

TfL Pension Fund - Public Sector Section

Actuarial valuation
as at 31 March 2018

22 March 2019



Summary

The main results of the Section's actuarial valuation are as follows:

- Technical provisions funding level as at 31 March 2018 has decreased to 94.5% (2015: 95.4%)



- Deficit of assets relative to technical provisions has increased to £603 million (2015: £396 million)



- The recovery plan implemented to address the Section's funding deficit is expected to achieve full funding on the technical provisions assumptions by 31 May 2026, which is 8.2 years following the valuation date (2015: 7.0 years)



- The Scheme Actuary's statutory estimate of solvency as at 31 March 2018 has increased to 45% (2015: 43%)



- The rate of employer contributions required to meet the increase in technical provisions arising from the accrual of future service benefits has increased to 26.9% of the relevant pay definition (2015: 25.55%)



Contents

Summary

Introduction

Scope
Next steps
Limitations

Funding

Statutory funding objective
Contribution requirements
Projections and sensitivities

Solvency

Discontinuance
Statutory estimate of solvency
Relationship between the cost of securing benefits and the technical provisions
Projections and sensitivities

Additional information

Risks
Benefit summary
Membership data
Asset information
Statutory Certificate
Glossary

Throughout this report the following terms are used:

Fund

TfL Pension Fund

Section

Public Sector Section

Trustee

TfL Trustee Company Limited

Principal Employer

TfL

Trust Deed & Rules

The Fund's Trust Deed and Rules dated 19 December 2008, as subsequently amended

Introduction

Scope

This is my report on the actuarial valuation of the Public Sector Section of the TfL Pension Fund as at 31 March 2018 and I have prepared it for the Trustee. As noted in the Limitations section of this report, others may not rely on it.

The actuarial valuation is required under Rule 43(3) of the Rules of the Fund and Part 3 of the Pensions Act 2004; a copy of this report must be provided to TfL in its capacity as Principal Employer and as representative for the other employers participating in the Section within seven days of its receipt.

The main purposes of the actuarial valuation are to review the financial position of the Section relative to its statutory funding objective and to determine the appropriate level of future contributions.

The report explains the financial position of the Section at 31 March 2018 using several different measures of its liabilities and how it has changed since the previous valuation at 31 March 2015. It also describes the strategy that has been agreed between the Trustee and TfL for financing the Section in future and provides commentary on how the funding position is expected to develop in future.

This report and the work involved in the actuarial valuation are within the scope of and comply with the Financial Reporting Council's Technical Actuarial Standards 100: Principles for Technical Actuarial Work and 300: Pensions.

Next steps

The Trustee is required to disclose to members, in a summary funding statement, certain outcomes of this actuarial valuation within a reasonable period. Members may also request a copy of this report.

The financial position of the Section and the level of contributions to be paid will be reviewed at the next actuarial valuation, which is expected to be carried out at 31 March 2021.

In intervening years the Trustee will obtain annual actuarial reports on developments affecting the Section's assets and technical provisions. The next such report, which will have an effective date of 31 March 2019, must be completed by 31 March 2020.



Gareth M Oxtoby
Fellow of the Institute and Faculty of Actuaries
Towers Watson Limited, a Willis Towers Watson company
22 March 2019

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http://eutct.internal.towerswatson.com/clients/615748/TFLTRVal31Mar18/Documents/PSS_valn_report_310318.docx

Limitations

Third parties

This report has been prepared for the Trustee for the purpose indicated. It has not been prepared for any other purpose. As such, it should not be used or relied upon by any other person for any other purpose, including, without limitation, by individual members of the Section for individual investment or other financial decisions, and those persons should take their own professional advice on such investment or financial decisions. Neither I nor Towers Watson Limited accepts any responsibility for any consequences arising from a third party relying on this report.

Except with the prior written consent of Towers Watson Limited, the recipient may not reproduce, distribute or communicate (in whole or in part) this report to any other person other than to meet any statutory requirements.

Data supplied

The Trustee bears the primary responsibility for the accuracy of the information provided, but will, in turn, have relied on others for the maintenance of accurate data, including the employers who must provide and update certain membership information. Even so it is the Trustee's responsibility to ensure the adequacy of these arrangements. I have taken reasonable steps to satisfy myself that the data provided is of adequate quality for the purposes of the investigation, including carrying out basic tests to detect obvious inconsistencies. These checks have given me no reason to doubt the correctness of the information supplied. It is not possible, however, for me to confirm that the detailed information provided, including that in respect of individual members and the asset details, is correct.

This report has been based on data available to me as at the effective date of the actuarial valuation and takes no account of developments after that date except where explicitly stated otherwise.

Some of the member data (such as date of birth and salary) required for the running of the Section, including for paying out the right benefits, is known as 'personal data'. The use of this data is regulated under the Data Protection Act, which places certain responsibilities on those who exercise control over the data (known as 'data controllers' under the Data Protection Act). Data controllers would include the Trustee of the Fund and may also include the Scheme Actuary and Towers Watson Limited, so we have provided further details on the way we may use this data on our website at <http://www.willistowerswatson.com/personal-data>.

Assumptions

The choice of long-term assumptions, as set out in the Section's Statement of Funding Principles dated 22 March 2019, is the responsibility of the Trustee, after taking my advice. They are only assumptions; they are not predictions and there is no guarantee that they will be borne out in practice. In fact I would expect the Section's experience from time to time to be better or worse than that assumed. The Trustee and TfL must be aware that there are uncertainties and risks involved in any course of action they choose based on results derived from these assumptions.

The funding of the Section is subject to a number of risks and it is not possible to make an allowance for all such risks in providing our advice. Unless stated, no explicit allowance has been made for any particular risk. In particular, no explicit allowance has been made for climate-related risks.

