Sustainable Social Housing Maintenance

Phase 1 - Results of a Questionnaire Survey
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Justine Cooper & Keith Jones

Sustainability and Social Housing Maintenance

Results of a Questionnaire Survey

Justine Cooper
Keith Jones

University of Greenwich

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1   BACKGROUND TO THE STUDY

1.1   Introduction

The primary aim of this report is to present the findings of a questionnaire survey into the issues/problems faced by Social Landlords as they seek to improve the quality of their existing housing stock in a way that is environmentally, socially and economically sustainable. The report presents an introduction to this research project and the broader IDCOP research project that it forms a part of and describes the methodology used by the research team in carrying out this work. The report provides a review of the social housing sector and current maintenance practices and issues surrounding environmental, economic and social sustainability. The report addresses two key research questions:

1. Has the sustainability agenda influenced the way that social housing maintenance is perceived, planned and implemented in England and Wales?
2. Are the current practices/toolkits used by maintenance managers conducive to improving the sustainability of the existing social housing stock?

The report concludes that, although sustainability principles are generally understood by those responsible for managing the maintenance of social housing, the current approaches do not fully address the sustainability agenda and that a step change in thinking about maintenance is required if routine improvements are to be made to the sustainability of the existing housing stock. The report provides a theoretical outline of a new maintenance model which has sustainability of the housing stock as its mainstay and details possible toolkits that could support the integration of sustainability into social housing maintenance planning.

1.2   Innovation in Design, Construction and Operation of Buildings for People

"Innovation in Design, Construction and Operation of Buildings for People" (IDCOP) is a multi institutional research programme funded under the Engineering and Physical Sciences Research Council (EPSRC) Sustainable Urban Environment (SUE) Programme. The aim of the IDCOP consortium is to find new ways to improve the performance of building envelopes over the whole building life cycle. The main research focus is to develop innovative solutions in terms of products and processes for maintaining, upgrading and improving existing buildings for the benefit of people. By providing information on occupier behaviour, predictive models can be produced to ensure a reduction in waste, consumption of resources and carbon emissions, whilst improving occupier comfort.

The specific work of IDCOP covers three areas; Façade Technology; Social Housing Maintenance and Refurbishment; and Embedded Sensor Technology and Occupier Behaviour. Within this programme of work the Social Housing section has examined the problems associated with the current maintenance process and has focussed on; the impact stakeholders have on decision making; what is achievable in terms of environmental and quality of life improvements for the various levels of maintenance funding strategies available; the impact that current initiatives (Decent Homes Standard and EcoHomes etc) have on priority setting, and, if priorities set by political agendas reflect the true sustainable issues that face social housing providers. This report focuses on a sub-section of the Social Housing work by considering how sustainable current maintenance practices are and identifying areas for improvement and re-design to the maintenance process that are required to reduce waste and achieve long term social, economic and environmental benefits. This report (the first of 3) presents the findings from the first phase of this process, to assess the generic issues / problems faced by Social Landlords as they attempt to implement a sustainability agenda. To this end a postal questionnaire survey was used to ascertain the views / opinions of those working directly in social housing maintenance. The report summarises the findings of the questionnaire survey.

2 THE UK SOCIAL HOUSING STOCK

2.1 The Social Housing Sector

According to the English House Condition Survey (EHCS) 2005 headline report there are approximately 22 million homes in England. There are approximately 3.9 million (17.9%) properties within the social sector, of which 2.1 million (9.5%) are owned by Local Authorities (LA) and 1.8 million (8.2%) are owned by Registered Social Landlords (RSL). That leaves 70.2% which are owner occupied and 11.9% which are rented from private landlords. The social housing stock is relatively old with just over 50% of it being constructed prior to 1965 compared to approximately 60% of the privately owned stock.

Only about 1% of UK's housing stock is replaced each year according to the UK Foresight Report, Constructing The Future (DTI 2001) and by 2050, two thirds of the stock will comprise houses that exist today. Therefore if the built environment is to address the changing needs of society in a more sustainable manner the construction (housing) industry will have to work, to a large extent with existing stock. The Foresight report recognised the rapid and unprecedented change the construction industry will experience over the next 20 years and proposed an integrated approach be taken throughout the construction process. The recommendations within the report; promote smart buildings; improve health and safety; enable supply chain integration; invest in people; improve existing built facilities; exploit global competitiveness; embrace sustainability; increase investment returns and plan ahead; should be not be viewed in isolation but used in a collective manner. These considerations provided the context for this study.

2.2 Quality of the Housing Stock

There have been concerns' regarding the condition of UK social housing since the 1980's when a combination of low management and maintenance allowances, unwillingness to raise rents to match repair needs and restrictions preventing the cross subsidisation of Housing Revenue Account (HRA) from general funds, resulted in large repair backlogs. (DETR, 2000). By 1996 the repair backlog had reached £19 billion for England alone (DCLG, 2000).

In 2000, in response to these concerns the UK Government committed itself to a target where all social housing would be decent by 2010. In this context decency was outlined in The Decent Home Standard (DHS)[1]. In 2004 this target was extended to include 70% of private sector dwellings occupied by vulnerable households (ODPM, 2004). There have been improvements in levels of decency across all tenures since 1996 but the greatest improvements have been made within the social sector and there is now little difference in the rates of non-decency between the social and private sectors. In 1996 42.6% (6.8 million) of all private accommodation and 52.6% (2.3 million) of all social accommodation was non-decent. In 2005 the levels of non-decent housing had reduced to 26.4% (4.76 million) of all private accommodation and 28.7% (1.1 million) of all social accommodation (EHCS, 2006).

The definition of what constitutes a Decent Home was amended by the DCLG in 2006 to reflect the Housing Health and Safety Rating System (HHSRS). A home is now considered decent if it meets: all components of the HHSRS; Disrepair; Modern Facilities; and Thermal Comfort criteria.

The HHSRS is a statutory instrument that places a legal obligation on landlords to ensure that their housing does not pose a danger to those who occupy it. It supersedes the fitness standard, being first introduced in England in the 2004 Housing Act and implemented from the 6th April 2006. The system focuses on physical causes of accidents, "based on the risk to the potential occupant who is most vulnerable to that hazard" (DCLG 2006) ensuring that a dwelling is "able to supply the basic needs for the everyday life of the range of households who could normally be expected to live there" and which "should not contain any deficiency that might give rise to a hazard which interferes with, or puts at risk, the health and safety … of the occupants". Twenty nine hazards are assessed under the headings physiological requirements, pollutants, psychological requirements, protection against infection and protection against accidents. When completing a HHSRS assessment the inspector is required to consider two judgements; the likelihood of an occurrence that could harm an occupant and the potential outcomes of such an occurrence, both of which are included in the HHSRS Formula together with the weighting / class of harm. The class of harm is made up of four categories, 1 is Extreme, 2 is Severe, 3 is Serious and 4 is Moderate. A house is deemed to have failed the HHSRS test if it contains 1 or more Category 1 criteria.

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[1] According to the UK government, 'A decent home is one which is wind and weather tight, warm and has modern facilities'.

A home is considered to have failed the Disrepair criteria if either:
- One or more of the key building components (e.g. wall structure, roof structure, plumbing) are old (older than its standard lifetime) and, because of their condition need replacing or major repair; or
- Two or more of the other building components (e.g. those which have a less immediate impact on the integrity of a dwelling) are old and, because of their condition, need replacing or major repair.

A home is considered to have failed the Modern Facilities criteria if it lacks three or more of the following:
- A reasonably modern kitchen (20 years old or less);
- A kitchen with adequate space and layout;
- A reasonably modern bathroom (30 years old or less);
- An appropriately located bathroom and WC;
- Adequate insulation against external noise (where it is a problem); and
- Adequate size and layout of common areas for blocks of flats

A home is considered to have failed the Thermal Comfort criteria if it does not have effective insulation and efficient heating. "A SAP 2005 rating of 35 has been established as a proxy for the likely presence of a Category 1 Hazard from excess cold" (DCLG, 2006) and loft insulation of 50mm has been established as the level at which action is triggered.

In 1996 the EHCS reported a total of 2,318,000 social dwellings as non-decent with the cause of non-decency; Thermal Comfort 83%; Unfitness (now replaced by the HHSRS) 15%; Modern Facilities 19%; Disrepair 18% (Note: the total exceeds 100% as individual dwellings may fail more than one criteria). In 2005 the number of non-decent social dwellings had reduced to 1,162,000 with failure due to thermal comfort being the greatest cause with 712,000 (failure due to thermal comfort only) properties affected. However in 2006, following the introduction of the HHSRS, the total number of non-decent housing had still fallen; to 1,131,000 and thermal comfort amongst social housing was still the greatest cause with 58.7% (781,000) but looking at the total housing stock, the HHSRS was the reason for most failures with 58.7% (4,752,000), closely followed by thermal comfort with 50.6% (4,099,000) (EHCS 2006).

The mechanisms to improve the quality of UK social housing vary depending on the legal status of the landlord. RSLs are 'not for profit' housing providers of social housing registered with the Housing Corporation and run by a committee or board of volunteers (in the case of new Housing Associations, at least one third of their board or committee must consist of tenant representatives). The Housing Corporation's regulatory code requires RSLs to achieve the DHS by 2010, unless specific extensions have been negotiated. RSLs are able to borrow money from banks and building societies to bring their housing up to a decent standard, this money can also be used to regenerate local neighbourhoods and the wider area. However this same funding has not been made available to LAs who wish to retain their stock but are unable to achieve the Decent Homes target (as the Government is keen to separate out the strategic and day-to-day management of housing stock). Instead a new financial framework has been developed for LAs to
- Devolve management of stock to an Arms Length Management Organisation (ALMO). The LA still owns the stock but it is managed by the ALMO which is a quasi private company. The ALMO programme (DCLG) "provides additional resources towards the cost of achieving the Decent Homes target to councils who set up ALMOs" which are then assessed to be Good (2*) or Excellent (3*). (this funding is additional to the LA existing resources); or
- Participate in Private Finance Initiative (PFI) where a private sector organisation takes control of the administration and management of the stock which is still owned by the LA; or
- Transfer all or part of stock to RSL.

It should be noted that:
- Total Government allocations to ALMOs 2002 – 2007 was £2.8 billion
- Total funding for ALMOs during the period 2008-2011 has been confirmed at £2.4 billion
- Allocation of further funding for ALMOs carrying out a wider remit including that of regeneration and the provision of affordable housing is dependent upon their governance by the Local Authority as they are unable to retain the income received from rents or council house sales.

Finally, whilst improvements in the quality of UK social housing have occurred as a result of the introduction of the DHS, it is not clear how these improvements have impacted the sustainability agenda. In essence the DHS is a minimum standard that triggers action against a pre-set range of criteria. However, these standards were not developed from the sustainability agenda and, whilst some of the criteria have obvious links to the sustainability debate (e.g. thermal comfort), others are more questionable (e.g. modern facilities). As such it could be argued that, whilst the DHS has stimulated improvements in the quality of UK social housing, it has done so without due considerations to the wider sustainability debate.

2.3   Environmental, Economic and Social Sustainability

A widely used and accepted international definition of sustainable development is that provided by Brundtland (1987) 'development which meets the needs of the present without compromising the ability of future generations to meet their own needs' and over the last 20 years there has been a growing realisation that we are not living within our means and are placing a great burden on the planet.

A set of five principles have been agreed by the UK Government, Scottish Executive, Welsh Assembly Government and the Northern Ireland Administration which provide the basis for a sustainable development policy within the UK. These 5 principles, which must be taken into consideration if a policy is to be sustainable, are:

- Living Within Environmental Limits. Respecting the limits of the planet's environment, resources and biodiversity – to improve our environment and ensure that the natural resources needed for life are unimpaired and remain so for future generations;
- Ensuring a Strong, Healthy & Just Society. Meeting the diverse needs of all people in existing and future communities, promoting personal well-being, social cohesion and inclusion, and creating equal opportunity for all;
- Achieving a Sustainable Economy. Building a strong, stable and sustainable economy which provides prosperity and opportunities for all, and in which environmental and social costs fall on those who impose them (Polluter Pays), and efficient resource use is incentivised;
- Using Sound Science Responsibly. Ensuring policy is developed and implemented on the basis of strong scientific evidence, whilst taking into account scientific uncertainty (through the Precautionary Principle) as well as public attitudes and values;
- Promoting Good Governance. Actively promoting effective, participative systems of governance in all levels of society – engaging people's creativity, energy, and diversity.

To support the UK Government Sustainable Development Strategy and to focus attention, 68 national sustainable development indicators have been set up, 20 UK framework indicators and 48 indicators which represent priorities relevant to the UK Government Strategy. All of the indicators fall into one or more of the following areas which have been identified as priority areas for immediate action (SD, 2007):

- Sustainable consumption and production. To live within our means we need to change the way we design, produce, use and dispose of products and services so that we achieve more with less.
- Climate change and energy. Whilst there may be disagreement about increased emissions levels and temperature change scenarios, it is now recognised and accepted that Climate Change is happening and is the greatest global, environmental challenge currently being faced. There is also general agreement that the primary cause of climate change is the release of greenhouse gases, such as carbon dioxide and methane, into the atmosphere by human activity
- Natural resource protection and enhancing the environment. "Natural resources are vital to our existence. Our health and well-being are closely linked to the quality of our air, water, soils and biological resources. Our economy and key industrial sectors are directly and indirectly reliant on functioning ecosystems.".
- Creating sustainable communities and a fairer world. By providing places where people want to live and work it is hoped that the cycle of degradation and poverty will be broken and the lives of those living in deprived communities and socially excluded groups will be improved.

The built environment is central to achieving sustainable development as it impacts the environmental, social and economic aspects of sustainability. A selection of ways the individual property impacts sustainability is as follows;

- Currently the UK's energy consumption attributable to domestic buildings is 27% of which 53% is as a result of space heating, 20% water heating, 6% lighting, 16% appliances and 5% cooking (Building a greener future: towards zero carbon development – DCLG consultation paper March 2007)
- The material requirements and waste production involved in the building of 100 houses includes for example 156,842 block, 694,500 bricks, 2,700m^2 of glass, 2,600m of reinforcing bar and 1,200m^3 of spoil. The environmental impact of materials should be considered from all stages of its lifecycle, from extraction, transportation, manufacturing/processing, construction, maintenance and eventual demolition. At all these stages high quantities of energy and water are used, huge amounts of waste is created as well as pollution to the air, water and land. More than 90% of the non-energy minerals extracted in the UK are supplied as building materials, 82% of which are aggregates.
- In certain places within the UK, notably the southeast, annual rainfall does not meet the annual extraction rates to supply our homes with water. We are also using more water per person than previously. Twenty years ago the average person used 140 litres a day, this has risen to 163 litres and is expected to rise by a further 20 litres in 20 years time.

There are a number of existing and announced policies impacting the building fabric and affecting domestic energy efficiency:

- Kyoto protocol 1997 target of 5.2% reduction in CO_2 emissions;
- EU committed to achieve 20% reduction in greenhouse gas emission by 2020 (compared to 1990 levels) which could become 30% as part of a global, post 2012 treaty;
- EU Energy Performance of Buildings Directive 2002 – requires all member states to achieve a minimum energy performance targets for buildings;
- Climate Change Bill proposes unilateral carbon dioxide reduction target of 26-32% by 2020 and 60% by 2050;
- 2006 pre budget report – policy targets that all new homes should be zero carbon by 2016
- Improvements to Part L of building regulations (4/2006) plus Home Information Packs will provide an indication of energy performance of houses sold;
- 2007 – pre budget report proposes exempting investing in micro-generation from business rates;
- Code for sustainable homes;
- Green mortgages and other financial incentives;
- Current consultation on draft strategy for sustainable construction;
- Warm Front.

In order for the 2050 target to be met the existing building stock must capitalise on energy efficiency and the installation of low and zero carbon technologies. There are two inter-related issues that need to be considered: physical improvements to the performance of existing homes; and changes to lifestyle to support sustainable living. A Review of The Sustainability of Existing Buildings (DCLG, 2006) concludes "that a substantial reduction in carbon emissions can be made by introducing cost effective technology that can make substantial savings for consumers on their fuel bill." However, lack of information and high upfront costs are still barriers to the implementation of many technologies and Government is looking to address these issues via policy development and will look at measures to promote greater energy efficiency and more sustainable buildings. In Securing the Future (HMG, 2005) the Government recognise the importance that people's lifestyle and behaviour have on carbon emissions and commits to greater community engagement; deliberative forums to help people live more sustainable lifestyles; investigating ways in which stakeholders can influence decision making; new commitments to support education and training in sustainable development and evaluation of key environmental taxes. Whilst procedures have been put in place to address these issues for new social housing (the Code for Sustainable Homes), no consideration has been given to how these issues can be addressed through the maintenance regime of the existing social housing stock.

2.4   Current Maintenance Practice in Social Housing

Maintenance ...."work undertaken in order to keep, restore or improve every facility, its services and surrounds to a currently acceptable standard...." (CIOB 1990)

A Stock Condition Survey (SCS) is central to the decision making process in the traditional way of identifying social housing maintenance needs (Figure 2.1). The survey is effectively a snapshot of the physical condition of the housing stock at a particular point in time and is used to develop the stock condition profile model. The model uses the four categories of the Decent Homes Standard (DHS) amongst other requirements to predict maintenance demand and the ensuing maintenance budget for the coming 25-30 year, although a rolling 12 month budget is also used. Maintenance demand is predicted using data relating to the length of time remaining before a component fails/requires maintenance. Budgetary constraints and specification standards (e.g. legislation) are applied to the demand profile upon which maintenance options and risk assessments are made to ensure that the housing stock remains viable over the period until the next refurbishment stage. Algorithms are applied to the demand model having a smoothing effect on the 25-30 year maintenance budget for cash flow purposes and to programme interventions against alternative maintenance strategies (e.g. responsive; planned maintenance etc).

There are a number of well documented problems with the model just described. Whilst organisational policies are assumed to drive the maintenance planning process it is not unusual to find that the policy objectives are unclear or that the organisations strategic objectives are not linked to its maintenance programmes.

In the past, maintenance priorities have generally been determined by what could be afforded and not by the needs of the building stock (Bowles, 1997), and for most organisations maintenance is still viewed as a necessary evil and a cost burden (Moua & Russell, 2001). So not surprisingly, as maintenance budgets fluctuate in response to the economic conditions of the day it usually results in maintenance works being conducted to the barest minimum standard resulting in no improvement being made to the quality of housing stock.

There are well documented issues relating to the effectiveness and efficiency of the stock condition survey process as the basis for developing planned maintenance programmes (O'Dell, 1996; Chapman, 1999). Chapman (1999) identified: poor specification of initial requirements; unclear aims and objectives and inappropriate frameworks; an inability to predict long term cost requirements; variations in levels of experience of those conducting surveys; unrealistic claims by consultants selling survey services; inappropriate or unusable data; poor links to organisational objectives; and a lack of fit of survey data to maintenance programmes as the key factors that contributed to high levels of dissatisfaction of the approach amongst social landlords. Chapman also identified the gap between clients' expectations of maintenance models and the limitations of the logic underpinning the stock condition survey process, acknowledging that the latter could at best provide short term predictions of maintenance costs, but was unable (in its current form) to effectively inform long term maintenance planning. The stock condition survey still has fundamental problems despite its continued use as a method of collecting data upon which long term maintenance programmes are determined and despite attempts to improve the process (Straub, 1998; Damen & Quah, 1998; Jones et al, 1999).
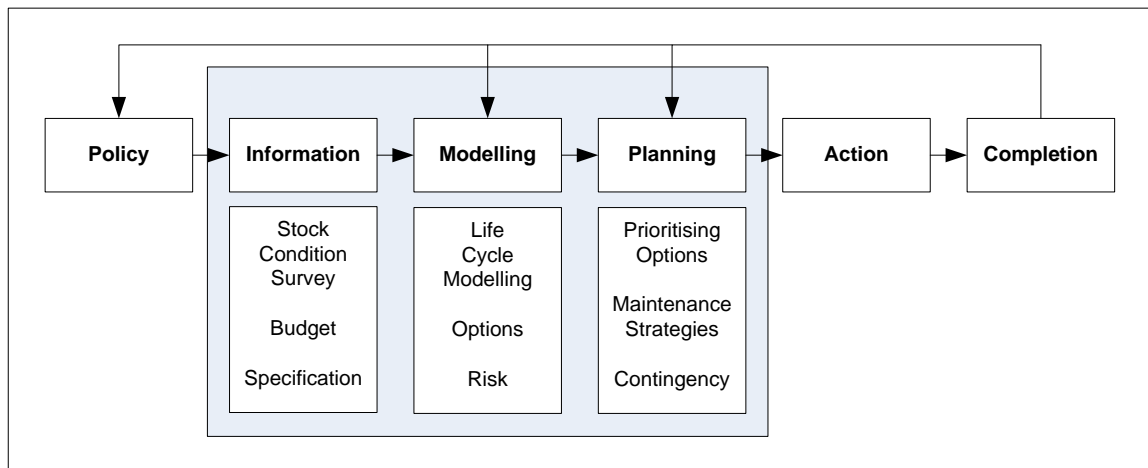
Figure 2.1 The Built Asset Maintenance Process Model
(source: adapted from Wordsworth, 2001)

Due to resource constraints the maintenance requirements highlighted in the demand model invariably exceeds the resource available. In this instance the maintenance manager must prioritise works to be carried out within the budget of any given year, however Shen & Lo (1999) point out that current prioritisation methods are "not adequate to allocate limited resources for items in urgent need" because firstly, "since subjective elements can easily be introduced into the decision-making process, it is difficult for maintenance managers to justify their decisions on the priority assigned to a particular maintenance item" and secondly the cut off line between the current programme and the backlog generally falls within a priority category. Therefore it is difficult to determine which items belong in the current programme and which in the backlog. (Shen et al, 1998).

Finally, the Building Asset Maintenance process implies that a feedback loop is in place when in reality, this rarely is the case and as a result lessons are not learnt and mistakes keep reappearing within the design process (Arditi & Nawakorawit, 1999).

Given the limitations of the above approach, and the apparent lack of fit of the DHS to the UK sustainability agenda, it must raise questions as to whether maintenance plans developed through such a model will ever deliver the improvements in sustainability being sought by the UK Government. This question formed the basis of the current questionnaire survey.

2.5   Details of the Questionnaire Survey

The questionnaire survey aimed to identify the issues/problems faced by Social Landlords as they seek to improve the quality of their stock in a way that is environmentally, socially and economically sustainable. In particular the survey sought to identify:
- The extent to which current maintenance practices are perceived to contribute to improving the sustainability of existing social housing;
- The impact that the DHS and the sustainability agenda has had on maintenance priorities and to assess whether these are perceived to have had a positive or negative impact on the sustainability of the existing social housing stock;

- The usefulness of the existing toolkits used by maintenance mangers in developing maintenance plans that deliver improvements to the sustainability of social housing;
- The extent to which the maintenance process, both planned and reactive, can be used as a means to improve the sustainable performance of the existing UK social housing stock;

The outcome was to identify gaps in current practice and suggest improvements that could result in routine maintenance being used to plan improvements in the sustainability of existing social housing.

A self-administered questionnaire (comprising of 5 sections: organisation details; stock profile; housing maintenance; quality; and sustainability strategy) was developed and piloted to 43 RSLs and 56 LAs who still maintained responsibility for the maintenance of their housing stock. The pilot questionnaire was sent to either the Chief Executive or Maintenance Manager of randomly selected organisations on the 17th August 2006, and respondents were given until the 2nd October 2006 to reply. A reply paid envelope was included with the questionnaire. Once the deadline was reached chase up letters were not issued, although late responses were accepted and the data included in the results. Eighteen questionnaires were returned of which 9 were completed, 5 from LAs and 4 from RSL's. This represents a response rate of 9%. The main reasons for none completion were that the organisation did not undertake maintenance planning (many RSLs were part of a group structure with maintenance being dealt with at the group level) or for LAs they had transferred their stock to an ALMO and as such no longer dealt with maintenance issues) or that as a matter of policy they didn't participate in questionnaire surveys. Greater success rates appeared to be from those questionnaires issued directly to the Chief Executive. For the main study all questionnaires were sent to the Chief Executive and only Parent (lead RSLs in group structures) RSLs were targeted.

With regards to the appropriateness of the questionnaire, initial analysis confirmed that:
- The primary decision making tool was the stock condition survey, however, other measures were also being used which appear to indicate a move towards a variety of decision making tools including performance based tools such as SAP 2001 etc;
- Sustainability at the moment was having little impact on what RSLs and LAs do but they appear to understand the importance of a range of issues covering Environment, Social and Economic;
- All respondents agreed that sustainability of their maintenance strategy could be improved and rated a range of factors which they believed should be included in a sustainable maintenance system;
- Sustainability was not currently monitored

Following the pilot study the questionnaire was amended to correct clerical errors and to reflect textual comments made by respondents, including lack of resources as an option for internal barriers to more sustainable practices and making requests for ratings clearer and 2 versions were developed to reflect the different operating circumstances of RSLs and ALMOs / LAs. The questionnaire was modified slightly prior to being distributed to the LA/ALMO. These modifications included; a request for examples of historical data collected to identify maintenance trends; if stock condition surveys are carried out in-house; in-house labour criteria for procurement of RM and PPM work and to provide examples of tenant engagement regarding energy use and other sustainability issues. The final questionnaires are given in Appendix A.

3 MAIN QUESTIONNAIRE SURVEY

Self-administered postal questionnaires were distributed to all Parent RSLs who's Chief Executive's name was known (published on the housing net website), all LAs who maintained responsibility for the maintenance of their housing stock and all ALMOs, throughout England and Wales. In this way the largest organisations would be targeted and the results would be based upon a greater percentage of the total social housing stock. Five hundred and sixty four RSL questionnaires were distributed on the 26th October 2006, with respondents asked to reply by the 1st December 2006. Two hundred and one postal questionnaires were issued to LAs and ALMOs within England and Wales on the 18th 29th and 30th January 2007 with subsequent response dates of the 16th and 23rd February 2007 and 2nd March 2007. Thank you letters were issued to respondents upon receipt of the completed questionnaires. Once the response dates were reached chase up letters / e-mails were issued. All returned questionnaires were included in the results regardless of when they were received. In total, 95 completed questionnaires were returned which represents a response rate of 12.4%. This was slightly better than in the pilot study.

Initial analysis of the quantitative data was carried out for each type of social landlord (RSL, LA, ALMO) and summary reports were sent to all those who had responded. This was done with the express purpose that those organisations participating in the interviews would have the results of the initial survey before the interviews were held. Follow up interviews were held with a selection of Maintenance Managers and Chief Executives within the North West, Midlands, Humberside, Greater London and the Home Counties representing all three types of social landlords. The results from these interviews will be reported in a subsequent research report (to follow).

Full quantitative analysis of the questionnaire data was undertaken using the statistics software SPSS. A single data file was compiled and used to generate all the statistics quoted in this report. The qualitative data was analysed using a modified form of content analysis. The following sections summarise the results of the questionnaire survey.

3.1 Detailed Survey Results – Organisational Details

Breakdown of Respondents

Figure 3.1 provides a breakdown of the proportion of responding social landlords by their management structure. At the time of the survey, in England and Wales there were approximately 1900 RSLs (Parent organisations), 125 LAs who still owned and managed their own housing stock and 76 registered ALMOs. Questionnaires were sent to 564 RSLs (whose Chief Executive details were published on the Housing Net). From these, 63 completed questionnaires were received which is a response rate of 11%. Questionnaires were sent to all LAs and ALMOs with 19 and 13 completed questionnaires received respectively which are response rates of 15% and 17%. Thus, whilst RSLs represent the greatest number of returns by volume, those from LAs and ALMOs represent the largest proportion of their respective populations.
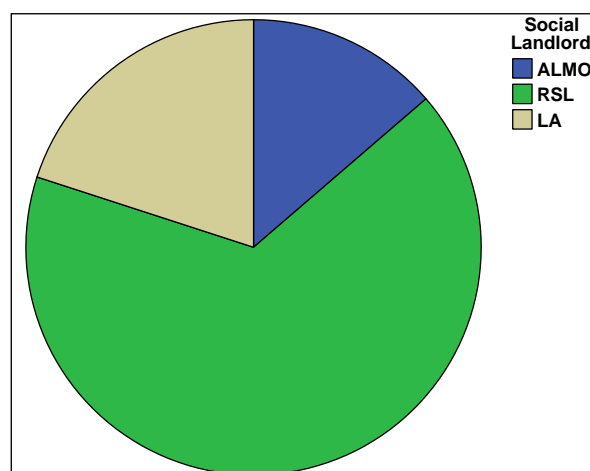
Figure 3.1 Breakdown of Respondents

Primary Activity of Respondents Department

Ninety two of the 95 respondents confirmed that they worked in a department where one of the main activities was the repair and / or maintenance of dwellings which suggests that the questionnaire reached its intended audience. Of the 3 remaining respondents, 2 said that they did not work in such a department and the 3rd failed to respond to this question. The 2 who did not work in a department where repair / maintenance of dwellings was one of the main activities, confirmed that they were responsible for the management of maintenance / repair of the organisations stock portfolio. One was a LA landlord and the other a RSL, and both were relatively small housing providers with between 1001-5000 and 0-1000 properties, respectively in their stock portfolios and this may indicate that the organisations in question were not departmentalised. The respondent who failed to complete this question also failed to complete question 1.3 and was an assistant completing the questionnaire on behalf of others within an ALMO.

