



A sustainable community? Life at Derwenthorpe 2012–2015

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This report from the Living at Derwenthorpe research project draws on early resident experiences of developing a sustainable community at Derwenthorpe.

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Derwenthorpe is being developed as an urban extension of over 500 new homes in York, through a partnership between the Joseph Rowntree Housing Trust, Barratt/ David Wilson Homes and the City of York Council. The development aims to provide both a socially and environmentally sustainable community and includes eco-friendly, energy efficient homes; incentives for lifestyle change to reduce environmental impact, and; the promotion of community participation and long-term stewardship. This interim report examines the extent to which a sustainable community is developing, drawing on early resident experiences.

The report shows:

- residents were primarily attracted to the scheme because of the house design and location rather than sustainability features per se;
- there was a high level of satisfaction with the homes, particularly amongst social renters;
- a high level of community activity and involvement was achieved in the first two years, although some residents were more involved than others;
- energy efficient interventions contributed to residents having lower than average carbon footprints from power (energy use) in their home compared to other national survey respondents;
- carbon footprints from travel were not below average despite a number of transport related interventions;
- there were a number of challenges in the delivery of the scheme including how best to deliver information to residents on energy efficiency measures and the operation of a communal heating system on a developing site;
- overall, housing providers can support residents to reduce their overall carbon footprints substantially by building to higher environmental standards.

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Executive summary

Derwenthorpe is being developed by the Joseph Rowntree Foundation/ Joseph Rowntree Housing Trust (JRF/JRHT) as an urban extension of more than 500 new homes on the east side of York, England. It is being built by the developer Barratt, through David Wilson Homes, on land JRHT bought from the City of York Council. It aims to provide both a socially and environmentally sustainable community, and offer lessons for future developments nationally.

After more than ten years of planning, the development began in 2012 and is expected to be completed in 2018. Derwenthorpe will provide 317 homes for sale (59 per cent), 135 for social rent (25 per cent) and 82 for shared ownership (15 per cent). The scheme is being built in four phases.

At the time of writing, there were 63 households in phase 1 and 34 households across phases 2/3 (61 owners (62 per cent); 22 social tenants (23 per cent); 14 shared owners (14 per cent)). The development includes a wide range of social and environmental interventions.

This document represents an interim report from the Living at Derwenthorpe research project by the Centre for Housing Policy and the Stockholm Environment Institute, University of York, commissioned by JRF. The research provides an evaluation of resident experiences of living at Derwenthorpe and aims to provide lessons on delivering sustainable communities in practice, considering both environmental and social aspects of sustainability, while also being mindful of the challenges of affordability for housing providers.

The evaluation methods include longitudinal (repeat) interviews with residents and a carbon footprint survey tool (REAP Petite) which allows comparison to national data collected by the tool.

The interim report focuses on four main areas:

- social sustainability (homes) – the extent to which the homes are ‘liveable’;
- social sustainability (community) – the extent to which Derwenthorpe is a successful mixed and active community;
- environmental sustainability (homes) – the extent to which the development is providing eco-friendly, energy efficient homes;
- environmental sustainability (community/ lifestyles) – the extent to which the scheme has provided incentives for lifestyle change to reduce residents’ environmental impact, particularly in the area of transport.

A final report in 2017 will include a further round of interviews with residents and wider stakeholder interviews and will also look at comparator communities to draw out wider lessons on delivering sustainable communities.

Social sustainability (homes)

There was a high level of satisfaction with the Derwenthorpe homes; 91 per cent of residents were satisfied with their homes, similar to national levels of satisfaction for owner-occupiers but exceeding levels of satisfaction for social housing residents. However, settled residents were slightly less satisfied than new residents, possibly as a result of high expectations being tempered by day-to-day living on a building site and/or operational issues related to energy efficiency measures.

Residents were particularly impressed with the space and light standards of the properties, as well as the general appearance and the internal layout of properties. Lifetime Homes standards also influenced satisfaction levels, with all residents benefiting from wide hallways and bathrooms. For some residents with disabled children, the combination of Lifetime Homes and overall good design had made a significant impact on their lives. Others discussed their potential use in the future, and the high level of flexibility in the properties.

Importantly, some aspects of design that were driving high satisfaction were related to improving energy efficiency, including the large windows (to capture sunlight), high standards of airtightness/insulation (providing comfort) and, more occasionally, specific interventions such as the winter gardens.

Learning points:

- Design of housing is key to resident satisfaction. Good design can serve more than one purpose; energy efficiency features such as large windows and accessibility standards can also promote people's overall quality of life.
- Building to Lifetime Home standards can transform the lives of households with disabled members, and can also enhance the living quality for all households (although it does increase the space that needs to be heated).

Social sustainability (community)

The majority (81 per cent) of respondents to the REAP Petite survey were satisfied with their area as a place to live, a level similar to or slightly lower than national data. Living on a building site may be a factor behind some of these responses, as although some green areas and the pond were in place from the beginning (and enjoyed by residents), the overall site was being developed around households.

Despite this, a significant early achievement of Derwenthorpe is the high level of community activity and involvement. A resident's association has been established, and a number of community interest based groups are well supported by residents, with some receiving initial support from a JRHT community development worker. Social network analysis revealed a very high level of connectedness between phase 1 residents, with households on average citing more than 20 other households as neighbours, and eight people as friends.

However, one limitation of this success was that there was a strong perception (both from those involved and those not) that a similar group of people was participating in social and governance activities. Children's and sports activities would have been welcome additions from those who currently had limited involvement. In addition, there was a specific request for specialist equipment in the play area to meet the needs of several families with disabled children.

Evidence was slightly mixed on the success of the mixed community. While overall views towards the mixed tenure community were generally positive in first interviews in phase 1, repeat interviews and those with phase 2/3 interviewees pointed to an emerging sense of difference between the tenure types. This requires further investigation but may reflect both different social attitudes and differing governance issues and policies for the respective tenures. Social network analysis also revealed disproportionately more contacts between home-owners than between owners and renters, although there were links across all tenures.

Learning points:

- Governance arrangements need to be perceived as fair and equitable to promote community cohesion.
- Different parts of the community may need different kinds of support to develop activities. In some cases, only short-term support or no support may be required; in other cases a higher level of intervention may be needed to promote the interests of those with less time and resources.

Environmental sustainability (homes)

Derwenthorpe will be completed 20 years after conception. Given significant improvements in building standards, Derwenthorpe's energy efficiency credentials are less different to other new developments than would have been the case at the turn of the millennium. In addition, it was originally intended to build Derwenthorpe at, or beyond, Code level 4 (for Sustainable Homes). However, the additional costs

meant that although this was provided in the first phase of 64 homes, new phases were being built to below Code level 4 in some areas (though remaining at Code level 4 for energy performance). This highlights the difficulties of delivering the aspiration to ensure both affordable and sustainable homes.

Despite these caveats, an environmental carbon footprint survey (REAP Petite) showed the impact of the homes as a major success in terms of lowering residents' carbon footprints from power (energy use) of their homes. In addition, the majority of Derwenthorpe residents were satisfied with the energy efficiency of their homes. Many remarked on how well the homes retained their heat, although a minority felt that the homes did not perform as well as expected.

There were also mixed views and experiences of other energy efficiency features of the development, including the mechanical ventilation and heat recovery (MVHR)/mechanical extraction ventilation (MEV) systems, winter gardens and water temperature restrictors and low water usage taps. Inefficiencies in operation were also reported by some residents (for example, MVHR being installed incorrectly), alongside a desire to override some features to achieve preferred living environments (for example, turning MVHR down or off). Additionally, many residents reported and/or demonstrated a lack of information on how to use many features. There was a clear need for further information and advice.

Evidence around lower fuel bills was also mixed. Just over half of residents felt that living at Derwenthorpe would reduce their energy costs, although quite a few were unsure and some felt that bills were higher than expected. The research also highlighted a number of challenges associated with the choice of a communal heating system, including: reliability and sequencing issues vis-à-vis the development schedule, information for and communication with residents and affordability/sustainability trade-offs.

Learning points:

- Energy efficiency measures built in from the start can help residents reduce their carbon footprints. Households' home energy footprints are easier for developers to influence than transport footprints.
- Residents need higher levels of, and ongoing, information and advice on how best to use energy efficiency measures. This is likely to be best achieved by a community engagement strategy.
- The evidence suggests that interventions that require the least (or no) operation by users will be the most successful (where training and skills of developers are sufficient to ensure high quality build and installation).
- Where more complex systems are used (such as MVHR), there is a need to support residents' use and provide information on and/or deliver maintenance services.
- The research highlighted a number of challenges associated with the choice of a communal heating system, which require detailed consideration at all stages of development and use.

Environmental sustainability (community)

Derwenthorpe aims to go beyond the provision of energy efficient homes to also provide incentives for lifestyle change to reduce environmental impact, particularly in the use of transport.

The evidence suggests that it is difficult to change households' travel patterns. Only a third (33 per cent) of REAP Petite respondents thought that living at Derwenthorpe would reduce their transport costs. Despite only having, on average, 1.1 car spaces per household, few households had reduced their car use substantially, often because of work and family commitments. There was also relatively poor initial take-up of the on-site car club, although there were promising signs of some better take-up as resident numbers increased.

Some small changes were, however, happening in travel patterns, with a number of households aspiring to reduce car use, a couple of households achieving it and a few planning on reducing car ownership in the future. There has also been a good up-take up of the cycle vouchers, and some evidence of more leisure cycling.

Most REAP Petite respondents (79 per cent) agreed that living at Derwenthorpe would make them live a greener lifestyle, however this most often referred to the energy efficiency of their homes and recycling, which, for some households from outside York was better than at their previous home. Few mentioned travel and consumption patterns, which are a much greater driver of an individual's footprint. Resident carbon footprints related to shopping were also higher than the national average (from REAP Petite), however this was in part due to moving house.

Learning points

- The travel related interventions, such as the car club, were in place from the outset of the scheme. While this gave them the greatest chance of success, this also meant that subsidies were needed for some time.
- Evidence suggests that it may be easier to influence lifestyles/short trips (for example, via the bike scheme) than commuting and wider travel patterns.
- Housing providers could consider schemes to try and reduce the high shopping carbon footprints associated with moving into new homes, for example via the promotion of community recycling and re-use schemes and liaison with councils over landfill waste management issues.
- There is also a need for developers to link into, and try and influence, wider city transport initiatives to affect travel changes in the local area.
- Overall, housing providers could also consider their potential role in supporting people to influence their overall carbon footprints through the development or promotion of specific environmental interventions and/or as part of a community engagement strategy.

Conclusion

Interim evidence suggested that Derwenthorpe is already achieving a relatively high level of social sustainability at the level of both home and community, demonstrating the importance and value of design, Lifetime Homes standards, and community development in supporting the development of sustainable mixed communities.

Evidence from Derwenthorpe on the success of the environmental interventions, both at the level of home and community, is more mixed. It is clear that it is difficult and expensive to deliver homes to high eco-standards and it is even more challenging for housing providers to influence sustainable environments. However, the early Derwenthorpe experience also provides some important lessons for sustainable housebuilding in the UK.

1 Introduction

Summary

- Derwenthorpe is as an urban extension of more than 500 new homes on the east side of York which aims to be both socially and environmentally sustainable. After over 10 years planning, the development started on site in 2012 and is expected to be completed in 2018. At the time of the research, 97 households were resident.
- Derwenthorpe is a mixed tenure community which will provide 317 homes for sale (59 per cent), 135 for social rent (25 per cent) and 82 for shared ownership (15 per cent). JRHT has a long-term stewardship role at Derwenthorpe, supported by a service charge paid by all residents.
- Phase 1 homes were developed to Sustainable Homes Code level 4, with five homes built to Code level 5. Phase 2/3 homes are being developed to Code level 3 (with energy performance at Code level 4). The development includes a communal heating system.
- The development also includes interventions designed to promote sustainable lifestyles and support a reduction in car use, including being sited on the Sustrans cycle way, provision of cycle voucher or bus vouchers and an on-site car club. 18 acres of green space and a pond include sustainable urban drainage and wildlife habitat.
- Social interventions include building to Lifetime Homes Standards, the provision of community and outdoor space, community development work, a Facebook page and digital inclusion initiatives.

Research by the Centre for Housing Policy and the Stockholm Environment Institute, University of York, is investigating how far Derwenthorpe is meeting its aims to deliver a socially and environmentally sustainable housing scheme. This interim report focuses on the resident experience of Derwenthorpe. A final report will be available in 2017.

Introduction to Derwenthorpe

Derwenthorpe is being developed as an urban extension of more than 500 new homes on the east side of York. It is being built by the developer David Wilson Homes on behalf of the Joseph Rowntree Foundation/Joseph Rowntree Housing Trust (JRF/JRHT), on land the trust bought from the City of York Council. It aims to be both socially and environmentally sustainable.

The vision

The original idea for Derwenthorpe (formerly called New Osbaldwick) was first put forward in the late 1990s by JRF/JRHT on land designated for housing by York City Council (see Appendix 2 for a detailed timeline). A competition to select a masterplan, public consultation and shortlisted plans for a new community in York followed. The then Director of the Joseph Rowntree Foundation, Richard Best, identified three main priorities for the community:

- an environmentally sustainable development which will not impact adversely on neighbouring communities;
- the creation of a strong mixed tenure community with a high quality of life for residents;
- a model which others contemplating edge-of-town extensions may find useful (JRF, 2001, p. 3).

There was an explicit intention to create a new community, 100 years on from the renowned New Earswick community developed by Joseph Rowntree to provide high quality housing and a successful community for Rowntree workers in York, updated and translated into the 21st century and building on the 100 years of housing and community research work undertaken by JRF.¹

The Derwenthorpe Business Plan 2009 stated that the vision for Derwenthorpe was fourfold:

1. Derwenthorpe will be a vibrant and supportive community where residents are actively encouraged to be involved in decisions affecting their day to day life, the services received and management of the communal facilities.
2. Derwenthorpe will provide high-quality homes for the residents across York, and offer a number of innovative and special attributes including mixed income and tenure options covering all financial circumstances.
3. Derwenthorpe will be a community which is able to adapt to changes in the external environment over time and give both physical and financial accessibility to people of all ages and needs.
4. Derwenthorpe represents a demonstration and influencing opportunity at both a local and national level offering a potential blueprint for family living in a truly sustainable community 'fit for the 21st century'.

This vision was ambitious and took a broad approach to achieving a sustainable community. There was an intention to excel across a number of social and environmental areas², including:

Social sustainability:

- creating a successful mixed tenure community (with higher proportions of social housing and shared ownership housing than standard);
- creating homes that could accommodate household change over time (exceeding Lifetime Homes³ standards and including study space and fibre optic broadband for working at home).

Environmental sustainability:

- providing eco-friendly, energy efficient homes (also developing and using a communal energy scheme for the site);
- providing incentives for lifestyle change to reduce environmental impact, particularly in the area of transport.

Social and environmental sustainability:

- creating a sense of place through both quality house design and considerable (18 acres) green and open space;
- providing long-term stewardship and promoting active community participation;
- creating an urban extension that would fit well into existing neighbourhoods.

There was an explicit aim to influence the future development of similar communities in the UK, and in particular to develop a model which could be replicated by volume house builders to scale rather than niche parts of the housing market.

Development to date

After JRF bought the land in 2002, the development was delayed by a long period of planning, local opposition, a public inquiry in 2006 and a European Commission investigation in 2008–2010. During this time a design competition was held and Richard Partington Associates were appointed as architects. The delays provided an opportunity for the designs to be tested by the development of prototype homes in the Temple Avenue Project (TAP) (JRHT/JRF, 2012), and for lessons to be learned from Temple Avenue and a smaller sustainable development (Elm Tree Mews) also developed by JRHT in York (Bell *et al.*, 2010) on the energy and carbon performance gap between the design, build and use of homes.

Development of the site started in 2011. As originally envisaged, the site is being developed as four sections (or phases) each linked into its neighbour, with no through traffic, but linked by the Sustrans cycle way and footpaths (see artist impression, Figure 1).

Figure 1: Artist impression of the completed four phases of Derwenthorpe



Phase 1, consisting of 64 homes⁴, was completed in July 2013, and the first resident moved in in May 2012. Phases 2 and 3 were being developed at the time of writing (125 and 186 homes respectively), with the first residents moving in by mid-2014 (with 34 households resident at time of research fieldwork, see later section). Phase 4 will provide an additional 165 homes by 2018.

Table 1 shows the planned tenure split for the development, with a total of 317 homes for sale (59 per cent), 135 for social rent (25 per cent) and 82 for shared ownership (15 per cent). Homes types are scattered so neighbours are usually in homes of different tenure. While some degree of tenure mix is usual in larger housing developments, it is rare to have it to this extent (Tunstall and Lupton, 2010). Phase 1 had a slightly lower proportion of social rented homes, though the highest proportion of shared ownership, across the phases. Phase 1 also had a higher proportion of larger homes, with a correspondingly higher sale price than subsequent phases. Phase 4 will have the highest proportion of social rented properties, also providing flats and bungalows (other phases are all houses).

Table 1: Derwenthorpe phases by tenure split

	Total number of properties	Social rent	Shared ownership	Private for sale
Phase 1	64	10 (16%)	15 (23%)	39 (61%)
Phase 2	125	28 (22%)	18 (14%)	79 (63%)
Phase 3	186	46 (25%)	28 (13%)	112 (60%)
Phase 4	165	46 (28%)	25 (15%)	94 (57%)
Total	540	135 (25%)	82 (15%)	317 (59%)

As shown in Figure 2, Derwenthorpe has been developed to offer a wide range of 'interventions' intended to enable and encourage residents to live sustainably (socially and environmentally). While home buyers purchase a freehold, they are restricted through covenants from altering environmental features of their homes or using an off-site energy supplier; tenancy agreements limit tenants in the same way. Tenants, shared owners and owners all pay a service charge for the maintenance of the public spaces and the long-term stewardship of the scheme.

Figure 2: Derwenthorpe social and environmental interventions

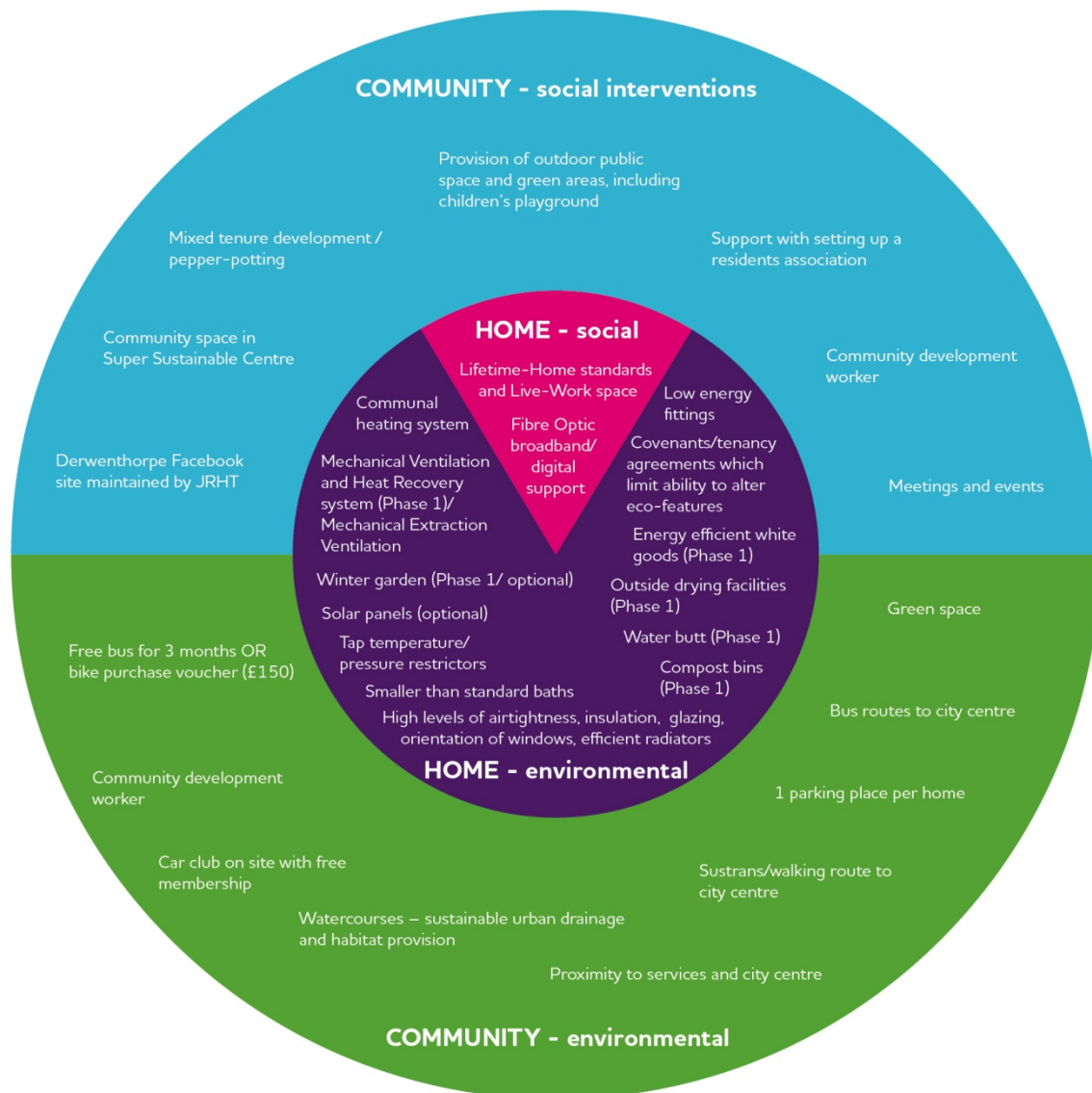


Figure 2 illustrates that the majority of interventions are provided in Derwenthorpe homes. Phase 1 homes were developed to Sustainable Homes Code level 4⁵ (providing at least 25 per cent improvement in dwelling CO₂ emission rate over target emission rate), with five homes being built to Code level 5 (providing at least 100 per cent improvement in dwelling CO₂ emission rate over target emission rate) (see Table 2). This put them in the top 16 per cent of homes for sustainability standards built from 2007–2013 (DCLG, 2013). As can be seen, some features were not provided or were different in phase 2/3, with homes being developed to Code level 3 (although energy performance was at Code level 4). These changes were made for capital cost reasons, and following resident feedback on the operational performance of the systems. notably, the mechanical ventilation and heat recovery (MVHR) system for ventilating homes in phase 1 was replaced by mechanical extract ventilation (MEV) in later phases; winter gardens⁶ became an option rather than a fixed part of the design of homes in later phases, and compost bins and water butts were not provided in later phases.

Table 2: Code levels for mandatory minimum standards in CO₂ emissions

Code level	Minimum percentage improvement in dwelling emission rate over target emission rate
Level 1	0% (Compliance with Part L 2010 Building Regulations only is required)
Level 2	0% (Compliance with Part L 2010 only is required)
Level 3	0% (Compliance with Part L 2010 only is required)
Level 4	25%
Level 5	100%
Level 6	Net zero CO ₂ emissions

Source: Code for Sustainable Homes Technical Guide, London: CLG, 2010, p.12 (Table 1.2)

A communal heating system delivers both heat and hot water to homes. The system is powered by a combination of biomass and natural gas. The original Derwenthorpe home user guide (2012) explained that the gas boilers acted as a back-up to the biomass to provide an ‘uninterrupted supply of heat and hot water to residents when the biomass boilers require maintenance work and/or where “peaks” in demand warrant it’. Additionally, with an aim to ensure that fuel costs remained affordable to residents, the energy supply agreement between Veolia (then Dalkia Utilities Services plc) and customers states that ‘at each price review date, we and JRHT will agree the energy mix to fuel the plant and equipment in the provision of the energy supply at the Derwenthorpe development in order to minimise the cost of the utility charge to you’. This is to ensure that current market costs of gas and biomass are considered, along with the carbon emissions associated with the generation of heat and hot water. The mix used raises challenges over balancing environmental sustainability and affordability objectives.

Figure 2 also shows the wider environmental interventions within the development as a whole, including interventions designed to promote sustainable lifestyles and support a reduction in car use, including siting by the Sustrans cycle way, provision of cycle vouchers to buy a bike, bus vouchers, and an on-site car club. The ponds and green space were designed to enhance quality of life as well as for a sustainable urban drainage scheme (SUDs)⁷ and wildlife habitat. The communal heating system is housed in the Super Sustainable Centre (SSC) which is also used as a communal building for community events and meetings.

Finally, Figure 2 summarises the social interventions to date, including Lifetime Homes, the provision of community and outdoor space, JRHT’s community development role, a Facebook page for Derwenthorpe residents and JRHT and JRF digital inclusion initiatives.



Phase 1 completed homes, 2013



Phase 2 homes under construction, 2013



Green area/pond (left) and playground/Super Sustainable Centre (right), 2013

Policy context: opportunities and challenges

Table 3 shows the development of Derwenthorpe against the wider policy landscape over the past ten years. The period has been characterised by considerable change particularly in the national economic/political and environmental context, including being marked by:

- A period of recession and then austerity where housebuilding has declined. In the Coalition Government period (quarter 1 2010 to quarter 1 2013), an average of 139,000 homes a year were completed compared with an average of 190,000 under the previous Labour government (quarter 1 1997 to quarter 1 2010) (Tunstall, 2015). New supply remains well below both the 2007 peak and below the numbers necessary to satisfy the needs of the estimated 180,000 – 240,000 new households formed a year (Whitehead and Williams, 2011; DECC, 2011).
- A key international and national goal of reducing national greenhouse gas emissions. At Kyoto in 1990, world governments pledged to reduce greenhouse gas emissions by at least 80 per cent below 1990 levels by 2050. In 2008, the Climate Change Act committed the UK to the Kyoto targets, with an interim target of a 34 per cent cut by 2020. The UK set a series of further intermediate targets (or ‘carbon budgets’), the first of which was to reduce its emissions by an average 12.5 per cent per cent from 1990 levels in the period 2008 to 2012 (EU Decision 2002/358/EC), a target that was met.

In addition, a number of specific policy changes relevant to the development of socially and environmentally sustainable communities have occurred in the last decade.

Table 3: Timeline of UK housing and environmental policy and key events at Derwenthorpe

	2006 and before	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Derwenthorpe development ⁸	Masterplanning competition, consultation and report (1999–2001) 2003 – planning permission sought (granted 2006)	Design competition – won by Richard Partington Architects	Derwenthorpe prototype – Temple Avenue (2008/9) European Commission Inquiry (2008–10)		Derwenthorpe build tender process	March 2011, development agreement in place with David Wilson Homes; build commences on phase 1	First residents in phase 1 (April)	Phase 1 completed (July) David Wilson Homes wins contract for phases 2–4: start on site, June; first occupation Dec	Material and skills shortage – four months behind (Mar)	Show home and 150 plots in build (July)	Building ongoing
National economic and political context		Recession begins			General election – Coalition Government	Austerity commences		April 2013 – introduction of the housing spare room subsidy reduction and benefit cap. Phased introduction of Universal Credit (to 2017)		General election – Conservative Government	
Environment policy related to sustainable housing/	National Heatwave Plans introduced (annually) from		Climate Change Act setting emissions reduction		Feed-in tariffs introduced for low-carbon electricity generated by	Carbon plan – vision for achieving 2020 emission	The Energy Act including introduction of the		Community Energy Strategy Energy	National fuel poverty strategy published	Expected national roll-out of SMART

communities	2004		targets. DECC set up. Energy performance certificates required		households; Flood and Water Management Act, 2010	reduction targets; National cold weather plans introduced (annually)	Green Deal & Energy Company obligation		suppliers obliged to roll out Smart meters to all UK homes by 2019. Infrastructure Act 2015		meters (until 2020)
Housing and planning policy related to sustainable housing/ communities	Target set that from 2016 all new homes must meet a zero carbon standard and introduction of code for sustainable homes (re-affirmed in the Building a Greener Future: Policy Statement in 2007)	Start of slowdown in UK housing market			Cuts in funding for new social and affordable housing	<i>Laying the Foundations</i> policy allows renegotiation of agreements between local authorities and developers (reducing the proportion of affordable housing on mixed sites)	National Planning Policy Framework (DCLG)	Changes to Part L of the Building Regulations	Changes to 'zero carbon' definitions and targets	Final housing standards review. Code for sustainable homes withdrawn. Zero carbon homes and allowable solutions regulations dropped.	

