Alameda County Employees' Retirement Association

Actuarial Audit
of
December 31, 2005 Valuation

Prepared by:

Nick J. Collier, ASA, EA, MAAA
Consulting Actuary

Karen I. Steffen, FSA, EA, MAAA
Consulting Actuary

A MILLIMAN GLOBAL FIRM

Milliman
Consultants and Actuaries

1301 Fifth Avenue, Suite 3800
Seattle, WA 98101-2605
Tel +1 206 624.7940
Fax +1 206 623.3485
www.milliman.com

June 7, 2007

Mr. Charles F. Conrad
Chief Executive Officer
Alameda County Employees' Retirement Association
475 14th Street, Suite 1000
Oakland, CA 94612

Re: Actuarial Audit Report

Dear Mr. Conrad:

The enclosed report presents the findings and comments resulting from a detailed review of the December 31, 2005 actuarial valuation performed by The Segal Group, Inc. (Segal) for the Alameda County Employees' Retirement Association (ACERA). An overview of our major findings is included in the Executive Summary section of the report. More detailed commentary on our review process is included in the latter sections.

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by ACERA's staff. This information includes, but is not limited to, statutory provisions, employee data, and financial information. In our examination of these data, we have found them to be reasonably consistent and comparable with data used for other purposes. Since the audit results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations may need to be revised.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Actuarial Standards of Practice promulgated by the Actuarial Standards Board and the applicable Guides to Professional Conduct, amplifying Opinions, and supporting Recommendations of the American Academy of Actuaries.

Milliman's work product was prepared exclusively for ACERA for a specific and limited purpose. It is a complex, technical analysis that assumes a high level of knowledge concerning ACERA's operations, and uses ACERA's data, which Milliman has not audited. It is not for the use or benefit of any third party for any purpose. Any third party recipient of Milliman's work product who desires professional guidance should not rely upon Milliman's work product, but should engage qualified professionals for advice appropriate to its own specific needs.

This work product was prepared solely for ACERA. It may not be appropriate to use for other purposes.
Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work.

OFFICES IN PRINCIPAL CITIES WORLDWIDE

One of the audit recommendations is to consider some form of increased funding. The funding requirements of '37 Act Systems are addressed in the California Government Code. We have not explored any legal issues with respect any potential changes in funding. We are not attorneys and cannot give legal advice on such issues. We suggest that you review these proposals with counsel.

We would like to express our appreciation to both the Segal consultants, in particular Andy Yeung, and the ACERA staff for their cooperation in supplying the data and information on which this report is based.

We are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

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

Sincerely,

Nick Collier

Nick J. Collier, ASA, EA, MAAA
Consulting Actuary

Karen I. Steffen, FSA, EA, MAAA
Consulting Actuary

NJC/KIS/nlo

This work product was prepared solely for ACERA. It may not be appropriate to use for other purposes.
Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work.

OFFICES IN PRINCIPAL CITIES WORLDWIDE

Alameda County Employees' Retirement Association
Actuarial Audit of
December 31, 2005 Valuation

Table of Contents

		Page
Certification Letter		
Section 1	**Executive Summary**	**1**
Section 2	**Membership Data**	**5**
Exhibit 2-1	Member Statistics	6
Section 3	**Actuarial Value of Assets**	**7**
Section 4	**Actuarial Liabilities**	**8**
Exhibit 4-1	Actuarial Accrued Liability by Member Type	8
Exhibit 4-2	Active Present Value of Benefits by Benefit Type	9
Exhibit 4-3	Comparison of Normal Cost Rate	10
Section 5	**Member Contribution Rates**	**11**
Exhibit 5-1	General Member Contribution Rates	12
Exhibit 5-2	Safety Member Contribution Rates	12
Section 6	**Funding**	**13**
Exhibit 6-1	Comparison of Employer Contribution Rates	13
Section 7	**Actuarial Assumptions**	**17**
Section 8	**Valuation Report**	**29**
Section 9	**Summary of Recommendations & Considerations**	**30**
Appendices		
Appendix A-1	**Comparison of Actuarial Accrued Liability**	**A-1**
Appendix A-2	**Comparison of Present Value of Benefits by Benefit Type (Active Members)**	**A-2**
Appendix A-3	**Sample Member Contribution Rates**	**A-3**
Appendix A-4	**Comparison of Employer Rates**	**A-4**
Appendix B	**Glossary**	**B-1**

Alameda County Employees' Retirement Association
Actuarial Audit of
December 31, 2005 Valuation

Section 1

Executive Summary

Purpose and Scope of the Actuarial Audit

This actuarial audit reviews the December 31, 2005 actuarial valuation performed by the ACERA retained actuary, The Segal Group, Inc. (Segal). The purpose of this audit is to verify that the results of that valuation are reasonable.

As requested, the following tasks were performed in this audit:

- ✓ full independent replication of the key valuation results (the valuation reflects only basic pension benefits and excludes supplemental benefits such as those paid from the Supplemental Retiree Benefit Reserve) ;
- ✓ review of the actuarial cost method and economic assumptions;
- ✓ determination if accounting information reported is accurate and follows the standards of the Government Accounting Standards Board; and
- ✓ review of the validity and appropriateness of the data used in the valuation.

Audit Conclusion

Based upon our review of the December 31, 2005 actuarial valuation, we found the actuarial work performed by Segal was reasonable, appropriate, and of high quality. The following table shows that our independent calculations are very close to those determined by Segal and should give the Board a high level of confidence that the results of the valuation are accurate.

	Segal	Milliman
Employer Contribution Rate	17.32%	17.28%
Funded Percentage	83.2%	83.3%

Our one significant comment has to do with the investment return assumption. Although we find that the 7.9% assumption may be considered reasonable, we would describe it as somewhat aggressive (i.e., in the long-term, the likelihood is that the actual return will be less than the assumption). There are several factors that impact this conclusion; probably the most significant is the impact of crediting a portion of the excess returns to the Supplemental Retiree Benefit Reserve (SRBR).

We provide a detailed discussion of the investment return assumption in Section 7. Although our recommendation is to retain the current assumption of 7.90%, there are a number of possible options for the Board to consider, including the following three:

1. **No Change:** The Board could retain the current investment return assumption, as it falls in the "best-estimate" range, although on the higher end. If the Board elects this option, they should be aware that, in our opinion, there is a less than 50% chance the assumption will be met in the long term. Also, this somewhat aggressive assumption combined with the current funding arrangement means the progress toward 100% funding will likely be slow.

2. **Lower the Assumption:** The Board could lower the current investment return assumption. This would increase the probability the assumption will be met in the long term. If the Board elects this option, they should be aware that lowering the assumption will increase the long-term costs, as more excess returns will be credited to the SRBR, which will ultimately require additional contributions from the employers. On the other hand, this will increase the funding to the SRBR, which may be a desirable result.

3. **Retain Assumption but Increase Funding:** The Board could retain the current investment return assumption, but look to increase funding. This would increase the probability that even if the assumption is not met in the long term, progress would be made toward 100% funding. Ideally, we would recommend that ACERA fund to a higher funding target (e.g., a funding percentage of 110% or 120%) to implicitly recognize market volatility and future credits to the SRBR. If the Board elects this option, this would increase the short-term costs, which may not be desirable given that the employers are already paying a fairly high contribution rate.

   One opportunity we see is that ACERA currently has a significant amount of deferred gains not recognized in the valuation assets. This will likely lead to decreases in the employer contribution rate over the next few years under the current funding policy. If the contribution rate was kept the same instead of decreased, this would result in an improved funding situation and could possibly transition into a situation where ACERA is funding to a higher target. We would recommend that ACERA discuss this and other options with Segal; however, if such an approach is decided upon, it should first be reviewed to verify it does not conflict with Section 31453.5 of the '37 Act.

Based on our understanding of ACERA's situation, we believe that option 3 is probably the best fit, if it is not prohibited by the '37 Act. Note that as audit actuaries, we will never have information as complete as ACERA's staff or retained actuary. Therefore, the Board should listen to the opinions of Segal and ACERA's staff, while factoring in our comments, in making their decision.

Statement of Key Findings

Our conclusions concerning the primary issues of this review are as follows:

- **Membership Data:** We performed tests on both the raw data supplied by ACERA staff and the processed data used by Segal in the valuation. Based on this review, we feel the data used is appropriate and generally complete. The one exception is that on the retiree data supplied by ACERA, the information on the members' beneficiaries was incomplete. Our understanding is that ACERA staff is currently in the process of obtaining this information. Segal made appropriate adjustments based on prior information to account for this issue, so we do not believe there is a material impact on the valuation.

- **Actuarial Value of Assets:** We have reviewed the calculation of the actuarial value of assets used in the December 31, 2005 valuation. We found the calculations to be reasonable and the methodology to be appropriate and in compliance with proposed actuarial standards of practice.

- **Actuarial Liabilities:** We independently calculated the costs and liabilities of ACERA. We found that all significant benefit provisions were accounted for in an accurate manner, the actuarial assumptions and methods are being applied correctly, and that our total liabilities matched those calculated by Segal very closely.

- **Member Contributions:** We reviewed the current member contribution rates. We found that both the base and COLA rates were determined in an accurate manner.

- **Funding:** We reviewed the application of the funding method and find it is reasonable and that it meets generally accepted actuarial standards. Based on the system's funding methods and assumptions, we believe the employer contributions are appropriately calculated. Our only concern is that although the funding meets GASB guidelines for financial reporting, it is at a minimum level, especially considering the impact of the SRBR on future returns.