Eighty nine of the 95 respondents confirmed that they were personally responsible for the management of the maintenance / repair of their organisations housing stock. Two respondents did not work in such a department

and 3 failed to respond but confirmed that they also worked in a department where one of the primary activities was the repair and / or maintenance of the organisations housing stock. This could simply be an indication that the questionnaire was completed by members of the team lower down the hierarchy.

Summary
On the whole it would appear that the questionnaire was completed by its intended audience.

3.2   Detailed Survey Results – Stock Profile

Size of Housing Stock Portfolio
Figure 3.2 shows a breakdown of respondents by the number of dwellings they had in their stock portfolio and shows that, whilst LAs were fairly evenly distributed across a range of stock sizes, RSLs generally had small stock portfolios (10,000 properties and less) and ALMOs larger stock portfolios (5000 properties or more). This trend was expected as ALMOs have been developed to take over the management of LA housing stock to ensure the governments 2010 Decent Homes target is met and LAs have traditionally had large stock portfolios.
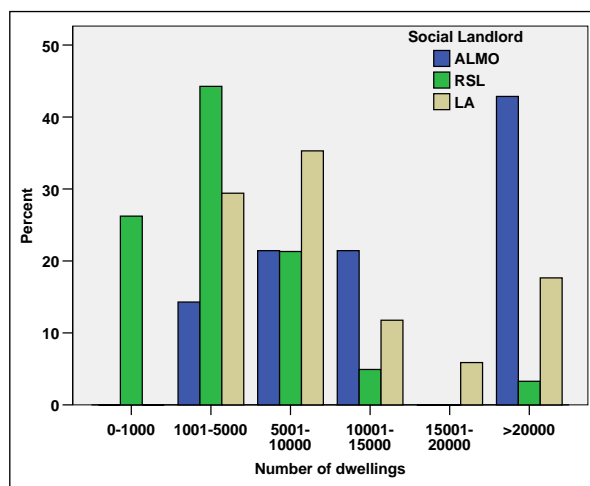
Figure 3.2 Size of Housing Portfolio

Since 2002 the English House Condition Survey has been run on a continuous basis with the latest published report (2005) based on fieldwork carried out between April 2005 and March 2007. The EHCS 2006 headline report states that there are approximately 22 million homes in England. There are approximately 3.9 million (17.7%) properties within the social sector, of which 2.1 million (9.5%) are owned by LAs and 1.8 million (8.2%) are owned by RSLs.
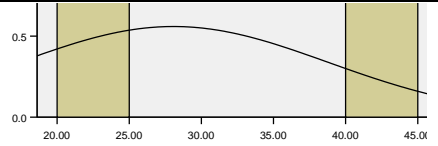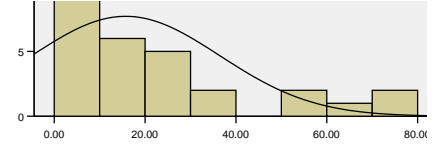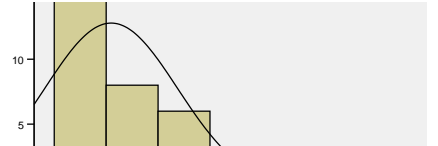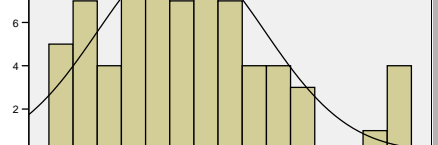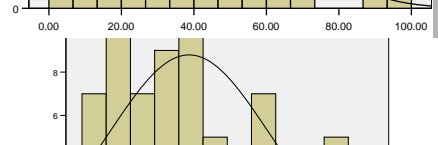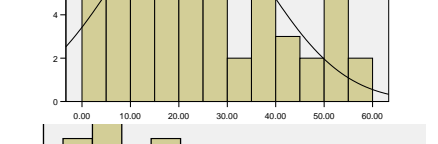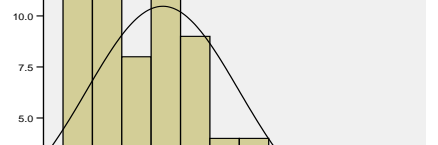
Whilst the questionnaire didn't ask landlords to provide an exact figure for the number of dwellings owned/managed by their organisation, through a review of information available on the internet and from the Housing Net database, it has been estimated that: the RSLs who responded to the survey (within England) were responsible for a total of 266,846 properties, which represents approximately 14.5% of the total RSL housing stock in England; the LAs who responded to the survey were responsible for 248,256 properties and ALMOs for 237,005 properties which together represents 23.1% of the total LA owned stock in England. Thus the respondents to the survey manage between them approximately 19% of the total social housing stock in England and as such it can be assumed that results of the survey provide a good reflection of the current social sector property profile in England. (note. The above figures are approximations as the EHCS is based on 2006 data and the questionnaire survey is based on 2007 data).

Breakdown of Housing Stock by Dwelling Types
Table 3.1 provides a breakdown of respondents by the number of different types of dwelling they had in their stock portfolio. The 'Number of respondents with property' column represents the number of landlords who had a particular type of dwelling, the 'Min % of stock type' column represents the landlord with the smallest percent of a particular dwelling type within their portfolio, the 'Max % of stock type' column represents the landlord with the largest percent of a particular dwelling type within their portfolio, the standard deviation has been calculated for each dwelling type and the corresponding distribution profile drawn. The x-axis represents percentage bands, the y-axis a count of the number of respondents with properties within each band. The highlighted row shows that the most common dwelling type was the purpose built low rise flat, with 80 out of the 95 respondents holding such dwellings in their portfolio. The distribution of purpose built low rise flats ranged from 0.5% to 100% of the stock portfolio with an average of 36.5% of a respondents stock comprising of purpose built low rise flats. The next most common dwelling type is the semi detached house which contributes to the stock profile of 68 out of the 95 responding organisations.

Overall it appears that those social landlords who responded to the survey have a variety of dwelling types within their stock portfolio.

Table 3.1 Dwelling Types Owned / Managed by Respondents

Dwelling Types	Number of respondents with property type	Min. % of stock type	Max. % of stock type	Mean % of stock type	Std. Dev.	Profile
Flats (General)	3	20.00	40.20	28.07	10.70	
Flats (Converted)	40	.33	80.00	15.73	20.71	
Purpose High Rise Flats	41	.33	64.00	10.96	12.79	
Purpose Low Rise Flats	80	.50	100.00	36.51	23.04	
Terraced Housing	71	.70	60.00	22.11	16.10	
Semi Detached Housing	68	.33	80.00	22.64	17.27	
Detached Housing	45	.01	10.00	2.03	2.67	
Bungalows	70	.33	72.00	11.86	13.01	
Other	1	1.00	1.00	1.00		.

According to the EHCS 2005 there are a total of 3.9 million properties for social rent within England of which 1.7 million are flats and 2.2 million are houses, a split of 44%/56% between flats and houses.

Figure 3.3 shows a similar percentage split between flats and houses for the respondents to the survey, RSLs (47%/53%) and ALMOs (43%/67%) had more houses than flats whilst LAs (53%/47%) had more flats than houses. This could suggest that at present some of the more difficult stock to maintain still resides with LAs.
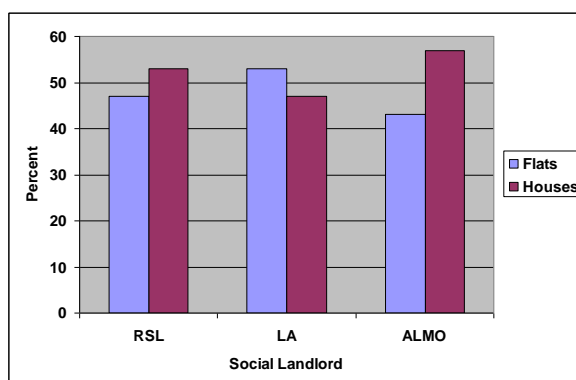
Figure 3.3 Breakdown of Flat/Houses by Type of Landlord

Age of Housing Stock

Figure 3.4 shows a breakdown of respondent's property age profile. The most common age groups for social housing owned by LAs was 1945-1964, for ALMOs was 1945-1964 (although the percentage for 1965-1980 was very similar), and for RSLs was post 1980. With regards to the age distribution of portfolios: There appears to be a similar pattern of distribution amongst all three types of landlords for the age groups 1919-1944, 1945-1964 and 1965-1980. RSLs had a higher proportion of properties constructed post 1980 compared to LAs and ALMOs. This could be because RSLs were able to gain funding to

Figure 3.4 Breakdown of Housing Stocks by Age

develop their own housing whereas LAs were restricted by funding mechanisms. ALMOs have the option to develop their own housing if they are on the Housing Corporations preferred list, however their primary purpose is to ensure that current housing meets the DHS by 2010. RSLs also had a higher proportion of properties constructed pre 1919. This could be as a result of large scale stock transfers from LAs to RSLs.

Table 3.2 provides a breakdown of the social housing sector by the age of its dwellings (EHCS, 2005). Comparing the pattern from Table 3.2 with the data presented in Figure 3.4 it is clear that the survey data has a similar trend to the national statistics.

Table 3.2 Dwelling Age as Provided by the EHCS 2005

					numbers of dwellings ('000s)	
Dwelling Age	LA Owned		RSL Owned		Total Social	
Pre 1919	106	2.7%	186	4.7%	292	7.3%
1919 – 1944	362	9.1%	151	3.8%	513	12.9%
1945 – 1964	811	20.4%	421	10.5%	1232	30.9%
1965 – 1980	738	18.5%	477	12.0%	1215	30.5%
Post 1980	149	3.7%	582	14.6%	731	18.4%

Occupancy level

The mean value of our sample whose properties were vacant was 3.4% which corresponds well with the current national average vacancy levels (4%) reported in the EHCS 2005.

Summary

Thus, from the comparisons presented above it would appear that the respondent's property portfolios are generally representative of current social housing landlords in England. As such the results from the survey can be considered indicative of the social housing sector in England.

3.3   Detailed Survey Results – Maintenance Practice

Value of Maintenance

Figure 3.5 shows the breakdown of respondents by the annual value of their maintenance work, with RSLs tending to spend £10 million and less per year whilst ALMOs and LAs are more likely to spend £5million or more per year.

Cross tabulation between the size of the stock portfolio and annual maintenance spend shows a statistically very strong association between portfolio size and maintenance with a Chi-square value of 132.78 which equates to an association of greater than 99% (with 15 degrees of freedom)
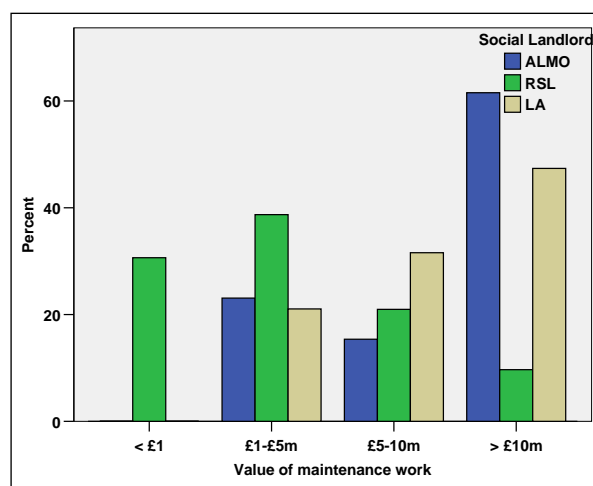
Figure 3.5 Annual Value of Maintenance Work

Table 3.3 provides a comparison between the mid points of the 'value of maintenance' and 'size of stock portfolio' and shows that, whilst maintenance spend per property varies considerably from £200 to £6,000, the average spend per property of £800 (based upon the total annual maintenance spend (£490 million) divided by the total stock (612,000 -using the mid points for each as below) is slightly lower than expected (in comparison to UK norms.)

An average annual spend / property of £6000 (1 respondent) appears high in comparison to the other social landlords. However, this is most likely due to the high DHS achievement rate of this organisation (99%), resulting from an extensive maintenance programme coupled with the recent completion of a 17 year major repairs programme costing around £12 million for an organisation with approximately 700 dwellings. This example has been calculated using the total maintenance expenditure and the total number of social housing dwellings, but not all dwellings will be maintained at any one time.

Table 3.3 Estimate of Average Maintenance Spend Per Property

Stock Portfolio Size	Mid Point of Stock Portfolio Size	Annual Maintenance Value	Mid Point of Annual Maintenance Value	No. of Cases	Spend / Property
0-1000	500	<£1m	£500k	15	£1,000
		£1-£5m	£3m	1	£6,000
1,001-5,000	3,000	<£1m	£500k	3	£167
		£1-£5m	£3m	23	£1,000
		£5-£10m	£7.5m	8	£2,500
5,001-10,000	7,500	£5-£10m	£7.5m	11	£1,000
		>£10m	£10m	5	£1,333
		£1-£5m	£3m	6	£400
10,001-15,000	12,500	£1-£5m	£3m	1	£240
		£5-£10m	£7.5m	2	£600
		>£10m	>£10m	5	£800
15,001-20,000	17,500	>£10m	>£10m	1	£571
>20,000	>20,000	>£10m	>£10m	10	£500

Note. The mid point for stock portfolio size >20,000 was taken as 20,000 and the mid point for costs >£10 million were taken as £10 million.

The average cost to make a dwelling decent (EHCS, 2005) was £3,883 for LAs and £2,905 for RSLs. Costs to make a dwelling decent was dependent upon the criteria of failure, LA housing failing due to thermal comfort only was reported in the EHCS 2005 as costing £1,272 whilst failure due to other criteria was reported as costing £7,290, respective figures for RSLs are £1,109 and £6,923. Overall, the average maintenance spend from respondents is similar to UK norms.

Maintenance Budgets

Figure 3.6 shows a breakdown of the criteria used by the respondents when establishing their maintenance budgets with property inspection remaining the most common method for all three types of social landlord. This is followed by previous years spend, then previous years budget (except for LAs where these are reversed) and finally other. ALMOs and LAs 'other' consisted of 'agreed with tenants', councillor concerns and 'LA capital and HRA allowance'. RSLs 'other' consisted of 'a combination of previous years spend and property inspection', 'asset management software forecasts', 'resident consultation', 'major repair', 'formula approach to responsive, and planned programmes.
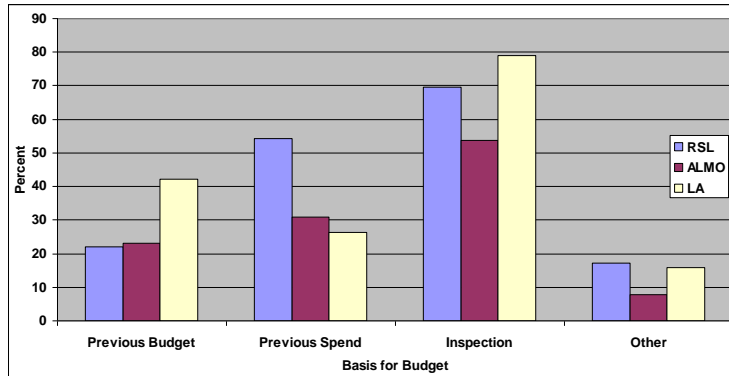
Figure 3.6 Basis for Maintenance Budgets

The values shown in Figure 3.6 add up to more than 100% as some organisations base their budget setting on more than one criteria, the most popular combination being spend and inspection.

Planned Preventative Maintenance vs. Responsive Maintenance

Figure 3.7 shows a breakdown of respondents by the ratio of Planned Preventative Maintenance (PPM) to Responsive Maintenance (RM) classified by the type of social landlord. Those responses where the percentage of PPM plus RM work did not add up to 100% were excluded from the analysis. From Figure 3.7 it can be seen that: RSLs were more likely to have a PPM:RM ratio in the region of 60:40 to 70:30; ALMOs were more likely to have a PPM:RM ratio in the region of 36:54 to 63:37; and LAs were more likely to have a PPM:RM ratio in the region of 60:40 to 83:17. The mode score for each type of landlord confirms the above. Very few organisations exhibited a predominance for RM work.

These figures could be as a direct result of government pressure to reduce the amount of work carried out in a reactive way which is promoted as a more inefficient way of operating maintenance. It is acknowledged however that there will always be an element of responsive maintenance repair work.
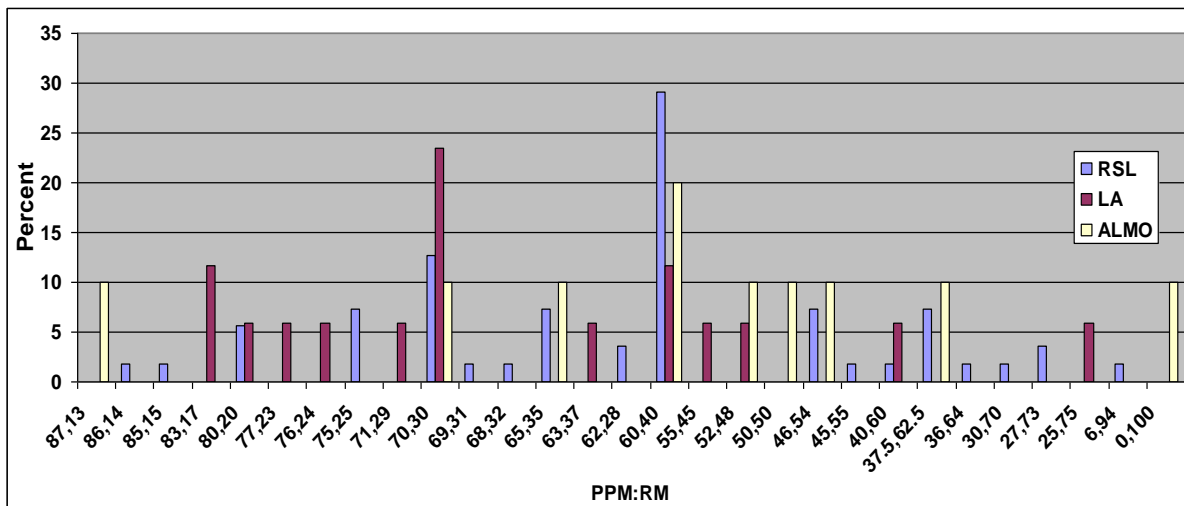
Figure 3.7 PPM vs. RM

Property Maintenance Inspection Cycles

Figure 3.8 shows the breakdown of respondents by the frequency with which they carry out property inspections and shows that generally inspections are undertaken every 4-5 years (48% of respondents). Further, 77% of those who did inspect every 4-5 years used this as their sole method of identifying maintenance need. There appeared to be a positive association between those organisations who did inspect every 4-5 years and their method for carrying out maintenance work (predominantly PPM) (as 80% of those who did inspect every 4-5 years had a PPM value of ≥60%).
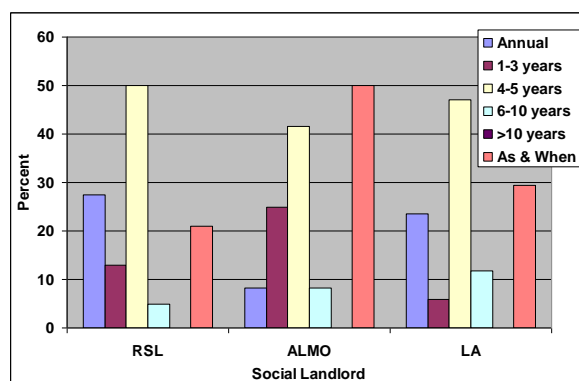
Figure 3.8 Frequency of Stock Inspections

The major exception to the above would appear to be ALMOs who undertake more inspections as and when defects are reported than RSLs and LAs. (Fifty percent of the ALMOs identified maintenance need by inspecting their properties 'as and when defects are reported', half of which did so in conjunction with a 3-5 year inspection cycle and the remaining half as a sole means of property inspection. The group of ALMOs who only inspect when a defect is reported were those with the largest property portfolios and annual maintenance spends. It is not possible to draw a conclusion regarding the preferred method of carrying out maintenance work for this group of 3 as PPM levels were reported as 52%, 6% and no answer given.)

Of the 26% of respondents who inspected as and when defects were reported, 50% of them did so in conjunction with 4-5 yearly inspections; 25% in conjunction with annual inspections and the remainder in conjunction with other combinations. One organisation who inspected as and when defects arose also inspected on a cyclical basis and differentiated between sheltered housing and general needs housing by frequency of those inspections, i.e. sheltered housing is inspected 1-3 years and general needs is inspected 4-5 years.

Overall 13% of respondents (to this question) relied only upon inspections carried out as and when defects were reported which would perhaps suggest that they were adopting a more reactive attitude toward maintenance. However no statistical association between frequency of inspection and level of RM:PPM was found.

Table 3.4 shows the results of cross tabulating maintenance inspection cycles with property portfolio size and indicates that the smallest social landlords rely more on annual inspections, whilst the other groups rely on inspections with a frequency of 4-5 years except for landlords with property portfolios in the region of 10,000-15,000 and >20,000 who rely more on inspecting properties as and when defects are reported. It would be easier and less costly for the smallest social landlords to carry out annual inspections of their properties because of the numbers of properties involved.

Table 3.4 Cross Tabulating Maintenance Inspection Cycles and Property Portfolio Sizes

Frequency of Inspection Property Portfolio Sizes	Annual	1-3 years	4-5 years	6-10 years	>10 years	As & when reported
0-1,000	43.7%	12.5%	31.25%	0.1%	0	18.75%
1,001-5,000	17.64%	20.59%	50%	8.82%	0	23.53%
5,001-10,000	14.29%	9.52%	71.43%	4.76%	0	14.29%
10,001-15,000	37.5%	0	37.5%	0	0	62.5%
15,000-20,000	0	0	100%	0	0	0
>20,000	12.5%	12.5%	37.5%	0	0	50%

Prioritising Maintenance Works

Table 3.5 shows a breakdown of respondents by the importance they placed on a variety of maintenance prioritising criteria and shows that 'need' is classed as the 'most important' criteria regardless of the type of landlord. RSLs and LAs selected 'budget' as being 'second most important' but ALMOs consider 'budget' to be joint most important. This could be a reflection of the quality of the properties managed by ALMOs, and could be an indication of the level of work carried out by LAs as part of the transfer deal. All landlords placed political criteria last as either 'not important'', least important' or 'third important'. This finding was unexpected given the dominance that the DHS has had on maintenance decision making, considering that all ALMOs stated that their maintenance strategies have been affected by the DHS as did 95% of RSLs and LAs (refer to section 3.4).

It was initially assumed that social landlords did not consider the DHS to be a political criterion but subsequent interviews established that this was not the case. Those interviewed confirmed that they had placed political

criteria as either not important or least important because they feel that the politics involved are dealt with at a higher level and are already established before reaching the Social Landlords maintenance department. As far as the mechanics of how maintenance works is carried out, all those responding felt that politics has no bearing on it.

Table 3.5 Prioritisation of Maintenance Works (where 1= Most Important, 5 = Not Important)

		RSL	LA	ALMO
Need	Sum	74	20	18
	Mean	1.17	1.11	1.50
	Mode	1	1	1
Budget	Sum	109	33	14
	Mean	1.76	1.83	1.4
	Mode	2	2	1
Politics	Sum	183	56	37
	Mean	3.27	3.11	3.36
	Mode	3	3	3
Other	Sum	1	10	0
	Mean	1	2.5	
	Mode	1	2 / 3	

Historical Data Collection and Identification of Maintenance Trends

Eighty percent of RSLs, 85% of ALMOs and 84% of LAs collect historical data to help identify maintenance trends. Those respondents who confirmed they did collect historical data for the identification of maintenance trends were also invited to provide examples of what data they collected (and considered to be historical). Table 3.6 provides an analysis of the answers given. There were 23 responses in total to this question which were broken down into 5 categories; Management Information System (MIS), KPI, Life Cycle Modelling, Components and MIS / Life Cycle Modelling. Category headings were assigned by the research team. The full range of responses to this question can be found in Appendix B.

Table 3.6 Forms of Historical Data Collected by Social Landlords

Category	Examples of Responses
KPI	Capital programme activity, reactive repairs budget, post contract scheme assessment, day 2 day elemental replacement, Average repair cost / number of jobs issued, trends most commonly items repair stock condition surveys predictions, Elemental costs, costs per property / block / estate.
Life Cycle Modelling	Department uses a property database containing, construction year and component renewal year. Lifecycle prediction combined with condition surveys, Life cycles, year of installation etc.
MIS	Day to day general repairs log, referrals to property teams, M&E engineering service records RM patterns of expenditure used to inform planned replacement of property components Breakdown central heating – generally responsive repair trends. Date and type of replacement or repair to each dwelling attribute used for cyclical and RM work. Responsive, planned and refurbishment data is all used to identify trends and drives elemental replacement. Reports by estate from responsive repairs ordering system. High levels of component breakdowns will feed into replacement programme. Asset Database, monitoring responsive trends. Comparison of monthly reports to those of the previous year. Types of work needed / historical information on construction / past work to inform decent home planning. Number of occasion's repairs completed to building elements. Comparison of time taken to carry out repairs. Number of repairs / trades.
Components	Replacement of gas central heating system, Gutters / roofing / drainage.
MIS / LCM	Checking defects in streets where the last upgrade was done at the same time, Maintenance and inspection records.
No Category	Responsive data. Major work data, Previous section 82 demand and decent homes stock condition information.

Twelve respondents effectively use some form of repetitive analysis of their maintenance records to inform their decision making process for example "responsive, planned and refurbishment data is used to identify trends and drive elemental replacement", which has been classified as 'Management Information System'.

Three used measures of the performance contract (KPIs), in particular cost and time to inform their decision making regarding maintenance trends.

Two respondents each used a form of life cycle assessment using prediction to decay their condition survey.

It was not possible to categorise 2 of the responses received.

Maintenance v Refurbishment

Figure 3.9 shows the breakdown of respondents by how they differentiate between PPM and refurbishment works and indicates that ALMOs placed a greater emphasis on funding than did RSLs and LAs. This finding was unexpected as traditionally PPM was revenue funded and refurbishment capital funded. As such funding was expected to be predominant for each type of social landlord.

A closer inspection of the 'other' category showed that indicators of funding and scale were also included in this category. Also, an alternative popular measure was if the works included remodelling of a property then this would be classed as refurbishment work, which again could be categorised under scale. What this has shown is that there is no clear definition as to when planned preventative maintenance finishes and refurbishment work starts.
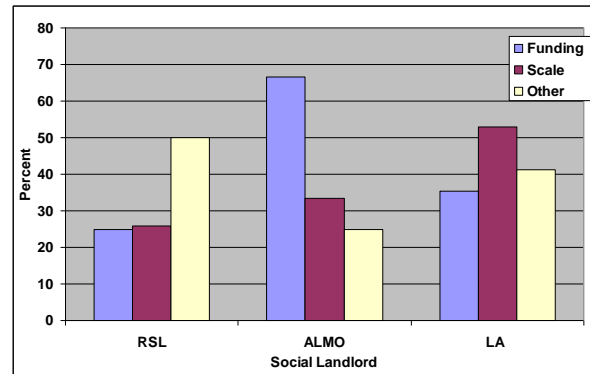
Figure 3.9 PPM vs. Refurbishment

Maintenance Decision Making

Figure 3.10 shows the breakdown of respondents by the information collected to aid maintenance decision making. The stock condition survey is the primary housing maintenance decision making tool (all respondents except one, collect this form of data) for all types of social landlord. Further, 92% of respondents rated it as the most important for their decision making. However, it is also clear from Figure 3.10 that other toolkits also inform the decision making process. Performance based tools such as HHSRS, SAP 2001 and SAP 2005 were not only widely used but also rated as the second most important source of decision making information.

