A PUBLIC POLICY PRACTICE NOTE

Introduction to Service Purchases for Public Pension Plans

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Developed by the Public Plans Committee

American Academy of Actuaries

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Introduction and Nomenclature

This practice note was developed by a committee consisting of participants of the Public Plans Committee of the American Academy of Actuaries for the purpose of providing an overview of methodologies, considerations, and current practices related to service purchases for public pension plans in the United States. It is intended for use by actuaries providing services to plans of this type.

Service purchase is an ancillary benefit feature commonly found in U.S. public pension plans, but typically not found in U.S. private-sector pension plans. Service purchases can take a variety of forms, as discussed below. Generally, a service purchase involves a plan participant making one or more payments to the plan in exchange for additional service under the terms of the plan. This practice note is intended to provide discussion of practice in the area of service purchases; to give actuaries background information that may aid in their discussion with plan sponsors considering implementing, changing, or closing such a program; and to summarize a few examples of existing service purchase programs operating as of the publication of this practice note.

Service purchase provisions can vary widely from plan to plan. As a result, no single approach to pricing service purchases is likely to fit all situations, and professional judgment is required. A set of common terms used throughout this practice note follows. The committee acknowledges that other terminology may be used in practice for the same ideas.

Actuarial equivalence	Two sets of cash flows are actuarially equivalent if they have the same actuarial present value under a stated set of actuarial assumptions
Additional service credit program (ASCP)	Plan provisions that allow a participant to receive credit for benefit service and/or eligibility service outside of the regular plan service crediting rules
Air time	Periods(s) of time not associated with any period of prior public service that is/are eligible for purchase under the ASCP
Benefit service	Service credit that is used to determine the defined benefit pension amount according to a formula that uses service as an input
Cost neutrality Expected cost neutrality	An action is cost neutral if it does not result in an increase or decrease in plan liability or actuarially determined contributions. For the purpose of this practice note, an action may be expected to be cost-neutral at a point in time based upon a given set of assumptions.
Eligibility service	Service credit used to determine when participants are entitled to receive benefits, whether immediately or in the future.
Military service	Service in a branch of the United States military (armed forces, National Guard, etc.) prior to the participant's employment at the current employer or service that occurs within the time period the participant works for that employer. Often,

	purchases are allowable only for pre-employment time, as service credit for military service while at the current employer may be required under federal law.
Plan sponsor	A governmental entity responsible for plan design and funding plan liabilities. Among U.S. public pension plans, there is wide variation in the assignment of responsibilities such as plan design, funding, investment decisions, and administration, including assigning multiple roles to the same entity. For purposes of this practice note, "plan sponsor" has the definition above, but adjustments may be needed depending on a specific jurisdiction's structure.
Public pension plan (Plan)	A local or state government-sponsored defined benefit plan within the United States.
Purchase cost/price	The total amount paid to receive service credit under the ASCP.
Refunded service	Service for which a participant received a cash-out of participant contributions and any additional amounts leading to a forfeiture of service following a separation of service.
Service	Includes benefit accrual, vesting, and/or eligibility service, as applicable under provisions of the plan
Service purchase	Voluntary action taken by participants and/or employers to add service. It usually involves some sort of payment to the plan to pay for this service. Reciprocity agreements without a transfer of funds are excluded.
Service transfers	Movement of credit for service from one plan or system to another.
System	A collection of one or more plans administered under one governing body.
System board	Administrative or governing body overseeing a system.
True-up	Adjustment to benefits or purchase price subsequent to the original purchase to reflect differences between actual participant circumstances, plan provisions, or actuarial assumptions and those used in setting the initial purchase cost.

Acronym Glossary

ASCP	additional service credit program
ASOP	actuarial standard of practice
COLA	cost-of-living adjustment
DROP	deferred retirement option plan
IRC	Internal Revenue Code
PVFB	present value of future benefits

Scope

In general, there are four different types of service purchases that can be found in public sector pension plans:

1) Other Government Service—Service with prior public or governmental employers or plans for which the participant does not receive credit under their current plan.
2) Air Time—Service not associated with any period of prior public employment.
3) Military Service—Typically applies to service with the U.S. armed forces prior to employment with the employer. Service purchase rules can follow standard approaches or may be more favorably structured for the employee.
4) Reinstated Service—Service forfeited by a participant because they took a refund or cash-out of their employee contributions (including any applicable interest) upon or following a prior separation from employment with the employer. This service often can be reinstated provided the participant pays back any refunded amounts (potentially with interest) after reemployment (see appendix).

This practice note discusses a variety of considerations with respect to the first two types of purchases listed above. With these types of purchases, the participant is generally required to pay to the plan an amount over and above any regular employee contributions in order to receive the additional service credits. While many of these considerations are actuarial in nature, some focus on typical plan administration topics that the actuary should be aware of when working on a public pension plan administering a service purchase program.

Military service purchases and reinstatements are excluded from the discussion because they are frequently subject to other policy goals and objectives, which often means that the amounts charged for them are not determined using actuarial pricing methods. However, the methods discussed in this practice note are still useful in comparing a purchase cost developed as described in this paper to the policy's purchase pricing method to determine the amount of subsidy inherent in the policy.

Also excluded from the scope of this practice note are:

- Employers entering or leaving a multiple-employer plan
- Reciprocity agreements
- Retiree medical plans
- Annuity purchases
- Early retirement windows that include service increases
- The basis of the division, if not discussed, in cases where the service purchase cost is split between the employer and employee

Current Guidance

Very little guidance exists in actuarial literature regarding service purchases.

Current practices and additional service credit program (ASCP) designs vary widely by system due to relevant state or local law, system limits, and plan provisions. In 2015 and 2018, the National Association of State Retirement Administrators (NASRA) conducted surveys focusing on service purchases.[1] The NASRA survey was conducted on a voluntary-response basis and therefore may not be fully representative. These surveys help provide some idea of the program variations among systems. In particular, ASCP provisions vary considerably regarding the following:

- Types of service permitted to be purchased;
- Eligibility requirements to be able to purchase;
- Minimum and maximum amounts of service allowed to be purchased;
- Time period over which the participant or employer is allowed to pay the cost of the service purchase; and
- Methods of calculation and the details specified for the service purchase calculation method.

Many systems are subject to statutory rules that require the plan's actuary to calculate the cost of the service purchase but leave the specifics of the calculation to be determined by the system and/or the plan's actuary. Non-actuarial calculation methods also are common. Further discussion regarding calculation details is provided in the Appendix.

[1] NASRA. *Responses to survey regarding full cost purchases of service credit.* November 2015.
NASRA. *Responses to survey on service purchase*. January 2018.

Consideration in the Design of an ASCP

Retirement Security Impacts

Pension plans in the public sector exist as a key part of the overall compensation structure with the goal of providing a secure retirement income to plan participants. Pension plans typically reward significant benefits to long-service participants who qualify for retirement, thereby encouraging longevity and preserving stability for the employer. A plan participant's eligibility to retire and their benefit amount are often tied to their length of plan service.

When a plan participant purchases service, they expect to increase the amount of their pension and, if allowed by the ASCP rules, accelerate commencement of their benefits. This increase could include movement from a more recent benefit tier (benefit structure) to an earlier, often more valuable, benefit tier.

Whether movement between benefit tiers occurs depends on ASCP provisions and the individual circumstances of the participant. While there are many unknowns on both sides, the core transaction is that the participant has purchased a certain level of benefits and the plan has taken on the risk that the purchase amount paid can be managed in a manner so as not to create additional costs for the plan above the intended level.

Workforce Management

The design of public sector pension plans can influence the hiring, termination, and retirement patterns of covered groups. Retirement subsidies and eligibilities may facilitate retirement at targeted points. Service purchase provisions can further influence employment decisions, as detailed below. Plan designs that include an ASCP can help achieve the following workforce management objectives:

Recruiting new hires: Service purchase provisions can help attract new hires by

1. *Making the overall retirement program more flexible and beneficial to incoming individuals.* The presence of a service purchase feature can influence the perceived value of one plan over another, even if a purchase is never initiated.

2. *Removing barriers related to forfeiture of service.* In many pension plans, employer-paid benefits often are forfeited if the participant separates from employment prior to vesting or, in some cases, before retirement age. Even if benefits are not forfeited when a person changes employer, benefits from the prior employer often are based on a frozen final average compensation. Either scenario would create a penalty for a person considering employment with another employer. Implementing service purchase provisions that allow an employee to receive credit for forfeited service with a new employer would eliminate or reduce this penalty, enhancing the recruitment efforts. An ASCP can facilitate portability among different employers that provide defined benefit plans. Usually, this type of purchase is accompanied by a requirement to forfeit the service in the other plan, thereby prohibiting a participant from accruing benefits in two plans for the same period of employment.

Retaining existing employees: A service purchase feature can foster staff retention by creating the opportunity to convert personal savings into retirement service credit. This is potentially advantageous to participants because it provides longevity protection to income derived from savings and may accelerate retirement timing.