The structure of the Willis Towers Watson Investment model, used to determine the discount rates referred to in this report, is based on a historical analysis of investment returns, although Willis Towers Watson has incorporated its subjective judgement to complement the information provided by historical returns. The model is designed to illustrate the future range of returns stemming from different asset classes and their inter-relationship and the consequent uncertainty in the future financial development of the Section. It should be noted that no economic model could be expected to capture future uncertainty perfectly or to be precise about the risk of extreme events. In particular, it should be noted that the timeframe in establishing our asset model and the assumptions used in this investigation are intentionally long-term, and are not meant to be reflective of the possible, or even likely, course of investment markets in the short term.

Funding

Statutory funding objective

The Trustee's formal funding objective is the statutory funding objective under the Pensions Act 2004, which is to have sufficient and appropriate assets to cover the Section's technical provisions.

The technical provisions are calculated by projecting the benefits (which are mostly pension payments) expected to be paid in each year after the valuation date and then discounting the resulting cashflows to obtain a present value. Benefits accrued in respect of service only up to the valuation date are taken into account in this calculation (although an allowance is made for an assumed level of future pensionable earnings increases for employed members). The main benefits taken into account in this actuarial valuation are summarised in the Additional Information section of this report.

The projections allow for benefit payments being made from the Section over the next 80 or so years. Most of these payments depend on future increases in price inflation statistics, subject to specified limits in some cases. The method and assumptions for calculating the technical provisions as at 31 March 2018 have been agreed between the Trustee and TfL and are documented in the Statement of Funding Principles dated 22 March 2019.

Key assumptions as at 31 March 2018 and 31 March 2015

The table below summarises the main financial assumptions used to calculate the Section's technical provisions for this and the previous actuarial valuation.

Assumption	31 March 2018		31 March 2015	
	Nominal % pa	Real ¹ % pa	Nominal % pa	Real ¹ % pa
RPI inflation	3.4	-	3.2	-
CPI inflation	2.4	(1.0)	2.2	(1.0)
Pension increases in payment				
- Pre-6.4.88 GMP	0.0	(3.4)	0.0	(3.2)
- Post-5.4.88 GMP	2.1	(1.3)	1.9	(1.3)
- Non-GMP				
- Existing Members	3.4	0.0	3.2	0.0
- New Members	3.2	(0.2)	3.0	(0.2)
Pension increases in deferment				
- GMP (section 148)	3.9	0.5	4.2	1.0
- Non-GMP				
- Existing Members	3.4	0.0	3.2	0.0
- New Members	3.2	(0.2)	3.0	(0.2)
General pensionable salary increases	3.65	0.25	3.7	0.5
Lower Earnings Limit Increases	2.4	(1.0)	2.2	(1.0)
Discount rate for valuing accrued benefits	Term dependent discount rate trending from a 65% confidence level to a 70% confidence level over the 10 year period to 31 March 2028. (Based on 18 year term: nominal rate of 4.84% per annum trending to 4.54% per annum over 10 years from 1 April 2018)		5.31 ²	2.11
Discount rate for calculating cost of future service accrual ²	5.16	1.76	5.31	2.11

Notes

1. Relative to RPI inflation. For the purposes of this table, we have shown real rates as the simple difference between the nominal rate and the assumed rate of inflation.
2. 60% confidence return calculated over approximate average term of the Section's liabilities (18 years).

Current mortality rates for deferred pensioners and pensioners are assumed to be in line with the tables summarised below, projected to 2018 in line with the CMI_2015 1.6% model for the appropriate gender. (For the 2015 valuation, mortality rates in deferment and in payment were assumed to be in line with the tables shown, projected to 2015 in line with the CMI_2014 1.5% model for the appropriate gender.)

Mortality assumptions	31 March 2018		31 March 2015	
Male members who retire on grounds of ill health	S2IMA	x 116%	S2IMA	x 107%
Female members who retire on grounds of ill health	S2IFA	x 109%	S2IFA	x 101%
Other male members	S2NMA	x 122%	S2NMA	x 117%
Other female members	S2NFA	x 122%	S2NFA	x 129%
Male dependants	S2NMAH	x 113%	S2NMAH	x 99%
Female dependants	S2DFA	x 124%	S2DFA	x 121%

Allowance is made for mortality improvements after 2018 in line with the CMI_2017 1.5% model for the appropriate gender. (For the 2015 valuation, allowance was made for mortality improvements after 2015 in line with the CMI_2015 1.6% model for the appropriate gender.)

Please see the Statement of Funding Principles for a full description of the assumptions.

Funding position

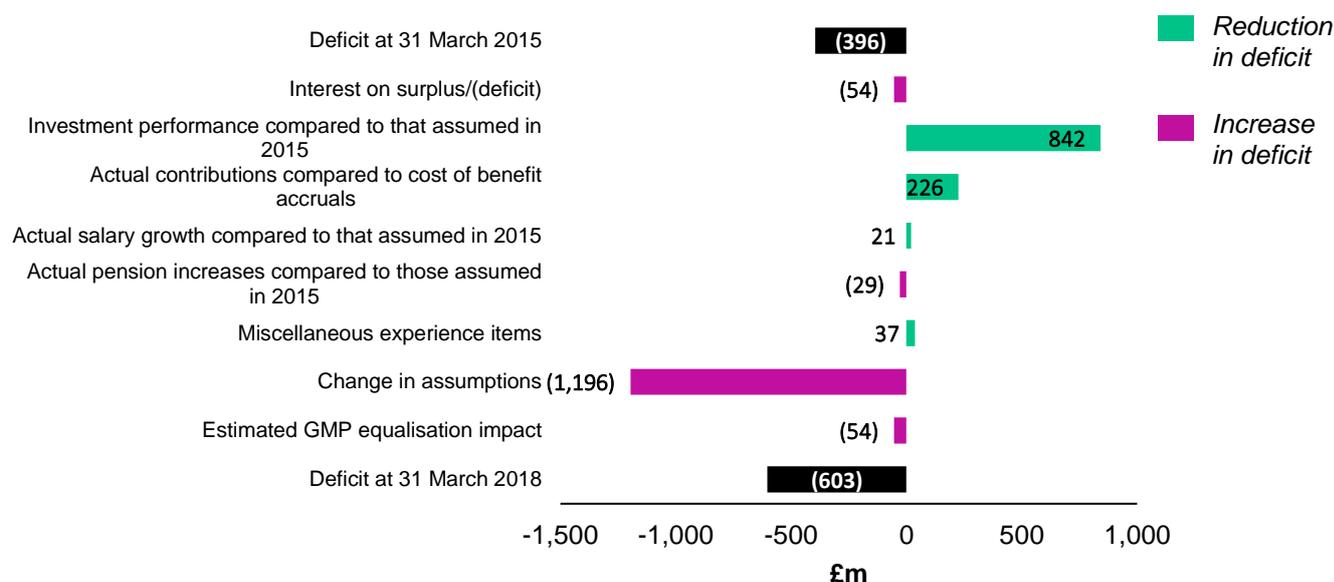
The table below compares the Section's technical provisions as at the date of the actuarial valuation with the market value of the Section's assets and the corresponding figures from the previous actuarial valuation. Figures shown as at the previous valuation date are after allowing for the transfer of assets and liabilities from the former Tube Lines Limited (TLL) Section of the Fund, which was completed prior to the 2015 valuation report being signed.

