

**Strathclyde Pension Fund (No 3 Fund)**

**Actuarial Valuation as at 31 March 2002**

**Valuation Report**

Prepared by:

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**June 2003**

**Strathclyde Pension Fund (No 3 Fund)**  
*Actuarial Valuation as at 31 March 2002 Valuation Report*

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Director of Finance  
Glasgow City Council  
Finance Department  
City Chambers  
Glasgow G2 1DU

Dear Mr Black

**Actuarial Valuation as at 31 March 2002**

As instructed, I have carried out an actuarial valuation of Strathclyde Pension Fund (No 3 Fund) (“the Fund”) as at 31 March 2002.

The valuation has been carried out in accordance with Regulation 76 of the Local Government Pension Scheme Regulations (Scotland) 1998 (“the Regulations”).

I now have pleasure in presenting my report on the results of the actuarial valuation to Strathclyde Pension Fund (No 3 Fund) as administering authority to the Fund. The provision of this report, more than twelve months after the effective date of the valuation, has been sanctioned by the Scottish Executive, as required by Regulation 76(2). This report has been prepared in accordance with the Actuarial Profession’s Guidance Note 9 as it applies to the Local Government Pension Scheme and current at the date of this report.

In preparing this report, I have taken account of the revised data forwarded to me on 15 April 2003.

My report is set out in the following sections

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## 1. Introduction

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### Purpose of the Valuation

The main purpose of the valuation is to review the financial position of the Fund and to determine the rate at which the employer should contribute in the future to ensure that the existing assets and future contributions will be sufficient to meet future benefit payments from the Fund.

### Previous Valuation

The previous valuation was carried out as at 31 March 1999 and the results of that valuation were set out in our report dated March 2000.

The results of the previous valuation indicated that the assets of the Fund represented 101% of the accrued liabilities of the Fund. The Common Rate of Contribution was certified as 370% of employees' contributions. At the time of the previous valuation, the employer contribution rate was 295% of employees' contributions. The rise from the rate paid over 1999/2000 to 2002/2003 was phased in over 3 years as shown in the table below.

Financial Year	Employer Contributions (% of employees' contributions)	Employer Contributions (% of payroll)
1999/2000	295%	15.2%
2000/2001	295%	15.2%
2001/2002	320%	16.4%
2002/2003	345%	17.7%

### Inter-valuation Period

At the previous valuation, the assessed cost to the employer of future service benefits was 390% of employees' contributions. Employer contributions paid during the inter-valuation period have been lower than this assessed cost leading to a fall in the funding level relative to the last valuation.

During the inter-valuation period there were a number of amending Regulations issued although there were no significant changes affecting the benefits paid from the Fund.

## 2. Valuation Process

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### Funding Method

Contributions are paid to the Fund by the employer to provide for the benefits which will become payable to Fund members when they fall due. The funding objectives are to meet the cost of Fund members' benefits whilst they are working and to build up assets to provide adequate security for the benefits as they are earned.

The factors affecting the Fund's finances are constantly changing and so it is necessary for its financial position and the contributions payable to be reviewed, from time to time, by means of an actuarial valuation to check that these objectives are being met.

At this valuation, I have, as in the past, adopted an approach which considers separately the benefits in respect of service completed before the valuation date ("past service") and benefits in respect of service expected to be completed after the valuation date ("future service"). This approach enables me to focus on:-

- (a) The *past service funding level* of the Fund. This is the ratio of accumulated assets to liabilities in respect of past service after making allowance for future increases to members pay and pensions in payment. A funding level in excess of 100% indicates a *surplus* of assets over liabilities, a funding level of less than 100% indicates a *deficit*.
- (b) The *future service funding rate* i.e. the level of contributions required from the employer to support the cost of benefits accruing in future.

The method I have adopted at this valuation is known as the "Attained Age Method". The key feature of this method is that in assessing the future service cost I calculate the contribution rate, which meets the cost of benefits accruing over the remaining working lifetime of the current employee membership. This is the same method adopted at the previous valuation and is an appropriate method for a Fund closed to new members.

A full description of the valuation methods adopted at this valuation is set out in Appendix A.

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## Valuation Data

In my review of the funding position of the Fund, I start with the known facts at the valuation date i.e. the benefit structure, the Fund's membership and the accumulated assets.

A summary of the benefits provided by the Fund is set out in Appendix B. A summary of the data used in my valuation calculations is set out in Appendix C.

I have carried out reasonableness checks on the data supplied. There have been some adjustments relative to the last valuation for members who left prior to 31 March 1999, but who were valued as active members on that date. This has led to a slight improvement in the funding level relative to the last valuation.

Finally, I was supplied with Fund accounts for the years from 1 April 1999 to 31 March 2000, 1 April 2000 to 31 March 2001 and 1 April 2001 to 31 March 2002. I have excluded money purchase AVCs from my calculations.

The following table summarises the assets of the Fund as at the valuation date split into the categories of equities, property and bonds/cash.

Asset Class	Market Value at 31 March 2002	
	£(000)	%
Equities	50,022	69.9%
Property	7,674	10.7%
Bonds and Cash	13,850	19.4%
<b>TOTAL</b>	<b>71,546</b>	<b>100.0%</b>

Further details of the assets held by the Fund are set out in Appendix C.

## Investment

The profile of the liabilities of the Fund includes a significant proportion in relation to pensions that are in payment (42% as at 31 March 2002). The other liabilities relate mainly to employee members with salary related benefits. The equity bias of the investments (70% of the assets as at 31 March 2002) means that there is some mis-match of the assets and liabilities.

I understand that following completion of the valuation, the investment strategy will be reviewed.

### **3. Valuation Assumptions**

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I need to make assumptions about the factors affecting the Fund's future finances such as inflation, pay increases, investment returns, rates of mortality, early retirement and staff turnover etc in order to place a value on the liabilities.

