Air Time is Dead, Long Live Air Time *{on-line version}*

George Diehr, June 2, 2015

Summary

This paper describes how the benefits of the now defunct purchase of additional service credit commonly called "air time" (AT) can be achieved through selection of an alternative available as part of CalPERS' retirement Option 4[1], "Reduced Allowance for Fixed Period of Time" (RA). With RA, your pension benefit is reduced from its base value for a fixed period of time. It then "steps up" to a value higher than its base value. Thus, during the period of reduced allowance you "pay" for an increased future value.

The two methods, AT and RA, were evaluated to establish that with similar choices for both plans they provide essentially the same benefits at the same costs. Using the AT-based estimates described herein against my own RA retirement plan values resulted in differences of less than 1%; however, we caution that not all estimates will be that close.

There are two objectives of this article: 1) to demonstrate that the benefits of air time can be realized ("mimicked") by use of RA retirement options; and 2) to provide tools you can use to explore a variety of RA alternatives. If you decide to select the RA option, CalPERS *requires* that you obtain benefit values from CalPERS' actuaries; however, since the actuaries will provide at most two estimates each year, the methods described here can help you narrow your choices.

The original *CSU-ERFA Reporter* article (June 2015) focused on the single-life, unmodified retirement option. In this document we also provide an example that uses the RA alternative and the 2-life, Option 2W retirement benefit.

Background. As most of you know and many regret, passage of the Public Employees' Pension Reform Act (PEPRA) eliminated the right to purchase additional retirement service credit except in cases of actual service such as military, Peace Corps, AmeriCorps, and others. Before its demise, members of CalPERS could purchase up to five years of "air time" for the actuarially determined present value of the benefit.

There were several ways to pay for AT: 1) time payments through pre-tax payroll deductions, 2) roll-over of pre-tax funds from 403(b), 457, 401(k) and IRA funds (tax

[1] CalPERS *Pub 18*, "A Guide to CalPERS Retirement Option 4", https://www.calpers.ca.gov/eip-docs/about/pubs/member/retire-option-4.pdf

sheltered annuities, TSAs), or 3) a combination of the two. After-tax payments were also allowed and were required if payments continued into retirement.

The purchase of additional service credit is equivalent to the purchase of an annuity. And, you while you can still purchase a commercial annuity, its cost will be considerably higher than AT cost for equivalent benefits.[2]

For someone in the State Miscellaneous 2%@55 plan who purchases 4 years of AT and retires at age 63, the pension benefit would increase by about 10% of their salary. The cost of that service credit would be about 3.5 months' salary for each year purchased; thus, buying 4 years costs about 14 months' salary. While this seems expensive to some, the payback is about ten years—well below remaining life expectancy at age 63. Retiring at age 63 and living 20 years in retirement, which is less than average remaining life expectancy, the benefit from AT purchase provides a rate of return of about 7.5%[3].

While AT is gone, CalPERS provides an alternative pension benefit choice that, under certain conditions, provides essentially the same benefit at the same cost as purchasing AT immediately prior to retiring. This alternative is part of retirement Option 4, "Reduced Allowance for Fixed Period of Time" (RA). The following hypothetical example provides more specifics on RA and compares its returns and benefits to AT.

Using Option 4 RA to Mimic Purchase of Air Time

Assume the following characteristics of Professor Cal who would like to achieve the same benefit as purchase of 4 years of AT:

Salary:	$8,133.33[4] / month
Service:	30 years
Age:	63
Pension plan:	2%@55; 2.5% at 63+ (the pre-PEPRA, "classic" benefit)
Purchase:	4 years of service credit at retirement, paid over 5 years

Nominal unmodified pension benefit: $6,000[5] = 2.5% * 30 * ($8,133 – 133)

[2] A $100,000, single-life annuity for a 63-year-old male (female) from a private insurer yields a fixed monthly income of $524 ($493). $100,000 of CalPERS additional service credit for both yields a monthly income of $702, provides up to 2% annual CoLA and a 25% pension benefit to a survivor. https://www.immediateannuities.com/

[3] The Social Security Life Expectancy Calculator, http://www.ssa.gov/oact/population/longevity.html estimates life expectancies at age 63 of 21.0 years for a male and 23.4 years for a female.