Retiring plan participants: Service requirements for vesting or retirement eligibility can result in mid-career hires working to a later age than may be desired by the employer or even the employee. For example, some public-safety plans historically have had a high service requirement for retirement eligibility, such as 25 or more years of service, and perhaps an age requirement, in keeping with the physical challenges of the job. Such a service requirement could make changing employers at age 35 or 40 problematic. To earn sufficient service to reach retirement eligibility, a participant who changes employers may need to remain in a new position beyond the age at which they are capable of working at an acceptable performance level. A service purchase feature may allow such a participant to retire at their preferred age even if they change employers later in their career.

Tax Implications

- At the federal level, pensions are generally taxed as ordinary income except to the extent that the payments represent a recovery of the "investment in contract" as defined in Internal Revenue Code (IRC) §72. In a simple case, the investment in contract is the sum of all after-tax employee contributions to the plan. Investment in contract excludes employee contributions that have been made on a pre-tax basis in accordance with IRC §414(h)(2). Service purchases, however, can be made with after-tax money, or with money rolled over from another qualified plan.
- Service purchases made with after-tax money add to the investment in contract. Related benefits are excluded from taxable income when paid out under rules specified in IRC §72.
- Service purchases made with untaxed money (for example, via a rollover from an IRC §401(a) Plan) do not add to the investment in contract and are fully taxable on payout.
- At the state level, each state has its own rules for taxation of pensions. While state taxation issues are outside the scope of this practice note, retirement system staff can direct participants to reliable information sources.

IRC §415 Limitations

- The benefit limitation rules (IRC §415 limits) may come into play in cases where the employer fully or partially subsidizes the service credit cost. Whether or not there is a subsidy from the perspective of IRC §415 likely depends on market interest rates, not on expected values, and is beyond the scope of this practice note. Service purchase rules can complicate IRC §415 compliance. Actuaries should be aware of the issues and encourage systems to explore any potential impact on their ASCP.
- Employee contributions to a defined benefit plan, including both regular and service purchase contributions, are limited by IRC §415(c). Service purchases made with rollover contributions

from other plans that have already been tested under IRC §415(c) are not retested under IRC §415(c).

- The treatment of service purchases under IRC §415(b) is as follows: All after-tax contributions, including those made to pay for service purchases but excluding repaid refunds, are accumulated with interest at rates specified in the regulations and annuitized. The resulting annuity is considered an employee-provided benefit and acts to increase the effective IRC §415(b) limit. For purposes of this calculation only, rollover amounts are treated in the same manner as after-tax employee contributions (assuming they have already been tested under IRC §415(c)).
- The treatment under IRC §415 ensures that a participant who makes a service purchase receives benefits equivalent to the cost of the service purchase, where the basis for such equivalence is specified in the IRC §415 regulations.
- For a service purchase made well in advance of retirement, it is possible that the eventual benefit is limited by §415(b) and the participant receives no additional value or experiences a decrease in value compared to expectations when the service was purchased. This can be a true-up issue, particularly if no §415(m) plan is provided.
- If the service purchase can count as years of participation, it might help employees reach the 10 years of participation service threshold, which would prevent reductions in limits under §415 that apply to participants who have completed less than 10 years of service.
- IRC §415(n) places a limit of five years of "nonqualified service credit," such as credit bought in a typical air time service purchase.

IRC §415 issues are complex and subject to future legislative change. A full discussion is beyond the scope of this practice note.

Public Perception

Participant service purchases and the way the cost calculations are developed can carry a public perception risk. A relatively short-service employee—particularly one at a high level such as a department head, executive, or elected official—may use the service purchase rules to retire with a full pension. Even though they may have paid "the full price" for the benefit based on the ASCP assumptions, the payout amount can still generate an unfavorable reaction. The plan may in effect be offering the participant an annuity purchase at terms not available to the general public. While this may be viewed as acceptable when the time purchased was accrued for a specified purpose (e.g., military service), it may be viewed adversely if the time purchased is not associated with other governmental service (i.e., air time). If the cost calculation produces results that seem too low, outside stakeholders could characterize the practice as a misuse of taxpayer funds for government employees. Those concerned may not use an actuarial analysis for this calculation but rather comparisons involving total nominal benefit payouts, life expectancy, and/or present values without life contingencies. Actuaries should be aware of these non-actuarial methods in order to anticipate possible reactions from outside stakeholders when advising the system on an ASCP.

As mentioned above, it is sometimes reasonable to use assumptions for purchasing service that differ from those used for the actuarial valuation. For example, a system might choose to use a discount rate in pricing service purchases that is lower than the plan's expected return on assets in order to

compensate the system for taking on additional investment risk related to the purchased service. However, using a lower discount rate for service purchases than for valuation purposes may be portrayed as overcharging participants or undervaluing plan liabilities. Actuaries consulting on or conducting work related to service purchases should be aware that outside parties might focus on such differences in assumptions and call the system's funding assumptions into question.

Communications

Public pension plans are complex financial systems. Plan participants will have varying degrees of familiarity with all of the rules, regulations, and options associated with their participation in the plan, including any choices under an ASCP. Retirement systems should be prepared to devote time and resources commensurate with the complexity of the ASCP to facilitate their participants' understanding of the program.

If a participant decides to participate in an ASCP, there should be clear communications on the potential costs, benefits, and risks. Educational materials such as Summary Plan Descriptions (SPDs), retirement handbooks, service credit purchase guides, etc. can provide a significant amount of information to participants regarding an ASCP, including the following:

- Potential advantages
- Eligibility requirements
- Further details on how the ASCP works
- Cost details and examples of purchase calculations, including a description of true-up provisions, if applicable (discussed in a later section)
- Available payment options
- Conditions under which purchase payments can be refunded (e.g., death prior to retirement, voluntary or involuntary termination of employment, etc.)
- Cautionary communications such as:
    - Applicable limits ("caps") on service or benefits
    - Actual increases in retirement benefits may differ from estimates provided at the time of purchase
    - Internal Revenue Code 415(b) limits
    - Potential tax implications

Educational materials could illustrate a few different hypothetical service purchase scenarios to give a variety of estimates. Furthermore, providing an estimate of the costs of the service credit purchase to the participant can help to anchor their expectations to an appropriate cost. Some retirement systems provide cost estimates upon request of the participant. Other systems make a calculator available on their websites that participants can access to estimate service purchase costs for themselves. This type of preparation could help avoid the "sticker shock" that might result if the participant received a final service purchase cost estimate that is much higher than anticipated.

For ASCPs with a true-up mechanism, participants should be educated about the possible range of outcomes at the point of true-up. If feasible, participants also may benefit from preliminary estimates of their true-up calculation as the true-up date approaches.

System staff will also need to be trained regarding the type and amount of information appropriate for participants. Participants likely will not understand the ASCP as well as system staff, which could lead to them missing opportunities or efficiencies. System staff should provide information that is as complete and consistent as possible according to system policies.

Some pension plans have caps on the amount of retirement benefits (e.g., 100% of compensation) or on the amounts of service credit that can be included in the calculation of retirement benefits. In addition, IRC §415(b) puts a limit on the amount of benefit that can be paid to the participant by the plan (absent a §415(m) excess plan). Counseling participants who may be affected by these potential issues is important.

Ultimately, participants should be made aware that any estimated increase in their retirement benefit provided at the time of the service purchase will likely differ to some degree from the actual increase in retirement benefit upon commencement. Numerous factors will affect the actual increase in retirement benefit. Some of these were mentioned above, such as retirement date, salary increases, marital status, caps on service or benefits, etc.

Administrative Expenses

A system will incur administrative expenses for administering an ASCP. These can include but are not limited to IT system setup and maintenance; operational elements such as sending letters, verifying paperwork, and completing calculations; actuarial expenses for setting assumptions and calculations; legal expenses; and communication expenses to advertise and explain the program. The system will need to determine the source of funding for these expenses. Possibilities include:

- Assign these costs as administrative expenses and fund them through the regular mechanism to handle administrative expenses.
- Charge participants or employers fees for calculations and administration services.

Principles for Setting Up ASCP Provisions

Who Purchases the Service?

Either the employer or the participant can pay for the service purchase, or they can share the cost. The previously addressed objectives for consideration in program design will need to be evaluated in terms of the parties that are intended to pay for the cost of the service purchase.

If participants pay for any portion of the cost in installments, there may be payment default risk. Typically, this risk is addressed by having a written agreement between the participant and the system containing the terms and conditions of the payment schedule. Legal counsel is typically involved in developing these agreements. Specific considerations around such agreements are discussed below in the section titled “Lump Sum vs. Installments.” However, even with an agreement, the possibility of default should be considered, including development of procedures to be followed if the participant defaults on the payment schedule. One approach is to prorate the service purchased based on the proportion of the full cost that the participant actually pays. This process can be further refined by specifying that service purchases will only be granted in certain increments such as months or half-years. If this refinement is included in the program, the

procedures must also indicate what will happen to funds paid in excess of the amount required for the incremental service being purchased.