Future levels of pay increases will determine the quantum of benefit to be paid in future in respect of employee members as well as affecting the amount of contributions received by the Fund. Once in payment, pension benefits, in excess of Guaranteed Minimum Pensions (“GMPs”) are linked to the Retail Prices Index through increases granted in line with the Pensions (Increase) Act 1971.

The *cost* of providing for benefits, however, depends not only upon the amount but also the *incidence* of benefits paid i.e. at what point in the future benefits come into payment and in respect of pension benefits for how long they continue to be paid.

As contributions are being invested now to provide for benefits payable in the future i.e. the benefits are being *pre-funded*, then part of the cost of providing the benefits can be met from investment returns achieved by the Fund's assets built up from contributions. The higher the rate of return achieved by the assets, the lower the contributions that will be required in future to meet the cost of the benefits.

The assumptions adopted at the valuation can, therefore, be considered as:

- *demographic* assumptions, which, generally speaking, are used to estimate the likelihood of benefits and contributions being paid; and
- *financial* assumptions, which, generally speaking, are used to estimate the *amount* of benefits and contributions payable and to place a current i.e. *present* value on these benefits and contributions.

#### **Valuation Approach**

At the previous valuation, a market-related approach was adopted. This means that the ongoing funding position and future contribution requirements was assessed by adopting financial assumptions related to market conditions as at the valuation date. As the assets are predominantly invested in equity type investments, to smooth out some of the short-term volatility associated with equity market values, we applied a smoothing mechanism which effectively meant that we considered average market conditions in the 12 months leading up to the valuation date.

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In order to ensure consistency between the assets and the liabilities, the financial assumptions are then derived from the average market yields over the twelve months to the valuation date.

In times of rising equity markets (as was the case at the previous valuation in 1999), this approach will lead to the assets being taken into account at less than their market value. At the last valuation, the assets were valued at around 92% of their then market value. Using the same approach for this valuation would result in a slight write-up of assets (to 101% of their market value) as at 31 March 2002. Although the principle of smoothing still holds, given the equity market falls since the valuation date (which are referred to later in this report), in my view it is inappropriate to take credit for any asset value in excess of the market value for this valuation.

### Financial Assumptions

The key financial assumptions are

- Future levels of price inflation
- Future levels of real pay increases – i.e. over and above price inflation
- The discount rate which is applied to future liabilities to determine their present value.

A full explanation of the derivation of the financial assumptions adopted at this valuation is set out in Appendix E. In summary, the assumptions that I have adopted at this valuation, and a comparison with those adopted at the last valuation, are given in the table below.

Financial Assumptions	Mar 1999		Mar 2002	
	% p.a.	% p.a.	% p.a.	% p.a.
	Nominal	Real	Nominal	Real
Discount Rate:	6.0%	3.2%	6.2%	3.6%
Pay Increases	4.3%	1.5%	4.1%	1.5%
Price Inflation/Pension Increases	2.8%	0.0%	2.6%	0.0%

### Comments on Changes to Assumptions

In nominal terms, the discount rate is slightly higher than the assumption at the 1999 valuation. As gilt yields have actually fallen slightly, this represents a weakening of the basis as I have assumed a higher level of out-performance of the assets over the risk-free rate.

Expectations of future inflation have fallen, so the real return has risen from 3.2% p.a. in excess of price inflation to 3.6% p.a. in excess of price inflation. At the previous valuation, it was assumed that earnings growth would be 1.5% p.a. more than price inflation. I have retained this assumption, giving a nominal rate of earnings growth of 4.1% p.a. at this valuation compared to 4.3% p.a. at the last valuation. The change in my assumptions for price inflation and earnings growth is driven by the change in market conditions and does not reflect a change in approach.

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Using a higher real discount rate reduces the value placed on the liabilities relative to the last valuation. The fact that I anticipated a greater part of future expected returns means that the margins in the assumptions are reduced. This needs to be considered when looking at the post valuation events later.

## Demographic Assumptions

### *Mortality*

Mortality investigations over the last few years have concluded that the general population is living longer and that this improvement will continue at a faster rate than seen in the past. My analysis of LGPS pensioner longevity over the course of the last 20 years or so confirms that pensioners are living longer although experience does vary across the country and from Fund to Fund.

I have therefore incorporated revised mortality tables for both existing pensioners and current employee members and deferred pensioner members. I have adopted a set of tables known as the PA92 tables (a series of tables derived from underlying mortality from 1991 to 1994 which can be projected to any year in the future).

For current pensioners, employee members and deferred benefits members who will become pensioners at some stage in the future, I have used the table known as PA92 c2002, which is the projected mortality to 2002 – i.e. expectations of current mortality. Investigations in other Scottish authorities indicate that current pensioners are dying earlier than this table implies. Accordingly, I have assumed that current pensioners have the rates applicable to individuals one year older, but there is some allowance for future improvement for non-pensioners by using the rates for lives one year younger.

The table below shows the expectations of life implied by the old and new tables for retirements at age 60.

	Years		Difference
	1999	2002	%
Non Pensioners:			
Males	19.5	23.5	21%
Females	24.2	26.5	9%
Pensioners:			
Males	19.5	21.7	11%
Females	24.2	24.6	2%

Further details of the demographic assumptions adopted at this valuation are included in Appendix D.

## 4. Inter-valuation Experience

The following tables set out, in summary, the actual experience of the Fund during the inter-valuation period compared to the assumptions adopted at the previous valuation.