Valuation statement	31 March 2018 £m	31 March 2015 post-TLL merger £m
Amount required to provide for the Section's liabilities in respect of:		
Contributing members, in respect of service up to the valuation date	4,829	3,990
Deferred pensioners	1,397	1,018
Retired members and dependants	4,570	3,620
+ reserve for GMP equalisation	54	-
+ value of AVCs and other money purchase benefits	74	58
Technical provisions	10,924	8,686
Market value of assets (including AVCs)	10,321	8,290
Past service (deficit)/surplus (assets less technical provisions)	(603)	(396)
Funding level (assets ÷ technical provisions)	94.5%	95.4%

Developments since the previous valuation

The funding level has decreased slightly to 94.5%, from 95.4% at the previous valuation. However, both assets and liabilities have increased in value, as a result of which there has been a more significant increase in the size of the funding deficit in £m. The main factors contributing to this increase in deficit are shown below. The size of the items depends on the order in which they are analysed and also on the precise method used. It should be noted that this analysis has been performed using the 2015 assumptions as a benchmark and that using a different benchmark would result in a different breakdown of the items.

The most significant item of intervaluation experience is the net impact of changes in assumptions, particularly the reduction in the discount rate. However, this was largely offset by the favourable investment performance over the period, which resulted in a significant gain.



Contribution requirements

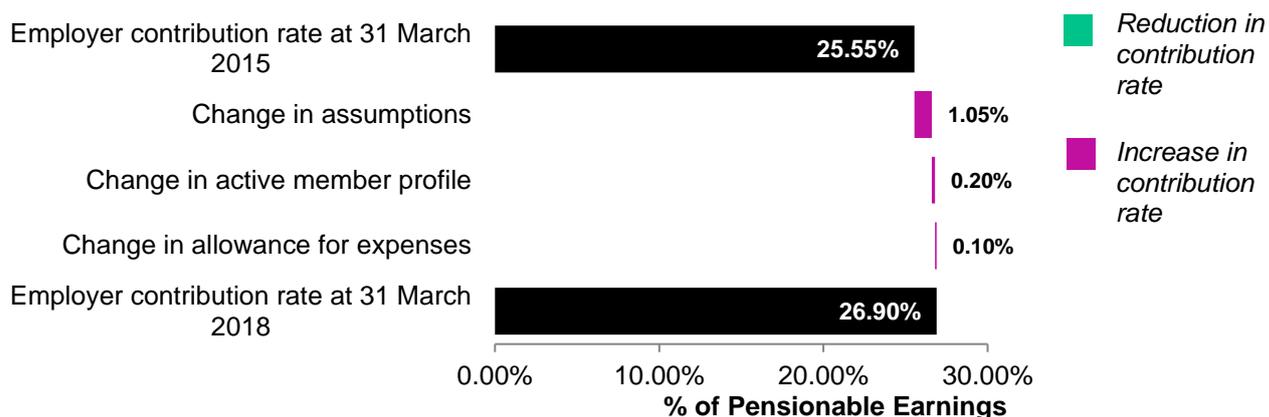
Future accrual of benefits

Under the method and assumptions described in the Statement of Funding Principles, the annual employer contribution rate required to meet the cost of the benefits that are expected to be earned in the Section after the valuation date is 26.9% of the relevant pay definition (as set out in Fund rule 13 for the purpose of calculating members' contributions).

This rate includes 0.4% of the total of the relevant pay definition (as set out in Fund rule 13 for the purpose of calculating members' contributions) in respect of non-investment expenses and 0.8% of the total of the relevant pay definition in respect of PPF and other levies.

The employer future service contribution rate has been calculated as the rate required over the year following the valuation date to meet the cost of benefits expected to be accrued over that year. On this basis, this rate will be sufficient, if the assumptions are borne out in practice, to cover the accrual of benefits in the future provided the age, gender and pensionable earnings profile of the employed membership remains reasonably stable.

An analysis of the change in ongoing contribution rate from 31 March 2015 to 31 March 2018 is shown in the chart overleaf. The main reason for the increase in the required contribution rate has been the change to the assumptions, and in particular the reduction in the real discount rate.



Recovery plan

As there were insufficient assets to cover the Section’s technical provisions at the valuation date, the Trustee and TfL are required to agree a recovery plan. This specifies how, and by when, the statutory funding objective is expected to be met.

