London Borough of Brent Pension Fund

Investment strategy review

February 2020

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For and on behalf of Hymans Robertson LLP

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This report is addressed to the Officers and Pension Fund Sub Committee (the "Committee") of the London Borough of Brent ("Brent") as administering authority to the London Borough of Brent Pension Fund (the "Fund"). In line with the agreed scope, the report sets out the results and commentary of the quantitative and qualitative analysis undertaken as part of the review of the investment strategy of the Fund and provides high-level comments on the Fund's investment structure.

Summary of report

We have summarised our findings and recommended next steps below:

- The Committee's current investment beliefs, which were formally signed off in November 2018, are still fit for purpose. We recommend that the Committee expands its Responsible Investment beliefs in light of the increased focus on, and importance of, this area.
- Inputting the current long-term target asset allocation into Hymans Robertson's Structure model gives a best estimate long term expected return of **5.40% p.a.** with a corresponding volatility of **9.77% p.a.** over 1 year.
- The current long-term strategy is therefore fit for purpose from a "returns" perspective, as it is expected to return in excess of the "required" return of **4.40% p.a.** used by the Actuary in the funding valuation.
- After assessing alternative investment strategies, we recommend a 5% increase in the allocation to equities, and a 5% allocation to private debt, both funded from "diversifiers". This change to the strategy increases the Fund's expected return to **5.52% p.a.** and only marginally increases the level of investment risk. Given the Fund's strong positive cashflow, we are comfortable with this change.
- We recommend that global low carbon mandate forms part of the Fund's equity allocation. The size of this allocation and the precise fund in question will be discussed with you further. We anticipate this being funded from a portion of the Fund's existing equities.
- The Fund's actual investment arrangements will deviate from their target over time and therefore we strongly recommend a degree of rebalancing takes place on a regular basis to try and prevent too much deviation from the desired strategic allocation. Further thoughts are set out in the final section of this report.

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General Risk Warning

Please note the value of investments, and income from them, may fall as well as rise. This includes equities, government or corporate bonds, and property, whether held directly or in a pooled or collective investment vehicle. Further, investments in developing or emerging markets may be more volatile and less marketable than in mature markets. Exchange rates may also affect the value of an overseas investment. As a result, an investor may not get back the amount originally invested. Past performance is not necessarily a guide to future performance.

1 Introduction

Addressee

This report is addressed to the Officers and Pension Fund Sub Committee (the "Committee") of the London Borough of Brent ("Brent") as administering authority to the London Borough of Brent Pension Fund (the "Fund"). The report sets out the results and commentary of the quantitative and qualitative analysis undertaken as part of the review of the investment strategy of the Fund. It has not been prepared for use for any other purpose and should not be so used. We also provide some high level comment on the Fund's investment structure.

This report has not been prepared for any other purpose. This report should not be released or otherwise disclosed to any third party except as required by law or regulatory obligation without our prior written consent. We accept no liability where this report is used by, or released or otherwise disclosed to, a third party unless we have expressly accepted such liability in writing. Where this is permitted, the report may only be released or otherwise disclosed in a complete form which fully discloses our advice and the basis on which it is given.

Background

2018

A strategic review took place in 2018, which was based on the member date from the 2016 triennial actuarial valuation. The 2018 review looked at:

- Establishing a set of Investment beliefs to support the long-term strategic approach;
- Setting the high-level allocation to growth, income (diversifiers) and protections assets; and
- The diversification opportunities available within the portfolio.

Following this review and subsequent discussions, the Fund agreed to restructure its equity exposure to take on more of a global focus, increase its allocation to income diversifiers (property and infrastructure) and restructure its protection allocation to include a 5% allocation to multi-asset credit ("MAC").

2019/2020 review

The 2019 actuarial valuation revealed the Fund remains with a funding gap (i.e. assets falling short of the current assumed value of future benefits) on the Fund's reported ongoing funding basis. Following on from the 31 March 2019 valuation. Hymans Robertson in our role as investment advisor to the Fund, have undertaken a review of the existing investment strategy.

Given the in-depth asset liability modelling carried out in 2018 (relatively recently), this paper focus more on the risk and return profiles of various strategies using more compact analysis, Hymans Robertson's proprietary "Structure Lite" model. This "lighter touch" approach was agreed with Officers on the basis of the membership profile of the 2019 valuation remaining broadly consistent with that previously modelled and the funding strategy also remaining materially unchanged.

