FINANCE AGENCY
REPORT BACK ON PENSION OBLIGATION BONDS
(AS revised on June 2, 2005)

BACKGROUND
At the FGOC meeting of May 6, we were asked to come back with a full discussion of Pension Obligation Bonds (POBs) for the committee to consider on June 3. In addition we are providing estimated rate impacts of PERS new rate stabilization policies. Since PERS had just made some dramatic changes to their practices to stabilize rates, we requested some additional time from the May 6 meeting to thoroughly analyze these changes and to determine their impacts on PERS rates both with and without possible POBs.

EXECUTIVE SUMMARY
As this memo will explain, the long-term benefits or costs to the County from issuing POBs ultimately depends upon the timing and extent of future PERS investment returns. To understand how future market behavior, be it positive or negative, will impact employer rates on the portion of UAAL that might be financed with POBs, we have created an extensive model that emulates what will happen to the portion of PERS assets and employer costs under different market scenarios assuming that POBs are issued. These results are compared to the alternative costs of not issuing POBs.

The major conclusions of this study are:

1. Short-term budget savings from the issuance of Pension Obligation Bonds (POBs) would be minimal due to PERS new rate stabilization policies and to the fact that the County of Santa Clara is receiving a fresh start in FY 2006. These minimal savings should not influence or be considered as a rationale to issue POBs.

2. A simple comparison of PERS interest rates of 7.75% and the rate on POBs currently estimated at 5.25% would suggest that market gains above 5.25% would profit the County’s retirement plans. This is not the case. Market gains must be above 6.31% to profit the plan. This is the most surprising and important finding of this study.

3. Market timing related to the issuance of POBs is not possible and short-term market losses early in the life of a POB issuance will increase the required average return rates over the remaining life of the issue. Our model computes these.

4. Large market gains early in the life of a POB will provide an additional reserve. However, this may not be a sufficient cushion to offset subsequent market losses. The historic gains from the years 1998 thru 2000 were not sufficient to offset the losses from 2001 through 2003. Ultimately the true success or failure of a POB may not be determined until they are paid off.
5. PERS new rate stabilization policies will avoid short-term rate spikes caused by bad markets such as those recently experienced by the County. This will be true with or without the issuance of POBs.

6. The new rate stabilization policies will not amortize the Unfunded Accrued Actuarial Liability (UAAL) but will actually increase it over time due to negative amortization.

7. The decades of the 1980's and 1990's saw the greatest bull market in history. Today, however, the market is extremely volatile and the market performance of the last two decades cannot be relied on as an indication of future market performance.

8. Not issuing POBs avoids market risk on the UAAL. While many external factors will change the total UAAL over time, the portion that exists today will not change because of market performance and has a set predictable payment formula to PERS. However, if POBs are issued, total payments will fluctuate based on future markets.

9. The success or failure of POBs will be totally dependent on future market conditions.

**DISCUSSION**

**Pension Obligation Bonds**

Pension Obligation Bonds are issued to fund the Unfunded Accrued Actuarial Liability (UAAL) of an employer's pension plan. The proceeds of the bonds are paid to the pension plan to extinguish (in whole or in part) the UAAL as of the date of issuance. The assumption is that the County pays debt service to bondholders at an all-in interest rate that is lower than the actuarially determined rate of interest the County would pay to amortize its UAAL through payments to the pension plan.

In California, POBs are viewed as an exception to the constitutional debt restriction imposed by Article 16 Section 18 on Cities, Counties and School Districts requiring voter approval of debt. This exception occurs because POBs are considered to be an obligation imposed by law. They are also authorized under the State law that permits the issuance of refunding bonds. The legal theory is that the County's UAAL is reduced to a debenture owing to its pension plan which is "refunded" much the way any other County bonds or COPs might be. With obligations imposed by law, most bond counsels require that each jurisdiction must first have a validation action to determine if there is authority to issue debt. While this generally is a 3-4 month process, the County's bond counsel advises us that the County has previously completed a validation action in the early 1990's. This means that if the County were to elect to issue POBs there would be no waiting period.

POBs are sold as taxable bonds because of the underlying arbitrage considerations of placing the proceeds into a pension fund that can subsequently invest in equities. Current rates on such issues generally range between 5% and 6%, however, the immediate market is on the lower side. For example, Riverside County just sold such an issue for an all in interest rate just below 5%.