The Trustee and TfL have agreed a recovery plan such that the deficit of £603 million is expected to be removed by:

- Contributions from 1 April 2018 until 31 March 2019 equal to 5.45% of the total of the relevant pay definition (as set out in Rule 13 of the Trust Deed & Rules for the purpose of calculating Members’ contributions) for all Members of the Section, and payable on the same dates as the Members’ contributions are due to be remitted to the Section; plus
- on or before 31 March 2019 a lump sum of £70 million; plus
- Contributions from 1 April 2020 until 31 May 2026 equal to 6.4% of the total of the relevant pay definition (as set out in Rule 13 of the Trust Deed & Rules for the purpose of calculating Members’ contributions) for all Members of the Section, and payable on the same dates as the Members’ contributions are due to be remitted to the Section.

If the assumptions documented in the Statement of Funding Principles are borne out in practice, including the allowance to be made for investment returns for the purposes of this recovery plan of 5.31% pa over the duration of the recovery plan, the deficit will be removed by 31 May 2026.

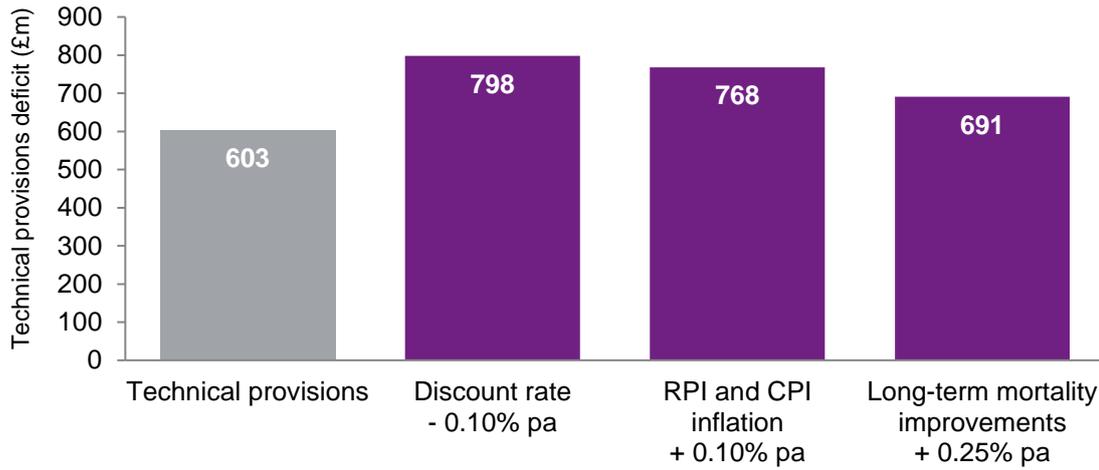
Contingent Funding Framework

As part of the 2018 valuation process, the Trustee has entered into a new Pensions Funding Agreement with TfL. Under this Agreement, it is anticipated that – as long as the employer covenant provided to the Section by TfL continues to be assessed as ‘strong’ - future actuarial valuations over the period to 2027 will be carried out on assumptions determined consistently with those adopted for this 2018 valuation. In addition, the Agreement sets out a framework for increasing TfL’s contributions to the Section in future if experience is worse than anticipated. Depending on the extent of the deterioration revealed by future actuarial valuations, the Agreement defines a number of predetermined steps by which the amount, or duration, of deficit contributions will be increased. This provides a legally binding commitment from TfL to make additional deficit contributions, in addition to the recovery plan agreed for the purposes of this 2018 valuation, should they be required. This Agreement represents a significant strengthening of the legally enforceable sponsor covenant provided to the Section by TfL.

Projections and sensitivities

Based on the assumptions underlying the calculation of the Section's technical provisions as at 31 March 2018 and allowing for contributions to be paid to the Section as described above, the funding level is expected to increase to 100% at a broadly uniform pace over the period to the end of the recovery period.

The chart below illustrates the sensitivity of the technical provisions deficit as at 31 March 2018 to variations of individual assumptions. (If more than one of these assumptions is varied, the effect may be greater than the sum of the changes from varying individual assumptions.)



Solvency

Discontinuance

In the event that the Section is discontinued, the benefits of employed members would crystallise and become deferred pensions in the Section. There would be no entitlement to further accrual of benefits.

If the Section's discontinuance is not the result of the employers' insolvency, the employers would ultimately be required to pay to the Section any deficit between the Scheme Actuary's estimate of the full cost of securing members' accrued benefits with an insurance company (including expenses) and the value of the Section's assets – the "employer debt". The Trustee would then normally try to buy insurance policies to secure future benefit payments. However, the Trustee may decide to run the Section as a closed fund for a period before buying such policies, if it is confident that doing so is likely to produce higher member benefits or if there are practical difficulties with buying insurance policies, such as a lack of market capacity.

If the Section's discontinuance is a result of the insolvency of the employers, the "employer debt" would be determined as above and the Section would also be assessed for possible entry to the Pension Protection Fund ("PPF").

If the assessment concluded that the assets (including any funds recovered from TfL) were not sufficient to secure benefits equal to the PPF compensation then the Section would be admitted to and members compensated by the PPF. Otherwise the Section would be required to secure a higher level of benefits with an insurance company.

Statutory estimate of solvency

The Pensions Act 2004 requires that I provide the Trustee with an estimate of the solvency of the Section at the valuation date. Normally, this means an estimate of the proportion of the accrued benefits that could have been secured by buying insurance policies with the assets held by the Section at the valuation date. For this purpose I have assumed that no further payments are received from the employers.

I have assumed that the insurance company price would be calculated on an actuarial basis similar to that implied by bulk annuity quotations seen by Willis Towers Watson at around the valuation date. I have assumed the cost of implementing the winding-up to be equivalent to 0.8% of the estimated value of the solvency liabilities (leading to assumed winding-up costs of £187 million).

The table below summarises how the main assumptions used to estimate the Section's solvency position at this and the previous actuarial valuation differ from the assumptions used to calculate the technical provisions liabilities.

