



February 19, 2009

Mr. John J. Gallagher Jr.  
Executive Director  
The Retirement Board of the  
Policemen's Annuity and Benefit Fund  
City of Chicago  
221 North LaSalle Street, Suite 162  
Chicago, IL 60601

**Subject: SB 2520 – Service Purchase**

Dear John:

Recently, we discussed how SB 2520, which allows PABF members to buy up to 10 years of law enforcement service earned with a former pension plan, could impact the Fund's administration. Specifically we discussed –

- 1) Developing actuarial equivalence factors as the basis for the service purchase amount;
- 2) Drafting illustrations that will help members make a decision on the service purchase;  
and
- 3) Assisting with communications of the service purchase program.

A summary of each topic is outlined below.

#### **Actuarial Equivalence Factors**

SB 2520 allows PABF members to buy up to 10 years of law enforcement service, in six month increments, earned while participating in certain State pension plans, including:

- “Downstate” Police Pension Funds
- Illinois Municipal Retirement Fund
- Cook County Employees’ and Officers’ Annuity and Benefit Fund
- Forest Preserve District Employees’ Annuity and Benefit Fund
- Metropolitan Water Reclamation District Retirement Fund
- State Employees’ Retirement System of Illinois
- State Universities Retirement System of Illinois
- Metropolitan Transit Authority and Local Mass Transit Pension Fund

The service purchased under PABF would not count towards the determination of benefits in the former plan. Current members have one year after the effective date of the amendment to apply, and five years after the application date to buy service. Members hired after the effective date of the amendment have two years to apply and five years after the application to buy service.

The service purchase should result in no significant increase to the PABF's unfunded actuarial liability as defined by GASB No. 25.

Three factors in the current valuation process can impact the development of service purchase amount. First, by buying service, the member could potentially accelerate the date of retirement. For example, a current member age 50 with 15 years of PABF service could buy five years of service earned with a prior plan and accelerate retirement. The option to accelerate retirement could generate a loss to PABF, and should be recognized in the service purchase amount. However, if the same member buys five years of service and subsequently delays retirement, the member should pay less for the service purchase. Because the decision to accelerate or defer retirement is a contingent event that occurs many years into the future, determining a static service purchase price could result in an inequitable service purchase amount. Consequently, members who defer retirement could receive an adjustment to the service purchase amount in the form of a refund of contributions.

Secondly, the increase in service will increase the benefit level and could influence the decision to retire early. A member could decide to retire based on the level of current salary being replaced.

The recommended methodology to develop the actuarial equivalence factors and service purchase amount is outlined below.

- 1) Estimate the member's projected actuarial liability at retirement, assuming that the member buys service and retires at the earliest possible date.
- 2) Estimate the member's projected actuarial liability at retirement, assuming that the member does not buy service and retires at the same earliest possible date defined in (1) above.
- 3) The difference between (1) and (2) represents the increase in actuarial liability at the earliest retirement date.
- 4) Discount item (3) from the earliest retirement date to service purchase date at the Fund's assumed investment return of eight percent. This represents the lump sum service purchase amount.
- 5) Adjust the service purchase amount between the calculation date and the actual payment date assuming a short-term interest rate, such as three percent.
- 6) At actual retirement, develop a refund amount based on the actual retirement age. The refund recognizes differences in retirement dates and benefit levels.

### **Service Purchase Illustrations**

**Illustration A** shows the service purchase impact for a member who is currently age 45, is earning \$80,000, has earned 10 years of service with PABF, and is considering buying five years of service from a “downstate” police pension plan. This cost of this option is \$149,000 and would allow the member to retire at age 50 instead of 55. If the member selects the option but retires after age 50, the refund to the member would range from \$20,000 at age 51 to \$547,000 at age 63 at mandatory retirement age. The cost of this benefit is approximate 37 percent of pay per year purchased.

**Illustration B** shows the cost impact for a member who is age 50, is earning \$100,000, has earned 15 years of PABF service, and buys five years of “downstate” pension service. This option allows the member to retire immediately at a cost of \$217,000. The annual benefit is approximately \$49,000, and the member is expected to recover the service purchase costs after approximately 4.5 years. If the member delays retirement, the refund approaches \$543,000 at age 60. The cost of this benefit is approximate 43 percent of pay per year purchased.