The act of issuing POBs does have an affect on the issuing entity's financial statements. The liability for the bonds goes from a footnote disclosure describing the unfunded accrued actuarial liability (UAAL) item to an actual Balance Sheet liability.
Both Standard and Poor's and Moody's have issued position papers stating generally that POBs in and of themselves are considered a debt transfer (e.g., the County's UAAL is viewed as an existing debt) and are not necessarily a sign of credit weakness. However, it is also interesting to note that Moody's listed the County of Santa Clara's absence of POBs as a credit strength a few years ago. A Financial Advisor stated that the rating agencies are as ambivalent about POBs as we are since they cannot predict the future. However, they want to make sure issuers are aware of the risks when they issue them. As a consequence, they will want to examine an issuer's rationale for such an issue to make sure that the risks are fairly assessed.

One positive aspect of POBs is that they are viewed more favorably from a credit perspective than COPs or Lease Revenue Bonds. Moreover, they can be structured so that there is no debt service reserve fund requirement. This means that all of the net proceeds can be paid to the pension plan rather than having to set aside a reserve with a Trustee in case a payment cannot be made.

Arguments in favor of POBs generally are: (for simplicity later in our discussion these will be referred to as argument F1 through F6)

1. They will provide immediate substantial budget relief.
2. The cost of funds is cheaper when one compares the cost of taxable POBs at (say) 5.25% to the rate that PERS charges on the UAAL of 7.75%.
3. Recent historic returns on PERS' investments are very high and if average recent historical returns reoccur, they could increase the principle over time at a faster rate than the liability. If sufficient capital is deposited to the plan, this could create an actuarial surplus greater than the outstanding bonds.
4. The long-term pension costs would be reduced.
5. POBs are a transfer of liability and will not affect the bond rating.
6. This is a brand new argument: PERS's new 30-year rolling amortization creates negative amortization. In other words, the payments each year are less than the 7.75% interest charge. As a consequence, the existing UAAL debt will never fully amortize by itself under PERS new stabilized payment schedule, but will, in fact, grow. Market gains greater than the actuarial estimate over time will be required to increase plan assets enough to eliminate the UAAL.

Arguments against POBs are generally (A1 through A6):

1. There is short-term market risk in that the large infusion of principle could hit a bad market and have early losses that may never recover. This could result in the County paying POB debt service as well as paying for a new UAAL.
2. Long-term costs would be greater if the market doesn't perform to expectations.
3. If an extended good market occurs, the entity would be stuck with a higher fixed debt serviced on the bonds than PERS would charge. In other words the rest of the asset balance in PERS would earn enough to offset the UAAL and lower the PERS rate below what the alternative POBs would cost. (This risk can be managed, however, by issuing a
portion of the POBs in way that makes them easy to retire/defense in the event the County enjoys reduced PERS rates at a future date.)

4. There is no additional market risk to principle for a UAAL. This is also a brand new argument developed from our study. To the extent that the market doesn’t perform to expectations, the other plan assets will indeed generate a growing UAAL. However, the slice that is unpaid at this time is not cash in the plan and will not increase this deficit. This is a very subtle but important point as will be shown later in our model. Perhaps thinking about a UAAL as a bank loan will help. To the extent that you owe the bank money, that liability remains unchanged regardless of market losses to the banks’ other assets. If you have assets in the bank you could lose money on those, but not on the loan itself.

5. Paying PERS the UAAL over time will help dollar cost average contributions to the plan.

6. A surplus in the plan resulting from POBs could increase political pressure for benefit increases.

The difficulty in discussing the possible benefits of POBs based upon the all of these arguments is that they are mostly true, although as our analysis will later show, F1 and F2 are not necessarily the case. Additionally, some definitely have greater weight than others.

The fact that opposing arguments can be true shows the complexity of the issue. For example, to say that long-term costs could increase with the issuance of POBs and say that they could also decrease are not opposing arguments. Both are dependent on future market conditions. The trick here is to understand how future market behavior, be it positive or negative, will impact rates on the portion of UAAL that is being financed through POBs.

**PERS's new rate stabilization policies**

On Wednesday April 20, 2005, the PERS board approved staff recommendations for rate smoothing which will have an immediate impact on the way market fluctuations will impact future employer payments to PERS. The approved recommendation included four components:

- Increase the actuarial value of assets corridor to 80%-120% from its current 90%-110% of market value.
- Use a 15-year spread of market value asset gain or loss from the current 3-year spread.
- Each year the employer’s rate will include a 30-year (rolling) amortization of all previously unamortized gains and losses. The current method of amortizing the difference at 10% each year resulted in an effective amortization period of 13 years.
- A minimum employer contribution rate of the employer normal cost less 30-year amortization of plan surplus. This will virtually eliminate the possibility that employers will get a “rate holiday”(i.e. zero employer rate) as the County of Santa Clara received for the years FY of 1999 thru 2003.

