

**Harborough District Council  
Leicester City Council  
Leicestershire County Council  
Oadby & Wigston Borough Council**

Pennbury Strategic Assessment  
Summary Report  
December 2008



# **Pennbury Strategic Assessment**

## **Summary Report**

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#### **Halcrow Group Limited**

Vineyard House 44 Brook Green London W6 7BY  
Tel +44 (0)20 7602 7282 Fax +44 (0)20 7603 0095  
www.halcrow.com

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# 1 Executive Summary

This Study has examined the impacts and consequences of the proposed eco-town at Pennbury. It is based on an analysis of published data in the Masterplan Vision, the Technical Papers which support it and our analysis of the implications for existing policies and major development and regeneration sites which may be affected by Pennbury. Our approach to the Study has been to examine the information which has been provided by the Co-op and the implicit and explicit assumptions which underlie it. The Study has been constrained by the fact that there is a lack of detail in the Masterplan Vision and the Technical Papers and no examples of completed development elsewhere in the UK which provide a relevant comparison with the eco-towns concept, either in terms of scale or ambition.

The Co-op's proposals for Pennbury are a response to the Government's Prospectus for Eco-Towns published in July 2007. Many of the objectives for Pennbury can be directly related to this and subsequent Government guidance. If these objectives can be met Pennbury could offer considerable potential benefits to the sub-region in terms of new jobs, homes, community facilities and infrastructure, as well as pioneering new approaches to zero carbon living. A large scale, well-designed, low-carbon development, properly supported by infrastructure could offer a critical mass and a wider range of local jobs, homes and facilities than a more dispersed pattern of unsustainable development.

However, the Co op Vision, Masterplan and stated aspirations are not matched by sufficiently detailed commitments and proposals to ensure that these objectives can actually be delivered. One of the main findings of this study is that the Masterplan contains a lack of specific information and detail to explain or justify many of the assumptions made, as well as ambiguities and uncertainties as to what is actually being proposed. These omissions and ambiguities are summarised below:

## **Employment**

The Co-op has produced no convincing evidence to demonstrate that the economic roles envisaged for the town will actually produce the number of jobs required, or that this role will not conflict with the economic strategy for Leicester and the wider area. There is very little detail provided on the types of environmental industries the eco-town will attract and considerable uncertainties whether these can actually be delivered in the number required. There is also ambiguity over plans for "knowledge based industries" and whether these will be confined to the environmental sector or will compete with plans for office and science/innovation parks elsewhere.

No convincing evidence is produced to support the assumption that 60% of Pennbury residents will work in the eco-town (this containment ratio would be almost double that of neighbouring Oadby & Wigston). If this assumption is incorrect, there will be much greater job leakage to other areas, with significant negative impacts on commuting, traffic generation and capacity, carbon emissions and sustainability.

This part of south east Leicester has very poor links to the strategic road network, both to the A46 northwards and the M1 southwards. This poor connectivity is likely to act as a constraint on the attraction of this location to employers.

Many of the assumptions made to predict retail expenditure, and the proportion which is likely to be spent within Pennbury, lack proper justification. Consequently there are doubts concerning the type and quantity of planned retail provision. Firstly a retail capacity study is required to justify the quantum of development proposed. Secondly a retail impact assessment should be undertaken by the Co-op to quantify the eco-town's impact on the vitality and viability of other retail centres in the area.

No evidence is provided to link employment (occupations/salaries) with housing provision. This is a fundamental weakness in the proposal.

## **Transport**

There is concern that the off-site transport infrastructure cannot be delivered, further detailed work would be required. Much of the land required is not in the ownership of the scheme promoters, the environmental implications of the required improvements could be significant and, even then, there may not be sufficient capacity, to cope with the likely traffic. There are funding uncertainties associated

with the provision of a tram in the longer term and question marks around the transport assessment and assumptions about public transport patronage.

### **Scale**

The case for this scale of settlement (15,000 homes and associated jobs, community facilities etc) is based heavily on recent population projections. These contain a number of questionable assumptions regarding migration and Leicestershire's likely future share of future regional growth. The large scale of growth planned creates significant challenges in accommodating both the traffic which will be generated and the number of jobs which will need to be created.

Given the uncertainties surrounding the basis for the population projections used and the fact that a partial review of the RSS is underway, there are considerable doubts as to whether there is a need for the scale of development proposed. At the very least it would be prudent to undertake a number of sensitivity tests on the population and migration assumptions to establish the implications for future housing needs.

### **Environment**

There have been no detailed surveys of local environmental features, such as ecology, landscape, cultural heritage. The Co op Masterplan is based on existing surveys and desk based studies alone. Up to date surveys must be undertaken and these may require changes in the layout of the developed areas, either to avoid features of importance or to provide for necessary environmental enhancements.

### **Location and Form of Development**

The location of the proposal derives largely from the landownership of the scheme promoters and not from any rational planning process which has considered and debated alternatives. Due to the proximity of Leicester, Oadby and Wigston, as well as a number of smaller villages, Pennbury would not be a freestanding settlement with its own identity. As currently planned, it would also not be a properly integrated urban extension. This ambiguity should be resolved and Pennbury should be tested as either a freestanding settlement or a sustainable urban extension.

### **Design**

The Masterplan is based on a high average density of 60 dwellings per hectare, with higher densities in the town centre. There is no design detail to demonstrate that this will produce a quality design or provide the necessary quality of life for residents. The massing and bulk of the development is likely to appear very dense and urban in character, which may appear visually intrusive in this rural area. The Co op Masterplan and development concept is based on the airfield which in itself is an alien feature in the landscape. We therefore question the basic starting point for the Co op's design interpretation which would be very different if related to the natural and historic features of the landscape.

### **Housing**

The housing strategy is not clearly founded on an analysis of local needs and opportunities. Assumptions about household size and composition are based on Leicestershire averages, but in fact there are wide variations between the city itself and the surrounding towns and villages. The Masterplan needs to be clear about who it is seeking to attract because different groups will have very different requirements for housing type, tenure and size. This in turn will have major implications for the sorts of jobs which should be provided.

Pennbury is likely to have a major impact on a number of allocated or proposed Sustainable Urban Extensions (SUE's) located in proximity to Leicester. It is likely that these sites would be in direct competition with Pennbury for market share, developer/investor interest and delivery of affordable housing. In particular, this impact could be most significant at Aston Green, West of Braunstone town and east of Hamilton.

**Conclusion**

The Co-op have at this stage in the planning process provided insufficient information to support the Pennbury proposal at this moment. We have serious reservations at this stage that neither the required transport infrastructure nor the level of jobs required can actually be delivered. Both the economic strategy and transport proposals should therefore be substantially revised, as these are fundamental to the overall sustainability of the concept.

Many of the other issues we have identified could be addressed through detailed design or management proposals, although no financial information has been made available to provide certainty that the scale of investment required in infrastructure and in social and community facilities will be forthcoming.

Many of the reservations with the current project stem from the scale of the proposal, and a lack of knowledge and experience of proposals of this scale to benchmark against. Further work could be done to establish whether different scales of growth would be acceptable in this location, designed in accordance with the eco-towns criteria, and whether this should be a free standing new settlement or a sustainable urban extension. Further work is also required to address the various social, economic and environmental issues we have identified, in a way which will best meet the needs of both existing and future residents.

## 2 Introduction

### 2.1 Terms of Reference

The Government is proposing up to ten new eco-towns across the UK to help meet the national demand for new homes and Pennbury is one of the locations that are currently being considered. The sites are being progressed outside the normal planning process; a Planning Policy Statement is expected later this year which will provide a framework for the consideration of individual planning applications. The Government expects “most” planning applications for eco-towns to be determined by the relevant local planning authority concerned.

Harborough District Council, together with Leicester City Council, Leicestershire County Council and Oadby & Wigston Borough Council, has commissioned a Strategic Assessment Project to enable and expand understanding of the potential impact and consequences of the Pennbury eco-town proposals. The project has the following objectives:

1. To form a view of the potential impact and consequences to the wider Leicestershire community of the proposal to build Pennbury
2. To validate the CLG work (Sustainability Appraisal, by Scott Wilson; Financial Appraisal by PwC) which is being done to assess the deliverability of the whole project over the projected lifespan
3. To provide an information base to assist local councils when responding to the consultation process for the forthcoming eco-town PPS
4. To provide an information base to assist local councils when undertaking public consultation about the possible impact and consequences of Pennbury
5. To draw conclusions to enable the councils to challenge, if appropriate, the Co-op’s conclusions with adequate grounds, weight of evidence and weight of authority

Halcrow was appointed on 11th September to undertake this work. A first draft report was produced on 20th October. The final report is due by the end of November. Note that to date no further information has been provided on item (2) above so this does not form part of this current report.

### 2.2 Government Objectives for Eco-towns

Eco-towns are intended to exemplify genuinely sustainable living and to become a model for the rest of the country and beyond, in three main areas:

- By developing zero carbon and more sustainable approaches to living, using the opportunities of new design at whole town scale
- By exploring the potential of well designed new settlements to increase housing supply
- By improving mechanisms to design and deliver affordable housing and to increase the supply of housing of all tenures and sizes

### 2.3 Evolution of the Pennbury Proposals

The Co-op’s initial proposals were published in July with a draft spatial report showing three alternative layouts for the town, and interim technical reports on transport, housing, employment etc. The ideas are still evolving; a preferred spatial option called “compact 50” was produced at the end of July and in October a revised Masterplan Vision and Transport Assessment was produced. This report is based on our analysis of all these documents.

#### 2.3.1 Key Uncertainties

The process has evolved rapidly, plans are still changing and there is a lack of detail to many aspects of the proposals. The five key areas of uncertainty are summarised below.