### Financial Experience

	Nominal		Real	
	Actual % p.a.	Expected % p.a.	Actual % p.a.	Expected % p.a.
Market Returns	0.9%	-	-1.2%	-
Smoothed Returns	3.6%	6.0%	1.6%	3.2%
Pay Increases	2.0%	4.3%	0.0%	1.5%
Pension Increases	2.0%	2.8%	-	-

*Smoothed returns are based on the assessed value of assets (i.e. 92% of market value at the last valuation and market value at this valuation).*

The main items of experience were:

- Investment returns (before any smoothing of asset values) averaged around 0.9% p.a. over the period from 1 April 1999 to 31 March 2002, a fall in real terms. This was materially less than required under the 1999 valuation basis, leading to an expected reduction in the funding level on a like for like basis of around 14 percentage points. However, this was partially offset by the release of the write-down of the asset value at the last valuation (this was 8% of the 1999 market value). This takes no account of equity market falls since 31 March 2002.
- Pay increases in respect of those who were members of the Fund throughout the inter-valuation period were less than expected in both nominal and real terms, leading to a improvement in the funding level relative to the last valuation.
- Headline inflation rose by an average of only 2.0% p.a. over the inter-valuation period (actual pension increases are slightly higher since September to September RPI is used for increases in the following April), leading to a slight improvement in the funding level relative to the last valuation.

Overall, the financial experience of the Fund during the inter-valuation period compared to the assumptions adopted at the previous valuation was a negative factor during the inter-valuation period.

## Demographic Experience

### *Employee Members*

	Actual	Expected	% Diff
Early Leavers	27	68	-61%
Deaths	3	9	-67%
Ill Health Retirements	62	46	36%
Early Retirements	37	-	

The number of early leavers excludes those who left prior to 31 March 1999.

The cost of unreduced or enhanced early retirements is, I understand met via additional employers' contributions ("strain payments"). However, to the extent that there have been any such early retirements the cost of which is not being met by strain payments, this will have reduced the funding level relative to the last valuation.

As a whole, the impact of membership movements for employee members during the inter-valuation period was to reduce the funding level relative to the last valuation.

### *Pensioner Mortality: Cessation of Pensions in Payment*

	Deaths		% Diff
	Actual	Expected	
Ill Health Pensioners	5	10	-52%
Early/Normal Pensioners	4	9	-54%
Dependants	4	1	641%
<b>Total</b>	<b>13</b>	<b>20</b>	<b>-34%</b>

The number of pensions ceasing during the inter-valuation period was lower than the numbers expected. As the incidence of pensioner deaths was among the older pensioners with small average pensions, for whom the average liability is relatively low, the lower than expected deaths had only a small negative impact on the funding level of the Fund.

The relatively small size of the fund reduces the significance (in statistical terms) of the demographic experience of the Fund. However, our analysis indicates that the mortality assumption proposed for this valuation is close to the experience of the Strathclyde Pension Fund (No. 3 Fund) and hence justifies the strengthening of the mortality basis for this valuation.

## 5. Valuation Results

The following table sets out the valuation results for the Fund using the methods and assumptions described earlier in my report. The figures shown in the table exclude the assets and liabilities in respect of money purchase AVCs.

Past Service Liabilities	£m	
Active Members	35.3	
Deferred Pensioners	7.0	
Pensioners	31.0	
<b>Total</b>	<b>73.3</b>	
Assets	71.5	
Surplus (Deficit)	(1.8)	
Funding Level	98%	
Employer Contribution Rates	% of employees' contributions	% of payroll
Future Service Funding Rate	400%	20.6%
Past Service Adjustment	60%	3.1%
Total Contribution Rate	460%	23.6%

The past service adjustment assumes that the deficit is funded over the expected future working lifetime of current employee members, the same approach as was used for the 1999 valuation.

In order that the repayment of the deficit is not adversely affected by the declining payroll, a fixed monetary payment method is recommended.

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A reconciliation of the past service position is set out in the following table.

	£m	£m
Surplus at Previous Valuation		0.8
Interest on surplus(deficit)	0.2	
Release of 1999 write down of assets	6.6	
Smoothed investment returns less than expected	(11.7)	
Salary increases less than expected	2.1	
Pension increases less than expected	0.9	
Contributions less than cost of new benefit accruals	(0.9)	
Retirement experience	(1.1)	
Pensioner mortality	(0.3)	
Withdrawals	(0.4)	
Other experience items	2.9	
Change in mortality assumptions and method	(4.6)	
Changes in market conditions	3.7	
Surplus(Deficit) at This Valuation		(1.8)

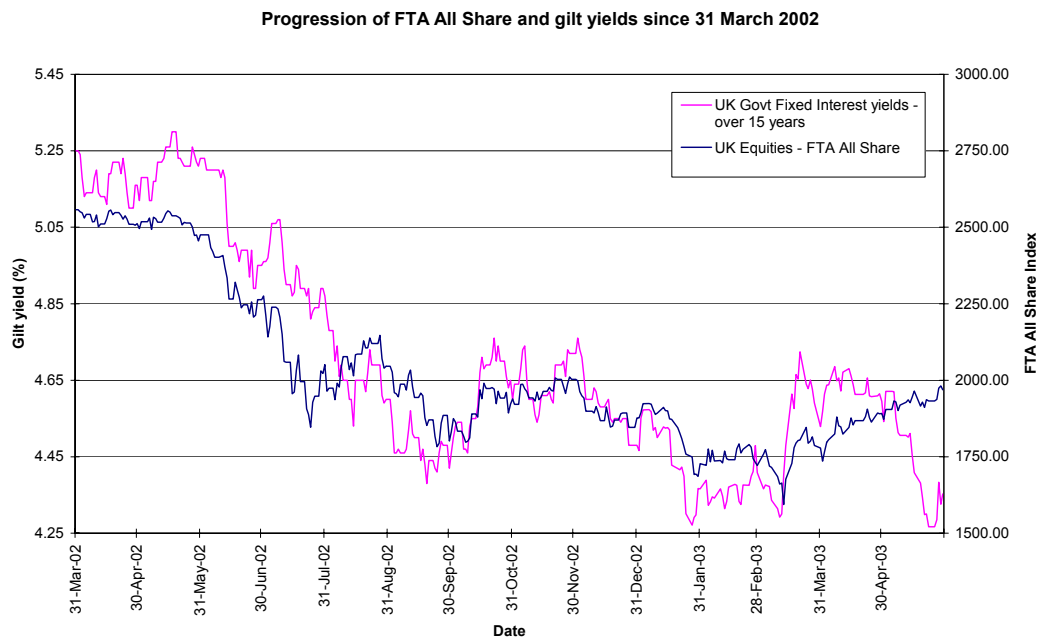
Other experience items includes a gain of £0.9m in respect of members who left prior to 1999 but who were valued as active in the last valuation.