Policy affecting the development of low carbon housing

During the period in which Derwenthorpe has been planned and designed, specific policies to help reduce emissions in housing have included:

- A commitment to zero carbon homes⁹, announced in 2006, for all new houses built from 2016, and introduction of the Code for Sustainable Homes. The Infrastructure Act 2015 introduced powers to enable housing providers to build homes at Code level 4 and to make up the difference through 'allowable solutions' (offsite provision via improved insulation, energy generation schemes etc). However, the Code for Sustainable Homes was withdrawn in March 2015 and both zero carbon requirements and allowable solutions were dropped in the government's July 2015 productivity plan.
- Increasing the Standard Assessment Procedure (SAP) energy efficiency rating of new homes and reporting via energy performance certificates (EPC).
- Amendments to Building Regulations (Part L covering conservation of fuel and power) to become more demanding from April 2014. From 2016, energy performance requirements will be set at a level equivalent to the (outgoing) Code for Sustainable Homes level 4.
- The Energy Act 2012 introduced the Green Deal ('pay as you save' loan scheme) and energy company obligation to help householders make energy saving improvements to their homes, though the Green Deal was dropped following the election in 2015 and ECO's future is uncertain.¹⁰
- In 2015, the new national fuel poverty strategy was published which aims to achieve a minimum EPC C rating for as many 'fuel poor' households as possible by 2030 (average SAP ratings in England are a D) (DECC, 2015a).
- A national community energy strategy was published in 2014 that sought to support communities in forming energy groups or taking forward energy projects as part of carbon reduction efforts (DECC, 2014).

Policy linked to sustainable lifestyles

Since the adoption of national carbon reduction targets, DECC and other national agencies have tried to encourage more sustainable lifestyles or to prevent wasteful behaviour, through a series of interventions including:

- promoting the generation of renewable energy and new community energy schemes (DECC, 2014);
- promoting 'active' transport modes (cycling and walking instead of car use) as a means to improve health (Active Transport for Healthy Living Coalition, 2014).
- developers and employers have been encouraged to develop sustainable transport plans and activities, sometimes as a condition of planning permission for new sites;
- local government has been set targets to increase the proportion of household waste recycled;
- European Union regulations have gradually sought to improve product energy efficiency, including light bulbs and power appliances;
- the UK government's Act on CO2 campaign attempted to engage the public with carbon reduction schemes, though rate of engagement on such schemes is slow (Kellett, 2007);
- community groups, charities and business groups have also promoted reuse of materials, growing your own food, reducing food miles, cycling and other initiatives. Group activities have demonstrated some success in changing behaviour (see, for example, Mulugetta *et al.*, 2010; Heiskanen *et al.*, 2010).

Policy on the development of mixed communities and socially sustainable communities

Although some aspects of national housing and planning policy have sought to encourage social mix for much of the last century, recent policy and developments in this area have been relatively sparse:

- the Town and Country Planning Act 1990 allowed local authorities to require developers to make ‘contributions’ to mitigate harmful effects of development. Over time, it has become established practice for councils to ask developers to build affordable housing, usually on site and in increasingly specific ratios of the total;
- however, *Laying the Foundations* (DCLG, 2011) allowed renegotiation of agreements between local authorities and developers (reducing the proportion of affordable housing on mixed sites);
- after the recession, spending has also been more limited on regeneration (Lupton and Fitzgerald, 2015).

Research aims and methods

The overall aim of the research is to ascertain the extent to which the Derwenthorpe development creates an environmentally and socially sustainable community. Noting the above policy context, the project will identify lessons which can be learnt from the scheme in relation to supporting energy efficiency in the home and beyond, facilitating sustainable lifestyles among residents and encouraging social mix in the context of a mixed tenure scheme.

The research project is a longitudinal study of residents’ responses and experiences from 2012 to 2016. This report documents the findings and learning points from 2012 to early 2015. A further report will be published in 2017 drawing on a further phase of interviews with residents and comparative research in other sustainable developments.

This study is one of a number of JRF research projects on Derwenthorpe (including a project by the Building Research Establishment to examine the ventilation systems’ effectiveness in more detail) within a broader research programme which is primarily focused on environmental sustainability and climate change.¹¹

This interim report draws on three parts of the evaluation (see Appendix 1 for full details):

In-depth longitudinal research with residents

A total of 28 separate households have taken part in interviews. This included 18 out of a possible 63 households (29 per cent) in phase 1 and 10 out of a possible 34 households (29 per cent) in phases 2/3.¹² The sample was broadly representative of the characteristics of homes and households in the development.

A total of 41 interviews have been carried out. This includes 31 interviews in phase 1 across two periods of fieldwork, including repeat interviews with the majority of the same households (and some to replace drop-out) (see Table 4). It also included one round of 10 interviews in phases 2/3. Throughout this report, analysis is reported for three main sub-samples of interviewees:

- phase 1 households (first interview);
- phase 1 households (second interview);
- phase 2/3 households (first interview).

Table 4: Interviews with Derwenthorpe residents

	Phase 1	Phase 2/3	Total
2012 –2013	16	–	16
2014 –2015	13 repeat interviews 2 new interviewees	10	25
Total	31	10	41

Tracking individual and household carbon footprints across Derwenthorpe

The research uses the Stockholm Environment Institute's online environmental footprint calculator (REAP Petite) that converts data provided by residents into carbon footprints for the individual, household or community (<http://www.reap-petite.com>, and see Appendix 3). REAP Petite asks respondents for information on five key areas about their household to calculate their footprint: power (to heat homes), travel, food, shopping (clothes and other consumables), and activities (e.g. going to the theatre, watching sport).

Evaluation of individual interventions

The biggest intervention at Derwenthorpe is the development itself and the combination of the elements – its location, the design and mix of the homes and the layout of the neighbourhood. The moving in process and interaction with the developers and JRHT constitutes another intervention. Other interventions have included vouchers to buy bikes, a car club and bus passes and JRHT is considering a range of alternative sustainable transport solutions.

Report structure

Chapter 2 profiles the residents and looks at the reasons why people moved to Derwenthorpe; Chapter 3 presents residents' overall satisfaction with their homes; Chapter 4 reviews people's views and experiences of Derwenthorpe as a new community; Chapter 5 looks at residents' responses to the key sustainability features of the homes; Chapter 6 reviews the travel and transport interventions at Derwenthorpe. Residents' overall carbon footprints, collected via the REAP Petite survey, are analysed in Chapter 7. Chapter 8 presents the key conclusions from the research.

2 Derwenthorpe residents: profile and reasons for moving

Summary

- Derwenthorpe phase 1 and early stages of phases 2/3 attracted residents in a variety of household types and socio-economic status. Just over one in five owning households had children, while the majority of renters and shared owners did. This translated into a high level of under-occupancy (i.e. more bedrooms than needed) in phase 1 for owners (89 per cent), compared with shared owners (50 per cent) and renters (13 per cent).
- Most respondents had moved from other homes in York and moved as a step up in housing terms. A minority of respondents had to move and were improving their housing situation in so doing.
- The most important factor in choosing Derwenthorpe was the homes themselves, particularly the design, space and light. For a minority, the accessibility/adaptation of the homes for a disabled member of the household drove the move. Location was also a key reason for moving to Derwenthorpe.
- About half of interviewees mentioned the green credentials of Derwenthorpe as a reason for moving but this was usually not the main reason for moving.

This chapter describes the profile of Derwenthorpe residents who had moved in at autumn 2014¹³ and then considers their reasons for moving to Derwenthorpe.

Profile of Derwenthorpe residents

Derwenthorpe phase 1 and early stages of phases 2/3 attracted residents in a variety of household types. The most common type of household in phase 1 was a couple with no children, who made up nearly half (44 per cent) of households (Table 5). This was also the most common type of household in phase 2/3 households although at a slightly lower proportion of 32 per cent of households (Table 6). Four in ten (40 per cent) households in phase 1 included children, and 36 per cent in phases 2/3.

There was a large difference in the proportion of single people between phase 1 and phases 2/3 – with three in ten (29 per cent) households comprising single people in phases 2/3 to date, compared with only one in ten (10 per cent) in phase 1. This may reflect the higher proportion of smaller (and less expensive) houses in later phases.

There was a clear difference in household type by tenure. In phase 1, 13 of the 15 social rented households and 8 out of 10 shared owner households contained children. This compared with only 7 of the 38 owners. Similarly, the seven social renters in phases 2/3 all contained children; four of the eight shared owners also contained children but only four of the 23 owners.

Table 5: Characteristics of Derwenthorpe households, phase 1 (with number of interview households in brackets)

	Social rented	Shared ownership	Owned	Total
Single person			6 (2)	6 (10%)
Couple, no children	1 (1)	2 (1)	25 (7)	28 (44%)
Single adult and dependent child/ren	8 (1)			8 (13%)
Couple and dependent child/ren	4 (2)	6 (2)	7 (1)	17 (27%)
Couple and adult child/ren	1			1 (2%)

Single adult and adult child/ren		2		2 (3%)
Three generations	1 (1)			1(2%)
Total	15 (5)	10 (3)	38 (10)	63 (18) (100%)

Source: JRHT data/ interview data

Table 6: Characteristics of Derwenthorpe households, phase 2/3 (with number of interview households in brackets)

	Social rented	Shared ownership	Owned	Total
Single person		1	9 (1)	10 (1) (29%)
Couple, no children		1 (1)	10 (3)	11 (4) (32%)
Single adult and dependent child/ren	4 (1)	1		5 (1) (15%)
Couple and dependent child/ren	3 (2)	1 (1)	3	7 (3) (21%)
Couple and adult child/ren			1 (1)	1(1) (3%)
Single adult and adult child/ren				
Other				
Total	7 (3)	4 (2)	23 (5)	34 (10) (100%)

Source: JRHT data/ interview data

In phase 1, the vast majority (89 per cent) of owners were under-occupying, compared with half (50 per cent) of shared owners, and only one in six (13 per cent) renters (Table 7). The higher occupancy rate of renters is mainly be explained by the allocation of houses by JRHT according to household size, while shared owners are probably more constrained by cost than open market buyers. A higher occupancy rate would offer a substantial gain in efficient use of land, building materials and, potentially, in energy for heating and lighting.

Table 7: Number of homes under-occupied, by tenure, phase 1

	No. homes phase 1	No. under-occupying
Owner	35	31 (89%)
Shared owner	10	5 (50%)
Renter	15	2 (13%)
Total	60	38 (63%)

Source: Data provided by JRHT. No information for 5 homes

Employment and income data was only available for the interview sample of 28 households (see Appendix 1). The majority of adults were working, and working full-time. A minority were not working for reasons including maternity leave and looking after children or studying. Three people were retired and one was on sick leave. Jobs were varied and included manufacturing, community development, academia, engineering, finance, teaching, medicine, retail, running own business and building/construction industry.

Of the 41 residents completing REAP Petite, 32 entered data on their household's income (Table 8). Compared with the national average of REAP Petite respondents, there was a slight over-representation of higher income households among Derwenthorpe respondents, although it should be noted that the Derwenthorpe sample size is relatively small¹⁴ and was also mainly phase 1 residents (32 out of 41 respondents).

Table 8: Household income of Derwenthorpe (and national REAP Petite sample respondents)

Household income bracket	Derwenthorpe		National RP sample
	No. of respondents	% respondents	% respondents
Up to £4,999	1	3	11
£5,000–£9,999	1	3	6
£10,000–£19,999	4	13	13
£20,000–£29,999	4	13	15
£30,000–£39,999	1	3	2
£40,000–£49,999	8	25	23
£50,000–£74,9999	8	25	18
£75,000+	5	15	10
Total	32	100	100

Source: REAP Petite survey (Derwenthorpe base=32; rest of RP sample base=439)

The majority of interviewee households (21 out of 28) had moved to Derwenthorpe from homes in York (including ring road villages). Data from David Wilson Homes on the originating postcode for all sold owner occupied properties¹⁵ showed that 81 per cent of owners had moved from another York postcode (York and surrounding areas), however this was much higher for phases 2 and 3 (86 per cent) compared with phase 1 (71 per cent), suggesting that phase 1 attracted a wider market than later phases.

Reasons for moving to Derwenthorpe

Main reasons for moving from former home

In the majority of cases, moving to Derwenthorpe represented what would commonly be seen as a ‘step up’ on previous housing, whether in terms of desired tenure status, home size and/or housing facilities and/or condition.

Ten interviewees wanted to move mainly because they wanted to go from renting (or living with parents) to owning (or part-owning) a home. Six interviewees wanted to move to get more space (to accommodate a new baby, growing children, household activities and possessions, or to start cohabiting). Just one household had wanted to move mainly to have a smaller home. One additional household moved to live in a lower maintenance (though not smaller) home.

Five wanted to move to increase the convenience of their location, including being closer to work and family and/or more accessible locations.

Five households had needed to move from their previous home, including following home repossession, landlords wanting their property back and overcrowding. Two households moved as their previous social rented property could not be adapted to meet the needs of a young, disabled child.

Main reasons for moving to Derwenthorpe

The most important factor in choosing Derwenthorpe was the homes themselves (Table 9). Virtually every household mentioned this, particularly referring to the space and the design (both internal and external) as attractions. In addition, the way that the homes met the care needs of their disabled members was paramount for four households. Three social renters had moved as the home could be adapted to the needs of their disabled children. One owner had moved to live close to another family member to share the caring responsibilities of their adult son.

The next most important factor was the location, relatively close to the city centre but with a less urban feel, a factor particularly important for phase 1 households.

Table 9: Main reason/s for choosing Derwenthorpe or accepting offer of Derwenthorpe rather than other potential (mainly York) neighbourhoods

	Homes – general	Homes – care needs	Location	Green elements of scheme	Community	Finance options
Phase 1	17	2	15	10	5	0
Phase 2/3	7	2	3	4	3	3
Total	23	4	17	14	8	3

Note: Respondents could give more than one main reason (base =18 phase 1 households; 10 phase 2/3 households)

Half of the 28 residents interviewed mentioned the green elements of the scheme as part of the decision-making process, but in each case they had been at most a subsidiary factor in their choice to buy or to accept the Derwenthorpe offer. For example, one owner (couple) said green elements of the scheme played a role in their choice 'but not primarily', and they 'didn't know about green credentials' until after deciding to inquire about homes they saw on RightMove. Another single person also only learnt about this from the sales office and explained: 'I'm not driven by but it certainly was a positive'. One family buying on the development was 'not looking for sustainable housing', but felt the energy efficiency measures were 'an added bonus'. One renting family said 'the thought of having cheaper energy was a good thing', but this was secondary to other aspects of the home and the location.

For eight residents, the plans for community development, and in some cases the 'friendliness' they sensed among existing residents or fellow buyers, played at least some role in the decision to buy or accept an offer at Derwenthorpe. For example, one shared owner couple said '*...we enjoyed, certainly, the messaging around a new community, being part of something new, with like-minded people...*'. For another family:

What actually really swung it for us was the community they were building here at Derwenthorpe, because we liked the idea of being part of something from the beginning and building a community, because we hadn't really had that anywhere else where we lived... That did swing it for us.

Family with children, owner, phase 2/3

Finally, at least three people mentioned financing options as key to finding themselves at Derwenthorpe, in particular the availability of shared ownership on the site and also the Help to Buy scheme in one case. More broadly, a few people in phases 2/3 felt that the homes were good value for money in York.

3 Derwenthorpe homes: liveability

Summary

- Derwenthorpe residents had a high level of satisfaction with their homes (91 per cent) similar to national levels of satisfaction for owner-occupiers and exceeding satisfaction levels for social rented households. A dominant theme, particularly among shared owners and renters, was being lucky or fortunate to have secured a property at Derwenthorpe.
- However, satisfaction levels were slightly lower for settled households compared with new households.¹⁶ The latter might have been tempered by high expectations and living on a developing site (including interruptions to other services because of this).
- Across phases, respondents were particularly impressed by the design of the homes (internal and external), space standards and the amount of light in the properties. There was also a high level of satisfaction with the different rooms in the home, particularly large living rooms and master bedrooms.
- The housing appeared to work well for all types of households, providing flexible space for family life. Households with disabled members were highly impressed by the adaptations and facilities in their home, making a real difference to their lives. Other impacts were reported, including health benefits.
- The housing costs and associated service charge, across tenures, were seen as affordable.

This chapter focuses on residents' experiences of their homes. The chapter starts with a consideration of residents' overall levels of satisfaction with their homes. It then moves on to consider the 'liveability' of the homes – the extent to which the development met the housing needs of households, including space standards, layout and affordability.

Overall satisfaction with homes

Residents' overall levels of satisfaction with their new homes were high. In the REAP Petite Environmental Survey, 27 (72 per cent) respondents said that they were very satisfied and a further seven households (19 per cent) were fairly satisfied (91 per cent satisfied overall) (Figure 3). Three households (8 per cent) were neither satisfied nor dissatisfied and just one (3 per cent) was very dissatisfied. This approximates to national levels of satisfaction for owner-occupiers (69 per cent very satisfied; 26 per cent fairly satisfied; 95 per cent satisfied overall), and exceeds satisfaction levels for social rented households (46 per cent very satisfied; 35 per cent fairly satisfied; 81 per cent satisfied) (DCLG, 2014). As Figure 4 shows, virtually all (7 out of 8 (88 per cent)) renters or shared owners were 'very satisfied' with their accommodation.

Figure 3: Responses to the question ‘How satisfied are you with your accommodation?’

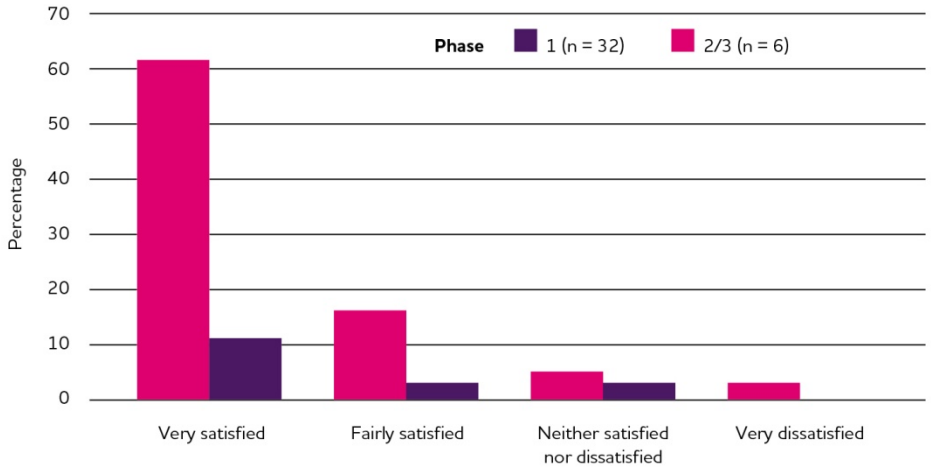
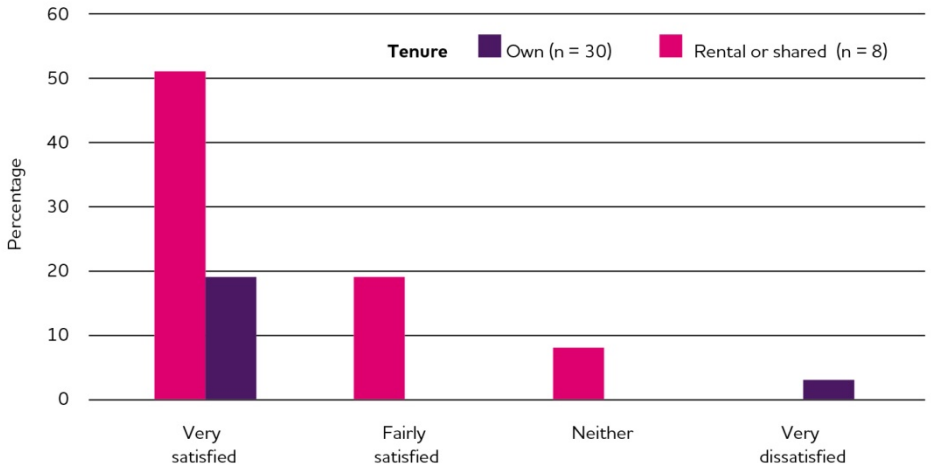


Figure 4: Responses to the question ‘How satisfied are you with your accommodation?’ by tenure



Many respondents reported feeling ‘lucky’ or ‘fortunate’ to have moved to Derwenthorpe, (particularly among renters and shared owners) or that it was an ‘ideal’ living situation:

I really cannot imagine what else somebody would want!
 Couple, owner, phase 1, first interview

To be honest, it’s perfect, we’re really happy... It’s met our expectations...we feel really privileged to live here.
 Family with children, renter, phase 1, first interview

One phase 2/3 shared owner (young family), who were not sure they would qualify for the scheme, on hearing that they had, said, ‘I could have cried with happiness’. Another young family on phase 2/3 explained on hearing they had been offered a rented home: ‘I couldn’t believe it! I never imagined we would get a house like this!’ Visiting the scheme appeared to make a big, positive, impression for many residents. For example, when one home buyer visited, they said;

It struck a chord with me... it was love at first sight... the lightness, the brightness, the airiness, the space, it’s just not being squashed in – it feels airy, breathy, light...it’s the openness.
 Single person, owner, phase 1

When one couple visited, they said,

It was almost one of those stupid grin moments when you walk through and think, 'crikey', and you walk upstairs and you think, 'my goodness' – the high ceilings, the big windows.

Couple, shared owner, phase 1

However, the REAP Petite data (Table 10) suggests that as respondents get settled into their homes, they are more likely to report they are 'fairly satisfied' than 'very satisfied' with their accommodation.¹⁷ It was difficult to pinpoint the reasons for this. It appeared that they were perhaps less satisfied with some aspects of service delivery on the site, including hot water reliability and other service charge issues (see later in this chapter). This may have impacted on their original position. Alternatively, it may just reflect a settling in process and becoming accommodated to one's high expectations and being surrounded by a large building site for the new phases. The comments of one household exemplifies this:

R1: I don't want you to come away with the impression that we're negative about the house or what is happening, we have specific issues like everybody.

R2: yeah, you get your pet peeves.

R1: but they are very upper middle class first world niggles that are not important in the grand scheme of things, because the house functions well, and we would make changes, and knock a wall, and things...

R2: yeah and the increased parking.

R1: but that does not detract from the fact that we are very happy here and very glad we made this move.

Couple, owner, phase 2, second interview

Table 10: Responses to the question 'How satisfied are you with your accommodation', by 'new' and 'settled' households

N=38	How satisfied are you with your accommodation?			
	Very satisfied	Fairly satisfied	Neither	Very dissatisfied
New	20	2	1	1
Settled	7	5	2	0
All	27 (72%)	7 (19%)	3 (8%)	1 (3%)

Fifteen of the second round of interviews involved residents who had been living at Derwenthorpe for a year or more. Of these fifteen households, eight described themselves as 'very' or 'highly' settled. Some of these felt settled straight away.

...A feeling of contentment... it's just a nice feeling, when you drive up you feel... in fact it's the first time that I've felt at home for a long time... If I won the lottery, I would not move from here, I would buy those three [houses] over there, so my sister could live in one, my dad could live in one and I could have one...because it would suit them as well.

Family with children, renters, phase 1, first interview

Four households described themselves as 'settled'. Three of the fifteen houses were in the process of moving home, all for very different reasons. One householder had felt settled but was headhunted for a job elsewhere. A second family had also felt settled but there were quite specific work-related reasons why they did not like their location at Derwenthorpe. Only one household was moving as Derwenthorpe was not giving them what they were looking for – they liked the house but wanted more open space.

Internal house design

All households (across phases and both new and settled households) appeared impressed by the design of their homes. In particular, residents noted what they considered to be excellent space standards: rooms were large and spacious with high ceilings. Windows were also large and the homes were thought to be extremely light and bright. Settled residents commented that they were still enjoying these features of the home.

The house probably feels bigger because it's full of light! And high ceilings.

Couple, shared owner, phase 1, first interview

I think the house has surpassed my expectations. I didn't realise it would be as nice as it is. I love having lots of space...

Couple with children, owner, phase 2/3, first interview

...the light and airy feel of it, the whole feeling of space... I pinch myself, I still pinch myself.

Single person, owner, phase 1, second interview

People often commented on how much they liked the downstairs living areas and/or large kitchen. The space gave flexibility, allowing different family members to share the space, and for adults to entertain.

A number of residents had wanted to enhance the downstairs space further by removing (partial) walls, particularly between the kitchen and living area to create one large open space. Three people (all home-owners) had already knocked down walls to reorganise the internal layout downstairs. However, a few households debated the value of being open plan and noted that it would be useful (or at least to have the option) to close off the kitchen to keep children safe and for noise reasons. This suggests that different households have different preferences, possibly linked to tenure and household type (particularly families and couples/singles), and supports the availability of different types of houses (as offered at Derwenthorpe) and, where possible, giving households options of choosing the internal layout of their home.

Third floor master bedrooms were highly praised. All bedrooms were considered to be good sizes. Bathrooms were well placed. Studies (phase 1) or study areas on landings (phases 2/3) were seen as useful additions to the homes, particularly for some who worked from home. Three people in phase 2/3 really liked the balconies off the bedrooms, with one home-owner making this into a second sitting room as the room was too good to be used as a bedroom.

Most households were satisfied with the kitchens and bathroom facilities provided, although a couple of people would have liked utility rooms. Homes were provided with a number of fixtures and fittings, and residents had some choice over details, including white goods in phase 1. In phase 1, a number of home-owners felt that the kitchen and bathroom fixtures and fittings could have been of a higher quality, given the quality of the overall house. In particular, some home-owners would have chosen better quality showers, kitchen cupboards, kitchen tops and/or white goods. There were no specific criticisms of kitchens or bathroom design by phases 2/3 residents.

We have felt that the design of the kitchen was a bit limited in many respects...I would say that the house generally is quite a high spec, luxury spec, but the kitchen let it down.

Couple, home owner, phase 1, first interview

In phase 1, a couple of households did not like having to walk through the living area (often carpeted) to take the rubbish out to the back garden (the kitchen does not have an outside door in many designs), but it was seen as a relatively minor inconvenience. It was remarked that the homes had been designed with good amounts of storage (with the exception of two families in phase 1).

Lifetime Homes and accessibility

Derwenthorpe properties are being built to Lifetime Homes standards, to enable residents to stay in their homes should they become less mobile or physically impaired. This feature of the home directly contributes to space standards, particularly for corridors and the downstairs toilet. Eight interviewees in phase 1, and two in phases 2/3, mentioned this as a valuable feature of the homes.

Three households (all renters; two in phase 1; 1 in phase 2/3) had moved to Derwenthorpe because the homes could be adapted to the needs of their disabled children. This move had been supported by the families' occupational therapist. In two cases, major adaptations had met the specific needs of the families before they moved in. This included the installation of a lift, as well as changed bedroom arrangements, for one family. For another family, a wet room had been put in and a downstairs bedroom for the child, as well as additional features like varying height work surfaces. The other family had moved mainly for the

space offered by the accommodation but had also been supported to install a wet room after moving in. All of these householders were highly satisfied with their homes and these facilities.