##### 1. Homes and Jobs for Whom?

It is unclear who will live and work in Pennbury. The eco-towns process is being driven by central government and the initiative seems to have arisen in response to national concerns and priorities (see 2.2 above). Pennbury would be located in close proximity to Leicester, Oadby, Wigston and

approximately 14 miles from Market Harborough. Each of these areas has their own unique socio-economic characteristics and needs, which translate into different household sizes and different housing and employment requirements. It is not clear how the Co-op proposals have considered these differences or what role Pennbury will play in meeting the different requirements of local communities. The Pennbury proposals have not been developed through the normal planning process and many aspects appear to be inconsistent with existing planning and regeneration policies and priorities. The proposals have not been tested through the normal process of planning and sustainability appraisal and democratic debate. Unless carefully managed, there is a risk that Pennbury could create a separate and distinct community with little in common, and limited interaction, with its neighbours.

## **2. Transport**

The transport components have been constantly changing. The initial transport strategy proposed to complete the 'missing' section of the Leicester ring road. This was subsequently dropped. Similarly, a tram was proposed for the later (unspecified) stages of the project but now all that is proposed in the latest documents is a funding contribution towards the cost of a feasibility study. There are also serious concerns that the off-site transport infrastructure cannot actually be delivered. Much of the land required is not in the ownership of the scheme promoters, the environmental implications of the required improvements could be significant and, even then, there may not be sufficient capacity to cope with the likely traffic. These uncertainties relate to one of the key aspects of the proposals.

## **3. Assumptions & Comparable Locations**

Designing a new town, of a new style, to new "rules", in a new location, requires that numerous assumptions are made (e.g. re car usage; commuting patterns; number, location and type of jobs that can be made available; what kind and scale of provision of retail facilities; size of houses required, educational provision etc.) as there are no directly comparable situations from which to draw evidence. This report makes reference to New Towns and other large scale sustainable and low carbon developments which are being planned elsewhere in the UK to help examine these issues and to test the assumptions underlying the Co-op's proposals. However, many of the current low carbon schemes elsewhere in the UK are still at a very early stage of development and the New Towns Commission enjoyed specific powers and financial incentives which are not available in today's de-regulated planning framework, so there are no directly comparable schemes to refer to. European experience provides some interesting examples of low carbon development, high quality public transport and higher density, urban living; many of the better known examples are cited in the various Government eco-town publications. However, the experience of these places is not directly transferable to Pennbury, since the political, social, economic and financial framework within which they have been developed is very different to that in the UK.

## **4. Extended Timescales**

Even with the fast track approach being followed for eco-towns, the Pennbury development is unlikely to commence for some 4-5 years, and will require at least a 15 year construction programme to complete. It is difficult to predict how housing and employment needs, or various other aspects of the Masterplan, may change over such a long timescale. To an extent, the detailed design of the town can respond to changing circumstances and requirements as they arise, but the overall Vision needs to be clear now and the Masterplan must have sufficient flexibility to be adaptable to changing needs.

## **5. Limited Data**

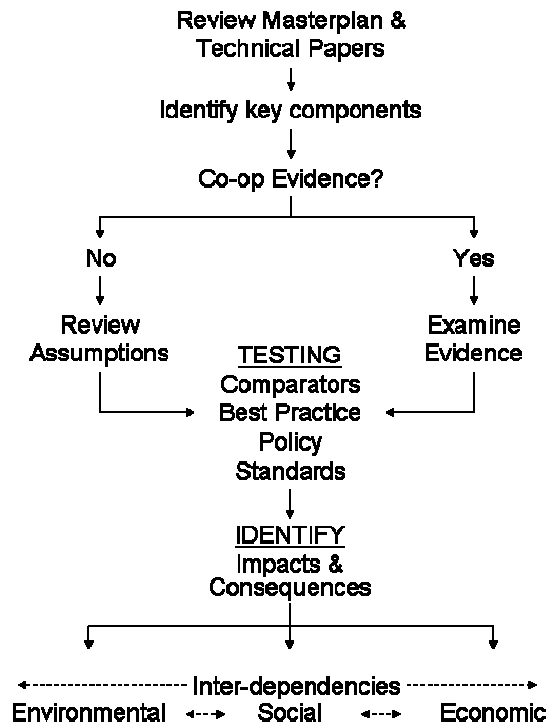
The Pennbury proposals are based largely on desk based assessments and existing surveys. In the timescales available so far the Co-op has had no opportunity to undertake detailed site surveys and assessments, e.g. in respect of ecology, cultural heritage or land contamination, and the proposals are not supported by an Environmental Impact Assessment. The Urban Design content of the Masterplan is at a very early stage of development and consists of broad principles and land use allocations. There is no detail on building heights or the overall scale, massing and likely appearance of the development. The transport elements of the Masterplan are still evolving and changing and there remain many uncertainties. With this lack of information it is only possible to draw general conclusions about the impacts of the scheme.

## 2.4 Study Methodology and Outputs

The overall methodology of the Study is summarised in Figure 1. This has involved the following stages:

- Identify the different economic, social and environmental components of Pennbury
- Critical appraisal of the evidence or assumptions which underlie these components
- Identify the impacts and consequences for the wider area

Figure 1 Study Methodology



The Study Outputs have comprised the following:

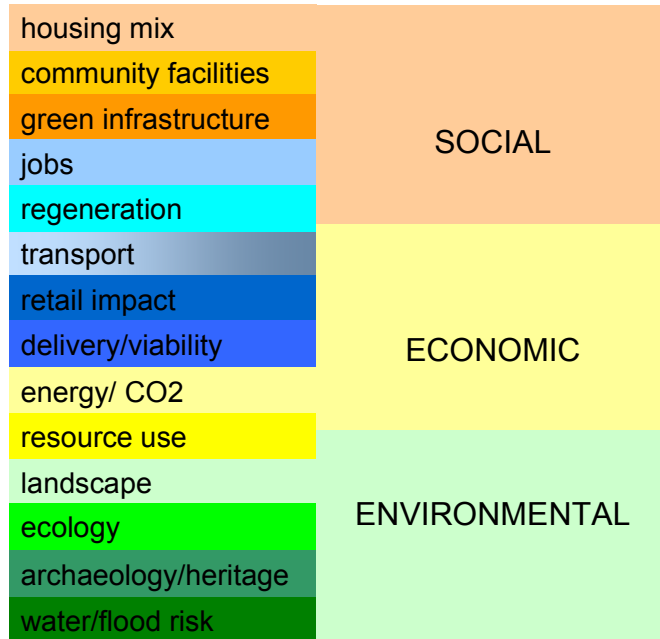
- Housing Technical Paper
- Employment Technical Paper (including Retail)
- Environment Technical Paper
- Landscape and Design Technical Paper
- Transport Technical Paper
- Policy Review
- Major Sites Review
- Summary Report (this report)

## 2.5 Inter-dependencies

We have analysed the different components of the eco-town separately, but in reality many aspects of the Masterplan are inter-dependent and linked to one another, and in turn these can all be related to the three interrelated social, economic and environmental aspects of sustainable development (see Figure 2). In particular social and economic assumptions and impacts are closely related – e.g. the relationship between housing and workforce characteristics. Likewise, impacts on one aspect of the environment – e.g. water quality – may affect many other aspects such as ecology and landscape. In our analysis we identify the main interrelationships between the assumptions, and the impacts of these on the Masterplan and the different aspects of sustainability.

**Figure 2 Inter-dependencies**

Development components    Sustainability components



**Illustration – Co-op Assumption is not met**

**Assumption – 60% of residents will work within Pennbury**

- An immediate implication for the masterplan is that less employment land is required
- Residents will have to commute to work elsewhere, which will have implications for the capacity of transport infrastructure, including public transport
- Increased traffic generation will impact air quality, carbon emissions, noise etc. in affected communities
- Demand for employment land elsewhere will increase, as well as competition for jobs
- The types of jobs provided at Pennbury will influence the skills, education etc and other characteristics of the workforce, which in turn will influence demand for different types of housing

## 3 Impacts and Consequences

### 3.1 Scope

The following sections summarise the main impacts and consequences of the Pennbury proposals under a number of headings, based on the Technical Papers produced by the Co-op.

#### 3.1.1 Employment

Achieving a broad balance between jobs and housing is a fundamental requirement of sustainable development, in order to prevent Pennbury simply becoming a dormitory with unsustainable levels of out-commuting. One of the main challenges for Pennbury will be to create a market for employment development which is separate, distinctive and supportive of existing economic strategies, rather than a source of new competition which will drain resources and investment from existing priority areas.

#### **Economic Role**

The plans for Pennbury need to be better co-ordinated with the economic policies, strategies and objectives of local authorities, economic development agencies and partners throughout the sub-region. The economic strategy for Pennbury is poorly developed and unconvincing. The Co-op needs to better demonstrate how the economic role of Pennbury will fit into the wider context, to ensure that sub-regional and local needs are met.

The Leicester and Leicestershire HMA Employment Land Study states that employment land planning cannot satisfactorily be tackled at a local level and highlights the need for City, County and District authorities to adopt a strategic rather than local approach to planning to ensure that both individual and sub-regional needs are met. The Co-op's report focuses mostly on the Eco-town and needs to better demonstrate how its economic role will fit in the wider sub-region.

The Co-op has produced no convincing evidence to demonstrate that the economic roles envisaged for the town will actually produce the number of jobs required, or that this role will not conflict with the economic strategy for Leicester and the wider area. In particular, there is little detail on the types of environmental industries the eco-town will attract and considerable uncertainties whether the eco-town will be in a strong position to attract such businesses given the competition elsewhere.