### Post Valuation Events

Since the valuation date, equity markets in the UK and overseas have fallen materially, by around 23%. The overall fall in Fund assets will be less due to holding non-equity assets and as at 31 May 2003 I estimate that the typical fund return from 31 March 2002 would have been -15%. In addition, since March 2002, prospective risk-free rates of return from government bonds have fallen as bond prices have increased. The yield on government bonds is currently around 4.35% p.a. and corporate bond yields have also fallen since the valuation date.

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The graph below shows the movement of the FTA All share Index and the over 15 year gilt yield since the valuation date.



If markets fail to recover between now and the date of the next valuation then funding levels at the next valuation will be materially worse than shown in this valuation. If current conditions prevailed at the valuation date, the funding level might be of the order of fifteen percentage points lower. The effect of smoothing would mitigate this since smoothing means funding levels will avoid the effects of the bottom or top of the markets. Having said that, it also means there would be time lag of around 6 months before the benefit of the recovery in markets would show through in funding levels.

## **6. Comments and Conclusions**

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The principal conclusions from this valuation are as follows:

- The funding level has fallen since the previous valuation. The fall in the funding level is due to the poor market returns since the last valuation and the allowance for longer life expectancy at this valuation. This has had a greater impact than the release of the write-down of the assets at the last valuation and the higher real discount rate used to value the liabilities at this valuation.
- Since the valuation date there has been a material decline in world stockmarkets, which will have had a negative impact of the financial position of the Fund. If markets fail to recover in the short term then the financial position of the Fund will be materially worse at the next valuation. If markets do recover then the financial position of the Fund at the next valuation will largely depend on the timing and level of any recovery.
- It has been agreed that the employer contribution rate will increase to 400% of employees' contributions with effect from 1 April 2004. It has also been agreed that additional contributions of £0.5m per annum payable monthly, will be paid with effect from April 2004.
- The certified contribution rates are set out in my certificate in Appendix E. I have certified a minimum deficit repayment of £0.3m in 2003/04, albeit, I understand that the minimum payment that year will be exceeded.
- In light therefore of the uncertainty of future financial conditions, I would suggest that the financial position of the Fund is monitored by means of interim funding reviews in the period up to the next triennial valuation.

I would be pleased to answer any questions arising from this report.

Kind regards

Yours sincerely



**Donald Fleming FFA**  
Fellow of the Faculty of Actuaries

## **Appendix A – Valuation Method**

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### **Valuation of Liabilities**

Using my assumptions, I estimate the payments, which will be made from the Fund throughout the future lifetime of current employee members, deferred benefit members, pensioners and their dependants. I then calculate the amount of money which, if invested now would be sufficient together with the income and growth in the accumulating assets to make these payments in future, using my assumption about future investment returns.

This amount is called “the present value” (or, more simply, “the value”) of members’ benefits. Separate calculations are made in respect of benefits arising in relation to service before the valuation date (“past service”) and for service after the valuation date (“future service”).

#### ***Past Service Funding Level***

A comparison is made of the value of the existing assets with the value of benefits in relation to past service (allowing for future pay and pension increases). If there is an excess of assets over past service liabilities then there is a past service surplus. If the converse applies there is a past service deficiency.

#### ***Future Service Funding Rate***

The first stage is to calculate the value of benefits earned by existing employee members in the future, by reference to projected pay as at the date of retirement or earlier exit. In the valuation I consider the benefits earned over the remaining working lifetime of current employee members. This is then expressed as a percentage of employees’ contributions over the same period having first deducted the equivalent contribution paid by the employee members.

#### ***Overall Result***

Any past service surplus (or deficiency) can be applied to reduce (or increase) the contribution rate payable by the employer over the period following the valuation date.

Using this method, a surplus is built up to offset the increasing future service contribution rate (since the method anticipates the ageing of the membership). This method will result in a stable overall contribution rate if the assumptions adopted are borne out in practice. It is therefore an appropriate method for a fund closed to new members.

#### ***Name of Method***

The method described above is known as the Attained Age Method of valuation.

## **Valuation of Assets**

Assets have been valued at their un-smoothed market value.

## Appendix B - Summary of Benefits

Eligibility	Permanent employees
Member Contributions	Officers            6% of earnings Manual Workers    5% of earnings (6% for post 31/3/98 entrants)
Normal Retirement Age	Age 65 or if earlier and a member before 1 April 1998 age 60 or on attaining 25 years pensionable service.
Early Retirement	Retirement on the grounds of ill-health with enhanced benefits or under other circumstances with possibly reduced benefits may also be allowed.
Pension at Retirement Age	1/80th of pensionable remuneration for each year of pensionable service. Pensionable remuneration is normally the average remuneration in the employee's final year.
Lump Sum at Retirement Age	3/80ths of pensionable remuneration for each year of pensionable service..
Pension Increases	All pensions in payment, deferred pensions and children's pensions other than benefits arising from the payment of additional voluntary contributions are increased annually. That part of pensions which is in excess of the GMP is increased under the Pensions (Increases) Act. That part of the pensions which is GMP increases in accordance with Section 37A of the Pensions Act.
Death in Service Benefits	A lump sum benefit of two times pensionable remuneration at date of death, plus,  A spouse's pension of 1/160th of pensionable remuneration for each year of service that the employee would have been able to reckon if he/she had retired on the grounds of ill health at the date of death. (for widowers benefits , only service from 1988 can count unless the employing authority exercises its discretion to extend this to 1972), plus,  Children's pensions may also be payable.
Death after Retirement Benefits	A spouse's pension equal to one half of the member's pension (but only service from April 1988 can count for widowers' benefits).
Benefits on Leaving Service	Members who leave service are entitled to either a refund of contributions, a preserved pension payable from normal retirement date, or a transfer payment to another scheme or to an insurance company.
The Scheme is contracted out of the State Earnings Related Pension Scheme, (State Second Pension with effect from 6 April 2002)	