I feel very fortunate to have been offered it. And it's a lot better for the family... with [child's] disability, it's a lot easier... Everyone's got their own bit of space.

Family with children, renter, phase 2/3, first interview

The Lifetime Homes standard was an important consideration for one person as their partner (at the time of looking for housing) needed a downstairs bathroom. For another household, it was also important as one person had a progressive medical condition. Three older respondents also thought it could prove useful in the future.

The other good thing is that the houses are built so you can stay forever. As the houses are built with the width you need...

Family with children, renter, phase 1, first interview

Exterior design

The exterior of the properties were also thought to have an impressive design. This was particularly remarked upon in phase 1, including the height of the buildings. A couple of people specifically commented on how they liked that the houses had been painted white – this made them distinctive and the light also reflected off the houses when the sun was shining. One person in phase 2/3 had only been interested in buying a house with white rendering, feeling that these looked much better than the brick phase 2/3 homes.

I love sitting here and looking out the window – it feels like I'm in a foreign country, well...it feels like it's warm, it's weird... I like just looking out and seeing a white house! You know, it makes a difference to seeing brick if you know what I mean... the white, and the woody bit on the front of these, it sort of gives it...like continentally... it's really good, I love it.

Family with children, renter, phase 1, first interview

...we liked the aesthetic of the white on the top...

Couple, home owner, phase 2/3, first interview

Garden

It was recognised that gardens were necessarily on the small side as it was a new housing development. Nonetheless, most people, across phases, were satisfied with the size of the garden and felt it met their needs fairly well for an outside green space. A few people were very pleased with the garden; one couple spent a lot of time in their garden and this had given them considerable satisfaction. Most households used the garden as a functional space.

Quite a few householders reported problems with the quality of the lawns. This was a feature of phase 1 interviews, but continued in repeat interviews with the settled householders (where problems had not been solved), and also into phase 2/3. It was felt that lawns had been laid poorly, possibly at the wrong time of year and on poor soil (with rubble from the build). There was a particular problem with drainage in the garden, with collecting water and muddy surfaces.

...when it rains or it's bad weather, it is horrendous, it is like a swampy, muddy mess... It's not draining water away properly...

Couple with children, shared owner, phase 2/3, first interview

A couple of people discussed trees in the garden. One household was disappointed that they were not allowed to put trees in, another householder had asked special permission to do so and another had asked for a tree to be removed (which was not permitted).

A couple of phase 1 householders would have liked a patio outside their living room doors. This has been provided in phase 2/3 (one person mentioned they would like this extended).

A few people in phase 2/3 disliked being overlooked particularly when backing on to the cycle paths and would have preferred solid fencing at the back of the property.

There were also differing views on the shed provided. Mostly, it was felt to be a good size, but two people would have liked it in a different part of the garden, one felt the floor was flimsy and another reported that the shed was filling with water as the drainage appeared to flow the wrong way (problem unresolved from first to second interview).

Enhancing lifestyles/quality of life

The housing seemed to work well for different household types (across phases, and over time), including single people, couples, families with young children and families with older teenagers. In particular, it was seen as providing adaptable space, space for each individual household member, and spaces for everyone to come together and entertain guests. One family with two children explained how the living room provided enough space for watching television, homework and playing all at the same time. They also now ate together around the table, something they had not done regularly before. Another family now had enough space to be able to all spend time downstairs together, something that they really appreciated.

Several households specifically mentioned that they now spent more time in their home than they had before because they liked it so much.

I love the house. I never really want to leave the house which is probably a bad thing!

Couple, home-owner, phase 2/3, first interview

This home-owner went on to explain how safe the home felt:

I liked the position of it...it feels very safe and it felt really safe [looking at it]on the plans, it felt like a kind of nice wee place to just, you know, hole up and have a family and do what we wanted and without it being scary at any point [laughs], or busy either, you know, it's not busy round here.

There were a number of other examples where the new homes appeared to have a positive effect on people's quality of life and health. One couple in their 60s described living in the home as like being on holiday every day as it was '*invigorating*' and '*refreshing*'. Others felt the house had impacted on their mood:

I am so much more happy coming home, when I'm coming home it feels great, it really lifts me up to have this sort of space...it's a real home, it's a home that fits me as well from the airiness, lightness, it's really somewhere that I want to be.

Single person, home owner, phase 1, first interview

I've had sort of anxiety problems in the past and I feel so content, it's really good, I feel like I'm going forward... it has influenced my mood, I come home and ...I don't tend to be as grumpy as I did...

Family with children, renter, phase 1, first interview

This final respondent, in their second interview, continued:

I still love it... I still wake up and I think I'm so lucky. I don't have one of those days when I think, 'Oh God', like I used to when I lived in [previous home]. And I can see a tree out of my bedroom window, very nice.

Affordability: housing costs

Overall, most home-owners in phase 1 felt that the properties, while not cheap, were appropriately priced compared with other same size properties in York, given the design and sustainability features of the homes and the location. One home-owner was able to afford the property as they were now saving £300 a month on petrol costs as they were no longer commuting to York. Phase 2/3 home-owners were more likely to speak about the homes as good value for money.

Shared owners seemed reasonably happy with their part-mortgage, part-rent arrangement. One couple had a 50 per cent mortgage, another family 30 per cent mortgage. Although this was a financial stretch, both households were hoping to increase the amount of mortgage over time. Again, affordability seemed a little more comfortable for phase 2/3 households: both shared owners had actually wanted a higher percentage mortgage (presently 53 per cent and 25 per cent shares) but explained that JRHT calculated it to ensure that it would be affordable for them.

It is affordable, 25 per cent mortgage and the rest is rent, and I think over the month it costs £520 which is, you know, really good. For private renting you'd be paying £600 or £700 and that is just dead money, isn't it?

Family with children, shared owner, phase 2/3, first interview

On the whole, renters across both phases found it just about affordable but judged it to be well worth the rent. One family who worked part-time (and received some Housing Benefit) felt that the monthly rent was just about affordable (£427 a month). Another family commented that the rent was quite an increase on their previous rent but that they '... weighed it up, it's worth it. It's social housing. If we were in the private sector, it'd be a thousand pounds a month'. One renter did note that rents had increased. A couple of renters were on maximum Housing Benefit.

At their first interview, most phase 1 residents appeared quite happy to pay a service charge, feeling that it was worthwhile to have a green, landscaped environment and facilities such as the playground. Generally, people also felt that the service charge was set at an appropriate level. One couple felt that the service charge was important for another reason:

I think it is positive as it gives us a stake in the Joseph Rowntree Housing Trust, one of the pluses for moving here was the sense that the builders might come and go but the housing trust is always going to be there – there is this sort of long commitment...It's not a hit and run scheme.

Couple, owner, phase 1, first interview

Only one phase 1 household was less than satisfied with paying the service charge at their first interview but had received some money back in recognition that full services had not been enjoyed as they had moved in very early. Satisfaction with the service charge, however seemed to have fallen over time for some phase 1 households, and two phase 2/3 householders also had some concerns. One phase 2/3 did not understand what the service charge covered, while another was very critical commenting that the green areas were available to everyone in York. Both of these comments may have stemmed from the fact that they were further away from the green areas of Derwenthorpe than phase 1 households. Phase 1 (settled) respondents tended to think the level of the service charge was reasonable but they wanted more evidence on how it was being spent. This issue had recently been taken up by the residents' association.

Estate management charge, not a problem, a bit more transparency in that would be nice. I know what they do for it, and that's fine, just stuff like I know some of it is for maintaining the garden, well when are they going to do that? It sounds silly, but I'm paying for it, I'd like to know exactly when it's going to get done...

Couple, owner, phase 1, second interview

Person 1: This is the thing about Joseph Rowntree, they are very nice, they need more work on articulating clearly on what they are doing with it...As service charges go, I actually think it's quite reasonable.

Person 2: We just want the evidence of it.

Couple, owner, phase 1, second interview

Affordability of heating and electricity is considered in Chapter 4.

Digital inclusion and internet connectivity

JRF has been supporting activities to promote digital inclusion, as part of community development in and around Derwenthorpe. An initial report of a separate evaluation found an overall higher level of digital fluency in Derwenthorpe than adjacent neighbourhoods (Harris and Gilchrist, 2015). All Derwenthorpe properties have a high-quality internet connection (fibre optic internet). It is not known whether this contributed to digital fluency or whether households with higher digital skills were attracted to the development. However, most interviewees appreciated it; in some cases, it was absolutely essential especially when people were working from home. Some problems were reported with connections (for example, the signal being poor upstairs, signal going down) but others were very pleased with the service compared with previous homes.

JRHT had set up, and maintains, a Derwenthorpe Facebook page. Analysis of the Facebook page showed a significant level of activity and debate on issues such as: the heating bill, use of green spaces, community activities, sharing of information on other community facilities. It had proved particularly helpful for heating problems, with people posting immediately when experiencing an issue (rather than everyone reporting the same problem). A couple of people understood that the site was moderated by JRHT and would have preferred to be able to post directly.¹⁸ In addition, some people felt that it would be better for the Facebook page to be private so the community's 'dirty washing' was not public (for example, when thinking about selling their homes).

4 Derwenthorpe community

Summary

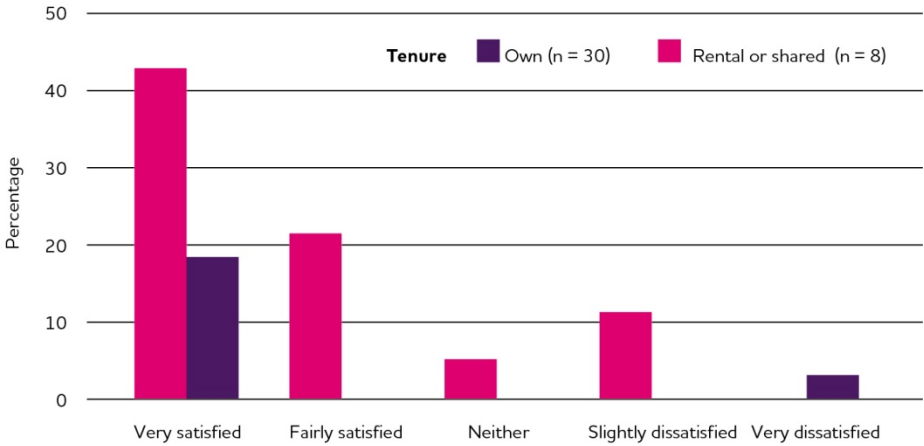
- The majority (81 per cent) of respondents to the REAP Petite survey were satisfied with their area as a place to live. This level of satisfaction is slightly lower than national data which reports that 91 per cent of owner-occupied households, and 82 per cent of social renters, were satisfied with their local area (DCLG, 2014). Living on a building site may be a factor affecting this.
- Regular community activities such as coffee mornings, community choir, yoga, knit and natter and the residents' association were well supported, although some households found the timing of the activities difficult and there was a perception that a similar group of people were involved in many of the activities. JRHT's community development role was appreciated by some interviewees, though others wanted to see residents taking a greater lead.
- Phase 2/3 interviewees were not yet heavily involved in phase 1 based activities, partly due to the inaccessibility issues alongside other interests taking priority. Children's and sports activities would be welcome additions.
- Social network analysis revealed a very high level of connectedness between phase 1 residents, with average total number of relationships per household at 24.5 (with eight of these described as friendships). Owners were more likely to have relationships with other owners although there were also relationships across tenures.
- Attitudes towards the mixed tenure community were generally positive in first interviews in phase 1, whereas repeat interviews and those with phase 2/3 interviewees pointed to an emerging sense of difference between the tenure types. This was felt to be partly created by differing governance issues and policies for different tenures.
- A majority (59 per cent) described Derwenthorpe as a strong community. There were some signs of phase 1 and phases 2/3 interest in developing links between each other.

One of the key aims of Derwenthorpe is to build a socially sustainable community. This chapter reports on residents' overall levels of satisfaction with the community and their views on community facilities, activities, the strength and nature of the community and governance of the development. The chapter also explores how social networks are forming in phase 1.

Overall satisfaction with the community

The majority (81 per cent) of respondents to the REAP Petite survey were satisfied with their area as a place to live, with 60 per cent very satisfied and a further 21 per cent fairly satisfied (Figure 5). Five respondents were not satisfied with their area as a place to live; four of these were new residents (one phase 1, three phase 2/3) and one was a settled resident (phase 1). This level of satisfaction is slightly lower than national data which reports that 91 per cent of owner-occupied households, and 82 per cent of social renters, are satisfied with their local area (DCLG, 2014).

Figure 5: REAP Petite responses to the question ‘How satisfied are you with your local area as a place to live?’ presented as percentage of respondents from different tenures



Living on a building site may be a factor behind some of these responses. One of the later phase respondents wrote ‘*Busy due to construction works*’, and another ‘*Noisy, dusty, not very pleasant at the moment*’. The shared owner who was very dissatisfied felt let down by environmental credentials, saying, ‘It’s no more green than any other recently-built development’.

The majority of interviewees in phase 1 reported feeling settled although three households were either in the process of or considering moving. While one household was relocating for work reasons, the other households were relocating to quieter rural locations and did not feel part of the Derwenthorpe community.

We don’t feel particularly connected to Derwenthorpe as such ... we don’t interact with people really, so it’s not as if we’re going to miss anyone if we move.
 Family with children, owners, phase 1, second interview

Interviewees from phases 2 and 3 had had less time to become settled, but still the majority reported beginning to settle into the community and to meet people.

The kids obviously are really good at making friends quickly. Slowly I’m meeting people. The kids, like I said now they’re at school, they have friends.
 Family with children, renter, phase 2/3

To be honest I haven’t seen much of the neighbours but it’s a nice place and when I have seen them they have been friendly, but I guess everyone is just getting used to being moved in aren’t they?
 Family with children, renters, phase 2/3

Others were more neutral, perhaps not desiring or expecting to develop relationships with their neighbours so quickly:

...we kind of like to keep ourselves to ourselves. We do say hello and have a conversation if we see people, but it’s not a case of, oh, we’re going to go round for a cup of tea or anything like that...I mean I’ve got enough friends and I’m quite funny like that, it takes me a while to get to that level with somebody.
 Family with children, renter, phase 2/3

Community facilities

Most phase 1 interviewees had visited the Super Sustainable Centre (SSC) quite soon after moving in, either for a JRF/JRHT community event or resident organised activity. The green landscaped areas and pond, and for some the playground, were very welcome initiatives. The Derwenthorpe community facilities were not mentioned much in the repeat interviews with phase 1 residents, but the comments there were concerned the area around the pond and playground, some positive.

The little one can play pretty much anywhere, apart from near the pond.

Family with children, renter, phase 1, second interview

Some comments also related to issues with anti-social behaviour, mainly in relation to the pond and playground area. This had been quite a prominent perceived problem in the early interviews but appeared to have been mainly addressed by the second round of interviews. Some residents, however, mentioned that they had heard more recent reports about anti-social behaviour in the visitor car park.

...until it's safe to park down there, nobody is going to. You hear stories about a lady whose car was moved three spaces down, picked up and moved by youths down there, or a guy who has had his windows smashed in.

Family with children, owner, phase 1, second interview

Interviewees from phases 2 and 3 mentioned community facilities most often in connection with inaccessibility, as at the time of the interviews there were physical barriers to accessing the communal areas:

I'm looking forward to when it opens up that side because there's the pond and the park and everything along there, so it will be nice to be able to get round it.

Couple, shared owner, phase 2/3

Community activities

For some, regular community activities such as coffee mornings, knit and natter, choir and yoga classes, as well as the residents' association, have been a very effective way of meeting neighbours and developing relationships. These had been set up relatively early in phase 1 and were mentioned positively by some households in both their first and second interview. For others daytime or early evening activities were difficult to fit around work. This was mentioned in first and second interviews. It appeared that some households had been involved consistently in community activities between interviews, while others had not really become involved.

You're not getting home before half the meetings are happening, so that creates a challenge for you in particular because I know you'd be quite community minded.

Couple, owner, phase 1, second interview

I don't think it's all one happy little bubble, I think it's more, you have the people who are [involved] – it's generally the retired people – who have got the time.

Family with children, shared owner, phase 1, second interview

Another issue was that the social make-up and format of the activities did not usually suit those with children.

...Been over to a couple of coffee mornings... I think we were the youngest by quite a bit!... I think there is a group of them that meet up quite regularly, they are more like the retired, couples, that meet up. They are very nice people but they are at a different stage.

Family with children, shared owner, phase 1, second interview

Very few interviewees in the later phases had attended any community activities apart from a couple who had attended a residents' association meeting. When they did mention these activities they tended to do so without any sense of ownership or engagement. However, one interviewee commented that they had attended a coffee morning and had found this useful and encouraging.

So we've been to a coffee morning just to get to know some of the neighbours and they were all really nice but most of them were from the first phase and they all seemed really happy. They're really happy with the development and that was positive as well to see what the people who have been here for a while [think], how the system works.

Couple, owner, phase 2/3

Others found the activities inaccessible or a low priority.

No, but they have like community things and like coffee things and I've had leaflets through, but I tend to be that busy [...] and here, there and everywhere that I don't seem to get round, not that I've got no intentions of going, just every day I seem to have something on.

(Family with children, renter, phase 2/3)

Of the one-off social events, the lighting of the Christmas tree lights was often mentioned by phase 1 residents as a well-attended and successful event. In contrast, costly events could be a deterrent to taking part.

...like the Christmas thing, everybody could go, you know, from the kids, everybody could go and it didn't cost us anything to do it either... the BBQ event seemed odd, you had to pay and bring your own things...£10 a ticket!

Family with children, renter, phase 1, second interview

More often, the community facilities were mentioned in relation to activities that residents would like to see in the future.

At the moment, community rooms are not used enough, someone has to be there to open the door.

Couple, owner, phase 1, second interview

Sports facilities and activities were also often mentioned (particularly by male interviewees), as the size of the community grows and there are more potential users and potential for putting together teams.

I think if there were sports activities, like a squash court, things like that would be interesting for me.

Family with children, owners, phase 1, second interview

...if you have phase 2 and phase 3 open then you might have a greater volume and greater variety then.

Family with children, renters, phase 1, second interview

Activities and facilities for children were also frequently mentioned as something that residents would like to see in the future.

...would like to see more child-focused activity, there are a lot of families with young children on the estate.

Couple, owner, phase 1, second interview

I would like to see something for the older children – a pool table at the SSC, a movie evening once a week.

Family with children, renter, phase 1, second interview

...play equipment for children with disabilities, because there isn't any and there are quite a number of families with children with disabilities.

Family with children, renter, phase 1, first interview

Most of the activities had a community and interest based focus, rather than an environmental one. However, in the first wave of interviews, several residents were keen to have community growing spaces, and a group of residents have been supported to develop these activities. The community garden is now well established, with most interviewees aware of the initiative. Some of the interviewees had taken part and were enthusiastic about its future, although several commented that it was difficult for them because of the timing of the get-togethers.

In the first wave of interviews, several people felt that some further central resources were really needed to ensure that Derwenthorpe operated as a community. A café and other central facilities were mentioned by a few people.

I'm not sure they have built into their housing development strategy sufficient things that draw the community together... there is a lack of any sort of central point that pulls this community together, the playground is good, but to create community you need business and you need shops.

Couple, owner, phase 1, first interview

This person raised this point again in their second interview, so it is clearly still an important issue for them. Another first phase resident also suggested a coffee shop as a place where you could meet neighbours informally; this is being considered as part of a future phase.

Social networks

In the past year research has included an element of social network analysis, where interviewees in phase 1 (14 households) were asked to map households they considered friends and households they considered neighbours. As shown below, this revealed a high level of social contact across phase 1 of Derwenthorpe.

Relationship types and importance of Derwenthorpe social networks

Table 11 shows that the average total number of relationships per household is 24.5, that is relationships with 38 per cent of households within phase 1. However, there is considerable variation within this, with the highest number of relationships being 28, and the lowest 5. From the social networks drawn by the 14 participating households, only 2 out of the 64 households in phase 1 were not mentioned, showing remarkable connectedness. Figure 6 shows an overview of the social links developing within phase 1.

Table 11: Average number of relationships

	Neighbours	Friends	All relationships
Average (per household)	16.5	8	24.5
Average per individual	10.5	5.09	15.59
Total	231	112	343

For some, Derwenthorpe is a 'highly sociable place' (couple, owner, phase 1) where they have found likeminded friends; for others their social networks were based around the people most active in the community.

We have made some really close friends now, quite a lot of socialising goes on.

Couple, owners, phase 1, second interview

Indeed for a group of residents at Derwenthorpe their shared interests and circumstances have led them to form a business Derwenthorpe Wellgood Ltd aimed at commercialising some of their ideas for eco-improvements. The business is strongly focused on sustainability and several ideas are being developed. This business has come about because of the concentration of like-minded people who have moved to Derwenthorpe with the intention of 'greening' their lives and who were 'naturally drawn together as a group'.

For others, friendships had not developed (28.5 per cent). Some commented that having moved from elsewhere, their new, Derwenthorpe based, local social networks were particularly important and that perhaps this was not the case for those who had existing local social networks.

I'm happy to have people over and chat to the neighbours as it were, but most of my friends are elsewhere and that's where I socialise.

Couple, owner, phase 1, second interview

Several interviewees mentioned the role of children in developing social networks, through shared school runs and relationships that had developed between the children themselves:

[the] little one has 800 friends!...who all come into house and on the trampoline...

Family with children, renter, phase 1, second interview

Others felt the sense of community at Derwenthorpe to be noticeably different to other places where they had lived and something that they considered a bonus.

Spatial links

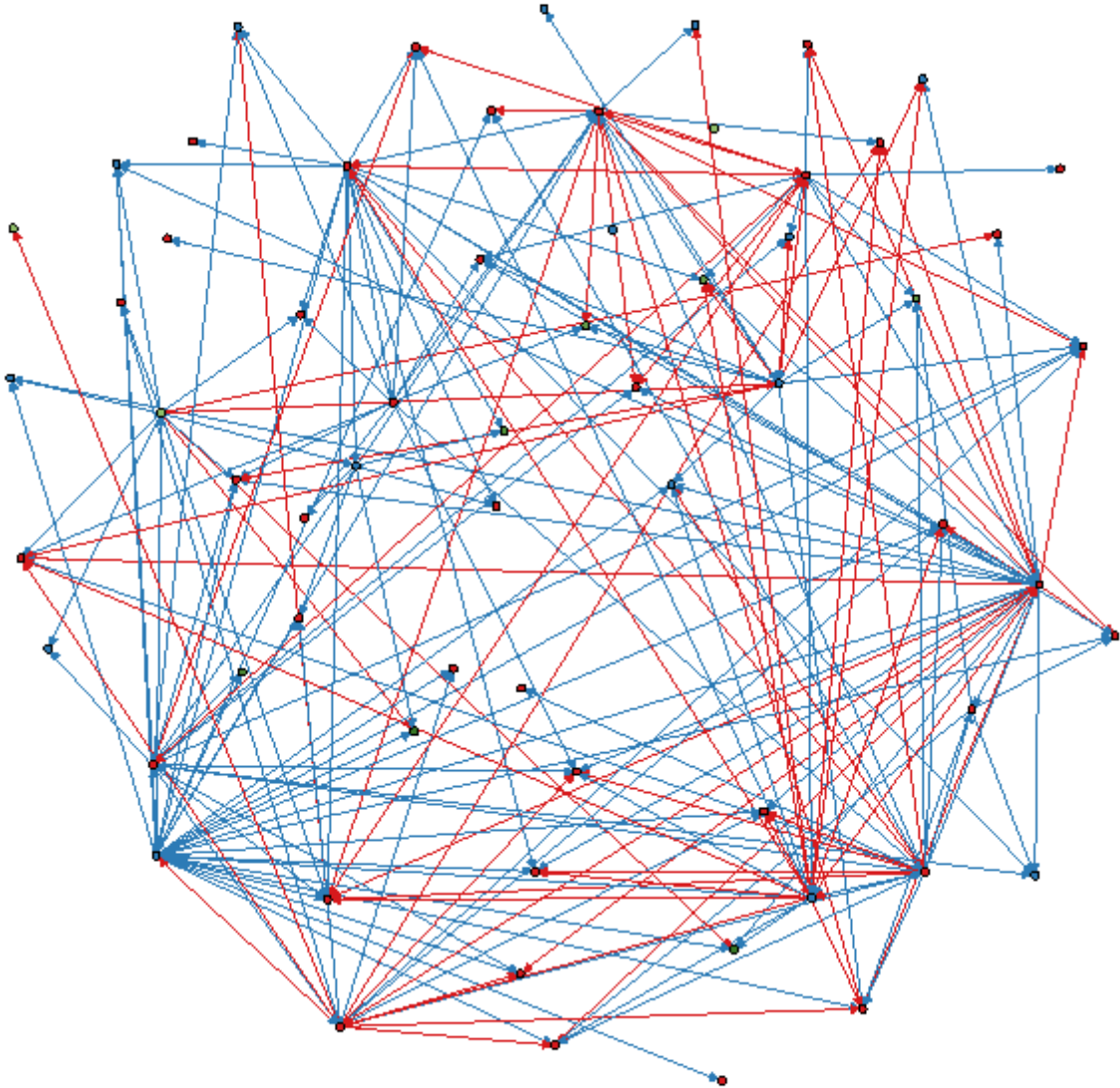
The spatial distribution of the phase 1 social networks is shown where the households are positioned roughly in relation to their spatial distribution within the phase (Figure 6). While neighbour relationships do tend to relate geographically to those households that are nearby, this also shows that for some households, both friendships and neighbour relationships are not geographically related. This distribution of friends and neighbours was explained as being due to involvement in activities.

The concentration of friends around our own house is coincidental; we have met people through choir, activities in the energy centre and parties. The people marked on the map represent those most active in the community.

Couple, owner, phase 1, second interview

Figure 6: Social networks by relationship type

(Each 'node' represents a household, each line a relationship. Node colours indicate tenure: red=owners, green=shared owners, blue=renters; line colours indicate relationship: red=friends, blue=neighbours)



Community and gender

There were more female interviewees than male interviewees. This gives the appearance that females have more social links, but as Table 12 shows, the average number of social links for females is only marginally higher than for males.

Table 12: Average number of social relationships by gender

	Neighbours	Friends
Male (N=9)	10.11	4.44
Female (N=13)	10.69	5.54
All (N=22)	10.50	5.09

However, several interviews were conducted with both male and female interviewees present, and social network maps were created as a composite of relationships initiated and maintained by both parties. However some of these relationships counted as belonging to male interviewees may in fact be adoptions of female relationships.

...maybe more in the sense that I [female interviewee] am more interested in having relationships with neighbours and interacting with them. Which I think you [male interviewee] would also like, but you wouldn't actively seek that.

Couple, owner, phase 1, second interview

It appears particularly likely that supportive relationships around children are mainly initiated by women, but may then lead to relationships involving males and the rest of the family.

She was really nice when these two were born, she made it her business to be ... I think she is the community leader.

Family with children, owner, phase 1, second interview

Comments were also made about social relationships in relation to gender, with males more frequently mentioning the importance of social networks relating to common interests outside the phase.

I've got my own community down at the sports club and the pub. I'm more integrated with people outside the community.

Couple, renter, phase 1, second interview

Community and tenure

Figure 7 shows social networks by tenure type, with both the nodes (households) and lines (relationships) colour coded by tenure type. Within phase 1, 61 per cent of households are owners, 23 per cent are in shared ownership and 16 per cent are renters. However, Table 13 shows that 75 per cent of social relationships where the person doing the mapping is an owner are with other owners, meaning owners disproportionately likely to have relationships with owners rather than with other tenures. Given the spatial distribution of tenure types this cannot be explained solely by proximity (although most homes are privately owned). Overall all tenure types were most likely to have formed friendships with owners (perhaps not surprisingly given that the majority of households are owners).