What Amounts and Types of Service Can Be Purchased?

The amount and type of service that can be purchased will depend on the objectives in offering the program. Permitting greater amounts of service to be purchased may be beneficial for workforce management purposes as the ASCP will be perceived as more valuable to the participants. However, the more service that is permitted to be purchased, as well as the more uses for which it is allowed, the greater the potential expense and uncertainty associated with permitting such service purchases.

Provisions related to the amount of service purchased may include minimums, maximums, or both. In addition, there may be constraints under IRC §415(n). See the "IRC §415 Limitations" section above. ASCP provisions also may include limitations specific to the various types of service that can be purchased, such as whether it is restricted to other governmental service or allows for service not worked at any other public employer ("air time"). There also may be limitations on overall plan benefits, that effectively act to limit the amount of service that can be purchased.

What Purposes Can Purchased Service Be Used For?

Service purchased can be used for purposes of eligibility, benefit accruals, vesting, or any combination of these. As such, it is important to consider what goals are sought when designing an ASCP. Considerations should include an analysis of the impact on workforce management objectives described earlier, such as recruitment and retention, the impact on the anticipated retirement security of participants, and logistical considerations such as administrative complexity. It is possible to develop different service costs for these varied purposes, but the resulting administrative and communication complexities of such an approach will be undesirable.

When Can Service Be Purchased?

An ASCP can specify at what point in a participant's career service can be purchased, ranging from any point in their career to a limited window associated with a designated event such as hire date, vesting date, or retirement date. Limiting service purchase to a window reduces uncertainty for the plan and its obligations related to the purchase while supporting payment plans where the service is paid for in installments over a period of time rather than as a single lump sum.

In general, if the service may be purchased early in a career, it is challenging to develop an accurate cost for it. The closer the service purchase is made to retirement, the less uncertainty there will be about the likely cost of that service. However, the later the service is purchased in a career, the shorter time period will be over which the payments can be made. Further, the later the service is purchased, the higher the cost will typically be, as there is less time to earn investment return on the amount paid for the service.

A service purchase initiated at the participant's retirement date is the simplest approach, resulting in the purchase of an immediate annuity. At the date of retirement, the participant's

benefit is calculable, and likewise the amount that the benefit will increase due to the newly purchased service is also calculable. Therefore, it is straightforward to arrive at a service purchase cost by multiplying an appropriate actuarial present value factor by the increase in benefit to arrive at a cost to purchase the additional service. By allowing purchases only at retirement, the system lowers its risk of liability gains and losses and the frequency of material winners and losers among participants resulting from the service purchase.

The service purchase cost calculation becomes proportionately more complex the further the service purchase occurs in advance of retirement. The participant or former participant likely will have choices prior to the benefit commencement date, leading to optionality in the calculation. Optionality can lead to adverse selection, which in turn increases the plan's liability. Participants have more information than the system regarding their own decisions and demographics (i.e., career prospects, retirement date, state of health, longevity, and other factors). This information asymmetry allows for adverse selection in favor of the participants and ultimately increases system costs.

Optionality, and the potential for adverse selection, are reduced if the service being purchased is benefit service only and does not qualify for eligibility service. For example, if the service purchased only increases the benefit once the participant becomes eligible for an unreduced retirement, then the cost calculation need not include any estimated cost to reflect the participant's ability to qualify for earlier retirement eligibility. Additionally, issues such as §415(b) limits and percent of pay maximums can be directly addressed.

If the purchased service also counts as eligibility service, the service purchase may qualify the participant for an earlier retirement date or different reduction factor than prior to purchase. The actuary will need to make an assumption about the date of benefit commencement in order to calculate the present value of the cost of the additional service. It is possible that the earlier eligibility is worth more than the increase in the benefit amount. Note that in this situation, the purchase cost may also depend on the participant's service earned at the time of the purchase.

For currently active participants, the complexities above are compounded because the benefit amount at retirement is unknown. It requires additional assumptions to project the benefit before and after the service purchase. The issues outlined above surrounding the varying retirement dates also still apply. This additional uncertainty introduces even more optionality into the calculation. Discussion about setting actuarial assumptions used in the actuarial present value factors is below.

How Is the Service Purchase Financed?

Participants can finance service purchases in a number of different ways. Additionally, plans should work with their legal counsel to proactively consider tax issues related to service purchase. For example, participants may be permitted to use pre-tax and post-tax funds or a combination of the two.

Single-sum purchases are common when purchasing service. The amounts being purchased are associated with the past and the participant receives full credit for the additional purchased service. In this way, a single-sum payment seems appropriate, plus it eliminates uncertainty as to whether all installment payments will be made. However, the size of the single-sum payment can

be a deterrent to the participant, and IRS limits on contributions can necessitate structuring large purchases across multiple years. A participant returning from a leave of absence or other break may not have the resources to purchase the service all at once.

Installment payments are more manageable for most participants and can be administered similarly to regular participant contributions. The payments can be made over a limited period of time (e.g., five years) and taken directly from payroll. The tax treatment of contributions for a service purchase taken directly from payroll should be understood and disclosed, but such issues are beyond the scope of this practice note. If not taken directly from payroll, the plan should set policies on taking payments from other sources (e.g., qualified accounts, personal accounts, etc.).

However, complications can occur over the payment period. For example, what if the participant were to terminate employment, retire, become disabled, die, or default before the full payment is made? Do they get a prorated portion of the initial targeted service, is the initial computation redone to determine how much benefit is to be provided, or is the entire purchase revoked and the prior payments returned (with or without interest)? If actuarial assumptions or plan provisions change during the payment period, should more or less service be granted for the original price, or should the price change? Generally, the longer the payment period, the more opportunity there is for these types of events to occur.

For the benefit of the plan and the participant, the system should implement a method by which to track and monitor the payment process to ensure it is timely and accurate. ASCPs (with assistance from their legal counsel) should set forth the terms of an installment purchase in an agreement with the participant at the inception of the purchase. Items to be considered include but are not limited to:

- The authority in the plan's governing statutes/rules allowing for service purchases
- Type of service purchase
- Total service purchase cost
- Actuarial and other assumptions used to determine service purchase pricing
- If costs are shared between employer and employee, a description of that division
- The length of any installment agreement, including the anticipated number of payments
- Interest rate to be applied to installment payments
- Definition of a payment default and what happens if one occurs
- Payment source(s)
- Plan reporting requirements to the participant
- Other contingencies, such as what happens if actuarial assumptions or the plan provisions change during the term of the agreement

Data or Administration System Considerations

An ASCP will likely necessitate changes in the administration system of the plan implementing it in order to reflect its terms. The system will need sufficient data to determine items such as:

- Type of service purchased
- Amount of service purchased

- Benefit and eligibility service with and without the purchased service
- Details of transactions, such as the purchase price(s), payment(s), and terms
- Source of funding for the service purchase transaction, including rollover status
- If utilizing an installment payment plan, method by which to gauge received payments to date and how much service those payments represent in the case of a default
- A mechanism to notify the system if a purchase amount is due to be refunded (see Appendix)
- If the service purchase covers a specific period of time (e.g., military service from one date to another), the dates that were covered by the original purchase to avoid double-counting
- Legal agreement(s) the system and participant entered into as part of the ASCP, including consideration of IRC §415(c) limitations
- Ability to track if the purchase was completed in full

Actuary's Cost Considerations

Rationale for Cost Determination

ASCPs can vary based on whether or not the participant's purchase cost is the full actuarial cost (however determined) of the additional benefits expected to be received. For many ASCPs, the policy intent is for the participant to pay the full actuarial cost, so that the ASCP is expected to be cost-neutral. However, for some types of service, such as military or other governmental service, the cost of the service purchase may be set at an amount that is less than the full actuarial cost, e.g., only the usual participant contributions. This situation reflects a policy intent to subsidize such purchases, with a residual net cost increase to the employers. Even if the purchases are subsidized, the actuary may be asked to determine the full actuarial cost so that the net cost to the employers is known.

Idea of "Cost Neutrality" and Limitations of This Concept

For ASCPs that are expected to be cost-neutral, it is important to understand that cost neutrality cannot be achieved through practical operating procedures. Some ASCPs require that expected cost neutrality be determined at the time of commencement of purchase. In that case, the payments to purchase the service will be the actuarial equivalent of the expected additional benefits resulting from the purchase, typically based on assumptions consistent with those used in the actuarial valuation. However, even though such a transaction does not change plan unfunded liabilities or contribution amounts when it occurs, costs may emerge when the individual participant's actual experience deviates from what was assumed. This is discussed in the "Risks Related to Deviations from Expected Results" section below.

Expected cost neutrality measures can change over time due to changes in assumptions, plan provisions, experience, and/or measurements. Because of this, an ASCP cost calculation expected to be cost-neutral when initially determined may no longer be expected to be cost-neutral if it is reassessed at some future point in time.