[4] $8,133.33 is used to simplify the computations: $133.33 is the "Social Security offset" used in computing retirement benefit. (Cents are ignored in the computations.)

Same with additional 4 years service: $6,800 = 2.5% * 34 * ($8,133 – 133)
Additional service credit benefit: $800 = 2.5% * 4 * ($8,133 – 133)

If AT were still available, its cost would be the same per year as the purchase of military service credit.[6] PERS' service cost estimator for four years credit yields:

Total cost[7]: $113,978[8]
Monthly payment: $2,271 (60 payments)

To mimic air time, Cal specifies a 5-year reduced initial allowance for his RA plan of:
$6,000 + 800 – 2,271 = $4,529.

In general, for the RA option to (closely) approximate the costs and benefits of a specific AT purchase, the appropriate *initial reduced allowance* is given by:

unmodified benefit + service credit benefit – service credit cost

Note that all of the amounts used here are monthly values.

At the end of the reduced allowance period, Cal's benefit will increase—"step-up"—from $4,529 to $6,800, a 50% increase.

Had Cal been able to purchase AT, and done it immediately prior to retiring, it would have provided Cal with an immediate pension benefit of $6,800, but his net income would have been reduced by payments of $2,271/month to a net of $4,529 for 5 years—approximately the same as the RA *initial reduced allowance*.

Two points: First, AT and RA are not truly "equivalent." Using parameters for AT provide very good estimates of values provided by Option 4, RA. Second, I have *claimed* that the formula for the *initial reduced allowance* for a five-year period will result in a step-up to the same level provided by AT: $6,800. While it made intuitive sense to me, that is hardly a proof.

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[5] For simplicity, throughout most of this paper we ignore annual pension benefit CoLAs, which are usually 2%.
[6] The link leading to the cost estimator is at: https://www.calpers.ca.gov/index.jsp?bc=/member/service-credit/scce/estimator.xml. Select "I Accept", "Military Service Credit", "Continue", "Continue", then specify parameters for the service credit purchase over the two screens.
[7] The 1-year cost is $28,494, 1/4th of the 4-year cost.
[8] Assuming 1.9% annual CoLA, the investment of $113,978 is paid back in about 11 years at age 74 for Cal. If Cal lives to age 83, the rate-of-return on his investment is about 8.7%.

To check that the two methods provide very similar results, I used data for my own choice of RA options, comparing the *initial reduced allowance* and step-up value with the cost and benefit of purchase of service credit for military time. The values were within 1%. In fact, due in part to CoLAs, the values specified here for the RA to mimic AT do not result in identical results. But they are close enough to provide a convenient way for someone contemplating retirement to evaluate the impact on the step-up value of alternative choices for the *initial reduced allowance* and period of reduction (payoff period for purchase of AT).

Generating Additional Scenarios

The AT purchase cost for a given number of service credit years is the product of number of years and cost for one year. Furthermore, given total cost you can also compute the monthly payment cost for alternative payoff periods. If you have a financial calculator or access to amortization tables, you can make very good estimates of monthly cost for any period of reduced allowance (payoff period for AT): the present value is the service credit purchase cost; the appropriate interest rate is 7.25% (not 7.5%)[9]; and the amortization period is the number of months of reduced allowance.

For example, assume Cal wants to use RA for the equivalent of 6 years of service credit and a reduced period of 7 years.

Additional Benefit:	6 years * 2.5% * (8,133 – 133) = $1,200
Total cost:	6*$28,494 = $170,966 (present value)
Term:	7 years or 84 months @ 7.25%
Monthly payment:	$2,601
Initial Allowance:	$6,000 + $1,200 - $2,601 = $4,599
Step-up Value:	$7,200

If you are handy with Excel, building a spreadsheet for alternative choices is not difficult.