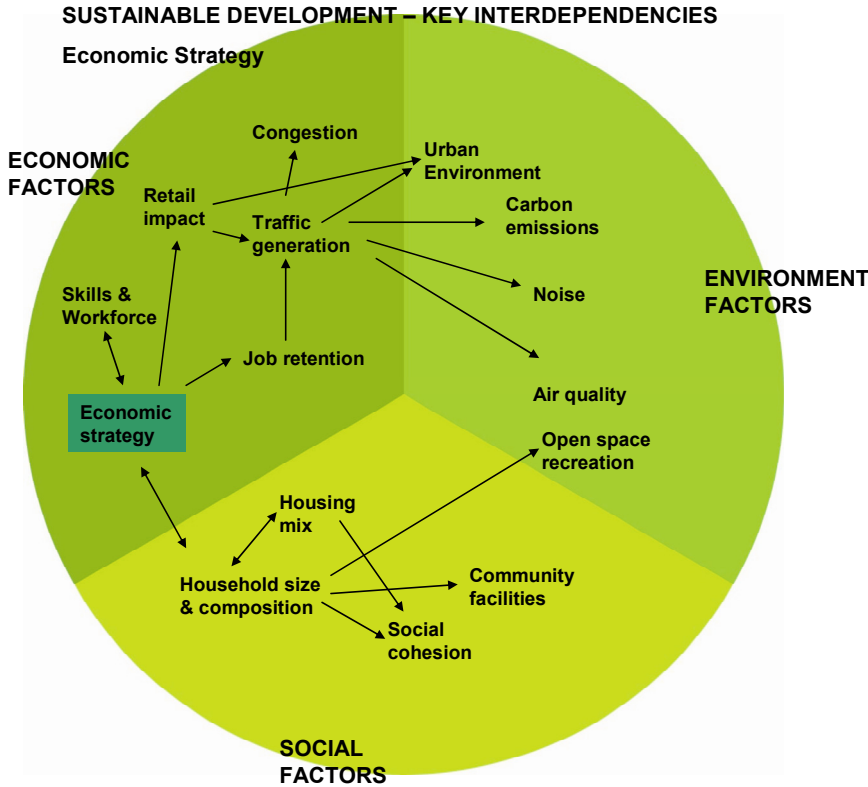
There is also some uncertainty over plans for "knowledge based industries" and whether these will be confined to the environmental sector or will compete with office and science/innovation plans elsewhere. Furthermore, there is little detail provided on the skills required for these jobs, how the eco-town will link to local Universities and to what extent it may drain more skilled workers from Leicester and the surrounding towns.

This part of south east Leicester has very poor links to the strategic road network, both to the A46 northwards and the M1 southwards. This poor connectivity is likely to act as a constraint on the attraction of this location to employers.

The macro-economic changes in the financial sector and the wider economy are difficult to predict, but credit is likely to be more restricted and marginal or unusual schemes (in market terms) may be more difficult to progress. The widespread decline in house prices is putting pressure on developers' margins and is likely to feed through into reduced resources available to contribute to section 106 or other developer contributions.

Figure 3 highlights the close inter-relationships between workforce characteristics and household composition. These are two of the key variables underlying employment and housing land provision in the Masterplan and the relationship between the two needs to be thoroughly understood. The economic strategy and retail impact will have a major influence on patterns of commuting and travel choice, which in turn links directly to a range of environmental issues, such as carbon emissions, air quality and noise.

**Figure 3 Economy Inter-dependencies**



**Regeneration**

It is a strategic objective of the Leicester Regeneration Company (LRC) to expand higher-paid jobs in the retail, offices and science/innovation sectors. The provision of office jobs, in particular, will involve reversing an intrinsically weak local market. Strong out-of-town competition would not only make this more difficult, but may affect market perceptions and confidence if it appears that a rival high-quality site is in the offing.

Co-op employment projections show 2,860 jobs in ‘Finance and Business Services’. The office floorspace indicated is 67,000 sq m. - this is 34% higher than the whole Leicester City New Business Quarter (NBQ) target. At a typical office floorspace density of 20 sq.m per employee, 67,000 sq.m. would accommodate 3,350 jobs. No evidence is presented to justify assertions that this scale of provision will serve local needs rather than compete with regeneration schemes elsewhere.

Definitions of science/innovation and environmental industries need to be clarified to avoid competition with the Science Parks planned at Leicester and Loughborough. The planning system offers limited controls over the occupiers of commercial floorspace and other mechanisms need to be explored to clearly establish the relationship and timing of the Science Parks and any knowledge-based or environmental industries at Pennbury, to avoid any conflict. It will be important to ensure that there is sufficient demand and potential for these sectors in the sub-region and that the Science Parks have attained a critical mass before Pennbury offers additional competition in this area.

**Economic Activity Rates**

The report provides no clear evidence on economic activity rates and does not demonstrate any clear linkages between the economic and housing strategies within the Masterplan. Greater analysis is required to establish the likely socio-economic profile of the Pennbury’s resident population to inform the likely characteristics of the labour force. The socio-economic profile of the resident population will influence employment provision, salaries and demand for housing and vice versa. The links between demographics, employment and housing need to be more clearly established and aligned to the wider strategic context.

## **Commuting and Self Containment**

No convincing evidence is produced to support the assumption that 60% of Pennbury residents will work in the eco-town (i.e. that the 60% containment ratio is achievable). 60% would be one of the highest containment ratios in the HMA and almost double that of neighbouring Oadby & Wigston. If this ratio is too high then there will be much greater job leakage to other areas than assumed by the Co-op, with significant negative implications for commuting, carbon emissions and sustainability.

The breakdown of jobs between employment sectors is based on national averages. This is not an appropriate comparator in terms of size or socio-economic profile. Moreover, the analysis presented by the Co-op is static and based on current employment characteristics. Instead, given the long timescales for implementation, the Co-op should produce some credible employment forecasts to validate the assumptions made in terms of future employment trends and needs. These should take account of likely structural changes in the UK, regional, and sub-regional economies.

In general there is a lack of consistent and clearly defined comparators throughout the Employment and Retail analysis. In some cases assumptions are based on national averages, in other cases on regional or sub-regional averages or those of other towns. Appropriate comparators should be identified (in terms of size, location and socio-economic profile) and then used consistently to inform the assumptions made across all strands of the analysis.

There is no analysis of the effects that very restrictive parking standards and complex goods delivery strategies may have on businesses within the eco-town. It is also likely that businesses will be liable for a range of environmental tariffs within Pennbury (e.g. contributions towards the Smarter Choices Travel Company or other exceptional infrastructure costs associated with grey water recycling for example). These may all increase business costs and have a negative effect on the achievement of very ambitious job creation targets.

## **Retail**

The Co-op make a series of assumptions in order to project the retail expenditure generated by the eco-town's residents, the retail expenditure retention rate (how much of residents purchasing power will be spent within the town) and consequently the retail floorspace that can be supported by the town. However, in most cases the assumptions lack proper justification. The convenience and comparison expenditure projections are very sensitive to the household size and expenditure profile assumptions, which are based on the county average. Minor variations in assumptions about the socio-economic profile of Pennbury residents or future household size would produce very different expenditure forecasts, and therefore different requirements for retail floorspace.

It has been assumed that 80% of convenience expenditure and 50% of comparison expenditure will be retained within Pennbury. The available evidence on existing retention rates shows wide variations – from 57.4% comparison goods retention rate for Market Harborough to 3% for Oadby. The Co-op acknowledges that its assumptions represent the maximum achievable but there is no sensitivity analysis or consideration of less aspirational scenarios. Full sensitivity analysis should be undertaken of the expenditure, retention and floorspace projections to explore the implications for both the type and quantity of planned retail provision.

The comparator locations chosen by the Co op (Wokingham and Christchurch) are dissimilar to Pennbury in terms of the position in the retail hierarchy of the adjacent centre (e.g. Christchurch is close to Bournemouth / Castlepoint which have a combined national retail ranking of 27 – this is not comparable to Leicester, which is expected to be ranked 10<sup>th</sup> in the country after the recent opening of Highcross). Moreover, both comparator locations have higher populations than Pennbury but much lower retail floorspace. This raises doubts on the level of retail floorspace planned for Pennbury; especially given that these centres already have existing catchment areas whereas Pennbury does not.

There is no analysis of the likely impacts of the eco-town on existing retail centres in the area; this is a major omission at this stage. The eco-town is unlikely to have any significant adverse retail impacts on Leicester City Centre, which is considerably larger and fulfils an important sub-regional role. However, the smaller retail centres such as Oadby, Wigston and Market Harborough, and planned retail provision in some of the Urban Extensions (e.g. Hamilton), are likely to be much more vulnerable to



### **Housing Mix and Household Composition**

Assumptions have been made by the Co-op concerning the types of people who may be attracted to moving to Pennbury without considering the location of the site close to Leicester, Oadby and Wigston. Each of these areas has their own unique socio-economic characteristics and needs, which translate into different household sizes and different housing and employment requirements. It is not clear how the Co-op proposals have considered these differences or what role Pennbury will play in meeting the different requirements of local communities.

The Co-op have assumed that Pennbury's household size and composition will mirror national and sub-regional averages and that the age profile of the town will reflect general Leicestershire trends. However there is a lot of evidence to suggest that New Towns and major new development areas have a very different household composition than the norm, which is younger, more economically active and with larger families. This will affect the demand for different kinds of housing, the size of the population and will influence economic activity and wage incomes. It will also have a major influence on requirements for education, health facilities and provision for retail, leisure and open spaces.

The Co-op acknowledge that the eco-town will have a propensity to attract younger/ middle aged innovators with children, and the number of 3 bed houses required is apparently adjusted accordingly. This process is not transparent and it is not clear to what extent this factor has been considered, or whether it has informed other elements of the Masterplan – e.g. school and community facility requirements

### **Social Cohesion**

The Co-op's housing mix, in terms of housing type and size is derived from the Draft 2008 Strategic Housing Market Assessment (SHMA), which relates to the housing market area as a whole. There is no evidence that the specific and different housing needs of local communities in this part of Leicestershire have been thoroughly considered or that the role of Pennbury in meeting them has been clearly defined.