## Appendix C - Valuation Data

A summary of the membership records on which my valuation calculations are based is as follows.

### Employee Members

	Number		Pensionable Pay £ (000)		Average £	
	2002	1999	2002	1999	2002	1999
Male Officers	37	60	760	1,037	20,538	17,282
Female Officers	18	16	302	237	16,794	14,812
Male Manuals	506	704	6,923	8,880	13,682	12,614
Female Manuals	1	5	13	60	13,320	11,977
Post 98 Males	-	-	-	-		
Post 98 Females	-	-	-	-		
<b>Total</b>	<b>562</b>	<b>785</b>	<b>7,999</b>	<b>10,214</b>	<b>14,233</b>	<b>13,011</b>

### Pensioners

	Number		Annual Pensions £ (000)		Average £	
	2002	1999	2002	1999	2002	1999
Males	477	361	2,025	1,420	4,245	3,933
Females	16	19	54	58	3,392	3,038
Dependants	27	66	38	86	1,418	1,308
<b>Total</b>	<b>520</b>	<b>446</b>	<b>2,117</b>	<b>1,564</b>	<b>4,072</b>	<b>3,507</b>

### Deferred Pensioners

	Number		Annual Pensions £ (000)		Average £	
	2002	1999	2002	1999	2002	1999
Males	215	148	572	341	2,662	2,306
Females	10	10	37	33	3,678	3,330
<b>Total</b>	<b>225</b>	<b>158</b>	<b>609</b>	<b>375</b>	<b>2,707</b>	<b>2,371</b>

### Notes

1. The numbers relate to the number of records and so will include members in receipt of or potentially in receipt of more than one benefit.
2. Annual pensions are funded items only include pension increases up to and including the 2002 PI Order.
3. Pensionable pay is full time equivalent earnings.
4. Pensions for deferred pensioners include increases up to the valuation date.

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Details of the assets held at the valuation date and accounts are as follows.

Assets at This Valuation (excluding AVCs)	Market Value at 31 March 2002	
	£(000)	%
UK Equities	41,562	58%
UK Fixed Interest Gilts	3,685	5%
UK Corporate Bonds	2,292	3%
UK Index Linked Gilts	-	0%
Overseas Equities	8,460	12%
Overseas Bonds	3,899	5%
Property	7,674	11%
Cash	-	0%
Net Current Assets	3,974	6%
<b>TOTAL</b>	<b>71,546</b>	<b>100%</b>

Revenue Accounts	Year to	March-02	March-01	March-00	TOTAL
		£ (000)	£ (000)	£ (000)	£ (000)
EXPENDITURE	Retirement Pensions	2,002	1,713	1,539	5,254
	Retirement Lump Sums	667	800	648	2,115
	Death Benefits	-	-	-	-
	Transfer Values	197	48	27	272
	Refunds/CEPs	-	-	-	-
	Admin Expenses	22	23	30	75
	Investment Expenses	226	184	94	504
	Other Expenditure	-	-	-	-
<b>TOTAL</b>		<b>3,114</b>	<b>2,768</b>	<b>2,338</b>	<b>8,220</b>
INCOME	Employees Ctbns	424	474	511	1,409
	Employers Ctbns	1,351	1,396	1,428	4,175
	Transfer Values	-	-	-	-
	Investment Income	2,241	2,334	2,360	6,935
	Other Income	-	-	1	1
<b>TOTAL</b>		<b>4,016</b>	<b>4,204</b>	<b>4,300</b>	<b>12,520</b>
<b>Fund Value</b>					
	Assets at Start of Year	73,969	80,276	71,828	71,828
	Cashflow	902	1,436	1,962	4,300
	Change in value	(3,324)	(7,743)	6,486	(4,581)
	Assets at End of Year	71,547	73,969	80,276	71,547
<b>Annual Returns</b>					
	Approx Rate of Return	-1.8%	-7.0%	12.2%	0.8%

## Appendix D – Actuarial Assumptions

### Financial Assumptions

In a market-related valuation the financial assumptions are derived from market indicators. The principal financial assumptions adopted in the valuation are as follows:

#### *Price Inflation*

I have derived the market's expectation of inflation by considering the difference in yields available from index-linked gilts and fixed-interest gilts as at the valuation date.