- **Actuarial Assumptions:** We reviewed the economic assumptions used in the valuation and found them to be reasonable, although somewhat on the high end of the best-estimate range. We find that while the 7.9% investment return assumption may be considered reasonable, we would describe it as somewhat aggressive (i.e., in the long-term, the likelihood is that that actual return will be less than the assumption). We are not recommending a change in the investment return assumption, but the Board should be aware that their current assumption is somewhat aggressive when deciding on the appropriate rate. There are two reasons that we have come to this conclusion:

  - SRBR: In the long term, excess returns that are credited to the Supplemental Retiree Benefit Reserve (SRBR) will lower the investment return that is credited to the reserves to fund the regular pension benefits. If the total return averages 7.9% prior to SRBR credits, we estimate the reduction will be about 0.5%.

  - Inflation Assumption: The inflation assumption is on the high end of the best-estimate range. Since the inflation assumption is a component of the investment return assumption, it will tend to result in an investment return assumption that is higher than it would be with a lower inflation assumption.

Although a detailed audit of the non-economic assumptions was beyond the scope of this assignment, we performed a general overview of these assumptions and found them to be reasonable. We are making a recommendation to review how future vested terminated members are treated.

- **Valuation Report:** Overall, we found Segal's report to be clear and complete. We have made a few minor recommendations where additional information could be included to enhance the understanding of an outside reader.
- **Recommendations & Considerations:** We are not recommending any changes be reflected in the December 31, 2005 valuation. There are a few minor issues that we are recommending Segal incorporate in future valuations. In Section 9 of the report we have gathered together all of these recommendations and comments for consideration in future valuations. Other than the issue with the investment return assumption and its impact on the funding of the plan, none of these recommendations is material.

Section 2

Membership Data

Audit Conclusion

We performed tests on both the raw data supplied by ACERA staff and the processed data used by Segal in the valuation. Based on this review, we feel the data used is appropriate and generally complete. The one exception is that on the retiree data supplied by ACERA, the information on the members' beneficiaries was incomplete. Our understanding is that ACERA staff is currently in the process of obtaining this information. Segal made appropriate adjustments based on prior information to account for this issue, so we do not believe there is a material impact on the valuation.

Comments

Overall, the data process appears to be thorough and accurate. We would add the following comments:

- Raw Data: The ACERA staff provided us with the same data that was supplied to Segal for use in the actuarial valuation.
  - ✓ **Completeness**: The data generally contained all necessary fields to perform the actuarial valuation. The one exception is that the current retiree file did not contain information on the retirees' beneficiaries. From a valuation perspective, this is significant for determining whether a retiree has a survivor eligible for the automatic 60% continuance. Segal informed us that they used current information where available; otherwise, they rolled forward prior data. We reviewed the number of retirees eligible for an automatic continuance on Segal's edited data and found it to be reasonable. Our understanding is ACERA is currently working to add this information to their data system.
  - ✓ **Quality**: We compared the ACERA data to information reported in the System's CAFR. The data appeared to be consistent with the totals shown in the CAFR.
- Parallel Data Processing: We performed independent edits on the raw data and then compared our results with the valuation data used by Segal. We found our results to be generally consistent.

  Our results did not match exactly; however, this is understandable as Segal, as the retained actuary, has more extensive data editing procedures. Overall, each data key component matched within an acceptable level, and we believe the data used by Segal was appropriate for valuation purposes.

  A summary of the data in aggregate is shown in Exhibit 2-1. Note that the "Milliman" column reflects the ACERA data after adjustments by Milliman. The "Segal" column reflects the actual data used in Segal's valuation.

This work product was prepared solely for ACERA. It may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work.

Exhibit 2-1
Member Statistics

	Segal	Milliman	Ratio Milliman/Segal
Active Members			
Total Number	10,503	10,503	100.0%
Average Age	46.5	46.5	100.0%
Average Service	11.1	11.1	100.0%
Average Annual Salary	$ 67,579	$ 67,108	99.3%
Retirees and Survivors			
Total Number	6,718	6,723	100.1%
Average Monthly Pension	$ 2,349	$ 2,355	100.3%
Vested Terminated Members			
Total Number	1,522	1,539	101.1%

Section 3

Actuarial Value of Assets

Audit Conclusion

We have reviewed the calculation of the actuarial value of assets used in the December 31, 2005 valuation. We found the calculations to be reasonable and the methodology to be appropriate and in compliance with proposed actuarial standards of practice.

Comments

The method used to determine the gross actuarial value of assets smoothes asset gains and losses by reflecting 10% of the difference between the market-related value and the expected marked value over the most recent ten 6-month periods. A corridor is then applied to prevent the actuarial value from deviating too much from the market value. This value is then adjusted to remove any non-valuation reserves which results in the valuation assets used in the funding calculations.

We reviewed the calculation of the actuarial value of assets and found it to be reasonable, and all adjustments were appropriate. Segal used the investment return assumption from the prior valuation of 7.80%, as it was the rate credited during the period. They reduced the actual investment return by both the investment and administration expenses. As these expenses are both included as part of the investment return assumption, this adjustment is proper.

As discussed above, ACERA uses an asset smoothing method to reduce volatility. The method used is the most commonly used among the '37 Act Counties. It is roughly equivalent to 5-year smoothing which is the most common among large retirement systems. We believe the use of an asset smoothing method is appropriate, and we generally recommend this to our clients, particularly in systems where contribution rates change annually. We also believe a 5-year period is reasonable.

When a smoothing method is applied, the actuarial value of assets will deviate from the market value of assets. Many systems apply a corridor; that is, the actuarial value of assets is not allowed to deviate from the market value by more than a certain percentage. The purpose of a corridor is to keep the actuarial value of assets within a reasonable range of the market value. The current asset method has a corridor limiting the gross (i.e., before excluding the non-valuation reserves) actuarial valuation of assets to within 80% to 120% of the gross market value. We believe the use of this corridor is appropriate.

This work product was prepared solely for ACERA. It may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work.

Section 4

Actuarial Liabilities

Audit Conclusion

We independently calculated the costs and liabilities of ACERA. We found that all significant benefit provisions were accounted for in an accurate manner, the actuarial assumptions and methods are being applied correctly, and that our total liabilities matched those calculated by Segal very closely.

Comments

We independently calculated the liabilities for all members based on the following:

- ✓ **Data** – We used the data provided by ACERA staff. As discussed in Section 2, we confirmed that this data was consistent with the valuation data used by Segal.
- ✓ **Assumptions** – We used the assumptions disclosed in the December 31, 2005 actuarial valuation report. This information was provided to us electronically by Segal.
- ✓ **Methods** – We used the actuarial methods disclosed in the December 31, 2005 actuarial valuation report. This was supplemented by discussions between Segal and Milliman on the technical application of these methods.
- ✓ **Benefits** – We incorporated the basic pension benefits for all tiers into our valuation system. We obtained this information from the ACERA website and the relevant law. Supplemental benefits such as the SRBR were excluded.

We did a detailed comparison of the actuarial accrued liability (AAL) computed in our independent valuation and the number reported by Segal. Exhibit 4-1 shows a summary of this analysis for each member type. The results for each group were reasonable, and our calculated AAL values match very closely with those reported in the valuation.

Exhibit 4-1
Actuarial Accrued Liability by Member Type
(Dollar Amounts in Millions)

	Segal	Milliman	Ratio Milliman/Segal
Actuarial Accrued Liability by Member Type			
Retiree	$ 2,217.3	$ 2,206.4	99.5%
Inactive	135.8	133.4	98.2%
Active	2,195.1	2,201.1	100.3%
Total AAL	**$ 4,548.2**	**$ 4,540.9**	**99.8%**

This work product was prepared solely for ACERA. It may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work.

A more detailed comparison of the AAL showing a breakdown by member status and tier can be found in Appendix A-1.

Additionally, Appendix A-2 shows the total (accrued and future) present value of benefits (PVB) for active members by tier with a further breakdown by benefit type. Similar to the AAL, our calculated PVB was close to Segal's in total. We also matched each of the different benefit types within an acceptable level. A summary of the total present value of benefits for active members is shown below:

Exhibit 4-2
Active Present Value of Benefits by Benefit Type
(Dollar Amounts in Millions)

	Segal	Milliman	Ratio Milliman/Segal
Present Value of Benefits by Benefit Type (Active Members)			
Service Retirement	$ 2,728.1	$ 2,746.7	100.7%
Withdrawal	96.8	97.1	100.3%
Disability	349.9	362.6	103.6%
Death from Active Status	70.8	70.1	99.0%
Termination Load [1]	155.8	157.0	100.8%
Total Active PVB	**$ 3,401.4**	**$ 3,433.5**	**100.9%**

[1] *Additional pay elements are expected to be received during a member's final average earnings period. The termination load is the estimated value of this additional pay for each of the four benefit types in total.*

Note that there will always be differences in the calculated liabilities when different software is used by different actuaries; however, the results should not deviate significantly. The level of consistency we found in this audit provides a high level of assurance that the results of the valuation accurately reflect the liabilities of ACERA based on the assumptions and methods.

Based on our results we believe there are no material issues with calculation of the liabilities. We did identify two factors that caused some relatively small differences between our AAL and the amount calculated by Segal.

The first difference is that Segal made a special adjustment to salary increases in the valuation year. We believe this is the main reason our calculated active liabilities are slightly higher than Segal's (about 1%). To estimate future benefits payable to current active members, we project members' compensation based on the assumption. Each year, compensation is assumed to increase due to both the general wage increases and the merit increases. The method Segal uses to project members' pay in the year following the valuation date deviates from this slightly. It assumes members receive the general wage increase (4.0%) in the valuation year, but that they do not receive any increases due to merit. Merit increases are assumed to apply in each succeeding year.