EcoHome XB and HQI information were used the least by all three types of landlord. EcoHome XB was only collected by a small number of ALMOs and RSLs despite having been designed specifically for social landlords, indicating that it hasn't yet penetrated its intended market. Those who did collect EcoHome XB type data rated it quite highly which may indicate that there is a current misconception or lack of knowledge about the toolkit.
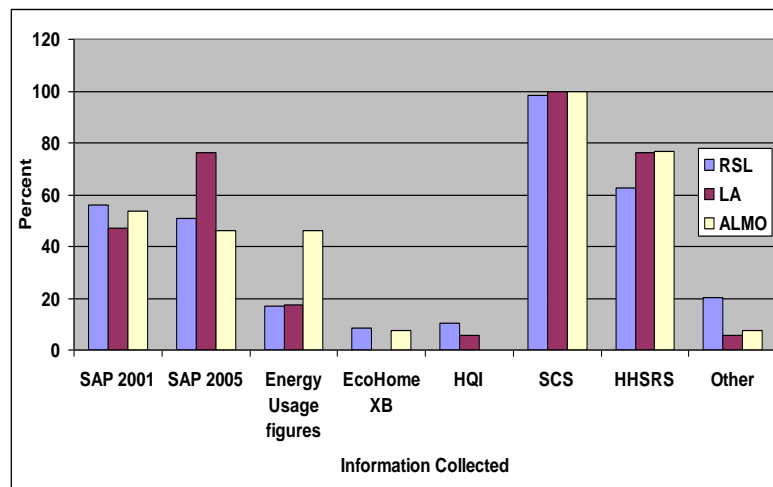
Figure 3.10 Information Collected to Aid Maintenance Decision Making

Table 3.7 Shows the importance rankings received by the various toolkits used for maintenance decision making (where 1 = Most Important, 9 = Not Important)

		RSL	LA	ALMO
SAP 2001	Sum	87	15	8
	Mean	2.64	1.88	1.33
	Mode	2	2	1
SAP 2005	Sum	52	28	9
	Mean	1.86	2	1.5
	Mode	1	2	1 / 2
Energy Usage	Sum	24	7	9
	Mean	2.67	2.33	1.8
	Mode	4	3	1 / 2
EcoHome XB	Sum	14	0	2
	Mean	3.5		2
	Mode	2 / 3 / 4 / 5		2
HQI	Sum	14	3	0
	Mean	2.33	3	
	Mode	1 / 3	3	
SCS	Sum	62	17	12
	Mean	1.13	1.06	1.09
	Mode	1	1	1
HHSRS	Sum	73	19	14
	Mean	1.97	1.46	1.56
	Mode	1	1	1
Other	Sum	16	1	1
	Mean	1.45	1	1
	Mode	1	1	1

Use of In-House Surveyors (LA/ALMO Only)
For ALMOs (67%) and LAs (82%) there was a preference amongst those surveyed to carry out SCS in-house. The main reasons for this were to reduce costs and provide a mechanism for checking consistency and accuracy in an attempt to overcome issues of subjectivity amongst surveyors with the SCS process. RSLs were not included in this analysis.

Procurement of PPM and RM Work
Figures 3.11 and 3.12 show a breakdown of respondents by how they procure their PPM and RM works. Partnering, Selective Tendering and In-house contracts were the preferred methods of procurement for both PPM and RM work (note: The results for in-house labour are skewed in comparison to the other results as this question was only asked of the LA and ALMOs during the second submission of questionnaires and therefore the size of the sample questioned was much reduced and does not include the opinions of RSLs. Figures 3.19 and 3.20 for the use of in-house labour does show a preference (by those questioned) for this form of procurement for RM work over PPM.).

For PPM: RSLs used Partnering Agreements the most followed by Selective Tendering and a Preferred Contractors Lists (note: it could be argued that Preferred Contractors are an embryonic form of Partnering); ALMOs used Selective Tendering the most followed by Partnering Agreements and Competitive Bids (note: this could indicate a greater proportion of large scale refurbishment work is being undertaken); and LAs used Partnering and In-house procurement (to the same extent) followed by Selective Tendering and Competitive Bidding. For RM work; RSLs used the Preferred Contractor list followed closely by Partnering; ALMOs used Partnering followed by In-house procurement the most; and LAs used In-house procurement followed by Partnering the most. Sealed bids, PFI, Negotiation and Other were the least used forms of procurement for both types of work and across all three types of landlord. This is despite the government's encouragement of the use of PFI. According to the interviews, the size of the organisations and a protracted and expensive process were cited as being the main reasons why PFI was not used more in social housing maintenance.

Respondents were able to select more than one form of procurement method in answering this question but there was no pattern to the combinations chosen. A combination of procurement is used to allow for flexibility and best value. Twenty nine out of 92 (who answered this question) use a single form of procurement and of those 29, 18 chose only to use Partnering. These 29 organisations are represented by all three types of landlord and all size of organisations.

The government and the Housing Corporation are encouraging the use of Partnering for maintenance work and this form or procurement appears to have penetrated the sector.
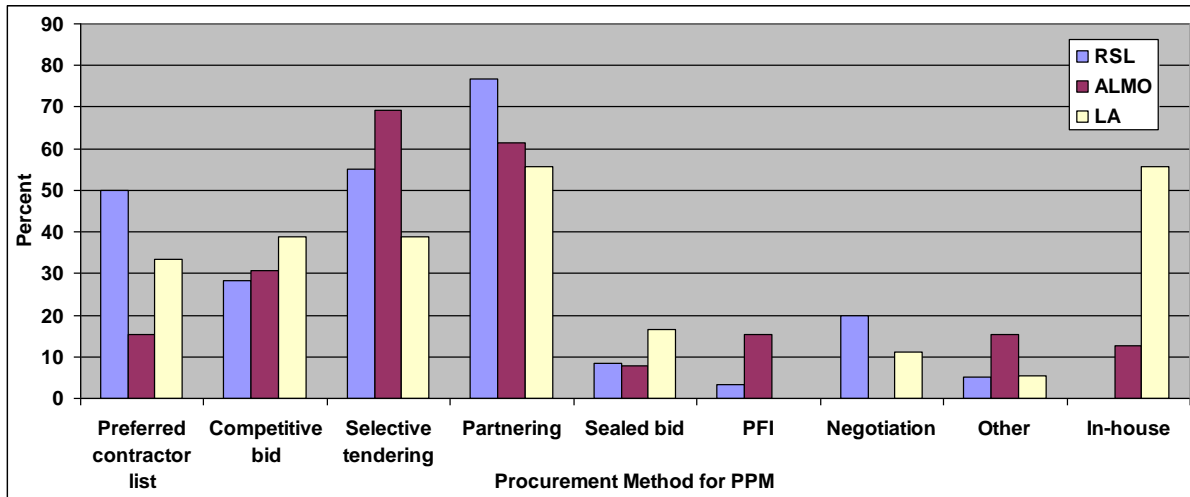
Figure 3.11 Procurement of PPM Work
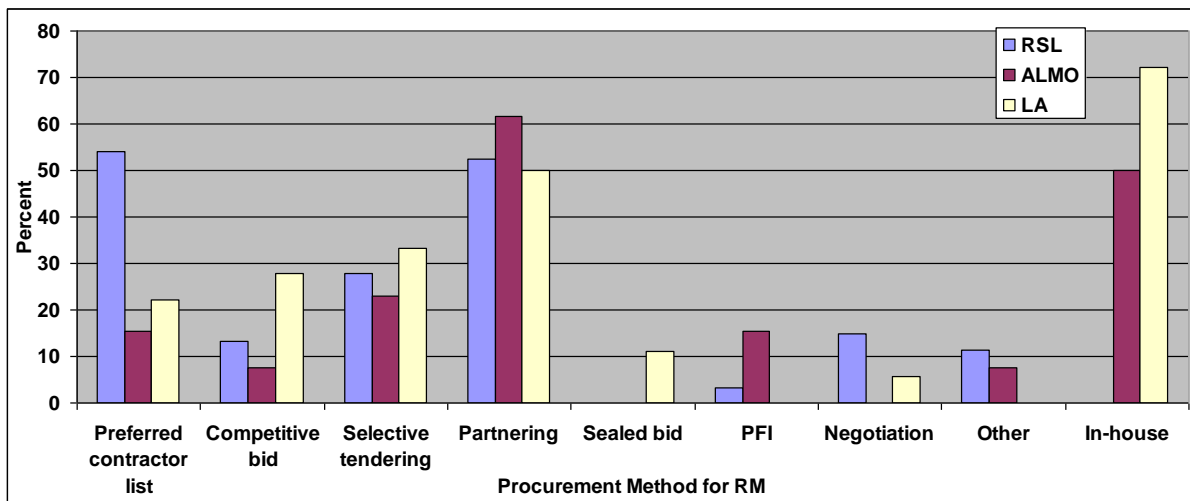
Figure 3.12 Procurement of RM Work

Sources of Maintenance Complaint

Figure 3.13 shows the breakdown of respondents by the sources of maintenance complaint. A similar pattern in the types of maintenance complaint received can be seen across all three types of social landlord. The most complaints were for Repair/Replace, followed by plumbing, heat loss / gain and sound penetration.

As the responding organisations have a variety of dwelling types and ages within their property portfolios it was not possible to compare the types of maintenance complaints to the dwelling types or ages.
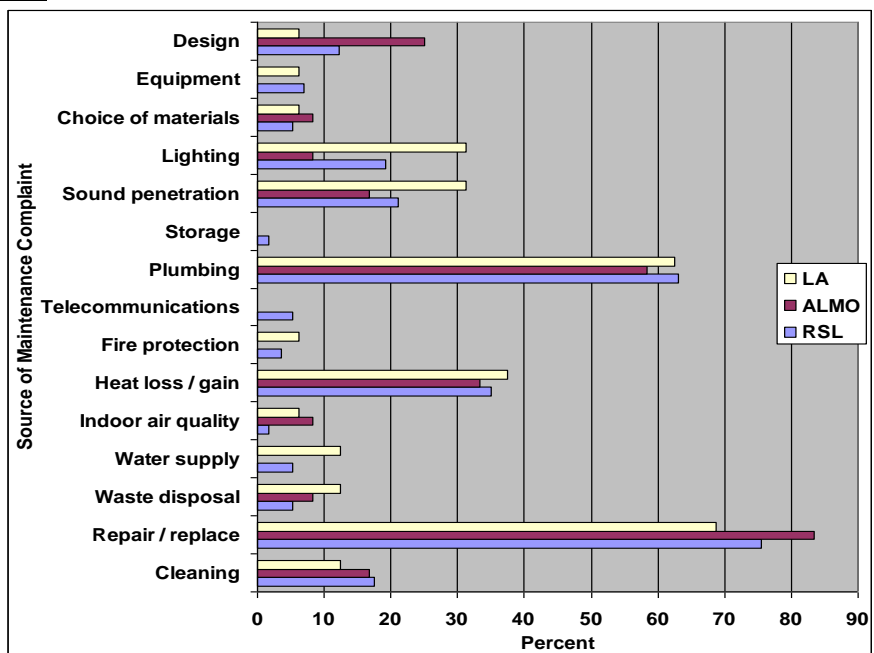
Figure 3.13 Sources of Maintenance Complaint

However there were a large proportion of properties aged between 1945 and 1980 within the social landlord housing stock where the above mentioned problems would be common. The number of converted flats used for social letting would also explain why there is a common problem with noise penetration.

EcoHome Principles

Figure 3.14 shows the breakdown of respondents that used EcoHomes principles in the development of their maintenance schemes. Overall 39% of landlords (43% of RSLs, 33% of ALMOs and 29% of LAs) considered the principles of EcoHome when developing their maintenance schemes. However, very few used the EcoHome XB toolkit, preferring instead to develop their own interpretation of the principles to match their specific needs.

Figure 3.15 shows the breakdown of respondents by the importance that EcoHome had in the development of their maintenance strategy. In total 85 out of the 97 landlords surveyed responded to this question with 39% saying that the principles of EcoHome were important in developing their maintenance strategy.

Generally speaking those organisations who considered the principles of EcoHome in their maintenance schemes also thought that it was important to the development of maintenance strategies. Organisations may not be collecting EcoHome data in the format that can be used to carry out XB assessments etc but they are using the principles to help their maintenance decision making. From an analysis of the textural answers given (Table 3.8) it appeared that the EcoHome Principles were being used in the main to help improve the thermal comfort of the property via

Figure 3.14 Use of EcoHomes Principles

Figure 3.15 Importance of EcoHome Principles

the heating systems / controls installed and insulation and the materials being used to reduce the impact on the environment, but also to help support a robust Environmental Policy, reduce waste and implement water saving measures. Finally, respondents were asked why they thought the EcoHome principles were important to the maintenance strategy (full table of responses under Appendix B). There were 29 responses to this question which the research team divided into 4 categories; solutions/primary replacements, strategy, assessments and targets.

Table 3.8 Reasons for Using EcoHome Principles

Catagory	Examples of Responses
Solutions/Primary Replacements	This category received the most responses with 11organisations stating that EcoHome principles are used within their maintenance strategy to aid decision making regarding maintenance solutions or primary replacement for example "Consideration to be given to renewal of drying areas in flats" and "Encourage the use of materials with a low impact on the environment".
Strategy	Eight responses stated that EcoHome is embodied in their organisation's strategy "We have adopted a strategy of implementing eco friendly materials and methods in the implementation of our investment programmes including innovative energy technologies"
Assessments	Five organisations use EcoHome to set targets to work towards "There are aspects of EcoHome which we try and emulate with our Asset Management Strategy. We have various targets of trying to reduce waste, energy saving measures, water saving ..". Ten organisations use EcoHome to form maintenance solutions "Only sustainable materials used, embodied energy cost in materials considered" and 4 organisations are using it to assess the sustainability of their stock and maintenance works required ".. assess our stock using EcoHome XB".
Targets	Three organisations use the EcoHome principles to set targets such as it "…. helps improve our SAP rating" and "We have various targets of trying to reduce waste, energy saving measures, water saving measures.."

It was not possible to categorise 2 of the responses which reflected how they were used rather than why.

Finally, two organisations were using the EcoHome principles as an opportunity to work with the designers of new build to establish standard components and innovation to improve lifecycle costs and thermal comfort. Many maintenance problems arise because maintenance issues and the people expert in this field are not included in the design process, which has a detrimental impact on the level and cost of future maintenance. Early involvement of maintenance managers in the design process will therefore have social, environmental and economic impacts on the 'in-use' portion of a buildings life cycle.

HHSRS and the Stock Condition Survey

Figure 3.16 shows the breakdown of respondents by whether or not they had incorporated the HHSRS into their SCS. A similar pattern can be seen across all three types of landlord as the majority have whilst a proportion haven't.

The HHSRS was first introduced as the method for assessing housing conditions in England in the 2004 Housing Act and was due for implementation from the 6th April 2006. (Incorporation of the HHSRS is not yet a legal requirement in Wales.). The number of landlords who were still to implement the scheme into their SCS could simply be a reflection of the number of landlords yet to carry out their SCS. As already reported such surveys are generally carried out on a

Figure 3.16 HHSRS and the SCS

cyclical basis with a preferred frequency of 4-5 yearly. With regard to the impact of the HHSRS: 78% of ALMOs; 56% of RSLs and 40% of LAs said that it had had an impact on their maintenance strategies. Of those respondents who said 'yes, the HHSRS did have an impact on their maintenance strategy' 26 provided examples of the impacts. These are summarised in Table 3.9.

Table 3.9 Examples of how the HHSRS Impacts Maintenance Strategies

Category	Example
Priorities	7 respondents believed that the priorities of their maintenance strategy had been altered by the introduction of the HHSRS "Failure under HHSRS means a whole property DH failure, therefore the repair goes to the top of the list for rectification. Actual rectification depends on the cost."
Maintenance Planning	A further 7 respondents believed the HHSRS had changed their maintenance planning by "We are now looking at general estate improvements where they relate to health and safety, footpaths. Also annual tenancy visit provide health and safety checks".
Cost	4 respondents believed that cost had been most affected by the introduction of the HHSRS because "HHSRS significantly increases the number of kitchens we need to replace because of unsafe layout. External door security is another major charge.

Note: The remaining 8 responses were considered not applicable and have not been included in the analysis.

Respondents also used this as an opportunity to confirm why they thought the HHSRS was not having an impact on their maintenance strategy. The most common reason given was that landlords had no HHSRS category failures or that the standard is considered to be very poor.

Current Problems Facing Organisations In Terms of Maintenance

Figure 3.15 shows the breakdown of respondents by the building maintenance problems they were experiencing. A 'lack of money' was by far the biggest problem being faced by all three types of Landlord. The next biggest issue was 'building design' then 'service inefficiencies', 'too many calls' and 'poor contractor performance'. Only RSLs and LAs had issues with 'poor construction quality'. This could be a reflection on the quality and age of properties managed by ALMOs who acquired these properties from LAs who traditionally had the oldest properties with the highest proportion of repairs backlog. With regards to the building design issues, this emphasises one of the drawbacks to the traditional way of designing and developing new buildings which does not incorporate early input from the maintenance department.

Organisations were permitted to choose more than one criterion resulting in scores of over 100% for each landlord.
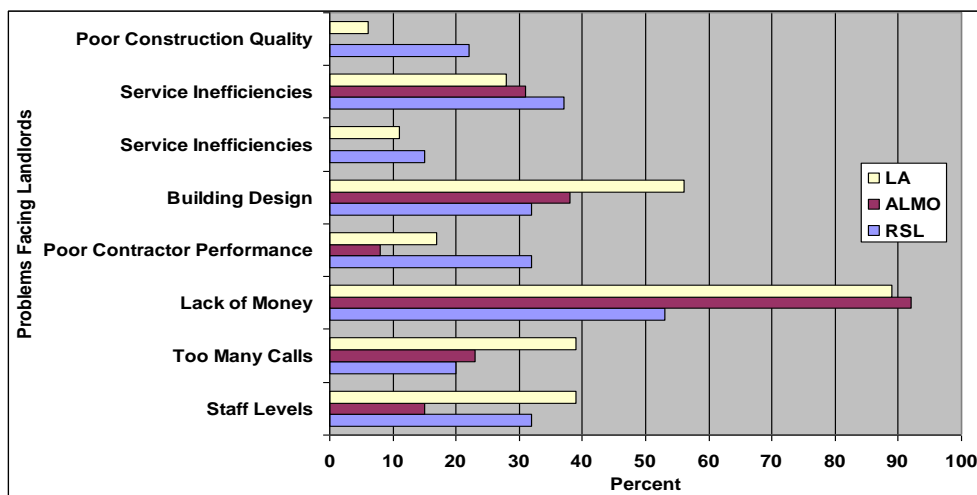
Figure 3.17 Maintenance Problems

Summary
It would appear that respondent's maintenance practices follow the traditional maintenance model (Figure 2.1) outlined in section 2.

- Policy clearly reflects the needs of the DHS and there is some evidence that at a strategic level the environmental principles are influencing decisions. There is only limited evidence of the environmental principles being reflected in operational procedures used to identify maintenance need and prioritise maintenance actions.
- The SCS is the primary toolkit used to assess maintenance need.
- Life cycle modelling and the use of management information on historic performance are being used to inform decision making but there is no evidence to suggest that this is fully integrated into the decision making process.
- Maintenance actions are prioritised according to need and then smoothed to reflect available budgets.
- PPM is the preferred maintenance strategy for the majority of organisations.
- Whilst maintenance actions are increasingly being procured through Partnering Agreements, PFIs do not seem to have penetrated the social housing maintenance market.

There is also evidence that the use of other performance measures (e.g. SAP ratings, KPIs e.t.c) is being used to provide a broader view of maintenance need.

3.4 Housing Quality

All social landlords in England are required to achieve DHS and all social landlords in Wales are required to achieve the Welsh Housing Quality Standard (WHQS) by 2010 and to set annual targets to help achieve this (the DHS does not apply in Scotland).

Percentage of Homes Achieving the DHS

Figure 3.18 shows a breakdown of respondents by the percentage of homes achieving the DHS. RSLs had a higher percentage of homes achieving the DHS than did LAs and ALMOs. Figure 3.25 also shows that RSLs (and to a lesser extent LAs) were more likely to have a high proportion of their stock already Decent Home compliant whereas ALMOs DHS compliance was more widely spread.
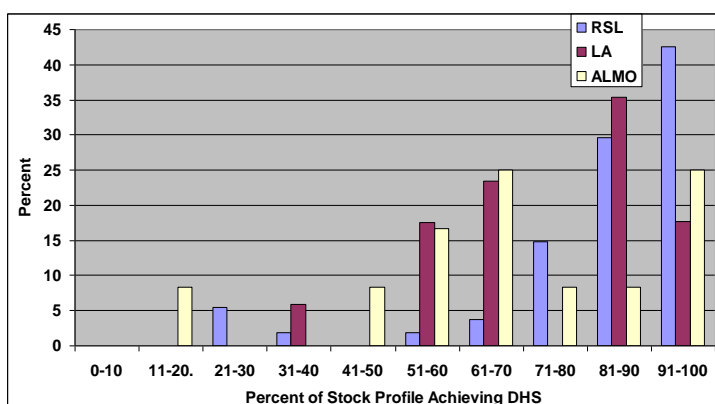
Figure 3.18 Percentage of Stock Achieving the DHS

Reasons for Failing DHS

Figure 3.19 shows that for ALMOs and LAs, most dwellings were failing due to repair whilst for RSLs, most dwellings were failing against the modernisation and thermal criteria. There appeared to be little similarity between the three types of landlord and the criteria by which dwellings were failing the DHS, except that all three have the least dwellings failing due to fitness.
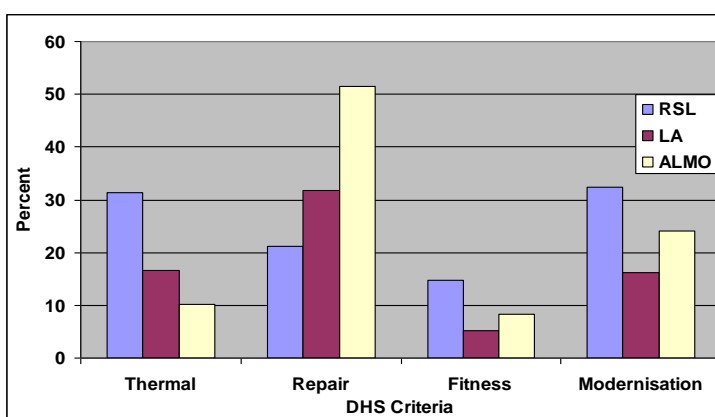
Figure 3.19 Criteria for Stock Failing the DHS

Table 3.10 Percentage of Dwellings by Landlord Type Failing DHS

		RSL	LA	ALMO
Thermal Comfort	Mean	31%	16%	10%
	Mode	10.0	10.0	2.0 / 14.0
Repair	Mean	21%	31%	51%
	Mode	10.0	No mode	No mode
Fitness	Mean	14%	5%	8%
	Mode	2.0	2.0	No mode
Modernisation	Mean	32%	16%	24%
	Mode	1 / 80 / 90	No mode	1.0

Table 3.10 shows the mean and mode values for housing failing the DHS criteria in relation to the type of landlord. This table provides some indication to the variety of answers given and the lack of consistency of type of DHS failure across the social housing sector (multiple and no mode values).

According to the EHCS 2006 thermal comfort criterion continues to be the most common reason for social housing failing the DHS. Of the housing that is failing the DHS, 58.7% of it was failing due to thermal comfort, 37.8% HHSRS, 16.2% Repair and 12.2% Modernisation. Therefore figures within this report appear to be more skewed towards repair and modernisation than in the EHCS.

Dwellings may fail DHS due to more than one criterion therefore landlords were permitted to select as many criteria as necessary. (Note: the figures in table 3.19 may be less than 100% as the landlord figures received did not always add up to 100%).

Impact of the DHS Maintenance Strategy

All ALMOs and 95% of RSLs and LAs believed that the DHS had had an impact on their maintenance strategy.

Those RSLs whose maintenance strategy had not been affected by the DHS were relatively small landlords (owning and managing between 0 and 1000 dwellings with an annual maintenance spend of less than £1 million) and a portfolio consisting of mainly purpose built low rise flats/semi-detached dwellings. They all had a different emphasis on how they conducted their maintenance work, one being predominantly RM focused, one predominantly PPM focused and one that employed both strategies. One RSL had 100% DHS achievement rate which may be why they no longer felt the standard impacted their maintenance strategy. The only LA whose maintenance strategy had not been affected by the DHS was located in Scotland, where the DHS does not apply.

Those organisations who stated that the DHS had impacted their maintenance strategy were asked to explain why this was the case (Table 3.11). This question received 76 responses (individual responses were on occasion split amongst a number of different categories resulting in 80 answers) which were broken down into 10 categories by the research team; one category called 'Statements' was the largest group (25) who confirmed that the DHS had impacted their maintenance strategy because they had to achieve the governments' target and so were adhering to the DHS because they had been told to. The remaining respondents explained in more detail how the DHS had influenced their maintenance strategy and these responses were broken down into the remaining 9 categories of; Priorities (15), Resources (8), Change in Procurement (7), Strategic (5), Measuring Decency (5), Quality (5), Changed Strategy (no details of how) (4), Tenants (4), Targets (2).

Table 3.11 Reasons why the DHS has impacted maintenance strategies

Category	Examples of Responses
Priorities	"The Decent Home Programme has provided the opportunity to replace many elements of work to prevent further deterioration of housing stock".
Resources (Operational)	"(DHS) takes first slice of budget".
Change in Procurement	"This has enabled us to develop a long-term partnering strategy instead of annual tendering practices which offer better value. We have been able to plan work over many years thus reducing costs and contractor inefficiencies that exist when carrying out restrictive annual maintenance programmes that are constrained by annual budgets"
Strategic, Measuring Decency and Quality	"Our business plan identifies how we deal with non-decent homes and preventative measures to be taken in the future
Measuring Decency	"Standards are not fully 'SMART' – difficult to measure, some are very intransigent"
Quality	"… has not only reduced replacement costs and is reducing future maintenance costs but has also provided the opportunity to review all of our technical specifications, materials and manufactured items used etc…".
Changed Strategy (no reasons why)	"Future PPM requirements to include DHS requirements"
Tenants	"Budgeting for DHS impacts on satisfying the tenants' wishes for other types of improvements through financial constraints".
Targets	"…ensure long-term sustainability of stock, reduce household bills, reduce annual maintenance and better design of work undertaken etc. Decent Homes has enabled us to develop a 30 year Asset Management Plan and will re-focus how investment is carried out in the future"

The responses to this question also highlighted the positive and negative attitudes towards the DHS, on the positive side landlords felt the DHS was; raising the standard of work; lowering RM costs and helping to establish future plans and priorities. On the negative side, landlords felt that: Reprioritisation of work away from a need basis; does not match maintenance plans; and does not match tenant expectations were all issues of concern.

DHS and the Sustainability of Homes

Figure 3.20 shows the breakdown of respondents by whether or not they believed the DHS had improved the sustainability of their existing stock. Sixty three percent of respondents believed that it had, 14% believed that it hadn't and 23% were undecided. Amongst these respondents, ALMOs exhibited the most positive attitudes towards the DHS (in terms of its impact on sustainability) with all respondents agreeing that it had resulted in improvements to the sustainability of their stock. RSLs (40.7% disagreed) and LAs (50% disagreed) were less convinced of the positive impacts that the DHS had had on the sustainability of their stock.

