



**Conference of Consulting Actuaries  
Public Plans Community (CCA PPC)**

# **Actuarial Funding Policies and Practices for Public Pension Plans**

October 2014



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*Paul Angelo*



*Tom Lowman*

## An Open Letter

**From: Paul Angelo, Chair and  
Tom Lowman, Vice Chair Conference of  
Consulting Actuaries Public Plans Community**

**To: Interested Parties in the Public Pension Arena**

**Re: Public Plans Community White Paper on  
Public Pension Funding Policy**

On behalf of the Conference of Consulting Actuaries' Public Plans Community (CCA PPC), the following "White Paper" is presented to provide guidance to policymakers and other interested parties on the development of actuarially based funding policies for public pension plans. The CCA PPC includes over 50 leading actuaries whose firms are responsible for the actuarial services provided to the majority of public-sector retirement systems in the US. All of the major actuarial firms serving the public sector are represented in the CCA PPC as well as in-house actuaries from several state plans. As a result, the CCA PPC represents a broad cross section of public-sector actuaries with extensive experience providing valuation and consulting services to public plans, and it is that experience that provides the knowledge base for this paper.

The White Paper is based on over two years of extensive and detailed funding policy discussions among the members of the CCA PPC, and reflects the experience of those members in providing actuarial consulting services to state and local public pension plans throughout the US. While there were naturally disagreements and compromises during those discussions, the White Paper reflects the resulting majority opinions of the CCA PPC as developed through those discussions. We believe this White Paper reflects a substantial consensus among the actuaries who provide valuation and consulting services to public pension plans.

This White Paper represents groundbreaking actuarial research in that it develops a principles based, empirically grounded Level Cost Allocation Model (LCAM) for use as a basis for funding policies for public pension plans throughout the US. In particular, we believe that the funding policies developed herein could serve as a rigorously defensible basis for an "actuarially determined contribution" under Statements 67 and 68 of the Governmental Accounting Standards Board.

The distinguishing feature of this approach is that it begins with stated policy objectives and then develops specific policy guidance consistent with those objectives. One of the main results is that an effective funding policy often represents a balancing of policy objectives. Another is that adherence to the policy objectives may lead to a narrower range of acceptable practices than is sometimes found in current practice.

The LCAM White Paper is intended to provide guidance not just in the evaluation of particular current policy practices but also in the development of actuarially based funding policies in a consistent and rational manner. For that reason, the reader is strongly encouraged to focus not only on the specific practice guidance but also on the detailed discussions and rationales that lead to that guidance. Also note that while this discussion is comprehensive it is not all-inclusive. There is a list of "items for future discussion" at the end of the paper. In addition, there may be other "level cost allocation models" that are appropriate in some circumstances.

The CCA PPC would like to acknowledge and thank the California Actuarial Advisory Panel for their seminal work in developing the principles-based level cost allocation model on which this White Paper is based. We also thank all the members of the Conference of Consulting Actuaries Public Plans Community who helped in the development of this paper.

# Introduction

This “white paper” is based on funding policy discussions among the members of the Conference of Consulting Actuaries Public Plans Community (CCA PPC) and reflects the majority opinions the CCA PPC members<sup>1</sup>. Those discussions relied heavily upon and generally concurred with the funding policy white paper prepared by the California Actuarial Advisory Panel (CAAP) and the level cost allocation model developed therein<sup>2</sup>. For that reason, the CCA PPC has chosen to build directly on the CAAP document in developing its own funding policy guidance.

The CCA PPC wishes to express its sincere appreciation to the CAAP for its seminal work in preparing a principles-based funding policy development. However, while much of the text of this CCA PPC white paper comes directly from the CAAP document, this white paper is presented solely as the majority opinions of the CCA PPC.

This CCA PPC white paper is intended for a national audience, as part of a nation-wide review and discussion of funding policies for public pension plans. Our hope is that the principles and policies developed herein may provide an actuarial basis for others developing funding practices and that legislative, regulatory and other industry groups may build these concepts into their guidance.

This white paper develops the principal elements and parameters of an actuarial funding policy<sup>3</sup> for US public pension plans. It includes the development of a Level Cost Allocation Model (LCAM) as a basis for setting funding policies. This white paper does not address policy issues related to benefit plans where a member’s benefits are not funded during the member’s

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*1 These comments were developed through the coordinated efforts of the Conference of Consulting Actuaries’ (CCA) Public Plans Steering Committee. However, these comments do not necessarily reflect the views of the CCA, the CCA’s members, or any employers of CCA members, and should not be construed as being endorsed by any of those parties.*

*2 See “Actuarial Funding Policies and Practices for Public Pension and OPEB Plans and Level Cost Allocation Model” at [http://www.sco.ca.gov/caap\\_resources.html](http://www.sco.ca.gov/caap_resources.html)*

*3 As used in this paper, an “actuarial funding policy” has the same meaning as a “Contribution Allocation Procedure” as defined in the Actuarial Standards of Practice (ASOPs). We further note that the actuarial policies that determine the level and timing of contributions must also include policies related to setting the actuarial assumptions. As noted at the end of this section, this paper does not address policies and practices related to setting actuarial assumptions.*

working career, e.g., plans receiving “pay-as-you-go” funding or “terminal” funding.

While this white paper develops guidance primarily for pension plans, we believe the general policy objectives presented here are applicable to the funding of OPEB plans as well. However, application of those policy objectives to OPEB plans may result in different specific funding policies based on plan design, legal status and other features distinctive to OPEB plans. We encourage those involved in the valuation and funding of OPEB plans to consider the applicability to those plans of the policy guidance developed here.

Some pension plans have contributions rates that are set on a fixed basis, rather than being regularly reset to a specific, actuarially determined rate. The CCA PPC believes that such plans should develop an actuarially determined contribution rate for comparison to the fixed rate. However, this white paper does not address procedures for evaluating that comparison, or for determining whether the fixed rate is sufficient or when and how the fixed rate should be changed. The CCA PPC intends to prepare a separate white paper on fixed rate plans including these considerations.

As developed here the LCAM is a level cost actuarial methodology<sup>4</sup>, which is consistent with well-established actuarial practice. The LCAM is a principles-based mathematical model of pension cost. The model policy elements are developed in a logical sequence based on stated general policy objectives, and in a manner consistent with primary factors that affect the cost of the pension obligation.

The particular model that we develop is based on a combination of policy objectives and policy elements that has been tested over many years and, we believe, is well understood and broadly applicable. However, there are other models and policy objectives that

practitioners may use that are internally consistent and may be as appropriate in some circumstances as the model that is developed herein, and it is not our intention to discourage consideration of such other policies<sup>5</sup>. Furthermore, there are situations where the policy parameters developed herein may require additional analysis to establish the appropriate parameters for each such situation<sup>6</sup>. It is up to the actuary to apply professional judgment to the particulars of the situation and recommend the most appropriate policies for that situation, including considerations of materiality.

Our approach begins with identifying the policy objectives of such a funding policy, and then evaluating the structure and parameters for each of the particular policy elements in a manner consistent with those objectives, as well as with current and emerging actuarial science and governing actuarial standards of practice.

This white paper is intended as advice to actuaries and retirement boards<sup>7</sup> in the setting of funding policy. While the analysis is somewhat restrictive in the categorization of practices, this guidance is not intended to supplant or replace the applicable Actuarial Standards of Practice (ASOPs). Like all opinions of the CCA PPC, this guidance is nonbinding and advisory only. Furthermore, it is not intended as a basis for litigation, and should not be referenced in a litigation context.

Given the wide range of such policies currently in practice in the U.S., this development also acknowledges that plan sponsors and retirement boards may require some level of policy flexibility

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<sup>4</sup> Here a “level cost actuarial methodology” is characterized by economic assumptions based on the long term expected experience of the plan and a cost allocation designed to produce a level cost over an employee’s active service. This is in contrast to a “market-consistent” actuarial methodology where economic assumptions are based on observations of current market interest rates, and costs are allocated based on the (non-level) present value of an employee’s accrued benefit.