Example of Alternative Computation Approach and Benefit Plan

For a single-life (unmodified) pension option, computation of the pension benefit is relatively simple: determine your "age factor" (Factor) at http://www.calpers.ca.gov/eip-

[9] Why 7.25% instead of 7.5%? CalPERS assumes an annual rate of 7.5%, but that is the annual rate based on monthly compounding: 7.25%/12, compounded over 12 months is very close to 7.5%. (For greater accuracy, use 7.2539%. The exact value is given by 1.075 raised to the 1/12th power minus 1 times 12: 12*(1.075^(1/12) - 1).

docs/member/retirement/service-retire/benefit-charts/pub-6-2percent-55.pdf), number of years' service (Yrs), and highest average monthly salary over a continuous12-month period (Sal). Your My|CalPERS account should also provide both your service credit and your highest 12-month salary period. The pension benefit is given by:

Factor * Yrs * (Sal - $133.33)

If, however, you want a different retirement benefit plan—say, 2-life Option 2W—computations are not so simple. The benefit is based on your age and the age of your beneficiary. Thus, for this plan you will want to use the benefit estimator at https://www.calpers.ca.gov/index.jsp?bc=/member/retirement/planning/estimate-calculator/rec.xml

Our second example will be for Professor Peri who plans to retire under Option 2W, which provides a constant benefit to a member and spouse/partner through both of their lives. Assume the following values for Peri:

Today's date: August 1, 2015
Retirement date: June 1, 2016
Date of Birth: Dec. 15, 1955
Highest salary: $8,600/month (Peri's estimate of her highest salary as of 6/1/16)
Unused sick leave: 250 days
Service Credit: 25.8 years as of June 30, 2014
She is still working full time.
Her eligible survivor and beneficiary is her husband, Cal, with birth date April 1, 1953.

The estimator provides the values below for Peri at her date of retirement. We have copied the Benefit Estimates for only the Unmodified and Option 2W. The Estimator also provides information for Options 2, 3, and 3W. Because Options 1 and 4 require additional information, CalPERS' estimator provides no information for them. Note that the information also includes benefit estimates at additional retirement ages.

Your date of birth:
12/15/1955

Planned retirement date:
06/01/2016

Final compensation
8600

Employment History

CSU
28.800 years of service {her service as of 6/30/2014 + 2 years' work + 1 year sick leave credit}
State Misc. 2% at 55
Survivor Continuance Provided
Covered By Social Security

Survivor and Beneficiary information:
Cal, DoB 04/01/1953

Unmodified Allowance

Benefit Estimate	At Age 60 1/4	At Age 61 1/4	At Age 62 1/4	At Age 63 1/4	At Age 64 1/4
For You	$5,681	$6,035	$6,399	$6,731	$6,943
For Cal (Your Survivor)	$1,420	$1,509	$1,600	$1,683	$1,736

Option 2W

Benefit Estimate	At Age 60 1/4	At Age 61 1/4	At Age 62 1/4	At Age 63 1/4	At Age 64 1/4
For You	$5,254	$5,570	$5,894	$6,186	$6,364
For Cal (Your Beneficiary & Survivor)	$5,254	$5,570	$5,894	$6,186	$6,364
For You, if your beneficiary dies first	$5,254	$5,570	$5,894	$6,186	$6,364

The benefit information for Option 2W allows Peri to compute the benefit increase for each additional year of service credit: $182.43 (= $5,254 / 28.8).

The next step is to determine the cost of service credit purchase and monthly payment for a specified term: https://www.calpers.ca.gov/index.jsp?bc=/member/service-credit/scce/estimator.xml. Some of the same information required above is entered for this estimator, such as DoB, benefit formula, estimated salary at retirement, etc. In addition, Peri opts for 1 year of service credit (she can scale this up) and 84 monthly payments (a 7-year reduced allowance period). The estimator returns:

Lump-Sum Payment Amount Projection: $29,809.38	**Installments Based on a Pay Schedule of: Monthly**
Installment Payment Amount Projection: $453.61	**Number of Installment Payments is: 84**

Peri can now estimate the *initial reduced allowance* (A) and the *step-up benefit* (S) for a range of years (Y) of service credit purchase.