Respondents were asked why they believed the DHS had had an impact on the sustainability of their stock (Table 3.12). There were 73 responses to this question. These responses were broken down into 10 categories by the research team, one of which included answers considered not applicable because they made statements rather than gave reasons. The other 9 categories, in order of group size, starting with the largest group were; No direct link (12), Standards (11), Desirability (10), Asset Management Strategy (10), Partial (9), Minimal Threshold (5), Funding (5), Unnecessary (5), Procurement (1).
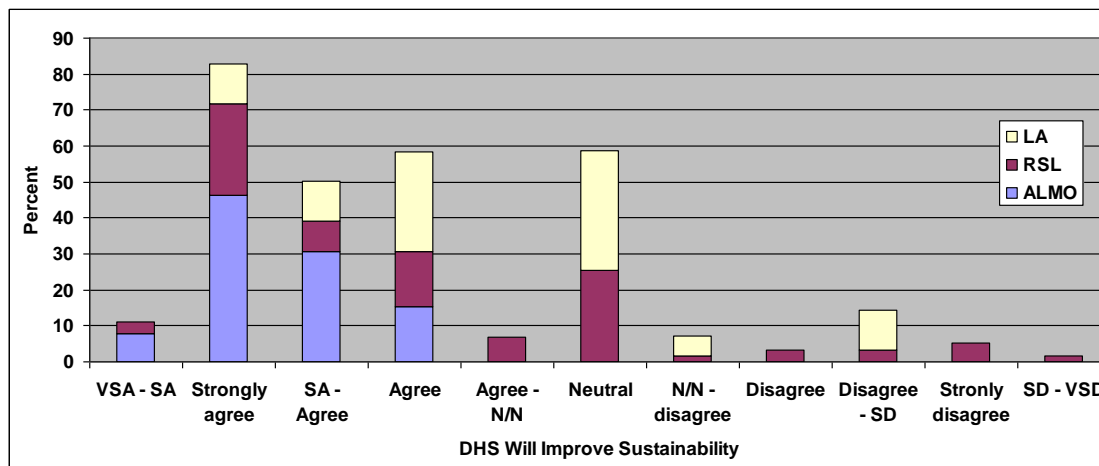
Figure 3.20 Impact of DHS on Sustainability

Table 3.12 Reasons Why the DHS Will / Will Not Improve Sustainability

Category	Examples of Responses
No Direct Link	"Sustainability is more than the condition of the home, it relates to other conditions on estates. More work needs to be done on security and environmental issues". "the standard is low and does not set challenging targets relating to sustainability".
Standard	"DHS specifically targets achievements and maintaining high quality homes, components and thermal performance in our properties". "Improved facilities and thermal improvements will improve stock and living conditions for tenants". "improvement in thermal performance of properties improves sustainability". "many materials being used in the Decent Home refurbishment would not be considered sustainable, e.g. UPVC windows".
Desirability	"Focused investment in maintenance – improved quality has also led to increased demand". "Just because a property has a new kitchen or more insulation does not mean it is desirable if in poor surroundings".
Asset Management Strategy	"Pressure to upgrade as cheaply as possible. This does not encourage sustainability." "DHS ends in 2010 but maintenance requirements will go on for ever". "DHS has enabled a more planned approach to delivering investment to address stock failure and programme work in a more effective way that provides best value"
Partial improvement to sustainability	"It only deals with individual properties – more needed for community works" "Works to implement could greatly improve sustainability, however a lot depends on tenant use". "For this council attainment of the DHS requires major investment in kitchens and bathrooms – little impact on sustainability". "Too black and white, detracts attention from the overall picture for a scheme".
Minimal Threshold	"It sets a standard albeit minimal". "DHS is not a high enough standard to properly address sustainability. Funds for stock regeneration have had to be re-deployed in order to achieve DHS".
Funding	"The strategy has led to an increased investment/improvement in the housing stock" "It can't be viewed as a finished project, will require continued investment to ensure no future slippage – difficulties in securing investment."
Unnecessary	"I believe we already had a strategy in-place – it was not necessary for the government to impose a 'solution'" with the statement that the DHS will improve sustainability.
Procurement	"engaging with the local businesses and invest in the local economy".

The 63% of respondents who believed that the DHS had had a positive impact on the sustainability of their stock did so mainly because of improvements to thermal comfort which had resulted in increased lettability and tenant satisfaction. However, this group were also critical of the DHS, highlighting: its lack of focus on wider community issues; the minimal thresholds for action; and its narrowly drawn parameters as examples of how it didn't address the wider sustainability agenda.

The 23% of all respondents that had a neutral opinion with regards the impact of the DHS on the sustainability of their stock did so because:

- of the limited range and requirements of the DHS and the lack of a direct link to the sustainability agenda. The standard consists of 4 criteria; repair, modernisation, HHSRS and thermal comfort, all limited to the individual building envelope, its contents, and its immediate external environment contents with requirements that trigger action which are well below current practice.
- It does not satisfy the economic, environmental and social aspects of sustainability of the housing stock and its occupants.
- It impacts the mechanics of maintenance work, in some cases leading to early replacement of elements which was not a sustainable method of working as it was wasteful both in terms of limited landlord resources as well as material resources.

Besides from its limited criterion to the building, it was also noted that it had a limited impact on the harder to treat dwellings (those built during the early 19th century) within the housing stock as it was not possible to modify the standard accordingly to take these special circumstance into account.

The 13% of respondents who believed that the DHS hadn't improved the sustainability of their existing stock reiterated many of comments made above: its limited nature; its low standard; it only addresses the condition of the property and not the wider community issues; it impacts the mechanics of maintenance work, by encouraging quantity and not quality programmes of work; but added that it was having a detrimental impact on landlord resources as well as the life cycle assessments of buildings and their elements and encouraged the use of unsustainable materials.

Quality Upgrades Beyond DHS

Figure 3.21 shows the breakdown of respondents by whether or not they allowed for incremental upgrades within their maintenance programmes. Seventy seven percent of LAs, 75% of RSLs and 53% of ALMOs did undertake incremental improvements to the quality oif their stock.

Those respondents who did undertake incremenatal upgrades were further asked to give examples of these upgrades and on the whole they were concerned with upgrades to insulation and heating or bathrooms and kitchens. When asked if these upgrades were above and beyond those identified in the DHS all stated that they were, with in the majority of cases the upgrades being a continuation of work carried out under the DHS programme. Those upgrades which were not a direct

Figure 3.21 Incremental Upgrades

continuation of DHS programmes tended to have focussed on the social aspect of sustainability, and in particular in improving security (at an individual house level or at an entire estate level) and working towards reducing the level of anti social behaviour. Finally, respondents were asked to give examples of the types of incremental upgrades they undertook. Of the 39 responses to this question (excluding those who answered Not Applicable), 19 were considered environmental upgrades, 13 social upgrades and 4 economic upgrades. In reviewing the responses to this question it is important to remember that just because a respondent states that they are going beyond what they would normally do, does not imply they were acting sustainably. These responses imply that those respondents who were making incremental upgrades were doing so to improve what they consider to be the quality of the dwelling.

Table 3.13. Types of Incremental Upgrade Undertaken.

Category	Examples of Responses
Environmental	"Repairs carried out at a higher/improved specification e.g. insulated render..".
Social	"Disabled arrangements and communication systems".
Economic	"General rule of replacement rather than repair and improvement rather than maintain".

Summary
The DHS has had an impact (both strategic and operational) on the way which social landlords respond to the maintenance needs of their tenants. The DHS has affected the way in which priorities are set and resources committed. The DHS has also allowed a more long term approach to be adopted to maintenance planning (setting targets and measuring progress) and the procurement of maintenance works (partnering). However, the DHS is not seen as a panacea for the problems of social housing. It was seen by a significant minority to be minimalist, and not linked to the wider sustainability agenda. Its focus on the condition of individual properties rather than on the performance of the house as a home, and, its lack of engagement with wider social and community issues have caused many question what will happen when the current DHS programme ends.

3.5 Sustainability Strategy

Organisational Sustainability Strategy

Figure 3.22 shows the breakdown of respondents by whether or not they had an organisational sustainability policy in place. Whilst 51% of RSLs, 50% of LAs and 46% of ALMOs did have a sustainability strategy in place, a large number didn't. What was also clear from Figure 3.22 is that a significant minority of those completing the questionnaire didn't know whether their organisation had a sustainability strategy or not.

Those respondents whose organisation had a sustainability strategy were asked to identify what areas it covered. The 26 responses were broken down into 'Environment' (10 responses), 'Integrated' (9), 'Social' (3), 'Not Relevant' (3) and 'Economic' (1) shown in Table 3.14.
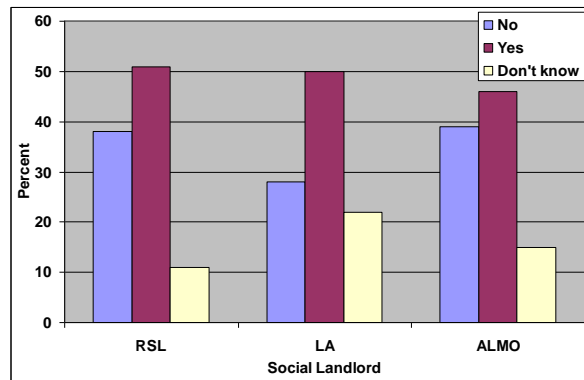
Figure 3.22 Organisational Sustainability Strategy

Table 3.14 Areas Covered by the Organisation Sustainability Strategy

Category	Examples of Responses
Environmental	A broad range of environmental issues were covered by this group including "… minimising waste, waste recycling measures, water conservation measures, minimising travel". In a small number of cases economic aspects were also included in their answers such as, "Green Charter – all materials and procurement", and one response also included the social aspect of sustainability such as, "Materials, services and communities".
Social	This group was driven by communities, demographics and responding to change.
Economic	Economics appears to be the least considered "Investment, continued improvement, stock appraisals, asset management strategy."
Integrated	This group received 9 responses and shows that their sustainability policy considers the environmental, social and economic aspects of sustainability in an integrated manner, "Financial stability, sustainable communities, minimising environmental impact, preserving and enhancing ecological value ..."

Sustainability and Maintenance Strategy

Figure 3.23 shows the breakdown of respondents by how much they believed sustainability had impacted their maintenance strategy. A 9 point Likert type scale was used where a 'moderate impact' formed the central choice. It was clear from Figure 3.23 that sustainability has had only a slight to moderate impact on the organisations maintenance strategy (only 32% of respondents indicated a moderately-significant or significant impact). Cross tabulation shows a statistically strong association between size of impact sustainability has had on maintenance strategy and those who have a sustainability strategy in place with a Chi-square value of 39.323 which equates to an

association greater than 99% (with 12 degrees of freedom).
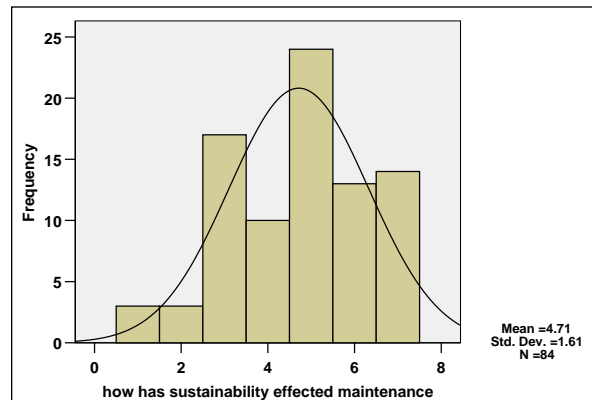
Figure 3.23 Effect of Sustainability on Maintenance

Overall, the largest percentage of landlords (28.6%) who answered this question believed that sustainability has had a moderate affect on their maintenance strategy.

28

Figure 3.24 shows a breakdown of the impact that sustainability has had on maintenance strategy for the three groups of social landlord questioned. Whilst ALMOs suggest that sustainability has had the greatest impact on their maintenance strategy (mean value is 5.15), RSLs suggest it has had the least. (On average the RSLs believe that sustainability has had a 'slight-moderate' and 'moderate' impact on their maintenance strategy which is in agreement with their views on the impact DHS will have on sustainability.)
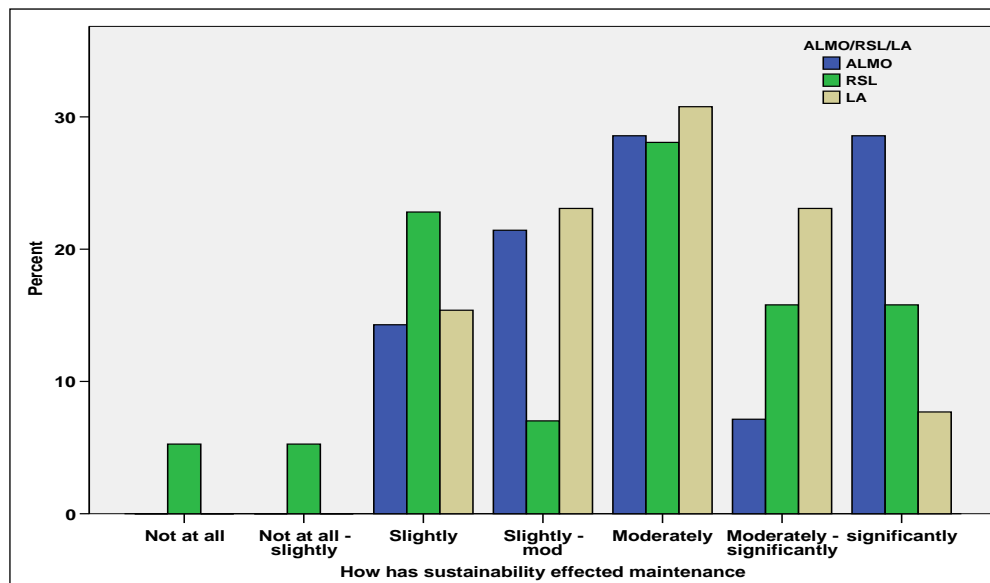
Figure 3.24 Bar Graph Showing Effect Sustainability Has Had On Maintenance

Relevance of Sustainability Debate to Social Housing Maintenance Managers
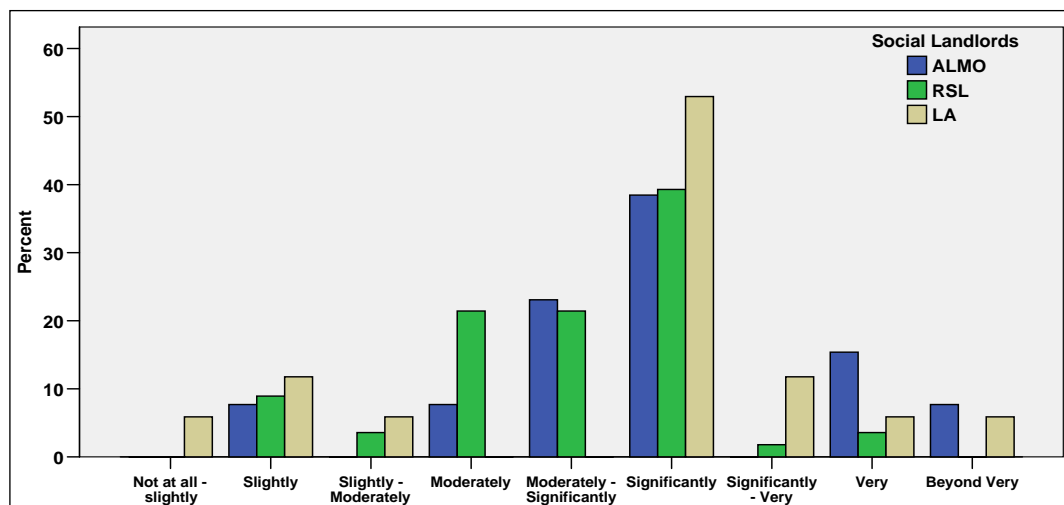
Figure 3.25 Relevance of Sustainability Debate

Figure 3.25 shows the breakdown of respondents by how relevant they believed the sustainability debate was to their work.

Overall, 71% of respondents believed that the sustainability debate had some significance (had moderately significant or greater impact) to the work they did. Whilst ALMOs felt it had the most significance (mean score of 6.8), LAs (mean score 6.5) and RSLs (mean score 6.0) were not far behind. Only 1 respondent did not believe that the sustainability debate had any relevance. This was a LA landlord with 5001-10000 properties in its portfolio which consisted mainly of older houses. They were PPM biased in the manner in which they carried out their maintenance work and had a high DHS achievement rate of 89.3%. EcoHome principles were considered during the development of maintenance schemes and were rated important to the maintenance strategy. However they did not have an organisational sustainability policy in place, believed that their maintenance strategy could be improved in terms of sustainability and considered the sustainability strategies of their contractors. It would appear that this respondent believed that the sustainability debate was irrelevant at the operational level but it would appear to have had an importance at the strategic level.

Measure the Sustainability of Existing Housing Stock

Figure 3.26 shows the breakdown of respondents by whether or not they measured the sustainability of their existing housing stock. ALMOs were the most likely to measure the sustainability of their stock, whilst the LAs and RSLs were less likely to do so. This finding concurs with the answers provided regarding the data being collected to aid maintenance decision making and the continued reliance upon a measure of the housing stock's condition as a means of determining works to be carried out. In many cases a narrow view of sustainability was taken and measures limited to single building elements.
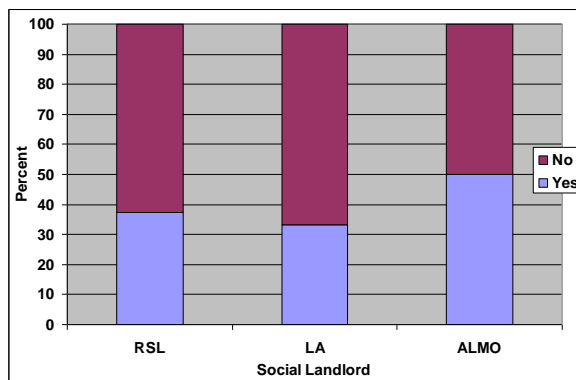
Figure 3.26 Stock Measured for Sustainability?

Those respondents who did measure the sustainability of their stock were asked for details of the measures they used. Twenty nine responses were received which were broken down by the research team into 4 categories (Table 3.25): SCS/Asset (10 responses); Recognised Toolkits (8); Economic (6); and Scenarios/Community Level (3). Two responses could not be categorised.

Table 3.15 Methods of Measuring Sustainability of Stock

Category	Examples of Responses
SCS/Asset	The largest group with 10 out of 25 of the responses have taken specific aspects of sustainability and tried to integrate them into their asset management strategy in order to come up with a matrix of measures which they can put into their SCS which will ultimately give them a ratings system so they can establish how they are performing.
Recognised Toolkits	Eight of the respondents used standard, recognised toolkits. The only truly sustainable toolkit is EcoHome XB which was being used by 2 of the 8 within this category. Five of the 8 were using SAP which only measures energy performance of the dwelling which is only a small aspect of sustainability. Of the 5 who used SAP as a measurement, only one was using it in-conjunction with customer data (satisfaction, turn around) to broaden the scope of their measurement to include social aspects of sustainability. The 1 remaining respondent was an EcoHome assessor and used aspects of BREEAM.
Economic	Six respondents based their sustainability rating solely on economic indicators, either in isolation or integrated, but all include demand, costs and turnover "Based on combined measurement of demand, void turnover, length of tenancy, repair/refurbishment costs".
Scenarios/Community Level	Finally there were a small number using "option appraisal" exercises including pathfinder.

Does the Sustainability Measurement Impact Maintenance Strategy

The Landlords who measured the sustainability of their housing stock were asked if this measurement impacted their maintenance strategy. Figure 3.27 shows a breakdown of the answers given. There was a similar spread across all three types of landlord in as much as, those who measured the sustainability of their stock stated that it impacted their maintenance strategies. However, it was also clear that a number of organisations were collecting sustainability data and not using it to inform their maintenance decision making (29% of ALMOs, 18% of LAs and 13% of RSLs). At present it is unclear as to why this is the case
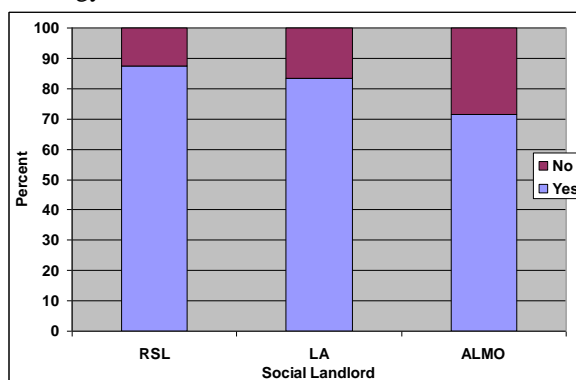
Figure 3.27 Sustainability Rating Impact on Maintenance Strategy

and will be addressed during the interview stage of this project.

Improving Organisational Maintenance Strategy in Terms of Sustainability

Figure 3.28 shows the breakdown of respondents by whether or not they believed their maintenance strategy could be improved in terms of sustainability. All ALMOs and the majority of RSLs (79%) and LAs (83%) believed it could and this was regardless of how they rated the sustainability of their current practices as those who considered their practices unsustainable also believed their practices could not be improved in terms of sustainability. This may indicate that those respondents did not believe the sustainability of existing housing can be improved through the maintenance practices of their organisation or through maintenance works but that such improvement would require more substantial intervention, such as refurbishment. The opposite was also true however, as organisations who considered their practices to be sustainable also thought that changes could be made to improve them.
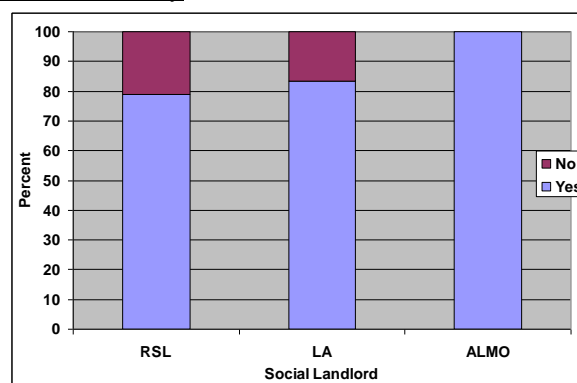
Figure 3.28 Could the Maintenance Strategy Be Improved

Those respondents who believed that their organisational maintenance strategy could be improved in terms of sustainability were asked to provide examples of how they thought that improvement could be made. Fifty five responses were received which were broken down by the research team into 6 categories (Table 3.26): Environment (17); Strategic (11); Economic (10); Social (5); Measurement; (4) and Better Understanding (3). One group of 5 could not be categorised.

Table 3.16 Sustainability Improvements to Maintenance Strategy

Category	Examples of Responses
Environment	This group was the largest with 17 responses who stated that their maintenance strategy could be best improved by taking more consideration of environmental performance. A broad range of environmental features were considered by this group which can be categorised further into; materials used, waste and recycling, thermal comfort of the home and transport. Some responses also included other aspects of sustainability such as economic "Spread the net wider on materials and services when procuring contracts", whilst others included social aspects such as "Maximising fuel efficiency within dwellings …".
Strategic	This group of 11 respondents identified strategic level changes that were required in terms of "A more comprehensive approach" and "A robust sustainability policy which compliments our decent homes strategy" must be incorporated to ensure that their maintenance strategy improves in terms of sustainability. This may indicate a more integrated approach to the other groups who have focussed on individual aspects of sustainability of social or environmental or economic.
Economic	This group of 10 respondents stated that their maintenance strategy could be improved by taking more account of economic sustainability in their maintenance work. Examples cited included better prioritisation of work and a better ratio of planned works to responsive repairs. The responses to this question once again demonstrated the difficulties facing social landlords in terms of reconciling the additional costs incurred by more sustainable practices with the financial constraints they face in terms of rents and value for money. One response also included the social aspects of sustainability "Better analysis of social and economic trends, maintenance expenditure and void patterns .."
Social	This group of 5 respondents believe that their maintenance strategy could be improved by focussing on the social aspects of sustainability: consulting more with their residents; including "wider community issues"; and use more local labour.
Measurement	This group of 4 respondents stated that the measuring of the sustainability of their stock and working to standards will help improve sustainability.
Better Understanding	This group of 3 respondents stated that their maintenance strategies could be improved but that they required greater knowledge/understanding of sustainability issues before they could make further comment.

This is a good indication of work still necessary to improve the sustainability of the existing housing stock and that most of these organisations believe they can have a positive impact but are still to fully embrace the principles of sustainability.

Sustainability of Current Practices

Figure 3.29 shows a breakdown of respondents by how sustainable they rated their current practices. Eighty nine of the 95 landlords surveyed answered this question, and 64 considered their practices to be sustainable, to varying degrees. RSLs provided the highest (very sustainable) and lowest rating of their practices (V unsustainable) indicating the level of disparity between members the same type of landlord.
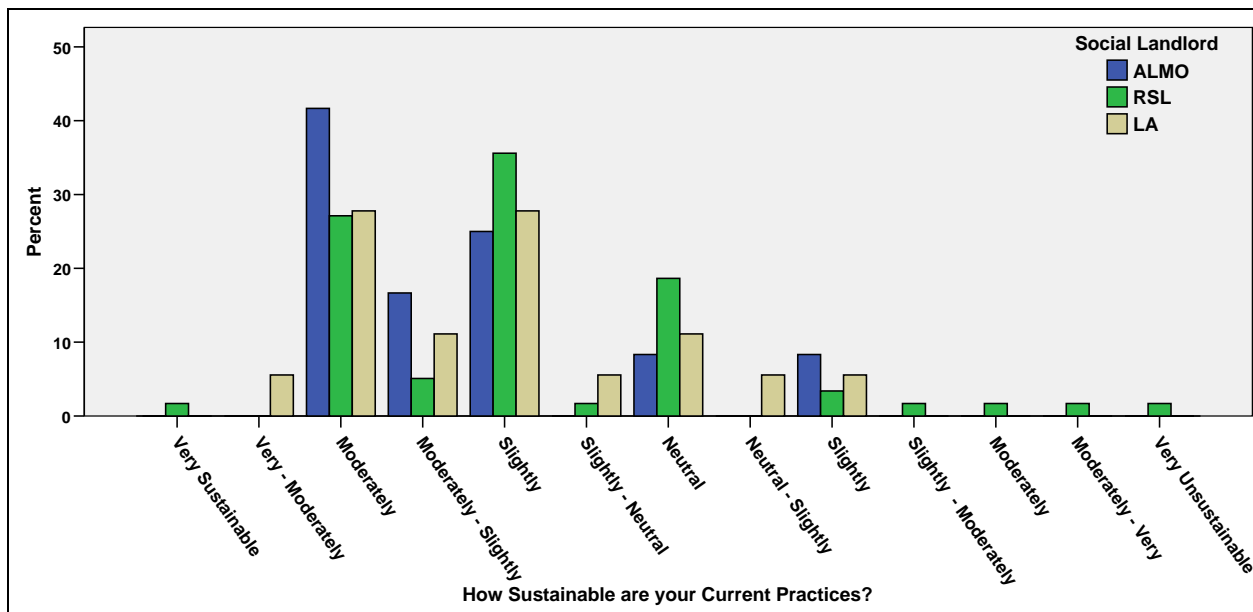
Figure 3.29 How Sustainable Are Your Current Practices – All Landlords

Which Sustainable Technologies Have Been INCORPORATED into Refurbishment Projects

The survey asked respondents which sustainable technologies had been included in refurbishment projects and Figure 3.30 shows a breakdown of the textural answers given. This figure shows that the most popular sustainable technologies that have been incorporated to date were those which increase the energy efficiency of the property such as high efficiency boilers, insulation, daft exclusion and double glazing 42%. The DHS stipulates minimum insulation thickness and SAP rating to trigger works to be carried out to
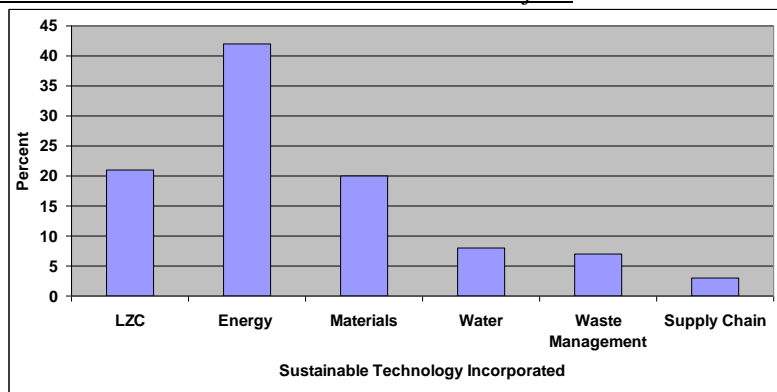
Figure 3.30 Sustainable Technologies Incorporated

improve the thermal comfort of properties and major works have been undertaken to reduce fuel poverty. Therefore landlords could have taken this opportunity to make great improvements to thermal comfort to satisfy their warmzone requirements whilst also meeting their DHS requirements to ensure this item wouldn't need revisiting for a long time. Government legislation has ensured that financial assistance has been available from energy suppliers for energy efficiency measures which has resulted in more works being undertaken than would have been possible had social landlords had to finance the project themselves.

Readily available and tested micro generation low and zero carbon (LZC) technologies were the second most popular sustainable technology being incorporated in refurbishment work with 21%; these include photovoltaics (PV), wind turbines, ground source heat pumps, solar thermal combined heat and power (CHP). Many of these installations were as demonstration projects to determine actual costs incurred and energy generation to reduce risk in the future by the implementation of these technologies.

Use and sourcing of materials was the third most popular sustainable technology being incorporated in refurbishment work with 20%. Specific items mentioned were; timber from sustainable sources, renewable materials, locally sourced materials and low emission paints. The use of Plastics instead of timber has been raised as a sustainable and unsustainable use of materials. Sustainable because of it reduced maintenance requirements, unsustainable because of its origin, chemical composition and disposal issues. This highlights a

popular debate currently underway and highlights the difficulties involved in accurately determining a materials life cycle analysis.

With 8%, water was the fourth most popular sustainable type of technology being incorporated as part of refurbishment works and includes sanitary ware to reduce use of potable water, rainwater harvesting, grey water recycling and reed beds for sewage treatment. Whilst the conservative use of water is receiving more headlines now, this is still a greater issue for the south of England than anywhere else.