This report will:

- Provide a detailed recap of the 2018 strategy review;
- Review the existing investment beliefs with a view to expanding those focussed on responsible investment;
- Evaluate the risk/return profile of the existing investment strategy against set criteria;
- Analyse a range of alternative investment strategies to determine whether or not they more effectively meet the set criteria; and
- Assess the structures of the growth and income portions of the strategy.

2 Recap of 2018 Investment strategy review

In 2018 a review of the Fund's investment arrangements was carried out using asset liability modelling to help inform decisions about the investment strategy. The review focussed on the high-level investment strategy in terms of the allocation to higher return seeking "growth" assets such as equities, diversifying "income" focussed assets such as property and infrastructure, and lower risk "matching" assets such as bonds. As part of the strategic review, asset liability modelling was carried out using information from the 2016 valuation and market conditions as at 31 March 2017. The analysis gave us the ability to test the impact of different contribution and investment strategies on the possible outcomes for the Fund. Objective metrics were adopted during the review as a means to assess the potential impact of changes to the investment and funding strategy. The metrics were as follows:

Long term

- The strategy should have at least a 2/3rds chance of achieving full funding on the Fund's ongoing funding basis in 20 years' time.
- The probability of the Fund being less than 90% funded after 20 years should be less than 10%.

Short term

- The increase in deficit in the worst 5% of outcomes over the next 3 years must be no more than 2 times.
- The probability of being less than 70% funded after 3 years should be less than 10%.

Conclusions of review

The analysis considered the impact of restructuring the allocation to growth assets and the potential impact of introducing greater diversification within the income ("diversifier") allocation. As a reminder, the main conclusions of the review included:

- The current strategy provided a good chance of meeting long term funding objectives, but alternative strategies existed that could more efficiently deliver on these;
- Based on the contribution strategy that was in place, it was possible to reduce the growth allocation (including DGF) within the investment strategy to be 60% over the longer-term; and
- There was scope to increase diversification and maintain the ability to meet the Fund's long-term objectives through increased allocations to diversifiers. This was due to the diversification benefits and the level of expected returns for equities and certain yielding assets.

Outcomes of review

Based on the conclusions of the review we recommended the Fund seek to reduce risk and diversify the strategy in two stages. This resulted in the following interim and long-term targets being agreed. Full details of the propose mapping to these strategies is included in Appendix 2.

Table 1: Asset allocation summary - 2018

	Interim Target	Long-term Target
Growth (including DGFs)	68%	60%
Income (Diversifiers)	17%	25%
Protection	15%	15%

However, it was also noted that moving from the current allocations to these new targets will take time e.g. as the London CIV launches sub funds and as private market allocations are built up over time; and during this process a degree of pragmatism is likely to be required on the Fund's allocations e.g. holding diversified growth funds as a proxy for Income assets. We discuss this further in this paper.

3 Strategic goals, objectives and beliefs

Strategic goals and objectives

The strategic goals of the Fund are to **pay benefits as they fall due, and to have a stable (and affordable over the long-term) contribution rate.** These goals are further expanded in the strategic objectives.

- The primary objective of the Fund is to provide pension and lump sum benefits for members on their retirement and/or benefits on death, before or after retirement, for their dependants, on a DB basis.
- The investment objective is to maximise returns over the long term within specified risk tolerances.

In order to achieve these objectives, the Officers must set a clear investment strategy. The approach to setting this strategy is set depend, in part, on the Fund's investment beliefs, and therefore it is important that the investment beliefs are reviewed and adjusted as necessary.

Investment beliefs

The current investment beliefs were formally signed off in November 2018. We believe that, for the most part, they are still appropriate and relevant for the Fund. However, we understand the Officer and Committee are committed to further developing the beliefs with respect to the Responsible Investment ("RI"). Responsible investment has moved up the agenda in recent times at both a macro and micro level. The Fund's current RI beliefs are listed below, and the complete list of beliefs can be found in the Appendices.