For this reason, the length of the period over which the service purchases are allowed to occur is the design element that most often affects expected cost neutrality over time. Many ASCPs allow service purchases at any time during the participant's career. Expected cost neutrality is easier to maintain when service purchases are allowed only at the time when the participant retires. In addition, the level of confidence in continued expected cost neutrality can be increased by having a true-up procedure, a feature that is discussed in a separate section below.

The full cost of the additional benefit under an ASCP will not be known until the participant and any beneficiaries are finished collecting benefits. For that reason, the ASCP design will necessarily reflect a compromise between exact cost neutrality and administrative practicality.

The following discusses strategies to reduce the risk of not attaining cost neutrality, but in practice some of that risk will always remain.

Risks Related to Deviations From Expected Results

The computation of the cost of a service purchase can contain many of the assumptions with which pension actuaries are familiar. If the purchase is expected to be cost-neutral, the assumptions used to determine the purchase cost will reflect all the elements that will play into the eventual benefit determination and the length of payment. However, careful consideration should be given to whether or not the assumptions used in the valuation are the best ones to use for individual service purchase calculations. Several key risks associated with the service purchase are:

- **Age at retirement**—Risk that the participant retires at an age different from assumed when the service purchase cost calculation price was developed, or that the value of the purchase can vary based on different eligibility thresholds.
- **Final pay for benefits**—Risk that the actual pay increases result in a compensation amount used in the benefit calculation that is different from assumed in the service purchase cost calculation.
- **Longevity**—Risk that the participant (and potentially, any beneficiary) experiences a higher or lower rate of mortality than predicted by the mortality table used in the service purchase cost calculation.
- **Investment performance**—Risk that the plan's assets earn more or less than the rate of investment return assumed in the service purchase cost calculation.
- **COLA**—Risk that cost-of-living adjustments are higher or lower than assumed in the service purchase cost calculation.
- **Form of payment**—Risk that the selected form of payment differs from what was assumed in the purchase cost calculation. Generally, this will be an issue if the plan subsidizes certain forms of payment, such as survivor benefits.
- **Beneficiary status**—Risk that the participant's marital status and/or spousal age differ from those assumed in the purchase cost calculation. This should only be an issue if the plan subsidizes certain forms of payment (i.e., not actuarially equivalent).

Regarding each element of risk listed above, the ultimate increase in the value of the member's benefit due to the purchased service based on known choices and individual experience could vary significantly from what was assumed or estimated at the point of purchase. For more information on

this subject, see the section titled “Assumptions and Plan Provisions Reflected in Service Purchase Calculations” below.

Antiselection

Several of these risks are compounded by the possibility of antiselection. The participant knows more than the plan about several of these risks, which may allow them to purchase service when it is potentially advantageous to them. For example, participants may be able to adjust their retirement dates in order to enhance the value of their service purchases.

Antiselection risk increases as the time period of purchase eligibility increases. Mechanisms to mitigate antiselection risk include limiting the service purchase to the time of retirement or limiting eligibility to purchase service to a set period from hire (e.g., to facilitate portability from another retirement system). Another effective mechanism for managing antiselection risk is a true-up calculation at retirement (discussed in the “True-up Provisions” section below).

Antiselection risk may cause an ASCP that by design is expected to be cost-neutral to deviate from its expected costs over time. If the behaviors and metrics of the population purchasing service deviate from the assumptions used in the pricing of that service, the ASCP will produce losses or gains. For example, if the valuation mortality assumption is used, a participant who expects to live much longer than predicted by the valuation assumption may select into the purchase group, while someone with a shorter expectation for their lifespan will select out. Over time, this dynamic will lead to losses on this assumption, although it may be difficult to identify. Several of the assumptions discussed above in the “Risks Related to Deviations From Expected Results” section can be influenced by participant choices.

Assumptions—Broad Comments

The determination of service purchase cost will require the use of actuarial assumptions. For the actuarial valuation, assumptions are set to be reasonable for the entire plan population. They are developed based on statistical methods—methods that may not be as well suited to the prediction of the behavior of an individual participant. For example, different employers and/or groups of employees within a plan may have different salary growth patterns, but those patterns are aggregated to one overall salary growth rate table for valuation purposes that is reasonable in aggregate.

One approach is to use the plan’s funding assumptions in setting the cost. This has the convenience of established, approved assumptions and works well in the aggregate provided that a representative cross-section of participants decides to purchase service. However, assumption sets that are valid for modeling the long-term cost of a large group of participants may not be appropriate for individual purchase service calculations, resulting in winners and losers with the group purchasing service. It may also not be practical in all cases depending on the plan’s assumptions. It may be more appropriate to determine the cost of the service using a “most valuable” retirement date. Here again there are complexities, as the “most valuable” retirement date may depend on other factors. such as the choice of an assumed termination date (or no termination assumption). It may also result in charging participants more than needed in the aggregate as not all participants will be able to or choose to retire at that time.

Another option is to use specialized assumptions for the service purchase cost calculation. As discussed above, this is challenging because participants can know more about future changes in their individual circumstances than the plan. A plan's history of service purchases could be used as the basis for an experience study to develop these assumptions, such as for the gender mix inherent in the assumptions.

Considering all of the actuarial assumptions used in determining the cost of the service purchase, technical or practical limitations may necessitate simplifications such as the following:

- The ASCP will require unisex assumptions for determining all costs either paid by participants or divided between employer and participant.
- The plan's administration systems may require a mortality table with static projection instead of a generational mortality table.
- An age-based salary scale may be simplified or condensed to a single rate for all years.
- Select-and-ultimate assumptions may be condensed to one-dimensional rates.
- Retirement assumptions may be set to be the earliest reduced or unreduced retirement age.
- Withdrawal and reemployment assumptions may be ignored.
- Assumption tables for different employee groups within the employer's population may be blended.
- The plan may want a less precise but easier-to-understand set of factors for purposes of administering and communicating the ASCP.

Specific limitations will depend upon the plan's preferences and the costs and benefits of implementing more precise methodologies.

Assumptions—Discount Rate

Actuarial Standard of Practice (ASOP) No. 27 section 3.9 states, "The actuary should take into account the purpose of the measurement as a primary factor in selecting a discount rate." The purpose of the measurement may lead the actuary to recommend a different discount rate for service purchases than for a funding or accounting valuation. Public pension plans in the United States typically set their funding discount rate equal to their expected long-term rate of return on assets to develop a budget for future contributions. The discount rate used in determining present values for the service purchase cost calculation may differ from this funding discount rate.

Some ASCPs use the plan's long-term expected return on assets to determine service purchase pricing, as this rate better reflects the plan's anticipated earnings than a risk-free rate. While a plan sponsor might fund an entire plan based on a higher expected rate of return, the plan sponsor should consider whether to offer the same pricing (without investment risk) to the population eligible for service purchases. Use of the expected rate of return likely guarantees purchasers a higher rate of return, with inherently greater risk for the plan sponsor, without compensation for assuming that risk.

An alternative approach is the use of "market assumptions" to determine service purchase pricing. Instead of using the expected return on assets, plan sponsors can use insurance company annuity pricing, corporate or municipal bond rates, or Treasury rates to determine the

discount rate for pricing service purchases to better reflect current market conditions. Some plan sponsors may want to share or transfer the risk associated with investments and market fluctuations to participants more explicitly than other risks. While an employer might fund an entire plan based on higher expected (risky) returns, employers should consider whether they want to offer the same pricing (without participant risk) to the population eligible for service purchases. Market-based assumptions will change with market conditions, and thus the cost of the service purchase will increase or decrease subsequent to the purchase. If a plan uses a market-based assumption to determine the cost of purchasing service, participant communications should explain the potential volatility.

If a rate other than the funding discount rate is chosen, service purchases will inherently generate gains or losses in the funding valuation as soon as they are executed. For example, a plan using a lower discount rate for service purchases than for funding purposes will see an apparent actuarial gain, as more assets will be paid into the plan than the expected liability increase.

The discount rate assumption may influence participant behavior by providing implicit financial incentives. If the discount rate used on the service purchase is sufficiently higher than other investments available to the participant, the participant may decide to purchase more service than otherwise. The current median funding discount rate for large public plans in the United States is approximately 7% as of the date of publication of this practice note, while United States 30-year Treasury bonds are yielding substantially less. Because the benefits from the service purchase are guaranteed, participants have an incentive to take advantage of this disparity.

Assumptions—COLA

Many U.S. public pension plans have a post-retirement cost-of-living adjustment (COLA), either automatically built into the benefit formula, tied to some index, or ad hoc with approval from an overseeing body. To the extent the additional benefit resulting from a service purchase qualifies for COLA increases, the actuary would typically consider a COLA assumption within the service purchase calculation. If the plan provisions contain a minimum and/or maximum rate of COLA, the actuary would also typically need to consider how to incorporate those constraints into the calculation.