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<sup>5</sup> In particular, the LCAM developed here incorporates the widely prevalent practice of managing asset volatility directly through the use of an asset smoothing policy element. Some practitioners are developing direct contribution rate smoothing techniques as an alternative to asset smoothing. The CCA PPC is considering development of a separate white paper on direct smoothing as an alternative to asset smoothing.

<sup>6</sup> For example, plans that are closed to new entrants may require additional analyses and forecasts to determine whether the policy parameters herein provide for adequate funding.

<sup>7</sup> Here “retirement boards” is meant to refer generally to whatever governing bodies have authority to set funding policy for public sector plans.

to reflect both their specific policy objectives and their individual circumstances. To accommodate that need for reasonable flexibility and yet also provide substantive guidance, this development evaluates various policy element structures and parameters or ranges according to the following categories:

- LCAM Model practices (i.e., practices most consistent with the LCAM developed herein)
- Acceptable practices
- Acceptable practices, with conditions
- Non-recommended practices
- Unacceptable practices.

These categories are best understood in the context of the different elements that comprise an actuarial funding policy and the various policy alternatives for each of those policy elements. They are intended to assist in the evaluation of specific policy elements and parameters relative to the general policy objectives stated herein, and are developed separately for each of the three principal policy elements discussed in this white paper (cost methods, asset smoothing methods and amortization policy). They are not intended as a grading or scoring mechanism for a system's overall actuarial funding policy.

Generally, throughout this discussion, "model practices" means those practices most consistent with general policy objectives and the LCAM as developed here based on those policy objectives<sup>8</sup>. Acceptable practices are generally those that while not fully consistent with the LCAM as developed here, are well established in practice and typically do not require additional analysis to demonstrate their consistency with the general policy objectives. Practices that are acceptable with conditions may be acceptable in some circumstances, on the basis of additional analysis to show consistency with the general policy objectives or to address risks or concerns associated with the practices. Systems that adopt practices that under this

model analysis are not recommended should consider doing so with the understanding that they reflect policy objectives different from those on which this LCAM is based or should consider the policy concerns identified herein.

This evaluation of practice elements and parameters was developed in relation to the LCAM and its general policy objectives, based on experience with the many independent public plans sponsored by states, counties, cities and other local public employers in the US, and is intended to have general applicability to such plans. However, for some plans, special circumstances or situations may apply. The specific applicability of the results developed here should be evaluated by their governing boards based on the advice of their actuaries.

Note that while the selection of actuarial assumptions is an essential part of actuarial policy for a public sector pension plan, the selection of actuarial assumptions is outside the scope of this discussion. For example, a pension plan should perform a comprehensive review of both economic and demographic assumptions on a regular basis as part of its actuarial policies. Another important consideration in determining a plan's funding requirements is the plan's investment policy and related investment portfolio risks. While actuarial assumptions, plan investments and even benefit design are all elements that affect funding requirements, they are beyond the scope of this paper.

This white paper is also not intended to address the measurement of liabilities for purposes other than funding, e.g., settlement obligations or other market-consistent measures<sup>9</sup>.

Finally note that some retirement systems have features that may require funding policy provisions and analyses that are not specifically addressed herein. One example is systems with "gain sharing" provisions whereby favorable investment experience is used as the basis for increasing member benefits and/or reducing employer and/or member contributions. The policies developed here should not be interpreted as being adequate to address these plan features without additional analysis specific to those features.

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<sup>8</sup> Some commentators have interpreted "model practices" as synonymous with "best practices." That is not the intent of this categorization of practices. Given their circumstances retirement boards may find that other practices, particularly those categorized and acceptable or acceptable with conditions, are considered both appropriate and reasonably consistent with the policy objectives stated herein.

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<sup>9</sup> See footnote 4

## **Transition Policies**

In order to avoid undue disruption to a sponsor's budget, it may not be feasible to adopt policies consistent with this white paper without some sort of transition from current policies. For example, a plan using longer than model amortization periods could adopt model periods for future unfunded liabilities while continuing the current (declining) periods for the current unfunded liabilities. Such transition policies should be developed with the advice of the actuary in a manner consistent with the principles developed herein. We have included in our discussion transition policies appropriate to each of the principal policy elements.



# General Policy Objectives

The following are policy objectives that apply generally to all elements of the funding policy. Objectives specific to each principal policy element are identified in the discussion of that policy element.

1. The principal goal of a funding policy is that future contributions and current plan assets should be sufficient to provide for all benefits expected to be paid to members and their beneficiaries when due.
2. The funding policy should seek a reasonable allocation of the cost of benefits and the required funding to the years of service (i.e. demographic matching). This includes the goal that annual contributions should, to the extent reasonably possible, maintain a close relationship to the both the expected cost of each year of service and to variations around that expected cost.
3. The funding policy should seek to manage and control future contribution volatility (i.e., have costs emerge as a level percentage of payroll) to the extent reasonably possible, consistent with other policy goals.
4. The funding policy should support the general public policy goals of accountability and transparency. While these terms can be difficult to define in general, here the meaning includes that each element of the funding policy should be clear both as to intent and effect, and that each should allow an assessment of whether, how and when the plan sponsor is expected to meet the funding requirements of the plan.
5. The funding policy should take into consideration the nature of public sector pension plans and their governance. These governance issues include (1) agency risk issues associated with the desire of interested parties (agents) to influence the cost calculations in directions viewed as consistent with their particular interests, and (2) the need for a sustained budgeting commitment from plan sponsors.

Policy objective 1 means that contributions should include the cost of current service plus a series of amortization payments or credits to fully fund or recognize any unfunded or overfunded past service costs (note that the latter is often described as "Surplus").

Policy objectives 2 and 3 reflect two aspects of the general policy objective of interperiod equity (IPE). The "demographic matching" goal of policy objective 2 promotes intergenerational IPE, which seeks to have each generation of taxpayers incur the cost of benefits for the employees who provide services

## GENERAL POLICY OBJECTIVES

to those taxpayers, rather than deferring those costs to future taxpayers. The “volatility management” goal of policy objective 3 promotes period-to-period IPE, which seeks to have the cost incurred by taxpayers in any period compare equitably to the cost for just before and after.

These two aspects of IPE will tend to move funding policy in opposite directions. Thus the combined effect of policy objectives 2 and 3 is to seek an appropriate balance between intergenerational and period-to-period IPE, that is, between demographic matching and volatility management.

Policy objective 3 (and the resulting objective of balancing policy objectives 2 and 3) depends on the presumed ongoing status of the public sector plan and its sponsors. The level of volatility management appropriate to a funding policy may be less for plans where this presumption does not apply, e.g., plans that are closed to new entrants.

Policy objective 4 will generally favor policies that allow a clear identification and understanding of the distinct role of each policy component in managing both the expected cost of current service and any unexpected variations in those costs, as measured by any unfunded or overfunded past service costs. Such policies can enhance the credibility and objectivity of the cost calculations, which is also supportive of policy objective 5.

Policy objective 5 seeks to enhance a retirement board’s ability to resist and defend against efforts to influence the determination of plan costs in a manner or direction inconsistent with the other policy objectives. This favors policies based on a cost model where the parameters are set in reference to factors that affect costs rather than the particular cost result. This separation between the selection of model parameters and the resulting costs enhances the objectivity of the cost results. As a result, any attempt to influence those results must address the objective parameters rather than the cost result itself.

A common example of agency risk is that, because plan sponsors may be more aware of and responsive to the interests of current versus future taxpayers, there

may be incentives to defer necessary contributions to future periods. This may be countered by avoiding policy changes that selectively reduce contributions.