Financial assumptions	31 March 2018 % pa	31 March 2015 % pa
Pensioner discount rate	Nominal gilt yield curve plus 0.25% pa	Index-linked gilt yield curve compounded with assumed long-term RPI inflation less 0.15% pa
Non-pensioner discount rate	Nominal gilt yield curve less 0.35% pa	Index-linked gilt yield curve compounded with assumed long-term RPI inflation less 0.55% pa
CPI inflation	2.7	2.1
Demographic assumptions	31 March 2018	31 March 2015
Future improvements in longevity	2016 CMI projections with a long term rate of 1.5% pa from 2018	2014 CMI projections with a long term rate of 1.6% pa from 2015
Proportion of pension exchanged for a lump sum at retirement	0%	0%

Actuarial valuation as at 31 March 2018
 TfL Pension Fund - Public Sector Section

My estimate of the solvency position of the Section as at 31 March 2018 is that the assets of the Section would have met 45% of the cost of buying insurance policies to secure the benefits at that date, based on the assumptions described above. Further details are set out in the table below alongside the corresponding details as at the previous valuation date:

Valuation statement	31 March 2018 £m	31 March 2015 pre-TLL merger £m
Estimated cost of buying insurance policies to cover:		
Employed members	12,160	10,203
Deferred pensioners	3,747	2,754
Pensioners and dependants	6,650	5,474
GMP equalisation	113	-
Expenses	187	203
AVCs and other money purchase benefits	74	58
Total estimated cost	22,931	18,692
Market value of assets	10,321	8,016
Solvency (deficit)/surplus (total estimated cost less assets)	(12,610)	(10,676)
Solvency level (assets ÷ total estimated cost)	45%	43%

The change in the solvency level from 43% to 45% is due mainly to the investment performance of the Section's assets being better than assumed and the estimated decrease in insurance company prices.

The solvency estimate should not be relied upon to indicate the position on a future winding-up. Changes in market interest rates and in the supply and demand for annuities mean that the actual position at any particular point in time can be established only by obtaining specific quotations for buying the insurance policies required to secure the benefits.

The coverage for particular benefits depends on where they fall in the statutory priority order below. However, money purchase liabilities, such as those arising from members' Additional Voluntary Contributions (AVCs), are excluded from the statutory priority order; their treatment is determined by the Section's own rules and would normally be that they are secured in full before any other benefits.

- category 1 – benefits relating to certain pension annuities secured by the Section before 6 April 1997 (of which I understand there are none for the Section);
- category 2 – the cost to the Section of securing the compensation that would otherwise be payable by the PPF if the employers became insolvent;
- category 3 – benefits in respect of defined benefit AVCs not dealt with above;
- category 4 – all other pensions and benefits due under the Section, including pension increases (where these exceed those under the PPF).

As the Section assets did not cover the Section 179 liabilities as at 31 March 2018, the Section would probably have qualified for entry to the PPF had the employers become insolvent at 31 March 2018, in which case the members would have received PPF compensation in place of their benefits.

Relationship between the cost of securing benefits and the technical provisions

My estimate of the cost of securing benefits with an insurance company of £22,931 million is £12,007 million higher than the Section's technical provisions of £10,924 million.

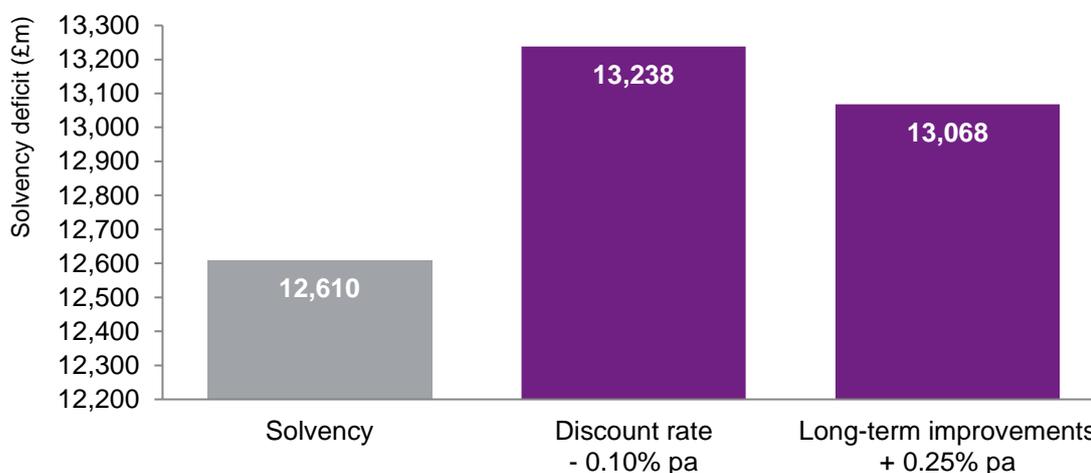
The technical provisions are intended to be a prudent assessment of the assets required under the Section's investment strategy to meet future benefit payments as and when they fall due but with reliance placed on the employers being able to support the Section in future if the assumptions are not borne out in practice. By contrast the estimated cost of securing benefits with an insurance company is based on the price that an insurer might be likely to charge to take on the risks associated with operating the Section without having recourse to future contributions from the employers.

If the statutory funding objective had been exactly met on 31 March 2018 (ie there had been no funding surplus or deficit), I estimate that the solvency level of the Section would have been 47.6%. This compares with 45.0% at the 31 March 2015 actuarial valuation.

Projections and sensitivities

Based on the assumptions underlying the calculation of the Section's technical provisions as at 31 March 2018 and allowing for contributions to be paid to the Section summarised in the Funding section of this report, the solvency level is projected to increase broadly uniformly over the recovery period, and will increase by a slightly greater extent than the technical provisions funding level.

The table below illustrates the sensitivity of the solvency deficit as at 31 March 2018 to variations of individual key assumptions. (If more than one of these assumptions is varied, the effect may be greater than the sum of the changes from varying individual assumptions.)