Waste management came next with 7% and included implementing waste management and recycling measures and waste reduction measures.

Finally with 3% the supply chain was mentioned which indicated the importance of using local labour and the implementation of a good supply chain. The inclusion of a supply chain in a sustainable maintenance strategy was voted 12th most important out of 31.

On the whole these results show a good understanding of the issues surrounding the built environment and include environmental, economic and social aspects of sustainability.

Which Sustainable Technologies Have Been CONSIDERED In Refurbishment Projects

The survey asked respondents which sustainable technologies had been considered for inclusion in refurbishment projects and Figure 3.31 shows a breakdown of the textural answers given. Seventy three percent of respondents had considered proven and readily available low and zero carbon technologies in their refurbishment projects. The technologies stated were PV, solar thermal, wind turbines, ground source heat pumps, biomass boilers, micro CHP and green roofs. Nine percent had considered waste management in the form of recycling materials and waste reduction; 6% had considered water, in the form of grey

Figure 3.31 Sustainable Technologies Considered

water recycling and reduced consumption; 6 % had considered construction methods such as MMC, Pod construction; and 6% had considered material use such as the use of eco paints and GRP windows.

This question did not make it clear whether or not the technology was first considered and then later installed or not. Comparing technologies installed and technologies considered, in the majority of cases landlords were considering LZC technologies regardless of what technologies were already installed, only 11% of those who answered this question were considering technologies other than LZC and these were water, waste and materials either as a stand alone item or in combination.

This would indicate that the energy hierarchy is being adhered to in that energy use is being reduced as much as possible and energy efficiency measures are being implemented before alternative energy sources are considered.

Tenant Engagement

Figure 3.33 shows the breakdown of respondents by the degree of engagement with tenants on issues of sustainability. It shows a similar pattern across all three types of landlord. Seventy five percent of RSLs confirmed that they engaged with tenants on issues regarding sustainability, 6% said no and 19% didn't answer. Seventy four percent of responding LAs confirmed that they did, 16% said no and 10% did not answer the question. RSLs and LAs provided high percentages of non-answers but the explanation may be as simple as the respondent not knowing if this takes place. From the follow up interviews it was found that tenant liaison was high up on landlords' agenda but was generally carried out by a separate department to
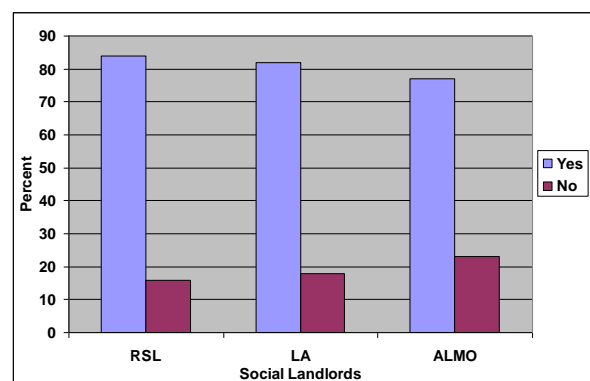
Figure 3.32 Landlords Engagement with Tenants

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that of maintenance, especially in the case of the larger landlords and whilst landlords engage with their tenants in a number of ways, sustainability was not always on the programme.

Sixty nine percent of ALMOs confirmed that they engaged with tenants on issues regarding sustainability, 23% confirmed that they didn't and only 8% didn't answer the question.

Sustainability Strategies / Policies of Contractors

Figure 3.34 shows the breakdown of respondents by whether or not they considered the sustainability strategies of their contractors. This question was answered by 90 out of the 95 respondents, 45 of which stated they did consider the sustainability strategies of their contractors and 45 said they didn't. Of the 45 who said they didn't, 80% agreed (in varying degrees) that the supply chain should be established as part of a sustainable maintenance strategy. This could indicate that the strategic desires of the organisation haven't yet manifested themselves at an operational level or that these are the operational desires which haven't yet been fulfilled. It is also clear from Figure 3.34 that ALMOs and LAs were more likely to consider the sustainability strategies of their contractors than RSLs. The reason for this could be because LAs (and by association ALMOs) need to be more open and accountable to their constituents than RSLs.
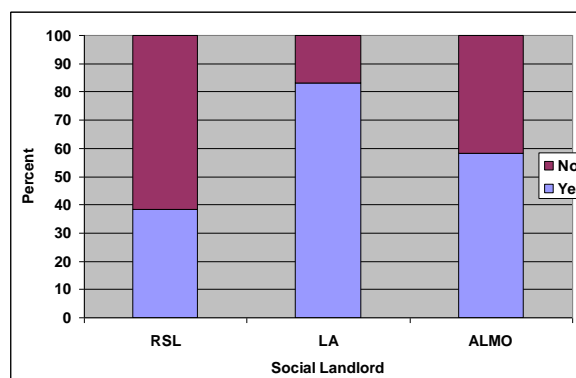
Figure 3.33 Consideration of Contractors Sustainability Strategies by Landlords

Those respondents who did consider the sustainability strategies / policies of their contractors were asked to provide examples of how this was done. Thirty eight examples were provided which were broken down by the research team into 6 categories (Table 3.27): Procurement Stage (13); Partnering / Framework Agreement (8); Review Contractor Policies (7); Quality System / KPI (5); and Landlord Policies (4).

Table 3.17Examples of how Sustainability Strategies of Contractors are Considered by Landlords

Category	Examples of Responses
Procurement Stage	Thirteen respondents used the procurement stage to evaluate the sustainability strategies and policies of new contractors, "As part of the overall evaluation process of bids/tenders. Generally we use a 70% quality and 30% price basis for our evaluation and Sustainability issues account for around 5-10% of the quality element".
Partnering / Framework Agreement	Eight of the respondents used their partnering and framework agreements to continuously evaluate the sustainability strategies and policies of their existing contractors. "They are all required to keep management systems that are audited annually for their environment and waste policies. "
Review Contractor Policies	Seven respondents reviewed their contractors sustainability policies and strategies but did not state at which stage of the process this was carried out, what impact it had (if any) on procurement or if the contractors were audited in accordance with their policies.
Quality System / KPI	Five respondents used some form of quality system or KPI to review the policies and strategies of their contractors. "… we are working with Envirowise and IEMA to help all our contractors achieve BS8555."
Landlord Policies	Four respondents required contractors to incorporate the landlord's policies or ensure that contractor's policies were in accordance with the landlords "The new major works contract 2006 – 2011 requires that the appointed constructor adheres to certain sustainability criteria."

Sustainable Maintenance Strategies

Table 3.28 shows a breakdown of what respondents believed should be included in a sustainable maintenance strategy. The criteria are ordered according to the priority rating they received from the RSL respondents. The mean priority ranking (a seven point scale was used where 1 = very strongly agree, 4 = neither agree nor disagree, 7 = very strongly disagree) received from LAs and ALMOs are also given.

A number of 'red herrings' were included in the sustainable maintenance strategy statements (install high NOx emitting boilers; install materials with a high ODP and GWP; use primary aggregates; use uncertified timber) to gauge the depth of understanding of the respondents. In the overall analysis the majority (3 out of 4) of the red herrings appear in the bottom quartile with 'use primary aggregates' and 'use uncertified timber' ranked at the bottom of the table. The 'installation of high NOx boilers' was ranked as high as 14th (second quartile) and could

indicate a lack of thorough understanding of the respondents regarding this issue. With regard to respondent type, LAs ranked all 4 red herrings bottom (this may demonstrate that LAs have a greater understanding of the issues involved), RSLs ranked 3 out of the 4 red herrings in the bottom quartile but ranked 'install high NOx boilers 14th and ALMOs ranked 'install materials with high ODP and GWP' 18th and the remaining red herrings in the 4th quartile.

Table 3.18 Criteria to be included in a Sustainable Maintenance Strategy

Criteria	RSL Rank/Mean	LA Rank/Mean	ALMO Rank/Mean
Home user guides are provided	1st / 2.47	4th / 2.35	13th / 2.75
Planned maintenance system used	2nd / 2.54	3rd / 2.28	6th / 2.58
Materials with a low impact on the Environment are used	3rd / 2.66	6th / 2.47	3rd / 2.50
Household security is considered during product procurement	4th / 2.72	5th / 2.38	13th / 2.75
Responsive maintenance system used	5th / 2.75	19th/ 3.06	6th/ 2.58
Renewable technologies considered as replacements for existing components	6th / 2.77	9th / 2.62	23rd / 3.08
Existing ecological features are protected during maintenance work	7th / 2.79	9th / 2.62	10th / 2.67
Labour is sourced locally	8th / 2.80	8th / 2.59	2nd / 2.39
Low toxicity paints / varnishes etc used	9th / 2.81	1st / 2.22	1st / 2.35
Supply chain established	10th / 2.84	15th / 2.92	3rd/ 2.50
Best practice policy is adopted in respect of air and water pollution	11th / 2.87	2nd / 2.27	8th/ 2.63
Energy consumption monitored and targets set to reduce use during occupation	12th / 2.88	13th / 2.74	19th / 2.96
Recycled / reclaimed materials are used	13th / 2.95	14th / 2.78	12th / 2.73
High NOx emitting boilers installed	14th / 2.99	28th / 3.65	24th / 3.15
Monitor and reduce construction waste	15th / 3.00	7th / 2.56	3rd / 2.50
Monitor and set targets to reduce water consumption during occupation	16th / 3.02	19th / 3.06	17th / 2.83
Waste reduction procedures are in place during ordering process	17th / 3.07	9th / 2.62	15th / 2.77
CCS aims and objectives are applied to maintenance work	17th / 3.07	12th / 2.72	11th / 2.71
Quality system in place	19th / 3.08	15th / 2.92	21st / 3.00
Enhancement of the site ecology is considered during maintenance planning	20th / 3.20	21st/ 3.12	22nd / 3.04
Plant is sourced locally	21st / 3.24	17th / 2.97	16th / 2.79
Energy consumption monitored and targets set to reduce use during maintenance work	22nd / 3.28	17th / 2.97	26th / 3.38
Material is sourced locally	23rd 3.37	23rd / 3.19	19th / 2.96
Monitor and set targets to reduce water consumption during maintenance work	24th / 3.47	27th / 3.53	25th / 3.21
Energy from renewable sources used during maintenance work	25th / 3.49	26th / 3.41	27th / 3.42
'E' technology used	26th / 3.55	25th / 3.30	30th / 3.64
Install materials with high ODP and GWP	26th / 3.55	29th / 3.70	18th / 2.89
Improvements are incorporated into the maintenance programme to upgrade the buildings overall performance	28th / 3.57	22nd / 3.14	9th / 2.64
Monitor and report transport use to calculate CO_2 emissions	29th / 3.68	24th/ 3.29	28th / 3.46
Primary aggregates are used	30th / 3.72	30th / 3.84	29th / 3.54
Uncertified timber used	31st / 4.69	31st / 4.84	31st / 4.09

The top 10 issues that RSL respondents believed should be incorporated in to a sustainable maintenance strategy included; Home user guide; Planned maintenance system used; Materials with a low impact on the Environment are used; Household security is considered during product procurement; Responsive maintenance system used; Renewable technologies considered as replacements for existing components; Existing ecological features are protected during maintenance works; Labour is sourced locally; Low toxicity paints / varnishes etc used; and Supply Chain Established.

The top 10 issues that LA respondents believed should be incorporated in to a sustainable maintenance strategy included; Low toxicity paints / varnishes etc; Best practice policy adopted in respect of air and water pollution; Planned maintenance system used; Home user guides provided; Household security considered during product procurement; Materials with a low impact on the environment used; Monitor and reduce construction waste; Labour is sourced locally; and in joint 9th place are; Existing ecological features are protected during maintenance work, Renewable technologies considered as replacements for existing components and Waste reduction procedures are in place during ordering process.

The top 10 issues that ALMO respondents believed should be incorporated in to a sustainable maintenance strategy included: Low toxicity paints / varnishes used; Labour sourced locally; joint 3rd are; Materials with a low impact on the environment used, Supply chain established and Monitor and reduce construction waste; joint 6th place are Planned maintenance system used and Responsive maintenance system used; then Best practice policy adopted in respect of air and water pollution; Improvements are incorporated into the maintenance programme to upgrade the buildings overall performance and Existing ecological features are protected during maintenance works.

Thus, whilst there may be a slightly different emphasis between the three groups of landlords there are a set of core issues (planned maintenance; materials with a low environmental impact; existing ecological features protected; and locally sourced labour) which are pertinent to all.

In addition to the pre-determined list of criteria shown in Table 3.28, respondents were given the opportunity to identify their own additional criteria. Seventeen respondents provide additional criteria and these were broken down by the research team into 6 categories (table 3.29); Environmental (40%); Economic (18%); Asset Maintenance Strategy (18%); Social (12%); Combination of all of the above (6%) and those who were not sure (6%) but who believed improvements were still possible.

Table 3.19 Additional Criteria for a Sustainable Maintenance Strategy

Category	Example of Responses
Environmental	The majority of responses in this section were extensions of those covered in Table 3.28. Additional items which were not covered included: Estate level improvements; Reduced packaging waste; and the use of Low/No maintenance components.
Social	Additional items not covered in Table 3.28 focussed around the role that tenants play in caring more for their homes and of measures to better engage them and "…get them on your side…".
Economic	Additional items not covered in table 3.28 included: securing greater funding for renewable energy through grants and incentives and reducing the cost burden associated with a high turnover of tenants.
Asset Maintenance Strategy	Additional items not included in Table 3.28 included: Constant review of standard replacement products and comparison with other material solutions; Partnered approach to include tenants / contractors / local government; Setting of specific asset management KPI's; and raised awareness for those delivering and responsible for maintenance services.

Barriers to More Sustainable Practices

Figure 3.35 shows the breakdown of respondents by what they considered to be the internal barriers to more sustainable practices and shows that cost was the biggest deterrent. Cost included the initial cost of sustainable technologies and long payback periods which in many cases cannot take account of savings made to utility bills as the tenant received this benefit and not the landlord. As there are no satisfactory mechanisms for measuring social or environmental benefits, these are omitted from the payback analysis. Lack of resources (which can again include lack of money) and culture were also

Figure 3.34 Internal Barriers to More Sustainable Practices

major barriers to more sustainable practices. Culture was recognised as a difficult barrier to overcome as it requires a change in people's behaviour and attitude towards sustainability.

There is a similar pattern of distribution amongst all three types of landlord (except that ALMOs didn't consider there was a lack of leadership) indicating that they encounter the same problems and fundamentally the same financial restraints.

Figure 3.36 shows the breakdown of respondents by what they considered to be external barriers to more sustainable practices and shows that the lack of any real incentive closely followed by a lack of joined up thinking were the main external barriers. This could be because landlords were not measured against sustainable objectives by their governing bodies and as a result were focused on reaching the targets they were measured against. The third biggest external barrier according to LAs was 'legislation' and 'lack of government leadership' by RSLs and ALMOs. There was a similar pattern of distribution amongst all three types of landlord indicating that they generally encountered the same problems.
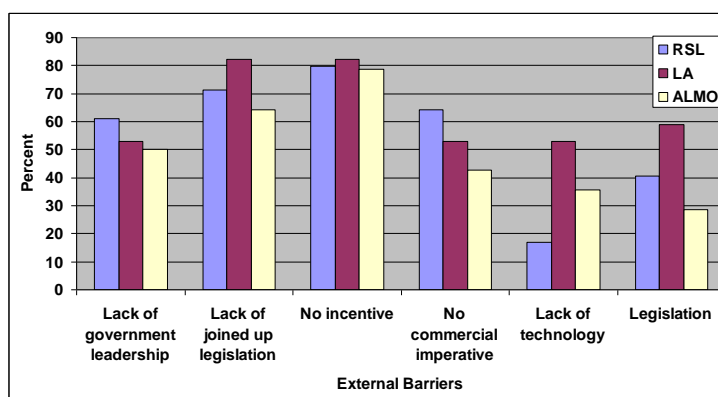
Figure 3.35 External Barriers to More Sustainable Practices

Cost of More Sustainable Solutions

In anticipation that Cost would be identified as the main barrier to a greater uptake of sustainable technologies, respondents were asked how much cost they could justify when procuring sustainable solutions. Figure 3.37 shows the breakdown of respondents by how much additional finance they believed they could justified for more sustainable solutions. RSLs and ALMOs could generally justify an additional 3-5% whilst LAs could justify an additional 6-10% of the like for like solution.

Respondents were also invited to give the reasons why they believed these additional costs could be justified and Table 3.30 provides a breakdown of the answers given. Nineteen responses were received to this question.
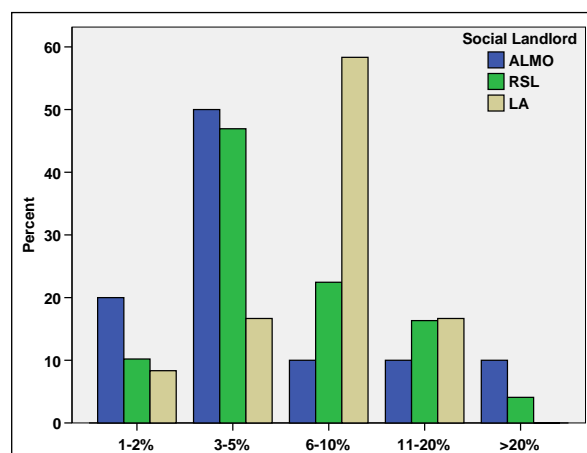
Figure 3.36 Justifiable Additional Cost of More Sustainable Solutions

Table 3.20 Reasons Why Additional Spend can be Justified

Justifiable Additional Spend	Reason
None (1)	Budgets are so tight that no additional costs could be justified
3-5% (5)	Limited by rent capping and the need to satisfy statutory requirements
6-10% (2)	Whilst initial costs may be greater these could be offset when WLC principles are introduced. Needs to be driven by governance i.e. Housing Corporation
11-20% (4)	If a longer term view is taken of payback period and maintenance costs.
>20% (2)	Greener / sustainable products invite new technology at far higher cost per se
Varies (5)	Dependent upon the views of our client when assessed against a basket of client priorities. Depends on the outcomes which would need to be evidenced. It will vary significantly due to life cycle costs of the solution

The respondents who believed a greater additional spend could be justified tend to exhibit a more long term, strategic view as the amount that can be justified rises. What seems clear is that in order for higher costs to be justified better whole life models are required which are supported by a clear evidence base of the performance of the technology in use.

3.6   Any Other Comments

The final question of the survey asked respondents if they had any other comments. Nineteen responses were received which were broken down by the research team into the following 4 categories (Table 3.31): Economics (4); Knowledge / Skills (4); Environment (3); and Lack of Imperative (2). Four responses have been classed as miscellaneous as these were in response to the completion of the questionnaire rather than on the issues raised.

Table 3.21 Any Other Comments

Category	Example of Responses
Economics	Further comments regarding economics and the difficulties landlords face trying to incorporate sustainability into their maintenance practices. This was one of the largest group receiving 5 out of the 19 responses. Examples included "With rent controls being applied by the government and the lack of grant funding for 'major works' we can only manage a repairs/maintenance system from within funds through rents received. We already commit 50% of our income in this way and are unable to put in additional resources unless we borrow against our debt free properties".
Knowledge / Skills	Four respondents focussed on the knowledge and skills issues needed to work in a more sustainable manner. Examples ranged from the difficulties smaller organisations had trying to get information on energy/saving products, whilst others highlighted the problem of disinterested key staff who lack the "inclination and drive to deliver new innovation to existing programme regardless of how much management time is invested.
Environment	This category only had 3 respondents but covered a very broad remit; "We must design homes that embrace the benefits of fuel saving technologies", **"Decent Homes Standard distracts attention from environmental issues as expectations are low"** and "Ecohomes XB is really quite new. It is something we are going to look at but haven't as yet had the opportunity. For a small organisation like us maintaining and evaluating items like CO_2 outputs during a contract is probably not achievable without significant resource."
Lack of Imperative	This received 2 responses "Sustainability issues have not yet moved up the maintenance agenda, either nationally or locally, there is no imperative to consider these issues. Maybe the Government could consider this after the DHS has been met beyond 2010." This again confirms that the DHS agenda is currently the overriding agenda for social housing landlords and until this target has been reached it will be difficult to focus attention and funding on anything else.

4 DISCUSSION

4.1 The Sample

The questionnaire survey sought to ascertain whether the sustainability agenda had influenced the way social housing maintenance is perceived, planned and implemented; and whether the current approaches/tools are conducive to improving the sustainability of the existing UK social housing stock. In addressing these issues the survey sought to gain as wide a range of views from those directly responsible for social housing maintenance decision making as possible. To this end a self administered postal questionnaire was developed and circulated to: all Local Authorities responsible for social housing management in England and Wales; all Arms Length Management Organisations in England and Wales; and all Parent Registered Social Landlords (who's Chief Executives names was on the Housing net website) in England and Wales. Replies were received from 95 organisations representing a response rate of 12.4%. Responding organisations managed dwellings across a range of portfolio sizes and in total were responsible for approximately 752,100 dwellings which represented approximately 19% of the total English and Welsh social housing stock at the time of the survey. The responding organisations stock profile (number of flats/houses and age profile) was similar to that reported from the English House Condition Survey. Whilst the average annual maintenance expenditure varied considerably between responding organisation, with the larger organisation generally spending less per dwelling than smaller organisations, and was lower than expected (£1370/dwelling - total spend on maintenance and refurbishment from the National Construction Statistics 2004 and the Housing Corporation Global Account 2004 divided by the total number of social houses in England 2004) this is most probably explained by the tendency for the calculation method used in this report, which would underestimate the maintenance spend per dwelling for the larger responding organisations. Thus, given the number of organisations responding to the survey, the number of social dwellings managed by these organisations and their maintenance expenditure profiles the authors believe that the questionnaire survey results are representative of English and Welsh social landlords.

4.2 Impact of Sustainability on the Built Asset Maintenance Model

The general theory of built asset maintenance (Fig 2.1) suggests that organisational policy is translated into specific information that is collected to inform stock models that aid planning and lead to action and feedback. In principle this model was followed by all those who responded to the questionnaire survey. The stock condition survey was used by all respondents to identify maintenance need which was combined with available budgets to produce life cycle models of need going forward. Annual maintenance need was then prioritised using local considerations and maintenance strategies developed that reflected local priorities (PPM v RM). Once maintenance actions were completed, feedback in the form of tenant reports or re-survey was used to inform policy and provide input into future models.

What was not so clear was the extent, if any, that the sustainability agenda had had on this process.

Policy
Sustainability as a concept was generally understood by those who answered the questionnaire and considered to be relevant to their work in maintenance management. About 50% of respondent organisations had some form of sustainability strategy in place. Where strategies existed they tended to cover specific aspects of environmental performance, and to a lesser extent social and economic issues. In only a small number of cases was an integrated approach to sustainability present. This lack of integration and/or penetration was further highlighted by respondents themselves who indicated that sustainability had only had a slight to moderate affect on their maintenance practice and that there was still significant room for improvement in the way organisations developed their maintenance strategies.

The DHS was the primary policy consideration driving maintenance (and refurbishment) decision making. Whilst the DHS was perceived to have raised the quality of social housing, it was not universally accepted that it had done so in a sustainable way. In particular there were concerns that the DHS policy was minimalist in its approach and not linked to the wider sustainability agenda, focussing too much on the condition of individual dwellings rather than on the performance of the dwelling as a home.

Thus, whilst sustainability as an issue was acknowledged to be important to the work of social landlords, it has yet to become widely adopted as a major policy driver to inform maintenance decision making.

Information
Whilst the vast majority of respondents believed that their maintenance practices could be improved in terms of sustainability, and 50% of organisations had some form of sustainability policy in place, only about a third of respondents actually measured the sustainability of their stock. Of those who did measure sustainability, most

had developed their own metrics and toolkits to reflect their specific interpretation of the sustainability agenda rather than using the standard toolkits being promoted by third parties (e.g. EcoHomeXB). The main reason for this appears to be a perceived lack of fit between the standard toolkits and the specific interpretation of the sustainability agenda by individual organisations. Where sustainability was measured it tended to be as a consequence of legislation (e.g. requirement for SAP ratings) rather than as a consequence of a pro-active decision to translate the sustainability agenda into maintenance action plans.

Whilst the DHS was not necessarily considered to be a 'sustainability standard', the one area where it was perceived to have had a positive impact on the sustainability agenda was in the area of maintenance budgets. Whilst inspections combined with previous years spend was the most commonly used budget setting criteria there was some evidence that this prescriptive approach was changing. It was general agreed that the DHS had raised the profile of maintenance within social housing organisations, resulting in increased investment and the acceptance of a more long term approach to maintenance planning, including the use of maintenance partnering agreements.

There was some evidence to suggest that the sustainability agenda and DHS were beginning to have an impact on the specification of maintenance activities. The majority of organisations stated that they were taking the opportunity to enhance the quality of the repairs/replacements that they carried out above that which they would have previously done and that these enhancements were focussed at the broader sustainability agenda (e.g. social improvements). This assertion was also supported by considering the number of organisations that had incorporated sustainable technologies into refurbishment programmes and the increased finance that organisation were prepared to commit (typically between 3-5% extra) for more sustainable solutions.

Thus, whilst sustainability information is not yet widely collected to inform maintenance decision making, where it is collected there is evidence that it does inform the decision making process.

Modelling

Evaluating the impact of the sustainability agenda to social housing maintenance and refurbishment in a holistic manner was perceived to be the most underdeveloped aspect of the built asset maintenance process. Whilst life cycle costing and management information systems were being used to inform maintenance planning, the models used to evaluate options and assess risks tended to be component condition based. Whilst this had an impact on the economic aspects of the sustainability agenda it didn't allow the broader issues associated with environmental and social performance to be effectively integrated into the decision making process. As such environmental and social interventions tended to be ad-hoc in nature. This lack of integration was further seen in the suggestions made for improving the sustainability of the maintenance process where a more comprehensive approach to the sustainability agenda combined with a diverse range of sustainability criteria were identified as areas for improvement. In order to incorporate this wider range of criteria a new approach to modelling will need to be developed that can balance the importance of the different criteria to individual organisations. Such a model needs to adopt a multi-criteria approach in which both quantitative and qualitative data can be used to inform the decision making process.

Planning

Prioritising maintenance actions had been affected most by the DHS, either by focussing attention onto quality issues or by supporting a move to a more planned maintenance programme in which incremental upgrades were included above and beyond those identified through a basic 'needs' model. Whilst the influence of the DHS was seen as positive in this context, there were concerns that it could have a negative impact on the long-term sustainability of the housing stock. In particular there were concerns that the DHS was distorting priorities away from the tenants agenda to a central (Government) agenda which didn't always coincide with tenants needs or desires. Also, the limited nature of the DHS, both in terms of its remit and timescale, was considered by some respondents to be storing up problems for the future and forcing organisations to address current maintenance issues in a none-sustainable way. Thus, whilst the DHS has affected priority setting, the lack of linkage between the DHS and sustainability agenda mean that many maintenance actions do not reflect the sustainability agenda.

Sustainability was perceived to have had a generally positive impact on maintenance strategies. The ability to programme works in a planned manner and the increased use of partnering agreements has reduced costs and improved contractor efficiency which has resulted in more actions being undertaken for the available resource. Further, in a few cases an integrated approach was adopted to management of the supply chain which allowed the sustainability of contractors polices to be evaluated and used as part of a SMART procurement process (e.g. typically considered as a component of the quality assessment under a balanced scorecard approach).

Action/Completion

There is little evidence to suggest that the sustainability agenda has had an impact on the process by which maintenance actions are carried out except that the use of local labour was perceived to be a desirable attribute of

a sustainable maintenance strategy and that tenant feedback was beginning to inform sustainable maintenance decision making

Summary

From the questionnaire survey it is clear that, whilst sustainability was considered by the vast majority of respondents to be an important issue for maintenance departments, it hadn't yet had a major impact on the social housing maintenance process. In the small number of organisations that had adopted a 'sustainable maintenance policy' there was:

- A clear link between the interpretation of the organisation's strategic sustainability agenda and the information collected for maintenance decision making – one size doesn't fit all;
- An acceptance that a wider range of information needs to collected than that normally associated with the stock condition survey;
- Evidence that the information collected was analysed in a way that supported a multi-criteria decision making process in which the relative importance of the different factors (e.g. economic, environmental, social) could be balanced;
- An acceptance that sustainability required a much wider range of analytical approaches, including the use of whole life performance models, to plan interventions over a long-term and to measure the impacts and pay-back.;
- An acceptance that tenants feedback was critical to setting sustainability targets and agendas.

4.3   New Maintenance Model and Toolkits

To address the weaknesses identified above the authors propose a new built asset maintenance model that places sustainable performance of a dwelling/neighbourhood, rather than the condition of building elements, at the centre of the maintenance decision making process.