For plans with an ongoing service cost for active members, policy objective 5 also reflects a policy objective to avoid encumbering for other uses the budgetary resources necessary to support that ongoing service cost. This introduces an asymmetry between funding policies for unfunded liabilities versus surpluses, which is discussed in the policy development for surplus amortization.

Note that the model funding policies developed here are substantially driven by these policy objectives. In some situations other plan features or policies (e.g., investment policy, reserving requirements, and plan maturity) may also be a consideration in setting funding policy. Such considerations are not addressed in this analysis.

# Principal Elements of Actuarial Funding Policy

The type of comprehensive actuarial funding policy developed here is made up of three components:

1. An **actuarial cost method**, which allocates the total present value of future benefits to each year (Normal Cost) including all past years (Actuarial Accrued Liability or AAL).
2. An **asset smoothing method**, which reduces the effect of short term market volatility while still tracking the overall movement of the market value of plan assets.
3. An **amortization policy**, which determines the length of time and the structure of the increase or decrease in contributions required to systematically (1) fund any Unfunded Actuarial Accrued Liability or UAAL, or (2) recognize any Surplus, i.e., any assets in excess of the AAL.

An actuarial funding policy can also include some form of "direct rate smoothing" in addition to both asset smoothing and UAAL/Surplus amortization. Two types of this form of direct rate smoothing policies were evaluated for this development:

1. Phase-in of certain extraordinary changes in contribution rates, e.g., phasing-in the effect of assumption changes element over a three year period.
2. Contribution "collar" where contribution rate changes are limited to a specified amount or percentage from year to year.

As noted earlier, it is also possible to use direct contribution rate smoothing techniques as an *alternative* to asset smoothing, rather than in addition to asset smoothing. While that approach is outside the scope of this discussion, the CCA PPC is considering development of a separate white paper on direct rate smoothing as an alternative to asset smoothing.

# Actuarial Cost Method

The Actuarial Cost Method allocates the total present value of future benefits to each year (Normal Cost) including all past years (Actuarial Accrued Liability<sup>1</sup> or AAL).

## Specific policy objectives and considerations

1. Each participant's benefit should be funded under a reasonable allocation method by the expected retirement date(s), assuming all assumptions are met.
2. Pay-related benefit costs should reflect anticipated pay at anticipated decrement.
3. The expected cost of each year of service (generally known as the Normal Cost or service cost) for each active member should be reasonably related to the expected cost of that member's benefit.
4. The member's Normal Cost should emerge as a level percentage of member compensation<sup>2</sup>.
5. No gains or losses should occur if all assumptions are met, except for:
  - a. Investment gains and losses deferred under an asset smoothing method consistent with these model practices, or
  - b. Contribution losses or gains due to a routine lag between the actuarial valuation date and the date that any new contributions rates are implemented, or
  - c. Contribution losses or gains due to the phase-in of a contribution increase or decrease.
6. The cost method should allow for a comparison between plan assets and the accumulated value of past Normal Costs for current participants, generally known as the Actuarial Accrued Liability (AAL).

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<sup>1</sup> Here "liability" indicates that this is a measure of the accrued (normal) cost while "actuarial" distinguishes this from other possible measures of liability: legal, accounting, etc.

<sup>2</sup> This objective applies most clearly to benefits (like, for example, most public pension benefits) that are determined and budgeted for as a percentage of individual and aggregate salary, respectively. For benefits that are not pay related it may be appropriate to modify this objective and the resulting policies accordingly.

## Discussion

1. Any actuarial cost model for retirement benefits begins with construction of a series or array of Normal Costs that, if funded each year, under certain stability conditions will be sufficient to fund all projected benefits for current active members. The following considerations serve to specify the cost model developed here.
  - a. The usual stability conditions are that the current benefit structures and actuarial assumptions have always been in effect, the benefit structures will remain in effect, and future experience will match the actuarial assumptions. Special considerations apply if in the past the benefit structure has been changed for current active members changing the benefits for members with service after some fixed date.
  - b. Consistent with Cost Method policy objective #3 and with the general policy objective of transparency, the Normal Cost for each member is based on the benefit structure for that member. This means that a separate Normal Cost array is developed for each tier of benefits within a plan. This argues against Ultimate Entry Age, where Normal Cost is based on an open tier of benefits even for members not in that open tier.
  - c. Consistent with Cost Method policy objective #4, the Normal Cost is developed as a level percentage of pay for each member, so that the Normal Cost rate for each member (as a percentage of pay) is designed to be the same for all years of service. This provides for a more stable Normal Cost rate for the benefit tier in case of changing active member demographics. This argues against Projected Unit Credit.
    - d. Also consistent with Cost Method policy objective #4, the Normal Cost for all types of benefits incurred at all ages is developed as a level percentage of the member's career compensation. This argues against funding to decrement. For plans with a DROP (Deferred Retirement Option Program) this also argues for allocating Normal Cost over all years of employment, including those after a member enters a DROP.
    - e. Consistent with Cost Method policy objective #6, the Normal Cost is developed independent of plan assets, and the Actuarial Accrued Liability (and so also the UAAL) is based on the Normal Costs developed for past years. This argues against Aggregate and FIL as model practices.
      - i. These methods should be considered as a fundamentally different approach to the determination and funding of variations from Normal Cost.
      - ii. Plans using these methods should also measure and disclose costs and liabilities under the Entry Age method, similar to the requirements of current accounting standards.
    - f. Historical practice includes the use of a variation of the Entry Age method (an "Aggregated" Entry Age method) where the Normal Cost and AAL are first determined for each member in a tier of benefits under the usual Entry Age method. However, the actual Normal Cost for the tier is then determined as the Normal Cost rate for the tier applied to the compensation for the tier, where the Normal Cost rate for the tier of benefits is determined as the present value of future Normal Costs for all active members in the tier, divided by the present value of compensation for all members in the tier.
      - i. This variation introduces an inconsistency between the Normal Cost that is funded and the Normal Cost on which the AAL is based.
      - ii. This inconsistency can be shown to produce small but systematic gains or losses, generally losses.

## ACTUARIAL COST METHOD

2. Consistent with all the above, under the cost model developed here the Normal Cost rate would change only when the projected benefits for the tier change either in amounts or in present value.
  - a. The Normal Cost rate (both in total and by member) will vary from valuation to valuation due to demographic experience and assumption changes.
  - b. The Normal Cost rate will not change when an individual member reaches an age or service where, under the consistent benefit structure for the member's tier, the member's benefit eligibility or accrual rate changes. This is because that event was anticipated in the projected benefits for the tier, so that the projected benefits are substantially unaffected by such predictable changes in eligibility or benefit accrual.
  - c. Similarly the Normal Cost rate for a member should be unaffected by the closing of the member's tier and the creation of a new tier for future hires, as discussed under item 1.b above.
  - d. However, if the benefit structure of a continuing, open tier is changed for members with service after some fixed date, then the Normal Cost rate should change to reflect the unanticipated change in projected benefits for members in the tier<sup>3</sup>. This calls for an extension or variation of the Entry Age method in order to value this type of benefit change.
    - i. There are two methods in practice to adjust the Normal Cost rate for this type of plan change. While a detailed analysis of these two variations is beyond the scope of this discussion, our summary conclusions are:
      - A. The "replacement life" Entry Age method would base the Normal Cost on the new benefit structure as though it had always been in place, thereby producing a consistent Normal Cost rate for all members in the tier. This has the advantages of a change in Normal Cost (both individual and total) more consistent with what would be expected for a change in future benefit accruals, a stable future Normal Cost rate for the tier and a relatively smaller (compared to the alternative) change in Actuarial Accrued Liability. Its disadvantages are that it may be more complicated to explain and to implement.
      - B. The "averaged" Entry Age method would base each member's Normal Cost on the new projected benefit for that member, thereby producing a different Normal Cost rate for different members in the tier, based generally on their service at the time of the change in benefit structure. The advantages and disadvantages are essentially the reverse of those for the replacement life version of Entry Age. The change in Normal Cost is less than what would be expected for a change in future benefit accruals, the future Normal Cost rate for the tier will be unstable (as it eventually reaches the same rate as under the replacement life variation) and there is a relatively larger (compared to the alternative) change in Actuarial Accrued Liability. Its advantages are that it may be less complicated to explain and to implement (where the latter may depend on the valuation software used).
3. While not recommended for funding, the Normal Cost under the Ultimate Entry Age method discussed above may nonetheless be useful when a new open tier is adopted for future hires. The combined normal cost rate for the open and closed tiers (as determined under the LCAM Entry Age method) will change over time as members of the closed tier are replaced by members in the new tier. This will result in an increasing or decreasing

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<sup>3</sup> Note that, as of this writing, for public sector pension plans this is relatively uncommon because of legal protections that are understood to apply both to accrued benefits and to future benefit accruals for current members.