The Co-op should make use of existing research, consultation and Equalities Impact Assessment to identify the different needs of the various communities who are likely to want to live at Pennbury. This will allow partners and stakeholders to devise appropriate mechanisms to address the specific housing needs of BME and other groups. Housing associations should be fully engaged in this process because they have a successful track record of involvement in this area.

The likely demographic characteristics of those who may move to Pennbury, combined with the fact that some in-migrants may well work outside the area, could create communities within Pennbury who have very little in common with people in the surrounding communities in terms of income, lifestyle or stage in lifecycle. The proposals for Pennbury will need to take steps to combat the emergence of two such distinct communities, including provision of a wide range of house types and tenures, sensitive allocation and management policies for affordable housing and early and effective provision of community and leisure facilities.

Pennbury should contribute to fulfilling the needs of existing communities, and its impact on existing communities should be carefully monitored. Where new development is provided to a higher standard than neighbouring existing communities (e.g. with less traffic congestion or more green areas) consideration should be given to upgrading facilities in existing areas so that they are not obvious 'poor relations' to their newer neighbours.

Sensitive and appropriate management of affordable housing will be important to help establish a cohesive community. Early and effective involvement of local residents is likely to be key to establishing a successful new community. Pennbury represents an opportunity to be engaging and innovative in the devolution of power and neighbourhood management, and this is recognised by the Co-op. Firm proposals and commitments are required, together with a willingness to work with local partners and stakeholders, to ensure that objectives for social cohesion and balanced and mixed communities can actually be achieved.

### **Migration and Population**

Part of the justification given for the housing requirements is in-migration into Leicestershire. Whilst there is evidence that Leicestershire and Leicester experience high levels of internal and international

migration, the information shown in the Co-op Report shows that the districts with the highest number of in-migrants are located to the north and west of Leicester.

The Co-op rely on the 2006 mid year populations projections, but there is some doubt as to the reliability of the methodology chosen. It is important to note that these are not predictions, or even expectations, of population change, but trend based projections, which require both internal and overseas migration assumptions. Migration is the most complex part of the projection process and there are some concerns that the national projections may have over-estimated population increases from this source.

The Co-op rely on the 2006 East Midlands population projection and then make an assumption about how much of the extra growth will be accommodated within Leicestershire. In fact there is a 2006 Leicestershire population projection and if this figure is used a considerably lower housing requirement is produced.

Given the uncertainties surrounding the basis for the population projections used and the fact that a partial review of the RSS is underway, there are considerable doubts as to whether there is a need for the scale of development proposed. At the very least it would be prudent to undertake a number of sensitivity tests on the population and migration assumptions to establish the implications for future housing needs.

### **The Northamptonshire Factor**

There is no evidence to support the assumptions made by the Co-op about the scale of additional provision required for the Northamptonshire Factor, in the East Midlands or Leicestershire.

The Pennbury proposals would also dramatically increase the amount of housing completions in the Leicester and Leicestershire Housing Market Area. Pennbury's additional housing provision of 5,000 in each of the three 5 year period would represent an increase of 66% on the 15,000 completions achieved 2001 to 2006.

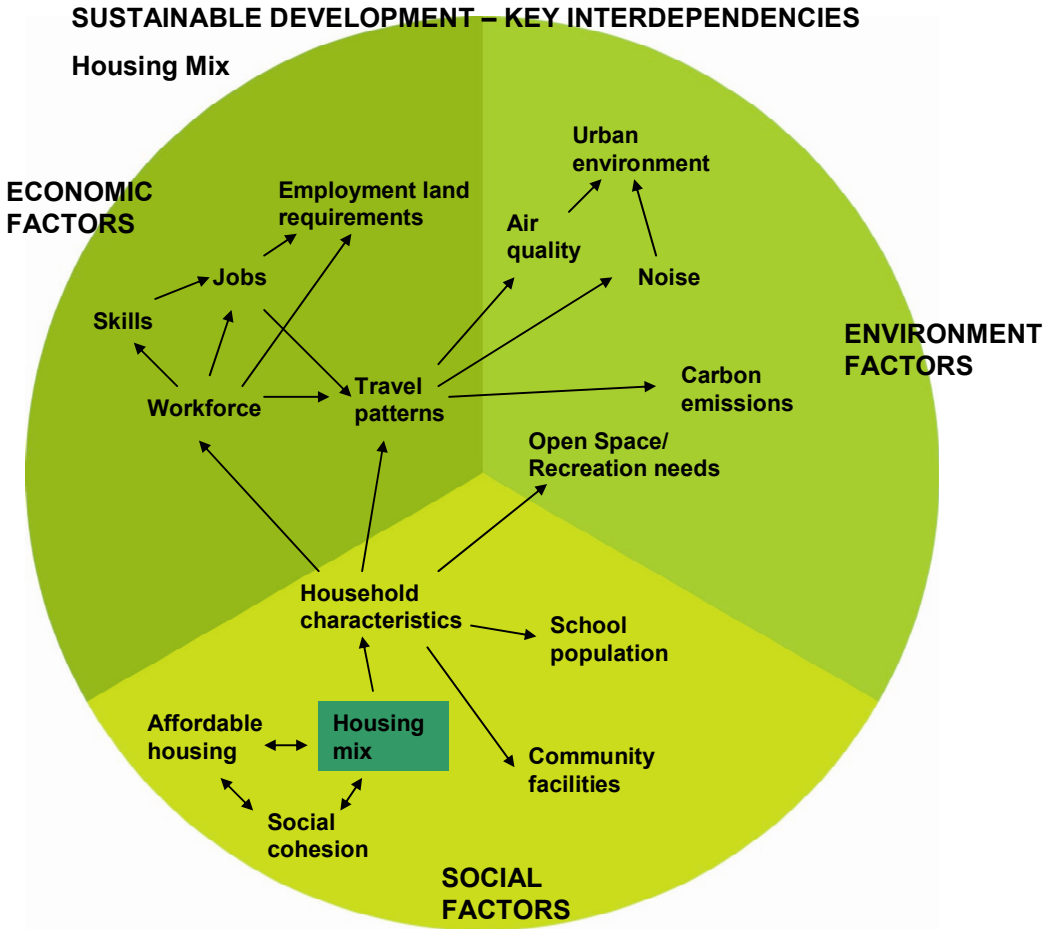
### **Spatial Requirements for Growth**

The available evidence suggests that most recent housing growth and demand have been evident to the north and west of Leicester city, and between Leicester, Nottingham and Derby, although this is partly a function of current policies. The Co-op has not provided evidence of the need for 15,000 new homes to the south-east of Leicester. The location of the proposal derives simply from the landownership of the scheme promoters and not from any rational planning process which has considered and debated alternatives.

### **Housing: Inter-dependencies**

Figure 5 highlights the linkages between housing mix, affordable housing and social cohesion. Housing mix has a direct relationship to household characteristics, which in turn affects workforce, skills, jobs and employment land requirements. Job and workforce characteristics also link directly to commuting and travel patterns, which in turn affect carbon and noise emissions and air quality.

Figure 5 Housing Inter-dependencies



3.1.3 Landscape and Design

The eco-town is centrally located on the airfield site, on top of a triangular ridge in open countryside. Over 60% of the total site area will remain as open countryside, for farming and biodiversity conservation purposes and 30% of the town itself is designated as public open space, including parks and play spaces. The Co-op assert that the compact form of the development will limit its impact onto the surrounding countryside and that the loose grid pattern of streets and blocks is derived from the orientation of wider landscape contours, but no evidence is presented to support these assertions. The scale and form of development proposed are likely to result in a high magnitude of change to the current rural landscape. Wider effects on rural tranquillity will be felt through increased traffic, from private vehicles, public transport, freight and construction traffic.

**Visual Impacts**

The prominent location of the site, at an elevated height, and the high densities proposed, will create a very urbanised, dense form which will be difficult to assimilate into the surrounding countryside

The settlements of Houghton on the Hill, Kings Norton and Illston on the Hill are likely to have prominent views of the site. The development boundary is very close to parts of Oadby, Little Stretton and Stretton Hall. Cross sections and massing diagrams should be produced in these locations to demonstrate the relationship between existing developments and the boundary of Pennbury.

A Zone of Visual Impact Assessment should be undertaken, based on the tallest buildings in the town centre, to illustrate how widely the development will be visible in the surrounding landscape and to neighbouring communities.

The masterplan layout should be superimposed on a contour plan, to help understand the relationship to the wider landscape.

**Landscape Impacts**

There is no evidence that the Masterplan will sensitively integrate this scale of development into the wider landscape. The main street alignments seem to have been derived from an artificial man made feature – the runway alignments – rather than any natural or historic landscape features

**Density and Identity**

The Masterplan Vision document proposes areas of medium/high density of 65 and 75 dwellings per hectare. These exceed the density levels of comparable developments within Leicester and elsewhere in sustainable urban extensions, and are considerably higher than typical densities in suburban locations nearby, e.g. Oadby. Higher (but unspecified) densities are proposed in the town centre. It is unclear how these will be reconciled with aspirations to create a traditional High Street with a mix of shops and facilities. The Masterplan Vision also seeks to create high levels of family housing with gardens and this may also not be compatible with the densities under consideration.