The key difference between the new "sustainable" maintenance model and the traditional model is a shift in thinking from 'condition measurement' to 'performance measurement' as the basis for identifying need and prioritising actions. In developing a performance based model maintenance mangers will need to move away from the use of a (predominantly) single, subjective criteria model to a multi-criteria model supported by a new range of toolkits that: allows need to be identified against a range of sustainability drivers; takes a holistic, long-term view of the underlying cause behind poor performance (in essence maintenance moves from a repair/replace paradigm to an improve/enhance paradigm); prioritises maintenance actions against the broad sustainability agenda, including the impact of changing demands may have on long-term need (e.g. climate change); measure the performance of the maintenance action against pre-set targets; be flexible enough to incorporate individual Landlord requirements that reflect their interpretation of the sustainability agenda. A generic interpretation of the new sustainable maintenance model is given in Fig. 4.1.
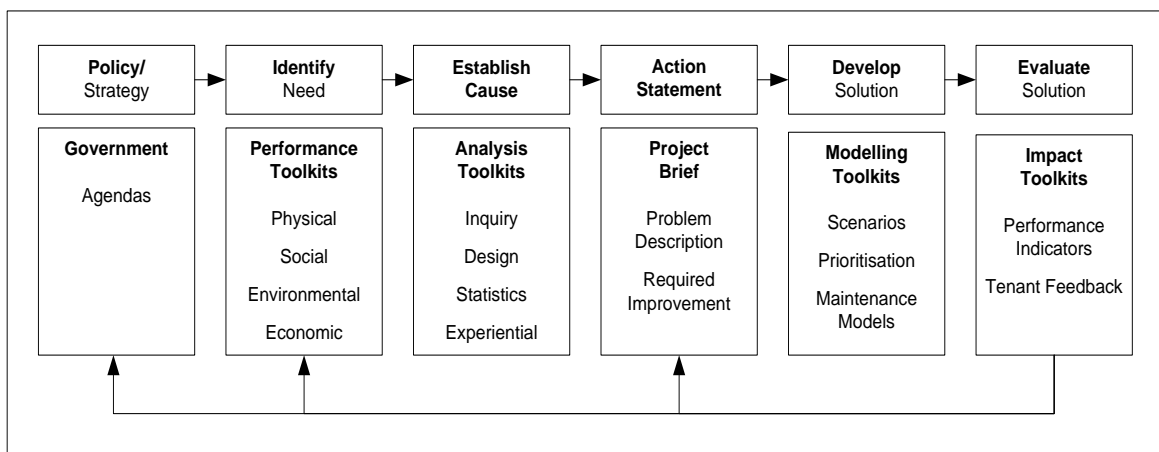
Figure 4.1 Performance Based Sustainable Housing Maintenance Model

In developing the model (through follow-up interviews) consideration will need to be given to:

Policy/Strategy
- Developing approaches that allow local interpretation of the sustainability agenda in such a way that specifically informs the development of the performance toolkits.
Performance Toolkits

- Developing a range of toolkits that reflect performance-in-use of dwellings against robust quantitative and qualitative indicators. Types of indicators may include
  - Physical – Health & Safety, Statutory Requirements etc
  - Social - Tenant Wellbeing, Community Engagement, Security, Household Running Costs etc
  - Environmental – Water Consumption, CO_2 Emissions, Material Use & Sourcing, Pollution, Waste, Energy etc
  - Economic – Asset Value, Future Risk & Exposure, Whole Life Costing etc.

Analysis Toolkits
- Developing a range of approaches that seek to identify why a dwelling is under performing and not just to recognise that it is under performing as in many cases this may be the symptom and not the cause of the problem, for example higher than expected energy consumption may be the result of poor insulation, it may be due to occupant behaviour or it might be a result of a combination of the two. Types of toolkit may include:
  - Inquiry – Interviews, Surveys etc
  - Design – Root Cause Analysis, Failure Modes Effects Analysis[2] etc
  - Statistics – Repairs Analysis, Portfolio Analysis, Whole Life Costing, Carbon Costing etc
  - Experiential – Case Studies etc

Project Brief
- Developing a project brief that communicates the cause of the problem and the expected improvements so that solutions can be proposed and evaluated. It will be used to measure how the proposed action performs against initial expectations.

Modelling Toolkits
- Developing a range of whole-life approaches that will allow alternative solutions to be evaluated against current and future (expected) needs. Types of toolkit may include:
  - Scenarios – Climate Change, Population Trends etc,
  - Prioritisation - Multi-Criteria Decision Making, Balanced Scorecard etc
  - Maintenance Models – Maintenance Strategies, Impact Models (which consider the consequences of inaction) etc.

Impact Toolkits
- Developing a range of toolkits that measure performance of the solution in use. These will be aligned to the performance toolkits thus closing the maintenance feedback loop.
  - Performance Indicators – Contractor Performance as well as Physical, Social, Economic and Environment performance etc.
  - Tenant Feedback – Questionnaires, Focus Groups etc

The general requirements of each of the toolkits will be established through a series of follow-up interviews with a sub sample of those who completed the questionnaire survey. The results of the interview process are reported in the second scientific report for this project.

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[2] These are similar to those identified in Integrated Logistics Support Toolkits suggested by El-Haram & Horner (2003)

5   CONCLUSIONS

The questionnaire survey sought to establish the extent to which the sustainability debate had influenced the way social housing maintenance is perceived, planned and implemented in England and Wales and the extent to which the existing practices/toolkits used by maintenance managers are conducive to improving the sustainability the existing social housing stock.

The sustainability debate has begun to influence the way maintenance mangers perceive the performance of their social housing stock. There was an acceptance that sustainability was an important concept that needed to be integrated into the decision they make concerning interventions aimed at improving the quality of social housing. In this context maintenance managers were generally aware of the impacts that the environmental and economic aspects of sustainability debate had on the performance of their social housing but were much less aware of how to interpret the social agenda. Greater understanding of the social factors that influence the performance of social housing need to be gained and integrated into the decision making process. Whilst the Decent Homes Standard has been the main policy driver for quality improvements over the past 7 years, it is not seen by many maintenance manages as a sustainability driver.

Maintenance planning continues to reflect traditional process and practice. Maintenance need was assessed using the stock condition survey and, although a few organisations augmented this information with additional information that reflected aspects of the sustainability agenda, the majority did not. Thus, whilst sustainability was acknowledged to be important, the tools used to assess the performance of the social housing stock did not generally reflect the sustainability agenda. Very few maintenance mangers were using specific 3rd party toolkits to assess the sustainability of their stock. Where specific aspects of sustainability were being assessed bespoke toolkits had been developed by individual maintenance mangers to reflect the particular interpretation of the sustainability debate to their specific circumstances. There was some evidence to suggest that the extra costs associated with sustainable solutions (up to a value of 5%) can be accommodated within maintenance budgets.

Sustainability appears to have had little impact on the way maintenance actions are implemented. Whilst maintenance mangers believed their current practices to be moderately sustainable, the use of local labour, and the effective integration of tenant feedback to inform sustainable decision making were perceived as areas for improvement. Whilst the majority of LAs tended to consider the sustainability credentials of their supply chains, the majority of RSLs didn't.

The current toolkits available to maintenance managers do not fully support the integration of the sustainability agenda into social housing maintenance decision making. The stock condition survey's focus on the physical condition of building elements appears to be too narrow in focus to reflect the breadth of issues associated with the sustainability debate. The DHS focus on a central agenda is perceived to skew priorities away from local concerns. Third party toolkits and their 'one size fits all' model for assessing the sustainability of social housing are perceived to be too complex and un-related to local issues to be widely used. Modelling approaches tend to be single variable models that can't accommodate the need to address a wide range of decision making criteria in a robust and defendable way. What is needed are a new range of toolkits that:
- Reflect the local interpretation of the sustainability agenda;
- Comprise customised performance indicators that relate to the local sustainability agenda;
- Provide a set of analysis tools to interpret the performance indicators;
- Provide a set of modelling toolkits that can integrate the performance indicators in a robust and defendable way;
- Allow the impact of actions to be measured and fed back into the maintenance process.

The development of such toolkits is the focus of phase 2 of this aspect of the SUE IDCOP project.

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APPENDIX A

RSL Questionnaire

LA / ALMO Questionnaire

Sustainability and Social Housing Maintenance *the* **University** *of* **Greenwich**

1.0   ORGANISATION DETAILS

1.1 What is the name of your organisation?..

1.2 Is one of the primary activities of your department the repair and/or maintenance of dwellings?   Yes ☐ No ☐

(If no, please pass the questionnaire to the appropriate individual within your organisation.)

1.3 Are you responsible for the management of maintenance and/or repair of your organisation property portfolio?   Yes ☐ No ☐

(If no, please pass the questionnaire to the appropriate individual within your organisation.)

2.0   Stock Profile

2.1 What number of dwellings do you currently have in your property portfolio? *(please tick the appropriate box)*
0 - 1000 ☐   1001 – 5000 ☐   5001 – 10,000 ☐   10,001 – 15,000 ☐   15,001 – 20,000 ☐   > 20,000 ☐

2.2 Please provide a breakdown (by approximate percentage) of your total housing stock;

Dwelling Type	Approx %	Age of Dwellings	Approx %
Flats – converted		Pre 1919	
Purpose built flats – high rise		1919 to 1944	
Purpose built flats – low rise		1945 to 1964	
Terraced House		1965 to 1980	
Semi-detached House		Post 1980	
Detached House			
Bungalow			

Location of dwelling	Approx %	Occupancy of dwelling	Approx %
Inner city		Vacant	
Suburban		Occupied	
Rural			

3.0   Housing Maintenance

3.1 What is the approximate annual value of maintenance works for which your organisation is responsible? *(m = million)*
Under one Million £'s ☐   between 1 and 5m ☐   between 5 and 10m ☐   Over 10m ☐

3.2 Are budgets for maintenance works normally based upon:
A   Previous years budget allocation   ☐   C   Property inspections of condition   ☐
B   Previous years spend   ☐   D   Others, *please specify*……………………………………………………………

3.3 What approximate percentage of maintenance work, in terms of cost have been carried out on the following basis:
A   Planned Preventative Maintenance ………………………………………………………………………………….........
B   Responsive Maintenance ………………………………………………………………………………………………….
3.4 Are property inspections for maintenance purposes carried out:
A   Annually   ☐   D   6 – 10 years   ☐
B   1 – 3 years   ☐   E   Greater than 10 years   ☐
C   4 – 5 years   ☐   F   As and when defects are reported   ☐

3.5 Please rate in order of importance (1= most important, items can be of equal importance and NI = not important) the following factors for prioritising maintenance works:
A   Priority of need ……………………………….   C   Political criteria …………………………………………….
B   Budgetary constraints ……………………….   D   Others, *please specify* …………………………………………

3.6 Do you use historical data to identify maintenance trends?   Yes ☐ No ☐

3.7 What differentiates works carried out as planned preventive maintenance to that of a refurbishment action?
A   Funding   ☐ Please state how …………………………………………………………………………………………………
B   Scale of Project   ☐ Please state how …………………………………………………………………………………………………
C   Other   ☐ *please specify*, ……………………………………………………………………………….......................

3.8 Please state the information collected for maintenance decision making and rate its importance to the process (1 = most important, items can be of equal importance and NI = not important)

Type of Data	Data collected (*tick*)	Importance (*rate*)
SAP 2001		
SAP 2005		
Energy usage figures		
EcoHome XB		
HQI		
Stock Condition Survey		
Housing Health and Safety Rating System		
Others, *please specify*		

3.9 On what basis is work procured? *Please tick as appropriate*

Planned Preventative Maintenance		Responsive Maintenance	
Preferred Contractor List		Preferred Contractor List	
Competitive Bidding		Competitive Bidding	
Selective Tendering		Selective Tendering	
Partnering		Partnering	
Sealed Bid		Sealed Bid	
PFI		PFI	
Negotiation		Negotiation	
Other, *please specify*		Other, *please specify*	

3.10 What are the major sources of maintenance related complaints? *Please tick as many as apply*

Cleaning	☐	Indoor Air Quality	☐	Plumbing	☐	Choice of Materials	☐
Repair/Replace	☐	Heat Loss/Gain	☐	Storage	☐	Equipment	☐
Waste Disposal	☐	Fire Protection	☐	Sound Penetration	☐	Design	☐
Water Supply	☐	Telecommunications	☐	Lighting	☐		

Other, please specify …………………………………………………………………………………………………..

3.11 Are the EcoHome principles taken into consideration during the development of your maintenance schemes?   Yes ☐ No ☐

3.12 Does EcoHome have any importance in your maintenance strategy?   Yes ☐ No ☐

3.12a If you answered yes to 3.12, please give further details ………………………………………………………………….
……..
……..
……..

3.13 What do you believe are the problems your organisation faces in terms of building maintenance? *(Please tick as many as appropriate)*

Not enough staff		Building design inefficiencies	
Too many calls for service		Service administration inefficiencies	
Not enough money		Poor construction quality	
Poor contractor performance		Other, *please state*	

4.0   Quality

4.1 Does the Decent Homes Standard have an impact on your maintenance strategy?   Yes ☐ No ☐

4.1a If you answered yes to 4.1 please provide your reasons why ………………………………………………………………..
……..
……..

4.2 What is the approximate percentage of dwellings which **ACHIEVE** Decent Homes Standard? ………………

4.3 Of the dwellings that are failing DHS please provide approximate percentage of dwellings failing on the following criteria *(the total may be more than 100% as some dwellings may fail on more than one criteria)*

Criteria	%	Criteria	%
Thermal Comfort		Fitness	
Repair		Modernisation	

4.4 Generally, do you believe the Decent Home Strategy will improve the sustainability of the existing housing stock

      Strongly Agree   Neither / Nor   Strongly Disagree

|-----------------------|-----------------------|-------------------------|-------------------------|-------------------------|-------------------------|

4.4a Please provide your reasons for your answer to 4.4 ……………………………………………………………………………
………
………

4.5 Do you allow for incremental upgrades to the quality of your stock within your maintenance programmes?　　Yes ☐　No ☐
4.5a If you answered yes to 4.5, please provide examples; ……………………………………………………………………
………
………
………

4.6 Are the incremental upgrades above and beyond those identified in DHS?　　Yes ☐　No ☐

4.7 Is the Housing Health and Safety Rating System incorporated into your Stock Condition Survey?　　Yes ☐　No ☐

4.7a If you answered yes to 4.7, does the Housing Health and Safety Rating System have an impact on the maintenance strategy?
　　Yes ☐　No ☐

4.7b If you answered yes to 4.7a, please give examples …………………………………………………………………………
………
………
………

5.0　　Sustainability Strategy

5.1 Is there an organisational sustainability policy currently in place?　　Yes ☐　　No ☐ Don't Know ☐

5.1a If you answered yes to 5.1, what aspects of sustainability does it cover? ………………………………………………………
………
………
………

5.1b How has sustainability affected your maintenance practices?
Not At all　　　　　　　Slightly　　　　　　　Moderately　　　　　　Significantly　　　　　　A Great Deal
|--------------|--------------|--------------|---------------|---------------|---------------|--------------|--------------|--------------|

5.2 Is there tenant engagement to raise awareness of energy use and other sustainability issues?　　Yes ☐　No ☐

5.3 How relevant do you think the sustainability debate is to your work as a maintenance manager within social housing?
Not At all　　　Slightly　　　　　　Moderately　　　　　　Significantly　　　　　Very
|----------------|--------------|--------------|--------------|---------------|---------------|---------------|--------------|--------------|

5.4 Do you currently measure the sustainability of your housing stock?　　Yes ☐　No ☐

5.4a If you answered yes to 5.4, please give examples of how this rating is achieved, …………………………………………..
………
………
………

5.4c If you answered yes to 5.4, does this rating have an impact on your maintenance strategy?　　Yes ☐　No ☐

5.5 Do you believe your organisational maintenance strategy could be improved in terms of sustainability?　　Yes ☐　No ☐

5.5a If you answered yes to 5.5, please give examples, …………………………………………………………………………..
………
………
………

5.6 How sustainable do you rate your current maintenance practices?
Very sustainable　　Moderately　　　　　Slightly　　　　　　　Neither / Nor　　　Slightly Unsustainable　Moderately　　　　V. Unsustainable
|----------------------|----------------------|-----------------------|------------------------|------------------------|------------------------|------------------------|

5.7a Which sustainable technologies have you **INCORPORATED** in your refurbishment projects …………………………………………..
………
………
………

5.7b Which sustainable technologies have you **CONSIDERED** incorporating in your refurbishment projects …………………………………
………
………

5.8 Do you consider the sustainability strategies / policies of your contractors? Yes ☐ No ☐

5.8a If you answered yes to 5.8, please specify how …………………………………………………………………………………………
………..
………..
………..

5.9 Which of the following do you believe should inform a **sustainable** maintenance strategy?	Strongly Agree	Agree	Neither / Nor	Disagree	Strongly Disagree
Improvements are incorporated into the maintenance programme to upgrade the buildings overall performance	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
'E' technology used	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Material is sourced locally	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Primary aggregates are used	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Plant is sourced locally	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Labour is sourced locally	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Recycled / reclaimed materials are used	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Materials with a low impact on the Environment are used	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Low toxicity paints / varnishes etc used	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Planned maintenance system used	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Responsive maintenance system used	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Waste reduction procedures are in place during ordering process	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Monitor and reduce construction waste	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Install materials with high ODP and GWP	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Quality system in place	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Uncertified timber used	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Energy consumption monitored and targets set to reduce use during occupation	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Energy from renewable sources used during maintenance work	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Monitor and report transport use to calculate CO_2 emissions	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Supply chain established	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Monitor and set targets to reduce water consumption during maintenance work	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Monitor and set targets to reduce water use during occupation	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Boilers are replaced with high NOx emitting boilers	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Renewable technologies considered as replacements for existing components	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Existing ecological features are protected during maintenance work	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Enhancement of the site ecology is considered during maintenance planning	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Home user guides are provided	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Considerate Constructors aims and objectives are applied to maintenance work	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Best practice policy is adopted in respect of air and water pollution	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Household security is considered during product procurement	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|
Energy consumption monitored and targets set to reduce use during maintenance work	|-----------|	-----------|	-----------|	-----------|	-----------|-----------|

5.10 What other activities do you think could be undertaken within the maintenance programme that would improve the sustainability of your existing stock? ……..
………..
………..

5.11 What barriers do you face in making your maintenance practices more sustainable?

Internal to Organisation	Yes	No	External to Organisation	Yes	No
Cost	☐	☐	Lack of Government Leadership	☐	☐
Bureaucracy	☐	☐	Lack of Joined up Legislation	☐	☐
Culture	☐	☐	No Incentive	☐	☐
Lack of Leadership	☐	☐	No Commercial Imperative	☐	☐
Lack of information	☐	☐	Lack of Technology	☐	☐
Lack of resources	☐	☐	Legislation	☐	☐

5.12 Do you think adopting more sustainable solutions will cost your organisation more money?   Yes ☐   No ☐

5.12a If you answered yes to 5.12, how much more do you think you could justify?

1 – 2% ☐   3 – 5% ☐   6 – 10% ☐   11 – 20% ☐   more than 20% ☐ please provide reasons …………………………..
………..
………..

6.0   Any Other Comments

6.1 Please make any other comments you feel may be relevant? …………………………………………………………………………
………..
………..
………..
………..
………..
………..
………..

7.0   Personal Details

Please be assured that all information related to your organisation will be treated in the strictest confidence. Should you wish to receive a summary of our results upon completion of our study then please supply your name and contact email. Results will only be presented in a collated and unattributable form.

7.1 Name ………..

7.2 Address ………...
………..
………..

7.3 Email ……..

Sustainability and Social Housing Maintenance *the* University *of* Greenwich

1.0   ORGANISATION DETAILS

1.1 What is the name of your organisation?..

1.2 Is one of the primary activities of your department the repair and/or maintenance of dwellings?   Yes ☐ No ☐

(If no, please pass the questionnaire to the appropriate individual within your organisation.)

1.4 Are you responsible for the management of maintenance and/or repair of your organisation property portfolio?   Yes ☐ No ☐
(If no, please pass the questionnaire to the appropriate individual within your organisation.)

2.0   Stock Profile

2.1 What number of dwellings do you currently have in your property portfolio? *(please tick the appropriate box)*
 0 - 500 ☐   0 - 1000 ☐   1001 – 5000 ☐   5001 – 10,000 ☐   10,001 – 15,000 ☐   15,001 – 20,000 ☐   > 20,000 ☐

2.2 Please provide a breakdown (by approximate percentage) of your total housing stock;

Dwelling Type	Approx %		Age of Dwellings	Approx %
Flats – converted			Pre 1919	
Purpose built flats – high rise			1919 to 1944	
Purpose built flats – low rise			1945 to 1964	
Terraced House			1965 to 1980	
Semi-detached House			Post 1980	
Detached House				
Bungalow				

Location of dwelling	Approx %		Occupancy of dwelling	Approx %
Inner city			Vacant	
Suburban			Occupied	
Rural				

3.0   Housing Maintenance

3.1 What is the approximate annual value of maintenance works for which your organisation is responsible? *(m = million)*
Under one Million £'s ☐   between 1 and 5m ☐   between 5 and 10m ☐   Over 10m ☐

3.2 Are budgets for maintenance works normally based upon:
A   Previous years budget allocation   ☐   C   Property inspections of condition   ☐
B   Previous years spend   ☐   D   Others, *please specify*……………………………………………………

3.4 What approximate percentage of maintenance work, in terms of cost have been carried out on the following basis:
A   Planned Preventative Maintenance ……………………………………………………………………………….........
B   Responsive Maintenance …………………………………………………………………………………………………

3.4 Are property inspections for maintenance purposes carried out:
A   Annually   ☐   D   6 – 10 years   ☐
B   1 – 3 years   ☐   E   Greater than 10 years   ☐
C   4 – 5 years   ☐   F   As and when defects are reported   ☐

3.5 Please rate in order of importance (1= most important, items can be of equal importance and NI = not important) the following factors for prioritising maintenance works:
A   Priority of need ……………………………..   C   Political criteria …………………………………………………
B   Budgetary constraints ………………………   D   Others, *please specify* …………………………………………

3.6 Do you use historical data to identify maintenance trends?   Yes ☐ No ☐

3.6a If you answered yes to 3.6 please give examples of what historical data is used …………………………………………
………
………
………

3.7 What differentiates works carried out as planned preventive maintenance to that of a refurbishment action?
A   Funding   ☐ Please state how …………………………………………………………………………………………
B   Scale of Project   ☐ Please state how …………………………………………………………………………………………

C   Other   ☐ *please specify*, …………………………………………………………………………......................

3.10 Please state the information collected for maintenance decision making and rate its importance to the process (1 = most important, items can be of equal importance and NI = not important)

Type of Data	Data collected (*tick*)	Importance (*rate*)
SAP 2001		
SAP 2005		
Energy usage figures		
EcoHome XB		
HQI		
Stock Condition Survey		
Housing Health and Safety Rating System		
Others, *please specify*		

3.8a Are stock condition surveys carried out by in-house surveyors?   Yes ☐ No ☐

3.11 On what basis is work procured? *Please tick as appropriate*

Planned Preventative Maintenance		Responsive Maintenance	
Preferred Contractor List		Preferred Contractor List	
Competitive Bidding		Competitive Bidding	
Selective Tendering		Selective Tendering	
Partnering		Partnering	
Sealed Bid		Sealed Bid	
PFI		PFI	
Negotiation		Negotiation	
In-house labour		In-house labour	
Other, *please specify*		Other, *please specify*	

3.10 What are the major sources of maintenance related complaints? *Please tick as many as apply*

Cleaning	☐	Indoor Air Quality	☐	Plumbing	☐	Choice of Materials	☐
Repair/Replace	☐	Heat Loss/Gain	☐	Storage	☐	Equipment	☐
Waste Disposal	☐	Fire Protection	☐	Sound Penetration	☐	Design	☐
Water Supply	☐	Telecommunications	☐	Lighting	☐		

Other, please specify …………………………………………………………………………………………………..

3.11 Are the EcoHome principles taken into consideration during the development of your maintenance schemes?   Yes ☐ No ☐

3.12 Does EcoHome have any importance in your maintenance strategy?   Yes ☐ No ☐

3.12a If you answered yes to 3.12, please give further details …………………………………………………………….
………..
………..
………..

3.13 What do you believe are the problems your organisation faces in terms of building maintenance? *(Please tick as many as appropriate)*

Not enough staff		Building design inefficiencies	
Too many calls for service		Service administration inefficiencies	
Not enough money		Poor construction quality	
Poor contractor performance		Other, *please state*	

4.0   Quality

4.1 Does the Decent Homes Standard have an impact on your maintenance strategy?   Yes ☐ No ☐

4.1a If you answered yes to 4.1 please provide your reasons why …………………………………………………………..
………...
………...
………...

4.2 What is the approximate percentage of dwellings which **ACHIEVE** Decent Homes Standard? ……………….

4.3 Of the dwellings that are failing DHS please provide approximate percentage of dwellings failing on the following criteria *(the total may be more than 100% as some dwellings may fail on more than one criteria)*

Criteria	%	Criteria	%
Thermal Comfort		Fitness	
Repair		Modernisation	

4.5 Generally, do you believe the Decent Home Strategy will improve the sustainability of the existing housing stock

```
                Strongly Agree              Neither / Nor              Strongly Disagree
   |----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
```

4.4a Please provide your reasons for your answer to 4.4 ……………………………………………………………………………..
………..
………..
………..

4.5 Do you allow for incremental upgrades to the quality of your stock within your maintenance programmes?   Yes ☐ No ☐

4.5a If you answered yes to 4.5, please provide examples; …………………………………………………………………………
………..
………..
………..

4.6 Are the incremental upgrades above and beyond those identified in DHS?   Yes ☐ No ☐

4.7 Is the Housing Health and Safety Rating System incorporated into your Stock Condition Survey?   Yes ☐ No ☐

4.7a If you answered yes to 4.7, does the Housing Health and Safety Rating System have an impact on the maintenance strategy?
                                                                                           Yes ☐ No ☐

4.7b If you answered yes to 4.7a, please give examples ……………………………………………………………………
………..
………..
………..

5.0   Sustainability Strategy

5.1 Is there an organisational sustainability policy currently in place?   Yes ☐   No ☐ Don't Know ☐

5.1a If you answered yes to 5.1, what aspects of sustainability does it cover? ……………………………………………………
………..
………..
………..

5.1b To what extent has sustainability affected your maintenance practices?

```
 Not At all         Slightly          Moderately         Significantly       A Great Deal
  |---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
```

5.2 Is there tenant engagement to raise awareness of energy use and other sustainability issues?   Yes ☐ No ☐

5.2a If you answered yes to 5.2, please give examples ……………………………………………………………………………
………..
………..
………..

5.3 How relevant do you think the sustainability debate is to your work as a maintenance manager within social housing?

```
 Not At all         Slightly          Moderately         Significantly          Very
  |---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
```

5.4 Do you currently measure the sustainability of your housing stock?   Yes ☐ No ☐

5.4a If you answered yes to 5.4, please give examples of how this rating is achieved, …………………………………………..
………..
………..
………..

5.4c If you answered yes to 5.4, does this rating have an impact on your maintenance strategy?   Yes ☐ No ☐

5.5 Do you believe your organisational maintenance strategy could be improved in terms of sustainability?   Yes ☐ No ☐

5.5a If you answered yes to 5.5, please give examples, …………………………………………………………………………..
………..
………..
………..

5.6 How sustainable do you rate your current maintenance practices?

Very sustainable   Moderately   Slightly   Neither / Nor   Slightly Unsustainable   Moderately   V. Unsustainable
 |----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|

5.7a Which sustainable technologies have you **INCORPORATED** in your refurbishment projects …………………………………………..
………....
……..
……..

5.7b Which sustainable technologies have you **CONSIDERED** incorporating in your refurbishment projects ……………………………
………....
……..
……..

5.8 Do you consider the sustainability strategies / policies of your contractors?   Yes ☐ No ☐

5.8a If you answered yes to 5.8, please specify how …………………………………………………………………………………………
………....
……..
……..