At the previous and current valuation dates the smoothed yields and implied inflation rates were as follows:

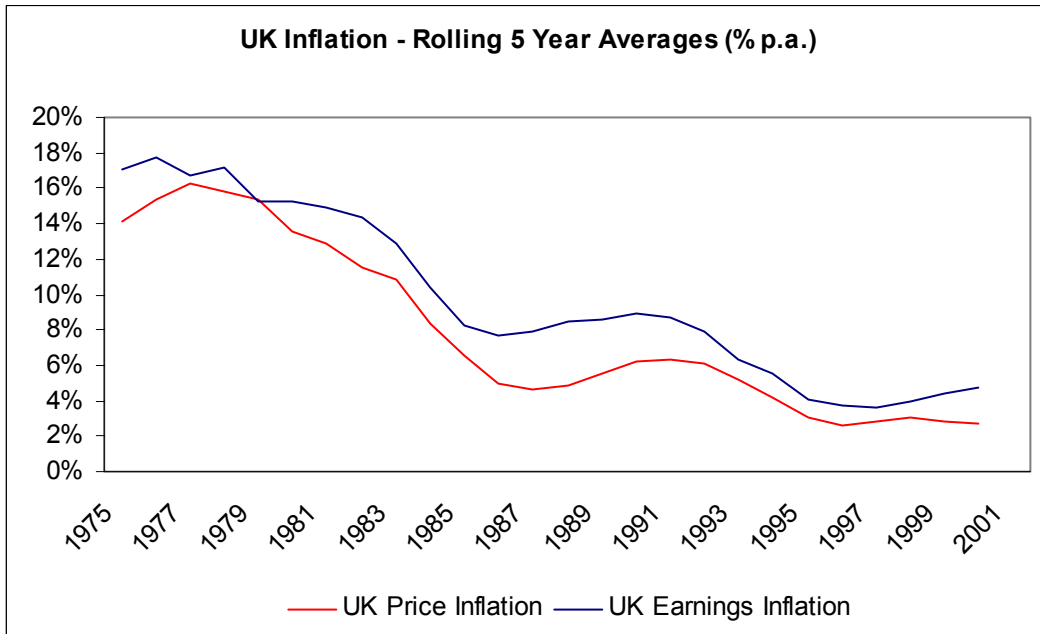
Yields Smoothed Over Year to:	Mar 1999 % p.a.	Mar 2002 % p.a.
Conventional gilt yields	5.1%	4.9%
Index Linked gilt yields	2.4%	2.3%
<i>Implying:</i>		
Future price inflation	2.8%	2.6%
Risk-free return (nominal)	5.1%	4.9%
Risk-free return (real)	2.4%	2.3%

#### *Pay Increases*

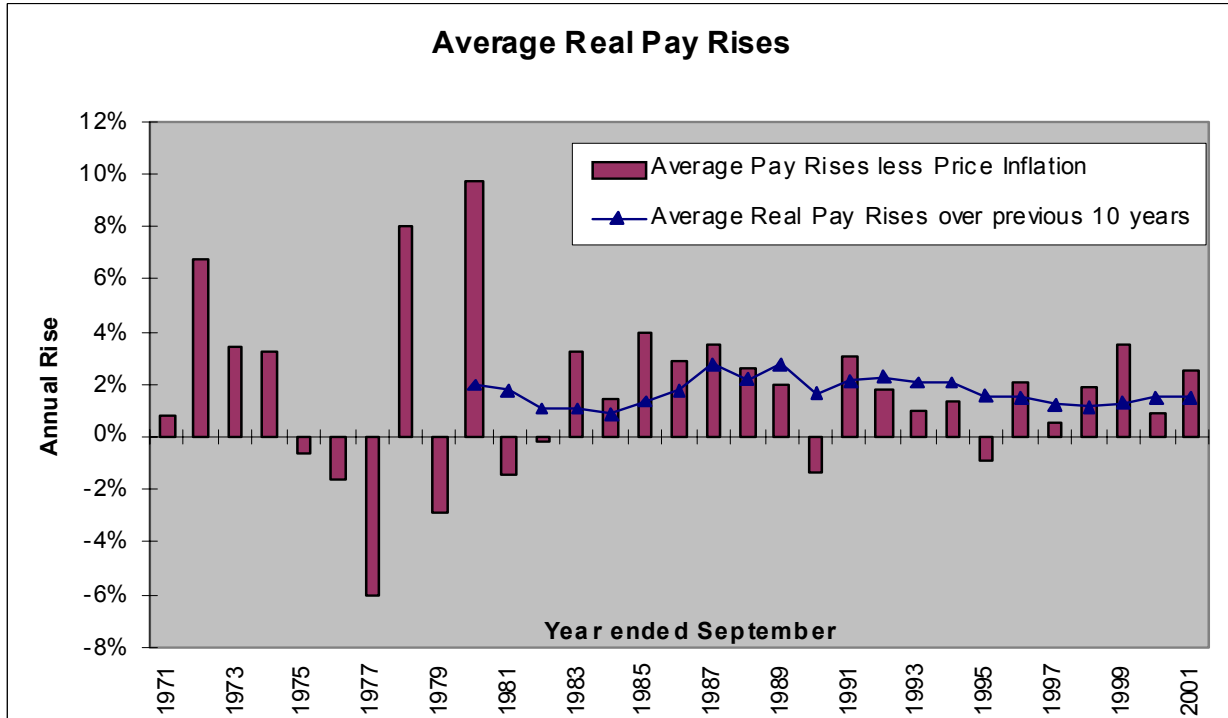
Having determined my assumption about future levels of price inflation, the next stage is to assess future levels of pay increases *relative to price inflation*.

Historically there is a strong correlation between pay and price inflation as shown in the following chart.

**Strathclyde Pension Fund (No 3 Fund)**  
*Actuarial Valuation as at 31 March 2002 Valuation Report*



The trend has been that real pay increases have been around 1% to 3% per annum although in recent times there has been a downward trend as actual levels of price inflation have reduced as shown in the next chart.



**Strathclyde Pension Fund (No 3 Fund)**  
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For this valuation I have retained the same assumption for real pay inflation as was used at the last valuation, i.e. real pay growth of 1.5% p.a. This gives a nominal rate of pay inflation of 4.1% p.a. for this valuation.

***Discount Rate/Investment Returns***

To determine the value of the Fund's liabilities the future expected cashflows are discounted to a current value using a discount rate. For this valuation, as for the last valuation, the discount rate has been derived as the expected return on assets.