Assumptions—Salary Scale

A salary increase assumption and other forward-looking assumptions also may be required, depending on the plan's benefit formula and administrative practices. As in the case of the mortality assumption, active participants purchasing service may have salary increase experience that differs from that of the plan's active participant population as a whole. Some of these assumptions may become policy discussions. For example, the salary increase assumption may reflect both inflation and merit components. The actuary typically considers whether the service purchase salary increase assumption will contain both components. The program may also contain provisions to deal with adverse selection—for example, if a participant makes a purchase in anticipation of an upcoming promotion. In this case, the service purchase cost may need to be recalculated if the salary increase that occurs is significantly larger than assumed and occurs within a specified period of time.

A non-level salary scale also can create anomalies when expressing service purchase cost as a percentage of pay. Year-over-year changes in the service purchase cost as a percentage of pay could jump due to the shape of the salary scale assumption.

Assumptions—Mortality

The mortality table that applies to the plan's population for valuation purposes may need to be adjusted for service purchases. If a participant is purchasing service close to their retirement date, the participant may be optimistic about their probability of survival and the value of the benefit they are about to purchase. In this scenario, liability losses would likely result from both participant experience and antiselection. For purchases significantly before the retirement date, the antiselection factor is unlikely to play a significant role.

Participants in a stronger financial position may be more likely to be able to afford the cost of a service purchase. In addition, higher-income individuals tend to have longer life expectancies than lower-income individuals. If service purchases are disproportionately made by higher-paid participants, then pricing service purchases using a funding valuation mortality table that was selected based on the aggregate longevity experience of higher and lower-paid groups may tend to understate costs.

Assumptions—Retirement, Termination, and Disability

If service is purchased at the time of retirement, no decrement assumptions for retirement, termination, or disability are necessary because uncertainty no longer exists with respect to those contingencies. Otherwise, assumptions about future employment may or may not be required for active participants purchasing service. For example, termination and retirement assumptions will affect the amount of service a participant is expected to earn during the remainder of their career with the plan as well as the date of benefit commencement.

Retirement assumptions may be set as retirement rates that vary by age, service, or both. The assumptions may be set to the earliest reduced age, unreduced retirement age, or most valuable retirement age with 100% certainty. In addition, it may be necessary to have separate retirement assumptions based on the following:

- Employee groups that have differing retirement patterns (such as uniformed participants), and
- A plan containing multiple pension tiers, especially if there are significant differences between the tiers regarding benefit formulas, retirement eligibilities, or other provisions.

Typically, in determining the cost of a service purchase, it is assumed that no termination or disablement will occur prior to retirement. If decrement prior to retirement is assumed, that could also change the most valuable retirement age. For plans that contain a return-of-contributions provision, the presence of termination decrements may cause the cost calculations to become recursive, and additional assumptions will be needed to resolve the recursion. See the section "Plan Provisions—Refundable Purchase Amounts" for additional discussion.

Assumptions—Marital Status

Participants purchasing service today may have a different value of benefits depending on their marital status at benefit commencement, particularly when the plan offers subsidies in some or all optional forms of payment. If the service purchase is not occurring at commencement, the actuary may need to consider the additional gains or losses that may develop from a participant's change in marital status or an unknown marital status at purchase.

Effect of Purchased Service on Assumptions That Vary by Service

Some actuarial assumptions vary based on service, either exclusively or in addition to other factors. For certain assumptions, it may be appropriate to include the purchased service when determining the appropriate value to use from the table of actuarial assumptions; however, regarding other assumptions, it may not be appropriate to consider the purchased service.

Consider a set of retirement rates that varies by age and service. If purchased service counts as eligibility service, then it may be appropriate to include the newly purchased service as part of the table lookup service value. A participant will likely understand that purchasing more service will result in an altered retirement eligibility date. That new retirement eligibility date would already be reflected in the behavior of participants at the higher service level and reflected in the retirement assumptions. Purchased service that counts toward eligibility usually results in accelerated retirements and should thus be reflected in the retirement rates used to value plan liabilities.

In contrast, consider a salary growth assumption that varies by service. The salary increase methodology used by the participant's employer is unlikely to consider purchased service (or the actuary should be made aware if it does). For example, a salary matrix used by a public-safety population may use public-safety service rather than the service value used by the pension plan. If pay increases for these participants are determined strictly by public-safety service, it would not be appropriate to adjust the salary increase assumption based on the service increase due to the purchase. Implementing this approach would require separate tracking of purchased service and regular service. This can be a consideration both in terms of the calculation of the service purchase cost and in actuarial valuations occurring subsequent to the service purchase.

Effect of Changes in Assumptions Between the Purchase Date and Retirement Date

Another cost wrinkle will occur each time the retirement system updates or changes its actuarial assumptions. Once an actuarial assumption is changed, it will implicitly affect the cost/benefit balance of service purchases that were calculated under previous assumptions. If the revised assumptions are more or less conservative, any retrospective increase/decrease in service purchase costs will fall into the employer rate. The only way to avoid this result is to "true-up" calculations to realign previous purchase prices whenever actuarial assumptions are changed or to charge/credit future purchasing participants for shortfalls/overstatements due to previous purchase calculations. Because neither of these options is particularly desirable, the plan sponsor will likely need to accept the possibility of assuming additional costs before proceeding with the adoption of an ASCP. For plans that perform a true-up calculation at the time of

retirement, the true-up section of this practice note provides additional discussion on assumption change treatment within the true-up calculation.

Cost Methods—Introduction

Actuarial cost methods divide up the present value of future benefits into past, current, and future liabilities. The actuary must choose a method to determine the cost of the service purchase, which can involve some or all of these portions of the present value of future benefits. The choice of cost method may also affect what assumptions are needed. There is no single best cost method to use for service purchase cost calculations. Each method will have advantages and disadvantages, as well as situations where it works well and others where it produces nonintuitive costs.

Some ASCPs use a method based on the plan's (sponsor and/or participant) contribution rate(s). Using plan-derived cost factors in effect uses the plan's funding-valuation cost method. Individual participant calculations may use the total normal cost rate as a representation of what would have been contributed for that service if it had been accrued over time. Other service purchase cost determinations are based on more individualized calculations.

Some sponsors create a table of approximate factors based on a set of actuarial assumptions. Service purchases are then based on multiplying a calculated factor by other participant demographics. For example, a table of factors may be based on age and service. Participants take one of those factors times their rate of pay to arrive at the cost for one year's purchase, then multiply it by the number of years to purchase for the full cost. This approach approximates some of the elements of the more precise cost calculation described above. It allows some gains and losses in exchange for ease of administration. Cost factor tables such as this may have cliffs within the array or matrix of factors derived that may be difficult to explain, but that are necessary to produce expected cost neutrality.

Individual participant purchase calculations may approach the cost of the service purchase from a variety of perspectives. For example, the actuary may calculate the value of the accrued benefit at the point of purchase or project it into the future. Because the participant will have "earned" this benefit after the service purchase, it follows that the present value of the benefit is the cost of the purchase. Alternatively, the actuary may consider what would have been funded into the plan as of the purchase date if the participant had entered the plan earlier by the number of years of the purchase. Because most public pension plans fund their liabilities on a level cost basis, this is essentially modeling the plan's funding pattern on the service purchase.

With individual participant calculations based on a difference in two measurements, the actuary should be aware of the effect of purchased service on assumptions that vary by service, as discussed above. This may affect assumptions such as salary increase rates, retirement rates, and termination rates, as applicable to the measurement. For each affected assumption, the actuary typically considers whether the purchased service should be added to the service dimension of the assumption. Furthermore, if the service being purchased will change the retirement behavior, any potential reduction in future employee contributions and its effect on the net employer cost is typically considered.

If the participant's purchase cost is determined on the same cost method as the plan's funding cost method, this is generally consistent with the goal of having little or no impact on the funding valuation; by setting the cost equal to what would have been funded, the impact on funding should be minimal. In contrast, charging only the value of the increase in the accrued benefit will likely lead to a loss on the

funding valuation basis because the increase in the actuarial accrued liability will typically be higher than the increase in the present value of the accrued benefit. Conversely, charging the full present value of the increase in projected benefits likely will lead to a gain because the increase in actuarial accrued liability will typically be lower than the increase in the present value of the benefits.

Plan Provisions—Introduction

The actuary will know the plan's benefit provisions at the time of purchase. However, there may be plan provisions that are immaterial or rarely used in the funding valuation that the plan sponsor must consider for the ASCP. Additionally, the system must consider how service purchases might be affected by future plan provision changes. Some concerns related to provisional changes may be mitigated through implementation of a true-up calculation process, as discussed in the "True-up Provisions" section below. Also, many of these considerations will be eliminated if the ASCP restricts purchases to the time of retirement or does not allow the service purchased to be used for benefit eligibility.