5.9 Which of the following do you believe **should** inform a **sustainable** maintenance strategy?	Strongly Agree	Agree	Neither / Nor	Disagree	Strongly Disagree
Improvements are incorporated into the maintenance programme to upgrade the buildings overall performance					
'E' technology used					
Material is sourced locally					
Primary aggregates are used					
Plant is sourced locally					
Labour is sourced locally					
Recycled / reclaimed materials are used					
Materials with a low impact on the Environment are used					
Low toxicity paints / varnishes etc used					
Planned maintenance system used					
Responsive maintenance system used					
Waste reduction procedures are in place during ordering process					
Monitor and reduce construction waste					
Install materials with high ODP and GWP					
Quality system in place					
Uncertified timber used					
Energy consumption monitored and targets set to reduce use during occupation					
Energy from renewable sources used during maintenance work					
Monitor and report transport use to calculate CO_2 emissions					
Supply chain established					
Monitor and set targets to reduce water consumption during maintenance work					
Monitor and set targets to reduce water use during occupation					
Boilers are replaced with high NOx emitting boilers					
Renewable technologies considered as replacements for existing components					
Existing ecological features are protected during maintenance work					
Enhancement of the site ecology is considered during maintenance planning					
Home user guides are provided					
Considerate Constructors aims and objectives are applied to maintenance work					

Best practice policy is adopted in respect of air and water pollution |-----------|-----------|-----------|-----------|-----------|-----------|

Household security is considered during product procurement |-----------|-----------|-----------|-----------|-----------|-----------|

Energy consumption monitored and targets set to reduce use during maintenance |-----------|-----------|-----------|-----------|-----------|-----------|
work

5.12 What other activities do you think could be undertaken within the maintenance programme that would improve the sustainability of your existing stock? ……
………
………
………
………

5.13 What barriers do you face in making your maintenance practices more sustainable?

Internal to Organisation	Yes	No	External to Organisation	Yes	No
Cost	☐	☐	Lack of Government Leadership	☐	☐
Bureaucracy	☐	☐	Lack of Joined up Legislation	☐	☐
Culture	☐	☐	No Incentive	☐	☐
Lack of Leadership	☐	☐	No Commercial Imperative	☐	☐
Lack of information	☐	☐	Lack of Technology	☐	☐
Lack of resources	☐	☐	Legislation	☐	☐

5.12 Do you think adopting more sustainable solutions will cost your organisation more money?   Yes ☐ No ☐

5.12a If you answered yes to 5.12, how much more do you think you could justify?
1 – 2% ☐   3 – 5% ☐   6 – 10% ☐   11 – 20% ☐   more than 20% ☐ please provide reasons …………………………..
………
………
………
………

6.0   Any Other Comments

6.1 Please make any other comments you feel may be relevant? …………………………………………………………………………
………
………
………
………
………
………
………
………
………

7.0   Personal Details

Please be assured that all information related to your organisation will be treated in the strictest confidence. Should you wish to receive a summary of our results upon completion of our study then please supply your name and contact email. Results will only be presented in a collated and unattributable form.

7.1 Name ……..

7.2 Address ……….
………
………
………

7.3 Email ………..

8.0   Return Details

Please return your completed questionnaire to, **Dr. Keith Jones / Justine Cooper, University of Greenwich, School of Architecture and Construction, Avery Hill Campus, Mansion Site, Bexley Road, Eltham, London, SE9 2PQ**

APPENDIX B

Responses to Open Questions

Table B.1 Types of Historical Data collected to Identify Maintenance Trends – Qu 3.6

Category	Response
KPI	Capital programme activity, reactive repairs budget, post contract scheme assessment, day 2 day elemental replacement Average repair cost / number of jobs issued, trends most commonly items repair stock condition surveys predictions. Elemental costs, costs per property / block / estate
Life Cycle Modelling	Department uses a property database containing, construction year and component renewal year. The welsh assembly lifecycle prediction combined with condition surveys is used to plan future works. Life cycles, year of installation etc
MIS	Day to day general repairs log, referrals to property teams, M&E engineering service records RM patterns of expenditure used to inform planned replacement of property components Breakdown central heating – generally responsive repair trends Date and type of replacement or repair to each dwelling attribute used for cyclical and RM work Responsive, planned and refurbishment data is all used to identify trends and drives elemental replacement Reports by estate from responsive repairs ordering system High levels of component breakdowns will feed into replacement programme Asset Database, monitoring responsive trends Comparison of monthly reports to those of the previous year Types of work needed / historical information on construction / past work to inform decent home planning Number of occasion's repairs completed to building elements. Comparison of time taken to carry out repairs Number of repairs / trades
Components	Replacement of gas central heating system Gutters / roofing / drainage
MIS / Life Cycle Modelling	Checking defects in streets where the last upgrade was done at the same time Maintenance and inspection records
No Category	Responsive data. Major work data Previous section 82 demand and decent homes stock condition information

Table B.2 Funding Differentiates Works Carried Out as PPM to that of Refurbishment - Qu. 3.7

Funding
Over £5000 too high level panel
Major works refurbishment are capital funded. Day to day and maintenance are revenue funded.
Dependent on funding for all work
Limited funding can restrict PPM
Preventive maintenance is revenue funded and refurbishments are generally capital with some RCCO provision
Extra funding ensures you can do more than basic
Correct funding permits better planning
Government regulation
Generally revenue; refurbishments = capital
Revenue vs. capital
PPM and single one off replacement
Do we need to borrow
Limited funds available after dealing with urgent/emergency works
PPM data is from SCS and at the present time DHS states what works are to be planned and not scale
E.g. new kitchens and bathrooms
We have a £105 million Decent Homes Standard Programme
HC, own, RCGF etc funded
Decent Homes Standard
Grant available
Housing Corporation Criteria
To help achieve efficiencies in day to day repairs
Funded by sales of £4 million per year
Condition of Property
Specific reserve
We class refurbishment as planned preventative maintenance and complete as necessary for need, decent homes standard etc
Funding availability may depend on recycled grant funding and capital bids

Table B.3 Scale Differentiates Works Carried Out as PPM to that of Refurbishment - Qu. 3.7

Scale of Project
Batched responsive repairs into schemes
If major works covering multiple trades
Refurbishments includes improvements which is a capital item for which there is currently no provisions
Longer projects tend to attract funding for innovative schemes
Major/minor works
Projects over £20,000
Carried out in-house; refurbishment = partnership agreements
Refurbishment generally street by street scale
Do we need specialist consultants?
Any flat modernised is classed as refurbishment
Decent Homes Standard gives 5 year program
If works required exceed typical PPM scale and cost (approx £12k 0 £15k) then project may become a full blown refurbishment. Also, most PPM works are funded from rental income, larger refurbishment works would typically be capitalised.
Dependant on funding
Use of stock condition information and Asset management strategy
If a void has never had much work carried out it needs a refurbishment to comply with decency. We also 'buy-back' properties which need in some cases refurbishment.
Planned maintenance along component lines
Type and extent of work
May require consultants
Scope of works
Candidate identified through property performance index and / or through local management request for review. All possible options appraised through a financial model.
As we make to sell some are upgraded for sale
PPM is elemental, refurbishment usually total
Significant expenditure / major components carried out
PPM is one or more specific elements
DHS works are major fund takers at present – from capital as insufficient funds from grants

Table B.4 Other Differentiates Works Carried Out as PPM to that of Refurbishment - Qu. 3.7

Other
One is capitalised the other isn't
Refurbishment may involve changing layout. PPM generally replaces what is already there.
Nature of work
If conversion works are necessary
Relative component failure dates
Cost and volume
Cost effectiveness
Type of works – time expired component or finishes compared to specific dwellings
Capital / revenue funding
PPM is renewing an element that is failing or failed whereas refurbishment is an upgrade / modernising or improvement where failure may or may not be resent
Repair prior to new painting program on a 5 year cycle
Stock condition data used to form programmes
Cyclical works are categorised as pre planned along with service contracts e.g. gas servicing, painting, fire alarms etc.
Nature of works required
Type of work and component replacement = planned, wholescale refurbishment = refurbishment
Component renewal in terms of condition
PPM identified as gas servicing / painting and prior to paint, repairs and ad hoc and planned renewals. Refurbishment tends to involve wider activity and remodelling
Strategic planning
Type of project
Nature of project
Stock condition data – decent homes complaints
All planned works are seen as preventative
Specification
Where refurbishment as part of preventative maintenance offers value for money
How much work is required and the complexity. If it will contribute to reducing the ongoing maintenance costs for the association
Replacement at end of lifecycle as opposed to repair
Analysis of SC data, demand and rental information drives planned programme, assessment for large scale refurbishment schemes identified on an individual basis through options appraisal and consultation with residents and community
The nature and timing of the work
Determined by work type
Extent of work within a property
Works identified as part of stock survey detail decent homes works these clearly define refurbishment works other works carried out not part of decent homes assessment will be classed PPM
Condition of properties

Table B.5 Reasons Why EcoHome Principles are Important to the Maintenance Strategy – Qu. 3.12a

Category	Response
Strategy	We have an affordable warmth strategy which is integrated with other work programmes
	The association has a robust environmental policy
	Change in company policies to improve 'green' issues and ensure measured targets are exceeded year on year
	Asset management strategy sets out outputs to meet ecohome principles via a CKH standard
	The issues addressed are reviewed in our maintenance strategy and those that are directly applicable are factored in where possible
	We have adopted a strategy of implementing eco friendly materials and methods in the implementation of our investment programmes including innovative energy technologies
	Captured in asset management strategy
	EcoHome principles are incorporated in our Asset Management strategy
Assessment	All major refurbishment / modelling to sheltered schemes undertaken to ECO homes standard
	EcoHomes used to identify minimum requirements (along with other measures)
	We have started to assess our stock using EcoHomes XB
	We will be incorporating eco-homes XB into our stock condition survey and future planned maintenance programmes
	EcoHome principles are incorporated in our Asset Management strategy and the ?&M policy
Solution / Primary Replacements	We are committed to energy savings and affordable warmth strategies. This is a major part of its investment strategy and new materials considered are measured against the environmental / energy impact
	Affordable warmth/energy efficiency considerations
	Development and maintenance department works closely at design stage looking at lifecycle costings, sustainability etc., standard components used alongside innovation (thermal heating etc)
	Consideration to be given to renewal of drying areas to flats
	We have taken opportunities to adopt sustainability measures in major refurbishments. However the additional costs are not reflective of the Governments Major Repairs Allowance – therefore the priority has to be DH first and sustainability second
	Developing affordable warmth strategy, components and specifications to provide some compatibility with new build.
	Encourage the use of materials with a low impact on the environment
	Only sustainable materials used, embodied energy cost in materials considered
	Selection of Heating systems and insulation
	CHP schemes underway, spend on insulation of cavity walls, use of low energy light bulbs
	Energy saving issues within EcoHomes have been used in our maintenance specifications – in collaboration with the Energy Saving Trust
Targets	It is part of our sustainability strategy and helps improve our SAP rating
	We are EMAS accredited and work to include environmental targets in its maintenance activities
	There are aspects with EcoHomes which we try and emulate with our Asset Management Strategy. We have various targets of trying to reduce waste, energy saving measures, water saving etc
No Category	EcoHome criteria fed into employers requirements documents, etc.
	Implementing energy efficiency measures to housing stock, ethos of ecohomes to be integrated within the association's future accommodation

Table B.6 Reasons Why the DHS has Impacted the Maintenance Strategy - Qu. 4.1a

Category	Response
Resources (operational)	Budgets have to be formulated with meeting the decent homes strategy in mind
	Balancing value for money between capital and revenue
	Investment in Decent Homes hopes to reduce revenue pressure
	Resources targeted to meeting DHS
	Majority of financial resources targeted at meeting DHS
	The impact is purely a financial issue for the organisation
	Takes a first slice of the budget
	Major lack of investment to meet and maintain the Welsh Housing Quality Standard. Currently proposing stock transfer option as a means of assuring investment for the future.
Tenants	DHS criteria do not match tenant expectations or maintenance plans
	Budgeting for DHS impacts on satisfying the tenants' wishes for other types of improvements through financial constraints.
	It skews properties away from need and doesn't always reflect what tenants want and need.
	Planned maintenance is closely linked to DH work to help maximise efficiencies and reduce disruption to tenants
Changed Strategy (no details how)	Deadline of 2012 for all Local Authority and Housing Association stock to comply with Welsh Housing Quality Standard. The requirements of the standard have certainly helped to shape our planned maintenance programme.
	Future planned maintenance requirements to include the decent homes standard requirements
	Captured in asset management strategy
	Need to align responsive maintenance with DHP
Targets	Feedback received to identify future plans
	….. environment, ensure long-term sustainability of stock, reduce household bills, reduce annual maintenance and better design of work undertaken etc. Decent Homes has enabled us to develop a 30 year Asset Management Plan and will re-focus how investment is carried out in the future
	5 year planned programme driven by Decent Homes Standard / Stock Condition Survey statistics and incorporated into business plan
Quality	Thus, we believe, has not only reduced replacement costs and is reducing future maintenance costs but has also provided the opportunity to review all of our technical specifications, materials and manufactured items used etc so that we plan and use parts that provide added benefits to the environment, ensure long-term sustainability of stock, reduce household bills, reduce annual maintenance and better design of work undertaken etc.
	Because it raises the standard of works
	Impacts on future responsive repairs and the ability to move towards a 3* service
	We now replace whole kitchens and bathrooms rather than individual components
	All social housing must comply with WHQS by 2012. The cost of bringing properties up to WHQS comes out of maintenance budget whenever work is carried out on a property, the opportunity is taken to upgrade to WHQS.
Priorities	The Decent Homes Programme has provided the opportunity to replace many elements of work to prevent further deterioration of housing stock.
	A decent home plus strategy has been adopted. Some replacement has been early, but it was economic to do so. Reactive repair costs are falling in general.
	All decisions to maintain / planned work are in some part driven by the likelihood of this work achieving Decency
	Priority for planned works
	Altered strategy to bring kitchens, bathrooms and heating up to standard by 2010 and have a continuing plan for the future
	Prioritising homes requiring meeting DHS
	DHS / Stock condition database is used to prioritise into planned works programmes.
	It dictates our priorities for property component replacement.
	Alters priorities.
	Helps focus spend priorities, does not allow any soft items to be carried out due to budget constraints.
	Some replacement requests postponed if in early years of decent homes programme.
	Significant attention is paid to try to avoid repairs which would be better replaced to DHS
	It provides a focus to where we concentrate our component replacements.
	Stock condition survey determines DHS programmes of work
	Viewed in conjunction with stock survey and may move planned date as a result
Strategic	We have a corporate commitment for all our properties to meet the decent homes standard by

	the end of 2008. New financial arrangements to ensure association can deliver minimum standard, this is now priority of board finance ring fenced for maintenance for ¾ year to ensure delivery of decent homes. We are attempting to do a Decent Homes Plus Standard Part of the preventative maintenance strategy is to ensure that DHS is maintained Our business plan identifies how we deal with non-decent homes and preventative measures to be taken in future.
Measuring Decency	It has forced us to collect additional data and amend our programme. Information fed into affordable warmth project and programmed replacements. This forms a major factor in our property condition assessment. Need to meet required standard by 2012 (Welsh Housing Quality Standard). Standards are not fully 'SMART' – difficult to measure, some are very intransigent. Compare stock against Decent Homes Standard
Change in Procurement	Reduction in internal work cost maintenance budget (boiler replacement). Future boiler replacement will now be procured through the maintenance contractor to ensure consistency in standard and VFM. …. thus reducing costs and contractor inefficiencies that exist when carrying out restrictive annual maintenance programmes that are constrained by annual budgets from HRA. We have been able to take sensible decisions to address stock condition failure and this is helping to reduce work carried out on a responsive works basis and carry out preventative work instead. Early indications show a reduction in demand for responsive repairs. However it is assumed that costs will increase because of quality of materials used in decent homes. The DHS has a significant impact. Asset management strategy now changed from replacing when breaks to maintaining high standards of materials and an achievable building cost model. As an RSL we have committed to meeting the DHS as a minimum standard, but are using a life cycle 'just-in-time' approach to component replacement to which DH is a by-product It means we may wait for capital DH works at times and just do minor repairs This has enabled us to develop a long-term partnering strategy instead of annual tendering practices which offer better value. We have been able to plan work over many years
Statements	We are an ALMO and as such were established to achieve the DHS. Our stock is 74% non-decent. Decent Homes Standard and to ensure we meet the 2010 target our programme work drives what we do. Programme should be completed 2008. Approximately 7000 homes are part of a 2004 – 2010 decent homes standard programme. We aim to achieve as close to 0% non-decent by 2008 and maintain at that level. To maintain a high level of decency currently 99%. We need to replace old central heating systems and refurbish at least 40 kitchens and bathrooms before 2011. Because it is a government target we are monitored on. As an ALMO we were set up to achieve 100% decency earlier than 2010. Achieving DHS is a priority for the Council. It is a key government objective to drive quality of housing stock and a minimum standard to which we seek to achieve. Meeting government target. Need to meet by 2010. It is our intention to be fully DHS compliant by 2010. A government requirement to meet DHS by 2010. Requirement to comply by 2010. Government legislation so has to be achieved. As a local authority landlord we are obliged to make our stock comply with the DHS by 2010. So that properties comply with the legislation. Target for compliance. Whilst engaged in maintenance work attempts have to be made to ensure compliance with DHS for 2010 and beyond. Planned Maintenance and Refurbishment programmes are tailored to achieving Decent Home Standard Budgeting for DHS impacts on satisfying the tenants' wishes for other types of improvements through financial constraints. Time Constraints and cost Kitchen designs and WHQS Only a small selection of our properties do not comply, but we are aware of the importance of the DHS.

Table B.7 DHS and its Impact on Sustainability – Qu 4.4a

Category	Response
No Direct Link	Agree - Sustainability is more than the condition of the home, it relates to other conditions on the estates. More work needs to be done on security and environmental issues.
	Neutral. As the main reason for failure is thermal comfort and therefore important, don't know what degree that will improve sustainability.
	Strongly disagree - Poor standard.
	Disagree. The standard focuses on the physical condition of the housing stock and not the sustainability of the neighbourhoods in which they are contained.
	Disagree – Strongly Disagree. Achieving decency in a property (due to financial constraints) is a ? doing the minimum ? The assessment criteria for decency pays little regard to increasing energy efficiency and sets very low standards for insulation and efficiency.
	Neutral. Just because we have to meet the decent homes does not mean it will improve sustainability, the two are not linked to the extent that one relies upon the other.
	Neutral. It is a mechanistic method which encourages serviceable elements in good condition to be renewed before they need to be.
	Neutral. Some of our properties are centuries old and survived without basic standards for much of that time and are still going strong.
	Neutral. Decent Homes and sustainability are not really connected.
	Neutral. Does not give very challenging targets relating to sustainability.
	Neutral. Environment externally is a bigger factor – I.e. crime, disorder etc.
	Neutral. Decent homes does not provide targets or priorities in relation to sustainability.
Desirability	Agree. Most properties already in reasonable demand. Improvements to dwellings and environment will increase demand for remainder.
	Strongly Agree – Agree. Focused investment in maintenance – improved quality has also led to increased demand
	Agree. Improves lettability of stock.
	Strongly Agree. It can help improve customer satisfaction, reduces litigation, helps in crime reduction and can assist to improve void letting timescales.
	Strongly agree. Will provide decent homes to live in and therefore will be a demand for the property.
	Strongly agree. Decent Homes will remain in demand.
	Strongly agree. Ensure they are more desirable i.e. no shared facilities and more modern facilities.
	Strongly agree – agree. By having a "decent" housing stock we have found tenants take more care in maintaining their homes and communal living conditions.
	Agree. Better heating and insulation. Greater satisfaction potentially leading to people staying in homes longer.
	Strongly Disagree. Just because a property has a new kitchen or more insulation does not mean it is desirable if in poor surroundings.
Standards	Strongly Agree. Improved facilities and thermal improvements will improve stock and living conditions for tenants, lower deterioration of stock given level of planned investment.
	Agree. Properties with all their major components in a good state of repair are more sustainable than those where the condition is generally poor.
	Strongly Agree. Improvements to the homes can only benefit the sustainability agenda.
	Neutral. Many material being used in the DH refurbishment would not be considered sustainable e.g. UPVC windows.
	Strongly Agree. New boilers, insulation, roofs, windows
	Strongly agree. Decent Homes Standard specifically targets achievement and maintaining high quality homes, components and thermal performance in our properties.
	Agree. Welsh Housing Quality Standard sets minimum SAP ratings and criteria relating to thermal efficiency and performance, by achieving this the stock will become more sustainable in terms of energy efficiency.
	Strongly Agree. Decent Home Strategy provides a minimum standard of acceptable living that aids the ?? an improving the integrity of our stock through modern methods of construction.
	Strongly Agree – Agree. It is a strong driver to help ensure better standards
	Strongly agree. It will force RSL's to improve their stock.
	Strongly Agree. Provides a standard to work to.
Asset Management Strategy	Neutral - Seems the drive to meet DHS makes landlords do quantity programmes and not quality. This means the life cycles will be short.
	Disagree. Pressure to upgrade houses as cheap as possible. This does not encourage sustainability.
	Disagree. Does not impact on the structural integrity of building and can be interpreted into a

	repair regime only.
	Agree. Forces us in to a planned approach to long term maintenance.
	Strongly Agree – Agree. The money should have been spent on the external or the building or the electrical woks.
	Strongly Agree. Decent Homes has enabled a more planned approach to delivering investment to address stock failure and programme work in a more effective way that provides best value.
	Strongly Agree. Focused maintenance expenditure and gave impetus to looking at sustainability.
	Strongly agree. Decent Homes Strategy is a part of overall asset management strategy which addresses sustainability.
	Neutral - The DH implementation deadline of 2010 has set a 'make decent' target – keeping homes decent after this deadline appears to have less political emphasis.
	Neutral. DHS ends in 2010, but maintenance requirements will go on for ever
Partial	Neutral. It's only focusing on a few items, kitchens, windows, bathrooms, heating, what about other maintenance issues.
	Neutral. Too black or white, detracts attention from the overall picture for a scheme.
	Strongly Agree – Agree. It will improve the sustainability in some areas but not all.
	Disagree – Strongly Disagree. For this council attainment of the DHS requires major investment in kitchens and bathrooms – little impact on sustainability.
	Strongly Agree – Agree. It only deals with individual properties – more needed for community works.
	Agree. Decent Homes have to be a basic requirement for sustainability but not the only one.
	Strongly Agree. Works to implement could greatly improve the sustainability, however a lot depends on tenant use.
	Disagree. The DHS certainly helps with sustainability but is too low a standard for long-term sustainability.
	Agree. Thermal efficiency yes, but other DH criteria depend on an organisations adherence to environmental / sustainable performance
Minimal	Agree. It sets a standard, albeit minimal
	Neutral – Agree. DHS is not high enough a standard to properly address sustainability. Funds for stock regeneration have had to be re-deployed in order to achieve DHS.
	I tend to agree with the statement but not strongly. DHS has given objective asset management a boost but, as the government has now recognised, the parameters are too narrowly drawn.
	Neutral. DHS is a minimum standard and does not necessarily influence supply / demand issues.
	Neutral – disagree. DHS is a pretty poor minimum standard and does not in general achieve Building regulation levels.
	Neutral. Decent Homes is the minimum standard we wish to achieve.
Funding	Disagree – Strongly Disagree. The standard helps to secure funding for maintenance.
	Strongly Agree - Agree. It provides focus on the major elements of a property and helps to justify expenditure.
	Strongly agree. The strategy has led to an increased investment/improvement in the housing stock
	Strongly disagree. It can't be viewed as a finished project will require continued investment to ensure no future slippage – difficulties in securing investment.
	Strongly agree. Decent homes is focusing investment in key areas.
Unnecessary	Agree – Neutral. Will help in older stock to a greater extent much of it social landlords are doing. Biggest impact on local authorities.
	VSD - Strongly disagree. The principles and benefits of sustainability help drive the products we use and therefore contribute to the wider environmental issues of climate change.
	Strongly agree. I believe we already had a strategy in place – it was not necessary for the government to impose a "solution".
	Neutral. Improvement programmes are and have been ongoing to our stock for a number of years DH has only set a mark in time for some failing properties to be dealt with.
	Agree. We were doing much of the work anyway and its 'tick box' nature can be overly prescriptive.
Procurement	Strongly Agree. The WHQS requires homes to be periodically repaired usually before component failure occurs. The standard will also require significant levels of local investment and we would aim to engage with local businesses and invest in the local economy.
N/A	Strongly Agree. The Governments Decent Homes Standard has encouraged us into producing our own decent homes plus standard.
	Strongly Agree. The need to maintain DHS and other improvement work to stock.
	Neutral. With pre 1919 properties there are always problems arising from dampness, cellars etc

	and kitchen/bathrooms will require refurbishing every 15 years or so and central heating every 20 years. Neutral. Stock in good condition and in high demand. Neutral. Stock already in good condition

Table B.8 Examples of Incremental Upgrades to the Quality to Housing Stock – Qu4.5a

Category	Response
Environmental Heating / Insulation	Heating and boilers and improved insulation, double glazing (incremental upgrades)
	Rewires, heating upgrades.
	Boiler replacement programme – funded from capital, kitchen replacement programme – funded from capital.
	High efficiency boilers, thermostatic radiator valves, lever taps, 38mm kitchen worktops (from 28mm), full central heating replacing all warm air heating.
	Enhanced thermal efficiency, security, H&S **(also social).**
	UPVC replacement windows and doors, 'A' rated condensing boilers, insulation (cavity walls and loft), security enhancements **(also social).**
	Energy efficiency measures such as cavity wall insulation, installation of energy efficient boilers.
	Yes. We continually review specification i.e. boilers.
	Boiler replacement upgrade to class 'A'
	Repairs are carried out to a higher / improved specification e.g. insulated render as apposed to ordinary render.
	DH and SAP improvements
	Condensing boilers: more kitchen units than previously supplied **(also social).**
Water	Installation of showers in bathroom upgrades.
	Over bath showers / decoration / flooring / tiling **(also social).**
	Electrical re-wire, bathrooms & kitchens, heating systems.
	Input showers to all bathroom upgrades, thermal upgrades include cavity wall, loft and fuel saving measures. Condensing boilers installed.
	Kitchen and bathroom refurbishment. Insulation and heating upgrades
	Where we fit showers for adaptations
	Showers
Social	As a principle we may opt to upgrade / improve a property to a point and allow for a return in later years to do further work, this will usually be driven by the tenants wishes.
	Sheltered housing remodelling, fire safety works, security works.
	Bathroom replacements will include changing the general layout to improve the dwelling as opposed to straight forward replacements **(also environmental)**
	Disabled arrangements and communication system.
	Whilst undertaking programmes we consider general and specific improvements of our stock, mindful of the end users. Many of our stock are subject to ASB and we attempt to limit future problems whilst undertaking works.
	When replacing kitchens, all walls are skimmed to leave a 'new' finish. Tenant choices are developed in consultation with them over time. TRV's are fitted to radiators, high efficiency boilers are fitted, high quality products are utilised, electric focal fires are offered where back boilers are removed; windows are double glazed; high security external doors are fitted where doors offer limited security.
	Showers are better, extra sockets, gardens improved etc **(also environmental)**
	Yes. Improved design / specification when renewing kitchens.
	Door entry upgrades and fire safety
	Extra kitchen units, showers **(also environmental)**
	Windows are double glazed; high security external doors are fitted where doors offer limited security. **(also environmental)**
	Window and door replacement programme developed beyond decent homes standard and other elemental replacement planned. **(also environmental)**
	Seek beneficial secondary gains i.e. improve access, improve internal comfort through specification.
Economic	Other work carried out where appropriate and cost effective.
	Showers to all bathrooms, use of local labour **(also environmental)**
	Yes. We have a general rule of replacement rather than repair and improvement rather than maintain.
	Will replace wooden windows with UPVC where the former is beyond economic repair.
Opportunistic	We use long term business planning, but try to closely associated works (such as new kitchen units and kitchen electrical upgrades) at the same time.
	Annual gas servicing, oil, solid fuel and electric are all linked to upgrades.
N/A	Programme for works not included under DHP
	Most programmes are component / element based
	Try to maintain a balanced programme considering DHS, tenant wishes, and general stock repair and improvements

	We obviously have some flexibility to undertake additional work if required within the programmes, i.e. windows, doors and also undertake gas repairs/replacements identified by annual gas inspections
	Where funding is not available to do a full upgrade
	Planed replacement on expected lifecycle of components or attributes of a dwelling
	Part modernisation works
	Various programs of plant and component improvement / upgrade
	All properties that are refurbished are insulated to Building Regulation
	Yes. Component renewal based upon life cycles
	Our planned maintenance programme is focused on individual component replacements based on lifecycles rather than wholesale regeneration / refurbishment of areas at a time
	Elemental upgrades on each 5 year cycle – external decorations, security, fencing, external doors etc
	Properties are not upgraded all at once, rewire programmes, new kitchens etc
	Based on a 7 year investment programme, the work is divided into a phased approach. Kitchens and bathrooms
	Yes. Staggering the fitting of replacement windows to those properties which aren't listed buildings.
	The council has agreed a standard which is above DHS

Table B.9 Reasons Why The HHSRS Impacts the Maintenance Strategy - Qu. 4.7b

Category	Response
Priorities	Yes. Assures most Cat 1 hazards are dealt with ASAP.
	Yes. All properties requiring a priority 1 repair will have works undertaken in current financial year.
	A failure under HHSRS means a whole property Decent Homes failure – therefore the repair goes to the top of the list for rectification. Actual rectification depends upon the cost.
	From the amount of works identified
	HHSRS has been incorporated into the Asset Management Strategy and is considered when making investment decisions. Only just started this and developing systems for capturing data.
	Yes. Immediate HHSRS failures procured through the maintenance contractor.
	Yes. Works identified are planned to be undertaken whilst undertaking cyclical and decent homes work fixes issues identified, whilst ensuring value for money.
Planning	It may well engender work or replacement that might otherwise have soon been the subject of maintenance work.
	Yes. We are now looking at general estate improvements where they relate to health and safety footpaths. Also annual tenancy visit provide for health and safety checks.
	Yes. Need to incorporate "new" failures into programs.
	Yes. Initially it appears very stringent in alerting both surveyor and specifiers to carrying out additional works outside the dwelling e.g. footpaths, handrails, staircase refurbishments.
	It's a poor standard that most RSL's will not get caught out. Note the sound insulation is so difficult to prove that most RSL's and LA agencies are baffled.
	Its early days with the HHSRS but it should impact on the maintenance strategy where compliance with the HHSRS is included in the various programmes, i.e. kitchen layout, ergonomics, falls of level, falls between levels etc.
	We are in the process of incorporating this and fire risk assessments into a single asset management database which will help inform strategic decisions.
Costs	Yes. Increase in cost, HHRS deals with the whole property (including garages, gardens etc) not just the dwelling.
	Yes. Increase costs of work, residents and councillors have a view that DHP will address all.
	Yes. This is purely a financial impact and has been factored into our 30 year global financial model.
	Yes. HHSRS significantly increases the number of kitchens we need to replace because of unsafe layout. External door security is another major change. Total extra costs of HHSRS = £5m over 4 years
N/A	Not had an impact yet but will soon when most recent survey completed
	Currently have no HHSRS category and failure – recent results from an independent stock condition survey.
	Yes. I expect it to in the future.
	We are still awaiting a final report – for the private sector HHSRS have increased spending need – public sector likely to be the same.
	Yes. Space standards and security are two big issues being addressed.
	Yes. Marginal.
	Not at present as no properties apply, but if any did, they would be of highest priority.
	Works to void, trips and falls.