Figure 7: Social networks by tenure

(Each node represents a household, each line a relationship. Node and line colours indicate tenure: red=owners, green=shared owners, blue=renters)

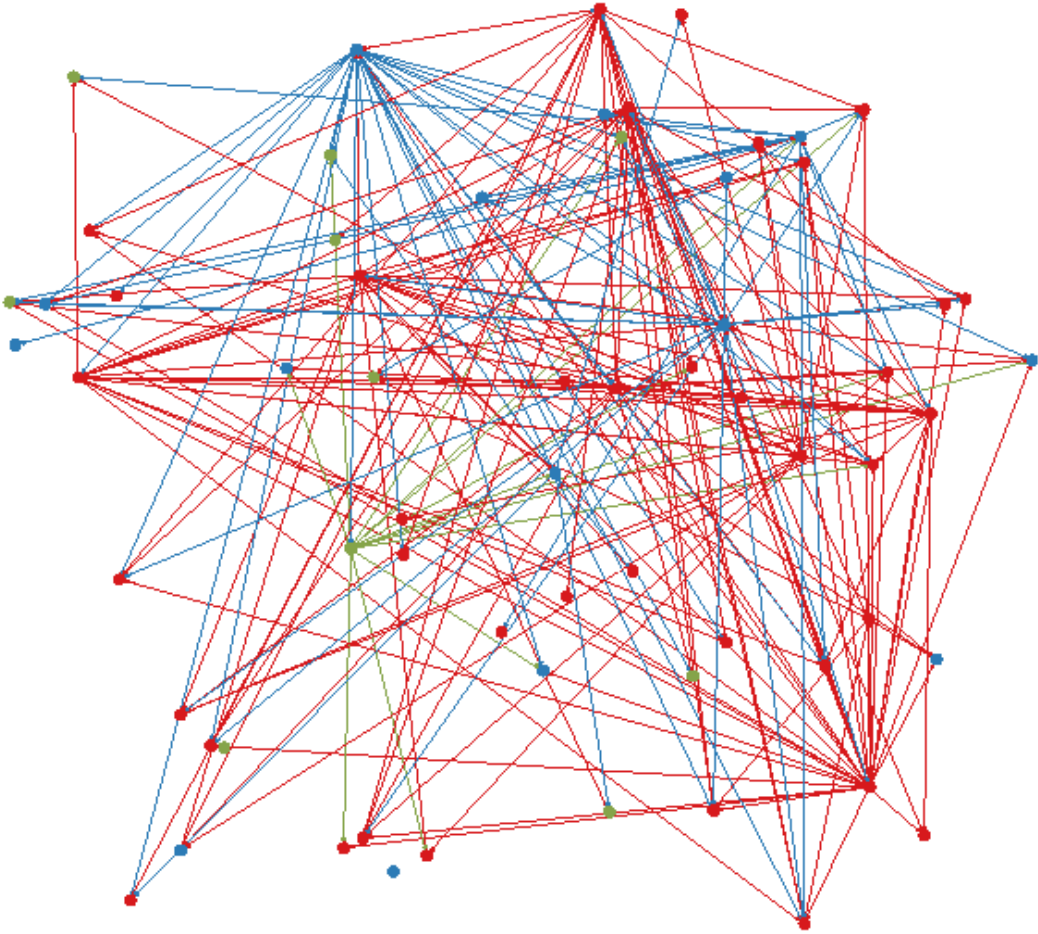


Table 13: Average number of social relationships by tenure type

Tenure at responding (mapping) household	Tenure at household with who there is a relationship		
	Owner	Shared owner	Renter
Owner (N=9)	20.89	1.67	5.11
Shared owner (N=2)	10.00	2.00	4.50
Renter (N=3)	13.33	1.33	3.00
All (N=14)	17.71	2.21	4.57

Derwenthorpe as a mixed community

Attitudes towards the mixed tenure community had been generally positive in the first round of interviews conducted in phase 1, and while the majority of phase 1 interviewees did not comment particularly on the mixed community, some clearly felt comfortable with the social mix.

Person 1...socially it's bound to be a good idea, I think, I hope...

Person 2...neither of us wanted to be in a rich person's gated community...I don't like artificial divisions.

Couple, owner, phase 1, first interview

It seems to be working, yes. I mean there is no one-upmanship effect you know.

Family with children, renter, phase 1, second interview

Others felt that the differences were more of a barrier and that standards of social behaviour differed between tenure types.

...there is more [ownership] on this side than there is on that side. On this side, everyone puts their bins out on the one night, in by the next day, over there, it's half a bloody week. Not just one, but loads, blown across the way.

Couple, owner, phase 1, second interview

A sense of difference between the tenure types, and to a certain extent, exclusion, is evident, particularly around participation in governance issues.

I feel that the people who are the owners are the biggest percentage of people doing things... that's my perception, it may not be the reality. Everybody I socialise with at these events, maybe one or two that are not fully owned... This idea of a mixed development? I mean we all speak and say hello but...I just wonder why they [renters] are not coming along...

Single person, owner, phase 1, first interview

Anything that the residents' association seems to do doesn't seem to be something for the whole community, because there are, well there are different cultures, different class levels I suppose, and they all tend to be sort of the la-di-da wine drinkers or tea drinkers with their fingers out, but they don't seem to want to make it so you feel comfortable if you don't want to do that... so it's not always something that everyone can join in with.

Family with children, renter, phase 1, second interview

Given that the majority of renting and shared ownership households have dependent children, and the majority of owner households do not, some of this difference can be attributed to the difficulty of fitting in participation in activities around caring responsibilities.

Comments were also made by shared ownership and renting participants about the way the residents' association operates and perceived validity of the issues (for the whole community) it addresses.

I don't tend to go to residents' meetings, I did go to one, and I thought it was a bit nanny state-ish, so I decided not to [go] as I would get angry with them.

Family with children, renter, phase 1, second interview

And I think sometimes the residents group, they can be a bit, they get hung up about things that are just part of life, like cars, there have been great big debates about parking.

Family with children, shared owner, phase 1, second interview

As in first interviews conducted in phase 1, most interviewees in phases 2 and 3 did not comment on the mixed tenure community in particular, but there was an awareness of the differences between types of tenure. For some this is a positive thing.

Yes, it's a good concept because it's all people coming with different backgrounds and building new things.

Couple, owner, phase 2/3

While some had misgivings about how this might affect fairness.

I know I'm being snobbish and I'm probably being totally unfair... but if they want them kind of integrated Joseph Rowntree Trust have got to play from a level playing field and what they pay for their heating, are Rowntree Housing Trust subsidising it or are we subsidising it?

Single person, owner, phase 2/3

Fairness around moving into the development was also an issue, with some shared owners feeling that owners had received preferential treatment (for example, in terms of what was provided free).

There appeared to be a greater feeling of separation in phases 2 and 3 than in phase 1 partly due to perceived physical separation of different types of tenure.

I didn't give it a great deal of thought, but since I've been here I'm not as impressed. I thought, and I'm not being snobbish or anything, maybe I am, the people, you know there is this side of the road and that side of the road basically.

Single person, owner, phase 2/3

When people moved in was also perceived to have had an impact.

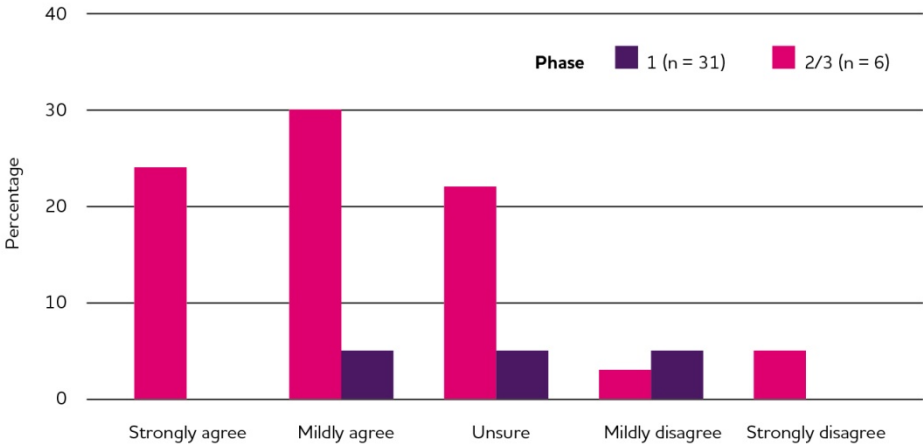
The only people that hadn't moved in were the Joseph Rowntree lot, which is a bit hard for them, I think, because we don't really know them that well, because they've all moved in after we met.

Family with children, owner, phase 2/3

Derwenthorpe as a strong community?

The majority (59 per cent) of the REAP Petite respondents felt that Derwenthorpe was a strong community (Figure 8). Just over a quarter (27 per cent) were undecided. Two settled residents from the first phase strongly disagreed, as well as one person from phase 2/3.

Figure 8: Responses to the question 'Please indicate the extent to which you agree or disagree with the statement that Derwenthorpe is a strong community'



Note: there are only a small number of respondents from later phases.

Some residents specifically mentioned the sense of community as a reason for buying at Derwenthorpe (also see Chapter 2). The fact that residents were all relatively new together was also seen to have helped develop a sense of community. Another couple said that although they personally were not involved with the community, they thought it did exist.

I think there is a pocket of community. In my head it's between the slightly older residents, and a few of the younger ones...In my head they are a particular type of person.

Couple, owner, phase 1, second interview

Another phase 1 couple felt there was a strong community but, similar to the previous interviewee, was not involved in it.

I think there is a very big one, I'm just not actively involved in it. I know that you get lots of leaflets through the door, and you go, 'oh that's nice that that is going on'. They've done different events. I think the community spirit is good.

Couple, owner, phase 1, second interview

Others felt it was less strong and only involved some residents.

Probably I would say there is a sense of one, but I wouldn't have said it was brilliantly strong. I think there are a lot of people who consciously opt out of it.

Family, owners, phase 1, second interview

The view was also expressed that mutually supportive communities cannot be manufactured.

Community to him is really about knowing the names of all your neighbours, they need a job done, you know which neighbour to go to get something done, you share a sense of ...if someone is sick you go and buy the shopping [...]it's not coffee mornings, community gardens and things like that, it's actually down to the people involved wanting to share their lives with each other.

Family with children, owner, phase 1, second interview

This idea of unforced social contact was reflected in the comments about activities that residents would like to see more of.

The kind of things where you would just naturally bump into people more, [...] more social evenings at the energy centre, where it is just come along and have a bit of a chat with people, because a lot of them [...] are oriented towards a specific meeting.

Couple, owner, phase 1, second interview

A renting family from phase 1 in their first interview noted that: 'As for the community here, well I've hardly met anybody, I've met the neighbours, they have been and introduced themselves, which was very good, very friendly'. In their second interview they commented that they still did not know many people although: 'Everybody is very polite, say hello as you go by, you know'. When asked if there was anything else that could be done to help improve the sense of community they said: 'I don't think there is much more they [JRHT] can do, as you can lead a horse to water, but you can't make it drink, they've put everything in place and then it's up to people. And if you push people into things, that's the next step, then they are not going to enjoy it'.

Residents in the newer phases expressed a desire to actively be part of building a new community, but felt that their opportunities were limited by lack of access to communal spaces and facilities.

I would say that at present it [a sense of community] is not very important but I think it's going to be very important to us when we do have a family and when we're using the communal spaces because I know that they're intended to be built into the site and we don't have any at the moment.

Couple, owner, phase 2/3

Community relationships between phases

As the new phases of the development are built, the relationship between them is also developing. Some residents in phase 1 were able to show prospective residents in phases 2 and 3 around their homes and were keen to reach out and make links with the new phases:

It's quite a joy showing people around as we're quite proud.

Couple, owner, phase 1, second interview

We got someone in the book group from the new phase!

Single person, owner, phase 1, first interview

Phase 1 residents were also concerned that it would be difficult to get to know people in the new phases as there was no access, and JRHT would need to actively try to bring the phases together. Phase 1 residents had also been discussing how the community might operate as a whole.

I think it will always be 'this is our little Derwenthorpe community and that is their little Derwenthorpe community'. I think it is going to take a long time for the two things to integrate. Because first of all the next phase is going to have to get its own sense of purpose, or are they going to come over here, and the people running things, are they now speaking for the whole of Derwenthorpe?

Couple, owner, phase 1, second interview

Within Derwenthorpe there are now several residents with relations in other phases. Family members who have followed their relations to Derwenthorpe have varying motivations for moving such as sharing care of dependants, taking advantage of the shared ownership scheme or the opportunity to move to an eco-development.

Links with Osbaldwick and Tang Hall

Relationships with neighbouring communities are most difficult between phase 1 and Osbaldwick due to historical tension dating from the time of the planning application when there was opposition to the plans including from Osbaldwick Parish Council.

Osbaldwick is still not happy, they're trying to change parish boundaries so that Derwenthorpe is not included!

Couple, owner, phase 1, second interview

While residents are aware of this tension, some residents have existing social or family relationships with neighbouring communities and others wish to be seen as part of the wider community and are seeking to strengthen links.

Some people have an air of 'Derwenthorpe is very special' whereas actually we are still part of a village and that's more important than Derwenthorpe on its own, I don't want to be part of a community that thinks it's a bit more special than anyone else or vice versa, you are all part of one village, you all use the same shops, you all use the same pubs, that kind of thing.

Family with children, shared owner, phase 1, second interview

I wanted to use [the community activity] to build a bridge to Osbaldwick, I feel it's the only community group that does this.

Couple, owner, phase 1, second interview

Residents in phases 2 and 3 were also aware of the likely impact of the development on neighbours outside the development, and felt the development may have had positive as well as negative impacts. One person described a neighbour in an adjoining area who appeared to be more secure now they had neighbours where previously it had been an open area and quite dark.

Governance issues and the residents' association

The role of JRHT

JRHT facilitated the formation of the Derwenthorpe Residents' Association which some interviewees felt that had been well handled and supported while allowing the community to go its own way:

...JRHT held coffee mornings and chaired it [...] and gradually that has changed and now it belongs to the residents and I think that was very skilful.

Couple, owner, phase 1, second interview

They [JRHT] are here to help, they helped a lot in the first place, but no, they don't interfere, and you can't always look to Joseph Rowntree to help solve issues, can you? But they are always there if need be.

Couple, renter, phase 1, second interview

I think they are guardians, not guardians, stewards. Not telling us what to do but supporting it, as it were, which I think is the best way for it, you can't force something to happen, they can provide structure and support, and that's good for that, but allow the community to do what it wants, after a fashion.

Couple, owner, phase 1, second interview

Some felt that it was time for the community to take a greater role in the running of Derwenthorpe, with one owner saying that JRHT is *'well intentioned'* but *'it doesn't implement ideas well'*. Others felt that the development of structures of governance had more input from JRHT than was needed.

I find that kind of trying to force a community thing a bit artificial because I think it would naturally develop anyway, because you are all new, you would naturally make friends and get contacts and that sort of thing... I can see why they [JRHT] are doing it but I thought it was a bit patronising...

Family with children, shared owners, phase 1, second interview

The residents' association

The formation of the residents' association has been seen by some as a great success. Though not all felt that the residents' association was representative or had a clear role.

We're concerned that the RA doesn't have any real power.

Couple, owner, phase 1, second interview

There has been a sense of it's very much 'retirees and busybodies'.

Couple, owner, phase 1, second interview

Some felt that this was up to them as individuals if they wanted a greater role.

They seem quite active, I'm aware of their presence [...] and I think they deserve commendation for their efforts' [if] there is a problem, the failing is on us. And I think if we did go to a meeting and stuff then we would be much better informed.

Couple, owner, phase 1, second interview

Others felt that the residents' association made assumptions about its role that were not representative:

They don't seem to recognise that some people may have moved here not for the eco, that it was an opportunity for shared ownership – the eco bit is very nice to have but it wasn't the reason why we bought the house whereas I know for some of them they feel very strongly about that and that's why they moved here.

Family with children, shared owner, phase 1, second interview

How the residents' association might function when the development is complete has also been a subject for discussion in phase 1.

There has been talk about whether the residents' association will be for everyone, we want one, but there will be different issues for the new phases.

Single person, owner, phase 1, second interview

Interviewees in phases 2 and 3 mentioned the residents' association in terms of having attended meetings to find out about planned changes rather than with any sense of active engagement.

Yes, I think it was a residents' association meeting. Yes, it was only a couple of weeks ago, because I think they want to increase our bill for heating before we've even started. So he was like, 'Oh, we better go and talk about that.' So he's been to that.

Family with children, owner, phase 2/3

5 Derwenthorpe homes: environmental sustainability

Summary

- Most households were pleased with the heating system, feeling that the homes heated up quickly and kept very warm. However, a minority felt that the homes took more heating than expected, and two households felt the house got very hot in the summer.
- Relatively frequent interruptions to the heating and hot water supply had caused some inconvenience and annoyance particularly in phase 1.
- Early difficulties with the MVHR system in phase 1 appeared to have mainly been addressed but maintenance issues loomed large and some people wanted more information about how the system worked. The MEV system in phases 2/3 caused far less debate but there was still some misunderstandings on how it operated.
- The winter gardens in phase 1 were either met by strong support or indifference.
- Households also had varying reactions to the water temperature restrictors and low water usage taps – some were happy with these whereas others felt it led to a waste of water and/or some had taken off or altered the settings to make the water hotter.
- It is clear that the potential impact of the environmental sustainability initiatives has been lessened by household's lack of knowledge and/or not using them as designed.
- Overall, the majority of residents were satisfied with the energy efficiency of their homes, and just over half felt that living there would reduce their energy costs, although quite a few were unsure and some felt that bills were higher than they expected.

This chapter focuses on residents' experiences of the environmental sustainability features of their homes and considers the overall impact of the homes in terms of energy efficiency, alongside the linked issues of costs of energy.

Insulation and heating

Most phase 1 residents, at first interview, thought that the heating system worked very well, in terms of hours needed to heat the house and the retention of heat. One household member commented that '*even candles*' could warm the house up! At repeat interviews, most of phase 1 households still felt that the homes kept their heat well.

We hardly ever have the heating on for more than a few hours a day or it would be unbearable.

Family with children, renter, phase 1, second interview

Another renter in phase 1, however, had experienced a problem of the house getting uncomfortably hot in summer. However, a couple of people in phase 1 thought that the house was quite cold in the winter and it took some time for the temperature to rise to the required level. This was still felt to be the case by the second interview.

A similar impression emerged in phase 2/3 interviews – five households felt the heating worked really well while a further two households explained that it took some time for the house to heat up, but it then retained the heat. A few people mentioned that the big windows also helped to warm the house, letting in lots of sun. In contrast, two households felt that the homes did not retain the heat well, possibly made

worse by poor positioning of radiators and thermostats. One phase 2/3 respondent also felt the house got too hot in the summer.

It's a lot warmer than you would expect... we don't need the heating on very much... because it's so good at keeping its heat, which wasn't the best in summer – we needed to keep the windows open.

Family with children, owner, phase 2/3, first interview

...it takes quite a while to get it heated, but once it is heated it really holds it very well which is lovely. You can switch the heating off and still have a nice warm house for the rest of the evening, so that's been really good.

Couple, owner, phase 2/3, first interview

Two interviewees wondered whether the ventilation system was making the upstairs colder than it should have been. This project was not able to measure the extent to which the houses were effective at retaining heat, however feedback from residents might point to some houses working better than others in this respect.¹⁹

At first interview, many residents felt that they were still experimenting with the heating, getting used to the controls and working out what worked best for them. One settled phase 1 respondent admitted that they did not understand the heating.

I don't really know how it works to be honest with you...probably like most people who haven't had time to read the bumph, [I] could probably do with a talk from somebody to say this is how it works. I mean it gets warm in the winter and what have you, but I mean if we are using it in a way that is efficient or whatever then I wouldn't know.

Family with children, renter, phase 1, second interview

The 'reliability' of the heating/hot water system was raised by most phase 1 interviewees at repeat interview stage. Householders explained that hot water had not been available on a number of occasions in the recent past due to break downs/interruptions to the communal heating system. A couple of people felt that there should be a back-up generator to avoid this happening, as well as an automatic monitoring of the situation; one respondent thought there should be individual boilers. Four householders in phase 1 suggested that there should be some compensation for breakdowns.

Person 1:...it is a great system I think, but I would never think you should introduce a system into the community if you can't guarantee, or you haven't got back-up, I just don't think that in this day and age and in the western world you can have an excuse really...

Person 2: I think what is annoying is that they pretend there isn't a problem, because I think some people had tried to complain and say 'are you going to give us any compensation for all these times that we haven't had any hot water?' and they said 'it's not unreasonable because it has not been more than four hours at a time' or whatever.

Couple, owner, phase 1, second interview

I don't know why it wouldn't have some sort of alarm bell that rings, 'my water has gone off'... it's getting a problem, everyone is getting quite annoyed about it.

Family with children, renter, phase 1, second interview)

Three phase 2/3 interviewees mentioned there had been some issues with the heating/ hot water system but there appeared little annoyance with this. This may have been because interviews took place before the worst interruptions and/or because charging for the system in phase 2/3 had been delayed due to the problems: one owning couple explained 'the billing is only going to start now because they've finally got it hooked up properly and there shouldn't be any more interruption'.

Heating costs and overall energy efficiency are examined further later in the chapter.

Mechanical ventilation and heat recovery (MVHR)/mechanical extract ventilation (MEV)

The mechanical ventilation and heat recovery (MVHR) system used in phase 1 was widely discussed in both initial and repeat interviews.²⁰ A number of early problems arose with the system. These included the wrong size installation in some homes or the installation being wrongly fitted. A few households felt that the system made the house too cold and there were also isolated problems such as the system setting off fire alarms, and smell. The noise levels of the original system, especially in bedrooms, had caused some issues, although overall most people felt these to be acceptable with the new systems/controller.

...it was like sleeping under a jumbo jet, we turned it off after the 24 hours because you just couldn't tolerate the noise!

Family with children, owner, phase 1, first interview

A lack of control over the system was also noted, for example one household knew that different settings were possible but had to ask several times for a manual control. Another householder understood that JRHT had decided not to provide controls so that people would not turn it right down and cause damp problems, but wanted to have control over the system.

... basically it's set to 3 all the time, it's noisy and it's cold. I could go out and buy those controls, but I don't feel I should have to. At the moment it is costing us a fortune.

Couple, owner, phase 1, first interview

Notwithstanding the problems, a number of households felt that a considerable benefit of the MVHR system was improved air quality in the house. For some, this was fresher air generally. One person had a lung condition and another allergic to dust felt that the system offered health benefits (this was also noted at re-interview).

The atmosphere in the house, from the air point of view, it's really nice, it's really fresh, you can feel it's a good breathing space.

Single person, owner, phase 1, first interview

However one household found the system to be dehydrating.

At the point of the second interviews, the installation and noise issues appeared to have mainly been addressed (although one person thought there was a distinct 'hum' in the neighbourhood because of the systems and another said their house gets too warm: 'I don't think the system has ever been right since we moved in'. A number of people explained that they had got used to or tolerated the system. However, at least one person would still like to turn it off and one household had turned it off a year ago. One had added their own controls.

A more widespread problem revolved around maintenance issues. One person was concerned they could not reach the loft to clean the equipment; another worried about it creating dirt; another household did not think you had to clean it for a few years. There generally appeared to still be a need for further information.

I haven't touched the MVHR, I know I'm supposed to do some maintenance on it every year. I think when [representative of builder] did the walk around he said don't worry about it for the first couple of years but after that you might have to change the filters, or clean the filters or something...it might be nice if something was sent out on the two-year mark, saying ... if you need some help, here's a diagram...

Couple, owner, phase 1, second interview

As a result of the problems associated with MVHR on phase 1, JRHT and DWH installed mechanical extract ventilation (MEV) systems into phases 2/ 3 properties. These systems are much simpler, only extracting air rather than also recovering heat, and as a result raised much less debate than the MVHR systems. However, four households either stated that they did not quite understand the system or were

not sure of the distinction between a normal extractor fan and the MEV system. Most did not comment on noise levels, although one household found it quiet, while one said it was bit noisy at night.

They seem to be constantly ventilating the house, you can hear it running... I don't understand how it works, I can just hear it [laughs]... I think [partner] certainly wants to know how it works, he's asked a few times and nobody can tell him...I think he's wondering if there's a way of switching it off or if it's a constant ventilation system because if it's just extractors, it should go off with all the switches.

Family with children, renter, phase 2/3, first interview

Four households, unprompted, commented positively on the window trickle vents.

They're quite good. They let a bit of breeze in and everything. It keeps the air circulating so it's good for condensation and things.

Family with children, renter, phase 2/3, first interview

Low energy fittings

The low energy light fittings were appreciated by most households across the phases; many of whom had used them in their previous home. A couple of households in both phase 1 and phases 2/3 had replaced some of the lights with energy efficient (or slightly less efficient) spotlights.

There were few comments on the lights more generally, although one household wondered whether there were too many lights in the house. Two households in phase 2/3 strongly felt that there was a design fault in the way that one switch operated two lights (in the lounge and hall/landing). They felt this was a waste of energy.

Winter gardens

Some of the houses on phase 1 have a winter garden, a small area between the living space and outer walls of the home which helps to heat the house in winter; both the inner and outer doors are kept closed to act as a buffer zone to the cold outside. Any heat from sun is trapped and transferred inside to help warm the rest of the house. The doors can be opened at other times of year to create more internal or outdoor space. The addition of a winter garden is an optional extra on for some houses but no phase 2/3 interviewee had one. A couple of households interviewed with a winter garden in phase 1 liked this unusual feature of their property. For one person, the existence of a winter garden had been a key reason for buying the house. Another simply 'loved it' and used both the downstairs and upstairs part daily.

I love [the winter gardens] they are absolutely delightful, if the weather is bad and you want to work from home, you can sit in your winter garden and you see the garden, but it's warm – and I think it's that little winter garden that also did it for me [to buy the property].

Single person, owner, phase 1, first interview

A couple of people had embraced the idea of the space and felt that it really served its purpose of heat collection and insulation. However, there appeared to be room for further explanation of its use as others admitted that they did not understand its role. One household felt it was a '*waste of space*' (as it was so cold) and would have preferred a balcony. Another was disappointed that it did not heat and cool as they had hoped.

On the days when you wanted it to be hot, it's cold and on the days when you wanted it to be cold, it's hot, so actually it hasn't really worked how I expected. The other thing I was really surprised about was that you have to open the doors on both floors to get any air flow. It's one of those features that someone has thought, 'Oh that'd be great', but they've not really thought through.

Couple, owner, phase, first interview

The winter garden area was being used for an extensive variety of uses: toy storage, wardrobes, office space, plant growing, sitting area. There was also one unexpected benefit of the winter garden for a family whose son's bedroom had the winter garden upstairs.

We use it so we leave that door slightly ajar [door to downstairs winter garden], when [their child] is playing in his bedroom, we can hear him and hear what he is up to – which I don't think was a design feature but we find it really useful. And you can shout up and tell him through the floor!...It's a good parenting tool!

Family with children, shared owner, phase 1, first interview

However, one person had heard that someone had taken the winter garden doors out and now had extra space in the house.

I was quite cross when I heard that some people had theirs made part of the kitchen or the office, instead of that funny little thing. Because I would definitely have wanted to do that.