## ACTUARIAL COST METHOD

combined normal cost rate (depending on whether the new tier has higher or lower benefits), consistent with the transition of the workforce over time to the new benefit level. However, the Ultimate Entry Age method Normal Cost for the combined tiers will reflect the expected long term Normal Cost for the entire workforce (unlike the LCAM Normal Cost which reflects only the recent hires in the new tier). For that reason, Normal Cost under Ultimate Entry Age may be useful for projecting longer-term costs or for evaluating a fixed contribution rate.

### Practices

Based on the above discussion, and consistent with the policy objectives, actuarial cost methods and parameters are categorized as follows:

#### LCAM Model Practices

- Entry Age cost method with level percentage of pay Normal Cost.
  - Normal Costs are level even if benefit accrual or eligibility changes with age or service.
  - All types and incidences of benefits are funded over a single measure of expected future service<sup>4</sup>.
  - The Normal Cost for a tier of benefits is the sum of the individually determined Normal Costs for all members in that tier.
  - Exception: for plans with benefits unrelated to compensation the Entry Age method with level dollar Normal Cost may be more appropriate.
- For multiple tiers:
  - Normal Cost is based on each member's benefit.
- For benefit formula or structure changes within a tier (generally after a fixed date):

- Normal Cost is based on current benefit structure (replacement life Entry Age<sup>5</sup>).

#### Acceptable Practices

- Aggregate cost method: Plans using the Aggregate method should disclose costs and liabilities determined under the Entry Age method.
  - Calculate Normal Cost and UAAL under Entry Age method.
  - Determine single amortization period for the Entry Age UAAL that, combined with the Entry Age Normal Cost, is equivalent to Aggregate method Normal Cost.
- Frozen Initial Liability cost method: This method should disclose costs and liabilities under the Entry Age method.
  - Calculate Normal Cost and UAAL under Entry Age method.
  - Deduct the FIL amortization bases from the Entry Age UAAL.
  - Determine single amortization period for the remaining Entry Age UAAL that, combined with the Entry Age Normal Cost, is equivalent to FIL method Normal Cost.
- Funding to Decrement Entry Age method, where each type and incidence of benefit is funded to each age at decrement.
  - This method may be appropriate for some plan designs or for plans closed to new entrants<sup>6</sup>.
- For benefit formula or structure changes within a tier (generally after a fixed date):

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<sup>4</sup> Under the LCAM model practice, Normal Cost is allocated over service that continues until the member is no longer working. For active members in or expected to enter a DROP (Deferred Retirement Option Program) this includes service through the expected end of the DROP period. This is not the method adopted by GASB in Statements 67 and 68, where service cost is allocated only through the beginning of the DROP period. The GASB method for DROPs is categorized as an Acceptable Practice for funding.

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<sup>5</sup> Note that this is not the method used in GASB's Statements 67 and 68. The GASB method is categorized as an Acceptable Practice.

<sup>6</sup> For example, a Plan that provides very valuable early career-benefits (such as heavily subsidized early retirement or disability benefits) may prefer to have the higher early-career Normal Costs associated with the Funding to Decrement Entry Age method.

## ACTUARIAL COST METHOD

- Normal Cost is based on each member's composite projected benefit (averaged Entry Age<sup>7</sup>).

### Acceptable Practices, with Conditions

- Projected Unit Credit cost method.
- Entry Age method variation ("Aggregated" Entry Age method) where the Normal Cost for a tier of benefits is determined as the Normal Cost rate for the tier applied to the compensation for the tier, and where the Normal Cost rate for the tier of benefits is determined as the present value of future Normal Costs for all active members in the tier, divided by the present value of compensation for all members in the tier.
- Aggregate or Frozen Initial Liability methods without the disclosures of costs and liabilities determined under the Entry Age method discussed above.

### Non-recommended Practices

- Normal Cost based on open tier of benefits even for members not in that open tier (Ultimate Entry Age).
  - Ultimate Entry Age Normal Cost may be useful to illustrate the longer-term Normal Cost for combined tiers or to evaluate fixed contribution rates.

### Unacceptable Practices

- Traditional (non-Projected) Unit Credit cost method for plans with pay-related benefits as the primary benefit.
- Note that while this white paper does not address policy issues related to pay-as-you-go funding or terminal funding, such practices would be unacceptable if the policy intent is to fund the members' benefits during the members' working careers.

### Transition Policies

- There are no transition policies that apply to funding methods. For substantial method changes (e.g., changing from Projected Unit Credit to Entry Age) special amortization periods could apply. These are discussed in the section on Amortization Policy.

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<sup>7</sup> Note that this is the version of the Entry Age method required for financial reporting under GASB Statements 67 and 68 for plans with benefit formula or structure changes within a tier.



# Asset Smoothing Methods

An asset smoothing method reduces the effect of short term market volatility while still tracking the overall movement of the market value of plan assets.

## Specific policy objectives and considerations

1. The funding policy should specify all components of asset smoothing method:
  - a. Amount of return subject to deferred recognition (smoothing).
  - b. The smoothing period or periods.
  - c. The range constraints on smoothed value (market value corridor), if any.
  - d. The method of recognizing deferred amounts: fixed or rolling smoothing periods.
2. The asset smoothing method should be unbiased relative to market.
  - a. The same smoothing period should be used for gains and for losses.
  - b. Any market value corridor should be symmetrical around market value.
3. The asset smoothing method should not be selectively reset at market value only when market value is greater than actuarial value.
  - a. Bases may be combined but solely to reduce future, non-level recognition of relatively small net unrecognized past gains and losses (i.e., when the smoothed and market values are already relatively close together).
4. The asset smoothing method should be unbiased relative to realized vs unrealized gain loss.
  - a. Base deferrals on total return gain/loss relative to assumed earnings rate.
5. The asset smoothing method should incorporate the ASOP 44 concepts of:
  - a. Likely to return to market in a reasonable period and likely to stay within a reasonable range of market, or
  - b. Sufficiently short period to return to market or sufficiently narrow range around market.
6. The policy parameters should reflect empirical experience from historical market volatility.
7. The asset smoothing method should support the policy goal of

## ASSET SMOOTHING METHODS

demographic matching (the intergenerational aspect of interperiod equity) described in general policy objective 2. This leads to a preference for smoothing methods that provide for full recognition of deferred gains and losses in the UAAL by some date certain.

- a. Note that this objective is also consistent with the accountability and transparency goals described in general policy objective 4.