In total, these changes will result in much more gradual rate changes to PERS client agencies. Had these new smoothing recommendations been in effect for the last 10 years, the County's
miscellaneous employer's rate would not have gone below 3% and for FY 2006 would be about 10% compared to the 13% scheduled. Additionally, these new policies will also have immediate impacts on the difference in rates attributed to UAAL. This will be explained later in our analysis.

**Stabilization Impacts on Rates**

In responding to the Committee's inquiry, we had our independent actuary, John Bartel, model our employer rates over 10 years under both the old and the new stabilization method. His analysis, Exhibit G, models three different return scenarios: a low growth 3.5%, a target growth 7.75%, and a high growth 12.1% for both plans.

As a general rule, both plans will experience very little rate change between the two methods if target growth is met. However, both low growth and high growth scenarios show dramatic differences. For example; in FY 2016:

**PUBLIC SAFETY:**

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<th>Growth Scenario</th>
<th>Old Method</th>
<th>New Stabilized</th>
</tr>
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<td>41.2%</td>
<td>30.0%</td>
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<tr>
<td>Med 7.75%</td>
<td>24.5%</td>
<td>23.4%</td>
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<tr>
<td>High 12.1%</td>
<td>2.3%</td>
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**MISCELLANEOUS**

<table>
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<tr>
<th>Growth Scenario</th>
<th>Old Method</th>
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<td>Med 7.75%</td>
<td>11.3%</td>
<td>10.9%</td>
</tr>
<tr>
<td>High 12.1%</td>
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In balance, given the shock to our budgets from recent PERS rate increases, we view rate stabilization as a good protection. However, it could prove frustrating in an environment of continued high earnings.

**Actuarial Concepts:**

Our model emulates what happens to our PERS assets, UAAL and employer costs for UAAL under different market scenarios if POBs are sold and compares these to the same factors if POBs are not sold. However, before we explain our model, we offer a brief review of actuarial concepts to help explain the model. These are also shown graphically in Exhibit A.
Point A represents the future cost (or liability), for all future benefits to participants in the plan. This is determined by actuaries who look at all plan participants, plan benefits, present and future salaries, survivor benefits, life expectancy, etc. to determine a future cost.

Part of the funding of this future cost will be the costs of future services to be paid for all participants of the plan. This would represent the future value of all future employer's normal costs, employee's statutory contributions and market gains to the plan on these contributions. Below point A is a point that is reduced by those amounts. This point B represents the future liability for all present costs to date. We will call this point the future actuarial liability for present pension costs.

Next, that future liability is discounted to the present by the slope representing the actuarial rate of return of 7.75% (line C). The point on the line representing today, point D represents the present, Accrued Actuarial Liability.

Below that point on the X axis, bar E is the actuarial value of assets in the plan. As you will recall, this value is always different from the Market value of assets because of smoothing. The space between the point D and bar E is the Unfunded Accrued Actuarial Liability (UAAL). The sale of POBs for the full UAAL would add to the Actuarial Value of assets and essentially fill this space.

**POB Model:**

Our POB Model was developed to determine what would happen to rates under different market scenarios and address when POBs would save costs and when they would cost more. It was developed to emulate the mechanics in PERS only for the portion of UAAL that would be
refunded through debt and purposely avoids addressing other potential impacts, such as future benefit increases and future market gains or losses to the existing plan assets. These will occur with or without the issuance of POBs and our model only measures the market impacts on the portion of funds from POBs.

In validating the model, POB assumptions were reviewed by an independent investment banker who actually provided a sculptured debt service schedule at the assumed rate. In addition, all actuarial functions, including PERS’s new rate stabilization policies were reviewed by both our independent actuary and by our PERS actuary.

Basic assumptions in the model are:

- $100 million in 30-year POBs are issued on June 30, 2005;
- Net proceeds of $99 million are deposited to PERS;
- The interest rate on the bonds is 5.25% (Taxable);
- Debt payments are sculptured vs. straight line to contour to PERS payments.

The model itself looks at eight different interactive functions. The following is offered to help flesh out the model and give the reader a sense of the model’s complexity and follow the logic of the model. A copy of the model for one of the 10 scenarios is attached as Exhibit B.