Plan Provisions—Ancillary Benefits

It is common for plans to include special ancillary benefits that are not based on service. One of the most common is the disability retirement benefit. The disability pension may be determined based only on pay and not service (e.g., 50% of pay). The plan should decide in advance how to manage any service purchase for a participant who later is subject to that particular ancillary benefit. Three potential approaches include:

- Do not provide any refunds or additional benefits to the participant at the time of the claim. This approach is based on the concept that a disability benefit is contingent, based on particular factors separately determined from typical pension benefits and is typically viewed as another risk assumed at service purchase; thus, participants would not qualify for purchase amount refunds or additional benefits. If this approach is adopted, the ASCP should clearly outline this possibility in participant communications and reflect the risk in the purchase cost.
- Purchased service amounts are refunded to the participant, with or without interest. If this approach is adopted, the decrement(s) triggering the refund is typically ignored in the initial service purchase calculation.
- If the benefit depends on service at the time of incidence, the purchased service is included in the calculation.

Similar considerations apply to other ancillary benefits offered under the plan (e.g., death benefits, disability benefits, etc.).

Plan Provisions—Service Caps

Actuaries typically consider situations when a participant's purchased service value decreases due to service caps or other benefit limitations. A participant may predict they need to purchase service to obtain the maximum service allowed as of their expected date of retirement and purchases at mid-career but end up working beyond the point where the maximum service was achieved. Options for this situation include:

- Do not provide compensation using a refund or additional benefit to the participant. The purchased service had value until the participant reached the service cap or earned the full pension. No refund or additional benefit should be awarded given that continuing to work was the participant's choice. Inherent risks accompany any purchase of service, and the plan should not be the only party bearing the risk. This would be similar to a subsidized early retirement benefit. Just because a person works past their most valuable retirement date does not mean the plan must compensate the participant with any refund or additional benefit other than the benefit accrued and defined by the plan.

- Refund the purchase price in full or in part, with or without interest.

Plan Provisions—Retiree Medical Eligibility

While retiree medical plans are outside the scope of this practice note, it is possible to have service purchases within a retiree medical plan or covering service that applies to both plans. Allowing the purchased service to count toward eligibility for retiree medical benefits can have a dramatic effect on the cost of the retiree medical plan. An actuary should be aware of how purchased pension service and retiree medical plan eligibility may be related. This consideration may be further complicated if the retiree medical and pension plans are administered separately or have different actuarial service providers.

Plan Provision—Subsidized Survivor Benefits

Some plans provide subsidized joint and survivor forms of payments to their participants. A typical design is for unmarried participants to commence their benefit in a single life annuity form of payment while married participants commence their benefit in a joint and survivor form of payment without any reduction to the benefit amount. All other things being equal, the present value of benefits is larger for a married participant than for a single participant because of the subsidized difference in the payment form. If a participant purchases service in a plan with a subsidized survivor benefit, the actuary typically considers how to reflect this subsidy in the service purchase price. For example, the actuary may reflect the participant's current marital status as the marital status at retirement or may use an assumption to predict or assume the marital status at retirement.

Plan Provision—Refundable Purchase Amounts

If a participant purchases service and terminates without becoming vested, the participant may be due a refund of their purchase amounts (discussed further in the appendix). However, because this is an enhanced benefit due to the participant as a result of the service purchase, it is typically considered when developing the purchase cost. This situation creates recursion—the participant's purchase price affects their termination benefit, which affects their purchase price. One approach in practice is to generate one or more factors to be applied to refundable dollars in calculating the cost of the service purchase. Another simpler approach is to develop the service purchase cost assuming no termination of employment prior to retirement. For additional discussion, see the section titled "Assumptions—Retirement, Termination, and Disability."

An extension of this idea is that a participant may purchase service, terminate, take a refund of that service purchase amount, and later become reemployed by an employer participating in the same fund. In those cases, the plan must decide under what conditions the refunded service purchase amount may be repaid and the originally purchased service regained.

ASCP Changes

Transition Considerations

Once the provisions of the ASCP are established, significant changes to the program are not expected to occur often, except for periodic assumption changes, which are discussed below. Generally, significant change would only occur after a comprehensive review of the program's provisions or the adoption of governing laws that affect the program's provisions. A comprehensive review could be prompted by a number of developments, including rates of ASCP participation that are significantly greater than or less than expected, significant actuarial gains or losses, significant fluctuation in actuarial gains and losses, or significant administrative burdens resulting in the desire or need to change or reevaluate the program. Failure to address any of these situations could cause the program to fail to meet its initial design objectives.

Transition from the current provisions of the ASCP to any newly adopted provisions will require proper notification and communication to plan participants and employers participating in the ASCP. Any notifications should be made well in advance—at least six months and preferably one year prior to the effective date of any changes. Note that changes in ASCP provisions could be applied on a prospective basis to all service credit purchases after a specified date. Alternatively, some or all of the current service credit provisions could be "grandfathered" and continue for a specified group of participants and/or a specified period of time.

Whether the changes in provisions are applied on a prospective basis for all participants after a specified date or continue for a specified group of participants and/or specified period of time is especially important if the changes to the ASCP are either more restrictive or result in an increase in purchase cost. Changes in ASCP provisions falling into these categories may include:

- Eliminating certain types of service that are available to be purchased, (e.g., eliminating purchases of air time);
- Implementation of a maximum amount of service credit that can be purchased or reducing the maximum amount of service credit that can be purchased;
- Increasing eligibility requirements for the purchase of service credit;
- Decreasing the time period over which installment payments can be made to pay for the cost of the service purchase;
- Changes to calculation methods; or
- Change in pricing methodology (as distinct from routine updates to actuarial assumptions).

A longer transition period from the current provisions to any new provisions may be preferable if the changes affect all participants on a prospective basis after a specified date and if the changes include more restrictive requirements or increase purchase costs.

As noted in the discussion in the prior section, the impact of any adopted changes in provisions will need to be clearly communicated, including the effect those changes may have on the potential costs, benefits, and risks of the ASCP. During a transition period, the plan should consider showing estimates of purchase costs based on current provisions and any adopted future changes to illustrate to the participants the impact of any changes.

A longer transition period may be desirable to ensure the system staff can administer the new provisions and allow for a sufficient testing period prior to implementation.

Changes in the provisions of the ASCP are generally much less frequent than changes in the actuarial factors used to determine the cost of service. The actuarial factors under many of the calculation methods used to determine the cost of service purchases are based at least to some extent on the actuarial assumptions adopted for use in the actuarial valuation. For many plans, the actuarial assumptions used in the actuarial valuation are reviewed every few years and any changes adopted by the governing body are reflected in the actuarial valuation for the pension plan. A discussion of many of the actuarial assumptions that may be used to determine the cost of the service purchase is provided in the “Assumptions” section.

Note that changes in actuarial factors used for determining the cost of the service purchase can either increase or decrease the cost, so again it is important to properly communicate information to participants regarding changes to the estimated cost. Participants may want to initiate a service purchase prior to or following any changes in actuarial factors if the costs are anticipated to increase or decrease, respectively, based on the new factors.

A common practice applied by public-sector retirement systems is to have any new actuarial factors for service credit purchases take effect at the same time as changes in other actuarial factors for determining actuarial equivalence (e.g., factors for determining optional forms of payment, etc.).

Commonly, the effective date of any changes in actuarial factors is made consistent with the date that changes in assumptions used to calculate actuarially determined contributions are effective. For example, an actuarial valuation as of July 1, 2020, may reflect changes in actuarial assumptions. That valuation may calculate actuarially determined contributions that are effective starting July 1, 2021. To be consistent with the effective date of the actuarially determined contributions based on the new

assumptions from the July 1, 2020, valuation, any changes in actuarial factors (including determining the cost of a service purchase) would also be made effective July 1, 2021.

Not only does the one-year "lag" in this example allow time for the valuation to be completed and for the actuarially determined contribution rates to be adopted and budgeted, but it also allows a period of time to implement new actuarial factors and properly communicate any changes in those factors prior to their effective date.

In summary, it is important that any changes in the program's provisions or actuarial factors be adequately communicated to participants and employers ahead of such changes. Including an appropriate period of time prior to the effective date of any changes is important in order to allow for appropriate administration of the change and communications to be released. Communications may also emphasize that certain changes are part of a regular operation of the plan, such as updating the actuarial factors. Providing estimates of the costs of the service credit purchase before and after any changes in provisions and actuarial factors is crucial so that informed decisions can be made regarding whether to proceed with the service credit purchase based on the current provisions/actuarial factors or to wait and proceed based on any new provisions/actuarial factors.

Risk Due to Legislative Changes

A public pension plan is governed by the laws surrounding it. Because laws can be changed, public pension funds may bear risk due to legislative changes. These changes may also apply to service purchases.

Participants who believe that the cost calculation for their service purchase is too high may seek a legislative remedy in order to make the cost more affordable. Legislative remedies could take a variety of forms, but passing less cost on to the participant is likely to result in more cost being borne by the funding mechanisms of the plan. A subsidized cost (whether from legislation or other sources) may result in a double adverse impact by passing a portion of the additional cost to the plan while creating greater demand for the ASCP through favorable pricing.