Family with children, owner, phase 1, first interview

At second interview, one couple spoke very highly of the winter garden, explaining that 'it really does enhance the feeling of space' and continued to use it for plant growing. The family with children described it in slightly more positive terms than at interview 1 saying that it was 'nice but odd' but did still think that the space would be better used for something else as it has been in phase 2/3. Two couple households remained underwhelmed describing how the space was 'just storage' and 'it's become more storage'. Only one phase 2/3 household mentioned a winter garden, saying that they would have quite liked this but that they had chosen the wrong house to have it fitted.

Drying facilities

Every phase 1 house had outside rotary drying facilities, although one renter had not been given one. Neither tumble dryers nor space for them was provided, as they tend to be heavy consumers of energy. One phase 1 family had deliberately given up their tumble dryer when they moved in. However, a couple of phase 1 families had brought a tumble dryer with them, reluctantly finding this an essential facility. Another was considering buying one but was deterred by the high prices of more highly rated eco-models.

SMART meters

JRF and JRHT are planning further work to monitor energy use to support residents and are also considering whether remote heating controls could help residents manage their heating use when away from home. A few households in phase 1 and phase 2/3 already had SMART meters. They appeared to quite like this feature (although one person was not sure if theirs was working and had lost interest over time).

I love readouts from things, looking at how much it costs me per day.

Couple, owner, phase 1, first interview

However, overall there did not appear to be widespread appetite for heating controls. In particular, a number of people thought remote heating controls were unnecessary, being quite happy to put the heating on when they returned home or put on a jumper while waiting for the house to heat up. Another person said they asked a neighbour to put their heating on before they returned from holiday.

Tap culture?

Water temperature restrictors and low water usage taps were installed in all properties. Most respondents across phases appreciated the reason for these, however not everyone found them practical. There was quite a variety of views on this. Some felt the water was absolutely fine, some had got used to the lower temperature, and other householders had taken off, or altered the settings on, the water temperature restrictors.

Person 1: One of the builders turned up my bathwater, because I love my baths and my water wasn't very hot and I'm one of these who'll keep topping it up.

Person 2: Yes, we found ourselves boiling the kettle to put water in the bath.

Couple, shared, phase 2/3, first interview

A few people wondered whether the low water usage taps/temperature restrictors might have the opposite effect from that intended; one person explained that they simply stayed in the shower longer than before, two others said that they ran the tap for some time to get heated water for a bath.

The only problem I have really is how warm the bath water is, and the speed of the hot water that comes into the house – you need to leave it running for quite some time which kind of defeats the object sometimes of saving money because you are running so much water off to get heated water.

Family with children, renter, phase 1, first interview

The bath has a temperature limiter ...I like the concept but think it's a false economy.

Couple, owner, phase 1, first interview

Another energy efficient feature of the property is smaller baths. Two households commented on this, with one person explaining that they had switched from nightly baths (for adults) to showers, as the baths were too small to be comfortable. A settled phase 1 couple (owners) said they bought a device which allowed them to have deeper baths by covering up the overflow hole.

Food production/recycling/ composting

Derwenthorpe kitchens incorporated recycling bin facilities in all phases. The vast majority of people, across phases, stated they were recycling (35 of 38 REAP Petite respondents said that they 'always' recycled) and used the bins provided in the kitchen. A few households explained that they were now recycling more than in their previous home, because of the facilities and also improved intentions on moving into an eco-development. There were a few criticisms of York City Council recycling collections; it was felt that a greater range of items could be recycled and one person also suggested that there should be a food waste collection.

Someone suggested it would have been a good idea to have had a skip for cardboard when everyone was moving in and would also have liked to see on-site recycling banks as a fortnightly collection can mean quite heavy boxes for older people.

Compost bins were provided to phase 1 households²¹ and had varying use. In the REAP Petite responses, 14 out of 37 respondents said that they 'never' used it, six did not know (four phase 1 and two phase 2/3), two used it 'rarely', and eleven were 'always' using it. Nobody was growing significant amounts of food in their garden and quite a few residents felt that the bin was too large given the size of the gardens.

I fear this mountain of compost that I can't get rid of!

Couple, owner, phase 1, first interview

...that's one bit I don't like the idea of, I just don't, for the garden that I've got, what am I composting and what am I going to use it on... we certainly want to be part of a greener community but we are not going to be like The Good Life!...we both work full-time and you have to be realistic about what you can and can't achieve. ...

Couple, shared owner, phase 1, first interview

In the first round of interviews, there were a number of calls for community production of food. A community garden was already being discussed by residents and investigated by JRHT, and has now been established by one of the phase 1 residents. This could possibly use the compost produced by the individual households. Some people also wanted allotments, although one person vehemently argued in favour of a community garden over allotments.

Water butts

Water butts were supplied to phase 1 houses.²² At first interview, most had not used them but by second interview many people had (particularly in the summer). However there seemed to be a positioning or design problem for some houses. Two households explained that their downspouts ended in their neighbour’s garden – in one case, this had been resolved by David Wilson Homes. A third household did not use the water butt because of poor positioning, and another said it didn’t collect water as it was in the wrong place. One household reported that they did not have a water butt.

Other desired features of sustainable housing

Only one interviewee’s house had photovoltaic solar panels.²³ They were very pleased with these at both initial and second interview. They felt it was ‘doing the job...It’s cost me 38p today’. Installing solar panels was the main suggestion made by other households when asked whether there was any other sustainable features they would like to see added (five people in phase 1 and 2 people in phases 2/3). This may partly reflect the fact that this intervention is a relatively well-known one. A few people appeared quite knowledgeable about them and felt they could offer additional benefits, with two households having enquired about their cost (one felt the cost was prohibitive, while the other was waiting for information). One household would have liked a rainwater harvesting facility.

Home interventions: energy efficiency and related costs

The REAP Petite survey included a question about people’s satisfaction with energy efficiency. The majority (62 per cent) were satisfied with the energy efficiency of their home (Figure 9), although it should be noted that nine people (24 per cent) reported that they did not know. Only three people (9 per cent) were dissatisfied. Table 14 may indicate that residents who are settled are less satisfied with the energy efficiency of their home than new residents, although this is difficult to interpret due to small numbers and the fact that so many new residents responded ‘Don’t know’ to this question.

Figure 9: Responses to the question ‘How satisfied are you with the energy efficiency of your home?’

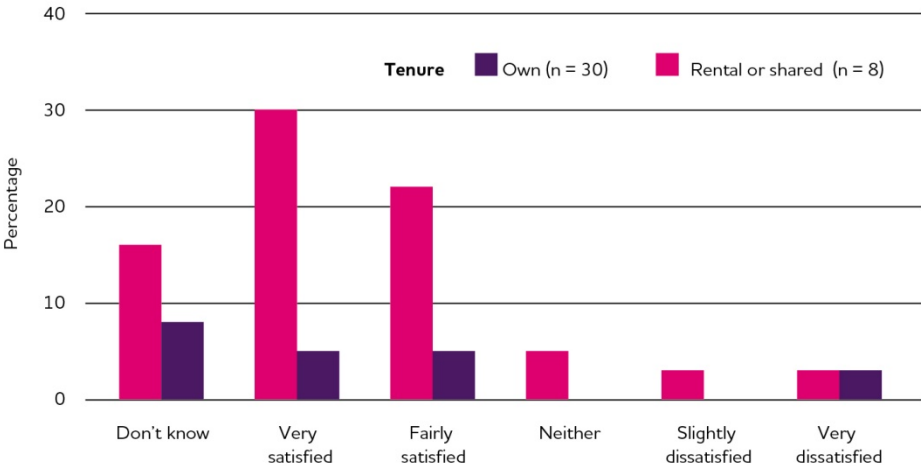


Table 14: Responses to the question ‘How satisfied are you with the energy efficiency of your home?’

N=38	How satisfied are you with the energy efficiency of your home?					
	Don't know	Very satisfied	Fairly satisfied	Neither	Slightly dissatisfied	Very dissatisfied
New (within a year of moving in)	9	10	3	1	0	1
Settled (more than a year after moving in)	0	4	7	1	1	1

Two interviewees in phase 2/3 were unhappy that in late 2014 there had been a switch from the use of (mainly) woodchip to gas in the communal heating system. They had understood that biomass fuel was going to be the main fuel used. Early information such as the Derwenthorpe Home User guide (2012) said gas boilers would act as a back-up to biomass to provide an uninterrupted supply of heat and hot water to residents when the biomass boilers require maintenance work and/or where demand peaked. More recently, the 2014 energy supply agreement between Veolia (then Dalkia Utilities Services plc) and customers stated that the energy mix would be reviewed at price reviews to minimise the cost to the customer. This agreement raised the issue of concerns about fuel affordability and sustainability issues. JRHT has stated that it remains committed to delivering low carbon energy heating and hot water at Derwenthorpe in the long term through a mix of biomass and gas. However construction delays have meant installation of additional biomass provision for phase 2 onwards has been delayed. It was originally expected that that this would have been in place by 2015 but is now expected to be installed in 2017. At the time of the interviews, however, it appeared that at least some householders did not have full information on what was happening.

It's a huge deception for us... they tried to relate that point, we are eco-friendly, we're biomass and everything and actually we are quite excited about that and suddenly they change with no agreement or anything, it's like a really big point...so these things, which are exclusive and were sold as being positive, seem to be now becoming quite negative and that's a shame compared to everything else that's been done because I think they have done a really good job...We saw it as an eco-home – but is it any different to others out there?... it's supposed to be level 3?... they advertise as homes with a big difference, well, I don't know what the difference is...

Couple, owner, phase 2/3, new

A similar point was made by a phase 1 interviewee, highlighting how one aspect of the scheme could undermine their confidence in the home as sustainable housing, yet at the same time being very satisfied with other aspects.

Up until I saw that power bill I would have said [the best thing was]how green it was and how effective and cheap it was to heat and how resilient we would be from rising gas and fossil fuel prices. And now I have to moderate that because it doesn't appear to be. Now I would say that it is just a nicely designed living space. Such a nice and practical space to be. Everyone who comes round loves it.

Couple, home owner, phase 1, new

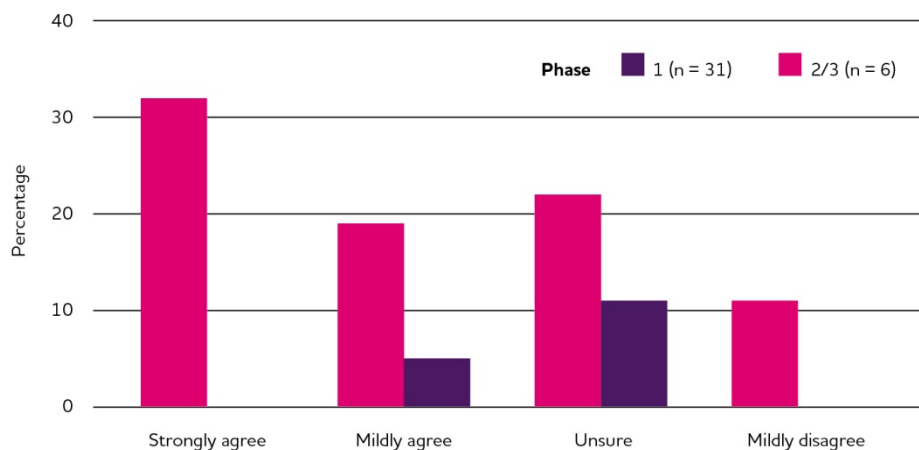
A number of other issues that could impact on energy efficiency related to the home design and resident behaviour discussed earlier:

- a few people thought the MVHR system was using more energy than needed;
- widespread noting of the need to run water for longer to achieve a given temperature meant water was wasted;
- some people had disabled or altered water temperature settings.

Energy costs

Related to energy efficiency is whether households were satisfied with the costs of the energy provided (heating/ hot water by communal heating and separate electricity supply). Overall, residents from both phases seemed to have mixed opinions on whether living at Derwenthorpe would reduce their energy costs (Figure 10). While a third strongly agreed with this, 12 respondents said they were unsure, and four said they mildly disagreed with this statement.

Figure 10: Responses to the question ‘Please indicate the extent to which you agree or disagree with the statement that Living at Derwenthorpe will reduce my energy costs’



At initial interview, most phase 1 residents were optimistic that their heating bills would be significantly less than their previous homes. At interview two, some households reported that bills were about what expected, but a number of households did say they were higher than they had expected. Most phase 2/3 households were yet to receive heating bills.²⁴ Most remained reasonably optimistic that the bills would not be too high.

It was about eight or nine months before we submitted our [energy] reading and of course had a massive bill, along with a lot of other people. And I think everybody's collective impression was that it certainly wasn't as low as we had been led to believe.

Couple, phase 1, owner, second interview

Many phase 1 (first interviews) said energy bills had not arrived for several months leading some to worry about the amount it might be. A number of households were quite annoyed that they were paying bills dating back such a long time.

I don't think it's too unreasonable month by month but we are still paying a lot for our bills, which is a bit annoying. If they had billed us from the start it would have been fine.

Family with children, shared owner, phase 1, second interview

There was a strong feeling among phase 1 residents that this billing problem could have been handled better, in particular keeping residents better informed and resolving the situation much earlier.

In late 2014, energy prices were increased to reflect operating and maintenance costs and the costs of future plant replacement. JRHT previously owned and operated the heating system and charged 7.02p/kWh (prices remained the same from April 2012). In late 2014, JRHT appointed Veolia (then Dalkia Utilities Services Plc) to operate the system. New charges consisted of a utility charge of 5.47p/kWh (2014) and a dwelling charge (£350 per household per annum). These changes occurred after most of the interviews had been completed. However, one home-owner explained that they were very disappointed about these changes. They stressed that they were still pleased with the house but:

[They] have messed up big time... what was the point of buying the property to keep your heating costs down, when you are now paying double... it's made me very, very angry. I'm totally unimpressed...

Single person, owner, phase 1, second interview

Two owners in phase 2/3 were also not pleased about the heating payment restructuring, one feeling that it meant inequitable treatment between owners and renters as the dwelling charge is covered within existing rental contracts (under the Landlord and Tenant Act JRHT cannot charge tenants standing charges for maintenance and replacement of heating systems, see (<http://www.legislation.gov.uk/ukpga/Eliz2/2-3/56/contents>)).

Electricity is supplied through a standard private supply to each home, and in the first interviews some phase 1 residents thought their usage either did not seem to be any different to their previous home or was higher, and some wondered if the MVHR system was partially accounting for this. However in the second interviews people generally felt that electricity bills were about what they had expected or perhaps a little less. Some noted that they tried to be energy efficient, for example turning lights off, with some noting that their usage was probably quite high, particularly with children in the house.

Yes, the electricity is a lot cheaper as well, isn't it? It's more efficient to run than the other houses we've been in. A lot more. The electricity bill's a quarter of what we paid, probably less than we paid in our old property.

Couple with children, renter, phase 2/3

6 Travel and transport interventions

Summary

- Travel times from Derwenthorpe to key services are generally the same as or less than travel times from other parts of York, and regional and national comparators. It is broadly typical of urban areas, and nearer to services than rural areas.
- A third (33 per cent) of REAP Petite respondents thought that living at Derwenthorpe would reduce their transport costs, but one fifth of respondents (22 per cent) were unsure and approaching half (46 per cent) disagreed with this.
- Parking was a big and controversial issue across the development.
- Although initial take-up of the car club had been poor, there were some improvements in take-up with more people moving to Derwenthorpe. An ongoing issue is likely to be ensuring easy access to the car club across the site.
- There was a good take-up of the bike purchase scheme. Some people were already cyclists but the scheme also encouraged new bike ownership for some (including children).

The Derwenthorpe development itself is an ‘intervention’. As well as the houses themselves, well-sited homes, which are close to key facilities and well-served by public transport, may be able to promote sustainable living by reducing the need to travel, reducing distance travelled, and by enabling lower energy use travel. Here, we examine data on Derwenthorpe’s location in relation to key services, alongside respondents’ views on whether Derwenthorpe is likely to reduce their travel, car dependency and support use of other transport modes.

Location in relation to key services

Derwenthorpe’s location was examined in relation to seven key services, using Department of Transport data. The services are: an employment centre, a primary school, a secondary school, a further education college, a GP, a hospital, and a large food store.²⁵ In terms of the minimum time to reach at least one provider of each of seven key services, by each of the three modes of travel, Derwenthorpe is at least as well located as other places in urban areas across England, and at least as well located as other places of all types in the region and in York.²⁶ However, it is not much better located than other urban areas in England, or than other places in the region or in York. Instead it is broadly typical. It is markedly better located than rural areas in England.

Travel times from Derwenthorpe to key services are generally the same as or less than travel times from other parts of York, and regional and national comparators. The only exception is that Derwenthorpe residents have longer journeys on foot or by public transport to hospital than the national, urban and regional average. However, the journey times between Derwenthorpe and comparators are similar, being within only five minutes difference. The small absolute time advantages over other urban, regional and city areas may not be enough for residents to really notice, or to act as a significant motivation for a change in behaviour, whether more frequent journeys or journeys by a different mode.

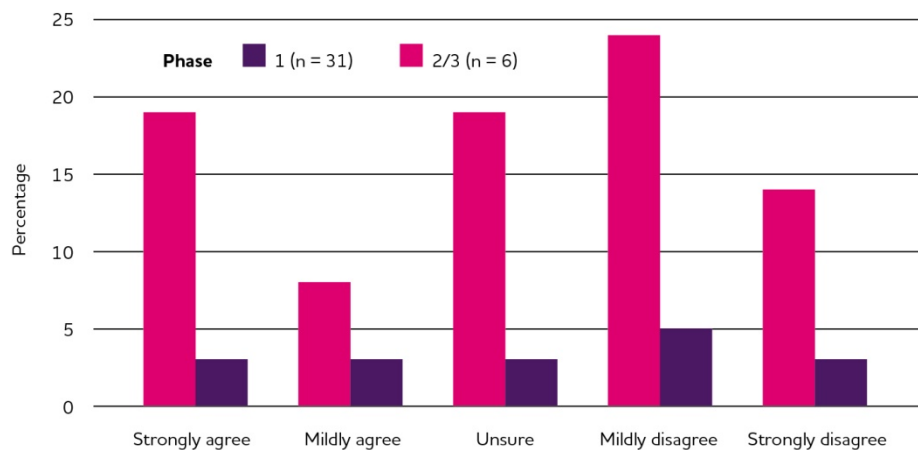
It should be noted that travel times to seven key services are not directly linked to the actual use by Derwenthorpe residents. Information from interviews and other contacts to date suggests that some people do not use the seven closest key services but instead, for example, send their children to other schools, still use their previous GP surgery or commute long distances to work. In addition, at least some residents’ travel and related energy consumption is related to long distance travel including to their place of work and flying for holidays. This suggests that even if Derwenthorpe’s siting offers the potential for

some travel energy saving compared with rural sites and energy parity with urban sites, individual lifestyles and behaviour (and interventions directed at them) may be more important than siting.

Views on whether Derwenthorpe can reduce transport costs

REAP Petite respondents were asked whether they thought that living at Derwenthorpe would reduce their transport costs (Figure 11), with a third (33 per cent) agreeing with this statement. However one fifth of respondents (22 per cent) were unsure and approaching half (46 per cent) disagreed. This may suggest that many Derwenthorpe residents felt that it would be difficult to change their travel patterns and modes of transport.

Figure 11: Responses to the question ‘Please indicate the extent to which you agree or disagree with the statement that Living at Derwenthorpe will reduce my transport costs’



Car dependency: present and potential patterns

Each Derwenthorpe house²⁷ has one allocated car parking space, with some of the larger houses also having a garage. Although attempting to reduce car dependency, it is important to note that JRHT does not have an objective of reducing the level of car ownership, rather ensuring that alternative transport methods are available and promoted effectively so that residents can ‘decide for themselves to use their car less’ (Derwenthorpe business plan, unpublished).

Of REAP Petite respondents (see Appendix 1), 10 out of 40 households had two cars, 29 out of 40 households had one car, and only one had no car.

Some interviewees supported the allocation of only one car parking space as an important and laudable principle, while others felt it was simply unrealistic especially for family housing.

We have two cars but it’s not because we want to run two cars, it’s because we have to run two cars – because a lot of them are family homes, I don’t think that has been particularly thought through and there’s going to be more cars than spaces and if you have got a family you are not going to park right over in the visitor centre car park and traipse your children...to me that seems like a bit of an idealistic view of what actually will happen.

Family with children, shared owner, phase 1, first interview

In this resident’s second interview, they returned to this point.

I think sometimes the residents’ group, they can be a bit, they get hung up about things that are just part of life, like cars, there have been great big debates about parking, it’s an eco-development and people should only have one car or no cars, and that’s just not practical.

Another respondent agreed.

I think it is naïve to think that people are going to give up their cars.

Couple, home owner, phase 1, first interview

Residents can use some spaces in the visitor car park, however there was some reluctance to do so given its location and the fact it is not closely overlooked.

Parking seemed to be a big issue for many residents, and was frequently discussed by the residents' association. A number of phase 1 residents in their first interviews explained that they parked their car (or second car) outside their house; they noted that lots of people did this and nobody had complained. This was much more convenient for people. However, one person wondered whether this might become unmanageable once everyone had moved into phase 1. Indeed, parking seems to have become a bigger problem over time. Some of the first phase residents were adjusting their habits to respect the increasing numbers of people on site:

Person 1: Parking is a problem, people don't use the allocated parking because they are too bloody lazy to walk.

Person 2: We are trying to address that. Our family used to park outside, we've asked them not to now.

Couple, renter, phase 1, second interview

Parking also appeared to be an issue on phases 2/3. One household felt that everyone should have signed up to having just one car on Derwenthorpe, while others were more concerned with being able to use their car parking space, which could also be a source of tension with neighbours. There was also a degree of annoyance with JRHT for not addressing this situation more promptly. However, this may be a temporary issue until appropriate signs are put up.²⁸

I'm not pleased about the car parking. So everyone only has one space, but then everyone parks their cars anywhere, so you could come back and someone's in your space and you're having to park down the street. I think because it's not very clearly marked where visitors' spaces are, so if you're a visitor, it looks like a car parking bay and we have raised with Joseph Rowntree several times and they've still not done anything about it, and I'm just a bit worried when all these new houses open that their visitors will park there, because it's not clear at all.

Family with children, owner, phase 2/3

As mentioned, the residents' association frequently discuss parking issues. According to one couple on phase 1, the meeting about parking had the greatest turnout, with 25 houses represented. This respondent said parking was 'an issue for everybody, and some people are a bit thoughtless' (couple, owner, phase 1, first interview).

Role of the car club

A car club was one of the community-wide environmental interventions, with one car sited in phase 1. JRF/JRHT made a decision to set this up at the beginning, although it was recognised that take-up would be limited to phase 1 until future phases were completed. At the time of fieldwork, building works meant new phase 2/3 residents could not easily access the car club. However, more recently, the car club moved site to make access easier.

According to figures from the car club scheme (up to May 2014, before phase 2/3 residents started to move in), there were 20 separate users of the Derwenthorpe car club, eight of whom were Derwenthorpe residents (the car club was also available to the neighbouring Osbaldwick community and was also marketed to business users).

The car club had only been used by two interviewees (and 7 out of 39 REAP Petite respondents). One interviewee was very effusive about the service, including its price, availability (particularly as so few people had used it) and ease of booking. It should be noted that this interviewee had also used the York

car club in their previous home. They were a little concerned that few people were using it and pleaded 'Don't take it away!'

Quite a few households had considered the car club but they did not think it would suit their needs; for example one person felt it was unaffordable for the length of time they needed it and also thought organising it would be time-consuming.

However, a small number of residents said that they might consider using the car club in the future, including two households that planned to go from two to one car (due to improved location), and a one-car household with occasional need for a second car. One resident said:

I looked into it but it didn't make financial sense. I can't remember why, [name of partner] doesn't drive though, so it was just, it didn't make sense to use it on an ad hoc basis. If, when, [partner] learns to drive it will be a good second car, I think it is a really good idea.

Family with children, owner, phase 1, second interview

Others also thought it was a good idea, but had forgotten it was available.

No, I forgot about it to be honest...Yes, we can't afford to run two cars, so I have the car every day and we pay his work pal...and that means that I can ferry about here, there and everywhere...Yes, but if there was a time if he had to take the car and I needed it desperately yes, I forget about the car club.

Family with children, shared owner, phase 2/3

However, most did not think they would need the car club as they would always have at least one car and many also used a bicycle and/or bus.

Most car clubs are in a city centre with few precedents of non-city centre car club schemes. In the former, there are usually enough people who are interested in collective provision rather than ownership, a particularly prominent attitude in the under 35s. In 2014, one stakeholder commented that 'At the utilisation levels we have been achieving, the car is not sustainable... unless we can fix that problem...'. To be economically sustainable, the car needs to be used on average for 70 hours a month, which Derwenthorpe had not achieved in its first two years. However, the number of hours booked had begun to improve in autumn 2014 and early 2015. With the move of the car to later phases, usage had also switched to mainly phase 2/3 residents. In early 2015, one stakeholder described the car club being 'nearly there' in terms of usage.

It was clear that a more proactive, ongoing approach to the promotion of the car club could be useful. Several residents interviewed were not aware of it, for example: 'I don't even know what that is, I've not heard of it' (family, renter, phase 2/3). This is likely to have changed for later phases with the car's new base. However figures suggest that a new challenge might be the continued take-up of the car club by phase 1 residents (none of whom booked the car in the first three months of the car moving away from phase 1). A second vehicle is unlikely unless use increases considerably. Another longer term option would be to consider alternative models of provision, for example a social enterprise model where the community could take more ownership of the scheme.

Discounted bike scheme/bus vouchers

All new Derwenthorpe residents were entitled to either a £150 voucher to help buy a bike or a free bus pass for one household member.

I can't tell you the things they give you. There was this scheme where they said would you like a free bus pass or £150 towards a bike, so I took a bus pass...

Family with children, renter, phase 1, first interview

Quite a number of interview householders (and 18 out of 39 REAP Petite survey respondents) had taken up the bike voucher and found it very useful. This was the most popular intervention, with 15 residents from phase 1 and three from later phases taking up the offer. A further two noted that they had 'applied for the bicycle scheme but heard nothing back'.

One couple had wanted a bike for ages so it was much appreciated; another household was using it to buy a second bicycle for her guests to use; a couple of people had used it to buy a bike for children and another was using it to buy a helmet and panniers for their existing bike.

The voucher was not as appropriate for some households. A couple of people explained that they already had bikes. Another was unsure how the scheme worked, for example they wanted to get two cheap children's bikes from a supermarket and wondered whether this was possible. Yet another was intending to buy a bike but hoped to get a secondhand one (so it would be less likely to be stolen, not for environmental reasons) but did not think you could use the voucher for this.

Free bus vouchers were mentioned as potentially useful by a few people although only two REAP Petite respondents had taken this up. A couple of senior citizens noted that they already travelled free on the bus. Views differed on the bus service: some found it to be quite good, others felt it was too infrequent and also poor value. One family from a later phase appreciated that the number 6 bus was temporarily diverted so it went near their house, but thought it would be a 'bit of a walk' when it went back to its usual route. They would welcome a bus direct from the site.

It was clear that different households had varying preferences for modes of transport – some liked the bus, others never used the bus; some liked to walk, others loved cycling. Some were frequently using the local Sustrans cycle route into town. However, most people also continued to use the car for local shopping, outings and particularly travel to work.

Other transport interventions?

A couple of people were keen on the idea of an electric bus for Derwenthorpe. This was looked into in 2014 but JRHT decided it would be too expensive. A few people also mentioned that they would like to see charging stations for electric cars. One person mentioned community bikes as a possible intervention.

Most interviewees were not really sure whether any further interventions (in any area) were needed but would be quite happy to try new things. One householder commented that they would prefer it if essentials such as hot water were given priority over what were described as 'extras' such as community environmental schemes.