1. The sculptured debt service payments on POBs.
2. The changing market value of proceeds over 30 years with various earning scenarios.
3. What the asset balance should be compounded at the actuarial rate of return of 7.75%.
4. The actuarial value of those same assets based on PERS’s new smoothing formulas.
5. The imputed surplus or deficit (i.e. the difference between 3 and 4), which would represent the new UAAL or Surplus created by the bond proceeds (and only those proceeds) over time.
6. The incremental credit or payment created by 5. This is then added to the annual sculptured debt (Item 1) to determine the combined cost.
7. The normal PERS costs and amortization schedule for the same amount of principle under their new rate stabilization policies.
8. The budgetary savings and cost for each year and the NPV of these costs. For the final analysis, any excess market surpluses or accumulated deficits on a market basis are factored into the model.

Model Results:

The questions that the model addresses and the responses follows:

1. Will there be substantial immediate budgetary savings if POBs are sold? (Argument FT)
In this case, our model assumes that each and every year PERS will earn its full actuarial rate of 7.75%. By making the rate of return equal to the expectation, we demonstrate the pure differences in POB annual costs vs. PERS UAAL costs.

Exhibit C

Exhibit C shows annual payments for PERS's former full amortization (line 2) compared to the annual debt service on the POBs line 1. Comparing these shows a growing budgetary savings between the two which represents the cheaper cost of POBs (i.e. 5.25% compared to 7.75%). However, line 3 shows the payments to PERS based on the new stabilization policies. As can be seen, the new PERS stabilized rates substantially reduce the budgetary savings and closely shadow the POB costs. Under the prior PERS policies the difference in payment would have been much more dramatic due to the 13-year amortization period. However, our requested rate relief for 2006 has already set us on a 30-year fresh start so short-term impacts of the new method are negligible.

With the new rolling 30-year amortization period it is now similar to the 30-year bond amortization and the additional budget costs will result from the sale of POBs. The annual debt service cost is approximately $2.5 million on a $100 million POB, if the plan meets its earnings objectives. Should the County of Santa Clara elect to issue approximately eight times this amount in POBs (representing approximately the full estimated UAAL at June 30, 2005), immediate annual savings would be in the $20 million dollar range.

What should also be noted (Argument F6) is that PERS's new policies do result in negative amortization and as a result, a $99 million UAAL today will grow to $372 million at the end of 30 years. This liability has a present value of $1.146 million at a 4% discount rate. How will various market earnings rates impact total costs over time? (Arguments F4 and A2)

While one could argue that on a NPV the liability only increases $15.6 million, we still find this deferral somewhat surprising on the part of CalPERS. The only way that this will be reduced is through excess earnings from other plan assets.
2. How will various market earnings rates impact total costs over time. (Argument F4 and A2)

To answer this question, we ran seven different scenarios showing a constant PERS rate of return over the 30-year amortization period. While we know that market returns are anything but constant, we nonetheless wanted to understand how different constant rates of return impact total PERS Costs. We ran return rates of 5%, 6%, 7%, and 7.75% (representing the PERS assumed actuarial rate of return), 8%, 9% and 10%. These were compared to the PERS Costs model of funding the UAAL. Exhibit D shows the results graphically. Graph 1 shows the annual pension costs, Graph 2 shows the cumulative pension costs under these scenarios and Graph 3 shows the NPV Costs or savings from these various return rates.

EXHIBIT D — Graph 1

PERS Annual Costs
$100M POBs
at 5.25%
Various Inv. Rates

[Diagram showing annual costs with different return rates]
What should be noted in Graph 2 is that at the end of the 30 years, there is either an up swing or down swing in the total cumulative costs for all of the scenarios except number 4. This represents the ending value of either an increased liability (upsokwing) or the benefit of an accumulated surplus (down swing) of these proceeds at the end of 30 years. The reason for no change in option 4 is because under the 7.75% gain rate there is no UAAL. In other words, the fully funded plan assets will exactly track the target line.
Graph 3 represents the net present value costs or savings of the various scenarios. In this case the NPV differential of all long-term costs under various options is compared to the normal PERS amortization model as the base case. For this reason the base case will always be a flat line representing zero.

The results support both arguments F4 that above expected returns will save long-term cost and argument A2 that earnings below the assumed rate will raise costs.

However, what is surprising and very counter intuitive, is the impact of return rates below the 7.75% assumed rate. The results argue against argument F2. The cheaper cost of the POBs at 5.25% only saves long-term costs if PERS earns a return rate between 6% and 7%. As can be seen in Graph 3, the net present value at 5% and 6% represent a net NPV cost over the option of paying PERS, and 7% shows a modest gain. Incidentally, this was the same result from our model in its earlier form using the old full amortization PERS method. This means that the break-even rate is much higher than the 5.25% bond rate.