If a participant purchases service prior to retirement, many years may pass between the time of purchase and retirement. The laws determining benefits may also change during this time. If they change, then the estimated cost of the service purchase may no longer be accurate. For increases in benefits, this may raise the value of the service purchased with no clear way to collect the additional cost from the participant. For decreases in benefits for current participants—for example, a reduction in COLA for future retirements—the system will need to consider whether the participants are due some portion of their service purchase cost payment back because they will no longer receive the benefit for which they were charged.

True-up Provisions

There is a mechanism whereby an ASCP that allows service purchases anytime during a participant's career can achieve the same level of expected cost neutrality as an ASCP that allows purchases only at retirement. A "true-up" provision allows the plan to adjust either the amount of service/benefit purchased or the cost of the purchase when the participant retires, based on the participant's actual data at retirement. From the plan's perspective, a "true-up" provision adds protection from participant

antiselection (discussed above) and other adverse plan experience. Still, it may create educational and financial risk from the participant's perspective. In particular, a true-up provision means a participant will not know how many years of service their purchase price will buy until they retire. At that time, the "true" cost of the intended number of years purchased would be determined based on the participant's actual information at retirement. The principal factors for which a true-up is performed include:

- *Age at retirement, or equivalently, date of retirement.* ASCPs that include a true-up feature will sometimes have the participant state their intended retirement age or date at time of purchase, and then true-up if the participant retires at some other age. Alternatively, the true-up can reflect any differences between the actual retirement age and the age or ages assumed in determining the original purchase price.

- *Salary at retirement.* Service purchases made prior to retirement require an assumption as to future salary increases. A true-up will reflect any differences between the actual salary at retirement age and the projected salary used in determining the original purchase price.

- *Marital status.* Marital status can substantially affect the cost of a service purchase, particularly for plans with a subsidized survivor benefit for married participants. A true-up may reflect any differences between the participant's marital status at retirement and either their actual or assumed marital status at the time of the original service purchase.

- *Service at retirement.* The original calculation for the service purchase was based on assumptions about the participant's retirement date (e.g., first eligible, most valuable, etc.) and service at that time. If the participant retires with a different amount of service than originally assumed and that difference affects the cost of the service being purchased, the purchase price is adjusted through a true-up calculation.

The true-up process compares the actual cost of the service purchased based on the participant's information at retirement with the original purchase cost based on assumptions made at purchase plus interest at the rate assumed in the purchase. If the recalculated cost is greater than the original cost (plus interest, if applicable), to realign expected cost neutrality, the participant could either pay the difference and receive the originally intended amount of service or accept a reduced amount of service at no additional cost. If the recalculated cost is less than the original cost (plus interest, if applicable), to realign expected cost neutrality, the participant could receive an increased amount of service or, if legally permissible, a refund of the difference in the actual cost and the original cost. If a refund is not permissible, the only alternative is to increase the amount of service purchased.

Although the true-up calculations adjust for differences between assumed and actual participant experience, public pension plans generally do not "true-up" to reflect differences between assumed and actual investment experience. This means that, even with a true-up provision, the participant receives a guaranteed return on investment from the date of purchase to the date of retirement.

Another aspect for which the plan might not true up is changes in assumptions between the date of purchase and the date of retirement—specifically changes in assumed morality and investment return. If changes in either economic or demographic assumptions occur, the plan typically will continue to use the assumptions in effect as of the date of the purchase when performing the true-up calculation at the date of retirement. Otherwise, every assumption change would require a reevaluation of all prior service purchases. One reason for this practice is that, generally, the true-up process involves only the

calculation elements reflecting the individual participant—e.g., salary, retirement date, etc.—and not events that are not specifically related to the participant, such as assumption changes. Note that from an administrative standpoint, adopting a true-up provision requires maintaining records of the calculation details from the original service purchase.

This paper includes case studies of systems with a long-established true-up feature discussed in the "Design Examples" section.

If the purchase cost is trued up at retirement, the participants may bear the risk of plan design changes. Alternatively, if the purchase cost is not trued up, the plan effectively bears these risks. Cost estimates for proposed legislation affecting plan design typically either include or exclude the effect of purchased service, depending on whether or not participants will pay for them at true-up.

Service Purchase Program Assessment

Public-sector pension plans are subject to many factors that can influence their funded status, stability, and long-term costs. Service purchase programs can be one of a long list of special features that may or may not have a measurable impact on the total cost of the plan. At a very high level, if a medium or large plan has just one or two service purchase events a year, it is unlikely that the actuarial gains and losses generated from those transactions have a meaningful impact on the plan as a whole. On the other hand, if the plan is relatively small or has a large volume of purchases, the net effect of the service purchases may be material. Paradoxically, plans with smaller levels of service purchases may desire simpler administration rules, leading to costs that vary from an actuarially determined cost, which may in turn lead to increased utilization of the service purchase program.

Even if it is known that the service purchase provisions do not significantly impact the plan, public policy concerns still may point to a need to assess the actual costs of the program. Several assessment methods are discussed below.

At Time of Purchase

One approach to the assessment is to make the determination at the time of purchase.

- If the demographic and economic assumptions used in the funding valuation are used to determine the cost of the service purchase, then it can be argued that the purchase is expected to be cost-neutral and the plan is not materially impacted.

- If the assumptions and methods used to price the service purchase differ from those used in the valuation, then from a funding viewpoint there is a specific subsidy or cost paid as part of the transaction. For example, if the plan values liabilities using the Entry Age method and a set of retirement rates but computes the service purchase cost on a present value of future benefits basis and a single retirement age, there will be a difference between the price that was paid and the change in the plan's actuarial accrued liability for funding purposes. This cost/subsidy can be measured by comparing the price paid to the change in that liability. If the non-valuation assumptions used in the purchase turn out to be more accurate for the individual participant or overall cohort of service purchasers, the initially calculated cost/benefit determined at time of purchase may disappear or even reverse once the actual experience of the group is known.

Typically, it is complicated to determine whether the service purchase created a cumulative gain or loss at a later point in time. Presented below are four different approaches that could be considered:

1. **At the time of the death of the participant and any survivors—**The plan can compare the total amount paid under the service purchase to the accumulated value of the purchase price, including all investment gains and losses in the interim period. This

approach has the advantage of being free from all assumptions simply using actual plan and participant experience. However, it requires a detailed recordkeeping regarding the participant's status over many years. Although possible, it is not likely that any plan would implement this approach.

2. **At the time of the participant's retirement**—The anticipated additional pension that was estimated at the time of the service purchase can be compared to the actual additional pension provided at retirement. This measurement accounts for differences in the actual versus the assumed retirement age, enhanced benefit, and investment experience from the time of purchase to retirement date. This approach may allow the plan to adjust its service purchase provisions and calculation methods periodically if it is determined that participants are receiving a benefit in retirement that is materially different from what was estimated at purchase.
3. **At periodic intervals**—A refreshed estimate of the additional pension that was purchased can be computed based on up-to-date service, pay, and age and compared to the original estimate. This approach allows the plan to determine whether the transaction is "on track" to result in the cost neutrality anticipated at the time of the transaction. If performed on a regular basis, it can provide data regarding emerging patterns of differences that may evolve over the course of the careers of the service purchase group.
4. **Periodically, in conjunction with experience studies—**If there is separate tracking of the purchased service amounts and additional contributions, the plan's active participant unfunded liability can be compared with and without service purchases.

Design Examples

University of California Retirement Plan

The ASCP at the University of California Retirement Plan (UCRP) allows active participants to purchase service credit only for certain types of leave, such as the following:

- Leave without pay
- Unpaid sabbatical
- Extended sick leave
- Temporary Layoff
- Furlough

The minimum period for which service credit can be purchased is four consecutive weeks unless a shorter period is required for vesting in UCRP.

The cost of purchasing service credit varies depending on when the leave occurred, its length, and how long the participant waits before electing a service credit purchase.

Generally, if the service credit purchase is elected within three years of returning from the leave, the cost is calculated using a "Plan Normal Cost Rate" method. If the service credit purchase is elected after three years of returning from leave, then the cost is based on an "Individual Actuarial Cost (IAC)" method.

The Plan Normal Cost Rate method uses the total Normal Cost Rate in effect at the time the cost of the service purchase is calculated. The total Normal Cost Rate is multiplied by the salary the participant would have earned if the participant hadn't been on a leave. Interest also is applied from the date the participant returns from the leave until the service is purchased. The total Normal Cost Rate for the calendar year in which the purchase occurs is from UCRP's Actuarial Valuation Report as of July 1 of the preceding calendar year. It is a pooled rate that varies by tier based on all of the active participants in that tier on the valuation date. The Entry Age Normal cost method and funding assumptions from the valuation are used in the determination of the total Normal Cost Rate and any interest rate applied in determining the cost of the service purchase.