Table B.10 Aspects of Sustainability Covered By The Policy – Qu 5.1a

Category	Response
Environment	Developing new homes, repairing, maintaining and improving existing homes, minimising waste, waste recycling measures, water conservation measures, minimising travel.
	As part of the environmental strategy energy waste and environmental issues are being addressed with the view to sustainable initiatives e.g. we actively encourage the use of environmental friendly products during refurbishment works
	EMAS accreditation means that all decisions are made with respect to the environment. Environmental works to estates.
	Developing it in line with environmental management policy.
	Efficient use of resources, reduce waste wherever possible, maximise re-cycling, increase use of recycled materials and those from renewable sources, purchase more sustainable goods and services, promote renewable technology.
	It is very broadly drawn. Main items which relate to us are improving SAP ratings and minimising waste.
	"Green Charter" – all materials and procurement. **(also economic)**
	Energy efficiency of homes, local supply chain development **(also economic)**
	Materials, services, communities **(also social)**
Integrated	Financial sustainability, sustainable communities, minimising environmental impact, preserving and enhancing ecological value and d/w factors effecting individual sites.
	Neighbourhood sustainability appraisals covering internal and external factors such as local housing conditions, surrounding condition, poverty and economic exclusion, built environment, social conditions and cohesion.
	Use EcoHome principles for refurbishment.
	We would like to think all aspects
	A broad approach is taken
	Asset management strategy also covers demand, feasibility, management etc. Also incorporates ASB, turnover etc. Builds a picture of profile of small and large sectors every 6 months.
	Each region does annual "traffic light" sustainability reports, association has a sustainability sub-group.
	Local labour, local supply of materials, energy saving, affordable warmth, timber
	Energy, local labour, environmental issues.
Social	Tenancies, garages, other buildings and homes, communities.
	Option appraisal, population of area.
	Stock condition, demand, turnover and any demographic change. **(also economic)**
Economic	Investment, continued improvement, stock appraisals, asset management strategy. Be willing to change and adapt.
Not Relevant	Offices and new developments.
	Heating, roofing, kitchens, bathrooms, rewiring.
	Currently dealt within the asset management strategy the company is currently in the process of developing such a policy.

Table B.11 Examples of How Housing Stock Measured in Terms of Sustainability – Qu. 5.4a

Category	Response
SCS / Asset	Stock condition and stock evaluation carried out. Stock condition surveys, asset management matrix. We have developed a model which appraises a number of key indicators across Management of Housing Repairs, stock condition and environmental needs. Sustainability matrix that brings in socio-economic considerations. Apart from SAP ratings we are currently investigating with ECSC what methods can be used to measure sustainability. Inspection of energy efficiency. Measure specific areas e.g. paint usage, timber sources, and aggregate use. Asset management strategy includes a rating system for sustainability. Asset Management Strategy spans all aspects to give social / demand / sustainability picture of stock profile. By analysing and weighting key sustainability indicators.
Recognised Toolkits	Trained eco assessor, elements of BREEAM used. Ecohome XB EcoHomes XB assessment tool / software SAP ratings / tenancy turnaround / customer satisfaction SAP, Decent Homes Standard Primarily through SAP ratings Housing Stock SAP score rating Improved SAP ratings, targeted investment **(also economic)**
Economic	Demand, turnover, building cost Desirability and affordability in terms of 30 year maintenance costs Condition, demand, 30 year maintenance costs Working models – investment vs. rental income vs. vacant time Based on combined measurement of demand, void turnover, length of tenancy, repair / refurbishment costs. New boiler programme.
Scenarios / Community Level	Housing Management Performance reports, demand/turnover, Decent Homes Strategy and Housing Management Plan. We have undertaken a number of masterplanning exercises in areas of concern and carried out option appraisal exercises on all of our non-traditional stock to ensure that long term demand can be assured as well as address any structural defects that need to be taken into account as part of DHS. Measured by the HNIR Pathfinder – looking at quality demand etc – local NRA studies have also been completed.
Not categorised	Data is compared with area housing manager and local elected members knowledge Doing yearly evaluations

Table B.12 Examples of how the Organisations Maintenance can be Improved in Terms of Sustainability – Qu 5.5a

Category	Response
Social	Local procurement etc **(also environmental)** More consultation with neighbours Using local labour and putting through apprentices help with lack of trades Involving residents in design which effects running costs and the build cost Increase in wider community issues
Environment	Use of sustainable construction materials including recycled materials, use of local contractors to minimise transport, implementing waste minimisation practices. Spread the net wider on materials and services when procuring contracts. **(also economic)** Greater clarity over the specification of materials and technologies used to ensure they are as sustainable as possible. Currently under review. Improve insulation, home comfort etc, solar heating, improving heating systems (efficiency). Yes. Need to consider the future effects of climate change and the use of the world's resources. More research required into sustainable materials. Current strategy/position do not take into account sustainable use of materials. Materials used on site, energy consumption. Recycling, waste disposal, energy efficient, affordable warmth **(also social)**. Yes. We intend to engage a specialist to look at carbon footprint We include additional energy efficiency measure in decent homes standard work but energy conservation and alternative sources need to be incorporated into the strategy. **(also social)**. Yes. Using contractors who are closer to the stock **(also social)**. Key staff need to be more pro-active, could specify more 'green' materials **(also strategic)** Ground source and solar space and water heating Better waste minimisation, more consideration of overall environmental impact. Maximising fuel efficiency within dwellings, further reducing waste and utilising sustainable materials. **(also social)**. Sourcing local products, searching out sustainable products. More use of carbon neutral energy sources
Strategic	With what we are doing Yes. A more comprehensive approach Yes, we are developing our asset management strategy to incorporate the work on sustainability we have begun. A robust sustainability policy which compliments our decent homes strategy. Further development of the current viability framework and other key elements. Yes. Current maintenance strategy does not consider sustainability at all. Improvement in respect of asset management strategy. A more comprehensive and measured approach to the strategy In the process of developing better systems to capture this information as part of its 30 year Asset Management Plan. We could produce a sustainability strategy for maintenance. Corporation and environmental issues, factoring owner occupier cooperation
Measure	Apply EcoHome principles Sustainability measurement is being introduced. To work to a standard that will last the give life cycle of repair or replacement element. This issue of sustainability performance is not currently addressed directly.
Economic	No account is taken of prioritising work to achieve better levels of sustainability (at present). Better ratio of planned works to responsive repairs. Ongoing assessment of existing stock to target expenditure and set challenging targets. Improvement in the supply chain. We are to work with all our contractors to achieve BS8555 for each of them. Either by increasing its priority or by increasing funds so that they extend to cover its current priority. Sustainability can have cost implications which can be difficult when attempting to prove Value for Money when benchmarking. Yes. There is an impact on the Global Financial Model for using certain sustainable products. This will be appraised and considered by our board in December when the revised asset management strategy is presented. Yes. Long term gains, more value engineering needed. Better analysis of social and economic trends, maintenance expenditure and void patters etc. **(also social)**

Better Understanding	Need to gain a better understanding of sustainability issues. Knowledge base is being improved. It needs to begin to drive the maintenance agenda. Sustainability needs to be reinforced by additional investment on the estate. Not known but intend to review the organisations sustainability early next year.
Not Categorised	Investigating potential options Only partly developed at present Always opportunities to learn from good practice We could be more proactive in terms of sustainability Need to investigate further sustainability options

Table B.13 Sustainable Technologies Incorporated and Considered in Refurbishment Projects - Qu 5.7a and Qu 5.7b

Environmental	Installed	Considered
High efficiency boilers	25	
Surestop water saving devices	1	
Home insulation	18	
Draft exclusion	1	
Renewable / low environmental impact materials	18	
Recyclable kitchen units	1	
Kitchen units made from recycled timber	2	
Low energy lighting	5	
Greywater recycling	1	2
Solar panels (PV and solar thermal)	15	27
Wind turbines (micro and macro)	3	12
Ground Source Heat Pumps	1	7
Locally sourced materials	2	
Energy Efficiency	8	
Double glazing (including low-e)	7	
Waste management (including recycling)	7	5
Community heating	1	2
CHP	3	4
Sunpipes	1	
Wood burning stoves	1	1
Showers	1	
Water butts (Rainwater harvesting)	4	
Low / Duel flush WCs	2	
Sensors (rather than clocks)	1	
Passive ventilation	1	
Heating systems and controls	10	
Low water usage taps	1	
Reed beds for sewage	1	
Green roof	1	1
PVCu products	3	
Energy generation		3

Social	Installed	Considered
Low emission paints	5	1
Local labour / Contractors	3	
Quality of manufactured units and building elements	1	
Economic		
Lettability	1	
Supply chain	1	
Life cycle costing	1	
Economically planning works	1	
Low maintenance materials	1	
Standardisation of building products		1
Integrated		
MMC	1	1
Pod construction	1	

Table B.14 Examples of how the Sustainability Strategy / Policies of Contractors is Considered – Qu. 5.8a

Category	Response
Procurement Stage	By reference in contract documents and during interviews questions on policy and actual review of policies When selecting new contractors it is our intention to consider their position on sustainability along with all other factors for example, waste management, recycling and use of local resources. As part of the first stage of tendering process At tender evaluation stage Consideration through procurement process Request for sustainability of their policies when tendering On capital side it is now a key performance indicator and tender quality assessment criterion. Yes. Requirement as part of assessment In the tender process looking at introducing as PI As part of construction clients charter Considered and scored as part of tender evaluation As part of the overall evaluation process of bids/tenders. Generally we use a 70% quality and 30% price basis for our evaluation and Sustainability issues account for around 5-10% of the quality element. Included in selection process
Via Partnering / Framework Agreement	Collaborative framework agreement in place. We work together with our contractors to develop apprenticeships / training, also waste reduction. Through our Construction Framework Alliance performance indicators collated on Eco sustainability. Each contractor within the partnership contract had to provide a statement regarding their approach. In partnering agreements. They are all required to keep management systems that are audited annually for their environment and waste policies. We also have a best practice and specification review group that is established to bring in their expertise of products they use elsewhere to ensure we install the best materials possible within budget constraints that offer wider benefits and the most efficient way of carrying out works etc to improve quality of life of our customers. Moving to a collaborative framework model Yes. Partnering, partnership forum Via partner assessments which we generally 50% cost 50% quality including sustainable factors.
Review Contractor Policies	Read, consider and see if there are any aspects we can incorporate ourselves. Yes - Environmental and health and safety. Yes. Ask contractors for sustainability policy All contractors supply us with the sustainable policies and inform us of the waste disposal chain with details of waste disposal procedures. Review policy Request policy to ensure they have sustainability on agenda. Yes. Review their procedures for waste disposal on larger works to promote recycling.
Quality System / KPI	Yes. As part of PQQ By use of annual meetings Quality system in place. Recycled / reclaimed materials are used Through key performance indicators As part of quality assessments. However we are working with Envirowise and IEMA to help all our contractors achieve BS8555.
Landlord Policies	EMAS – specific over COSHH compliance and waste policies. The new major works contract 2006-2011 requires that the appointed constructor adheres to certain sustainability criteria. Scrutiny of adherence will be developed in the near future. Yes we now require that they conform with our environmental management policy and continue to work with them to improve sustainability. Yes. We look at their re-cycling processes both on site and at their offices, to ensure their practices accord with ours.
Not at Present	Just completed initial review and we are soon to complete impact assessment to ensure greater compliance.

Table B.15 What Informs a Sustainable Maintenance Strategy? – All Landlords – Qu. 5.9

Variable	Sum	Mean	Median	Mode	St. Dev
Improvements are incorporated into the maintenance programme to upgrade the buildings overall performance	237	3.34	3	4	1.851
'E' technology used	277.5	3.51	4	3	0.937
Material is sourced locally	278	3.27	3	3	1.034
Primary aggregates are used	305	3.72	4	4	0.920
Plant is sourced locally	272	3.13	3	3	0.906
Labour is sourced locally	246	2.70	2.5	3	0.885
Recycled / reclaimed materials are used	262.5	2.89	3	3	0.867
Use materials with a low impact on the Environment	236.5	2.60	3	3	0.742
Low toxicity paints / varnishes etc used	236	2.62	2.5	2	0.922
Planned maintenance system used	224.5	2.49	2.5	2	0.755
Responsive maintenance system used	242	2.78	3	2	0.875
Waste reduction during ordering process	264.5	2.94	3	3	0.921
Monitor and reduce construction waste	256	2.84	3	3	1.032
Install materials with high ODP and GWP	237	3.49	3.5	4	1.037
Quality system in place	256	3.05	3	3	0.887
Uncertified timber used	385	4.64	5	4	1.331
Energy consumption monitored and targets set to reduce use during occupation	252	2.86	3	3	0.970
Energy from renewable sources used - maintenance work	298	3.47	3.5	4	1.098
Monitor and report transport use to calculate CO_2 emissions	311	3.58	3.5	4	1.089
Supply chain established	256	2.81	2.5	2	1.018
Monitor and set targets to reduce water consumption during maintenance work	300	3.45	3.5	3	0.890
Monitor and set targets to reduce water use during occupation	264	3.00	3	3	0.903
High NOx emitting boilers installed	255	3.15	3	2	1.480
Renewable technologies considered as replacements for existing components	250.5	2.78	3	3	0.738
Protect existing ecological features	244	2.74	3	3	0.819
Consider enhancement of site ecology	278	3.16	3	3	1.038
Home user guides are provided	216	2.48	2.5	2	0.823
CCS aims and objectives are applied to maintenance work	259.5	2.95	3	3	0.861
Best practice policy adopted for of air and water pollution	236.5	2.72	3	3	0.758
Household security	236.5	2.66	2.5	2[a]	0.928
Energy consumption monitored and targets set to reduce use during maintenance work	281.5	3.236	3	4	0.985

a. Multiple modes exist. The smallest value is shown

Table B.16 What Informs a Sustainable Maintenance Strategy? – RSL – Qu. 5.9

Variable	Sum	Mean	Median	Mode	St. Dev
Improvements are incorporated into the maintenance programme to upgrade the buildings overall performance	164	3.57	4	2	1.985
'E' technology used	188	3.55	4	4	0.992
Material is sourced locally	188.5	3.37	3	3	1.090
Primary aggregates are used	201	3.72	4	4	0.888
Plant is sourced locally	191	3.24	3	3	0.993
Labour is sourced locally	171	2.80	3	3	0.914
Recycled / reclaimed materials are used	177	2.95	3	3	0.822
Use materials with a low impact on the Environment	159.5	2.66	3	3	0.728
Low toxicity paints / varnishes etc used	165.5	2.81	3	2	0.983
Planned maintenance system used	150	2.54	2.5	2[a]	0.773
Responsive maintenance system used	156.5	2.75	3	2	0.841
Waste reduction during ordering process	184	3.07	3	3	0.909
Monitor and reduce construction waste	180	3.00	3	3	1.108
Install materials with high ODP and GWP	174	3.55	3.5	4	1.052
Quality system in place	169.5	3.08	3	3	169.5
Uncertified timber used	262.5	4.69	4.8	4	1.333
Energy consumption monitored and targets set to reduce use during occupation	167	2.88	3	3	0.914
Energy from renewable sources used - maintenance work	195.5	3.49	3.5	4	1.060
Monitor and report transport use to calculate CO_2 emissions	213.5	3.68	4	4	1.003
Supply chain established	173.5	2.84	3	2[a]	1.019
Monitor and set targets to reduce water consumption during maintenance work	201.5	3.47	3.5	3	0.905
Monitor and set targets to reduce water use during occupation	178	3.02	3	2	0.983
High NOx emitting boilers installed	161.5	2.99	3	2	1.268
Renewable technologies considered as replacements for existing components	166	2.77	3	3	0.773
Protect existing ecological features	167.5	2.79	3	3	0.835
Consider enhancement of the site ecology	188.5	3.20	3	3	1.110
Home user guides are provided	143	2.47	2.3	2	0.821
CCS aims and objectives are applied to maintenance work	178	3.07	3	3	0.845
Best practice policy adopted in for air and water pollution	166.5	2.87	3	3	0.704
Household security	163	2.72	2.8	3	0.936
Energy consumption monitored and targets set to reduce use during maintenance work	193.5	3.28	3.5	4	1.014

a Multiple modes exist. The smallest value is shown

Table B.17 What Informs a Sustainable Maintenance Strategy? – ALMO – Qu. 5.9

Variable	Sum	Mean	Median	Mode	St. Dev
Improvements are incorporated into the maintenance programme to upgrade the buildings overall performance	29	2.64	2	4	1.433
'E' technology used	40	3.64	4	4	0.710
Material is sourced locally	38.5	2.96	3	2[a]	0.828
Primary aggregates are used	42.5	3.54	4	4	0.941
Plant is sourced locally	33.5	2.79	3	3	0.722
Labour is sourced locally	31	2.39	2	2	0.795
Recycled / reclaimed materials are used	35.5	2.73	3	2[a]	1.033
Use materials with a low impact on the Environment	32.5	2.5	2	2[a]	0.842
Low toxicity paints / varnishes etc used	30.5	2.35	2	2[a]	0.591
Planned maintenance system used	33.5	2.58	2	2	0.760
Responsive maintenance system used	33.5	2.58	2.5	2	0.641
Waste reduction during ordering process	36	2.77	3	2[a]	0.857
Monitor and reduce construction waste	30	2.5	2.3	2	0.707
Install materials with high ODP and GWP	26	2.89	3	3	0.741
Quality system in place	26	3	3	3	0.929
Uncertified timber used	45	4.09	4	5	1.393
Energy consumption monitored and targets set to reduce use during occupation	38.5	2.96	2.5	2	1.145
Energy from renewable sources used -maintenance work	44.5	3.42	3	4	1.205
Monitor and report transport use to calculate CO_2 emissions	41.5	3.46	3	4	1.658
Supply chain established	30	2.5	2.5	2	0.674
Monitor and set targets to reduce water consumption during maintenance work	38.5	3.21	3	3	0.916
Monitor and set targets to reduce water use during occupation	34	2.83	3	3	0.492
High NOx emitting boilers installed	31.5	3.15	2.8	2	1.684
Renewable technologies considered as replacements for existing components	40	3.08	3	3	0.703
Protect existing ecological features	32	2.67	2.8	3	0.492
Consider enhancement of the site ecology	36.5	3.04	3	4	0.838
Home user guides are provided	33	2.75	2.8	2	0.866
CCS aims and objectives are applied to maintenance work	32.5	2.71	2.8	2	0.838
Best practice policy adopted for of air and water pollution	31.5	2.63	2.8	2[a]	0.742
Household security	33	2.75	3	3	0.657
Energy consumption monitored and targets set to reduce use during maintenance work	40.5	3.38	3.8	4	0.742

a Multiple modes exist. The smallest value is shown

Table B.18 What Informs a Sustainable Maintenance Strategy? – LA – Qu. 5.9

Variable	Sum	Mean	Median	Mode	St. Dev
Improvements are incorporated into the maintenance programme to upgrade the buildings overall performance	44	3.14	3	4	1.610
'E' technology used	49.5	3.30	3.5	3[a]	0.902
Material is sourced locally	51	3.19	3	3	0.981
Primary aggregates are used	61.5	3.84	4	4	1.044
Plant is sourced locally	47.5	2.97	3	3	0.591
Labour is sourced locally	44	2.59	2.5	3	0.814
Recycled / reclaimed materials are used	50	2.78	3	2	0.911
Materials with a low impact on the Environment are used	44.5	2.47	2.3	2[a]	0.737
Low toxicity paints / varnishes etc used	40	2.22	2	2[a]	0.752
Planned maintenance system used	41	2.28	2.3	2	0.691
Responsive maintenance system used	52	3.06	2.5	2[a]	1.102
Waste reduction during ordering process	44.5	2.62	3	2[a]	0.961
Monitor and reduce construction waste	46	2.56	3	3	0.856
Install materials with high ODP and GWP	37	3.70	3.8	3[a]	1.085
Quality system in place	50.5	2.97	3	3[a]	0.943
Uncertified timber used	77.5	4.84	5	5	1.261
Energy consumption monitored and targets set to reduce use during occupation	46.5	2.74	3	2[a]	1.062
Energy from renewable sources - maintenance work	58	3.41	3	2[a]	1.202
Monitor and report transport use to calculate CO_2 emissions	56	3.29	3	3	0.687
Supply chain established	52.5	2.92	2.5	2	1.204
Monitor and set targets to reduce water consumption during maintenance work	60	3.53	4	4	0.838
Monitor and set targets to reduce water use during occupation	52	3.06	3	3	0.864
High NOx emitting boilers installed	62	3.65	3	2	1.983
Renewable technologies considered as replacements for existing components	44.5	2.62	2.5	2	0.600
Protect existing ecological features	44.5	2.62	3	3	0.961
Consider enhancement of the site ecology	53	3.12	3	3	0.944
Home user guides are provided	40	2.35	2	2	0.806
CCS aims and objectives are applied to maintenance work	49	2.72	3	3	0.895
Best practice policy adopted for of air and water pollution	38.5	2.27	2	3	0.793
Household security	40.5	2.38	2	2	1.054
Energy consumption monitored and targets set to reduce use during maintenance work	47.5	2.97	3	3	47.5

a Multiple modes exist. The smallest value is shown

Table B.19 What Other Activities Could be Undertaken to Improve Sustainability of Maintenance Programme – Qu. 5.10

Category	Response
Environment	Low or no maintenance components used, solar / geothermal energy resources, recycling facilities. Focus stock investment on fuel poverty / reducing energy used. Monitor and set targets to reduce packaging waste from suppliers, monitor and set targets to reduce material wastage during maintenance programme. Carry out programmes of solar/PV/GSHP micro CHP and wind energy. Environmental improvements to the estate. Improved infrastructure / amenities -Demolition and remodelling of dwellings. Main focus is currently on improving SAP levels through home insulation programme. We still feel this is the most effective way of making our more sustainable, followed by more efficient heating systems and controls. Replacing lighting / timber window frames
Social	Tenants caring more for their homes Involve customers in the process and get them on your side. Stability of residents is a big factor, which we have no real control, constant changing tenants make it difficult.
Integrated	Partnered approach to include tenants / contractors / local government Set specific asset management KPI's. Raise awareness for those delivering and responsible for maintenance services. Decent Homes Plus initiative (environmental, landscaping, re-designs etc).
Economic	Funding / grant insensitive for take up of the ECO related innovation Greater funding for renewable energy.
Don't Know	Unsure at this point
Not Categorised	Constant review of standard replacement products and comparison with other material solutions.

Table B.20 How Can Additional Money be Justified for More Sustainable Solutions – Qu. 5.12a

Category	Response
>20%	Change in supervision and quality control and procurement Greener/sustainable products invite new technology at far higher costs per se.
11-20%	New systems / products cost more, also training on usage Timber windows being used at higher supply, fit and maintenance cost Just guessing and this is in short-term Depending on the long term views and whether cash payback for organisation is important.
6-10%	Needs to be driven by governance i.e. Housing Corporation Generally speaking using sustainable materials will lead to an initial cost increase although this may not be so when whole life costing principles are introduced to the equation.
3-5%	Budgets are tight and have to be closely managed. Yes - The lack of existing funding has to go to current priorities to ensure that we are not subjected to section 11 and section 32 claims against us. Given that rents are pegged to 2.5% not a great deal. The income is from rents and if you have to cap rents or minimise increases, the cost of sustainability will not be covered. Could be found from Business plan
None	Unfortunately none – as any amount means that we will miss the post HHSRS DHS by a greater extent. Programmes in 5.10 would require over 25% increase in budget. LDC currently have to make saving to required programme following options appraisals for council to retain the stock.
Varies	Depends on the outcomes which would need to be evidenced This would be dependent upon the views of our client when assessed against a basket of client priorities Unable to commit to a clear target / estimate It will vary significantly due to the life cycle costs of the solution.

Table B.21 Any Other Comments – Qu. 6.1

Category	Response
Environment	We must design homes that embrace the benefits of fuel saving technologies. **(also social)** Decent Homes Standard distracts attention from environmental issues as expectations are low. Ecohomes XB is really quite new. It is something we are going to look at but haven't as yet had the opportunity. For a small organisation like us maintaining and evaluating items like CO_2 outputs during a contract is probably not achievable without significant resource. **(also economic)**
Economics	With the rent controls being applied by the government and the lack of grant funding for 'major works' we can only manage a repairs/maintenance system from within funds through rents received. We already commit 50% of our income in this way and are unable to put in additional resources unless we borrow against our debt free properties. We would not wish to do this if our overall financial viability was detrimentally affected. Most Associations have a hard time just keeping the basics going – kitchen, windows, bathrooms, roof. A lack of money means that eco saving and energy and others goes by the Board. There are a lot of good theories all of which the principles we totally agree with, however there are cost implications and time to investigate and monitor new sources of technology or ratings e.g. the CO_2 emissions are not measured say if you purchased timber in Scandinavia the emissions in travel are not measured and so cannot prove more efficient. The council is finding a significant gap in funding for the necessary repairs to its homes and where sustainable options have been sought this has been through grant opportunities rather than direct funding. The solar panel work was combined with roofing. Without the grant this would not have gone ahead. Sustainability will be improved by the appropriate spending of funds in the right areas of maintenance, quality of materials and contractors are paramount considerations.
Knowledge / Skills	Not easy to get information on energy/saving products or sustainability particularly as we are a small organisation. Not sure about this whole question of sustainability so have not answered Key staff lack the skills, inclination and drive to deliver new innovation to existing programme regardless of how much management time is invested. More understanding of whole life cycle costing in planning of maintenance and major works.
Lack of Imperative	We are a new organisation and as such has yet to develop sustainability strategy. Sustainability issues have not yet moved up the maintenance agenda, either nationally or locally, there is no imperative to consider these issues. Maybe the Government could consider this after the decent homes standard has been met beyond 2010.
Misc	It was difficult to answer some of these questions due to the nature of our operations - The most appropriate answers were provided. The council's maintenance department and housing stock investment department are both currently under interim management by external consultants – it has been impossible to accurately answer some of the questions hence the blanks. As an organisation we really need to do a stock take of what is possible and build it into a plan. We are on the brink of evolving a 'joined up' stock maintenance strategy and are looking into aspects that have previously been ignored because we are such a small company. The attached information is my view only and should not be used to reflect that of the ALMO.

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