Environmental, social and corporate governance ('ESG') issues can have a material impact on the long-term performance of its investments *– the Committee recognises that ESG issues can impact the Fund's returns. The Committee commits to an ongoing development of its ESG policy to ensure it reflects latest industry developments and regulations and ESG is integrated into strategic considerations.*

Climate change and the expected transition to a low carbon economy is a long-term financial risk to Fund outcomes – *the Committee recognises that environmental issues can impact the Fund's returns. The Committee aims to be aware of, and monitor, financially material environmental-related risks and issues through the Fund's investment managers and advisors.*

In light of the Fund's increased focus and importance of responsible investment, we believe that there is scope to add to these existing beliefs. Our proposed additional beliefs to consider are set out below.

Proposed additional beliefs

Ongoing engagement is preferable to divestment

The Committee believe that, in relation to ESG risks, ongoing engagement with investee companies is preferable to divestment. This engagement maybe via our managers or alongside other investors (e.g. LAPFF). Where, over a considered period, however, there is no evidence of a company making visible progress towards carbon reduction, we believe that divestment should be actively considered.

We must act as responsible owners

As asset owners in the 21st Century, we believe it is our responsibility to support the transition to a low carbon global economy, consistent with the aims of the Paris 2016 Climate Change agreement to limit temperature increases by 2050 to a maximum of 2^{o}C.

The Fund's investment managers should embed the consideration of ESG factors into their investment process and decision-making *Investment managers are responsible for implementing the Fund's strategy. In this role, the managers should reflect the Fund's desire for achieving long-term sustainable returns and improve corporate behaviour.*

4 Investment strategy

Current investment strategy

The Fund's current strategic long-term target strategy and current allocation are shown below.

Table 2: 2018 outcomes summary

Asset Class	Current Allocation[1]	Interim Target	Long-term Target
Global Equity	37%	35%	35%
UK Equity	13%	5%	5%
EM Equity	3%	5%	5%
Private Equity	5%	5%	0%
DGFs	19%	18%	15%
Infrastructure	4%[2]]	12%	15%
Property	0%	5%	10%
Multi Credit	4%	5%	5%
Gilts	9%	10%	10%
Cash	6%	0%	0%

[1] As at 31/12/19. [2] Note a further 5% of capital has been committed to the LCIV Infrastructure fund which has not yet been drawn.

As shown, the Fund's current allocation deviates from both the agreed interim and long-term targets. This partly reflects market moves, with equities having performed strongly, but also assets being held in DGF to help fund the agreed investments in property and infrastructure (LCIV infrastructure and property offerings have taken much longer to launch than anticipated). This raises the question about whether the Fund should wait for the LCIV or look to address this imbalance within the portfolio sooner. This is discussed in a later section.

Target return

As previously noted, the purpose of the investment strategy is to help deliver on the Fund's long-term objectives alongside the agreed funding strategy. The funding strategy is developed by the Fund's actuaries, also Hymans Robertson, at formal valuations, the most recent being 31 March 2019. We therefore need to ensure that the investment strategy is consistent with the assumptions adopted as part of this valuation.

As part of the 2019 formal valuation, the actuaries adopted a future investment return assumption (a "discount rate") of 4.4% when reporting the funding level for the Fund. However, when doing so the actuary is required to make a prudent assumption of future investment returns. Thus, we use this only as a guide for evaluating the investment strategy i.e. we would expect each strategy to achieve this as a minimum with a view to achieving excess return in the most efficient manner.

4.4% p.a. is therefore the minimum return the Fund should be seeking to achieve on its investment strategy and what we use as very much the lower bound to assess the current and alternative investment strategies considered in this section.

Risk and return profile – current long-term target

Inputting the long-term target asset allocation (shaded column, table 2) into Hymans Robertson's Structure model gives a best estimate long term expected return of **5.40%** p.a. with a corresponding volatility of **9.77%** p.a. over 1 year.

This is in excess of the "required" return used by the Actuary in the funding valuation i.e. continuing with the current investment strategy is consistent with the funding objectives and therefore fit for purpose from a pure return front.

The volatility measure captures risk in the form of the potential variance in expected return over a 1 year period. The 9.77% p.a. figure for the current portfolio therefore implies that over a 1 year period expected return could vary by +/- 9.77% in any two years out of three. Equity risk is the largest contributor to both return and risk when measured on an absolute basis.

The expected risk and return figures are based on projected returns from Hymans Robertson's proprietary stochastic asset model, Economic Scenario Service (ESS). The assumptions underlying this model are provided in the Appendix 3 and are as at 31 December 2019.