### Discussion

1. Longer smoothing periods generally reduce contribution volatility. A discussion of smoothing periods could include the following considerations:
  - a. To the extent that smoothing periods are considered as being tied to economic or market cycles, those cycles may be believed to be longer or shorter than in past years.
  - b. If markets are more volatile, then longer smoothing would be needed even if only to maintain former levels of contribution stability.
  - c. Better funded plans, more mature plans and higher benefit plans (i.e., plans with a higher "volatility index") have inherently more volatile contribution rates, so may justify longer smoothing.
  - d. Sponsors may be more sensitive to contribution volatility.
2. However, ASOP 44 implies that longer smoothing periods call for narrower market value corridors.
  - a. In effect, the corridor imposes a demographic matching style constraint on the use of longer smoothing periods which otherwise would obtain greater volatility management.
3. The model interpretation is that five year smoothing is "sufficiently short" under ASOP 44.
  - a. This reflects long and consistent industry practice, as well as GASB Statement 68.
  - b. This implies that five year smoothing with no market value corridor is ASOP compliant.
  - c. It still may be useful to have a market value corridor as part of the asset smoothing policy.
    - i. This avoids having to introduce the corridor structure in reaction to some future discussion of longer smoothing periods.
4. Consider the extensive data available on the impact of smoothing periods and market value corridors after large market downturn (such as occurred in 2008).
  - a. The smoothing method manages the transition from periods of lower cost to periods of higher cost.
    - i. The level of those higher costs is determined primarily by size of the market loss and UAAL amortization period, not the asset smoothing policy.
  - b. The smoothing period determines length of the transition period.
  - c. The market value corridor determines cost pattern during the transition.
    - i. A wide corridor or no corridor produces a straight line transition.
    - ii. "Hitting the corridor" accelerates the cost increases or decreases in early years of transition.
      - A. In effect the corridor inhibits the smoothing method after years of large losses (or gains).
    - iii. There are various possible policy justifications for such an accelerated transition.
      - A. Market timing: get more contributions in while the market is down.
      - B. Cash flow management: low market values may impair plan liquidity.
      - C. Employer solvency: if the employer eventually is going to default on making contributions, then get as much contribution income as possible before that happens.
      - D. Employer preference: employers may prefer to have the higher costs in their rates as soon as possible.

## ASSET SMOOTHING METHODS

- iv. Following the 2008 market decline, these justifications were generally not found to be compelling.
  - A. The normal lag in implementing new contributions rates defeats iii. A and B.
  - B. Employers are presumed solvent and if not, accelerating contributions would make things worse.
  - C. Many employers clearly preferred more time to absorb the contribution increases.
- v. Absent these considerations, 2008 experience argues for permitting a wide corridor with a five year smoothing period, based on the fact that five year smoothing produced actuarial value to market value ratios that exceeded 140%.
  - A. Projections in early 2009 actually showed these ratios could have been as high as 150% if markets had not recovered some before the June 30, 2009 valuations.
- 5. Other industry indicators for market corridor selection with long smoothing periods
  - a. CalPERS 2005 policy: 15 year rolling smoothing with 20% corridor.
- 6. Structural issue: Fixed, separate smoothing periods vs. a single, rolling smoothing period
  - a. Fixed, separate smoothing periods for each year of market gain or loss insure that all deferred gains and losses are included in the UAAL (and so in the contribution rates) by a known date. This is consistent with accountability and with demographic matching.
  - b. A single rolling smoothing period avoids "tail volatility" where contributions are volatile not only when gains and losses first occur but also when (under a layered approach) each year's gain or loss is fully recognized.
    - i. Rolling smoothing is consistent with volatility management but substantially extends the recognition period for deferred investment gains and losses.
      - A. This will extend the time when the actuarial value of assets is consistently above or below the market value of assets.
      - B. That argues for narrower corridors than are appropriate for fixed (layered) smoothing periods.
    - ii. In effect, rolling smoothing recognized a fixed percentage of deferred investment gains and losses each year.
      - A. For example, 5 year rolling amortization recognizes 20% of the deferred amount.
      - B. Base corridors on this deferral recognition percentage.
    - c. With fixed, separate smoothing periods, tail volatility due to alternating periods of market gains and losses can be controlled by limited active management of the separate deferral amounts.
      - i. One such adjustment involves combining the separate deferral amounts when the net deferral amount is relatively small (i.e., the smoothed and market values are very close together) but the recognition pattern of that net deferral is markedly non-level.
        - A. The net deferral amount is unchanged as of the date of the adjustment.
        - B. The period over which the net deferral amount is fully recognized is unchanged as of the date of the adjustment.
      - ii. Other uses of active management of the deferral amounts may add complexity to the application of the policy and may reduce transparency.
      - iii. Restarts of fixed, separate smoothing periods should not be used:
        - A. Too frequently, as this would produce a de facto rolling smoothing period, or

## ASSET SMOOTHING METHODS

- B. To selectively restart smoothing at market value only when market value is greater than smoothed value. This would violate General Policy Objective 5, since it would selectively change the policy only when the effect is to reduce contributions.

### Practices

Based on the above discussion, and consistent with the policy objectives, asset smoothing methods and parameters are categorized as follows:

#### LCAM Model Practices

- Deferrals based on total return gain/loss relative to assumed earnings rate.
- Deferrals recognized in smoothed value over fixed smoothing periods not less than 3 years.
- Maximum market value corridors for various smoothing periods:
  - 5 or fewer years, 50%/150% corridor.
  - 7 years, 60%/140% corridor.
- Combine smoothing periods or restart smoothing only to manage tail volatility.
  - Appropriate when the net deferral amount is relatively small (i.e., the actuarial and market values are very close together).
    - The net deferral amount is unchanged as of the date of the adjustment.
    - The period over which the net deferral amount is fully recognized is unchanged as of the date of the adjustment.
  - Avoid using frequent restart of smoothing to achieve de facto rolling smoothing.
  - Avoid restarting smoothing only accelerate recognition of deferred gains, i.e., only when market value is greater than actuarial value.
- Additional analysis, such as solvency projections, is likely to be appropriate for closed plans.

#### Acceptable Practices

- Maximum market value corridors for various smoothing periods:

- 10 years, 70%/130% corridor.
- Five year (or shorter) smoothing with no corridor (including use of market value of assets without smoothing).
- Rolling smoothing periods with the following maximum market value corridors for various smoothing periods:
  - Express rolling smoothing period as a percentage recognition of deferred amount and set corridor at that same percentage. For example:
    - 3 year rolling smoothing means 33% recognition, with a 33% corridor.
    - 4 year rolling smoothing means 25% recognition, with a 25% corridor.
    - 5 year rolling smoothing means 20% recognition, with a 20% corridor.
    - 10 year rolling smoothing means 10% recognition, with a 10% corridor.
  - Perform additional analysis including projections of when the actuarial value is expected to return to within some narrow range of market value.

#### Acceptable Practices, with Conditions

- Maximum market value corridors for various smoothing periods:
  - 15 years, 80%/120% corridor.

#### Non-recommended Practices

- Longer than 5 year smoothing with no corridor.
- 15 years or shorter smoothing with corridors wider than shown above.

#### Unacceptable Practices

- Smoothing periods longer than 15 years

#### Transition Policies

Generally, transition policies for asset smoothing would allow current layered smoothing to continue subject to the appropriate model corridors (as determined by the future smoothing periods, if changed from the past/current layers). Transition from rolling asset smoothing would fix the rolling layer at its current period.

# Amortization Policy

An amortization policy determines the length of time and the structure of the increase or decrease in contributions required to systematically (1) fund any Unfunded Actuarial Accrued Liability or UAAL, or (2) recognize any Surplus, i.e., any assets in excess of the AAL.