This result goes against the existing conventional wisdom as was exemplified in a November 2004 Riverside County Study: “Many public agencies have looked at the decision to issue bonds in isolation by simply comparing the cost of funds to the anticipated rate of return on invested funds. Although incomplete, this approach does capture the essence of the financing transaction. The POB rate becomes the ‘breakeven’ rate. For the purposes of illustration, if the bonds carry a rate of 5.5%, as long as the CalPERS rate of return exceeds that rate, the financing produces true economic benefit.”
Our model proves that this logic is incorrect and demonstrates why. Explaining why this logic is incorrect, however, is one of the larger challenges of this report and is the basis of argument A4. If additional assets are added to the plan and they don’t keep pace with the target of 7.75%, a deficit (incremental UAAL) starts developing purely on the $99 million deposited in PERS. As these steady return rates compound in the model, the deficit compounds and grows. After a few years it starts impacting rates to a point that the combination of debt service and incremental PERS rates, solely on the loss in deposited POB assets, exceeds the alternative cost of paying PERS for the UAAL. The point where these increase costs are offset by the lower costs of interest on the bonds (e.g. 5.25%) is the break-even point. As is argument A4 stated, an incremental UAAL doesn’t develop under the PERS cost model because the County of Santa Clara is paying off a liability and assets returns don’t affect that portion of the liability (recall the bank load analogy in argument A4).

If the projected nominal interest costs of the POB is 5.25%, the actual rate that PERS has to earn on average each year to break even on a NPV basis is actually 6.31%. As stated earlier, this is the most important finding of this study. While not an impossible threshold, 6.31% is a big difference from the interest rate of the POBs that is traditionally touts as the cost of funds and the nominal economic target. However, for the component of plan assets from POBs, the 7.75% bar is lowered to 6.31%. In a sense, this provides a 1.44 basis point hedge (1.44%) on the portion of the UAAL funded from POBs.

This raises a question: how does this new 6.31% threshold compare to traditional PERS rates of return? As was reported in the Board’s budget analyst report of May 3, 2005, PERS returns have averaged as follows:

- Last 25 years: 10.96%
- Last 20 years: 12.02%
- Last 15 years: 9.91%
- Last 10 years: 10.17%

While these rates are encouraging, one has to acknowledge that the late 1980 and 1990’s represent the greatest bull market in history. Since the new millennium however, the market hasn’t reached these rates and, in fact, 2000 thru 2004 show an average return of only 3.58%. The Committee may recall that at the end of 1999 both Plans had surpluses and the Miscellaneous Plan was “super-funded”. Subsequent losses and low returns have been a major reason for the present UAAL along with benefit increases.

In addition, the new millennium period has had tremendous volatility in the market in general. As an example, all gains in the Dow between July and March this fiscal year were virtually wiped out in April; and as of May 23, 2005, more than half of this loss has been recovered. There is simply no way to time the market with such volatility. An additional fact to consider is the fact that until the early 1990’s, PERS investments were approximately 60% fixed and 40% equities. This provided a far more stable return than PERS current portfolio, which is approximately 60% equities and 40% fixed. In summary, when looking at PERS returns, one has to consider that the fund now has greater volatility in a more volatile market environment.
Exhibit E contains two graphs. Graph 1 shows the historical returns from PERS over 34 years. This clearly demonstrates the historic bull market. While PERS returns for this period far exceed the old 8.25% actuarial rate of return, the majority of these returns occurred during this bull market.

**EXHIBIT E - Graph 1**

Comparison of PERS
Actual & Actuarial 8.25% to S&P 500

```
Year
0 5 10 15 20 25 30 35 40 45 50 55 60
```

```
PERS Actual | PERS Actuarial at 8.25% | Standard and Poors 500
```

```
1 2 3
```

**EXHIBIT E - Graph 2**

Comparison of PERS
Actual & Actuarial 7.75% to S&P 500

```
Year
0 5 10 15 20 25 30 35 40 45 50 55 60
```

```
PERS Actual | PERS Actuarial at 7.75% | Standard and Poors 500
```

```
1 2 3
```
Looking at Graph 2 we see the 20-year period thru 1990. This includes the new actuarial rate of return of 7.75%. In looking at this graph, it should be noted that while the returns met the 7.75% return, it took 16 years to do so, and caught up because of the bull market of the mid 1980’s.

While most economists agree that the increase market volatility will continue, several believe that returns in the new millennium may look more like historic returns prior to the recent bull market. The key point is that no one knows what the market will do and should the County of Santa Clara elect to issue POBs, it has to be fully aware of possible consequences of a market below the 6.31% break even threshold.