**Illustration C** shows the cost impact for a member who is age 50, is earning \$100,000, has earned 20 years of PABF service, and buys five years of “downstate” pension service. The member is already eligible for retirement and the additional service will only be used to increase the retirement benefit, not accelerate the payment start date. This option costs the member \$142,000. If the member delays retirement, the refund approaches \$385,000 at age 63. On and after age 59, the member’s benefit is limited to 75 percent of final average pay, before and after the service purchase, and the member receives a full refund, with interest, of the service purchase amount. The cost of this benefit is approximate 28 percent of pay per year purchased.

### **Communications of Service Purchase Program**

As shown in the preceding illustrations the high cost of buying service could deter individuals from participating in the service purchase program. Some issues to consider include –

- 1) What’s the value of benefits from all programs before and after the PABF service purchase? It’s possible that the present value of benefits earned with the prior plan and PABF are greater than the present value of PABF benefits with the service purchase.
- 2) The inherent value of swapping DC benefits for DB benefits could help the member make a decision. For example, if a member has received a refund of contributions and has transferred the refund to a 457 account, the investment and longevity risk may persuade the member to buy service. Members who purchase service would earn the assumed actuarial return of eight percent and will effectively transfer investment and longevity risk to PABF.

**Key Observations and Conclusions**

Ensuring the service purchase program produces minimal increase in the projected unfunded actuarial liabilities requires a complex administrative policy. The high cost of the service purchase could deter members from participating in the program. Providing information to members on the impact of delayed retirement and recovery cost could help in the decision process.

Please contact us if you have questions or comments.

Sincerely,



Alex Rivera, F.S.A., E.A.  
Senior Consultant



Michael R. Kivi, F.S.A., E.A.  
Senior Consultant

cc: Chris Lucas - Gabriel, Roeder, Smith & Company  
Andy Plautz - Gabriel, Roeder, Smith & Company  
Dana Woolfrey - Gabriel, Roeder, Smith & Company

AR: mf

Enclosure

Chicago Policemen's Annuity and Benefit Fund Program  
 Illustration of Service Purchase Program

Illustration A

Attained Age	45
Attained Service	10
Service Purchased	5
Pay	\$80,000

Change in Accrued Liability at Earliest Retirement	218,441
Interest Discount to Age 45	0.6806
Service Purchase Amount at Age 45	148,667
Cost Per Year of Service as a Percent of Pay	37%

Age	Before Service Purchase		After Service Purchase		Increase in Accrued Liability	Service Purchase Amount <sup>b</sup>	Refund/ (Shortfall) <sup>c</sup>
	Accrued Liability <sup>a</sup>	Retirement Benefit	Accrued Liability	Retirement Benefit			
50	379,992		598,433	48,897	218,441	218,441	0
51	437,130		653,005	53,517	215,875	235,916	20,041
52	500,909		713,989	58,693	213,081	254,790	41,709
53	572,080		778,860	64,223	206,779	275,173	68,393
54	651,492		847,806	70,125	196,314	297,186	100,872
55	741,147	61,492	917,611	76,133	176,464	320,961	144,498
56	808,691	67,303	992,484	82,599	183,793	346,638	162,845
57	884,232	73,813	1,076,456	89,859	192,224	374,369	182,145
58	964,680	80,767	1,165,655	97,594	200,975	404,319	203,344
59	1,050,297	88,189	1,260,356	105,827	210,059	436,664	226,605
60	1,123,229	95,745	1,296,033	110,475	172,804	471,598	298,793
61	1,199,203	103,876	1,332,448	115,418	133,245	509,325	376,081
62	1,282,524	113,007	1,374,133	121,078	91,609	550,071	458,463
63	1,367,897	122,734	1,415,066	126,966	47,169	594,077	546,908

<sup>a</sup> Assumes 100% retirement at given age, if eligible.

<sup>b</sup> Based on change in actuarial liability at attained age, increased with interest at 8%.

<sup>c</sup> Projected service purchase amount less increase in accrued liability. Service purchase amount projected at 8% after purchase date.