Alternative investment strategies

This section seeks to determine the extent to which changes to the current long-term target could take to still meet the Fund's return objectives. We have modelled potential alternative portfolios which show what effect different asset allocations have on expected risk and return. This modelling helps give an indication of the implications of changing the Fund's investment strategy, most notably in terms of taking more investment risk, or seeking more diversification.

Table 3: Modelled investment strategies

Asset Class	Current Long-term Target	Current – Restructured	Diversifier Focussed	Growth Focussed
Global Equity	*35%*	*40%*	*30%*	*45%*
UK Equity	*5%*	*5%*	*2.5%*	*7.5%*
EM Equity	*5%*	*5%*	*2.5%*	*7.5%*
Private Equity	*0%*	*0%*	*0%*	*0%*
Total equities	**45%**	**50%**	**35%**	**60%**
Multi Asset	*15%*	*5%*	*15%*	*13%*
Infrastructure	*15%*	*15%*	*15%*	*12%*
Property	*10%*	*10%*	*10%*	*0%*
Private Debt	*0%*	*5%*	*10%*	*0%*
Total diversifiers	**40%**	**35%**	**50%**	**25%**
Multi Credit	*5%*	*5%*	*5%*	*5%*
Gilts	*10%*	*10%*	*10%*	*10%*
Total protection	**15%**	**15%**	**15%**	**15%**
Return (p.a. over 20 yr)	**5.40%**	**5.52%**	**5.38%**	**5.50%**
Risk (vol, over 1 yr)	**9.77%**	**9.88%**	**9.39%**	**10.18%**

From the quantitative analysis above we can see the following points from a strategic perspective:

- Two of the alternative strategies, with the exception of the “Diversifier-Focussed” one, achieve a higher per annum expected return than the current long-term target
- Increasing the allocation to equities increases the overall risk and return levels
- Adopting a more Diversifier focussed strategy marginally reduces the expected return but reduces the risk more noticeably.

Summary and conclusions for investment strategy

The above results suggest that there is scope for the Fund to increase its long-term target exposure to equities to c50% of total assets, as it increases expected return and only marginally increases the level of investment risk (as shown by column “Current- Restructured”). Given the Fund’s strong positive cashflow, we are comfortable with this move and believe the impact of the risk change is marginal.

This represents a 5% increase in the strategic equity target, compared the 2018 targets, with this allocation funded by reducing the allocation to “diversifiers”

Asset Class	Current Long-term Target	Revised long-term target	Change
Total equities	**45%**	**50%**	**+5%**
Total diversifiers (including DGFs)	**40%**	**35%**	**-5%**
Total protection	**15%**	**15%**	**0%**
Total assets	**100%**	**100%**	**-**

In the following section we talk about the Investment structure i.e. the mandates that sit within the investment strategy and the approach to implementation.

5 Investment structure

There are number of aspects that fit within this Section.

Governance and implementation

Diversified Growth classification

The Fund has mandates with Ruffer and Baillie Gifford that invest across a range of asset classes, collectively these mandates are called Diversified Growth ("DGF") mandates. For the purpose of this paper, we define these assets in the "Diversifiers", as we believe this reflects the role these assets perform in the Fund's overall arrangements. This classification represents a different approach to the 2018 review, when the DGFs were in the "Growth" asset grouping. Please note, this is purely a presentational change, it had no impact on the 2018 or 2020 results, as the modelling is carried out on a mandate specific basis.

London CIV

The CIV continues to experience considerable turnover and change e.g. most recently the departure of the Head of Fixed Income. This ongoing change seems to be having implications on the time it is taking the CIV to launch certain sub-funds and draw money for those sub-funds that are launched e.g. the Fund has committed money to the CIV's infrastructure fund but this has not been drawn yet. We are taking the CIV's current position seriously and are meeting them on a number of occasions over the coming months, which we will keep you updated on.

In terms of this paper, this lack of sub-fund offering/time to get money invested raises questions for the Fund e.g. is there scope/willingness for the Fund to invest outside the Pool? How should money, expected to be invested with the CIV, be held in the interim e.g. the money earmarked for property and infrastructure.

Asset classes

Equities

We continue to support the Fund having a diverse allocation to equities (including global emerging markets). With the majority of this exposure accessed via index-tracking mandates.