## Specific policy objectives and considerations

1. Variations in contribution requirements from simply funding the Normal Cost will generally arise from gains or losses, method or assumption changes or benefit changes and will emerge as a UAAL or Surplus. As discussed in the general policy objectives, such variations should be funded over periods consistent with an appropriate balance between the policy objectives of demographic matching and volatility management.
2. As with the Normal Cost, the cost for changes in UAAL should emerge as a level percentage of member compensation<sup>8</sup>.
3. The amortization policy should reflect explicit consideration of these different sources of change in UAAL, even if the resulting policy treats different changes in the same way:
  - a. Experience gains and losses.
  - b. Changes in assumptions and methods.
  - c. Benefit or plan changes.
4. The amortization policy should reflect explicit consideration of the level and duration of negative amortization, if any.
  - a. This consideration should not necessarily preclude some negative amortization that may occur under an amortization policy that is otherwise consistent with the policy objectives.
  - b. Amortization periods developed in consideration of negative amortization (along with other policy goals) may be relevant for level dollar amortization (where negative amortization does not occur).
5. The amortization policy should support the general policy objectives of

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<sup>8</sup> As with the Normal Cost, this amortization policy objective applies most clearly to benefits (like, for example, most public pension benefits) that are determined and budgeted for as a percentage of individual and aggregate salary, respectively. For benefits that are not pay related, or when costs are budgeted on a basis other than compensation it may be appropriate to modify this objective and the resulting policies accordingly.

## AMORTIZATION POLICY

accountability and transparency. This leads to a preference for:

- a. Amortization policies that reflect a history of the sources and treatment of UAAL.
  - b. Amortization policies that provide for a full amortization date for UAAL.
    - i. Note that this objective is also consistent with the demographic matching aspect of general policy objective 2.
6. The amortization of Surplus requires special consideration, consistent with general policy objective 5 (nature of public plan governance).
- a. Amortization of Surplus should be considered as part of a broader discussion of Surplus management techniques, including:
    - i. Excluding some level of Surplus from amortization.
    - ii. "Derisking" some portion of plan liabilities by changing asset allocation.
  - c. Multiple layer amortization is also more transparent, since it tracks the UAAL by source. However, layered amortization is more complicated and can require additional policy actions to achieve stable contribution rates (including active management of the bases).
  - d. Discussion of periods will assume multiple, fixed amortization and then revisit the use of rolling periods to manage volatility.
3. For gains and losses, balancing demographic matching and volatility control leads to an ideal amortization period range of 15 to 20 years.
- a. Lesson learned from the 1990s is that less than 15 years gives too little "volatility control", especially for gains.
    - i. Short amortization of gains led to partial contribution holidays (contributions less than Normal Cost) and even full contribution holidays (no contribution required).
    - ii. This is inconsistent with general policy objective 5, in that it led to insufficient budgeting for ongoing pension costs and to pressure for benefit increases.
  - b. Longer than 20 years becomes difficult to reconcile with demographic matching, the intergenerational aspect of interperiod equity described in general policy objective 2.
    - i. 20 years is substantially longer than either average future service for actives or average life expectancy for retirees.
  - c. Periods longer than 20 years also entail negative amortization (which starts at around 16 to 18 years for many current combinations of assumptions)<sup>9</sup>.
    - i. Here negative amortization is an indicator for not enough demographic matching but based on economic rather than demographic assumptions.

### Discussion

1. The policy objectives lead to a general preference for level percentage of pay amortization.
  - a. Consistent with policy objectives and with the Normal Cost under the Model Actuarial Cost Method.
  - b. This discussion of amortization periods presumes level percentage amortization. Level dollar amortization is discussed separately as an alternative to level percentage amortization.
2. The policy objectives lead to a general preference for multiple, fixed amortization layers.
  - a. Fixed period amortization is clearly better for accountability, since UAAL is funded as of a date certain.
  - b. Single layer, fixed period amortization is not a stable policy, since period would have to be restarted when remaining period gets too short.

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<sup>9</sup> Note that for emerging lower investment return and salary increase assumptions even twenty year amortization may entail no negative amortization.

## AMORTIZATION POLICY

- ii. Consider observed consistency between the period of onset of negative amortization and the periods related to member demographics.
- iii. As discussed later in this section, negative amortization is a much greater concern when using open or rolling amortization periods.
- d. Two case studies — CalPERS and GASB:
  - i. CalPERS 2005 analysis focused on volatility management. Resulting funding policy uses exceptionally long periods for gain and loss amortization (as well as for asset smoothing.)
  - ii. GASB Statements 67 and 68 focus on demographic matching. Resulting expensing policy uses very short recognition periods. (This is cited for comparison only, as the GASB statements govern financial reporting and not funding.)
  - iii. Our general policy objectives indicate a balance between these two extremes.
- 4. For assumption changes, while the amortization periods could be the same, a case can be made for longer amortization than for gain/loss, since liabilities are remeasured to anticipate multiple years of future gains or losses.
  - a. A similar or even stronger case for longer periods could be made for changing cost method (such as from Projected Unit Credit to Entry Age), or for the initial liability for a newly funded plan.
  - b. However longer than 25 years entails substantial (arguably too much) negative amortization.
- 5. For plan amendments that increase liabilities, volatility management is not an issue, only demographic matching.
  - a. Use actual remaining active future service or retiree life expectancy.
  - b. Could use up to 15 years as an approximation for actives.
- i. Any period that would entail negative amortization is inconsistent with general policy goals 2 (demographic matching) and 5 (nature of public plan governance).
- c. Could use up to 10 years as an approximation for inactives.
  - i. Particularly for retiree benefit increases, amortization period should control for negative cash flow where additional amortization payments are less than additional benefit payments.
- d. For Early Retirement Incentive Programs use a period corresponding to the period of economic savings to the employer.
  - i. Shorter than other plan amendments, typically no more than five years<sup>10</sup>
- e. For benefit improvements with accelerated payments (e.g. one time “13th check” or other lump sum payments) amortization may not be appropriate as any amortization will result in negative cash flows.
- 6. Plan amendments that reduce liabilities require separate considerations so as to avoid taking credit for the reduction over periods shorter than the remaining amortization of the original liabilities.
  - a. Reductions in liability due to such benefit reductions should not be amortized more rapidly than the pre-existing unfunded liabilities, as measured by the average or the longest current amortization period.
  - b. Benefit “restorations<sup>11</sup>” should similarly be amortized on a basis consistent with the pre-existing unfunded liabilities or with the “credit” amortization base established when the benefits were reduced.
- 7. For Surplus, similar to short amortization of

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*10 For example, a Government Finance Officers Association (GFOA) 2004 recommended practice states that “the incremental costs of an early retirement incentive program should be amortized over a short-term payback period, such as three to five years. This payback period should match the period in which the savings are realized.”*

*11 A benefit restoration occurs when a previous benefit reduction has been fully or partially restored for a group of members who were subject to the earlier benefit reduction.*

## AMORTIZATION POLICY

- gains, the lesson from the 1990s is that short amortization of surplus leads to partial or full contribution holidays (contributions less than Normal Cost, or even zero).
- a. This is inconsistent with general policy objective 5, and led to insufficient budgeting for ongoing pension costs and to pressure for benefit increases.
  - b. General consensus is that this is not good public policy.
    - i. See for example Recommendation 7 by California's 2007 Public Employee Post-Employment Benefits Commission, and also CalPERS 2005 funding policy.
  - c. Because of both the ongoing nature of the Normal Cost and the nature of public plan governance, amortization of UAAL and Surplus should not be symmetrical.
    - i. It may be appropriate to amortize surplus over a period longer than would be acceptable for UAAL.
    - ii. Such an asymmetric policy would reduce the magnitude and/or likelihood of partial or full contribution holidays.
    - iii. One approach would be to disregard the Surplus and always contribute at least the Normal Cost. However if Surplus becomes sufficiently large then some form of Surplus management may be called for.
  - d. Note that long amortization of Surplus does not preclude other approaches to Surplus management that are beyond the scope of this discussion, including:
    - i. Treating some level of Surplus as a non-valuation asset.
    - ii. Changing asset allocation to reflect Surplus condition.
8. Separate Surplus related issue: When plan first goes into Surplus, should existing UAAL amortization layers be maintain or eliminated?
- a. Could maintain amortization layers and have minimum contribution of Normal Cost less 30 year amortization of Surplus.
    - b. However, maintaining layers can result in net amortization charge even though overall plan is in Surplus.
    - c. Alternative is to restart amortization of initial surplus, and any successive Surpluses.
      - i. In effect, this is 30 year rolling amortization of current and future Surpluses.
      - ii. Restart amortization layers when plan next has a UAAL.
9. Level dollar amortization is fundamentally different from level percent of pay amortization.
- a. No level dollar amortization period is exactly equivalent to a level percent period.
  - b. Level dollar is generally faster amortization than level percent of pay, so longer periods may be reasonable.
  - c. Plan and/or sponsor circumstances could determine appropriateness of level dollar method.
    - i. Level dollar would be appropriate for plans where benefits are not pay related and could be appropriate if the plan is closed to new entrants.
    - ii. Level dollar could be appropriate for sponsors and plans that are particularly averse to future cost increases, e.g., utilities setting rates for current rate payers.
    - iii. Level dollar could be appropriate for sponsors and plans that want an extra measure of conservatism or protection against low or no future payroll growth.
    - iv. Level dollar could be useful as a step in developing amortization payments in proportion to some basis other than payroll.
10. Multiple, fixed period layers vs. single, rolling period layer for gains and losses.
- a. Multiple, fixed amortization periods for each year's gain or loss ensures that all gains and losses are funded by a known date. This is consistent with accountability and with demographic matching.