We discussed this issue with Segal, and they indicated that this approach was designed to take into account an across-the-board salary increase for county employees in 2006 that was expected to be less than the actuarial assumption for general wage growth. If the actual across-the-board increase for the valuation year is already known at the time the valuation is being performed, this is a reasonable adjustment. Our only recommendation is that it would be more "apples-to-apples" to adjust the first year general wage increase, as this is the assumption that relates to the across-the-board increase, instead of just assuming active members do not receive any merit increases in the first year following the valuation date.

The second factor is a technical issue with the timing of the benefit payments. We believe this difference is the main reason our calculated retiree liabilities are slightly less than Segal's (about ½%). In a valuation, the actuary first projects the future benefit payments for the retiree members based on the data and assumptions. The actuary then places a value on each future benefit expected to be paid based on the investment return assumption. A dollar paid in the future is less than a dollar paid today due to the time value of money.

In Segal's calculations, they are effectively treating the benefit payments as being paid on the first of the month. Our understanding is that benefit payments are made at the end of the month. This difference results in Segal's liabilities for all members being fractionally greater than Milliman's, all other things being equal. Although we think that using our method is more technically precise, we believe Segal's method is reasonable.

We also looked at the normal cost rate (the allocated cost of benefits earned during the year). In the many audits we have been involved with, this is usually the area where we see the greatest differences. Although there were some differences, the overall match was very close and deviation by tier fell within an acceptable level.

Based on these results, we feel that Segal is valuing all significant plan provisions in an accurate manner.

Exhibit 4-3
Comparison of Normal Cost Rate
(Dollar Amounts in Millions)

	Segal	Milliman	Ratio Milliman/Segal
Gross Normal Cost Rate			
Basic	15.88%	15.88%	100.0%
COLA	3.80%	3.90%	102.6%
Total	19.68%	19.78%	100.5%
Member Normal Cost Rate			
Basic	6.51%	6.65%	102.2%
COLA	1.82%	1.85%	101.7%
Cost Sharing	0.48%	0.46%	96.8%
Total	8.81%	8.97%	101.8%
Employer Normal Cost Rate			
Basic	8.89%	8.77%	98.6%
COLA	1.98%	2.05%	103.4%
Total	10.87%	10.81%	99.5%

Section 5

Member Contribution Rates

Audit Conclusion

We reviewed the current member contribution rates. We found that both the base and COLA rates were determined in an accurate manner.

Comments

Member contributions are of two types: Normal contributions and cost-of-living contributions. For Safety members, a cost-sharing contribution of 3% of pay also applies.

Normal contributions for each tier are defined in the following sections of the County Employees' Retirement Law:

Tier	'37 Act Reference	Formula
G1	31621.2	1/100th of 1-Year FAS at age 60
G2	31621	1/120th of 3-Year FAS at age 60
S1	31639.5	1/100th of 1-Year FAS at age 50
S2	31639.5	1/100th of 3-Year FAS at age 50

Note that FAS means Final Average Salary.

Normal member contributions are determined using the Entry Age Normal Actuarial Cost Method and the following actuarial assumptions:

1. Expected rate of return on assets
2. Individual salary increase rate (wage growth + merit)
3. Mortality for members after service retirement

The determination of the member cost-of-living contributions is based on Section 31873 of the County Employees' Retirement Law. This section requires that the cost of this benefit be shared equally between members and the County. The law is not well defined on what basis the split should be determined. However, we used the same method we use for our other '37 Act clients with this provision and found our results to be consistent with Segal's.

The following graphs show a comparison of the member contributions calculated by Segal and the rates we independently calculated for each tier. Note that in each case the Milliman lines (solid) and the Segal lines (dashed) are very close to each other. This indicates that our results are consistent. Member contribution rates for sample ages are shown in Appendix A-3.

This work product was prepared solely for ACERA. It may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work.

Exhibit 5-1
General Member Contribution Rates
(Includes Basic and Cost of Living)

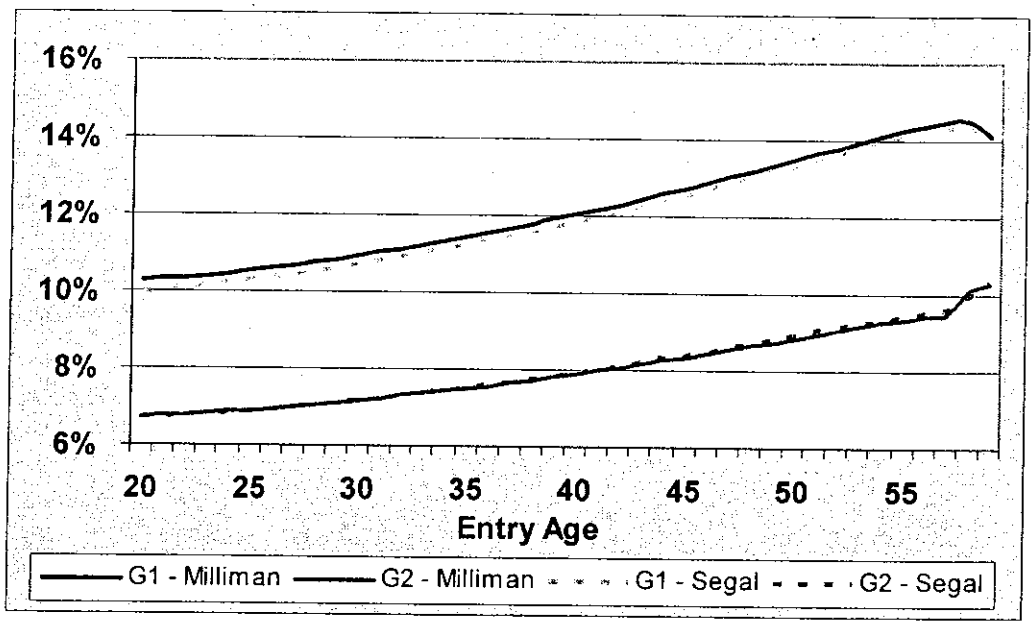
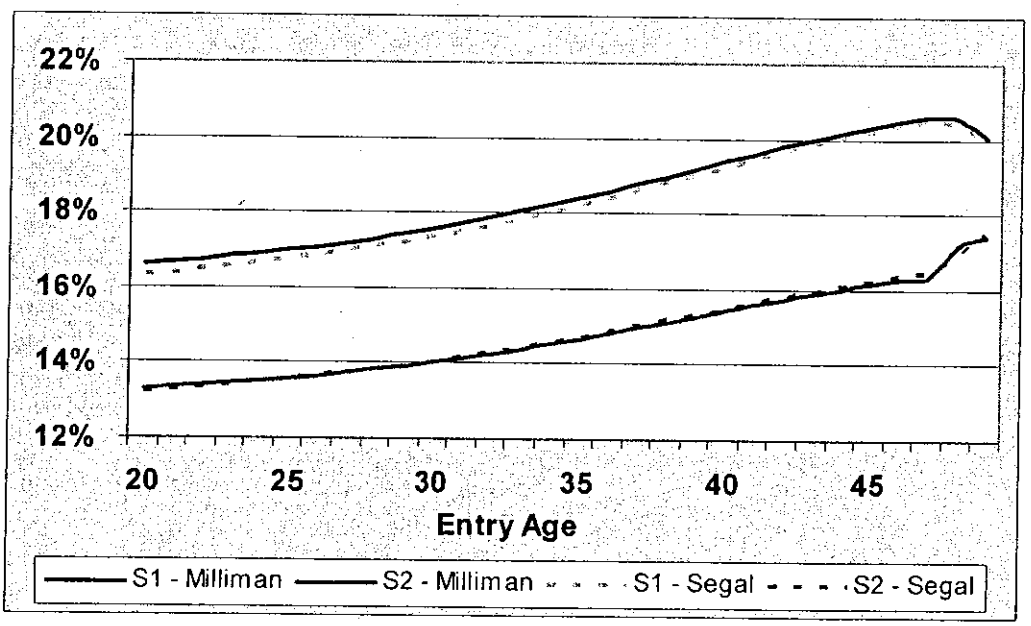


Exhibit 5-2
Safety Member Contribution Rates
(Includes Basic, Cost of Living and Cost Sharing)



Section 6

Funding

Audit Conclusion

We reviewed the application of the funding method and find it is reasonable and that it meets generally accepted actuarial standards. Based on the system's funding methods and assumptions, we believe the employer contributions are appropriately calculated. Our only concern is that although the funding meets GASB guidelines for financial reporting, it is at a minimum level, especially considering the impact of the SRBR on future returns.

Comments

Contribution Rates

We independently calculated the employer contribution rates based on our parallel valuation. We found that all rates were reasonable and matched very closely to Segal's calculation in total. A summary comparison of our results is shown below.

Exhibit 6-1
Comparison of Employer Contribution Rates

	Segal	Milliman	Ratio Milliman/Segal
All County Categories Combined[1]			
Net Normal Cost Rate	10.85%	10.86%	100.1%
UAAL (with POB Credit)	6.41%	6.38%	99.5%
Total Employer Contribution	17.26%	17.24%	99.9%
General Tier 1 Members - District			
Net Normal Cost Rate	11.91%	11.39%	95.6%
UAAL (with POB Credit)	9.62%	9.73%	101.1%
Total Employer Contribution	21.53%	21.12%	98.1%
County & District Categories Combined			
Net Normal Cost Rate	10.87%	10.86%	99.9%
UAAL (with POB Credit)	6.45%	6.42%	99.5%
Total Employer Contribution	17.32%	17.28%	99.8%

[1] *Includes Hospital Authority, Court and First 5 employees.*

A more detailed analysis of employer contribution rates by tier can be found in Appendix A-4.

This work product was prepared solely for ACERA. It may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work.