One area that is worth further discussion is Responsible Investment. Over recent years, there has been notable evolution in the investment strategies being offered by investment managers (index-tracking and active). Given the Fund's large index-tracking exposure, we strongly recommend that you consider such mandates, at least for a proportion of the Fund's index-tracking exposure. The main index-tracking offerings tend to look to offer similar levels of investment returns than the broad market, but with a notably lower carbon exposure. We will provide further comments at the Pre-Committee training session. Following this session, we can agree next steps with you.

Protection assets

We continue to be comfortable with the Fund's current arrangements, with the gilts offering low cost exposure to nominal protection assets and the MAC mandate offering low duration exposure to credit markets.

Diversifiers

We continue to support notable allocations to property and infrastructure.

We also believe there is merit in including an allocation to Private Debt in the Fund's investment strategy. Private debt is an income focussed asset with a shorter-term focus than infrastructure, so would provide natural diversification within the "diversifier" bracket whilst adding wider diversification within the portfolio. The aim of allocating to assets in this category is to deliver an absolute return, meaningfully higher than might currently be achieved investing in cash or short-term high-quality bonds, but with a degree of reasonable predictability. To deliver the predictability in returns, a large part of the return will be derived through identifiable sources of income rather than relying on the uncertainty of capital gains.

Private Debt mandates tend to focus on sub-investment grade credit ratings, therefore a core skill of the underlying investment manager is to assess the credit worthiness of the underling debt issuer. The LCIV plans to offer a Private Debt vehicle although the development of this remains at a very early stage with no set date for launch available.

Implementation

CIV

As stated previously, the issue over getting access via the CIV is real one and affects a number of assets classes. The Fund has already committed £50m to the CIVs infrastructure offering, albeit none of this money has been called yet. No money has been committed to the CIV for Private Debt or Property (due to the lack of vehicle available).

For all the asset classes, there is scope to access these outside the pool e.g. buy secondary property units or commit further money to your existing infrastructure manager Alinda,or make other infrastructure investments e.g. JP Morgan/IFM. This is in part depends on the Committee's comfort for investing outside the Pool. We will discuss this with you at your February meeting. You may wish to raise this with the CIV and also other London Boroughs who are facing similar challenges.

Time to invest

In addition, to the above point, the nature of a number of these asset classes means that it can take considerable time to get access e.g. infrastructure you commit money, with this money then gradually drawn by the manager as they find investments. This means that you typically gradually work towards the target allocation. Given this, you may have to invest these monies elsewhere, until it is ready to be drawn. Another feature of these less liquid asset classes is the challenge of rebalancing i.e. you can't buy or sell to rebalance to target allocations. Again, this means a degree of pragmatism needs to be required in any rebalancing process.

Recommended strategy

Taking the above points into account we propose the following approach to implementation (see table below).

		Previous		Recommended	
Asset Class	**Current Allocation**	**Interim Target**	**Long-term Target**	**Interim Target**	**Long-term Target**
Global Equity ex UK	*37%*	35%	35%	40%	*40%*
UK Equity	*13%*	5%	5%	5%	*5%*
Global Low carbon	*0%*	0%	0%	To be discussed with Committee	
EM Equity	*3%*	5%	5%	5%	*5%*
Private Equity	*5%*	5%	0%	5%	*0%*
Total equities	***58%***	**50%**	**45%**	**55%**	***50%***
DGF	*19%*	18%	15%	20%	5%
Infrastructure	*4%**	12%	15%	10%	*15%*
Property	*0%*	5%	10%	0%	*10%*
Private Debt	*0%*	0%	0%	0%	5%
Total diversifiers	***23%***	**35%**	**40%**	**30%**	***35%***
Multi Credit	*4%*	5%	5%	*5%*	*5%*
Gilts	*9%*	10%	10%	*10%*	*10%*
Cash	*6%*	0%	0%	0%	0%
Total protection	***19%***	15%	15%	**15%**	**15%**
Total	***100.0***	**100.0**	**100.0**	**100.0**	**100.0**

Points to note include:

- We continue to support a phased approach to working towards the long-term target allocations, with an interim allocation in place.
- We anticipate a global low carbon mandate forming part of the Fund's equity allocation. The size of this allocation and the fund in question will be discussed with you further. We anticipate this being funded from a portion of the Fund's existing equities.
- Private equity will run off over time. However, this will take time, hence it continues to justify a place in the Fund's interim strategy.
- Until there is a decision on potential routes of investment, we do not propose any interim allocations to property and private debt. We have set the interim infrastructure allocation to 10% (reflecting the current allocation and the future commitment), albeit in reality the Fund will struggle to reach this allocation in the absence of further commitments.
- The Fund's DGF mandates provide a low governance diverse approach to investment markets. We remain comfortable with DGF, performing a role in the Fund's investment strategy at this time.
- We do not propose any changes to the Fund's protection assets at this time.