Investment Bankers will counter that if markets under perform, based on the billions of dollars of assets in the Plan, the county and all PERS agencies will have much bigger issues to deal with than the portion impacted by POBs. While this argument has some merit we believe that it is off point. The reason to issue POBs is to reduce cost. If adverse markets cause cost increases and no one can predict future markets, issuers must be aware of possible loss consequences.

*Given increased market volatility, what is the short-term market risk and how would early market swings either positive or negative impact long-term costs? (Argument A1)*

To answer this question, we modeled various scenarios attempting to replicate more volatile market swings early in the life of a new POB to show their impacts on the $99 million plan contribution and resulting long-term cost. Again, this was only on the portion of proceeds from a POB, or $99 million. First two were also included in the last model and are repeated to form a base line. The various scenarios follow:

- **PERS Cost scenario:** How the $99 million UAAL impacts our PERS costs if we continue to pay PERS amortization.
- **Equal scenario:** How would our costs behave with the issuance of $99 million POBs assuming that we earned the PERS actuarial Rate of 7.75% each year?
- **2000 scenario:** How would our rates be affected by early market losses equal to those of 7.2% experienced in 2001, 6.1% in 2002 then a modest 3.9% gain in 2003 followed by our new threshold of 6.31% rate every year there after?
- **Catch-up scenario:** The same experience in the first three years as the 2000 model and then determine what return rate over 30 years would be necessary to offset those early losses.
- **Up/Down scenario:** This replicates market gains in 1998 through 2000 of 20.5%, 12.5% and 10.5% and then shows 2000 scenario returns of 2001 through 2003. Again, the rate is set at 6.97% for the final 24 years.
- **Gain scenario:** How would our costs differ if we issued POBs and early gains were 12%, 13% and 10% in the first three years and then 6.97% every year there after.
- **Historic scenario:** This represents PERS historic market returns for the 30-year period between 1975 and 2004. This includes the historic bull market of the late 1980’s and 1990’s.
Admittedly, we did not run detailed Monte Carlo-type simulations showing a wide variety of combinations of gains and losses. The purpose of our model is not to assess return probabilities, however, we provide a brief discussion of this later in this study. Additionally, we did not run some “super best case” scenarios such as simulating the yields experienced by agencies who sold POBs in the early 1990’s.

The results of these simulations are displayed in Exhibit F Graphs 1 through 3. Similar to the previous constant return scenarios, Graph 1 shows annual cost, Graph 2 shows cumulative costs including the final up-swing representing an ending UAAL or down-swing representing surpluses. Graph 3 shows the net present value from the PERS cost base line.

EXHIBIT F

Graph 1

PERS Annual Costs

$100M POBs
EXHIBIT F
Graph 2

Cumulative PERS Costs
$100 M POBs
at 5.25%

Fiscal Year
The 2000 scenario is the disaster scenario. Many issuers sold POBs in 2000 and are looking at results similar to the 2000 model. What is particularly interesting in the model is that once the deficit occurs in the early years, it will not subside nor stabilize with subsequent 6.31% returns. Instead, the deficit will continue to compound, but be offset somewhat by required increasing payments to the plan. This scenario has a NPV cost of $38 million.

The Catch-up scenario shows that to close this gap caused in the 2000 model, would require annual returns of 7.21% over the next 27 years to catch up. This is not a particularly high recovery rate and reduces a portion of our concerns about early market risk. Such returns can be accomplished, however, it sets the bar higher than the threshold.

The Up/Down scenario has perhaps the most surprising results. One would think that the three years gains of 20.5%, 12.5% and 10.5% would provide more than enough surplus to cushion
subsequent market losses of 7.2%, 6.1% and a slight 3.9% gain. In this case it didn’t and the reason is that with a 7.75% target, losses have a far greater impact than gains. Comparing the 20.3% gain to 7.75% required return provides a 12.75% cushion. However, a 7.2% loss actually represents a 14.95% variance to the required return. Unless early market gains are sustained by generally positive subsequent returns, they can evaporate quickly. Continuing returns of 6.62% for 24 years would be required to offset this early set back. The true success or failure of a POB may not be determined until they are actually paid off.

The Equal scenario assumes that 7.75% is actually earned. Again under this scenario all PERS earnings targets are met and there is no increasing actuarial liability, surplus or additional costs from PERS.

The Gain scenario is the opposite of the 2000 scenario and shows how early gains can build up the nest egg and provide a cushion against future losses and lower future costs. The early gains created a NPV Gain final benefit of $26 million. As mentioned earlier, this isn’t a super best case such as the consecutive years of market gains experienced in the 1990’s. Given current market volatility, we doubt that another run such as that experienced in the 1990’s will reoccur for a while, but no one knows. In this case the nest egg would provide enough cushion for 27 years of substandard 5.77% returns to break even to the PERS Cost scenario.