We have one minor technical recommendation in the way Segal is calculating the employer contribution rates. Segal has reflected lower-than-assumed salary increases in their calculation of liabilities; however, this adjustment is not made to the payroll used to amortize the Unfunded Actuarial Accrued Liability (UAAL). This is clearly not a material issue, but we recommend Segal consider the change to be consistent with their treatment of pay when measuring liabilities.

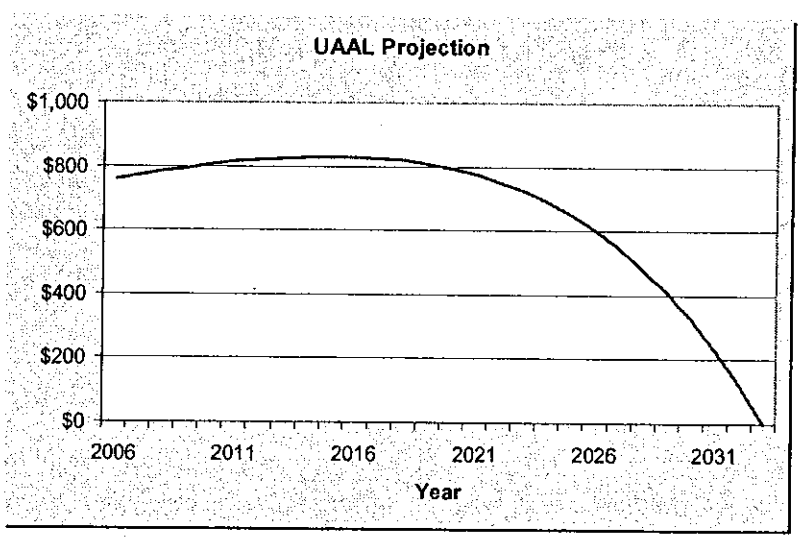
Contribution Adequacy

The Government Accounting Standards Board (GASB) provides general guidelines on the appropriate annual pension cost for financial reporting purposes. The Annual Required Contribution (ARC) of the employer is based on certain minimum requirements and is measured on the basis of an actuarially sound funding methodology. These requirements for determining a system's ARC are generally the same as those used for funding purposes. Thus, the GASB requirements are often used as a benchmark for determining funding adequacy for a retirement system.

In general, the guidelines expect each system to receive contributions equal to the normal cost plus a payment to amortize either the UAAL or any surplus amount. Under GASB, the payment on a positive UAAL amount should be at least equal to a 30-year amortization payment.

ACERA funds the UAAL over a closed (i.e., declining) 27-year period as of December 31, 2005. This meets the generally accepted minimum requirements for the ARC.

In our experience, the GASB minimum standard of 30-year amortization of the UAAL is too often being considered as a funding target. In our view, this should be considered a minimum funding target. The 27-year period is only slightly better. On the positive side, it is a closed (i.e., declining) period, so ACERA will make progress toward a better funded position in the future if all assumptions are met. However, the progress is slow. For the next nine years, the UAAL dollar amount is actually expected to increase if all assumptions are met, as shown in the following graph.



In reality, the recognition of deferred asset gains will likely lead to a decrease in the UAAL over the next few years. Still, we would like to see even stronger funding, particularly given the impact of a portion of the excess returns in good years going to the Supplemental Retiree Benefit Reserve (SRBR); however, we realize this is not always practical.

One possible approach to improving funding is to maintain the same contribution rate as the prior year when the current method would call for decreasing it. For example, if ACERA has another strong investment return in 2007, it is likely that the system will see a decrease in the UAAL due to the recognition of deferred asset gains. If the current contribution rate is maintained and not decreased, additional funds would amortize the UAAL over a shorter period. This would allow ACERA to improve its funding without increasing the employer contribution rate. There are a number of factors that would impact this decision that we cannot be fully aware of; however, we believe it is worthwhile discussing with your retained actuary. Also, ACERA would need to review this from a legal perspective, as it is not clear whether this would satisfy Section 31453.5 of the '37 Act.

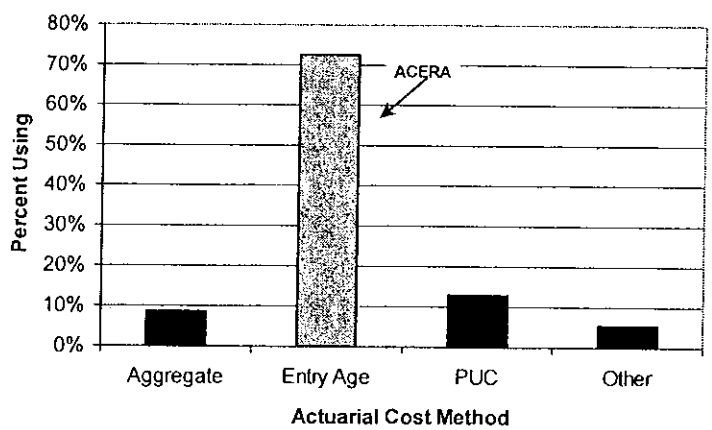
Actuarial Cost Method

ACERA uses the Entry Age Actuarial Cost Method. We agree that it is appropriate for valuing the costs and liabilities of ACERA, and is the cost method that we usually recommend. In ACERA's case there is really no question, as this method is required under the '37 Act.

Purpose of a Cost Method: The purpose of any cost method is to allocate the cost of future benefits to specific time periods. Most public plans follow one of a group of generally accepted funding methods, which allocate the cost over the members' working years. In this way, benefits are financed during the time in which services are provided.

Most Common Public Plan Cost Method (Entry Age): The most common cost method used by public plans is the Entry Age Actuarial Cost Method. The focus of the Entry Age Cost Method is the level allocation of costs over the member's working lifetime. For a public plan this means current taxpayers pay their fair share of the pensions of the public employees who are currently providing services. Current taxpayers are not expected to pay for services received by a past generation, nor are they expected to pay for the services that will be received by a future generation. The cost method does not anticipate increases or decreases in allocated costs.

The 2006 Public Funds Survey shows that nearly 75% of the retirement systems surveyed are using the Entry Age Cost Method, as illustrated in the graph below.



GASB Disclosure

We reviewed the items shown in Exhibits I, II, & III of Section 4 in the December 31, 2005 valuation report. In Exhibit I, the actual contribution equaled the ARC each year. Based on our review of the valuation, we believe the valuation performed for funding purposes meets the guidelines for financial reporting specified by GASB; therefore, we would expect the employer contributions to equal the Annual Required Contribution (ARC). Similarly, the values reported in Exhibits II & III are consistent with the valuation.

Section 7

Actuarial Assumptions

Audit Conclusion

We reviewed the economic assumptions used in the valuation and found them to be reasonable, although somewhat on the high end of the best-estimate range. We find that while the 7.9% investment return assumption may be considered reasonable, we would describe it as somewhat aggressive (i.e., in the long-term, the likelihood is that the actual return will be less than the assumption). We are not recommending a change in the investment return assumption, but the Board should be aware that their current assumption is somewhat aggressive when deciding on the appropriate rate. There are two reasons that we have come to this conclusion:

- SRBR: In the long term, excess returns that are credited to the Supplemental Retiree Benefit Reserve (SRBR) will lower the investment return that is credited to the reserves to fund the regular pension benefits. If the total return averages 7.9% prior to SRBR credits, we estimate the reduction will be about 0.5%.
- Inflation Assumption: The inflation assumption is on the high end of the best-estimate range. Since the inflation assumption is a component of the investment return assumption, it will tend to result in an investment return assumption that is higher than it would be with a lower inflation assumption.

Also, the Board may want to consider increasing funding in conjunction with the decision on the investment return assumption, as discussed in the Executive Summary.

Although a detailed audit of the non-economic assumptions was beyond the scope of this assignment, we performed a general overview of these assumptions and found them to be reasonable. We are making a recommendation to review how future vested terminated members are treated.

Comments

The purpose of the actuarial valuation is to analyze the resources needed to meet the current and future obligations of the system. To provide the best estimate of the long-term funded status of the system, the actuarial valuation must be predicated on methods and assumptions that will estimate the future obligations of the system in a reasonably accurate manner.

An actuarial valuation uses various methods and two different types of assumptions: economic and demographic. Economic assumptions are related to the general economy and its long-term impact on the system, or to the operation of the system itself. Demographic assumptions are based on the emergence of the specific experience of the system's members.

This work product was prepared solely for ACERA. It may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work.

Actuarial Standard of Practice No. 27: Selection of Economic Assumptions

The Actuarial Standards Board has adopted Actuarial Standard of Practice (ASOP) No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*. This standard provides guidance to actuaries giving advice on selecting economic assumptions for measuring obligations under defined benefit plans, such as ACERA.

As no one knows what the future holds, the best an actuary can do is to use professional judgment to estimate possible future economic outcomes. These estimates are based on a mixture of past experience, future expectations, and professional judgment. The actuary should consider a number of factors, including the purpose and nature of the measurement, and appropriate recent and long-term historical economic data. However, the standard explicitly advises the actuary not to give undue weight to recent experience.

Recognizing that there is not one "right answer", the standard calls for the actuary to develop a best estimate range for each economic assumption, and then recommend a specific point within that range. Each economic assumption should individually satisfy this standard.

After completing the selection process, the actuary should review the set of economic assumptions for consistency. This may require the actuary to use the same inflation component in each of the economic assumptions selected. However, if a change occurs in one assumption, the actuary needs to consider if the change would modify other economic assumptions as well.

An actuary's best-estimate range with respect to a particular measurement of pension obligations may change from time to time due to changing conditions or emerging plan experiences. The actuary may change assumptions frequently in certain situations, even if the best-estimate range has not changed materially, and less frequently in other situations. Even if assumptions are not changed, we believe that the actuary should be satisfied that each of the economic assumptions selected for a particular measurement complies with *Actuarial Standard of Practice No. 27*, unless that assumption has been prescribed by someone with the authority to do so.