Rebalancing

For a range of reasons, the Fund's actual investment arrangements will deviate form the target over time e.g. market movements, manager performance etc. We strongly recommend a degree of rebalancing takes place on a regular basis e.g. quarterly, to try and prevent too much deviation from the desired strategic allocation (also rebalancing has proven to add value over the long-term).

For the Fund, we propose the following key principles:

- At a high level, the important rebalancing is between Equities, Diversifiers and Protection assets groupings. **We recommend rebalancing ranges of +5% at each of these grouping levels e,g. for protection assets a range of 10%-20%.**
- Pragmatism is applied. When rebalancing, we propose it is not all the way to the target allocation, instead just moving to half way between central and outer range. This reduces the transaction costs associated with such rebalancing.
- Rebalancing between mandates within these groupings is also relevant, albeit we view its as lower priority. For the underlying equity mandates, we propose ranges of +3% at each fund level. We note that these ranges are large for the smaller allocations, but we believe this is acceptable in terms of total Fund risk.
- For Diversifiers, the DGFs will be used to help balance the total allocation, this may mean that at times, the actual allocation deviates notably from the target. We remain supportive of both of the Fund's managers. We will discuss this with you in more detail at your February meeting.
- For Protection assets, we propose ranges of +3% at each mandate. We also recommend any unallocated cash holdings are included in the Fund's Protection asset allocation

We look forward to discussing this paper with you in February. Once there is agreement we recommend it is turned into a formal investment policy

A summary of key points are included in the first section of this report.

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10 February 2020

For and on behalf of Hymans Robertson LLP

Appendices

Appendix 1 – Current Investment Beliefs

Clear and well-defined objectives are essential to achieve future success – the Committee is aware that there is a need to generate a sufficient level of return from the Fund's assets, while at the same time having a clear understanding of the potential risks and ensuring there is sufficient liquidity available to pay members' benefits as they fall due.

Strategic asset allocation is a key determinant of risk and return, and thus is typically more important than manager or stock selection – the Committee understands that having the appropriate strategy in place is a key driver of the Fund's future success. As a result, priority is given to more strategic investment matters. The Committee is aware that there is need to take investment risk in order to generate a sufficient level of return.

Return and risk should be considered relative to the Fund's liabilities, funding position and contribution strategy – the Committee believes that as the funding position of the Fund improves, the level of risk taken by the Fund should reduce as appropriate i.e. only take as much risk as necessary. The Committee believes that there exists a relationship between the level of investment risk taken and the rate of expected investment return. In reducing risk, the Fund's expected return would typically also reduce.

Long term investing provides opportunities for enhancing returns – As a long-term investor it is important that the Fund acts as an asset owner. As a long-term investor, the Fund may choose to gain additional compensation by investing in assets that are illiquid or may be subject to higher levels of volatility (a premium return is required for any such investments).

Environmental, social and corporate governance ('ESG') issues can have a material impact on the long-term performance of its investments – the Committee recognises that ESG issues can impact the Fund's returns. The Committee commits to an ongoing development of its ESG policy to ensure it reflects latest industry developments and regulations and ESG is integrated into strategic considerations.

Climate change and the expected transition to a low carbon economy is a long-term financial risk to Fund outcomes – the Committee recognises that environmental issues can impact the Fund's returns. The Committee aims to be aware of, and monitor, financially material environmental-related risks and issues through the Fund's investment managers and advisors.

Equities are expected to generate superior long-term returns – the Committee believes that, over the longer term, equities are expected to outperform other liquid assets, in particular government bonds. However the Committee also recognise that equities can be highly volatile over the short-term.

Diversification reduces the overall volatility of the Fund's asset returns – the Committee believes that diversification across asset classes can help reduce the volatility of the Fund's overall asset value and improve its risk-return characteristics. However, the Committee also recognise that there is scope to over diversify and that any desire to diversify needs to be aligned to the Fund's governance arrangements.