The IAC method determines the PVFB associated with the service credit to be purchased and then expresses that amount as a rate to be applied to the participant's current salary to determine the cost of the service purchase. The cost of the service purchase depends on the individual participant's age at the time of the purchase. Tables of IAC rate factors are developed for each tier and vary by age within the tier. The IAC rate factors are based on the UCRP valuation assumptions with certain adjustments, such as the following:

- A static mortality projection of future mortality improvement is used instead of a generational projection.
- Sex-distinct assumptions such as mortality rates, percent with survivor, etc. have been blended based on recent Plan demographics to produce a "unisex" assumption.
- Assumptions that vary by participant group (i.e., staff or faculty), such as salary scales and retirement rates, have been blended based on recent Plan demographics.

- Assumptions dependent on earned service such as salary scale and retirement rates, have been modified to be independent of service to date.
- No termination rates are assumed before retirement.
- No limits have been applied, including: §415 limits, salary limits, or the plan's 100% of salary cap on benefits.
- The IAC factors are adjusted to prevent the service purchase cost from being less than the increase in the lump sum cash-out the participant could receive as a result of the service credit purchase if the participant retired immediately after purchase.

LA Fire and Police

Since 2008, the Los Angeles Fire & Police Pensions plan (LAFPP) has maintained an ASCP known as the Public Service Purchase (PSP) program. The LAFPP PSP is included here as a design example of an ASCP with a carefully designed and fully operational true-up provision. All the PSP provisions including the true-up are clearly described in the Los Angeles Charter and Administrative Code (Section 4.2212), and a copy of that Administrative Code Section is included as part of the Application to Purchase Public Service provided to participants (referred to as "members" in the LAFPP plan provisions). Key provisions of the PSP, including the true-up, are summarized on the LAFPP website page describing the PSP application process.

Generally, the PSP allows for the purchase of a minimum of six months and a maximum of four years of service with a "Public Entity," including military service, for which the participant is not eligible for a retirement benefit from another entity. Purchased service counts only for the amount of a participant's benefit and does not count toward establishing eligibility for service or disability retirement. One complication is that LAFPP also has a Deferred Retirement Option Plan (DROP), so in the documentation all references to retirement date read "the date a member retires or enters DROP."

The Administrative Code that defines the PSP program including the true up includes a definition of "Full Actuarial Cost" and a detailed description of "Cost Neutrality" that specifically describes the purpose and operation of the true-up provision:

> **"Full Actuarial Cost"** means the cost to be paid for purchased service in order to achieve "cost neutrality" to the Plan as determined by the Board's actuary.
>
> **"Cost Neutrality."** The member shall be required to pay the full actuarial cost of the purchased service as determined by the Plan's actuary based upon the additional benefits available from the Plan as a result of the purchased service without taking into consideration incidental administrative expenses incurred by the Plan.
>
> In determining the purchase cost, the actuary shall determine the full actuarial cost utilizing the actuarial assumptions in effect for the PSP program at the time of purchase and taking into consideration the additional benefits that may be provided by the Plan as a result of the purchased service. Factors to be considered by the actuary shall include, as applicable: the member's age; the date benefits will first become payable (the specified date or the actual date); the number of known eligible survivors; the ages of any known eligible survivors; the member's pension base (estimated or actual); the investment earnings rate that is assumed to accrue to the Plan on the member's PSP

payments; and any other factors that are relevant to cost neutrality. For all PSP program purposes, the date a member enters DROP shall be considered the date that benefits first become payable, notwithstanding that no benefits are actually paid to the member until he or she terminates employment and exits DROP.

A member's cost for the purchase of service may differ from the amount determined in advance if a true-up is required. A purchase is finalized when the member has paid the full cost for the service purchased, including any adjustment in cost or service required as a result of a true-up. In the event that the member's pension base changes after the member's purchase has been finalized, a pension base adjustment shall be made by adjusting the years of service, retroactive to the date that benefits first became payable, so that the amount of the monthly benefit purchased remains unchanged.

A separate true-up mechanism may apply in the specific case of a participant whose pension base (i.e., pensionable earnings) changes after a PSP is finalized. The pension base is also included in the other conditions that trigger a true-up calculation. Those conditions are described both in the Administrative Code and on the PSP page of the LAFPP website, where they appear as one of the steps in the PSP process:

> **Step 4: True-up the Cost.** Under the following circumstances, a "true-up" or recalculation of the cost for the purchased service will be made prior to the date of retirement on a service pension or date of DROP entry:
>
> - An advance purchase was made 180 days or more prior to the actual date of retirement on a service pension or DROP entry; or,
> - If the retirement or DROP entry date differs from that specified at the time of purchase; or,
> - If there is a change in the number of known eligible survivors from that specified at the time of purchase; or,
> - In the event the pension base differs from that estimated at the time of purchase.

The website also describes how the true-up can adjust either the cost of the PSP or the benefit purchased:

> If the trued-up cost is less than the amount the member has paid, including assumed investment earnings, the difference can be refunded upon member's separation from City service or used to purchase additional eligible service.
>
> If the trued-up cost exceeds what the member has paid, including assumed investment earnings, it will be possible to make a lump-sum payment prior to retirement/DROP entry to complete the purchase or receive pro-rated service based on the amount already paid.

The Administrative Code also specifies that "the actuarial assumptions used in the true-up shall be those in effect at the time the purchase was initially made." This means that the true-up calculation does not reflect any changes in actuarial assumptions made after the service is purchased, because the true-up calculation must be based on the same actuarial assumptions

for investment return, mortality, and consumer price index that were used in the original purchase calculation.

Operationally, the original PSP calculations are performed by LAFPP staff using programs initially developed by the external actuary and then incorporated into the system's benefit calculation software. In practice, updates to the software generally are needed only when the actuarial assumptions are changed. True-up calculations currently are performed by the external actuary, who maintains a library of prior sets of assumptions so that future true-ups can use the assumptions in effect at the time of the initial purchase.

The LAFPP PSP has other carefully designed features to accommodate IRC §415 limits and plan defined maximum benefits, as well as purchase options that include both lump sums and installment payments. All these features are described in the Administrative Code sections provided to participants.

Indiana Public Retirement System—'77 Fund

The ASCP at the Indiana Public Retirement System (INPRS) for the 1977 Police Officers' and Firefighters' Retirement Fund utilizes a feature limiting risk of the purchased service to the system. Early or normal retirement within this fund requires 20 years of service. Participants can typically purchase service after earning one year of service, but it only affects the participant's benefit after the participant reaches 20 years of service. A purchase by a participant who has not yet completed 20 years of service is deposited into the participant's contribution account, where it earns interest and could be refunded in the event of a nonvested termination. This provision limits the risk that a participant purchases service to advance their retirement eligibility date because in order to use the purchase, they must earn enough service to be eligible to retire.

Summary

Service purchase features found in U.S. public pension plans involve many actuarial and non-actuarial considerations. The actuary may be involved in additional service credit program (ASCP) design, program assessment, assumption setting, calculation details, and/or true-up mechanics. Antiselection risk is found throughout many of these components. Additionally, the actuary may encourage the plan to engage appropriate experts in non-actuarial areas, such as legal or administration system considerations. This practice note provides an overview of common aspects of ASCPs, but ultimately it will be up to the actuary to apply applicable standards and professional judgment to their principal's particular situation.

Appendix

Additional Considerations on Refunds of Contributions

Systems that issue refunds of contributions also need to consider what happens to a participant that becomes reemployed with the plan. Typically, a refund of contributions occurs simultaneous with the participant forfeiting their service in the plan. Upon reemployment, a participant may be allowed to pay back the contributions refunded and regain the forfeited service. However, the forfeited service will likely have a different value upon reemployment. The plan sponsor must set rules for how much the participant should pay back into the fund to regain the lost service. This type of service purchase differs fundamentally from many others discussed because it represents service earned at one time under the plan. Many of the other considerations covered in this practice note may not apply, particularly if the participant returns within a period of time specified in the plan. Possibilities include:

- Allowing the participant to repay the contributions without interest. This may be considered if the refund was mandatory.
- Requiring the participant to pay back contributions with interest. The rate of interest charged could be set at the crediting rate granted on all participant contributions (as if the participant never left) or at the expected rate of return used to discount the liabilities (as if the system had use of the funds the entire time).
- Treating the regained service as a service purchase, basing the purchase cost on the same calculation method as is used for any other service purchase.

Subsidized or Non-Actuarial Pricing Methods

Certain types of service purchase programs may be designed with the understanding that they will be subsidized for the participant and create additional liabilities for the plan. Military service purchases are a common example. In other cases, the purchase price may not maintain internal equity with other participants. In these cases, the methodology used to determine service purchase costs often are set by policy goals rather than actuarial pricing methods. Examples of such service purchase pricing methods include:

- Not charging for the service purchase (free)
- Pricing based on participant and/or employer contributions that would have been made over the time period being purchased
- Pricing based on a set rate per defined time period (e.g., day, month, year) being purchased
- Floor or minimum pricing (e.g., no less than employee contributions over the time period being purchased)