## AMORTIZATION POLICY

- b. A single rolling smoothing period avoids tail volatility where contributions are volatile not only when gains and losses occur but also when each year's gain or loss is fully amortized. This is consistent with volatility management.
  - c. With fixed, separate smoothing periods, tail volatility can be controlled by limited active management of the amortization layers, including combining consecutive gain and loss layers as necessary to reduce tail volatility.
    - i. As with asset smoothing, active management should be used to manage the pattern of future UAAL funding and not to accomplish a short-term manipulation of contributions.
    - ii. In particular the net remaining amortization period should be relatively unaffected by any combination of offsetting UAAL amortization layers.
    - iii. The use of active management of the amortization layers may add complexity to the application of the policy and may reduce transparency.
11. Plans with layered amortization of an unfunded liability should consider actions to achieve a minimum net amortization charge that is not less than the payment required under a single 25 year amortization layer. This may be accomplished through active management of the amortization layers or through other means.
12. Rolling amortization periods for a single layer of gains and losses or for the entire UAAL.
- a. Similar to level dollar, acknowledge that rolling amortization is fundamentally different from fixed period amortization.
    - i. Rolling amortization will have a substantial unamortized UAAL at the end of the nominal amortization period.
  - b. Argument can be made for a single, rolling amortization layer for gains and losses if the actuarial valuation assumptions are expected to be unbiased so that there is an equal likelihood of future gains and losses that will offset each other.
    - i. Such rolling amortization also requires that there are no systematic sources of future actuarial losses from plan design features, such as a subsidized service purchase option.
    - ii. Extraordinarily large gains or losses that are not reasonably expected to be offset by future losses or gains should be isolated from the single rolling gain/loss amortization layer and amortized over separate, fixed periods.
    - iii. Plans with a significant single rolling gain/loss amortization layer should affirmatively show that policy objectives will be achieved, without substantial violation of intergenerational equity.
- c. This argument is substantially weaker for rolling amortization for assumption changes (especially if consistently in a single direction, such as mortality assumption adjustments or recent changes in investment earnings assumptions.)
- i. Inconsistent with policy objective of intergenerational equity, as well as accountability and transparency.
  - ii. Similar concerns for rolling amortization of gains and losses in the presence of biased assumptions or other systematic sources of actuarial losses.
- d. It is very difficult to reconcile rolling amortization of plan amendments with intergenerational equity, as well as with accountability and transparency objectives.
- e. Specific exception for rolling, lengthy amortization of Surplus, since as described earlier this helps meet general policy objective 5
13. Rolling amortization and the Aggregate cost method.
- a. The Aggregate cost method produces contribution levels and patterns similar to using the Entry Age method with a single rolling level percent of pay amortization layer for the entire UAAL and a relatively short rolling amortization period.

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- i. Effective rolling amortization period reflects average future service of active members.
- b. However, the Aggregate cost method is fundamentally different from Entry Age (and from Projected Unit Credit) in that Aggregate does not measure an AAL or a UAAL.
  - i. Aggregate combines a high level of tail volatility management (policy objective #3) with high levels of demographic matching and accountability (policy objectives 2 and 4).
  - ii. Aggregate also provides no policy flexibility in the selection of an amortization period (since no UAAL is calculated) which provides protection from some agency risk issues, consistent with policy objective #5.
- c. Retirement boards desirous of the high level of tail volatility management and computational simplicity associated with rolling amortization of the entire Entry Age UAAL should consider adopting the Aggregate cost method.
  - i. If a UAAL is measured (as under the Entry Age or Projected Unit Credit cost methods) then, as discussed above, the policy objectives indicate layered amortization with the possible exception of a single rolling amortization layer for gains and losses.

### Practices

Based on the above discussion, and consistent with the policy objectives, amortization methods and parameters are categorized as follows:

### LCAM Model Practices

- Layered fixed period amortization by source of UAAL
- Level percent of pay amortization
- Amortization periods

Source	Period
Active Plan Amendments <sup>12</sup>	Lesser of active demographics <sup>13</sup> , or 15 years
Inactive Plan Amendments	Lesser of inactive demographics <sup>13</sup> , or 10 years
Experience Gain/Loss	15 to 20 years
Assumption or Method Changes <sup>14</sup>	15 to 25 years
Early Retirement Incentives	5 years or less

- 30 year amortization of surplus (for plans with ongoing Normal Cost and/or plan expenses)
  - Eliminate all prior UAAL layers upon going into Surplus
- Combine gain/loss (and other) layers or restart amortization only to avoid tail volatility.
  - Combining layers should result in substantially the same current amortization payment.
  - Avoid using restart of amortization to achieve de facto rolling amortization.
  - Restart amortization layers when moving from Surplus to UAAL condition.
- Additional analysis, such as solvency projections, is likely to be appropriate for closed plans.

<sup>12</sup> The effect of assumption changes integral to the measurement of the cost of plan amendments (e.g., change in rates of retirement to anticipate the effect of new benefit levels) should be included in the UAAL change associated with the plan amendment.

<sup>13</sup> Demographics based periods include remaining active future service or retiree life expectancy. Amortization period should also control for negative cash flow where additional amortization payments are less than additional benefit payments.

<sup>14</sup> Method change includes the initial liability for a newly funded plan.

## AMORTIZATION POLICY

### Acceptable Practices

- Up to 15 years for inactive plan amendments.
- Level dollar fixed period layered amortization by source of UAAL, using the same model amortization periods as above.
  - Ideally, some rationale should be given if used with pay related benefits.

### Acceptable Practices, with Conditions

- Up to 25 year layered fixed period amortization by source, for all sources of UAAL.
  - Ideally with some rationale given for using periods outside the model ranges.
- Rolling amortization of a single combined gain/loss layer with an amortization period that does not entail any negative amortization.
  - With model periods for other sources of UAAL.
  - Use separate, fixed period layers for extraordinary gain or loss events.
  - Plans with a significant single rolling gain/loss amortization layer should demonstrate that policy objectives will be achieved.
- Up to 30 year fixed amortization of change in funding method (e.g. from PUC to Entry Age) or initial liability for a newly funded plan (i.e. an existing plan previously funded on a pay-as-you-go basis but not a new plan creating new past service benefits.)
  - Ideally some rationale should be given for using periods outside the model ranges.