Economic Assumptions

Based on the information and economic environment present as of the valuation date, we believe the economic assumptions recommended by Segal are reasonable. In our opinion, the inflation assumption and the investment return assumption are on the high end of the best-estimate range.

With respect to any particular valuation, each economic assumption should be consistent with every other economic assumption over the measurement period. The economic assumptions are much more subjective in nature than the demographic assumptions. The current economic assumptions are as follows:

Assumption Type	*Rate*
Inflation	3.75%
Real Investment Return	4.00
Total Investment Return(1)	7.90%
Inflation	3.75%
Real Wage Growth (Productivity)	0.25
Total Wage Growth	4.00%
Rate of Payroll Growth	4.00%

(1) Inflation and the real investment return are assumed to be compounded, not added.

The Board should be aware that the liabilities and normal cost are directly impacted by these important assumptions. The most critical assumption in determining the present value of benefits is the total investment return assumption.

In our opinion, the current package of economic assumptions is reasonable, although somewhat aggressive. Since economic assumptions are subjective in nature, it is our recommendation that the Board be fully comfortable with the implications of the assumptions. There is an "actuarial risk" associated with the economic assumptions the same as there is an investment risk associated with a given portfolio mix.

Assumptions generally do not affect the actual long-term cost of a plan. The ultimate cost will emerge in accordance with the benefits and expenses that are actually paid. However, this is not completely true in ACERA's case, as the investment return assumption will impact the amount credited to the SRBR.

The following portion of this report discusses three of the key economic assumptions (inflation, wage growth and investment return).

Inflation

Use in the Valuation: Inflation as referred to here means price inflation. The inflation assumption has an indirect impact on the results of the actuarial valuation through the development of the assumptions for investment return, general wage increases and the payroll increase assumption. It does not have a direct impact on the valuation results unless it directly impacts the assumed COLA paid.

The long-term relationship between inflation and investment return has long been recognized by economists. The basic principle is that the investors demand a "real return" – the excess of actual investment returns over inflation. If inflation rates are expected to be high, investors will demand expected investment returns that are also expected to be high

This work product was prepared solely for ACERA. It may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work.

enough to exceed inflation, while lower inflation rates will result in lower demanded expected investment returns, at least in the long run.

Historical Perspective: The data for inflation shown below is based on the national Consumer Price Index, US City Average, All Urban Consumers (CPI-U) as published by the Bureau of Labor Statistics. The data for periods ending in December of each year is documented in Exhibit 1 at the end of this section.

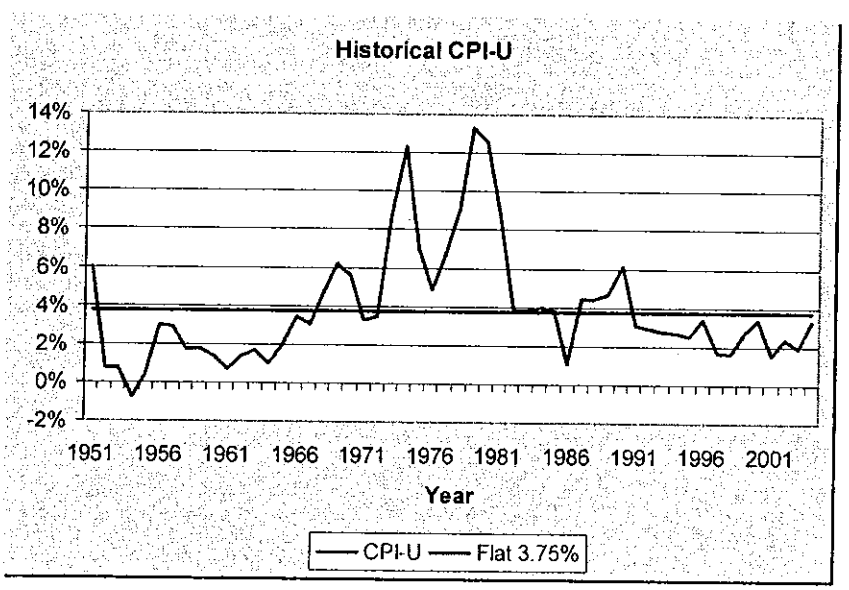
Although economic activities in general and inflation in particular, do not lend themselves to prediction on the basis of historical analysis, historical patterns and long term trends are a factor to be considered in developing the inflation assumption.

There are numerous ways to review historical data, with significantly differing results. The tables below show the compounded annual inflation rate for various ten-year periods, and for longer periods ended in December of 2006.

Decade	CPI
1996-06	2.4%
1986-96	3.7%
1976-86	6.6%
1966-76	5.9%
1956-66	1.8%

Period	CPI
1996-06	2.4%
1986-06	3.1%
1976-06	4.2%
1966-06	4.6%
1956-06	4.1%
1946-06	3.8%
75 years	3.6%

The following graph shows historical national CPI increases. Note that the actual CPI increase has been less than 3.75% for each of the last 15 years.



Forecasts of Inflation: Since the U.S. Treasury started issuing inflation indexed bonds, it is possible to determine the approximate rate of inflation anticipated by the financial markets by comparing the yields on inflation indexed bonds with traditional fixed government bonds. Current market prices suggest investors expect inflation to be about 2.5% over the next ten years. This rate is similar to the amount forecast by ACERA's investment consultant Strategic Investment Solutions, Inc. (SIS).

Although most investment consultants and economists forecast lower inflation, they are generally looking at a shorter time horizon than is appropriate for a pension valuation. To consider a longer, similar time frame, we looked at the expected increase in the CPI by the Office of the Chief Actuary for the Social Security Administration. In the April 2006 report, the annual increase in the CPI over the next 30 years was estimated to be 2.8%, under the intermediate cost assumptions. The lower cost assumption used a forecast of 1.8% and the high cost assumption used a forecast of 3.8%; this implies a reasonable range of 1.8% to 3.8%.

Note that historically inflation in California has been slightly higher than the national average, so this may appear to argue for a higher assumption; however, we do not see this trend continuing indefinitely. More importantly, the correlation between inflation and the investment return is on a national, not local, basis.

Reasonable Range and Recommendation: We believe that a range for inflation between 2.0% and 4.0% is reasonable for an actuarial valuation of a retirement system. Inflation has averaged 4.0% over the last 50 years; however it has averaged almost a full percent less over the last 20 years. Also, current economic forecasts, in particular those of Social Security, are predicting lower rates in the future. Given these facts, we are not recommending a change, but noting that we consider the current assumption of 3.75% on the high end of the best-estimate range.

Consumer Price Inflation	
Current Assumption	3.75%
Best-Estimate Range	2.0% - 4.0%

Investment Return

Use in the Valuation: The investment return assumption is one of the primary determinants in the calculation of the expected cost of ACERA's benefits, providing a discount of the estimated future benefit payments to reflect the time value of money. This assumption has a direct impact on the calculations of actuarial accrued liabilities, normal cost, and member and employer contribution rates. The valuation interest rate should represent the long-term rate of return on the actuarial value of assets, considering the fund's asset allocation policy, expected long term real rates of return on the specific asset classes, the underlying inflation rate, and investment and administrative expenses.

The current assumption for investment return is 7.9% per year, net of all investment-related and administrative expenses.

Method to Determine Best-Estimate Range for Investment Return: The following chart sets out the targeted asset allocation as of December 31, 2006 and the expected real rate of return for each class that was used by Segal in determining the expected return. Although we are reviewing the 2005 valuation, our comments on the investment return assumption are based on the economic environment as of December 31, 2006, as we believe this analysis will be more meaningful. Note that we compared the real returns by class used by Segal with those used by Milliman's investment consultants and found them to be reasonably close, with Milliman's being about 0.2% less on average.

Asset Class	Target Asset Allocation	Segal's Expected Real Rate of Return
U.S. Equity	41%	6.7%
International Equity	22%	7.5%
Fixed Income	28%	2.7%
Real Estate	9%	4.9%
Total Portfolio	100%	

Milliman calculated the best-estimate range for the investment return assumption based upon the target asset allocation, the expected real rates of return used by Segal, Segal's administrative and expense assumptions, and the assumed inflation assumption of 3.75%. In addition, a 10.9% annual portfolio standard deviation was included, as calculated by ACERA's investmnt consultant, SIS. We then used a standard Milliman model to project future returns based on the capital market assumptions, the asset allocation, and assumed annual rebalancing.

Using properties of the lognormal distribution, we calculated the 25th and 75th percentiles of the long-term total return distribution. This becomes our best-estimate range because 50% of the outcomes are expected to fall within this range and it is the narrowest range with 50% of the probable outcomes.

The capital market assumptions were combined with the target asset allocation policy to generate expected rates of returns which were then added to the inflation assumption. The real rate of return is subject to significant year-to-year volatility as measured by the standard deviation. Volatility over time will lower the mean real rate of return but diversification by asset class will reduce the volatility and narrow the range of expected total returns for the entire portfolio. The results are summarized on the following page.

Expected Return with 3.75% Inflation and Segal's Expected Rates of Return
(net of investment and administrative expenses)

Horizon In Years	Percentile Results for Nominal Rate of Return				
	5th	25th	50th	75th	95th
1	(8.5%)	0.8%	7.9%	15.4%	27.2%
5	0.2%	4.7%	7.9%	11.2%	16.1%
10	2.4%	5.6%	7.9%	10.2%	13.6%
20	4.0%	6.3%	7.9%	9.5%	11.9%
50	**5.4%**	**6.8%**	**7.9%**	**8.9%**	**10.4%**

Over a 50-year time horizon, we estimate there is a 25% chance the nominal rate of return will be less than 6.8% and a 25% chance the return will be greater than 8.9% (bold numbers on the bottom line in the table above). Therefore, we can say the return is just as likely to be within the range from 6.8% to 8.9% as not. The median return over 50 years is expected to be about 7.9%. However, this analysis does not reflect that approximately one-half of the return on the market value of assets in excess of the investment return assumption is credited to the SRBR.