Overall changing travel patterns?

A number of residents reported changed travel patterns since moving into Derwenthorpe. However, most key changes revolved around commuting patterns. In some cases Derwenthorpe had resulted in reduced travel as this location was closer to their work than previously.

Sometimes the travel changes were relatively small. For example, one family in phase 2/3 had increased car travel slightly as they had chosen to keep their child at their previous school about three miles away; but also explained that they now went for walks at the weekend in the local area which they had not previously done.

In other cases, travel patterns and changes were independent of Derwenthorpe's influence, in particular major travel use was dictated by the availability of jobs and career choices.

We don't use the car an awful lot when we're in York and we tend to get shopping and things delivered. So, we don't make a lot of unnecessary trips in the car. So I think if [partner] could avoid going to [Northern city] and back every day...we probably wouldn't use it that much.

Couple, owner, phase 2/3

Overall, it appeared that Derwenthorpe as an intervention might be having some influence over leisure and lifestyle choices (like cycling) and possibly some short distance travel, but has so far had less success with influencing people's overall car dependency and use, particularly for commuting and longer journeys.

7 Overall environmental impact of Derwenthorpe' residents

Summary

- Derwenthorpe residents generally held neutral or slightly positive attitudes towards the environment, broadly similar to national attitudes. There were no significant differences in these scores across phases, tenure or settled/new residents. In addition, there was no significant relationship between residents' environmental attitudes and their carbon footprints.
- Most REAP Petite respondents (79 per cent) agreed that living at Derwenthorpe would help them live a greener lifestyle, often referring to the energy efficiency of their homes and recycling. However, few mentioned travel and consumption patterns which are a much greater driver of an individual's footprint.
- Derwenthorpe residents' overall individual carbon footprints were not significantly different from REAP Petite respondents nationally.
- Power (household energy) emissions were, however, significantly lower at Derwenthorpe while shopping footprints were higher than the rest of the national sample. Overall, Derwenthorpe residents' carbon footprints vary more than other REAP Petite respondents, mainly caused by a high variation in travel footprints.
- The design of the homes and the communal heating scheme are the main drivers behind the significantly lower power footprints for Derwenthorpe.
- For seven of nine households, total emissions dropped compared with previous homes, but emissions associated with shopping increased for six of nine households, because of buying new furniture and appliances.

This chapter focuses on the overall environmental impact of Derwenthorpe, by examining the carbon footprints of Derwenthorpe residents using the REAP Petite survey (see Appendix 1 for methods and Appendix 3 for the questionnaire). It begins by considering the environmental attitude of residents and then provides findings from the REAP Petite survey, showing individual resident footprints across power, food, travel, shopping, activities and other areas. It compares footprints to UK and York REAP Petite averages. It also considers differences between types of households and over time. Finally, the chapter presents data on how environmental attitudes relate to footprint data.

Environmental attitudes

Chapter 2 highlighted that the green credentials of Derwenthorpe had not been a prime motivator for people moving into the scheme, although some residents did have a secondary interest in the eco parts of the scheme. These points were further investigated through the REAP Petite survey, showing that there was a level of interest in responding to the green credentials of the scheme but, overall, people's environmental attitudes were not markedly different to other households nationally.

First, Derwenthorpe residents' environmental attitudes were assessed through an environmental attitudes score, called the New Ecological Paradigm (NEP). This uses a scale to assess attitudes based on responses to 15 questions around the relationship between humans and the environment to assess respondents' 'worldview' (see Appendix 1 for questions and calculation method). Responses are reported using a 5-point Likert scale (strongly agree to strongly disagree). The maximum possible score on the NEP scale, indicating very pro-environmental attitudes, is 75 and the minimum score, indicating negative attitudes to protecting the environment, is 15. A neutral attitude would score 45.

The mean environmental attitude score of 42 Derwenthorpe respondents was 48.6, indicating neutral or slightly positive attitudes towards the environment (although there was quite a wide spread in the data, with a minimum score of 33 and a maximum score of 58).²⁹ During the survey period, 579 respondents

nationally also completed the environmental attitude scale, with a slightly higher mean score of 49.3 (minimum score of 23 and a maximum of 75). The difference in attitude between Derwenthorpe and other respondents was not statistically significant.³⁰

Settled residents (n=12) had a slightly more positive (higher mean) environmental attitude (50.5) than new (n=30) residents (47.9), but a statistical test revealed that there was no significant difference between these values.³¹ Similarly, phase 1 residents (n=32) mean attitude (48.9) was slightly higher (more positive) than the mean of later phases (n=8) (47.8), however this difference was also not significant.³² There was also no significant difference in environmental attitudes by tenure.

Secondly, REAP Petite respondents were asked whether living at Derwenthorpe would make them live a greener lifestyle. Figure 12 shows that the majority of people (79 per cent; N=29) agreed with this statement. Three people (all settled residents) disagreed with this statement, two of whom were unhappy with the energy efficiency of their home (one person did not specify a reason).

A number of people definitely thought that making the move to Derwenthorpe had heightened their awareness about the importance of energy efficiency, and in particular explained that they were more inclined to switch things off /use less energy.

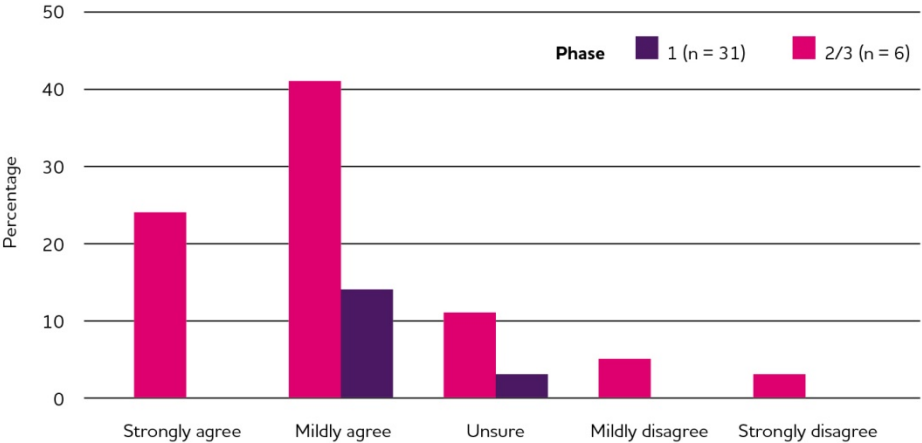
Before we moved in here I wouldn't have said it was important at all, but now we're in here, I'd say it is more because the more energy you save, the more money you save, don't you really? I do constantly do go around turning things off that don't need to be on.

Family with children, renter, phase 2/3

The objective of buying this house is not for the eco-friendly thing but when we decided to buy it, we tried to do the most eco-friendly as possible thing.

Couple, owner, phase 2/3

Figure 12: Responses to the question 'Please indicate the extent to which you agree or disagree with the statement that Derwenthorpe will make me live a greener lifestyle'



Some pointed out that they were initially attracted to the scheme because of its green credentials, and were already quite green, but that the development was helping them become greener (particularly because of the greater efficiency of the home).

Table 15 may indicate that new residents agreed more that Derwenthorpe would make them live a greener lifestyle than settled residents. It may be that people's initial enthusiasm tailed off or new behaviour became habitual. One phase 1 interviewee when asked whether he thought living at Derwenthorpe would encourage him to reduce his carbon footprint said, 'I think when we first moved in, the novelty of greenness, although we had recycled before, I think it's levelled itself out, I can't say that I'm as keen as I should be.' (Family with children, renter, phase 1, second interview). It should be noted

that this resident, like many others seems to equate carbon footprint with recycling, despite consumption patterns being a much greater driver of an individual's footprint.

Table 15: Responses to the question ‘Please indicate the extent to which you agree or disagree with the statement that Derwenthorpe will make me live a greener lifestyle

N=37	Derwenthorpe will make me live a greener lifestyle				
	Strongly agree	Mildly agree	Unsure	Mildly disagree	Strongly disagree
New (within a year of moving in)	7	14	2	0	0
Settled (more than a year after moving in)	2	6	3	2	1

Derwenthorpe residents’ individual carbon footprints

The research examined the extent to which living at Derwenthorpe might be supporting a lower carbon lifestyle, using the REAP Petite survey to calculate individual environmental footprints (see Appendices 1 and 3 for full explanation and survey). The survey asks questions about households’ power, travel, activities, shopping and food consumption. If households’ bills were available their power footprint was calculated directly from them, otherwise the power footprint was calculated by responses to a series of questions about the size of the house, occupancy and number and types of appliances used (see West *et al.*, in press, for more details). The household footprint was then divided by the number of people in the household to give an individual footprint.

A total of 48 surveys were returned by Derwenthorpe residents over the period 2013–2015.³³ 705 non-Derwenthorpe residents nationally completed the survey over the same period (reported as ‘rest of REAP Petite sample’ here). Because they were self-selecting, this data is likely to be biased towards people with lower carbon footprints than the UK mean.³⁴ As they were targeted, the self-selection bias among Derwenthorpe residents is likely to be smaller.

Table 16 shows the mean of the individual footprints, broken down by sector (power, food, travel, shopping and activities), for Derwenthorpe and the rest of REAP Petite sample. It also shows the mean UK footprint which has been calculated by dividing the total UK carbon footprint by the number of individuals in the UK.³⁵ It highlights that:

- Derwenthorpe overall carbon footprints (at 14.52 tonnes of carbon dioxide equivalent) were similar to the rest of the REAP Petite sample (where the mean was 14.50)³⁶;
- Derwenthorpe residents have a statistically significantly lower power footprint per person (1.53 tonnes per year) than the rest of the REAP Petite sample (2.73 tonnes per year);
- Derwenthorpe residents have a statistically significantly higher shopping footprint per person than the rest of the REAP Petite sample (at 1.52 compared with 1.18 tonnes per year);
- Derwenthorpe residents appeared to have a higher travel footprint than the rest of the REAP Petite sample, but this was not statistically significant³⁷;
- Derwenthorpe carbon footprints were lower than the UK mean (at 14.52 tonnes compared with 16.24 tonnes per year).

However, when interpreting these results it should be noted that, compared with the national REAP Petite sample, Derwenthorpe REAP Petite respondents are skewed towards higher income households (see Chapter 2) with the richest 10 per cent of households nationally consuming three times more carbon for household energy and travel than the poorest 10 per cent (Preston *et al.*, 2013).

The design of the homes and the community heating system are the main drivers behind the significantly lower power footprints for Derwenthorpe compared with the rest of the UK sample.³⁸

Table 16: Individual footprint (broken down by sector) and environmental attitude score data for Derwenthorpe and rest of the REAP Petite sample, compared with the UK average

		Power	Food	Travel	Shopping	Activities	Other*	Total	Attitude
<i>Mean UK footprint</i>		<i>3.54</i>	<i>2.57</i>	<i>3.59</i>	<i>1.81</i>	<i>0.87</i>	<i>3.86</i>	<i>16.24</i>	-
Rest of sample	Mean	2.73	2.18	3.54	1.18	1.01	3.86	14.50	49.3
	N	705	705	705	705	705	705	705	579
	Standard deviation	2.06	.71	2.91	1.23	.33	.00	4.53	5.2
	Minimum	.25	.55	.34	.22	.43	3.86	6.35	23.0
	Maximum	17.51	4.72	28.78	30.55	3.20	3.86	42.37	75.0
Derwenthorpe	Mean	1.53	2.35	4.30	1.52	.96	3.86	14.52	48.6
	N	40	40	40	40	40	40	40	42
	Standard deviation	.56	.68	4.05	.82	.23	.00	4.91	5.1
	Minimum	.69	1.23	.57	.60	.55	3.86	8.12	33.0
	Maximum	2.65	4.05	19.58	3.61	1.38	3.86	30.82	58.0

Note: The footprint is measured in tonnes of carbon dioxide equivalent.

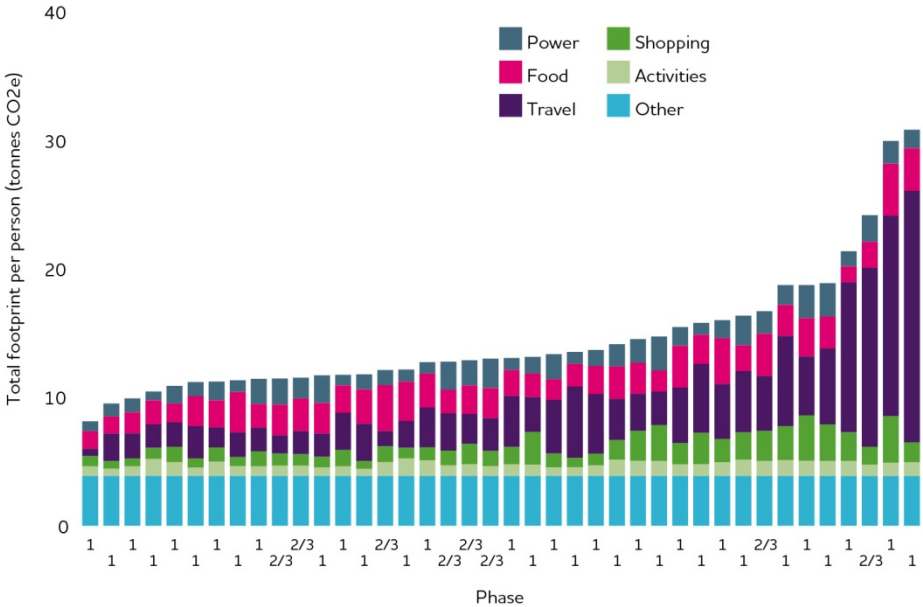
* 'Other' is standard across the UK and is based on the individual share of emissions associated with government spending on hospitals, roads etc.

Standard deviation shows how spread out the data is around the mean, with a larger number showing greater variation in the data, and a smaller number showing that responses are more similar.

Figure 13 shows the considerable variation in carbon footprints between individuals at Derwenthorpe – ranging from under 10 to around 30 tonnes of carbon dioxide equivalent per person. It also graphically shows particularly large differences between respondents’ travel footprints. The range may reflect the mixed community at Derwenthorpe and that there was a lower than average proportion of low earners and above average proportion of high earners among Derwenthorpe respondents compared with the national REAP Petite sample.

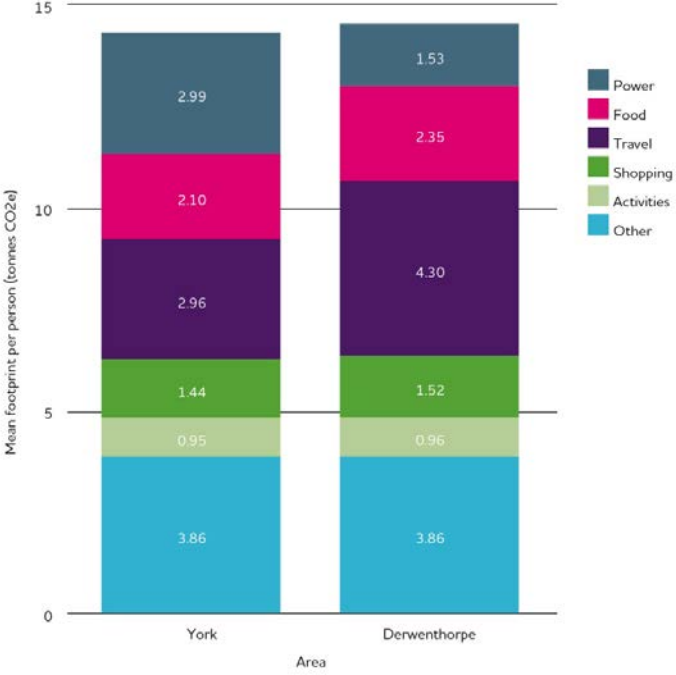
It should be noted that with a relatively small sample, as is the case for the Derwenthorpe sample, any additional respondents can make quite a large difference to the sample mean and variation in this and therefore whether a significant difference is found between datasets e.g. between Derwenthorpe respondents and the rest of the REAP Petite sample. Therefore, the results presented here should be seen as a ‘snapshot’ in time, and may change as more residents complete the tool.

Figure 13: Footprints for all Derwenthorpe respondents, ordered from lowest to highest



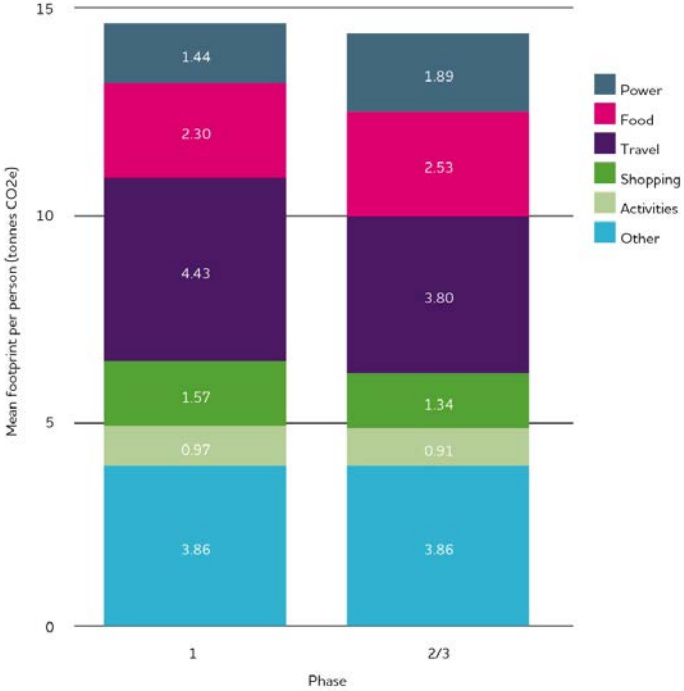
Derwenthorpe respondents were also compared with other York residents who completed the REAP Petite survey (Figure 14). Derwenthorpe respondents had a slightly higher mean footprint per person than other York residents (14.52 compared with York’s 14.30) however this was not statistically significant (see Table A5, Appendix 1). Shopping footprints were significantly higher for the Derwenthorpe sample than York, and power footprints were significantly lower than for other York respondents (see Table A5, Appendix 1).

Figure 14: Comparison of York REAP Petite and Derwenthorpe REAP Petite respondents; mean footprint per person by area



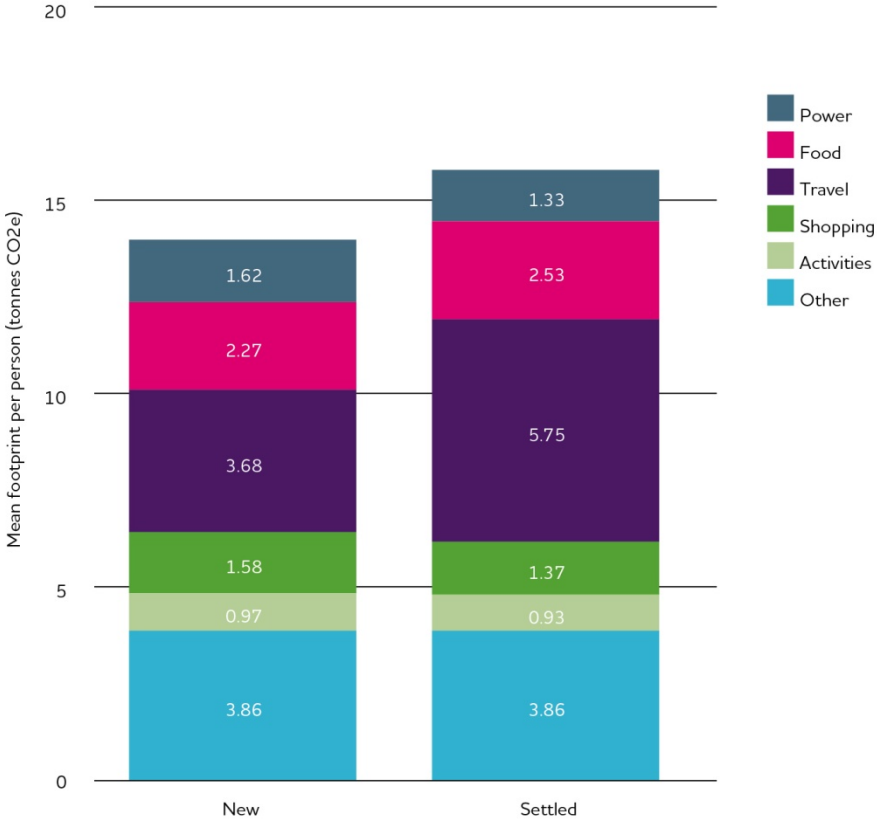
Comparing footprints within Derwenthorpe, the mean total footprint was 15.34 tonnes for phase 1 residents, and lower at 14.45 for later phases (see Figure 15). However, there was no significant difference between either total footprint or any of the component parts. It should also be noted that only eight residents completed the survey from later phases.

Figure 15: Mean footprint per person for power, food, travel, shopping, activities and other for the different phases of Derwenthorpe



We also compared footprints between new and settled respondents. For new respondents, mean total footprint per individual was 14.16, and for settled respondents this was higher at 17.10. In addition, settled respondents had greater variation in their footprints than new respondents. As Figure 16 shows, most of this difference came from the travel component, although statistical tests showed that none of the differences were significant.

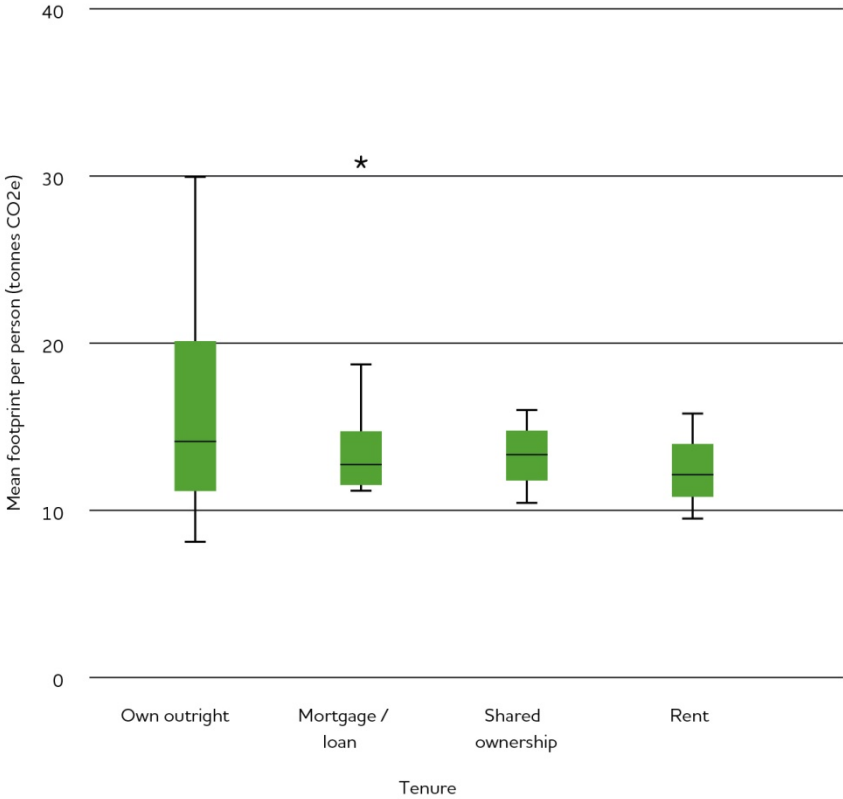
Figure 16: Mean footprint per person for power, food, travel, shopping, activities and other for new compared with settled residents of Derwenthorpe



It might be expected that the wealthier the household, the higher the carbon footprint (Minx *et al.*, 2009, Preston *et al.*, 2013). Data from Derwenthorpe suggests that residents who own their homes outright had the greatest spread in their total footprints and the highest footprint, and residents who rented their houses had the lowest footprints (see Figure 17), but this difference was not statistically significant³⁹, although the sample size is relatively small.

Figure 17: Total footprint by tenure at Derwenthorpe

The black line shows the mean footprint; the bars show minimum and maximum values. The star indicates a statistical outlier.



Case-studies of individuals over time

All residents were asked to complete their footprints for their previous house and then every year when at Derwenthorpe. Nine residents completed their footprint for their Derwenthorpe house and their previous house, and a further three completed REAP Petite more than once at Derwenthorpe but not for their previous home. This allows us to see how footprints have changed over time (Table 17). It can be seen that seven (out of nine) respondents saw a drop in their footprint after moving to Derwenthorpe, and two (out of three) respondents saw a drop in their footprint while at Derwenthorpe.

Table 17: Total individual footprints of phase 1 Derwenthorpe residents who completed REAP Petite more than once

Total footprint (tonnes of CO ₂ equivalent)				
Previous home	Year 1	Year 2	Year 3	Notes
20.58	24.91	21.30	43.63	Very high travel footprint
16.91			14.12	
15.12	11.43			
14.21	15.46			Relatively high food footprint
10.77	9.90			
16.07	15.57			Lower power at Derwenthorpe offset by travel and shopping
13.16	13.23		13.04	Lower power at Derwenthorpe offset by shopping
14.55	12.15			
9.84	7.93		8.31	
	14.30		16.61	Travel footprint increased
		26.73	15.99	Travel footprint decreased
	30.60		26.62	Very high travel footprint

Year 1 responses were given within one year of moving, and so on. Grey shading shows the highest footprint for that individual.

Residents tended to show a decrease in their shopping footprint over time (Table 18), which may be caused by an inflated first year footprint due to new furniture and appliances for the new home. According to REAP Petite responses, the mean number of new items of furniture bought by respondents per year was 2.7, the mean number of small appliances bought was 1.1, and the number of gadgets was 2.1, but there was a quite a lot of variation around these mean values. Means did not vary much by tenure, but there was a slightly higher mean number of purchases of new furniture and new gadgets by phase 1 residents compared with phase 2/3 residents. One couple moving from rented accommodation said: 'We didn't actually come with all that much furniture because it had to fit into really kind of small rooms before. So we've had to buy just about everything else to kind of fit in'.

Table 18: Shopping footprints for Derwenthorpe residents who completed the tool more than once

Phase	Shopping footprint			
	Previous home	Year 1	Year 2	Year 3
1	1.89	5.22	1.55	4.07
1	1.92			1.52
1	0.77	1.17		
1	1.17	1.82		
1	0.66	0.63		
1	1.91	2.43		
1	0.97	2.73		2.37
1	1.10	0.83		
1	0.66	1.08		0.51
1		2.64		0.71
1			2.91	1.55
1		1.87		1.48

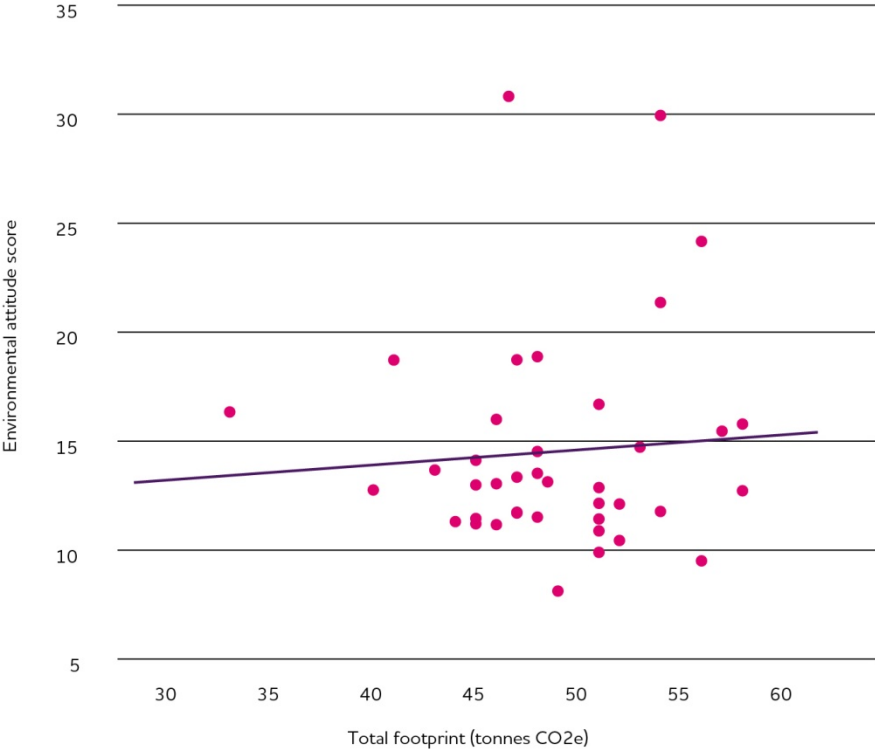
Year 1 responses were given within one year of moving, and so on. Grey shading shows the highest Shopping footprint for that individual.