Historic Returns, if repeated for the period in question, would create a pension windfall for both existing plan assets and for POB contributions to the Plan. However, such returns would also eliminate the current UAAL in 14 years and create a surplus on its own. The benefit of POBs under historic returns would be lower rates and an increased ending surplus of $670 million resulting only from the POB proceeds.

PERS Cost actually represents a low risk option and the lowest budgetary cost. Using PERS funding plan has the advantage of contributing to PERS on a dollar cost averaging basis and avoids short-term market risk (arguments A1 and A5), lowers market risk to principal (argument A4) and generally supports the remaining arguments against issuing POBs.

However, we agree with the assessment of the Board’s Budget Analyst that argument A3 is not a compelling argument. While, indeed, above market gains on a plan either fully funded by POBs or partially funded could create plan surpluses, and result in a higher POB charge than PERS would charge, this would not necessarily be a bad thing. In addition, as previously shown, PERS new rate stabilization negates against future employer rates going to zero.

The negative amortization of the new rolling 30-year amortization of the UAAL (argument F6) does cause us some concern. While the UAAL increases over time, our analysis shows that discounted at 4% it actually goes up $15.6 million on a NPV basis. Nonetheless, it does result in a deferral of liability amortization. Absent excess future market gains on other plan assets, this amount will continue to escalate. However, this is the only option that can guarantee that future payments will remain constant on the UAAL that exists today. Under this option you clearly know the future costs for this portion of UAAL.
An important point to make here is that the PERS option is a valid and stable funding plan. While we believe that all of the major Counties who have sold POBs did so with good analysis, the simple truth is that no one can tell if POBs will gain or cost more over time. An issuer who sold POBs in 2000 and hit the bad market may have had better analysis and rationale that an issuer who sold them in 1993 and hit the lotto. It all comes down to market timing, which no one can predict.

One additional argument against POBs is that once the liability transfer is made and the UAAL is eliminated, to the extent that surpluses are generated, employee organizations may not consider the bond debt when asking for pension improvements (argument A 6).

Market Return Probabilities:

Lastly, while we did not run detailed Monte Carlo-type simulation analysis, some evidence of return probabilities are included in Exhibit G attached. While we are aware that in a study for Riverside, Mr. Bartel ran detailed stochastic assets and liability forecasts, we did not request that he do so for us. However, his report comparing PERS old and new smoothing methods also includes confidence levels based upon stochastic modeling.

Stochastic modeling involves running thousands of possible return simulations to determine the number above and below each designated point to determine probability. For example, in the attached report his 3.5% long-term earnings scenario had a 75% return confidence, meaning that 75% of the simulations earned at or over this rate. The 7.75% target had a 50% confidence and the 12.1% has a 25% confidence. A rough interpolation of these probabilities would suggest that our 6.31% breakeven threshold would have a better than 50% probability. However, that is only a break-even point. If the County were to sell POBs, we would want to assure that there is a good chance to make a gain. In our opinion, a target of 7.00% would be a minimum target for this purpose. Absent additional stochastic analysis on return probabilities, we would not venture a guess on this return probability, but it would be better than 50%.

Options:

Options that the County of Santa Clara could consider include:

1. Using PERS funding method and not issuing POBs. This is the lowest risk of the options, but could also result in the missed opportunity to capture future market gains on the POB contribution to the Plan.
2. Issuing POBs for a portion of the UAAL say 50%. This is the moderate risk option and blends both the risk and rewards of both options.
3. Issuing POBs for the full extent of the UAAL in an amount over $800 million. This is clearly the highest risk option and is not supported by the administration.
4. Explore possible ways to issue POBs over time to mitigate short-term market risk.
SUMMARY

We would describe our position on POBs as ambivalent. From an optimistic perspective they can substantially reduce pension costs and from a pessimist view, poor market timing will result in increased costs. A major point revealed in our analysis is that POBs sold at 5.25% actually have 6.31% threshold and the question is not as simple as many have thought.

As our PERS actuary said, to him “it's the equivalent of taking a second mortgage on your house and put it into the stock market”. An investment banker would counter that over time the market should gain a lot more than the cost of POBs, and in any event, substantial market losses will affect a lot more than the portion of employer costs affected by the UAAL. We are not persuaded by this argument. The fact is that to the extent POBs are issued, there should be a reasonable expectation that they will save costs on their own.