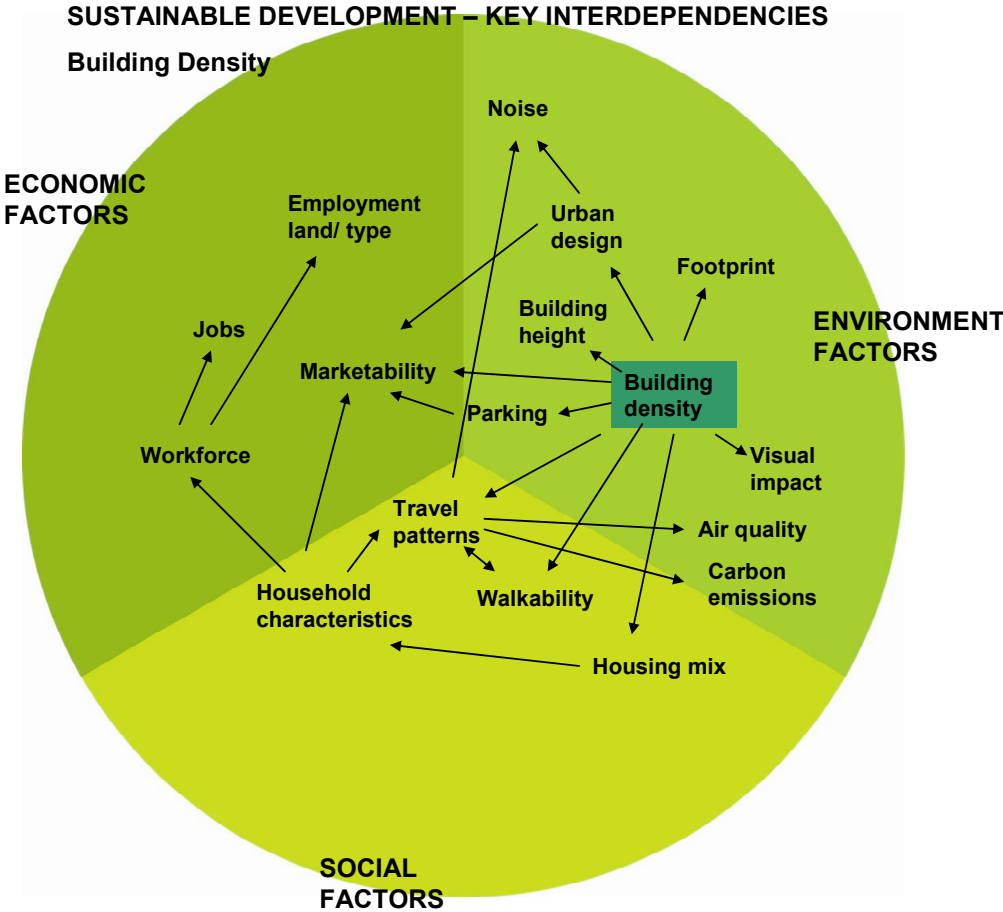
A high standard of urban design and architecture will be required in order to ensure that the potential benefits of higher densities are achieved and the potential disbenefits are mitigated. The Masterplan Vision contains insufficient detail of building heights, typologies and plot layouts. A great deal more information is required to illustrate the Masterplan and to demonstrate that the densities proposed are achievable, and will produce an attractive urban environment and a high quality of life for residents, workers and visitors.

The location of the site, close to Leicester, Oadby and a number of adjacent rural communities, will make it difficult to establish a separate and distinct identity for Pennbury

**Landscape and Design: Inter-dependencies**

Figure 6 illustrates the multiple environmental implications which flow from building density, on visual impact, parking, building height, urban design and building footprint. Density also affects walkability and travel patterns, as well as housing mix and therefore household and workforce characteristics.

**Figure 6 Landscape and Design Inter-dependencies**



### 3.1.4 Environment

The Masterplan is based on a desk based analysis of the main environmental assets on the site and surrounding area; namely ecology, land contamination, cultural heritage and archaeology and water resources/flood risk. It is predominantly a greenfield location and although there are a limited number of statutorily designated sites present – comprising three Scheduled Ancient Monuments and an SSSI (to the south of the site) – there are numerous locally designated sites and a wealth of protected ecological species. These locally designated sites and species are nonetheless important and valued, and need to be protected and enhanced. There is little evidence that the Masterplan has seriously considered these aspects.

#### **Ecology**

The report acknowledges that some existing information is outdated and that the survey work was not comprehensive, and therefore recommends targeted species surveys for 2009 to gather further evidence. A Phase 1 habitat survey and a protected species walkover survey and appraisal, should be undertaken as a priority. Based on the results of this, a further programme of seasonal surveys and monitoring needs to be undertaken to fully appraise ecological resources on the site. The findings of these surveys may have significant implications for the Masterplan and the Co-op should give undertakings that the Masterplan will be reviewed once this data becomes available.

It is very important to identify the local importance of the 220 non-statutory sites. These sites may have parish or borough level importance. Non designated sites contribute to the mosaic of environmental assets and may be highly valued locally. Desk based research of these sites is insufficient and further site investigations and consultations with local stakeholders is required.

It is unclear from the report the level of importance of the ‘protected’ species identified. The Rutland and Leicestershire BAP is not explicitly stated as a reference document. Leicestershire LBAP priority habitats include hedgerows, broad-leaved woodland, eutrophic standing water, field margins, mature trees, neutral grassland, roadside verges, rocks and built structures, springs and flushes and wet woodland. All these habitats are known or are likely to exist in the areas under discussion.

Mitigation for the effects of climate change on the biodiversity needs to be considered. This could include reversing fragmentation, enhancing linkages across the countryside, minimizing barriers, and should be an important part of any sustainable plan. The Masterplan is very strategic and there is no evidence to date that this has been considered.

The site is less than 2km from the SSSI in the south. Development impact at the Kirby-Foxton’s site will be dependent on the activities undertaken, although it is understood to be separated from the main development site by a watershed. The nearest section of the site identified for light manufacturing uses may have an impact on the species and habitat at the SSSI site, due to the nature of manufacturing operations and by products. It would be prudent to include the SSSI as potentially affected site and investigate further.

Although the Rutland Water SPA site is about 25km away from the site it is important to ensure that the proposed development will not affect this European site of nature conservation importance. The separate Sustainability Assessment document identifies that increased recreational pressures *could* impact on Rutland Water. It recommends a number of amendments to the Recreation Policy in the draft Planning Policy Statement (PPS) by way of mitigation, including application of Natural England Accessible Natural Greenspace Standards (ANGSt) to open space provision within the eco-town and additional measures, including site management measures, which may be required to be specified at the detailed project-based Appropriate Assessment stage. This is unacceptable and too late in the process because by this stage it may not be possible to actually agree appropriate site management measures. The PPS Appropriate Assessment should be satisfied that all the potential effects on European sites are capable of being managed and mitigated before it is approved. Residual effects should not be left to a project level Appropriate Assessment, because by this time the policy context may be fixed.

A detailed ecological strategy should be prepared for the site, which should aim to provide general biodiversity enhancements across the site through the provision of wildlife corridors, minimal pollution

and disturbance, the use of native species and the preservation and enhancement of notable features on the site such as arable field margins, woodland, watercourses, ponds/lakes, hedgerows, and species rich grassland. This should include an exploration of options to enhance the biodiversity value of the relatively poor green wedge area and options to provide and enhance woodland, wild birds and key BAP habitats/species. The Strategy should also consider potential secondary impacts on biodiversity as a result of increased water abstraction and impacts on fish populations within the River Sence.

### **Land Contamination**

Potential contamination sources have been identified during the assessment of historic and current activities on the site which could represent a risk to sensitive receptors. The site is considered to be environmentally sensitive, there are numerous watercourses identified and it is considered that surface water could potentially be in continuity with the groundwater.

At this stage the study recommends that targeted investigations are undertaken on a number of zones, concentrating on specific source areas i.e. the historic landfill, Leicester East Airfield, the various sewage treatment facilities, the railway and highways infrastructure and farmsteads if they are redeveloped. This should involve soil and groundwater sampling, installation of monitoring wells (for further groundwater monitoring if required). In addition, an Unexploded Ordnance (UXO) survey should be undertaken especially in the vicinity of the airport.

Although it may be implicit, the report does not explicitly discuss any impact on habitat and species. Identification of this aspect will be particularly important for aquatic habitats.

### **Cultural Heritage and Archaeology**

The extent of archaeological interest is considerable. The report recommends intrusive surveys and other studies, including aerial mapping to better understand the nature of the cultural heritage interest. It is worth noting that PPG16 states that there should be a strong presumption in favour of preserving in situ nationally important archaeological remains whether Scheduled or not.

The Scheduled Ancient Monuments are, by definition, of national interest. The Masterplan appears to have retained the area around the Strettons as a green area, however, without much more information or detailed layouts it is not possible to demonstrate that the setting of these monuments will not be adversely affected.

Until the further detailed cultural heritage studies are completed the full implications for cultural heritage resources cannot be determined. The precautionary approach would suggest that cultural heritage resources should be thoroughly researched and understood before the Masterplan is finalised. This may suggest that parts of the site are not suitable for development or, at the very least, it may affect the programme of implementation.

### **Water and Flood Risk**

The strategy for water supply is unclear. The Masterplan contains aspirations to achieve exemplary levels of water efficiency, reduced demand, grey water recycling, SUDS and rainwater harvesting, but does not go into sufficient detail to conclude that these objectives will be met. The implications for the wider water environment need to be carefully considered, since this is classified as a moderate-severe stress area by the Environment Agency.

No evidence is presented as to the cost implications of the water supply and treatment proposals, which could be substantial.

There is generally inadequate detail presented in respect of flood risk management. The Environment Agency have identified that the amount of water entering the River Sence can have a significant impact on Great Glen through flooding downstream. Surface water run off will therefore need to be minimised, and other mitigation measures considered – e.g. flood storage areas. The Masterplan Vision shows a number of flood storage areas in diagrammatic form but there is insufficient detail provided to be satisfied that these will perform as required.