Note that the median for the investment return (net of expenses) of 7.9% is less than the 8.4% reported by Segal in their "Review of Economic Actuarial Assumptions for the December 31, 2006 Actuarial Valuation." The difference is that Segal is reporting an arithmetic mean, and we are showing a geometric mean.

The simplest way to understand this difference is with an example. If during a two-year period a fund returns 0% one year and 20% the next year, the arithmetic mean is 10.00% (the simple average of the two numbers); whereas, the geometric mean is only 9.54%. That is, if the fund earned 9.54% each year for two years, it would be equivalent to the 0% return followed by the 20% return. This is consistent with the way the investment return assumption works in the valuation. We assume one flat return rate to approximate the actual future return which we know will be volatile from year to year.

The following chart shows the difference between the arithmetic mean and the geometric mean over time.

Horizon In Years	Arithmetic Mean	Geometric Mean
1	8.4%	8.4%
5	8.4%	8.0%
10	8.4%	7.9%
20	8.4%	7.9%
50	**8.4%**	**7.9%**

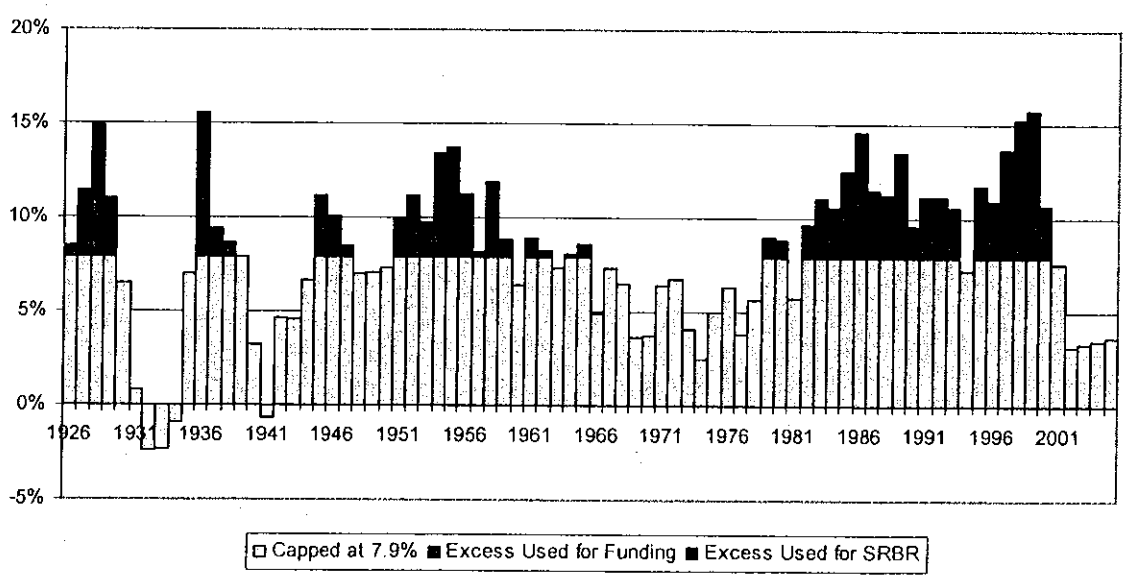
This work product was prepared solely for ACERA. It may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work.

A fund with an asset allocation like ACERA's, which is heavily invested in equities, can expect volatile returns including many years above 7.90% and many below 7.90%. If the total fund averages 7.90% and one half of excess actuarial returns are credited to the SRBR, the return on the valuation assets will be somewhat less than 7.90%. Based on historical returns (adjusted on a pro-rata basis to equal 7.90%) for a fund with a 70% equity / 30% bond mix and 5-year smoothing of gains and losses, the impact is an approximate 0.6% reduction in the investment return on the valuation assets.

Note that for purposes of this illustration we assumed that exactly one half of the return over 7.90% would be credited to the SRBR. The actual mechanics of the interest crediting (such as filling up the contingency reserve) would result in slightly less than one-half of the excess being credited on average. A more complex model would be necessary to get a more exact estimate on an average reduction in the investment return due to the SRBR, but we believe using a slightly lower amount of 0.5% is a reasonable estimate based on the expected return. Note that if the actual return prior to SRBR credits is higher than 7.9%, the reduction due to the SRBR credits will likely be greater; conversely, lower returns in the future will likely result in a reduction less than 0.5%.

The following graph illustrates how much of the return might be credited to the SRBR. It shows the returns described above, with the red bars representing the approximate 0.6% reduction in investment return.

Impact of Crediting a Portion of Excess Returns to SRBR
(Based on Historical Investment Returns with 5-Year Smoothing)



Segal discusses this issue in their "Review of Economic Actuarial Assumptions for the December 31, 2006 Actuarial Valuation." Their specific comments are:

> "Please note that in August 2006, the Actuarial Standards Board issued an Exposure Draft which would revise Actuarial Standard of Practice No. 4 which governs the measurement of pension obligations. If adopted, this revision will require explicit consideration of the impact of the Article 5.5 "excess earnings" mechanism when setting the Association's investment return assumption in order to receive an unqualified actuarial certification. An accurate measurement of this impact will

This work product was prepared solely for ACERA. It may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work.

require an extensive analysis to be performed. Based on such an analysis, we believe that ongoing consideration of the Article 5.5 impact can be built into our risk adjustment model. It is possible that such consideration would require an increase in the risk adjustment, which would in turn reduce the Association's investment return assumption. We believe that the revised standard would likely further lead to a lower investment return assumption under any alternative model that is compliant with the revised standard."

We agree with Segal's comments. Although, the recognition of the "excess earnings" mechanism may not be technically required under current actuarial standards, it should be taken into account, at least in general terms when setting the assumption.

Best-Estimate Range: Based on guidance in *ASOP No. 27*, we conclude that a reasonable range for the investment return, net of expenses, is 6.59% to 8.80%, prior to reflecting the excess credit to the SRBR.

	Percentile Results[1]		
Components of Return	**25th**	**50th**	**75th**
Real Investment Return[2]	3.8%	4.9%	5.9%
Assumed Inflation	3.75%	3.75%	3.75%
Expenses	(0.9%)	(0.9%)	(0.9%)
Net Investment Return	6.8%	7.9%	8.9%

(1) Does not reflect impact of "excess earnings" credit to SRBR.
(2) Inflation and the real investment return are assumed to be compounded, not added.

Recommendation: This is not a simple issue. On the surface, it would appear that a reduction in the investment return assumption might be appropriate; however, our recommendation is to retain the current assumption. Note that although our analysis of the expected return is different than Segal's, our overall recommendation is the same.

Based on our analysis, we would recommend against increasing the investment return assumption, as we believe the current assumption is on the aggressive side. Therefore, the question is whether it is appropriate to lower the assumption. The two key factors in our recommendation not to lower the current assumption are:

- Increased Costs: Generally when actuaries discuss assumptions, they discuss how assumptions don't affect the ultimate cost of the benefits, they just affect when they are paid. This, however, is not quite true for ACERA. If the investment return assumption is lowered, more returns will be classified as "excess earnings". This will increase the portion of returns going to the SRBR that will ultimately require additional contributions by the employers.
- Long-Term View: When funding a pension plan, a long-term view should be taken. The same is true of the assumptions. There is always going to be volatility, but assumptions should not be changed constantly, unless there is a compelling reason.

Segal discusses the "risk adjustment" in their review of economic assumptions, which is the buffer against the potential risk of shortfalls in the investment returns. Based on our analysis, the risk adjustment is basically zero. This means that there is approximately a 50% chance the assumed investment return of 7.90% will be met over the long term. We are using a 50-year time horizon as the long term. Our model estimates the following:

- 50% probability the 7.9% net investment return will be met prior to reflecting excess return credits to the SRBR.
- 37% probability the 7.9% net investment return will be met if the SRBR receives an annual credit of 0.5% of the valuation assets on average.

This means there is good chance the employers will need to make up for return shortfalls in the future. Options to address this issue are discussed on page 2 of the Executive Summary.

General Wage Growth

Use in the Valuation: Estimates of future salaries are based on two types of assumptions. Rates of increase in the general wage level of the membership are directly related to inflation while individual salary increases due to promotion and longevity (referred to as the merit scale) occur even in the absence of inflation. The merit scale is discussed later with the other demographic assumptions. This section will address the general wage growth assumption (price inflation plus productivity increases).

The current wage growth assumption is 0.25% above the price inflation rate, or 4.0% per year. Note that the 0.25% represents increases in wages due to productivity as discussed below.

Historical Perspective: We have used statistics from the Social Security System on the National Average Wage back to 1951. For years prior to 1951, we studied the Total Private Nonagricultural Wages as published in *Historical Statistics of the U.S., Colonial Times to 1970.*

There are numerous ways to review this data. For consistency with our observations of CPI, the table below shows the compounded annual rates of wage growth for various 10-year periods, and for longer periods ended in 2005.

The excess of wage growth over price inflation represents "productivity" or the increase in the standard of living, (also called the real wage inflation rate). The following table shows the compounded wage growth over various periods, along with the comparable inflation rate for the same period. The differences represent the real wage inflation rate.