Chicago Policemen's Annuity and Benefit Fund Program  
 Illustration of Service Purchase Program

Illustration B

Attained Age	50
Attained Service	15
Service Purchased	5
Pay	\$100,000

Change in Accrued Liability at Earliest Retirement	217,121
Interest Discount to Age 50	1.0000
Service Purchase Amount at Age 50	217,121
Cost Per Year of Service as a Percent of Pay	43%

Age	Before Service Purchase		After Service Purchase		Increase in Accrued Liability	Service Purchase Amount <sup>b</sup>	Refund/ (Shortfall) <sup>c</sup>
	Accrued Liability <sup>a</sup>	Retirement Benefit	Accrued Liability	Retirement Benefit			
50	377,697		594,818	48,601	217,121	217,121	0
51	434,316		619,480	50,769	185,164	234,491	49,327
52	497,689		678,736	55,795	181,047	253,250	72,203
53	568,624		774,154	63,835	205,530	273,510	67,980
54	647,555		842,684	69,701	195,128	295,391	100,263
55	736,670	61,121	912,067	75,673	175,398	319,022	143,625
56	803,805	66,896	986,488	82,100	182,683	344,544	161,861
57	878,889	73,367	1,069,952	89,316	191,063	372,108	181,045
58	958,852	80,279	1,158,612	97,004	199,761	401,876	202,115
59	1,043,951	87,656	1,252,742	105,187	208,790	434,026	225,236
60	1,116,443	95,167	1,288,203	109,808	171,760	468,748	296,988
61	1,191,958	103,248	1,324,398	114,720	132,440	506,248	373,808
62	1,274,775	112,324	1,365,831	120,347	91,055	546,748	455,693
63	1,359,632	121,992	1,406,516	126,199	46,884	590,488	543,604

<sup>a</sup> Assumes 100% retirement at given age, if eligible.

<sup>b</sup> Based on change in actuarial liability at attained age, increased with interest at 8%.

<sup>c</sup> Projected service purchase amount less increase in accrued liability. Service purchase amount projected at 8% after purchase date.

Chicago Policemen's Annuity and Benefit Fund Program  
Illustration of Service Purchase Program

Illustration C

Attained Age	50
Attained Service	20
Service Purchased	5
Pay	\$100,000

Change in Accrued Liability at Earliest Retirement	141,623
Interest Discount to Age 50	1.0000
Service Purchase Amount at Age 50	141,623
Cost Per Year of Service as a Percent of Pay	28%

Age	Before Service Purchase		After Service Purchase		Increase in Accrued Liability	Service Purchase Amount <sup>b</sup>	Refund/ (Shortfall) <sup>c</sup>
	Accrued Liability <sup>a</sup>	Retirement Benefit	Accrued Liability	Retirement Benefit			
50	594,818	48,601	736,441	60,173	141,623	141,623	0
51	649,060	53,193	796,574	65,283	147,514	152,953	5,440
52	709,676	58,339	863,953	71,021	154,277	165,189	10,912
53	774,154	63,835	935,436	77,134	161,282	178,405	17,122
54	842,684	69,701	1,011,220	83,641	168,537	192,677	24,140
55	912,067	75,673	1,052,385	87,315	140,318	208,091	67,773
56	986,488	82,100	1,096,098	91,222	109,610	224,738	115,129
57	1,069,952	89,316	1,146,378	95,696	76,425	242,717	166,292
58	1,158,612	97,004	1,198,564	100,349	39,952	262,135	222,183
59	1,252,742	105,187	1,252,742	105,187	0	283,106	283,106
60	1,288,198	109,807	1,288,198	109,807	0	305,754	305,754
61	1,322,677	114,571	1,322,677	114,571	0	330,214	330,214
62	1,360,705	119,895	1,360,705	119,895	0	356,632	356,632
63	1,397,977	125,433	1,397,977	125,433	0	385,162	385,162

<sup>a</sup> Assumes 100% retirement at given age, if eligible.

<sup>b</sup> Based on change in actuarial liability at attained age, increased with interest at 8%.

<sup>c</sup> Projected service purchase amount less increase in accrued liability. Service purchase amount projected at 8% after purchase date.