Additional Information

Risks

The table below summarises the main risks to the financial position of the Section and the actions taken to manage them:

Risk	Approach taken to risk
Employers unable to pay contributions or make good deficits in the future	<p>At each valuation the Trustee takes advice from an independent specialist on the ability of the employers to pay contributions to the Section and, in particular, to make good any shortfall that may arise if the experience of the Section is adverse.</p> <p>This advice is taken into account when determining the level of technical provisions and in considering the appropriateness of any recovery plan to remove a deficit relative to the technical provisions.</p> <p>Between valuations the Trustee monitors the employers' financial strength regularly.</p>
Investment returns on the existing assets could be insufficient to meet the Trustee's funding objectives	<p>The Trustee takes advice from the Scheme Actuary on possible assumptions for future investment returns. For the calculation of the Section's technical provisions, the Trustee has adopted discount rates that are lower than the expected returns on the Section assets.</p> <p>The Trustee is able to agree further contributions with the employers at subsequent valuations if future returns prove insufficient.</p>
Investment returns on future income could be lower than the returns available at the valuation date	<p>The Trustee takes this risk into account when determining the Section's technical provisions, by incorporating a level of prudence into the investment return assumptions.</p> <p>The Section does not currently directly hedge most of its exposure to changes in interest rates.</p>
Price inflation could be different from that assumed which could result in higher liabilities	<p>The Trustee invests in assets that are expected to be correlated to future inflation in the longer term (sometimes referred to as "real" assets). This means that, over the longer term, such assets are expected to keep pace with inflation. Such assets include equities, property and index-linked bonds.</p> <p>The Section does not currently directly hedge most of its exposure to inflation risk.</p>
Falls in asset values might not be matched by similar falls in the value of the Section's liabilities	<p>The Trustee considers this risk when determining the Section's investment strategy. It consults with the TfL in order to understand TfL's appetite for bearing this risk and takes advice on the TfL's ability to make good any shortfall that may arise.</p> <p>To the extent that such falls in asset values result in deficits at future valuations, TfL would be required to agree a recovery plan with the Trustee to restore full funding over a period of time.</p>
Members live longer than assumed	<p>For the calculation of the technical provisions, the Trustee has adopted mortality assumptions that it regards as prudent estimates of the life expectancy of members so that higher reserves are targeted in respect of the risk than are expected to be necessary.</p>
Options exercised by members could lead to increases in the Section's liabilities	<p>The Trustee sets the terms for converting benefits in respect of member options on the basis of actuarial advice with the view to avoiding strains on the Section's finances as far as is reasonably possible without disadvantaging members.</p> <p>The terms are kept under regular review, generally following each actuarial valuation.</p>
Legislative changes could lead to increases in the Section's liabilities	<p>The Trustee takes legal and actuarial advice on changes in legislation and consults with TfL, where relevant.</p>



Benefits summary

The Section is a registered pension scheme under the Finance Act 2004 and was previously contracted-out of the State Second Pension.

The main benefit provisions of the Fund are the same for each section and are summarised as follows:

Existing members:	Mainly those who joined the Fund on or before 1 April 1989
New members:	Mainly those who first joined after 1 April 1989
Scheme Pension Age (SPA):	Age 65 for men and women
Pensionable salary:	The greater of salary over the 12 months preceding date of retirement/leaving and total Contributory Pensionable Salary over the same period
Contributory Pensionable Salary:	Set each April as the annual rate of salary as at previous November

Note: for the purposes of the above two definitions

- *For an Existing Member, salary means basic salary excluding fluctuating emoluments but including any permanent additional allowance with the consent of the Principal Employer and the Trustee.*
- *For New Members, salary is as for Existing Members but less the Lower Earnings Limit.*
- *For LUL Company Plan Employees, salary is multiplied by 90% for pre-6 April 1998 accruals and by 100% for post-5 April 1998 accruals.*

Total Membership:	Service as a contributing member of the Fund, plus service credited by transfers-in or any other service granted by the former LT Board and Trustee.
Retirement at SPA:	A pension equal to one-sixtieth of Pensionable Salary for each year of Total Membership less, for Existing Members, £10.10 pa for each year of Total Membership after 1 October 1993.
Retirement before SPA, on grounds of ill-health:	Subject to 5 years' service, an immediate pension calculated as for retirement at SPA but based on Total Membership at retirement, plus an extra period equal to the shorter of 10 years and prospective service to SPA.
Retirement before SPA, not on grounds of ill health:	An immediate pension calculated as for retirement at SPA, but reduced for early payment. No reduction applies on retirement on or after age 60.
Lump Sum at Retirement:	On retirement part of the pension may be exchanged for a lump sum.
Death after Retirement:	A dependant's pension equal to one half of the pension which would have been in payment at the date of death assuming no pension was commuted or surrendered at retirement. Children's allowances are also paid.

Death in Service:	A lump sum of 4 times Pensionable salary A dependant's pension equal to one half of the pension which the member would have received on retirement on grounds of ill health at the date of death. Children's allowances are also paid.
Leaving Service:	If under 3 months' total membership, members are entitled to a refund of their contributions. If over 3 months' and less than 2 years' total membership, members have the option to take a deferred pension, a transfer value or a refund of their contributions. If 2 years' or more total membership, members have the option to take a deferred pension or a transfer value. A dependant's pension of one half of the member's deferred pension is paid on death before SPA provided that the member had completed at least 2 years' total membership.
Pension Increases:	
- Existing Members	Pensions in excess of any GMP in payment are guaranteed to be increased each year in line with retail price inflation.
- New Members	Pensions in excess of any GMP in payment are guaranteed to be increased each year in line with retail price inflation up to 5% pa.
- All Members	The GMP arising from service between 6 April 1988 and 5 April 1997 is increased each year when in payment in line with consumer price inflation up to 3% pa.
Revaluation in deferment:	Increases in deferment on pensions in excess of any GMP are the same as those awarded to pensions in payment.
Contributions:	Members pay 5% of Contributory Pensionable Salary, less £20 a year for Existing Members. Members may also pay additional voluntary contributions to increase their benefits. Employers make up any balance of cost of meeting the Fund's benefits.