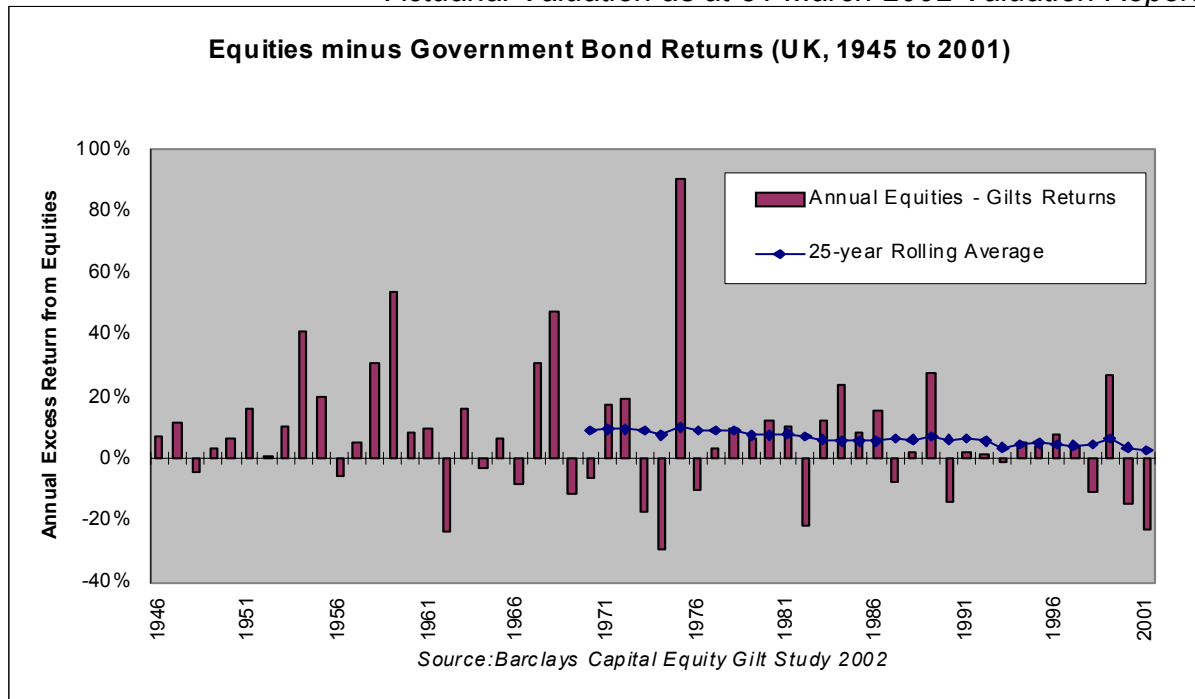
In a market-related valuation it is necessary to assess future average levels of investment returns in current market conditions. I have derived the discount rate as the expected return underlying a typical long-term investment strategy of 75% in equity type investments and 25% in bonds and cash.

Redemption yields from gilts and bonds give an indication of the market's expectations of long term interest rates and so some indication about future "risk free" rates of return. In the recent past the Government's finances have been such that there have been few new gilt issues. The gilt market has therefore reduced in size. However, a number of financial institutions including insurance companies are required to hold certain levels of gilts for solvency purposes. Demand for gilts has therefore outstripped supply, particularly at the longer end of the market which has contributed to an increase in price and a corresponding reduction in future yields.

The shortage of gilt supply has been partly addressed by a steady increase in the supply of corporate bonds. Within the UK the amount of corporate bonds in issue now exceeds the amount of gilts. As corporate bond yields are usually higher than gilt yields, I propose to make some allowance for this. I propose a margin of 0.5% to represent a "typical" institutional grade corporate bond. Assuming approximately 60% of the overall bond portfolio is corporate bonds and 40% gilts, this gives an overall return on bonds of 5.2% p.a.

There is however no comparable market indicator to derive the market's expected future return from investing in equities at any particular point in time. It is generally accepted however that the expected future return from investing in equities over the longer term should exceed that available from investing in bonds to compensate for the extra risk. This extra expected return is often referred to as the equity risk premium. By comparing yields from bonds and equities it is possible to derive the equity risk premium. As seen from the next chart, since 1945 the return on equities has exceeded the return on government bonds in many years – but not all. In three of the last four years, equities have under-performed bonds, and this has continued in 2002.

**Strathclyde Pension Fund (No 3 Fund)**  
*Actuarial Valuation as at 31 March 2002 Valuation Report*



Longer-term trends can be looked at by averaging the returns over the period. If the average returns over successive 25 year periods are considered, a gradual decline in the out-performance of equities relative to bonds is seen, from around 9% p.a. more than bonds in the 35 years to 1970 to under 3% more than bonds in the 25 years to 2001. Given the further falls in equities in 2002, most of which have occurred after 31 March 2002, a further fall in the 25 year average for 2002 would be expected, perhaps to as low as 1% more than bonds.

For the purposes of the 2002 valuation, I propose to assume that, over the long-term, the fund's equity component will deliver a return of 1.6% per annum more in nominal terms than the risk-free rate of return on gilts.

Assuming a notional overall portfolio of 75% equities and 25% bonds products, a discount rate of 6.2% as shown in the table below.

Financial Assumptions	Mar 1999		Mar 2002	
	% p.a. Nominal	% p.a. Real	% p.a. Nominal	% p.a. Real
Anticipated extra long-term return from:				
<i>Equities</i>	1.10%		1.60%	
<i>Corporate Bonds</i>	0.00%		0.5%	
Overall anticipated long term return from:				
<i>Equities</i>	6.2%		6.5%	
<i>Bonds and gilts</i>	5.1%		5.2%	
Discount Rate:	6.0%	3.2%	6.2%	3.6%
Pay Increases	4.3%	4.3%	4.1%	1.5%
Price Inflation/Pension Increases	2.8%	2.8%	2.6%	0.0%

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***Pension Increases***

Pension increases in April are based on the RPI to the year to the preceding September. The rise in headline RPI for September 2002 was 1.7% and this is expected to become the rate of increase to pensions in payment and deferred pensions in April 2003.