Passive management has a role to play in the Fund's structure – the Committee recognises that passive management allows the Fund to access certain asset classes (e.g. equities) on a low-cost basis and when combined with active management can help reduce the relative volatility of the Fund's performance. There is a belief that passive management is most suitable for markets that are deemed as being more efficient such as developed market equities.

Active management can add value but is not guaranteed – the Committee recognises that certain asset classes can only be accessed via active management. The Committee also recognises that active managers may be able to generate higher returns for the Fund (net of fees), or similar returns but at lower volatility, than equivalent passive exposure. There is a belief that active management is most suitable for markets that are deemed as being less efficient e.g. emerging market equities, specialist markets e.g. infrastructure or where views on the relative value of different asset classes are a targeted source of value e.g. DGF mandates.

Private markets can offer opportunities – Private markets can offer opportunities and give higher return due to higher illiquidity premia. However, it is recognised that private markets can be more expensive, less transparent (e.g. fees and drivers of return), increase the Fund's governance burden and require ongoing maintenance to achieve target exposure. Such factors must be taken into account when considering such an allocation.

Choice of benchmark index matters – the Committee recognises that, for each asset class, there is a range of benchmark indices that they could use. As a result, the Committee focus on the benchmark's underlying characteristics and consider how they may be appropriate for the Fund.

Rebalancing policies are important – the Committee recognises that rebalancing the Fund's assets towards the strategic asset allocation is important in achieving the Fund's longer-term objectives, in particular following a period of strong or weak market performance.

Fees and transaction costs matter – The Committee considers the fees and costs of its investment arrangements to ensure the Fund is getting value for money and to minimise, as far as possible, any cost leakages from its investment process. It also does not seek to move in and out of investments regularly due to the cost drag. The Committee also seek to have transparency on the fees that it is paying to its providers.

Governance "budget" matters – The Committee recognises that the resources (and time) involved in deciding upon (and implementing) an investment strategy and structure play a part in any investment decisions made. A low governance approach to accessing markets is likely to be preferred if it can offer similar risk adjusted returns to alternative approaches.

The London CIV is the Fund's preferred approach to implementation – the Committee recognises the potential benefits of LGPS pooling. There preferred route is to implement their investment strategy via the London CIV, subject to carrying out suitable due diligence on the CIV's investment offering.

Appendix 2 – 2018 Investment Strategy Review mapping

<table>
<tr><th></th><th>Style</th><th>Manager</th><th>31/03/2018 Value (£m)</th><th>31/03/2018 Actual allocation (%)</th><th>Current Target Asset Allocation (%)</th><th>Interim Asset Allocation (%)</th><th>Proposed Target Asset Allocation (%)</th><th>Comment</th></tr>
<tr><td rowspan="2">Private Equity</td><td>Fund of Funds</td><td>Capital Dynamics</td><td>64.5</td><td>7.8</td><td rowspan="2">10.0</td><td rowspan="2">5.0</td><td rowspan="2">0.0</td><td rowspan="2">Allocation gradually being unwound. No further commitments to be made. Further work to get indication of timescale for run-off. Continue to include exposure in total equity allocation.</td></tr>
<tr><td>Fund of Funds</td><td>Yorkshire</td><td>0.5</td><td>0.1</td></tr>
<tr><td rowspan="3">Equities</td><td>UK Passive</td><td>LGIM (CIV)</td><td>108.4</td><td>13.1</td><td rowspan="3">45.0</td><td rowspan="3">45.0</td><td rowspan="3">45.0</td><td rowspan="3">Adjust the benchmark to have lower UK allocation and add a proportion of emerging markets. Redeem small cap equities and proceeds invested into passive mandate</td></tr>
<tr><td>Overseas Passive</td><td>LGIM (CIV)</td><td>274.3</td><td>33.0</td></tr>
<tr><td>Small-Cap</td><td>Henderson</td><td>31.6</td><td>3.8</td></tr>
<tr><td rowspan="2">Diversified Growth</td><td>Multi-asset</td><td>Baillie Gifford (CIV)</td><td>75.5</td><td>9.1</td><td rowspan="2">21.0</td><td rowspan="2">18.0</td><td rowspan="2">15.0</td><td rowspan="2">Although DGFs are part of Fund's growth exposure they also provide a degree of exposure to income and protection assets. They can act as "balancing" item for strategic allocation during the period as the income exposure is being built up.</td></tr>
<tr><td>Multi-asset</td><td>Ruffer (CIV)</td><td>48.8</td><td>5.9</td></tr>
<tr><td>Total growth</td><td>-</td><td>-</td><td>603.6</td><td>72.8</td><td>76.0</td><td>68.0</td><td>60.0</td><td></td></tr>
</table>