What is concerning to us is that while POBs do have some positive factors and our models do in fact demonstrate that the short-term adverse markets are recoverable, they now represent increased short-term budgetary costs from what PERS will be charging. Consequently, any consideration of POBs now has to be based on long-term considerations, and in the final analysis, faith that market returns will respond appropriately. Unfortunately, no one can predict the future.
Table 1: Funding of 30-Year Fresh Start UAAL Amortization

<table>
<thead>
<tr>
<th>Scenario 1</th>
<th>Scenario 2</th>
<th>Scenario 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal and Interest Payment Dates</td>
<td>12/1 and 9/1</td>
<td>12/1 and 9/1</td>
</tr>
<tr>
<td>Bond Par Amount</td>
<td>$1,018,735,462.30</td>
<td>$1,018,735,462.30</td>
</tr>
<tr>
<td>True Interest Cost</td>
<td>5.81%</td>
<td>5.81%</td>
</tr>
<tr>
<td>Percent of UAAL Extinguished</td>
<td>100%</td>
<td>50%</td>
</tr>
<tr>
<td>Savings Solution</td>
<td>Level annual dollar savings</td>
<td>Proportional annual savings</td>
</tr>
<tr>
<td>Average Annual Savings</td>
<td>$16,684,511</td>
<td>$8,510,000</td>
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<tr>
<td>Current Interest Bonds</td>
<td>$730,356,000</td>
<td>$385,800,000</td>
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<tr>
<td>Capital Appreciation Bonds</td>
<td>$228,341,463</td>
<td>$114,582,117</td>
</tr>
<tr>
<td>Total Gross Cash Flow Savings</td>
<td>$468,697,463</td>
<td>$240,812,375</td>
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<tr>
<td>Total Present Value Savings</td>
<td>$423,779,528</td>
<td>$120,563,403</td>
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Table 2: 33.3% Funding of 30-Year Rolling Amortization

<table>
<thead>
<tr>
<th>Date</th>
<th>6/1/2007</th>
<th>6/1/2007</th>
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<tbody>
<tr>
<td>Principal and Interest Payment Dates</td>
<td>12/1 and 9/1</td>
<td>12/1 and 9/1</td>
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<tr>
<td>Bond Par Amount</td>
<td>$329,779,458.56</td>
<td>$329,779,458.56</td>
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<tr>
<td>True Interest Cost</td>
<td>6.87%</td>
<td>2.90%</td>
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<td>Percent of UAAL Extinguished</td>
<td>93%</td>
<td>35%</td>
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<tr>
<td>Savings Solution</td>
<td>Level annual dollar savings</td>
<td>First Payment in FY 07-08</td>
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<td>Average Annual Savings Thereafter</td>
<td>$834,224</td>
<td>$2,775</td>
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<tr>
<td>Current Interest Bonds</td>
<td>$337,675,920</td>
<td>$307,040,000</td>
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<tr>
<td>Capital Appreciation Bonds</td>
<td>$12,104,469</td>
<td>$132,638,633</td>
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<tr>
<td>Total Gross Cash Flow Savings</td>
<td>$350,580,389</td>
<td>$9,627,114</td>
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<tr>
<td>Total Present Value Savings</td>
<td>$312,096,940</td>
<td>$10,202,336</td>
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UAAL amortizations provided by Banker Associates, LLC.
Marked conditions as of February 27, 2007.

KNN
<table>
<thead>
<tr>
<th></th>
<th>Scenario 1</th>
<th>Scenario 2*</th>
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<tbody>
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<td>Due Date</td>
<td>6/1/2007</td>
<td>6/1/2007</td>
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<tr>
<td>Principal and Interest Payment Dates</td>
<td>12/1 and 6/1</td>
<td>12/1 and 6/1</td>
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<td>Bond Par Amount</td>
<td>$340,114,234.25</td>
<td>$392,229,964.85</td>
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<td>True Interest Cost</td>
<td>6.81%</td>
<td>5.81%</td>
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<tr>
<td>UAAL Extinguished ($)</td>
<td>$324,966,039</td>
<td>$386,810,086</td>
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<td>UAAL Extinguished (%)</td>
<td>38.3%</td>
<td>38.4%</td>
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<tr>
<td>Savings Solution</td>
<td>Level annual dollar savings</td>
<td>Level annual dollar savings</td>
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<tr>
<td>Average Annual Savings</td>
<td>$3,051,510</td>
<td>$4,397,046</td>
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<tr>
<td>Total Gross Cash Flow Savings</td>
<td>$166,646,313</td>
<td>$181,912,256</td>
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<td>Total Present Value Savings</td>
<td>$250,727,814</td>
<td>$260,021,871</td>
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* Scenario 2 takes into account the addition of $100.0 million debt, increased.

Market conditions as of February 27, 2007.