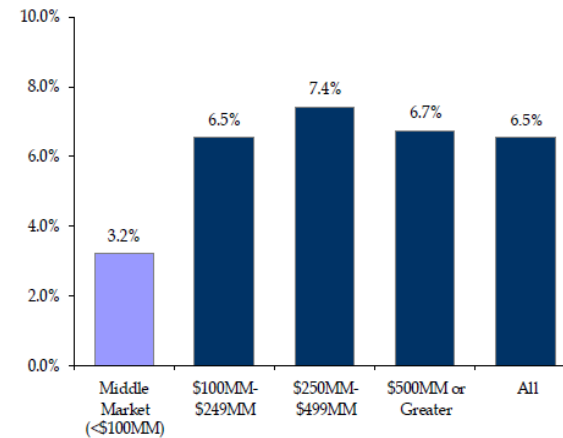|	
Total Gross Unlevered Return	10%-12%+
Total Gross Levered Return	14%-16%+ **

*Closing fees, amendment fees, prepayment fees, etc. where applicable.

**Effect of 1:1 leverage.

Note: (1) Cumulative institutional loan default rates for public filings by deal size from 1995 to 2011.
Source: S&P LCD

Note: (2) Reflects ultimate recovery rates for the period 1989 to 2009.
Source: S&P LSTA

Default Rates by Loan Size[1]

Middle Market (<$100MM): 3.2%
$100MM-$249MM: 6.5%
$250MM-$499MM: 7.4%
$500MM or Greater: 6.7%
All: 6.5%

Recovery Rate by Loan Class[2]

Middle Market (<$200MM): 86%
Large Cap Loans (>$200MM): 81%
Senior Secured Bonds: 71%
Senior Unsecured Bonds: 52%
Senior Subordinated Bonds: 35%