Discretionary benefits

No future discretionary benefits or discretionary increases in benefit have been allowed for in the calculation of the technical provisions and statutory estimate of solvency, other than our understanding of established practices in benefit calculations.

Changes to the benefits

Since the valuation as at 31 March 2015 no changes have been made to the Section's benefits.

Uncertainty about the benefits

An allowance of 0.5% of liabilities has been made in the calculation of the technical provisions and statutory estimate of solvency as an estimate for the possible changes to the benefits that may be required to ensure that the Section's provisions in respect of Guaranteed Minimum Pensions do not unlawfully discriminate between male and female members.

Membership data

A summary of the data provided for this and the previous valuation is presented below.

Membership data as at 31 March 2018 and 31 March 2015

Pensions in payment	31 March 2018				
	Numbers	Annual pensions £m	Mean annual pensions £	Median annual pensions £	Average Age
Existing Members					
Male	22,126	179.10	8,094	4,646	71
Female	2,784	12.90	4,700	2,783	73
	24,910	192.00	7,720	4,447	71
New Members					
Male	6,209	41.53	6,690	3,761	64
Female	1,284	6.99	5,614	3,713	61
	7,493	48.52	6,510	3,745	64
Dependants	10,347	41.88	4,047	3,145	76*
Total	42,750	282.40	6,618	3,970	70*

Pensions in payment	31 March 2015				
	Numbers	Annual pensions £m	Mean annual pensions £	Median annual pensions £	Average age
Existing Members					
Male	22,822	165.30	7,243	4,444	70
Female	2,936	12.38	4,217	2,648	73
	25,758	177.68	6,898	4,252	70
New Members					
Male	4,769	26.24	5,502	2,456	64
Female	869	3.94	4,534	2,721	60
	5,638	30.18	5,353	2,514	63
Dependants	10,623	38.65	3,638	2,906	76*
Total	42,019	246.51	5,867	3,714	70

* Excludes children

Deferred pensions		31 March 2018				
		Numbers	Annual pensions £m	Mean annual pensions £	Median annual pensions £	Average Age
Existing Members						
	Male	3,520	17.70	5,027	2,802	57
	Female	844	3.80	4,501	2,652	55
		4,364	21.50	4,925	2,781	56
New Members						
	Male	8,758	33.16	3,787	1,990	48
	Female	3,936	14.12	3,588	2,167	46
		12,694	47.28	3,725	2,041	48
Total		17,058	68.78	4,032	2,323	50

Deferred pensions		31 March 2015				
		Numbers	Annual pensions £m	Mean annual pensions £	Median annual pensions £	Average Age
Existing Members						
	Male	4,711	21.46	4,555	2,752	55
	Female	978	4.40	4,499	2,778	53
		5,689	25.86	4,546	2,753	55
New Members						
	Male	8,133	25.56	3,143	1,724	47
	Female	3,286	10.33	3,144	1,936	45
		11,419	35.89	3,143	1,787	47
Total		17,108	61.75	3,609	2,202	50

Current active members	31 March 2018			31 March 2015		
	Numbers	Pensionable salaries £m	Average Age	Numbers	Pensionable salaries £m	Average Age
Existing Members						
Male	2,007	111.42	56	2,990	154.71	55
Female	123	5.98	54	161	7.61	52
	2,130	117.40	56	3,151	162.32	55
New Members						
Male	18,383	770.74	45	15,807	638.05	44
Female	6,118	227.51	42	5,321	192.80	42
	24,501	998.25	44	21,128	830.85	44
Total	26,631	1,115.65	45	24,279	993.17	45

Pension credit members

In addition, at 31 March 2018, there were 78 pension credit members who were receiving total annual pensions of £0.530 million and 148 deferred pension credit members with total annual pensions of £1.117 million. (At 31 March 2015, there were 50 pension credit members who were receiving total annual pensions of £0.268 million and 113 deferred pension credit members with total annual pensions of £0.925 million.)

Notes

- 1 The data shown at 31 March 2015 includes that in respect of members of the Tube Lines Limited Section.
- 2 The pensionable salaries shown are annualised full-time equivalent pensionable salaries for all members and are after the deduction of the Lower Earnings Limit for New Members.
- 3 The annual pensions shown (for pensions in payment and deferred pensions) exclude the 1 April increase immediately after the effective date.
- 4 Pension increases applied to the excess over the GMP over the intervaluation period were as follows:

1 April 2015	2.3%
1 April 2016	0.8%
1 April 2017	2.0%
1 April 2018	3.9%
- 5 Average ages are weighted by pensionable salaries or pensions as appropriate.

Asset information

Movements in the market value of assets

The audited accounts supplied as at 31 March 2018 show that the market value of the Section's assets was £10,321 million. This includes Additional Voluntary Contributions (AVCs) which amounted to £74 million.

The change in the Section's assets (including AVCs) from £8,016 million as at 31 March 2015 to £10,321 million as at 31 March 2018 is detailed in the Trustee's Report and Financial Statements over that period. The table below summarises a broad reconciliation of the change (including AVCs):

Public Sector Section	£m	£m
Assets at 31 March 2015 (including AVCs)		8,015.6
Income		
Contributions:		
Employers	998.9	
Members - normal	153.3	
- AVCs	31.1	
Transfers in from other sections	285.4	
Transfers in from other pension schemes	27.0	
Investment income	248.2	
Total income		1,743.9
Expenditure		
Benefits paid:		
Pensions and other benefit payments	1,051.4	
Transfers out to other pension schemes	15.5	
PPF and other levies	25.6	
Expenses	25.1	
Total expenditure		(1,117.6)
Change in market value of investments		1,679.3
Assets at 31 March 2018 (including AVCs)		10,321.2
Represented by:		
Equities		5,471.3
Bonds		1,405.5
Alternative assets		3,225.0
Other assets (excluding AVCs)		145.5
Money purchase AVCs		73.9
		10,321.2

Note: The AVCs for members of all of the individual sections of the Fund have been included in the Section's financial statements.