A Water Cycle Strategy and detailed flood risk modelling will be required to demonstrate an integrated and sustainable approach to the supply of drinking water, disposal of storm and wastewater and impacts on downstream rivers.

Detailed modelling will be required of water consumption, run off rates, storage capacity, infiltration rates and capacity of watercourses, in order to demonstrate that SUDS proposals and flood storage areas are feasible and adequate.

No detail is provided on the maintenance and management of water areas.

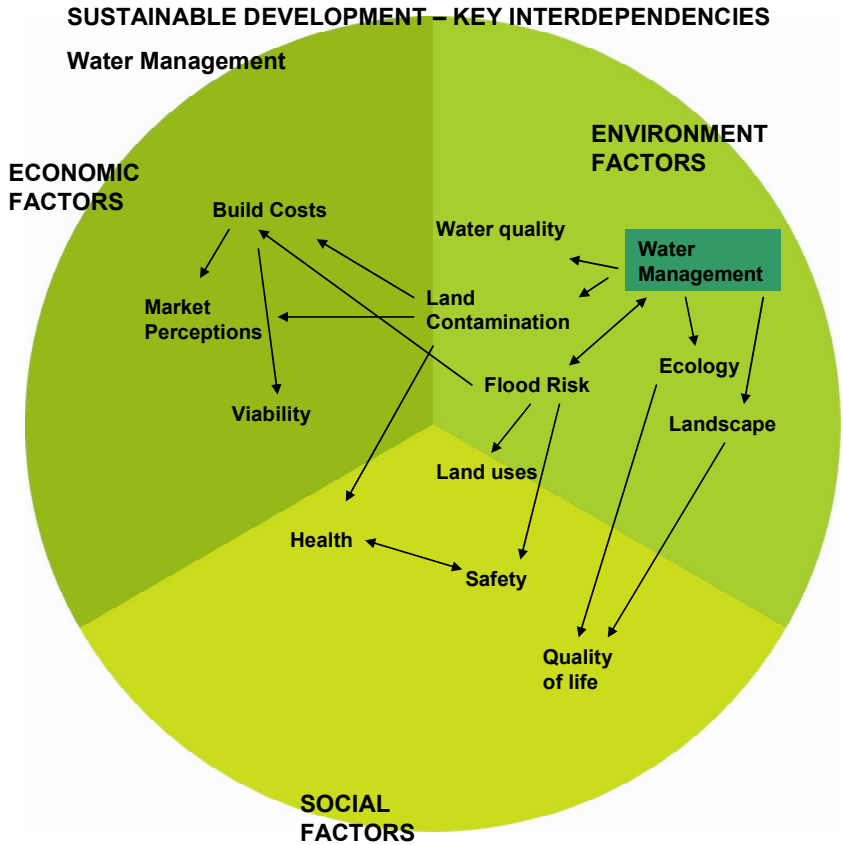
The Sustainability Appraisal<sup>1</sup> of the draft PPS for eco-towns states that “Eco-towns in areas of serious water stress should aspire to water neutrality, ie achieving development without increasing overall water use across a wider area”. The concept of water neutrality is interesting and worthwhile and it is noteworthy that it does not currently feature in the Co-op’s proposals, even though Pennbury is located in an area of moderate-severe water stress.

A site wide water management strategy should be prepared, which gives detailed consideration to water demand for residential and commercial uses, water saving measures, SUDs, water storage and recycling, flood risk, and the sourcing of water and any likely secondary impacts for water resources and ecology. The strategy should be prepared in consultation and partnership with the water supplier and other relevant stakeholders and should contain a clear statement of principles and objectives for water management.

**Water Environment Inter-dependencies**

Figure 7 illustrates how water is an important medium for transmitting effects and has direct effects on a wide range of environmental factors and indirect effects on a range of social and economic factors. Water management has direct links to water quality, land contamination, flood risk, ecology and landscape. Land contamination then links to build costs and market perceptions, and flood risk links to build costs, land uses, and health and safety.

**Figure 7 Water Environment Inter-dependencies**



<sup>1</sup> SA of draft PPS, DCLG November 2008, Table 6

### 3.1.5 Transport

Transport is a major source of carbon emissions and the development of a sustainable transport strategy is a key challenge for this project. Government guidance suggests that transport provision in eco-towns should be designed to equal or better the modal share for sustainable modes achieved in the most sustainable European communities - the good practice target for modal split for all journeys is suggested at 40%.

These objectives are extremely challenging. Harborough District currently has higher per capita total CO<sub>2</sub> emissions than the UK average, Leicester and Oadby and Wigston. The area exhibits a high level of car ownership and a decline in bus usage, and the proportion of residents in the local area that travel to work by car is significantly higher than the national average.

#### **Commuting and Self Containment**

The Co-op assume that 60% of Pennbury residents will work within the eco-town (a containment factor of 60%). The modal shares are public transport 58%, cycling 16%, car driver 17%, and car passenger 9%. Car use is therefore 26% in line with government guidance.

The containment factor in the Co-op's analysis has been derived from Census data from selected "comparable" locations. However, it is unreliable to base the whole case on Census data, which is imprecise, and there are doubts as to whether the comparator locations are really appropriate. The containment assumption is crucial to the whole traffic model and to the assessment of the effects of traffic generation on the road network. Separate transport modelling has shown that this level of containment may be extremely difficult to achieve in practice.

#### **Transport Assessment**

There are very real difficulties involved in implementing the Co-op's proposed public transport improvements<sup>2</sup> in respect of the A6 and A47. It is not clear that the necessary measures can be implemented in such a constrained urban environment, where the costs of the measures are likely to be considerable, the environmental implications significant and acquisition of multiple parcels of land far from straightforward. The measures will be required upfront and delivery costs and complexities could well hinder Pennbury's development.

Even if the levels of bus service proposed were sustainable and the necessary corridor improvements deliverable, proposed service journey times appear unrealistic. It does not appear physically possible to accommodate the levels of buses required along the corridors in to the City (numbers would be such as for buses to delay each other); in the city centre itself (nor is it clear where they would be garaged); and congestion is still likely to be increased on the two corridors, not least by removal of existing general traffic lanes, causing other traffic to re-route to unsuitable routes.

An assessment of other locations reveals significantly different mode shares than Pennbury. To an extent this is to be expected, but it underlines the scale of travel behaviour change which Pennbury will need to bring about if the Co-op's modal share assumptions are to be met. Cycle mode share is considered ambitious and comparison with Cambridge is inappropriate given that this is a city with extensive cycling infrastructure and a long-standing cycle culture; current mode share at Ilkeston is no more than a sixth and at Market Harborough is no more than a third of this target.

Average site-wide residential car parking ratio of 0.5 per dwelling is considered ambitious, given that the edge of city centre (Zone 2) area of Leicester supports up to 1 space per dwelling, even though non-car accessibility within these areas would be similar to the Pennbury. Modelling work indicates that this level of parking restraint potentially affects demand for residential premises (in terms of occupation levels, household make up and population skill mix) and suggests that there could be a similar effect in terms of commercial premises take-up. Anecdotal evidence suggests that lack of parking has deterred commercial investors at certain city centre sites.

### 3.1.6 Impacts and Consequences: Summary

Figure 8 summarises the impacts and consequences of the main assumptions made.

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<sup>2</sup>Source: WYG Working Note 2 September 2008, Public Transport – Response To Proposed Transport Interventions

**Figure 8 Impacts and Consequences Summary Table**

Assumptions	Impacts on Masterplan	Consequences for Wider Area
<b>Housing</b>		
<p>The average household size will be 2.4</p> <p>The Co-op have assumed that Pennbury's household size and composition will mirror national and sub-regional averages and that the age profile of the town will reflect general Leicestershire trends. There is a lot of evidence to suggest that Pennbury will have a very different household composition, which is younger, more economically active and with larger families than more traditional towns.</p>	<p>Based on 15,000 households, this results in a total population of 36,000.</p> <p>A different household size and composition will have a direct impact on the demand for housing, as well as requirements for education and health facilities and provision for retail, leisure and open spaces.</p> <p>This is a key variable that will have a major impact on objectives to achieve a balanced and mixed community and a broad balance between jobs and housing.</p> <p>Household composition affects economic activity rates, workforce characteristics and thus employment land requirements</p>	<p>If household size or composition is different from assumptions then the housing needs of certain sections of the community may not be met. Pennbury could become a separate and distinct community with little in common with it's neighbours.</p> <p>There could also be an undersupply or over-supply of social infrastructure, including schools and community facilities, and a mismatch between jobs and housing – which would increase commuting.</p>
<p>The proposal uses the 2006 ONS mid-year population projections as a key argument for the need for Pennbury.</p> <p>The Co-op rely on the 2006 East Midlands population projection and then make an assumption about how much of the extra growth will be accommodated within Leicestershire.</p> <p>These are not predictions, or even expectations, of population change, but trend based projections, which require both internal and overseas migration assumptions. There are some concerns that the national projections may have over-estimated population increases from this source.</p>	<p>If the population projections are unsound this reduces the need for such a large development.</p>	<p>The scale of the development may not be justified and may not meet minimum suggested requirements for an eco-town (5,000 homes).</p> <p>If there is no real need for this scale of development Pennbury will either take longer to develop, will not be completed or will depress prices and divert housing from elsewhere.</p>
<p>Pennbury is needed because the Leicester and Leicestershire HMA faces a shortfall of 51,000 dwellings between 2001 and 2026</p>	<p>There is no evidence to support the assumptions made by the Co-op about the scale of additional provision required for the Northamptonshire Factor, in the East Midlands or</p>	<p>As above</p>