	Style	Manager	31/03/2018 Value (£m)	31/03/2018 Actual allocation (%)	Current Target Asset Allocation (%)	Interim Asset Allocation (%)	Final Proposed Target Asset Allocation (%)	Comment
Infrastructure	Direct	Alinda	24.9	3.0	8.0	12.0	15.0	Priority is to work towards current target. Investigate scope to commit additional monies e.g. working with existing managers and CIV. Also potential use of secondary market.
	Funds+ Direct	Capital Dynamics	8.4	1.0				
Property	Europe fund-of-funds	Aviva	2.1	0.2	0.0	0.0	0.0	Being wound down. No further commitments
New income mandate	One or more	TBC	0.0	0.0	0.0	5.0	10.0	Potential to add core UK property or other additional income fund via secondary market as initial step
Total income	**-**	**-**	**35.4**	**4.2**	**8.0**	**17.0**	**25.0**	
Fixed Income	Active	Henderson – Total Return	94.1	11.3	15.0	0.0	0.0	Redeem Henderson Fund, not going to be part of CIV.
Fixed Income	Active/ Passive	Recommend LGIM/CIV	-	-	-	15.0	15.0	Recommendation is for proportion c.10% in passive longer duration bonds plus c 5% allocation to multi-asset credit
Cash	Short-dated	In-house	97.0	11.7	1.0	-	-	Remove 1% strategic allocation to cash
Protection	**-**	**-**	**191.1**	**23.0**	**16.0**	**15.0**	**15.0**	**-**
TOTAL	**-**	**-**	**830.2**	**100.0**	**100.0**	**100.0**	**100.0**	-

Appendix 3 – ESS Assumptions

The distributions of outcomes depend significantly on the Economic Scenario Service (ESS), our (proprietary) stochastic asset model. This type of model is known as an economic scenario generator and uses probability distributions to project a range of possible outcomes for the future behaviour of asset returns and economic variables. Some of the parameters of the model are dependent on the current state of financial markets and are updated each month (for example, the current level of equity market volatility) while other more subjective parameters do not change with different calibrations of the model.

Key subjective assumptions are the average excess equity return over the risk free asset, the volatility of equity returns and the level and volatility of yields, credit spreads, inflation and expected (breakeven) inflation, which affect the projected liability and bond returns. The output of the model is also affected by other more subtle effects, such as the correlations between economic and financial variables.

Our expectation (i.e. the average outcome) is that long term real interest rates will gradually rise from their current low levels. Higher long-term yields in the future will mean a lower value placed on liabilities and therefore our median projection will show, all other things being equal, an improvement in the current funding position (because of the mismatch between assets and liabilities). The mean reversion in yields also affects expected bond returns. The impact of the yield reversion assumption is illustrated in the standard results charts that we produce using the model output.

While the model allows for the possibility of scenarios that would be extreme by historical standards, including very significant downturns in equity markets, large systemic and structural dislocations are not captured by the model. Such events are unknowable in effect, magnitude and nature, meaning that the most extreme possibilities are not necessarily captured within the distributions of results.

Given the context of this modelling, we have not undertaken any sensitivity analysis to assess how different the results might be with alternative calibrations of the economic scenario generator.

The returns presented here are time weighted returns over the specified period and are unaffected by the timing of any contributions received or pensions paid over that period. Such returns are, in general, a poor estimator of money weighted returns, which are sensitive to the timing of cashflows.

The probability that a specific asset return will be exceeded will not usually equate to the probability that some funding plan based on this return will be sufficient to meet all the pension payments. Complex interactions between the assets, yields and cashflow timings can mean that the two probabilities are materially different, especially for more mature schemes.

We would be happy to provide fuller information about the scenario generator, and the sensitivities of the results to some of the parameters, on request.