Statutory Certificate

Actuarial certification for the purposes of regulation 7(4)(a) of the Occupational Pension Schemes (Scheme Funding) Regulations 2005

Name of scheme: **TfL Pension Fund - Public Sector Section**

Calculation of technical provisions

I certify that, in my opinion, the calculation of the Section's technical provisions as at 31 March 2018 is made in accordance with regulations under section 222 of the Pensions Act 2004. The calculation uses a method and assumptions determined by the Trustee of the Section and set out in the Statement of Funding Principles dated 22 March 2019.



Gareth M Oxtoby
Fellow of the Institute and Faculty of Actuaries
Towers Watson Limited, a Willis Towers Watson Company
22 March 2019

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Glossary

This glossary describes briefly the terminology of the regime for funding defined benefit pension schemes as introduced by the Pensions Act 2004.

Actuarial report: A report prepared by the Scheme Actuary in years when an actuarial valuation is not carried out that provides an update on developments affecting the Section's assets and technical provisions over the year.

Actuarial valuation: A report prepared by the Scheme Actuary that includes the results of the calculation of the technical provisions based on the assumptions specified in the Statement of Funding Principles and assesses whether the assets are sufficient to meet the statutory funding target.

Contingent asset: An arrangement separate from the assets already held by the trustees under trust (or agreed and documented in the schedule of contributions) that provides for the trustees to receive certain assets should certain pre-defined events take place.

Covenant: This represents an employer's legal obligation and its ability to provide the financial support to a scheme that may be required now and in the future. The trustees' assessment of the sponsor's covenant will inform both investment and funding decisions.

Demographic assumptions: Assumptions relating to social statistics for Section members, which can affect the form, level or timing of benefits members or their dependants receive. This can include levels of mortality experienced by the Fund and the proportion of members electing to exercise benefit options.

Discount rates: Assumptions used to place a capital value at the valuation date on projected future benefit cash flows from the Section. The lower the discount rate the higher the resulting capital value.

Financial assumptions: Assumptions relating to future economic factors which will affect the funding position of the Section, such as inflation and investment returns.

Funding target/objective: An objective to have a particular level of assets relative to the accrued liabilities of the Section. See also statutory funding objective.

Pension Protection Fund (PPF): Provides compensation to members of an eligible occupational scheme in the event that it is wound up with insufficient assets and the employer is insolvent. The level of PPF compensation provided would not usually be at the full level of the benefits that would otherwise have been due.

Prudence: Regulations require that assumptions are chosen prudently when assessing the level of technical provisions, although they do not define this term. I have interpreted prudence to be the level of conservatism in the assumptions. Where this is interpreted quantitatively, assumptions said to be prudent would result in higher technical provisions than a "best estimate" assumption (where a "best estimate" assumption is one where there is a 50% chance that the actual outcome will be higher or lower than assumed).

The Pensions Regulator: The regulatory supervisor for occupational pension schemes with statutory objectives to protect members' benefits and the Pension Protection Fund, and statutory powers to take interventionist action.

Recovery plan: A document required where an actuarial valuation discloses that the statutory funding objective is not met (ie the assets held are less than the technical provisions). It is a formal agreement between the trustees and the employer that sets out the steps to be taken to achieve the statutory funding objective by the end of an agreed period (the "recovery period").

Schedule of contributions: A document that sets out in detail the agreed contributions payable to a scheme by members and the employers and the dates by which such contributions are to be paid. It includes, but is not limited to, contributions agreed under a recovery plan.

Scheme Actuary: The individual actuary appointed (under the Pensions Act 1995) by the trustees to perform certain statutory duties for the Fund.

Scheme-Specific Funding Regime: A term used to refer to the legislative and regulatory rules that stem from the Pension Act 2004 and which govern the funding of occupational defined benefit pension schemes in the UK.

Statement of Funding Principles (SFP): The SFP sets out the trustees' policy for ensuring that the statutory funding objective and any other funding objectives are met and, in particular, the assumptions for calculating the technical provisions at the effective date of the actuarial valuation. The trustees are responsible for preparing and maintaining this document, taking into account the advice of the Scheme Actuary and in many cases seeking the agreement of the employer.

Statement of Investment Principles (SIP): The SIP sets out the trustees' policy for investing the Section's assets. The trustees are responsible for preparing and maintaining this document, taking into account written investment advice from the appointed investment advisor and consulting the employer before any changes are made.

Statutory estimate of solvency: An estimate of the cost of discharging a scheme's liability to pay benefits through the purchase of insurance policies in respect of each member's full benefit entitlement under the Section (unless the actuary considers that it is not practicable to make an estimate on this basis, in which case the estimate of solvency can be prepared on a basis that the actuary considers appropriate).

Statutory funding objective: To have sufficient and appropriate assets to cover the Section's technical provisions.

Statutory priority order: The order in which the assets of a scheme must be applied in securing the benefits of different members in the event of it being wound up. The order is consistent with the Pension Protection Fund (PPF) because benefits covered by the PPF are the highest priority class of defined benefit liabilities.

Summary funding statement: An update sent to members following the completion of each actuarial valuation or actuarial report informing them of the assessed financial position of the Section.

Technical provisions: The amount of assets required to make provision for the accrued liabilities of the scheme. The technical provisions are calculated using the method and assumptions set out in the Statement of Funding Principles.

Winding-up: This is a particular method of discharging a scheme's liability to pay benefits. It typically arises where the employer no longer provides financial support to it (for example if it becomes insolvent) and would usually involve using the scheme's assets to buy insurance policies that pay as much of the scheme's benefits as possible in accordance with the statutory priority order.