Assumptions	Impacts on Masterplan	Consequences for Wider Area
	Leicestershire.	
There is both the demand and the funding available for 4,500 affordable houses. The scale of affordable housing provision envisaged at Pennbury would be significant compared to recent Housing Corporation investment in Leicestershire.	The Masterplan makes provision for affordable housing at the lower end of the Government's suggested range for eco-towns.	If affordable housing provision is slower coming forward because of public funding constraints this may affect the overall rate of delivery or objectives to achieve a balanced and mixed community.
<b>Employment</b>		
The economic activity rate will be 1.2 jobs per household.	If the socio-economic composition of the population is different than assumed (as seems likely) the Masterplan may not provide the right type or amount of employment land	If the employment strategy is not soundly based then either not enough jobs will be created or the jobs provided may not match the skills of the local residents.  This could result either in high unemployment levels within Pennbury or high levels of in and out commuting.
60% of Pennbury residents will work within the eco-town This requires that 10,800 of the 18,000 jobs be located in Pennbury itself.	This is an aspiration within the Masterplan, but there is no convincing analysis or delivery strategy to ensure it materialises.	As above
A cluster of environmental industries / jobs, linked to the Institute of Energy and Sustainable Development at De Montfort University, will be created at Pennbury.	There is no real analysis of labour force issues, existing clusters or specific types of environmental jobs likely to be created. The employment land requirements may not be soundly based.	As above, plus if the wrong type of jobs are provided this could conflict with economic priorities elsewhere.
Co-op employment projections show 2,860 jobs in 'Finance and Business Services'. The office floorspace indicated is 67,000 sq m.	The Masterplan office provision is 34% higher than the whole Leicester New Business Quarter target.  The Masterplan assumes that it will be possible to control the types of employers that move into office and industrial space in Pennbury. In practice market forces may make this impossible.  Definitions need to be clarified of the various employment sectors proposed in the Masterplan, particularly "environmental industries", "knowledge-based sectors" and	If demand and potential for these sectors in the sub-region is insufficient, Pennbury would not serve just local needs but would compete with and divert resources from other priority areas – e.g. the Science Parks and priority regeneration areas.  If sufficient demand exists, timing should be co-ordinated to ensure priority schemes elsewhere have attained a critical mass before Pennbury

Assumptions	Impacts on Masterplan	Consequences for Wider Area
	“finance and business services’	offers much competition
The breakdown in jobs between employment sectors is based on national averages. No employment forecasts are presented to validate the assumptions made in terms of future employment trends and no consideration is given to structural changes in the UK, regional, and sub-regional economies.	These assumptions feed into the employment land provisions in the Masterplan  The assumptions are unsound and are not robust	If the employment strategy is not soundly based then either not enough jobs will be created or the jobs provided may not match the skills of the local residents.  This could result either in high unemployment levels within Pennbury or high levels of in and out commuting.
<b>Retail</b>		
The expenditure profile of Pennbury residents in terms of comparison and convenience shopping will be the same as the average for Leicestershire.	The retail expenditure assumption informs all subsequent analysis, and leads to the quantum of retail floorspace proposed	If retail floorspace is overprovided, Pennbury may divert spending from neighbouring centres. The smaller centres of Oadby, Wigston and Market Harborough may be particularly vulnerable.  If a significant retail element is provided within Pennbury in advance of housing provision, this would increase competition with neighbouring centres
Convenience shopping retention rates is assumed to be 80%. Comparison shopping retention rates is assumed to be 50%.	The available evidence on existing retention rates shows wide variations. The Masterplan should be informed by sensitivity testing to ensure the right assumptions are made.	Over-provision of retail floorspace may undermine the vitality and viability of neighbouring smaller centres
The town centres of Ilkeston, Wokingham and Christchurch have been used as comparators, based on the assumption that they have similar characteristics to Pennbury.	The chosen comparators have very different characteristics to Pennbury/Leicester. The retention rates and expenditure profiles chosen in the Masterplan, and therefore the quantum of retail floorspace proposed, may therefore be unsound	As above
The Co-op estimate that 50,000 sq m of retail floorspace will create 3,950 jobs	This is one of the assumptions underlying the employment projections.  For comparison, the Highcross retail and leisure extension totals 60,000 sq m and its new jobs amount to approximately 2,500 persons	If the retail employment jobs are over-estimated, either unemployment will increase at Pennbury or there will be more out-commuting to jobs elsewhere
<b>Environment</b>		
The Masterplan is based on a desk based analysis of the main environmental assets on the	The identified development parcels may not reflect the location of locally important, but nevertheless significant,	Environmental assets may be damaged and opportunities missed to improve linkages and

<b>Assumptions</b>	<b>Impacts on Masterplan</b>	<b>Consequences for Wider Area</b>
site and surrounding area; namely ecology, land contamination, cultural heritage and archaeology and water resources/flood risk.	environmental assets	enhance local environmental features. The delivery programme may be delayed whilst necessary surveys and mitigation works are completed.
The strategy for water supply and treatment lacks detail and no evidence is presented as to the cost implications of the water supply and treatment proposals, which could be substantial, or how the proposed water demand reductions will be achieved	The Masterplan may need to be revised once a detailed Water Cycle Strategy has been undertaken.  The implications for the wider water environment need to be thoroughly understood and provided for since this is classified as a moderate-severe stress area.	
The strategy for flood risk management lacks detail	The Masterplan assumes that large areas of SUDS and flood storage may be made available. These assumptions are not supported by detailed technical analysis or flood risk modelling	Inappropriate design of SUDS or flood storage areas could cause localised flooding
<b>Landscape and Design</b>		
The compact form of the development will limit its impact onto the surrounding countryside	In order to achieve “compactness” the Masterplan incorporates medium/high density levels on parts of the site. The design content is lacking to demonstrate that a high quality outcome will be achieved.	The prominent location of the site, and the high densities proposed, will create a very urbanised, dense form which will fundamentally alter the character of this part of rural Leicestershire. Surrounding settlements are likely to have clear views of the development.  The location of the site, close to Leicester, Oadby and Wigston, as well as a number of adjacent rural communities, will make it difficult to establish a separate and distinct identity for Pennbury.
The loose grid pattern of streets and blocks is derived from the orientation of wider landscape contours	The evidence from the Masterplan suggests that the main street alignments have been derived from an artificial man made feature – the runway alignments – rather than any natural or historic landscape features	Landscape impacts will be exacerbated
<b>Transport</b>		
60% of trips generated will be within the town (containment factor of 60%)	The containment assumption is crucial to the whole traffic model and to the assessment of the effects of traffic generation on the road network. Accurate survey data should be used to provide reliable information on travel patterns	If containment is less than assumed traffic generation, congestion and off-site traffic effects will be much greater than expected

<b>Assumptions</b>	<b>Impacts on Masterplan</b>	<b>Consequences for Wider Area</b>
	within this part of Leicestershire.	
Trip generation assumptions for Anytown and Ecotown	These assumptions underlie predictions of traffic generation	As above
Transport assessment assumptions	The transport assessment does not take account of potential increased demands as a result of increased external commuting, different mode shares or of other travellers using the public transport route (or routes) for part of the journeys.	If the transport assessment assumptions are unreliable the planned public transport facilities will have less capacity than anticipated and traffic generation, congestion and off-site traffic effects will be much greater than expected
Off-site transport improvements	The masterplan assumes that the planned improvements can be delivered. However, they can only proceed with the approval of the landowners affected and the feasibility of this is untested	The environmental implications of large scale land acquisition are unknown, but may well be serious, since much of London Road Leicester passes through Conservation Areas.
Bus priority measures and bus capacity improvements can be made on London Road, Leicester.	London Road is already a bus Quality Corridor with extensive bus lanes and bus priority. It is unclear whether there is any spare capacity for further bus priority measures or bus infrastructure (e.g. stops) on this route.	The planned public transport improvements may not be capable of being delivered. This would increase traffic generation for other modes and consequently traffic congestion and environmental effects.
Cycle mode share is assumed to follow Cambridge levels	This assumption feeds into predictions of traffic generation	If the cycle mode share assumptions are unreliable traffic generation, congestion and off-site traffic effects will be greater than expected
Car parking standards will be well below the norm	This assumption feeds into the traffic model and predictions of traffic generation. It will also influence assumptions of building density.	If restricted parking standards cannot be delivered then traffic generation will be greater than expected. If the standards are rigorously applied, this may deter take up of residential and employment sites.

## 4 Further Work

### 4.1 Introduction

Figure 9 summarises the further work which needs to be undertaken to test the key assumptions in the Masterplan, to help ensure it is robust and soundly based on evidence. This will also help to ensure that the sustainability objectives of the project are actually delivered.

The list of further work required in Figure 9 is comprehensive, but in no particular order. However, the further work required in respect of transport and the economic strategy are the key issues and both these areas need to be substantially upgraded.

The work should be led by the Co-op and their consultants, with the active participation of the relevant local authorities and other stakeholders.