Base 2W Option Benefit, W: $5,254
Cost/year service credit, C: $453.61/month
Benefit/year of service credit, B: $182.43

*Step-up benefit = 2W benefit + years purchased * benefit per year purchased*
S = W + Y * B
*Initial reduced allowance = step-up benefit – years purchased * benefit cost*
A = S – Y * C

Years, Y	Benefit = Y * B	Step-up Benefit, S = W ($5,254) + Y * B	Years Purchased * Benefit Cost, Y * C	Initial Reduced Allowance, A = S – Y*C
1	$182.43	$5,436	$453.61	$4,983
5	$912	$6,166	$2,268	$3,898
7	$1,277	$6,531	$3,175	$3,356
10	$1,824	$7,078	$4,536	$2,542

The payback period for purchase of any number of years of service credit is the same. With a 7-year reduced allowance (payoff) period, payback years is:

= 7 * (Cost per month / Benefit per month - 1)[10]
= 7 * (C / B – 1)
= 7 * (453.61 / 182.43 – 1)
= 10.41 years (Multiplying C and B by 12, converts months to years.)

Prof Peri likes the 7-year service credit choice (reduced allowance of $3,356; step-up to $6,531) but believes that since she will be FERPing for five years she should be able to manage a shorter payoff/reduced allowance period. Rather than using the CalPERS service credit cost estimator, she computes the monthly cost for a 5-year payoff. Using an HP 10BII calculator and entering the lump sum cost for purchase of 7 years service credit (PV = 7 * $29,809.38), a payoff of (N =) 60 months, and an interest rate of (I/YR =) 7.2539%, yields a monthly cost of (PMT =) $593.84[11].

Results for a 5-year reduced allowance/payoff period:

[10] The rationale behind the formula may be better understood if expressed as: 7 * (C – B)/B. C – B is the net cost per month. 7*(C-B) is the total net cost (reduction from the base benefit) *per month* over the 7-year period. When the reduction ceases, the monthly benefit, B, begins, thus "rebating" the total net cost per month in 7*(C-B)/B months. A little algebra simplifies the formula to 7 * (C/B – 1).
[11] Using the CalPERS service credit cost estimator with a 60-month payoff yields the same monthly cost: $593.84.

Years, Y	Benefit = Y * B	Step-up Benefit, S = W ($5,254) + Y * B	Years Purchased * Benefit Cost, Y * C	Initial Reduced Allowance, A = S – Y*C
1	$182.43 (=B)	$5,436	$593.84	$4,983
7	$1,277	$6,531	$4,157	$2,374

She decides that this plan—purchase 7 years' service credit with 5-year payoff and elect the 2W Option is manageable. Her average monthly FERP income of $4,300 will more than bridge the gap between the base 2W allowance of $5,254 and the reduced allowance of $2,374, providing an attractive bounce to $6,531 (+ CoLA) in five years when her FERP ends. Payback is about 11.3 years (16.3 years after retirement), when she is about 76.5 years old, with still over 10-years' life expectancy at her age at retirement[12].

Limitations/Differences of RA and AT

Alternatives that were previously provided for AT purchase, such as ability to purchase AT before retirement with a lump-sum payment or make monthly pre-tax payroll deductions (or a mix of the two), cannot be exactly mimicked with RA; however, I consider this to be a minor loss. Cal and Peri can achieve approximately the same results as payroll deductions while employed by making similar pre-tax contributions to a TSA prior to retiring. At retirement they use TSA money to supplement their income during the initial reduced allowance period. In Cal's case, a TSA at retirement of $113,978 which earns 7.5%/year will provide $2,271 per month providing (almost[13]) the same total income as AT.

There are tax differences between AT and RA; however, the differences are also small. If Cal rolls over the full AT cost from a TSA there will be no immediate tax consequence. But his monthly pension benefit—including the increase provided by the service credit purchase—will be taxed. With the RA, withdrawals from his TSA over the 5-year reduced allowance period will also be taxed. Thus, the end results are very similar.