**Demographic Assumptions**

The assumptions I have adopted are based on my analysis of the incidence of retirement, and withdrawal of our Local Government client funds. The mortality assumptions are based on published mortality tables. Other than allowing for longer life expectancy in retirement I have retained the same demographic assumptions as used in the last valuation. Sample rates are shown in the following tables:

Age	Incidence per 1000 active members per annum						Promotional Salary Scales	
	Male Officers & Post 98 Males			Female Officers and Post 98 Females			Male Officers & Post 98 Males	Female Officers & Post 98 Females
	Death	Ill Health Retirement	Withdrawal (Ultimate)	Death	Ill Health Retirement	Withdrawal (Ultimate)		
20	0.5	-	150	0.2	-	156	112	107
25	0.5	-	101	0.2	0.6	162	170	141
30	0.6	0.6	62	0.3	1.0	138	214	162
35	0.7	0.8	42	0.5	2.0	95	244	182
40	1.2	104	31	0.8	2.6	64	269	205
45	2.0	302	24	1.3	4.2	49	296	228
50	3.2	808	18	1.9	8.2	39	324	252
55	5.0	18.0	13	2.5	21.6	32	324	252
60	9.0	36.0	-	3.2	-	-	324	252

**Strathclyde Pension Fund (No 3 Fund)**  
*Actuarial Valuation as at 31 March 2002 Valuation Report*

Age	Incidence per 1000 active members per annum						Promotional Salary Scales	
	Male Manuals			Female Manuals			Male Manuals	Female Manuals
	Death	Ill Health Retirement	Withdrawal (Ultimate)	Death	Ill Health Retirement	Withdrawal (Ultimate)		
20	0.9	-	153	0.2	-	247	103	103
25	1.0	3.2	119	0.2	2.6	244	116	117
30	1.1	5.2	90	0.3	3.6	193	127	126
35	1.2	7.8	70	0.5	5.2	140	135	133
40	1.7	10.8	56	0.8	7.2	106	142	140
45	2.9	15.6	42	1.4	9.2	81	145	143
50	5.3	22.8	28	2.2	13.6	60	146	145
55	7.8	36.8	20	2.0	25.6	47	146	145
60	11.0	70.0	-	4.4	-	-	146	145

<b>Other Assumptions</b>	
Age Retirements	It is assumed that active members will retire at age 60 or when they would satisfy the <i>Rule of 85</i> if later subject to no later than age 65.
Pensioner Mortality	Current Pensioners - PA92 c2002 +1 year
	Prospective Pensioners - PA92 c2002 - 1 year
	Ill Health Retirement - As above with + 4 years
Proportions Married (including a loading for dependants benefits)	90% of members will be married and entitled to a spouse's pension
Wife/Husband Age Difference	Husbands are assumed to be 3 years older than their wives

## **Appendix E - Rates and Adjustments Certificate**

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Glasgow City Council  
Finance Department  
City Chambers  
Glasgow G2 1DU

Dear Sir

1. On your instruction, I have made an actuarial valuation of Strathclyde Pension Fund (No 3 Fund) (“the Fund”) as at 31 March 2002.
2. In accordance with Regulation 76 of the Local Government Pension Scheme (Scotland) Regulations 1998, I have made an assessment of the contributions which should be paid to the Pension Fund by the employing authorities as from 1 April 2003 in order to maintain the solvency of the Fund.
3. The required contribution rates are set out in the attached statement.

Yours faithfully

Donald Fleming FFA  
Fellow of the Faculty of Actuaries

Hymans Robertson  
221 West George Street  
GLASGOW  
G2 2ND

**Strathclyde Pension Fund (No 3 Fund)**  
*Actuarial Valuation as at 31 March 2002 Valuation Report*

**STATEMENT TO THE RATES AND ADJUSTMENTS CERTIFICATE**

The Common Rate of Contribution payable by the employer under Regulation 76 for the period 1 April 2003 to 31 March 2006 outlined in the table below, plus additional annual contributions of £0.3m, payable monthly, for the year 2003/2004 and £0.5m, payable monthly, for the years 2004/05 and 2005/06.

Year to	Common Contribution Rate	
	% of employees' contributions	% of payroll
31 March 2004	370%	19.0%
31 March 2005	400%	20.6%
31 March 2006	400%	20.6%

**Notes**

Further sums should be paid to the Fund to meet the costs of any early retirements using methods and assumption issued by me from time to time.

The certified contribution rates represent the minimum level of contributions to be paid. The employer may pay further amounts at any time and future periodic contributions may be adjusted on a basis approved by me.

The assumptions underlying the number of members who will become entitled to pensions under the provisions of the Scheme and the liabilities arising in respect of such members are set out in Appendix D.

## **Appendix F - Surplus Certificate**

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This certificate is given to the Commissioners of Inland Revenue for the purposes of paragraph 2 of Schedule 22 to the Income and Corporation Taxes Act 1988.

Name/description of scheme	Strathclyde Pension Fund (No 3 Fund)
Inland Revenue Reference Number	49/24736

I hereby certify that :-

1. in my opinion, as at 31 March 2002 the value of the assets of the scheme did not exceed 105 percent of the value of the liabilities of the scheme;
2. the assets and liabilities to which paragraph (1) refers have been determined in accordance with principles and requirements prescribed by the Pension Scheme Surpluses (Valuation) Regulations 1987.

Name	<b>Donald Fleming FFA</b>	Qualification: FFA
Date	June 2003	
Address	Hymans Robertson 221 West George Street GLASGOW G2 2ND	