Decade	Wage Growth	CPI Incr.	Real Wage Inflation
1996-2005	4.1%	2.5%	1.6%
1986-1995	3.9%	3.5%	0.4%
1976-1985	7.2%	7.0%	(0.2)%
1966-1975	5.8%	5.7%	0.1%
1956-1965	3.8%	1.7%	2.1%

Period	Wage Growth	CPI Incr.	Real Wage Inflation
1996-2005	4.1%	2.5%	1.6%
1986-2005	4.0%	3.0%	1.0%
1976-2005	5.1%	4.3%	0.8%
1966-2005	5.3%	4.7%	0.6%
1956-2005	5.0%	4.1%	1.1%
1931-2005	4.7%	3.4%	1.3%

Forecasts of Future Wages: The wage index we used for the historical analysis has been projected forward by the Office of the Chief Actuary of the Social Security Administration. In a report in April, 2006, the annual increase in the National Average Wage Index over the next 30 years under the intermediate cost assumption was forecast to be 3.9%, 1.1% higher than the Social Security intermediate inflation assumption of 2.8% per year. The range of the assumed real wage inflation in the 2006 Trustees report was 0.6% to 1.6% per year.

Best-Estimate Range: Based on our judgment, we believe that a range between 0.25% and 1.5% is reasonable. We believe that wages will continue to increase at a rate greater than price inflation. The current real wage assumption of 0.25% is on the low end, and we would generally recommend a higher rate. However, given that inflation is on the high end, the overall result of a 4.0% general wage increase assumption is reasonable.

Real Wage Inflation	
Current Assumption	0.25%
Reasonable Range	0.25% - 1.5%
General Wage Growth	
Current Assumption	4.0%
Reasonable Range	3.0% - 5.0%

Payroll Increase Assumption

The UAAL is amortized as a level percentage of payroll in determining contribution rates as a percentage of pay. The current payroll increase assumption is equal to the general wage growth assumption of 4.0%. It is our general recommendation to set these two assumptions equal, unless there is a specific circumstance that would call for an alternative assumption; therefore, we agree with this assumption.

Demographic Assumptions

Demographic assumptions relate to assumptions such as the probability of an active member leaving the system and the promotional rate component of the salary increase assumption. We looked at both the current demographic assumptions and the recent changes recommended in the experience study. We found them to be reasonable and generally consistent with other '37 Act systems we work with.

Studies of demographic experience involve a detailed comparison of actual and expected experience. If the actual experience differs significantly from the overall expected results, or if the actual pattern does not follow the expected pattern, new assumptions are considered. Recommended revisions normally are not an exact representation of the experience during the observation period. Judgment is required to predict future experience from past trends and current evidence, including a determination of the amount of weight to assign to the most recent experience.

Since we have not independently reproduced the experience study that the current assumptions are based on, we can only make general observations about the appropriateness of the assumptions. Based on this review, we feel the package of demographic assumptions is appropriate for ACERA.

We would add a few comments on the specific assumptions. We have discussed each of these issues with Segal. They are planning to review these assumptions as part of the triennial investigation of experience for the period ending December 31, 2007. We believe this a reasonable approach.

- **Deferred Retirement Age for Safety Members:** For current active Safety members who terminate with a deferred vested benefit, it is assumed that they will retire at age 55. Given that these members can get their full retirement benefit with a COLA starting at age 50, it seems unlikely that they would wait until age 55. We recommend that this assumption be changed to age 50, or at least reviewed with the next triennial investigation.
- **Deferred Retirement for Safety Members Eligible for Immediate Retirement:** For current active Safety members who terminate with 20 years of service and are less than age 55, it is assumed that 25% will elect a refund and 75% will defer to age 55, as discussed in the prior bullet point. We would recommend that the probability of the member electing a refund be changed to 0% for Safety members with 20 years or service (or at least reviewed with the next triennial investigation), as based on our experience with other systems, this is an extremely low probability.
- **Merit and Longevity Increases:** It has been our observation that merit increases have a greater correlation with the member's service than their age. In particular, members who have a significant amount of service with their employer (20 years) tend to be at the top their pay range and generally receive very small merit increases, usually about 0.5%. Using an age-related scale will yield higher pay increases for these individuals who generally have the highest liabilities, and consequently will result in a higher liability than if a service-related scale was used. We would recommend that Segal consider studying the impact of service when developing the merit assumption in the next experience study.

Section 8

Valuation Report

Audit Conclusion

Overall, we found Segal's report to clear and complete. We have made a few minor recommendations where additional information could be included to enhance the understanding of an outside reader.

Comments

We offer the following comments on the report:

- Segal's report states that "No withdrawal is assumed after a member is eligible for retirement." This is not true for Safety members with 20 years of service who are less than age 55. We discussed this with Segal and they indicated they would change the comment.
- Segal's report indicates that the rates may be adopted for the fiscal year July 1, 2006 through June 30, 2007. Given that the report was issued in June of 2006, this would not satisfy the 45-day notice rule. Our understanding is that the contribution rates are actually implemented in September, so the 45-day rule is not an issue. Also, we do not believe the two-month delay has any material financial impact.
- We found the report to be generally complete. There were a few items that were not included that we felt might help the understanding of the outside reader:
  - The UAAL contribution rate is calculated separately for General and Safety members. To perform this calculation, the assets are allocated between Safety and General member on a theoretical basis. It would be helpful to disclose the assets allocated to each group and the method used.
  - Similarly, a theoretical POB credit amount is maintained for both General and Safety members. It would be helpful to disclose information about the POB credit and the method used.

This work product was prepared solely for ACERA. It may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work.

Section 9

Summary of Recommendations & Considerations

Recommendations:

We are not recommending any changes be reflected in the December 31, 2005 valuation. There are a few minor issues that we are recommending Segal incorporate in future valuations. Other than the issue with the investment return assumption, none of these recommendations is material.

- ✓ **Actuarial Valuation Data:** We recommend ACERA provide additional information on retirees' forms of payment and beneficiaries. It is our understanding that this process is currently underway.
- ✓ **Compensation Increases:** Segal is reflecting actual across-the-board increases that are less than the general wage assumption by assuming no merit increases in the valuation year. We recommend that if these differences are known, they be reflected in the general wage increase assumption instead.
- ✓ **Payroll:** As noted in the prior bullet point, Segal is adjusting the compensation used in the calculation of liabilities to account for actual across-the-board increases that are less than the general wage assumption. We recommend that if they make this adjustment, they also reduce the projected payroll in the valuation year.
- ✓ **Investment Return Assumption (Arithmetic vs. Geometric)***:* Although we agree with Segal's recommendation of retaining the investment return assumption, we use somewhat different approaches. As discussed in Section 7, our method uses the expected geometric return when calculating the expected return. Using the geometric returns results in a slightly lower expected return. We recommend that Segal consider this impact when reviewing the investment return assumption.
- ✓ **Investment Return Assumption (SRBR)***:* Although we are not recommending a change in the investment return assumption, we recommend the Board consider the impact of excess returns being credited to the SRBR when deciding on the appropriate assumption.
- ✓ **Employer Contribution Rate***:* If the investment return assumption is not lowered, we recommend the Board and County give consideration to increasing the contribution rate from the current 27-year closed amortization of the UAAL. Ideally, we would recommend that ACERA fund to a higher funding target (e.g., a funding percentage of 110% or 120%) to implicitly recognize market volatility and future credits to the SRBR. If the Board elects this option, this would increase the short-term costs, which may not be desirable given that the employers are already paying a fairly high contribution rate.

One opportunity we see is that ACERA currently has a significant amount of

This work product was prepared solely for ACERA. It may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work.

deferred gains not recognized in the valuation assets. This will likely lead to decreases in the employer contribution rate over the next few years under the current funding policy. If the contribution rate was kept the same instead of decreased, this would result in an improved funding situation and could possibly transition into a situation where ACERA is funding to a higher target. We would recommend that ACERA discuss this and other options with Segal; however, if such an approach is decided upon, it should first be reviewed to verify it does not conflict with Section 31453.5 of the '37 Act.

✓ **Assumption for Future Deferred Safety Members:** We recommend the following two changes be either reflected in the next valuation or reviewed with the next triennial investigation:

- Change the retirement age for current and future vested terminated Safety members eligible for the 3% at 50 formula to age 50 (currently age 55).
- Change the probability of refund for future vested terminated Safety members with 20 years of service to 0%.

✓ **Valuation Report:** We have made some minor suggestions on the valuation report as discussed in Section 8.

- Correct description of withdrawal assumption for Safety members who are eligible to retire, but have non-zero probabilities of withdrawal.
- Disclose additional information on calculation of UAAL contribution rate.
- Disclose additional information on POB credit.