On the plus side, RA offers choices not available with AT. For example, AT required selection of an integral number of years, with a maximum of 5. RA allows a fractional number of years and is not limited to 5. As shown in the alternative scenario for Cal and

[12] Because Option 2W is a 2-life pension benefit, we should be using the life-expectancy of the last person to die. The joint life expectancy for a female age 60 and male age 63 is over 30 years. https://www.pgcalc.com/pdf/twolife.pdf . Thus, either Cal and/or Peri can expect to enjoy their pension with its step-up benefit until 2045—about 14 years beyond their break-even point.

[13] "Almost" because with RA the CoLA benefit is paid based on the reduced allowance during the reduced period, then on the step-up value; with TA the CoLA is paid on the full benefit beginning at retirement.

for Peri, both considered RA plans that were equivalent to purchase of greater than 5 years of service credit. I back-fit the choices I made for my RA plan to determine that I had purchased the equivalent of 6.4 years of AT.

Conclusion

The paper describes how RA can mimic AT and also shows how to use the cost for purchase of military service to generate estimates for RA of reduced initial allowances for various step-up values and reduced allowance periods. We must caution that our method provides *estimates*. Furthermore, we are aware that there are subtle differences in RA and AT that result in small, but real, differences in the AT-enhanced pension benefit and the step-up benefit of RA[14].

If you decide to utilize Option 4 RA, or any other Option 4 alternative, CalPERS "strongly recommends"—and "requires" for RA—that you submit a "CalPERS Retirement Allowance Estimate Request" form, https://www.calpers.ca.gov/eip-docs/about/pubs/member/forms/retire-allow-request.pdf. RA parameters—the amount by which to reduce your benefit and the period of reduction—are selected in Section 5 where you can also specify choices for a beneficiary (e.g., for a 2W Option).

{see next page for "Sidebar"}

[14] With purchase of AT, your (full) pension receives CoLA increases. With RA, for the reduced allowance period the CoLA increases apply only to the reduced allowance. When the reduced allowance period ends, your step-up benefit will be higher by the accumulated CoLA percentage increases during the reduced allowance period. This difference appears to account for estimated step-up benefits that are greater than the AT benefits. I.e., since the CoLA cost to CalPERS during the reduced allowance period is less than the CoLA cost for the AT benefit, you realize an offsetting step-up benefit that modestly exceeds the AT benefit. The longer the reduced period, the greater that offset will be.

========== {Sidebar}==========

Is an "Annuity" For You?

An annuity, purchase of additional service credit, and CalPERS retirement Option 4 RA are all essentially the same: you make a lump sum payment or time payments or accept reduced income for a period of time in exchange for a guaranteed, life-time income. The benefit is based on the amount you contribute, your life expectancy, and the rate of return the insurer expects. There are a large variety of these products but we'll stick with the single life-time income variety, with no guaranteed years of payment, and no death benefit.

An example of the cost and benefit of an annuity may provide perspective. As detailed in the article, for about $114,000 Cal—age 63—can realize an increased monthly pension of $800 plus 2% annual CoLA. His cost is recaptured in 10.2 years, much less than his remaining life expectancy of 20+ years.

Back to the question: who should consider an annuity? If you have limited assets and will need virtually all of your CalPERS pension to meet expenses, an annuity is probably not for you. And if you have already retired from CalPERS, the RA is no longer available. You can, of course, still buy a commercial annuity.

An annuity reduces longevity risk—the risk that you will outlive income provided by your assets. A deferred annuity, what RA provides, is a way to convert possibly temporary excess income or assets into an increase in future income at CalPERS' 7.5% annual rate of return. While you might be able to beat that RoR, you are not likely to without taking substantial investment risks. CalPERS' 7.5% is guaranteed—it is as secure as your pension.

For someone who has retirement income that exceeds current needs, investing some of that income to increase future income can be attractive. There are alternatives, of course, to "annuitizing". You could invest the funds. But even with fortunate investment choices you still face a longevity risk. The downside of an annuity is that you die sooner than expected.

Finally, before making an irreversible decision, it is wise to consult a financial planner who charges for her service and is not in the business of selling something. But keep in mind that you may need to make an advisor aware of CalPERS' retirement options such as the RA. Not every pension provides the variety of options available from CalPERS.