The process of completing REAP Petite may have had some influence on people’s thinking about carbon footprints. One interviewee (phase 1, settled), said: ‘I think I said last time I think it would increase, I think I said it would pick up more than it actually had, but it is weird things, like I said now I have to go further to the store, but now I’ve done online shopping, but someone has to drive it to me, so I’m not sure that has actually improved it’, indicating detailed thought about his emissions.

Carbon footprints and environmental attitudes

There did not appear to be a clear link between Derwenthorpe residents’ environmental attitudes and their footprints (see Figure 18 which shows no obvious trend). A statistical test showed no correlation between these variables.⁴⁰ Similarly, although there was a slight correlation at the national level, this was not found to be statistically significant.

Figure 18: Environmental attitude of Derwenthorpe residents plotted against total footprint



8 Conclusions and key learning points

This report has examined Derwenthorpe's early residents' experiences of living in their homes and developing community over the period 2012 to early 2015. The vision for Derwenthorpe was to offer 'a potential blueprint for family living in a truly sustainable community fit for the 21st century' (Derwenthorpe business plan, unpublished). Building on considerable learning from its research and practice, JRF/JRHT's vision was ambitious and broad, aiming to deliver both a socially and environmentally sustainable community at Derwenthorpe. This final chapter discusses the successes, and challenges, of the early development of Derwenthorpe, and identifies key learning points in four key areas for other housing providers nationally:

- social sustainability (homes) – the extent to which the homes are 'liveable' including accommodating change over time;
- social sustainability (community) – the extent to which Derwenthorpe is a successful mixed and active community/place to live;
- environmental sustainability (homes) – the extent to which the homes are providing eco-friendly, energy efficient homes (using communal energy);
- environmental sustainability (community/lifestyles) – the extent to which the scheme has provided incentives for lifestyle change to reduce environmental impact, particularly in the area of transport.

Social sustainability (homes)

The most striking and consistent finding was residents' high level of satisfaction with their homes. The vast majority of residents (91 per cent) were satisfied with their homes, approximating to national levels of satisfaction for owner-occupiers but exceeding levels of satisfaction for social rented households. Settled residents appeared slightly less satisfied than new residents, possibly as a result of high expectations being tempered by day-to-day living on a building site and/or operational issues related to energy efficiency measures. However, in terms of the quality of life offered by the homes, residents were unanimous in expressing satisfaction, frequently delight, in their new homes. Many felt lucky to have moved to Derwenthorpe, particularly shared owners and social tenants.

Residents were particularly impressed with space and light standards of the properties, as well as the general appearance and the internal layout. Lifetime Homes standards also influenced satisfaction levels, with all residents benefiting from wide hallways and bathrooms. For some residents with disabled children, the combination of Lifetime Homes (fully used to meet individual needs), and overall good design, had transformed their lives. Others discussed the potential usefulness of these features in the future, including expanding into the roof space. Importantly, some aspects of design that were driving high satisfaction were related to improving energy efficiency, including the large windows (to capture sunlight), high standards of airtightness/insulation (providing comfort) and, more occasionally, specific interventions such as the winter garden.

Learning points

- Design of housing is key to resident satisfaction. Good design can serve more than one purpose – energy efficient features such as large windows, and accessibility standards, like Lifetime Homes can also promote people's overall quality of life.
- Building to Lifetime Home standards can transform the lives of households with disabled members, however it can also enhance the living quality for all households (although it does increase the space that needs to be heated).

Social sustainability (community)

The majority (81 per cent) of respondents to the REAP Petite survey were satisfied with their area as a place to live, a level similar to or slightly lower than national data. Living on a building site may be a factor behind some of these responses, as although some green areas and the pond were in place from the beginning (and enjoyed by residents), the overall site was being developed around households.

1.

Despite this, a significant early achievement of Derwenthorpe was the high level of community activity and involvement. A residents' association had been set up, and a number of community interest groups were well supported including a choir, community garden, yoga, knit and natter group, a book club and coffee mornings. These activities had been facilitated by the JRHT community development worker and the availability of communal facilities in the super sustainable centre. However one limitation of this success was that there was a strong perception (from both those involved and not involved) that a similar group of people was participating in social and governance activities. Children's and sports activities would have been welcome additions from those who had limited involvement. In addition, there was a specific request for specialist equipment in the play area to meet the needs of several families with disabled children.

Perhaps even more significantly, social network analysis revealed a very high level of connectedness between phase 1 residents, with on average, households citing over 20 other households as neighbours, and eight people as friends. This is likely to have been supported by community development processes (including supporting activities identified above), good design and the 'pioneering' nature of the development in terms of attracting people interested in forming a community. There were some early signs of phase 1 and phases 2/3 interest in developing social links, although the ongoing building meant that opportunities were currently constrained.

Evidence was slightly mixed as to the success of the mixed community. While overall views towards the mixed tenure community were generally positive in the first interviews in phase 1, repeat interviews and those with phase 2/3 interviewees pointed to an emerging sense of difference between the tenure types. This requires further investigation but may reflect both different social attitudes and differing governance issues and policies for the respective tenures. Social network analysis also revealed disproportionately more contacts between home-owners than between owners and renters, although there were links across all tenures.

Learning points

- Governance arrangements need to be perceived as fair and equitable to residents to promote community cohesion.
- Different parts of the community may require different kinds of support to develop activities. In some cases, only short-term support or no support may be required; in other cases a higher level of intervention may be required to promote the interests of those with more limited time and resources.

Environmental sustainability (homes)

When finished, it will be 20 years from Derwenthorpe's conception to completion. Given significant improvements in building standards and, until recently, targets to deliver 100 per cent zero carbon homes in new developments by 2016 (this target was dropped in July 2015), Derwenthorpe's energy efficient credentials were less different to other new developments than would have been the case at the turn of the millennium. In addition, it was originally intended to build Derwenthorpe at, or beyond, Code 4 (for Sustainable Homes). However, the additional costs of this (see Morgan *et al.*, 2015), meant that new phases are being built to below Code 4 in some areas (though remaining at Code 4 for energy performance). This highlights the difficulties of delivering both affordable and sustainable homes.

Despite these caveats, REAP Petite results show the impact of the homes as a major success in terms of lowering carbon footprints from power (energy use) of homes. In addition, the majority of Derwenthorpe residents were satisfied with the energy efficiency of their homes. Many remarked on how well the

homes retained their heat, although a minority felt that the homes did not perform as well as they had expected.

There were also mixed views and experiences of other energy efficiency features of the development, including the MVHR/MEV systems, winter gardens and water temperature restrictors and low water usage taps. Inefficiencies in operation were also reported by some residents (for example, MVHR being installed incorrectly), alongside a desire to override some features to achieve preferred living environments (for example, turning MVHR down or off). Additionally, many residents reported and/or demonstrated a lack of information on how to use many features. While JRHT/David Wilson Homes provided written information and verbal explanation on the systems, there was a clear need for further information and advice in this area. Evidence around lower fuel bills was also mixed. Just over half of residents felt that living at Derwenthorpe would reduce their energy costs, although quite a few were unsure and some felt that bills were higher than they expected. The research also highlighted a number of challenges associated with the choice of a communal heating system, including reliability and sequencing issues vis-à-vis the development schedule, information for/communication with residents, pros and cons of a single provider and affordability/sustainability trade-offs.

Learning points

- Energy efficiency measures built in from the start can help residents reduce their carbon footprints. Households' home energy footprints are easier for developers to influence than transport footprints.
- Residents need higher levels of, and ongoing, information and advice on how best to use energy efficiency measures of their homes. This is likely to be best achieved by a community engagement strategy.
- The evidence suggests that interventions that require the least (or no) operation by users will be the most successful (where training and skills of developers are sufficient to ensure high levels of build).
- Where more complex systems are used (such as MVHR), there is a need to support residents with their use and provide information on and/or deliver maintenance services.
- The research highlighted a number of challenges associated with the choice of a communal heating system, which require detailed consideration at all stages of development.
- Time lags in developments may have significant impact on the finalised scheme due to wider prevailing opportunities or constraints, linked to policy and regulatory changes and market dynamics.

Environmental sustainability (community/lifestyles)

Derwenthorpe aims to go beyond the provision of energy efficient homes to also provide incentives for lifestyle change to reduce environmental impact, particularly in the area of transport.

The available evidence suggests that it is difficult to change a household's travel patterns. Only a third (33 per cent) of REAP Petite respondents thought that living at Derwenthorpe would reduce their transport costs. Despite only one car space per household, few households had reduced their car use substantially, often because of work and family commitments. There was also relatively poor initial take-up of the on-site car club, although there were promising signs of some better take-up as resident numbers increased. Some small changes were happening in travel patterns, with a number of households aspiring to reducing car use, while a couple of households had achieved it and a few were planning on reducing car ownership in the future. There has also been good up-take up of the cycle vouchers, and some evidence of more leisure cycling.

Most REAP Petite respondents (79 per cent) agreed that living at Derwenthorpe would make them live a greener lifestyle, however this most often referred to the energy efficiency of their homes and recycling, which, for some households who had moved from outside York, was better than at their previous home. Few mentioned travel and consumption patterns which are a much greater driver of an individual's footprint. Resident's carbon footprints related to shopping were also higher than the REAP Petite national average, however this was in part due to moving home.

Learning points

- The travel related interventions, such as the car club, were in place from the beginning of the scheme. While this gave the greatest chance to influence behaviour at the individual level, the Derwenthorpe experience suggests that take-up may be low at the start of the initiative and a subsidy and/or alternative business/social enterprise model may need investigation.
- The car club experience also suggests the importance of more marketing and demonstration of benefits for households as part of any community engagement work. There is also a need for developers to link into, and try and influence, wider city transport initiatives to affect travel changes in the local area.
- Evidence suggests that it may be easier to influence lifestyles/short trips (for example, via the bike scheme) than commuting and wider travel patterns.
- Providers of new housing could consider schemes to try and reduce the high shopping carbon footprints associated with moving into new homes, for example via the promotion of community recycling and re-use schemes and liaison with councils over landfill waste management issues.
- Overall, housing providers could also consider their potential role in supporting people to influence their overall carbon footprints through the development or promotion of specific environmental interventions and/or as part of a community engagement strategy.

Conclusion

This interim evaluation examined both social and environmental sustainability of Derwenthorpe (homes and community) over 2012–2015.

Interim evidence suggests that Derwenthorpe is already achieving a relatively high level of social sustainability. In terms of homes, residents reported high levels of satisfaction, particularly with space standards and amount of light in the properties. Design for sustainability (for example, large areas of glazing), as well as Lifetime Homes standards, were successful beyond their original aims. The evidence supports good design as appealing to home buyers and renters alike, and challenges the more traditional approach of the mainstream housebuilding industry.

Social sustainability was also being achieved to a good extent at the level of the community. There was considerable evidence of a community where neighbours 'knew each other' and where friendships had been made. A sizeable part of the community was also active in resident initiated activities, including a well-supported residents' association. This suggests that community development still has a positive role to play in local neighbourhoods, but also that a new and different scheme like Derwenthorpe may have attracted some particularly highly motivated households. The community is still developing and therefore not functioning at critical mass yet. There were also some mixed messages on mixed communities, with successes around social networks but some low-level tensions between different sections of the community (around tenure as well as lifestyle preferences). Notwithstanding this, Derwenthorpe is likely to generate considerable learning in relation to the development of socially sustainable communities.

Reflecting the results of other research, interim evidence on the success of the environmental interventions at Derwenthorpe is more mixed. There was a considerable difference between design as intended and used by residents in the home. It was clear that some technology challenged both the developer and the user, for example there were issues with both the installation and use of the Mechanical Ventilation and Heat Recovery system. There was also a gap in residents' understanding and preferences for use of a number of home environmental features. In 2010, Bell *et al*/signalled the need for a ten-year programme of radical change in the building industry to address the skills (and incentives) gap. As acknowledged at the national level, there is also a clear need for greater information and education for householders on energy efficiency measures. Housing providers and/or allied organisations could usefully introduce specific community engagement programmes for residents.

This research did not consider the costs of Derwenthorpe; future research might usefully do this. However, following Morgan *et al*'s report (2015), there appear to be some trade-offs between

affordability and longer term sustainability in terms of both up-front costs and longer term maintenance and management (including of the communal heating system). It is clear that it is difficult and expensive to deliver homes to high eco-standards. In light of this, any lowering of national expectations and requirements (including abandoning zero carbon home targets and local authorities no longer being unable to require developers to build above Code 4 from 2016) are concerning.

At the community level of environmental sustainability, there was some success in terms of influencing lifestyles (for example, uptake of the cycle voucher scheme, recycling, establishment of a community garden) but wider travel and transport patterns were less conducive to quick change, reflecting both the nature of behavioural change and the impact of broader local planning considerations and local, regional and national economic and transport plans. Ultimately, it is much more challenging for housing providers to influence sustainable environments, however there is scope to exert positive influence for relatively low level costs through the development of community environmental interventions.

Derwenthorpe's success will be appraised over the long term and its influence will shift with wider policy change. Lessons indicate the substantial challenges and achievements of delivering sustainable developments in the mainstream, alongside the necessity of meeting the challenges if the UK is to address any future carbon housing goals.

Notes

- 1 See <http://www.jrf.org.uk/topic/communities-and-neighbourhoods>.
- 2 These objectives have been summarised and themed by the authors, drawing on various JRF/JRHT documents on Derwenthorpe, for example, JRF (2001; 2009).
- 3 The Lifetime Homes Standard is a series of 16 design criteria intended to make homes more easily adaptable for lifetime use at minimal cost. The concept was initially developed in 1991 by the Joseph Rowntree Foundation and Habinteg Housing Association. For further details, see <http://www.lifetimehomes.org.uk/>.
- 4 63 homes were available for occupation at this time; the remaining home was the sales office and will become available on conversion.
- 5 The Code for Sustainable Homes was an environmental assessment method for rating and certifying the performance of new homes, with mandatory performance on energy and CO2 emissions, water, materials, surface water run-off, waste, and health and wellbeing elements. This code was withdrawn by government in March 2015 (with exception of legacy cases), with some of its standards being incorporated into Part L of the Building Regulations from 2016.
- 6 A winter garden helps to heat the house in winter; both the inner and outer doors are kept closed to act as a buffer zone to the cold outside. Any heat from sun is trapped and transferred inside to help warm the rest of the house. The doors can be opened at other times of year to create more internal or outdoor space.
- 7 The sustainable urban drainage system is designed for both water conservation and flood risk management. The site has underlying clay formations and previously the local area experienced standing water in particular areas. There was also flooding from the Osbaldwick beck – the SUDs scheme will help counter water collection and flooding in the future.
- 8 For full details on development timeline, see Appendix 2.
- 9 According to the UK, a 'zero carbon' rating equated to the top level, Level 6 of the Code for Sustainable Homes (see Table 1.2). This referred to a net contribution by cooking, heating and lighting in homes, so any emissions could be compensated if homes could generate sustainable energy (or otherwise reduce net emissions, on or off site). Energy use by appliances was excluded, as were other energy uses such as in construction or due to travel. This was a response to the European Union Energy Performance of Buildings Directive (2010/31/EU) that required most new homes to be nearly-zero energy by 2020.
- 10 The Green Deal Home Improvement Fund, launched in June 2014, closed to new applicants at the end of July 2014.
- 11 <http://www.jrf.org.uk/topic/derwenthorpe>
- 12 Households who had moved into completed houses at the time of the research fieldwork.
- 13 Information was collected at this point to allow time to contact households and interview in late autumn/early 2015.
- 14 This relatively small sample size means that each time a new respondent completes the survey it can significantly change the mean result, and therefore key messages may change over time.
- 15 Unpublished data supplied to research team by David Wilson Homes (base of 38 phase 1 properties and 86 phase 2/3 homes).
- 16 'New' households are those interviewed, or completing survey, in first 12 months of living at Derwenthorpe. 'Settled' households are those who have been living there for one year or more.
- 17 It should be noted that numbers are small; there were only 14 settled respondents, compared with 24 who completed it as new residents.
- 18 Technically, all posts are visible on the page as default; the administrators could remove or hide posts if needed to but have not done this.
- 19 The BRE study for JRF is examining in more detail how the MVHR systems are working in phase 1 homes.
- 20 JRF has also commissioned the Building Research Establishment to conduct a specific evaluation of the ventilation system at Derwenthorpe.
- 21 They were not provided to latter phases, partly following negative customer feedback and preference for communal composting, partly due to revised costing calculations for the development/ shift from Code 4 to Code 3.

- 22 They were also not provided to latter phases, partly due to revised costing calculations for the development/ shift from Code 4 to Code 3.
- 23 Five properties on phase 1 had been fitted with solar panels.
- 24 This was due to recent interruptions in the provision of heating/hot water (see Chapter 4).
- 25 The data gives typical travel times by foot or public transport, bicycle and car, using the shortest possible route. Car times take account of congestion. Public transport times take account of frequency.
- 26 Derwenthorpe is at the extreme west of LSOA York 014C, which includes all of the Derwenthorpe site, but also extends east of the ring road and includes some substantially less accessible areas such as Murton. For this reason, the following analysis presents the results for this LSOA, and also the adjacent LSOA to the west which covers part of Tang Hall (but does not include any of Derwenthorpe's site). Travel times from Derwenthorpe itself are like to be between those for these two sites.
- 27 Note that phase 4 will include some flats without parking spaces.
- 28 JRHT has since provided signage for visitor spaces.
- 29 These scores are lower than other studies using the scale. For example, a study of random members of the population in Maine, USA, found average scores of 54 (Kotchen and Reiling, 2000), and a study of older consumers in the UK found a mean score of 52 (Sudbury-Riley et al., 2014), but more research is needed to ascertain why this is the case.
- 30 Mann-Whitney U test (non-parametric test for difference between means): Mann-Whitney U=11354, N=621, p=0.473.
- 31 Mann-Whitney U test (non-parametric test for difference between means): Mann-Whitney U=138.0, N=42, p=0.241.
- 32 Mann-Whitney U test (non-parametric test for difference between means): Mann-Whitney U 127.0, N=42, p=0.508.
- 33 It should be noted that six residents completed the tool multiple times over this period, four twice and two three times. The mean score of these multiple entries is used in further analysis.
- 34 Although it should be noted that this is not supported by the environmental attitude scores, which seem to be lower than in previous studies. Further research is needed to uncover why this might be the case. It may be that a revised version of the scale is needed for UK respondents as the scale was developed in the US. See Appendix 1 Table A2 for a list of questions. In addition, the rest of the REAP Petite sample spans all income classes, see Table 9.
- 35 Calculated from average UK consumption figures from the Stockholm Environment Institute's REAP model, which uses national accounts to estimate footprints for different economic sectors. Here, we have taken the UK carbon footprint from these accounts and divided it by the number of individuals in the UK. Note that direct comparison between a cohort of users from REAP Petite, and average data from REAP should be avoided due to the different baselines and methodologies used in the preparation of the data, as the REAP Petite results are derived from the responses made by individual households, unlike the REAP data which uses national level economic sector data. See Appendix 1 for more information.
- 36 See Appendix 1 for statistical tests of significance (Table A4)
- 37 Due to a large standard deviation (i.e. there were a couple of outliers in the Derwenthorpe sample with particularly high or low travel footprints). It should be noted that as the Derwenthorpe sample is relatively small, each time a new respondent completes their footprint, it can make large changes to the mean, and so these results should be seen as a snapshot in time. We will repeat the survey in 2016 when there will be a larger sample size.
- 38 Data on actual energy use was provided by JRHT for most of the properties, although data was missing in a minority of cases and assumptions were made for these households (based on average for similar households at Derwenthorpe).
- 39 Kruskal Wallis test showed no significant difference in footprint by tenure ($\chi^2=0.875$, $df = 3$, $p = 0.831$).
- 40 Non-parametric Spearman's Rank Correlation test for correlation between attitude and total footprint: $\rho = 0.008$, $N = 40$, $p=0.962$.

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The interpretation of the material and any errors are solely the responsibility of the authors.

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Appendix 1: Research methods

Appendix 1 outlines the three main research methods used in the evaluation.

1 In-depth research with a panel sample of residents

The study includes in-depth longitudinal research with a household panel sample of up to 36 households. The target was to include 18 interviewees from phase 1 (first interviews 2012/13 and re-interviewed twice), 10 interviews with the first tranche of phase 2/3 residents (first interview in late 2014/ early 2015 and re-interviewed once) and a final eight interviewees across phase 2/3 in 2016 (interviewed once).

The sample was selected using the following strategy:

- *Level 1 sampling: Property based.* Properties were selected randomly to achieve a similar balance of types of properties in our sample as in the development (by tenure and number of bedrooms).
- *Level 2 sampling: Household based.* We then reviewed the selected sample against the known characteristics of the (prospective) households, where this was possible from information provided by JRHT, substituting households (randomly) to allow representation of all types of households across the range of properties.
- *Level 3 sampling: Spatial distribution.* A final check was made to ensure that we did not only select householders resident in certain areas of the development, with substitution where a number of next-door neighbours had been selected.

Residents were approached by letter to take part. They were given an opportunity to proactively respond by post, email or telephone. The research team also informed residents that they would door knock on doors in the area over the coming few weeks. The majority of interviewees were recruited on the doorstep (following receipt of the letter).

In phase 1 (first round of interviews), 16 interviews were achieved out of the target of 18 interviews. In phase 1 (repeat interviews), 13 of the original 16 households were re-interviewed. Another two households were also recruited at this point to achieve the original 18 phase 1 respondents. Ten interviews were achieved with phase 2/3 interviewees.

Table A1.1 shows that the interview sample includes fifteen owners, eight social renters and five shared owners. It also includes a range of different household types.

Table A1: Characteristics of Derwenthorpe interview sample, phase 1 and 2/3

	Social rented	Shared ownership	Owned	Total
Single person			3	3
Couple, no children	1	2	10	13
Single adult and dependent child/ren	2			2
Couple and dependent child/ren	4	3	1	8
Couple and adult child/ren			1	1
Single adult and adult child/ren				–
Three generations	1			1
Total	8	5	15	

Interviews were carried out in residents' homes, with the exception of one which was conducted at the respondent's workplace (at their request). Interviews took on average just over an hour. In many cases where households contained couples, both members of the couple were interviewed together. Some interviewees offered a house tour. Each household received a £15 shopping voucher to thank them for taking part.

2 Tracking individual ecological footprints across Derwenthorpe (and to comparators)

The Stockholm Environment Institute has created an online environmental footprint calculator (REAP Petite) that converts data provided by residents into carbon footprints for the individual (as well as household or community) (<http://www.REAP-petite.com>, and see Appendix 3 for survey form). Unlike most other online footprint calculators, REAP Petite measures both the direct and the indirect supply chain impacts that are associated with the things that individuals/households consume. It measures energy used for home heat and power, and also direct and indirect impacts of consumer durables, travel, shopping and leisure activities, in the UK and abroad. It allows individuals to compare their footprint with that of others in their household, the wider community, other participating communities, and the national average as soon as data is entered, and to monitor changes over time. It provides suggestions for reductions and enables users to make pledges to take action and see their effects. Calculations can be completed online in 15 minutes. Respondents are asked to consider the expenditure of their household, and then at the end of the tool can either see their individual or their household footprint. The individual footprint is simply the household footprint divided by the number of people in the household. It assumes that children have the same footprint as adults, because although they may have lower consumption in some areas e.g. food, they may be higher in others e.g. clothes.

The underlying data in REAP Petite comes from several sources (see West *et al.*, in press, for details), including SEI's REAP multi-regional input-output model, which reports total UK footprints using 123 economic sectors (expenditure and emissions data are from 2006). These sectors bear little resemblance to a typical household's shopping list and therefore in the development of REAP Petite these categories were converted to more familiar items such as jewellery and power tools. In addition, the direct transport and housing footprints in REAP Petite are based upon more recent Defra emissions factors, as the tool was developed after the REAP tool. Therefore, direct comparison between a cohort of users from REAP Petite and average data from REAP should be avoided due to the different baselines and methodologies used in the preparation of the data. The key methodological difference is that the mean UK footprint from REAP is simply the carbon footprint for the UK divided by the number of individuals in the UK, whereas the REAP Petite data is calculated from actual household activities and purchases. However, we have provided REAP data to give some context for the REAP Petite data as it does highlight some key real differences e.g. the significantly lower power footprint for Derwenthorpe (a reflection of the modern housing).

For the Derwenthorpe research, REAP Petite was adapted to both further refine the instrument and also to incorporate some important additions relevant to this project, including: Derwenthorpe specific categories (house type; heating system), knowledge of and involvement of Derwenthorpe environmental interventions, household characteristics (size, income, tenure), views on energy efficiency, and a series of closed and open questions on satisfaction with new home and community.

Additionally, a measure of environmental attitude was incorporated into the survey. The New Ecological Paradigm (NEP) scale was chosen as it is widely used for measuring the degree of pro-environmental attitude (see Table A2). It was created in the 1970s and revised in the 1990s (Dunlap *et al.*, 2000) and has been used in hundreds of studies (Hawcroft and Milfont, 2010). The revised NEP involves using a five-point Likert scale in response to 15 items. This allows a picture of the environmental attitude of respondents to be built up (Dunlap *et al.*, 2000).

Table A2: The New Ecological Paradigm (NEP) scale

Question	Response score				
	1 Strongly disagree	2 Mildly Disagree	3 Unsure	4 Mildly agree	5 Strongly agree
1. We are approaching the limit of the number of people the earth can support.	1	2	3	4	5
2. Humans have the right to modify the natural environment to suit their needs.	5	4	3	2	1
3. When humans interfere with nature it often produces disastrous consequences.	1	2	3	4	5
4. Human ingenuity will insure that we do NOT make the earth unlivable.	5	4	3	2	1
5. Humans are severely abusing the environment.	1	2	3	4	5
6. The earth has plenty of natural resources if we just learn how to develop them.	5	4	3	2	1
7. Plants and animals have as much right as humans to exist.	1	2	3	4	5
8. The balance of nature is strong enough to cope with the impacts of modern industrial nations.	5	4	3	2	1
9. Despite our special abilities humans are still subject to the laws of nature.	1	2	3	4	5
10. The so-called "ecological crisis" facing humankind has been greatly exaggerated.	5	4	3	2	1
11. The earth is like a spaceship with very limited room and resources.	1	2	3	4	5
12. Humans were meant to rule over the rest of nature.	5	4	3	2	1
13. The balance of nature is very delicate and easily upset.	1	2	3	4	5
14. Humans will eventually learn enough about how nature works to be able to control it.	5	4	3	2	1
15. If things continue on their present course, we will soon experience a major ecological catastrophe.	1	2	3	4	5

Recruitment of respondents

Recruitment for respondents has taken various forms, including letters from the research team, presentations at community events, and attendance at a residents' association meeting. The survey has also been promoted via the Derwenthorpe Twitter and Facebook pages, at approximately six monthly intervals. Finally, we conducted a series of door-knocking sessions to encourage completion.