Alameda County Employees' Retirement Association
Actuarial Audit of
December 31, 2005 Valuation

Appendix A-1

Comparison of Actuarial Accrued Liability
(Dollar Amounts in Millions)

Tier	Segal	Milliman	Milliman/Segal
G1			
Actuarial Accrued Liability			
Retiree	$ 1,376.7	$ 1,384.5	100.6%
Inactive	61.6	55.4	89.9%
Active	777.1	788.9	101.5%
TOTAL	$ 2,215.4	$ 2,228.8	100.6%
G2			
Actuarial Accrued Liability			
Retiree	$ 204.8	$ 199.4	97.4%
Inactive	52.5	54.6	104.0%
Active	899.0	892.1	99.2%
TOTAL	$ 1,156.3	$ 1,146.1	99.1%
S1			
Actuarial Accrued Liability			
Retiree	$ 575.2	$ 563.5	98.0%
Inactive	9.9	10.8	109.1%
Active	215.4	216.7	100.6%
TOTAL	$ 800.5	$ 791.0	98.8%
S2			
Actuarial Accrued Liability			
Retiree	$ 60.6	$ 59.0	97.4%
Inactive	11.8	12.6	106.8%
Active	303.6	303.4	100.0%
TOTAL	$ 376.0	$ 375.0	99.7%
Total			
Actuarial Accrued Liability			
Retiree	$ 2,217.3	$ 2,206.4	99.5%
Inactive	135.8	133.4	98.2%
Active	2,195.1	2,201.1	100.3%
Total AAL	**$ 4,548.2**	**$ 4,540.9**	**99.8%**

Alameda County Employees' Retirement Association
Actuarial Audit of
December 31, 2005 Valuation

Appendix A-2

Comparison of Present Value of Benefits by Benefit Type (Active Members)
(Dollar Amounts in Millions)

Tier		Segal	Milliman	Milliman/Segal
G1				
	Service Retirement	$ 744.6	$ 753.4	101.2%
	Withdrawal	3.2	3.1	96.9%
	Disability	48.2	51.3	106.4%
	Death from Active Status	14.6	14.6	100.0%
	Termination Load	70.4	71.1	101.0%
	G1 Total	$ 881.0	$ 893.5	101.4%
G2				
	Service Retirement	$ 1,340.2	$ 1,347.3	100.5%
	Withdrawal	72.8	72.7	99.9%
	Disability	220.8	225.0	101.9%
	Death from Active Status	46.5	45.7	98.3%
	Termination Load	49.5	49.7	100.4%
	G2 Total	$ 1,729.8	$ 1,740.4	100.6%
Total Active PVB (General)		$ 2,610.8	$ 2,633.9	100.9%
S1				
	Service Retirement	$ 199.8	$ 200.5	100.4%
	Withdrawal	0.9	0.9	100.0%
	Disability	7.4	7.7	104.1%
	Death from Active Status	1.1	1.1	100.0%
	Termination Load	19.8	19.9	100.5%
	S1 Total	$ 229.0	$ 230.1	100.5%
S2				
	Service Retirement	$ 443.5	$ 445.5	100.5%
	Withdrawal	19.9	20.4	102.5%
	Disability	73.5	78.6	106.9%
	Death from Active Status	8.6	8.7	101.2%
	Termination Load	16.1	16.3	101.2%
	S2 Total	$ 561.6	$ 569.5	101.4%
Total Active PVB (Safety)		$ 790.6	$ 799.6	101.1%
Totals				
	Service Retirement	$ 2,728.1	$ 2,746.7	100.7%
	Withdrawal	96.8	97.2	100.4%
	Disability	349.9	362.5	103.6%
	Death from Active Status	70.9	70.0	98.7%
	Termination Load	155.8	156.9	100.7%
Total Active PVB		**$ 3,401.4**	**$ 3,433.5**	**100.9%**

Appendix A-3

Sample Member Contribution Rates

Entry Age	Total Member Rates[1]		
	Milliman	Segal	Milliman / Segal
General Tier 1			
25	10.54%	10.31%	102.2%
35	11.44%	11.26%	101.6%
45	12.72%	12.58%	101.2%
General Tier 2			
25	6.91%	6.89%	100.3%
35	7.50%	7.53%	99.6%
45	8.35%	8.41%	99.3%
Safety Tier 1			
25	16.98%	16.75%	101.4%
35	18.40%	18.23%	101.0%
45	20.34%	20.22%	100.6%
Safety Tier 2			
25	13.58%	13.58%	100.0%
35	14.65%	14.72%	99.5%
45	16.13%	16.24%	99.3%

[1] *Rates shown are for the biweekly pay greater than $161 and include cost-sharing.*

This work product was prepared solely for ACERA. It may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work.

Alameda County Employees' Retirement Association
Actuarial Audit of
December 31, 2005 Valuation

Appendix A-4

Comparison of Employer Rates

	Segal	Milliman	Milliman/Segal
County Only			
General Tier 1			
Normal Cost Rate	11.91%	11.39%	95.6%
UAAL (before POB credit)	9.62%	9.73%	101.1%
Pension Obligation Bond Credit	-5.07%	-5.11%	100.8%
Total Contribution	16.46%	16.01%	97.3%
General Tier 2			
Normal Cost Rate	9.75%	9.87%	101.2%
UAAL (before POB credit)	9.62%	9.73%	101.1%
Pension Obligation Bond Credit	-5.07%	-5.11%	100.8%
Total Contribution	14.30%	14.49%	101.3%
Safety Tier 1			
Normal Cost Rate	23.93%	22.58%	94.4%
Member Cost Sharing	-3.00%	-2.99%	99.7%
UAAL (before POB credit)	21.04%	20.19%	96.0%
Pension Obligation Bond Credit	-4.92%	-4.85%	98.6%
Total Contribution	37.05%	34.93%	94.3%
Safety Tier 2			
Normal Cost Rate	16.68%	16.71%	100.2%
Member Cost Sharing	-2.96%	-2.94%	99.3%
UAAL (before POB credit)	21.04%	20.19%	96.0%
Pension Obligation Bond Credit	-4.92%	-4.85%	98.6%
Total Contribution	29.84%	29.11%	97.6%
Total County Categories Combined			
Normal Cost Rate	11.33%	11.34%	100.1%
Member Cost Sharing	-0.48%	-0.48%	100.0%
UAAL (before POB credit)	11.46%	11.45%	99.9%
Pension Obligation Bond Credit	-5.05%	-5.07%	100.4%
Total Contribution	17.26%	17.24%	99.9%
Districts Only			
General Tier 1 Districts			
Normal Cost Rate	11.91%	11.39%	95.6%
UAAL (before POB credit)	9.62%	9.73%	101.1%
Total Contribution	21.53%	21.12%	98.1%
County and Districts Combined			
Normal Cost Rate (Net)	10.87%	10.86%	99.9%
UAAL (Net)	6.45%	6.42%	99.5%
Total Contribution	**17.32%**	**17.28%**	**99.8%**

Appendix B

Glossary

The following definitions include excerpts from a list adopted by the major actuarial organizations in the United States. In some cases, the definitions have been modified for specific applicability to ACERA and include terms used exclusively by ACERA.

Actuarial Accrued Liability	That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of pension plan benefits and expenses which is not provided for by future Normal Costs.
Actuarial Assumptions	Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement, and retirement; changes in compensation; rates of investment earnings and asset appreciation or depreciation; procedures used to determine the Actuarial Value of Assets; and other relevant items.
Actuarial Gain (Loss)	A measure of the difference between actual experience and that expected based on a set of Actuarial Assumptions during the period between two Actuarial Valuation dates, as determined in accordance with a particular Actuarial Cost Method.
Actuarial Present Value	The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions.
Actuarial Valuation	The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a pension plan.
Actuarial Value of Assets	The value of cash, investments and other property belonging to a pension plan, as used by the actuary for the purpose of an Actuarial Valuation.
Actuarially Equivalent	Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.
Amortization Payment	That portion of the pension plan contribution which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.
Contingency Reserve	The Contingency Reserve is used to satisfy the California Government Code requirement for Section 31616 requirement for ACERA to reserve at least 1% of assets, up to a maximum of 3% of assets.

This work product was prepared solely for ACERA. It may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work.

Cost-of-Living Reserve	The accumulation of employer contributions for future annual cost-of –living increases for retirees and continuance beneficiaries. Additions include contributions from employers and related earnings and deductions include monthly cost-of-living benefit payments.
COLA Contribution Reserve	This CCR refers to the amount of excess investment earnings that have been set aside to reduce future employer COLA contributions as provided under Section 31617 of Article 5.5 under the CERL. If no earnings are allocated under 31617 or they have already been allocated as a credit for future employer COLA contributions, the CCR value is zero.
Employers' Advance Reserve	The accumulation of employer contributions for future retirement benefit payments. Additions include contributions from employers and related earnings and deductions include transfers to the Retired Members' Reserve.
Entry Age Actuarial Cost Method	A method under which the Actuarial Present Value of the Projected Benefits of each individual included in an Actuarial Valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit ages. The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. The portion of this Actuarial Present Value not provided for at a valuation date by the Actuarial Present Value of future Normal Costs is called the Actuarial Accrued Liability.
Funding Percentage	A measurement of the funded status of the system. The Funded Ratio is calculated by dividing the Valuation Assets by the Actuarial Accrued Liability. For example, a Funded Ratio of 90% indicates assets are 10% less than liabilities.
Funding Excess	The excess, if any, of the Actuarial Value of Assets over the Actuarial Accrued Liability.
Members' Deposit Reserve	The accumulation of member contributions. Additions include member contributions and related earnings and deductions include transfers to the Retired Members' Reserve and refunds to members.
Non-Valuation Reserves	Those funds not available to fund the Regular Benefits. These are the Contingency Reserve, the Unallocated SRBR Reserve and the COLA Contribution Reserve.
Normal Cost	That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.
Plan Year	A 12-month period beginning January 1 and ending December 31.

Projected Benefits	Those pension plan benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits.
Regular Benefits	The benefits provided under the non-SRBR section of ACERA. These will include both Basic Benefits and COLA Benefits.
Supplemental Retiree Benefit Reserve (SRBR)	The SRBR represents funds required by statute to be set aside from investment earnings to provide supplemental benefits to retirees. The benefits that ACERA is currently funding from the SRBR include healthcare insurance subsidies, supplemental COLA, Medicare Part B reimbursement, vision, dental, and increased death benefits to retirees.
Unfunded Actuarial Accrued Liability	The excess, if any, of the Actuarial Accrued Liability over the Actuarial Value of Assets.
Valuation Date	The date upon which the Normal Cost, Actuarial Accrued Liability, and Actuarial Value of Assets are determined. Generally, the Valuation Date will coincide with the ending of a Plan Year.
Valuation Reserves	All reserves excluding the Non-Valuation Reserves.