<b>Figure 9: Further Work Required</b>	
<b>Housing</b>	
<b>Assumption</b>	<b>Further work</b>
Household size of 2.4	A more robust analysis of potential household size and composition including <ul style="list-style-type: none"> <li>• Where the population for Pennbury is likely to come from</li> <li>• Analysis of Leicester, Oadby/Wigston and Market Harborough profiles</li> <li>• Analysis of household size and composition in Sustainable Urban Extensions and major new developments in East Midlands and nationally</li> </ul>
Age profile of residents	
Location of Pennbury	Robust evidence to demonstrate need for 15,000 new homes in this location <ul style="list-style-type: none"> <li>• Sensitivity testing of population projections</li> </ul>
Housing demand	
Population projections	
Northamptonshire factor	
Housing Mix	<ul style="list-style-type: none"> <li>• Greater analysis to establish the likely socio-economic profile and wage levels of Pennbury's resident population to inform the likely housing need</li> <li>• Analysis and testing of how changing household composition over time will affect demands for schools and other community facilities</li> </ul>
Social Cohesion	<ul style="list-style-type: none"> <li>• Evidence that the specific and different housing needs of local communities, including BME and people living with disability, in this part of Leicestershire have been thoroughly considered and the role of Pennbury in meeting them has been clearly defined</li> <li>• Undertake Equalities Impact Assessment of housing and employment strategies</li> </ul>
Community Infrastructure	<ul style="list-style-type: none"> <li>• Survey of the role and capacity of community infrastructure in surrounding settlements to determine how Pennbury may complement existing facilities</li> </ul>
Affordable housing	<ul style="list-style-type: none"> <li>• Discussions with local Housing Associations and Housing Departments to establish scale and profile of local housing needs</li> <li>• Analysis of effects of any off-site affordable housing provision</li> </ul>
Housing Management	<ul style="list-style-type: none"> <li>• Analysis, testing and stakeholder consultations on Registered Social Landlord Co-operative and Proxy Community concepts</li> </ul>
<b>Economy</b>	
<b>Assumption</b>	<b>Further work</b>
Economic Activity Rates	<ul style="list-style-type: none"> <li>• Greater analysis to establish the likely socio-economic profile of Pennbury's resident population to inform the likely characteristics of the labour force</li> <li>• More robust evidence and justification on the projected economic activity rate per dwelling for the Eco-town</li> </ul>
Economic role and job creation	Evidence to justify <ul style="list-style-type: none"> <li>• That the economic roles envisaged for the town will actually produce</li> </ul>

	<p>the number of jobs required (i.e. how are the 14,000 jobs are going to be created?)</p> <ul style="list-style-type: none"> <li>• The specific Environmental Technology sectors in which the jobs will be created and the labour force and skills strategy required to support them</li> <li>• The specific Knowledge Based Industries envisaged and how these will relate to the sub-regional and regional context</li> <li>• That the economic strategy is consistent with and underpins the housing strategy</li> </ul> <p>Employment forecasts to validate the assumptions made including:</p> <ul style="list-style-type: none"> <li>• Analysis of future employment trends</li> <li>• Analysis of structural changes in the UK, regional, and sub-regional economies</li> <li>• Sensitivity testing of breakdown of jobs between sectors using representative local (rather than national) comparators</li> </ul>
Finance and Business Services	<ul style="list-style-type: none"> <li>• Evidence to justify assertions that the scale of provision of Finance and Business Services floorspace will serve local needs and will not compete with regeneration priorities in Leicester, Oadby and Wigston</li> </ul>
Knowledge Based Industries	<p>Detailed information with regards to:</p> <ul style="list-style-type: none"> <li>• how the proposals will avoid conflict with both Loughborough and Leicester City Science Park proposals</li> </ul>
Commuting and 60% self containment ratio of jobs	<ul style="list-style-type: none"> <li>• Evidence of containment rates from comparable locations</li> <li>• Detailed local workplace and transport surveys to understand local commuting patterns</li> <li>• Analysis of where 7,200 out-commuters from Pennbury will work and implications for jobs and skills in the sub-region</li> </ul>
Employment Land	<ul style="list-style-type: none"> <li>• Evidence to justify 40% plot ratio for B1, B2 &amp; B8 sites and 200% plot ratio for town centre office development, related to specific job sectors identified and with reference to local comparators</li> <li>• Analysis of employment land in relation to supply and demand for employment land and premises in the sub-region</li> </ul>
<b>Retail</b>	
<b>Assumption</b>	<b>Further work</b>
Expenditure profile	<ul style="list-style-type: none"> <li>• Greater analysis to establish the likely socio-economic profile of Pennbury's resident population to inform the likely expenditure profile</li> </ul> <p>Sensitivity analysis to justify</p>
Retail Capacity	<ul style="list-style-type: none"> <li>• The expenditure profile of Pennbury population</li> <li>• Household size assumptions</li> <li>• Expenditure retention assumptions</li> <li>• Retail capacity conclusions</li> <li>• Retail floorspace projections</li> </ul>
Retail impact	<ul style="list-style-type: none"> <li>• A retail impact assessment to assess impact on planned investments and existing premises in local retail centres, particularly Oadby, Wigston and Market Harborough</li> </ul>
Retail Phasing	<ul style="list-style-type: none"> <li>• Details of the planned phasing of the retail provision to demonstrate no negative impacts on neighbouring retail centres during the early stages of the development</li> </ul>
Retail Jobs	<ul style="list-style-type: none"> <li>• Evidence of local job creation (by floorspace and turnover) in retail sector</li> </ul>
<b>Transport</b>	
<b>Assumption</b>	<b>Further work</b>
Commuting and self containment	<ul style="list-style-type: none"> <li>• Detailed local workplace and transport surveys to understand local commuting patterns</li> <li>• Analysis of other comparators with a similar socio-economic profile to Pennbury</li> <li>• Undertake analysis of implications of in-commuting for surrounding road network</li> </ul>

Transport assessment	<ul style="list-style-type: none"> <li>Sensitivity testing of transport assessment to examine implications for traffic generation of alternative mode shares</li> </ul>
On-site transport infrastructure	<p>Design implications of on-site transport infrastructure</p> <ul style="list-style-type: none"> <li>Outline design of guided busway and bus priority measures and implications for pedestrian/cycle movements and severance</li> </ul>
Off-site transport infrastructure	<p>Feasibility and environmental studies of off-site transport infrastructure</p> <ul style="list-style-type: none"> <li>Feasibility studies of tram system</li> <li>Capacity analysis and outline design of guided busway and bus priority measures</li> </ul>
Car parking ratio of 0.5 per dwelling Restricted parking at commercial developments	<ul style="list-style-type: none"> <li>Justification and methods to demonstrate how parking ratios will be achieved</li> <li>Evidence of trip generation from comparable, low parking developments</li> </ul>
Cycle use and 16% mode share	<ul style="list-style-type: none"> <li>Details of the proposed cycle network and the infrastructure design for the cycle network</li> </ul>
<b>Environment</b>	
<b>Assumption</b>	<b>Further work</b>
Ecology, Protected Species, Priority Habitats and non-statutory designated sites of importance for nature conservation	<ul style="list-style-type: none"> <li>Undertake a programme of seasonal surveys and monitoring of key species/habitats within and adjacent to the site</li> <li>Devise appropriate ecological enhancement and mitigation strategies</li> <li>Consider impacts on Kirby-Foxton's SSSI to the south of the site</li> <li>Prepare a detailed ecological strategy for the site, which should aim to provide general biodiversity enhancements across the site through the provision of wildlife corridors, minimal pollution and disturbance, the use of native species and the preservation and enhancement of notable features on the site such as arable field margins, woodland, watercourses, ponds/lakes, hedgerows, and species rich grassland. This should include an exploration of options to enhance the biodiversity value of the relatively poor green wedge area and options to provide and enhance woodland, wild birds and key BAP habitats/species. The Strategy should also consider potential secondary impacts on biodiversity as a result of increased water abstraction and impacts on fish populations within the River Sence.</li> </ul>
Cultural heritage and Archaeology	<ul style="list-style-type: none"> <li>Undertake targeted intrusive surveys and aerial mapping of cultural heritage features</li> <li>Provide more detail of development boundary and likely impacts on setting of Scheduled Monuments at the Strettons</li> </ul>
Climate change	<ul style="list-style-type: none"> <li>Consider effects of climate change on the biodiversity of the site and design appropriate mitigation</li> </ul>
Land contamination	<ul style="list-style-type: none"> <li>Undertake targeted investigations of specific high risk zones, including landfill, airfield sewage pumping/treatment sites, the railway and highways infrastructure</li> <li>Undertake an unexploded Ordnance (UXO) survey in the vicinity of the airport</li> </ul>
Water and flood risk	<ul style="list-style-type: none"> <li>Produce a Water Cycle Strategy which gives detailed consideration to water demand for residential and commercial uses, water saving measures, SUDs, water storage and recycling, flood risk, and the sourcing of water and any likely secondary impacts for water resources and ecology. The strategy should be prepared in consultation and partnership with the water supplier and other relevant stakeholders</li> <li>Produce Strategic flood Risk Assessment and undertake detailed flood risk modelling, including effects of any proposed SUDS and water storage areas</li> <li>Produce Surface Water Management Plan</li> <li>Develop institutional model for maintenance of SUDS and water features</li> </ul>

Energy	<ul style="list-style-type: none"> <li>• A feasibility study should examine all potential technologies and sustainability issues including cost, procurement of supply, life-cycle carbon and environmental impacts, and long-term management. This should include consideration of options to explore the feasibility of community renewable schemes</li> </ul>
<b>Landscape and Design</b>	
<b>Assumption</b>	<b>Further work</b>
Landscape and Visual Impacts	<ul style="list-style-type: none"> <li>• Produce cross sections and massing diagrams where the development boundary comes close to residential communities at Oadby, Little Stretton and Stretton Hall to demonstrate the relationship between existing and proposed development.</li> <li>• Undertake a Zone of Visual Impact Assessment to illustrate how widely the development will be visible in the surrounding landscape and to neighbouring communities.</li> <li>• Superimpose the masterplan layout on a contour plan, to help understand the relationship to the wider landscape</li> <li>• Produce a landscape strategy to illustrate landscape treatment within the site and mitigation of visual impacts at the site boundary</li> </ul>
Design and density	<ul style="list-style-type: none"> <li>• Provide details of massing, building heights, building typologies and plot layouts for each Character Area and for each density range</li> <li>• Produce cross sections for each level of the road hierarchy and for the guided busway</li> </ul>
Land Uses	<ul style="list-style-type: none"> <li>• Locate all land uses on the Masterplan - including Sewage Treatment Works, CHP plant, recycling facilities, electricity sub-station etc – so that spatial relationships can be considered</li> </ul>