The study is asking people to complete REAP Petite for both the new Derwenthorpe homes and also for their old homes, where possible (particularly for interviewees). We are also incorporating a longitudinal element, asking everyone to complete REAP Petite at least once a year. We presumed 50 per cent participation rates.

To date, 40 different households have fully completed a REAP Petite form (see Appendix 3), a 42 per cent response rate (31 from phase 1 and 9 from phases 2/3). In addition, nine people have also completed a REAP Petite for their previous home. Annual heating and hot water consumption figures for each household were provided by JRHT and used to calculate power consumption. The remainder of the footprint was calculated using responses to the questions in REAP Petite. Table A3 shows that rental and shared ownership respondents were in the minority and under-represented according to Derwenthorpe's residential profile.

Table A3 Tenure of Derwenthorpe respondents

Number of children	Number of respondents
Own outright	10
Own with mortgage	19
Shared ownership	4
Rent	4
Not answered	5

The Derwenthorpe REAP Petite respondents spanned single occupancy households to those with three or more children, with 42 per cent respondents having two people in the household, compared with only 31 per cent in the national REAP Petite respondents. Derwenthorpe households also had a greater percentage of households without children than the national sample (65 per cent compared with 30 per cent, respectively).

Comparators

By agreement with JRF, the study is also recruiting simultaneous local and national comparators outside Derwenthorpe. To date, three main comparators are available:

- *Lancaster co-housing scheme* – an eco-housing development of 41 homes. 17 REAP Petite responses were received in 2013 (41 per cent response rate).
- *BedZED* – a low-carbon development of 82 homes in London. 19 responses were received in 2015 (23 per cent response rate).
- *Local/national 'scattergun' approach* – the research team and JRF have widely publicised the REAP Petite tool locally and nationally. To date 705 non-Derwenthorpe users have completed a survey. There are some clusters of respondents e.g. from Belfast, Glasgow, Southampton and Lancaster. This is not a nationally representative sample and may be biased towards individuals who are interested in environmental issues (and who therefore might be expected to have lower carbon footprints). This sample is referred to as 'rest of REAP Petite sample' in this document.

We will report the findings of our comparators in the next report.

Analysis of carbon footprints

Data is not normally distributed, so a Kruskal-Wallis test for difference between means was conducted for each of the footprint sectors. There was no significant difference in total footprint or environmental attitude between Derwenthorpe residents and the rest of the REAP Petite sample (Table A4). However, there was a significant difference in the power and shopping footprints between Derwenthorpe residents and the rest of the REAP Petite sample. A similar result was found for a comparison between Derwenthorpe and REAP Petite respondents from York (Table A5).

Table A4: Results of Kruskal-Wallis test for difference between means between footprint sectors of Derwenthorpe and rest of REAP Petite respondents

	Power	Food	Travel	Shopping	Activities	Total	Attitude
Chi-Square	24.182	2.275	.462	6.996	.266	.297	.516
Df	1	1	1	1	1	1	1
p value	<0.001*	.131	.497	.008*	.606	.586	.473

An asterisk indicates where there is a significant difference

Table A5: Results of Kruskal Wallis test for significant difference between average footprints of York and Derwenthorpe respondents

	Power	Food	Travel	Shopping	Activities	Total	Attitude
Chi-Square	29.559	3.213	3.884	4.987	.297	.59	.101
Df	1	1	1	1	1	1	1
p value	<0.001*	.073	.049	.026*	.586	.808	.750

An asterisk indicates where there is a significant difference

3 Evaluation of individual interventions

The biggest interventions at Derwenthorpe are its location, and the design of the homes and neighbourhood, which the evaluation will focus on throughout the study. The moving in process itself constitutes another intervention. Planned smaller interventions have included bike vouchers, a car club, bus passes and a bus route. A community garden has also been set up by residents, with support from the Joseph Rowntree Housing Trust.

The impact of individual interventions and various combinations are being evaluated through interviews with intervention providers, observation (where possible), as well as through questions added to the footprint tool and household research.

References

- [Dunlap, R. E., Van Liere, K. D., Mertig, A. G., and Jones, R. E. \(2000\) 'New trends in measuring environmental attitudes: measuring endorsement of the new ecological paradigm: a revised NEP scale', *Journal of Social Issues*, Vol. 56, No.3, pp 425–442](#)
- [Hawcroft, L. J., and Milfont, T. L. \(2010\) 'The use \(and abuse\) of the new environmental paradigm scale over the last 30 years: A meta-analysis', *Journal of Environmental Psychology*, Vol. 30, No. 2, pp. 143–158. doi:10.1016/j.jenvp.2009.10.003](#)
- [West, S.E., Owen, A., Axelsson, K., and West, C.D. \(in press\) 'Evaluating the use of a carbon footprint calculator: communicating impacts of consumption at household level and exploring mitigation options', *Journal of Industrial Ecology*](#)

Appendix 2: The creation of Derwenthorpe timeline

December 1989 – Site designated for housing in the Greater York Study.

1998 – Discussions begin between York City Council and the foundation to develop the site.

1999 – A competition to choose a masterplan is held, PRP Architects wins.

2002 – York City Council signs an agreement to transfer the land to the Joseph Rowntree Housing Foundation, in return for 'careful attention to environmental and social sustainability, provision of affordable housing and community participation'.

July – August 2003 – Outline planning application made to York City Council.

2003 – Local MP John Greenway presents a petition signed by 800 people calling for a public inquiry.

2004 – Two great crested newts discovered on the site. More environmental studies have to be done and the masterplan is adjusted.

2005 – Local planners 'minded to approve' application, but local government office decides it needs to be called in for an inquiry by an independent planning inspector and the secretary of state.

June – July 2006 – Communities secretary Ruth Kelly calls in the planning application, beginning a six-week public inquiry.

May 2007 – Ruth Kelly grants planning permission.

2007 – Protesters apply for Derwenthorpe site to be classified as a village green.

Early 2008 – Village green inquiry investigates and rejects the claim.

June 2008 – European Commission objects to the sale of land by York City Council to the Joseph Rowntree Housing Trust.

April 2010 – Commission rules Joseph Rowntree Housing Trust must procure a developer for each phase.

November 2010 – Mansell chosen as infrastructure contractor.

March 2011 – David Wilson Homes selected to build homes, work starts onsite

Source: 'Model village', Inside Housing, February 17 2012. Available at: <http://www.insidehousing.co.uk/model-village/6520514.article> (accessed 21 June 2015).

Appendix 3: REAP Petite questions

The following pages show the paper copy of the REAP Petite tool which was sent to Derwenthorpe residents, who could complete either this or the online version of the tool.

Calculate your Footprint

This questionnaire allows us to calculate the impact your household has on the environment. It is divided up into a number of different sections: some basic details, power, food, travel, shopping and other activities. This information will be put into a spreadsheet which allows us to calculate the greenhouse gas emissions associated with your household. The more information you provide, the more accurate your result will be.

Please complete even if you completed last year – we can then let you know how your carbon footprint has changed over time.

At the end of the questionnaire is an optional section called “Views” – this asks some demographic information about the person completing the questionnaire and their attitudes towards the environment. At the end of the questionnaire, you can leave contact details which we will use to provide you with your results.

Details

Your postcode _____
 How many people live in your home? _____
 How many of these are under 18? _____

Power

1. What kind of home do you live in?

- | | | | |
|------------------------------|-------------------------------------|--------------------------------------|--------------------------------------|
| Detached house | <input type="checkbox"/> 2 bedrooms | <input type="checkbox"/> 3 bedrooms | <input type="checkbox"/> 4+ bedrooms |
| Semi detached house | <input type="checkbox"/> 2 bedrooms | <input type="checkbox"/> 3 bedrooms | <input type="checkbox"/> 4+ bedrooms |
| Mid terrace | <input type="checkbox"/> 2 bedrooms | <input type="checkbox"/> 3+ bedrooms | |
| End terrace | <input type="checkbox"/> 2 bedrooms | <input type="checkbox"/> 3+ bedrooms | |
| Detached bungalow | <input type="checkbox"/> 2 bedrooms | <input type="checkbox"/> 3 bedrooms | <input type="checkbox"/> 4+ bedrooms |
| Semi detached bungalow | <input type="checkbox"/> 2 bedrooms | <input type="checkbox"/> 3+ bedrooms | |
| Flat with 3 external walls - | <input type="checkbox"/> 1 bedroom | <input type="checkbox"/> 2 bedrooms | <input type="checkbox"/> 3+ bedrooms |
| Flat with 2 external walls | <input type="checkbox"/> 1 bedroom | <input type="checkbox"/> 2 bedrooms | <input type="checkbox"/> 3+ bedrooms |

2. What is the main fuel used to heat your home?

- | | |
|--------------------------------------|---|
| <input type="checkbox"/> Gas | <input type="checkbox"/> Liquid petroleum gas |
| <input type="checkbox"/> Electricity | <input type="checkbox"/> Coal |
| <input type="checkbox"/> Oil | <input type="checkbox"/> Wood |

3. If you have your household’s energy bills available, please enter the amount of energy used per year. You should receive an ‘Annual Energy Statement’ once a year which contains this information.. If you do not have this information, we can estimate it from your answers to the rest of the questionnaire.

Fuel	Amount
Gas	KWh per year
Electricity	KWh per year
Oil	Litres per year
Lpg	Litres per year
Coal	Tonnes per year
Wood	Tonnes per year

4. Do you own any of the following appliance?

Appliance	Yes – energy efficient	Yes – not energy efficient	No – did not have
Fridge			
Freezer			
Washing machine			
Dishwasher			

5. What proportion of your household's light bulbs are energy efficient?

- All of them Some of them
 Most of them None of them

6. Which of these home energy efficiency improvements does your household have installed?

- Thick Loft insulation (150mm – 270mm)
 Thin Loft insulation (less than 150mm)
 Filled cavity walls Condensing boiler
 External Wall Insulation Combined Heat and Power System
 Hot water tank insulation Double or Triple Glazing

7. Which of these renewable technologies does your household have?

- Photovoltaics Ground source heat pump
 Solar water heating Biomass Boiler

8. Does your electricity come from 'Green' sources?

- Yes No

9. Do you turn lights and electrical items off when not in use?

- All the time Some of the time
 Most of the time Never

Food

1. In an average **week**, how many meals eaten by your household contain meat? (please circle). Note, if some members of your household eat less meat than others, choose a smaller number.

Breakfast	0	1	2	3	4	5	6	7
Lunch	0	1	2	3	4	5	6	7
Dinner	0	1	2	3	4	5	6	7

2. Per **week**, the average household in York¹ spends the following amounts on food and non-alcoholic drinks:

One person	Two people	Three people	Four people	Five people
£20	£52	£61	£82	£102

Do you think **your household** spends:

- Nothing
 Less than this
 About this amount
 More than this

3. Per **week**, the average household in York spends the following amounts on alcoholic drinks:

One person	Two people	Three people	Four people	Five people
£3	£6	£9	£12	£15

Do you think **your household** spends:

- Nothing
 Less than this
 About this amount
 More than this

4. Per **week**, the average household in York spends the following amounts on catered food and drink from canteens, restaurants and pubs:

One person	Two people	Three people	Four people	Five people
£14	£28	£43	£57	£71

Do you think **your household** spends:

- Nothing
 Less than this
 About this amount
 More than this

5. Does your household try to buy local and seasonal produce?

- All the time

¹ On the online version of the tool, the figures presented here are derived from the postcode inserted under Details and the number of occupants.

- Most of the time
- I don't tend to think about it

6. Does your household grow your own fruit and vegetables?

- No
- Yes, we had a small vegetable patch
- Yes, we had a large vegetable patch/allotment

Travel

1. How many different cars are used by your household in the average week? Include hired cars, car shares and cars where someone gets a regular lift:

For **car one**:

What type of car is it?

- | | |
|---|---|
| <input type="checkbox"/> Small petrol car up to 1.4l | <input type="checkbox"/> Small diesel car up to 1.7l |
| <input type="checkbox"/> Medium petrol car 1.4l to 2.0l | <input type="checkbox"/> Medium diesel car 1.7l to 2.0l |
| <input type="checkbox"/> Large petrol car over 2.0l | <input type="checkbox"/> Large diesel car over 2.0l |
| <input type="checkbox"/> Medium petrol hybrid car | <input type="checkbox"/> Medium LPG or CNG car |
| <input type="checkbox"/> Large petrol hybrid car | <input type="checkbox"/> Large LPG or CNG car |

How many people usually travel in it? _____

What is your household's yearly mileage in this car? _____

For **car two**:

What type of car is it?

- | | |
|---|---|
| <input type="checkbox"/> Small petrol car up to 1.4l | <input type="checkbox"/> Small diesel car up to 1.7l |
| <input type="checkbox"/> Medium petrol car 1.4l to 2.0l | <input type="checkbox"/> Medium diesel car 1.7l to 2.0l |
| <input type="checkbox"/> Large petrol car over 2.0l | <input type="checkbox"/> Large diesel car over 2.0l |
| <input type="checkbox"/> Medium petrol hybrid car | <input type="checkbox"/> Medium LPG or CNG car |
| <input type="checkbox"/> Large petrol hybrid car | <input type="checkbox"/> Large LPG or CNG car |

How many people usually travel in it? _____

What is your household's yearly mileage in this car? _____

For **car three**:

What type of car was it?

- | | |
|---|---|
| <input type="checkbox"/> Small petrol car up to 1.4l | <input type="checkbox"/> Small diesel car up to 1.7l |
| <input type="checkbox"/> Medium petrol car 1.4l to 2.0l | <input type="checkbox"/> Medium diesel car 1.7l to 2.0l |
| <input type="checkbox"/> Large petrol car over 2.0l | <input type="checkbox"/> Large diesel car over 2.0l |
| <input type="checkbox"/> Medium petrol hybrid car | <input type="checkbox"/> Medium LPG or CNG car |
| <input type="checkbox"/> Large petrol hybrid car | <input type="checkbox"/> Large LPG or CNG car |

How many people usually travel in it? _____

What is your household's yearly mileage in this car? _____

For car four:

What type of car was it?

- | | | | |
|--------------------------|--------------------------------|--------------------------|--------------------------------|
| <input type="checkbox"/> | Small petrol car up to 1.4l | <input type="checkbox"/> | Small diesel car up to 1.7l |
| <input type="checkbox"/> | Medium petrol car 1.4l to 2.0l | <input type="checkbox"/> | Medium diesel car 1.7l to 2.0l |
| <input type="checkbox"/> | Large petrol car over 2.0l | <input type="checkbox"/> | Large diesel car over 2.0l |
| <input type="checkbox"/> | Medium petrol hybrid car | <input type="checkbox"/> | Medium LPG or CNG car |
| <input type="checkbox"/> | Large petrol hybrid car | <input type="checkbox"/> | Large LPG or CNG car |

How many people usually travel in it? _____

What is your household's yearly mileage in this car? _____

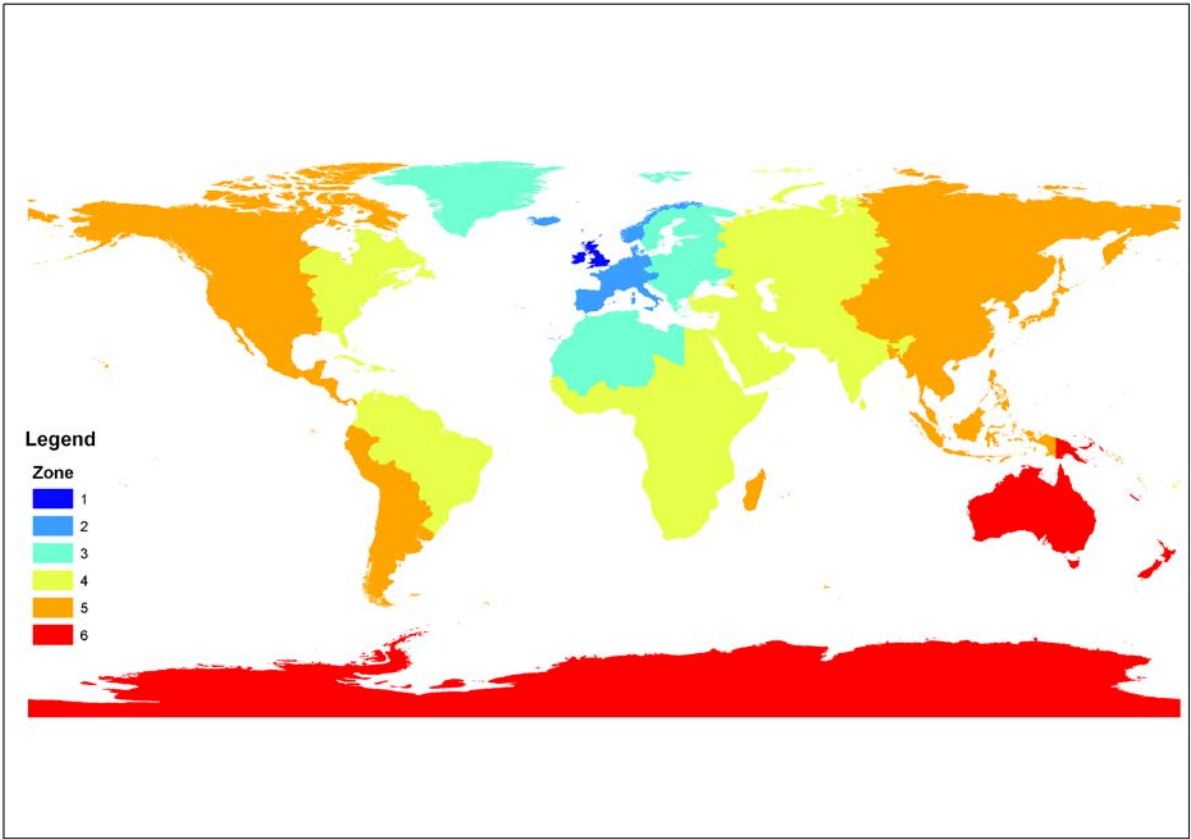
NOTE: LPG = Liquefied Petroleum Gas, CNG = Compressed Natural Gas

2. Estimate how many miles your household travels by each mode of transport in the average week. Include commuting travel (i.e. getting to work), but *not* travel done as part of your job:

Mode of transport	Total Miles travelled
On foot	
Bicycle	
Bus	
Train	
Light rail	
Tram	
Underground	
Ferry – foot passenger	
Ferry – car passenger	

5. Using the map, how many return flights have been made in total by your household to the following locations in the past year. For example, if four people travelled to Western America, include this as four return flights to Zone 4

- ___ Zone 1 (UK)
- ___ Zone 2 (Western Europe)
- ___ Zone 3 (Eastern Europe and North Africa)
- ___ Zone 4 (Western USA, Brazil, rest of Africa, Middle East, West Asia) _____
- Zone 5 (Rest of America, East Asia)
- ___ Zone 6 (Australia and New Zealand)



Shopping

1. Per **month**, the average household in York spends the following amount on clothing:

One person	Two people	Three people	Four people	Five people
£33	£66	£99	£132	£165

Do you think **your household** spends:

- Nothing Up to double this amount
 Less than this More than double this amount
 About this amount

2. Per **month**, the average household in York spends the following amount on footwear:

One person	Two people	Three people	Four people	Five people
£8	£15	£23	£30	£38

Do you think **your household** spends:

- Nothing Up to double this amount
 Less than this More than double this amount
 About this amount

3. Per **month**, the average household in York spends the following amount on newspapers and books:

One person	Two people	Three people	Four people	Five people
£11	£23	£31	£45	£56

Do you think **your household** spends:

- Nothing Up to double this amount
 Less than this More than double this amount
 About this amount

4. Per **month**, the average household in York spends the following amount on toiletries and make-up:

One person	Two people	Three people	Four people	Five people
£17	£34	£51	£68	£86

Do you think **your household** spends:

- Nothing Up to double this amount
 Less than this More than double this amount
 About this amount

5. How many of these items have you bought in the last **year**?

- Large item of furniture (e.g. sofa/bed/wardrobe)
 Small item of furniture (e.g. bookcase/coffee table)
 small kitchen appliance (kettle/juicer/food processor)
 small household appliance (iron, electric fan)
 fridge washing machine
 freezer dishwasher

6. How many of these items has your household bought in the last **year**?

- | | |
|---|---|
| <input type="checkbox"/> mobile phones | <input type="checkbox"/> laptop |
| <input type="checkbox"/> cameras | <input type="checkbox"/> desk top computers |
| <input type="checkbox"/> MP3 player | <input type="checkbox"/> hi fi |
| <input type="checkbox"/> flat screen television | <input type="checkbox"/> DVD player |
| <input type="checkbox"/> regular television | <input type="checkbox"/> camcorder |
| <input type="checkbox"/> digital box | <input type="checkbox"/> CDs |

7. In one **year**, the average household in York spends the following on jewellery and watches:

One person	Two people	Three people	Four people	Five people
£64	£128	£192	£256	£320

Do you think **your household** spends:

- | | |
|--|---|
| <input type="checkbox"/> Nothing | <input type="checkbox"/> Up to double this amount |
| <input type="checkbox"/> Less than this | <input type="checkbox"/> More than double this amount |
| <input type="checkbox"/> About this amount | |

8. In one **year**, the average household in York spends the following on power tools:

One person	Two people	Three people	Four people	Five people
£38	£76	£113	£151	£189

Do you think **your household** spends:

- | | |
|--|---|
| <input type="checkbox"/> Nothing | <input type="checkbox"/> Up to double this amount |
| <input type="checkbox"/> Less than this | <input type="checkbox"/> More than double this amount |
| <input type="checkbox"/> About this amount | |

Activities

1. Per **month**, the average household in York spends the following on games, computer games, sports equipment and hobbies:

One person	Two people	Three people	Four people	Five people
£8	£16	£23	£31	£39

Do you think **your household** spends:

- | | |
|--|---|
| <input type="checkbox"/> Nothing | <input type="checkbox"/> Up to double this amount |
| <input type="checkbox"/> Less than this | <input type="checkbox"/> More than double this amount |
| <input type="checkbox"/> About this amount | |

2. Per **month**, the average household in York spends the following on watching and participating in sports, including gym membership:

One person	Two people	Three people	Four people	Five people
£9	£18	£26	£35	£44

Do you think **your household** spends:

- | | |
|--|---|
| <input type="checkbox"/> Nothing | <input type="checkbox"/> Up to double this amount |
| <input type="checkbox"/> Less than this | <input type="checkbox"/> More than double this amount |
| <input type="checkbox"/> About this amount | |

3. Per **month**, the average household in York spends the following on making phone calls including mobile calls:

One person	Two people	Three people	Four people	Five people
£20	£40	£60	£80	£99

Do you think **your household** spends:

- Nothing Up to double this amount
 Less than this More than double this amount
 About this amount

4. Per **month**, the average household in York spends the following on betting and the lottery:

One person	Two people	Three people	Four people	Five people
£6	£12	£18	£25	£31

Do you think **your household** spends:

- Nothing Up to double this amount
 Less than this More than double this amount
 About this amount

5. Per **month**, the average household in York spends the following on cinema, theatre, television licenses and subscriptions:

One person	Two people	Three people	Four people	Five people
£18	£36	£53	£71	£89

Do you think **your household** spends:

- Nothing Up to double this amount
 Less than this More than double this amount
 About this amount

6. Per **month**, the average household in York spends the following on pets and pet food:

One person	Two people	Three people	Four people	Five people
£6	£11	£17	£22	£28

Do you think **your household** spends:

- Nothing Up to double this amount
 Less than this More than double this amount
 About this amount

6. If your household contains smokers, how much is spent on cigarettes and tobacco per **week**?

- Nothing £20.00 to £40.00
 Less than £20.00 More than £40.00

7. How frequently do you redecorate your home?

- Rarely - one room every three or more years
 Occasionally - one room every one or two years
 Often - always working on something

Views

This section will help us put your responses into context, but is entirely voluntary.

1. Name
2. Sex Male Female Prefer not to say
3. Age
4. Contact details (email, phone, address). This will allow us to let you know your footprint calculation:

5. Yearly Household Income:

- | | |
|--|--|
| <input type="checkbox"/> £0 | <input type="checkbox"/> £20,000 – £29,999 |
| <input type="checkbox"/> £1 – £4999 | <input type="checkbox"/> £30,000 – £49,999 |
| <input type="checkbox"/> £5000 – £9999 | <input type="checkbox"/> £50,000 – £74,999 |
| <input type="checkbox"/> £10,000 – £19,999 | <input type="checkbox"/> £75,000 plus |

Now we would like to get your opinion on a wide range of environmental issues. For each of the following statements please indicate the extent to which you agree or disagree. This will give us a measure of your environmental attitude.

	Strongly Disagree	Mildly Disagree	Unsure	Mildly Agree	Strongly Agree
We are approaching the limit of the number of people the earth can support					
Humans have the right to modify the natural environment to suit their needs					
When humans interfere with nature it often produces disastrous consequences					
Human ingenuity will insure that we do NOT make the earth unlivable					
Humans are severely abusing the environment					
The earth has plenty of natural resources if we just learn how to develop them					
Plants and animals have as much right as humans to exist					

Living at Derwenthorpe

1. Which year did you move to Derwenthorpe?

2. Which month did you move to Derwenthorpe?

3. Why did you move to Derwenthorpe?

4. What is it like living at Derwenthorpe?

5. In which of these ways do you occupy your home? (please tick)

Own it outright

Buying it with the help of a mortgage or loan

Pay part rent and part mortgage (shared ownership)

Rent it from Joseph Rowntree Housing Trust

Rent it from an individual private owner

Live here rent-free (e.g. living in relative's/friend's property)

Don't know

6. How satisfied are you with your local area as a place to live? (please tick one option)

Don't know

Very satisfied

Fairly satisfied

Neither satisfied nor dissatisfied

Slightly dissatisfied

Very dissatisfied

7. How satisfied are you with your accommodation? (please tick one option)

Don't know

Very satisfied

Fairly satisfied

Neither satisfied nor dissatisfied

Slightly dissatisfied

Very dissatisfied

8. How satisfied are you with the energy efficiency of your home? (please tick one option)

Don't know

Very satisfied

Fairly satisfied

Neither satisfied nor dissatisfied

Slightly dissatisfied

Very dissatisfied

9. How easy or not do you find it to meet your household energy bills at the moment?

Don't know

Very easy

Fairly easy

Neither easy nor difficult

Slightly difficult

Very difficult

10. How regularly do you use your household recycling bins provided by the council?

Don't know

Always

Usually

Sometimes

Rarely

Never

11. How regularly do you use your compost bin?

Don't know

Always

Usually

Sometimes

Rarely

Never

12. How regularly do you use your water butt?

Don't know

Always

Usually

Sometimes

Rarely

Never

13. Please indicate the extent to which you agree or disagree with the following statements about Derwenthorpe.

	Strongly agree	Mildly agree	Unsure	Mildly disagree	Strongly disagree
Derwenthorpe is a strong community					
Living at Derwenthorpe will reduce my energy costs					
Living at Derwenthorpe will reduce my transport costs					
Derwenthorpe will make me live a greener lifestyle					

14. Has anyone in your household used or participated in any of the following over the last six months at Derwenthorpe? (tick all that apply)

Car club	
Bicycle purchase discount scheme	
Discounted bus pass	
Community environmental event e.g. organised walk; community presentation	
No but hope to use one or more of above in the future	
No and do not plan to use any of above	

15. Please add any other comments on Derwenthorpe here

Thank you for your time!

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