### Non-recommended Practices

- Fixed period amortization of the entire UAAL as a single combined layer, with periodic reamortization over a new (longer) starting amortization period.
- Layered fixed period amortization by source of UAAL over longer than 25 years (i.e., 26 to 30 years).
- Rolling amortization of a single combined gain/loss layer with an amortization period that does entail any negative amortization, but no longer than 25 years.
  - Same three conditions that apply to Acceptable with Conditions rolling gain/loss amortization.

- Rolling/open amortization of entire UAAL as a single combined layer (exclusive of plan amendments but inclusive of gain/loss, assumption and method changes) even where the amortization period does not entail negative amortization.

### Unacceptable Practices

- Layered fixed period amortization by source of UAAL over longer than 30 years.
- Rolling/open amortization over longer than 25 years of a single combined gain/loss layer.
- Rolling/open amortization of entire UAAL as a single combined layer (exclusive of plan amendments) where the amortization period entails negative amortization.
- Rolling/open amortization of entire UAAL as a single combined layer (including plan amendments) even where the amortization period does not entail negative amortization.

### Transition Policies

Transition policies are particularly applicable to amortization policy. Generally, transition policies for amortization would allow current fixed period amortization layers (with periods not to exceed 30 years) to continue, with new amortization layers subject to these guidelines. Transition from rolling amortization would fix any rolling layer at its current period, with future liability changes amortized in accordance with these guidelines. During the transition (i.e., as long as the remaining period for the formerly rolling base is longer than model or acceptable periods) any new credit layers (e.g., due to actuarial gains or less conservative assumptions) should be amortized over no longer than that same remaining period.

# Direct Rate Smoothing

An actuarial funding policy may include some form of direct rate smoothing, where the contribution rates that result from applying the three principal elements of funding policy (including asset smoothing) are then directly modified.

As noted in the Introduction, some practitioners are developing direct contribution rate smoothing techniques as an alternative to asset smoothing. At this time, there are no widely accepted practices established for this type of direct rate smoothing. This discussion does not address the use of direct rate smoothing techniques as an alternative to asset smoothing. The CCA PPC is considering development of a separate white paper on direct rate smoothing as an alternative to asset smoothing.

The balance of this discussion pertains only to direct rate smoothing when used in conjunction with asset smoothing. Two types of such direct rate smoothing policies that are known to be in current practice were evaluated for this development:

1. Phase-in of certain changes in contribution rates, specifically, phasing-in the effect of assumption changes element over short period, consistent with the frequency of experience analyses.
2. Contribution collar where contribution rate changes are limited to a specified amount or percentage from year to year.

## Discussion

1. Contribution rate phase-in can be an effective and reasonable way to address the contribution rate impact of assumption changes.
  - a. Ideally the phase-in period should be no longer than the time period until the next review of assumptions (experience analysis).
    - i. This approach is most appropriate when experience analyses are performed on a regular schedule.
    - ii. For systems with no regular schedule for experience analyses, the phase-in period would ideally be chosen so as to avoid overlapping phase-in periods.

## DIRECT RATE SMOOTHING

- a. The plan and its sponsors should be clearly aware of the additional time value of money cost (or savings) of the phase-in, due to the plan receiving less (or more) than the actuarially determined contributions during the phase-in.
  - b. Any ongoing policy to phase-in the effect of assumption changes should be applied symmetrically to both increases and decreases in contribution rates.
  - c. Ongoing policy may be to phase-in only significant cost increases or decreases.
  - d. Note that the phase-in of the contribution rate impact of an assumption change is clearly preferable to phasing in the assumption change itself. While a detailed discussion is outside the scope of this discussion, phasing in an assumption change may be difficult to reconcile with the governing actuarial standards of practice.
2. Contribution collars have the policy drawback that the collar parameters arbitrarily override the contribution results produced by the other funding policy parameters (including asset smoothing), each of which have a well-developed rationale.
    - a. If contribution collars are used they should be supported by analysis and projections to show the effect on future funded status and future policy based contribution requirements (prior to the application of the contribution collar).
    - b. There may also need to be a mechanism to ensure adequate funding following extraordinary actuarial losses.
  3. Using either form of direct rate smoothing for other than assumption changes (i.e., for actuarial experience or plan amendments) appears inconsistent with the development of parameter ranges for the other elements of the funding policy.

### Practices

Based on the above discussion, and consistent with the policy objectives, parameters are categorized as follows:

#### LCAM Model Practices

- None

### Acceptable Practices

- For systems that review actuarial assumptions on a regularly scheduled basis, phase-in of the cost impact of assumption changes over a period no longer than the shorter of the time period until the next scheduled review of assumptions (experience analysis) or five years.
  - Phase-in should be accompanied by discussion and illustration of the impact of the phase-in on future contribution rates.
  - Phase-in may be applied only to cost impacts deemed material, but should be applied consistently to both cost increases and decreases.

### Acceptable Practices, with Conditions

- For systems that do not review actuarial assumptions on a regularly scheduled basis, phase-in of the cost impact of assumption changes over a period of up to five years.
  - Phase-in of the cost impact of any prior assumption changes must be completed before commencing another phase-in period.
  - Phase-in should be accompanied by discussion and illustration of the impact of the phase-in on future contribution rates.
  - Phase-in may be applied only to cost impacts deemed material, but should be applied consistently to both cost increases and decreases.

### Non-recommended Practices

- Phase-in of the cost impact of assumption changes over a period greater than five years.
- Phase-in of the cost impact of actuarial experience, in conjunction with model or acceptable practices for asset smoothing and UAAL amortization.
- Contribution collars in conjunction with model or acceptable practices for asset smoothing and UAAL amortization.
- Phase-in or contribution collars for the cost impact of plan amendments.

## Items for Future Discussion

This white paper is intended to address the principal elements of an actuarial funding policy as applicable in most but not all situations. Other issues related to funding policy that may be of varying significance are listed in this section, including some of a more technical nature. These items may be the subjects of future guidance.

**Impact of Risk/Employer ability to pay/Level of benefit protection**—These are three considerations that could affect the development of an actuarial funding policy. While this white paper notes that these factors should be considered, it does not develop policies or procedures for doing so. This paper also does not address appropriate disclosure items, including disclosures related to risk. These considerations (and interrelationships) are outside of our current scope but are important items for future discussion.

**OPEB Plans** – As noted earlier, while we believe the general policy objectives developed here apply to OPEB plans as well, application of those policy objectives to OPEB plans may result in different specific funding policies based on plan design, legal status and other features distinctive to OPEB plans. Many of the actuaries who participated in developing this paper work on both pension and OPEB funding. We may address funding policies specific to OPEB plans in a later document. That process would also draw on experts in the design, underwriting and valuation of OPEB plans.

**Self Adjusting System**—We expect that an increasing number of plans will have self adjusting provisions (in this context we are referring to benefit adjustments). These provisions could impact the selection of funding methods.

**Transfers of Service Credit**—New entrants (or even current member) are sometimes eligible to transfer service credit for employment prior to plan membership. This generally creates actuarial losses, which is inconsistent with our policy objectives. Later we may discuss whether and how this should be anticipated in the valuation.

**Purchase of Service**—This can raise the same type of issues as Transfers of Service Credit since unfunded actuarial liabilities often increase when employees purchase service credit.

**Actuarially determined contribution as a dollar amount or percentage of pay**—Sometimes the contribution requirement is determined prior to the year it is due and shown as a dollar amount or a percentage of payroll. Either can be

used to determine the contribution amount required.

**Role for Open/Stochastic Valuations and risk disclosures**—Our guidelines are developed in the context of a closed group, deterministic valuation. This is in part due to the belief that such a valuation best achieves our policy objectives. However, there are also advantages associated with other valuation practices.

**Lag time between valuation date and fiscal year –**  
Because of the time needed to produce the valuation and to budget for rate changes, the contribution made for a given fiscal year is often based on an earlier valuation date. This will generate contribution gains or losses when rates decrease or increase, respectively. Some systems adjust for these gains or losses in setting the rates but many do not.

