Brownfield residential redevelopment in England

What happens to the most deprived neighbourhoods?

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What changes have brownfield housing development brought to our most deprived neighbourhoods in England?

Government policy has emphasised the importance of regenerating towns and cities and delivering new housing supply by focusing on recycling previously developed (brownfield) land. The aim of this study is to examine the extent of brownfield regeneration through the delivery of new housing development and its effects on housing and socio-economic change across the most deprived neighbourhoods in England.

The report examines:

- the trends and spatial patterns of brownfield land reuse for housing development across different English regions, including the reuse of more problematic vacant and derelict land;
- the differing patterns of brownfield residential development in four different types of deprived neighbourhood;
- how policy has affected these neighbourhoods' changing housing market conditions, population growth, and relative economic deprivation.

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Executive summary

The reuse of brownfield, or previously developed, land for housing has been a major policy objective in England since the late 1990s, aimed at reducing urban sprawl and greenfield development, as well as contributing to a more compact form of urban development. In February 1998, the government announced a national target for at least 60% of all new housing to be built on brownfield land by 2008, a target that was subsequently achieved eight years ahead of schedule. Since then, the amount of new housing built on brownfield land has risen consistently, reaching a provisional estimate of 80% in 2008.

Previously developed land is defined by the government in *Planning Policy Statement 3* as land 'which is or was occupied by a permanent structure, including the curtilage of the developed land and any associated fixed surface infrastructure' (DCLG, 2006, p. 27).

This report explores how far brownfield policy objectives have been achieved in different areas and the impact of residential brownfield regeneration on the most deprived neighbourhoods. The key findings from the report may be summarised as follows:

- While the government's brownfield housing target has been met consistently since 2000, the actual amount of brownfield land used for residential purposes during 2000–06 (2,774 hectares a year) was only marginally higher than that achieved throughout the period 1989–98 (2,644 hectares a year). There has actually been a decline in the total amount of land used for residential development from 5,660 to 4,765 hectares a year over the two time periods. The meeting of the brownfield target has, therefore, been mainly a result of a parallel decrease in the use of greenfield land.

- The patterns and extent of brownfield land reuse for housing development vary greatly across the English regions:
  - the North West and London have been performing well, with a high proportion of residential development land coming from brownfield sources and including reuse of problematic vacant and derelict land;
  - the North East has been particularly good at recycling vacant and derelict land, but the overall proportion of land used for housing that is brownfield rather than greenfield remains lower than in most other regions;
  - in the South East and East of England, brownfield land reuse tends to be related to the redevelopment of previous residential sites.

- The average new-build dwelling density in England increased from 31 dwellings per hectare in 2001–04 to 42 in 2005–08. However, the most stark increase in dwelling density was found on sites that were previously vacant and derelict (from 39 to 68) and on sites primarily used for other development, such as transport and commercial use (from 46 to 71), and for minerals, landfill and defence use (from 28 to 51).

- There has been an increase in the proportion of brownfield land used for housing in the most deprived neighbourhoods. Around 24% of England's brownfield land reused for housing development was located in the 20% most deprived neighbourhoods in 2005-08 compared with 17% in 2001–04. Indeed, the amount of brownfield land recycled for housing use increased most rapidly in the 10% most deprived neighbourhoods in England, with a 25% increase between 2001–04 and 2005–08.

- The increased level of brownfield housing development in the most deprived neighbourhoods is mirrored by strong housing market performance in these areas. The

house price gap between the most deprived neighbourhoods and the England average narrowed between 2001 and 2008. House prices increased by 102% in the 10% most deprived neighbourhoods and by 96% in the 20% most deprived neighbourhoods, compared with 81% in England overall. Between 2005 and 2008, even with a slow-down in the property market, house price increases in deprived neighbourhoods outperformed the England average.

- The uptake of brownfield land across different types of deprived neighbourhoods for housing development has been high, even in areas with long-term vacant and derelict land. The market for flats in particular has grown since the mid-2000s. This new housing has also altered the socioeconomic dynamics of these neighbourhoods, with population growth evident in the most deprived areas between 2001 and 2007.

- Overall, these redeveloped areas have seen improvements in employment and income deprivation rankings (as measured in the government's Economic Deprivation Index) when compared with other neighbourhoods that have not experienced brownfield redevelopment for housing.

- House price increases, population growth and improvements in deprivation indices are broad signs of brownfield regeneration policy success in deprived neighbourhoods. However, the brownfield housing market in these areas has been the result of selective activities of developers that have targeted areas with greatest development potential within the constraints of the planning framework, which has restricted greenfield development.

- The impact of brownfield residential development on deprived areas differs according to neighbourhood type:

  – *escalator*: where incomers arrive from similar or more deprived areas and out-movers go to less deprived areas. This neighbourhood type represents upward progression through housing and labour markets;

  – *gentrifier*: where the social composition is altered by incomers from less deprived areas and out-movers to similar or more deprived locations;

  – *isolate*: where there is less inward and outward migration to and from other less deprived areas, resulting in socially isolated neighbourhoods;

  – *transit*: where most incomers and out-movers come from and go to less deprived areas. Typically, this represents young households moving on to the housing ladder.

- The analysis of brownfield reuse trends in the four types of deprived neighbourhood suggests different development trajectories within them.

  – *Gentrifier areas* performed best in terms of the take-up of brownfield land in the early 2000s and their improvement in the Economic Deprivation Index, although house price increases here were not as high as in the other three area types.

  – *Transit areas* experienced a high level of brownfield reuse, particularly in the mid-2000s, resulting in extremely high-density housing. Like gentrifier areas, they have experienced high population growth, which has supported improvements in economic deprivation rankings. These areas did not experience the highest house price change, as they commanded relatively high house prices throughout the 2000s.

  – *Isolate areas* experienced major brownfield recycling activities but at a relatively low density. While these neighbourhoods experienced a substantial increase in house prices from a very low level, there was lower population growth.

- In contrast to the other neighbourhood types, *escalator areas* tended to perform at a more modest level in terms of average house price increase across different house types and improvement in the Economic Deprivation Index rankings. However, they experienced the highest level of price increase in the flats market between 2001 and 2008.

- The findings emerging from this report raise a number of issues for national policy:

  - First, they raise questions over whether a blanket national brownfield target, with a very broad-brush definition of previously developed land, continues to be meaningful in measuring progress towards overall housing targets in light of the reduction in land becoming available for residential development throughout the 2000s. The uptake of brownfield land for housing development may fall further following the recent economic downturn, which may hinder national attempts to increase housing supply. While brownfield policy objectives have been successful in the past, any future targets for brownfield reuse should adopt a more nuanced and contextualised approach to reflect local circumstances. For instance, brownfield development in less desirable areas (for example, where land is contaminated or there is low housing demand) could be supported by government gap funding. Alternatively, in areas that have no sustainable brownfield sites, more greenfield land should be released for housing development.

  - Second, while brownfield land reuse has supported urban containment and some regeneration in deprived neighbourhoods, there are concerns about whether this approach necessarily supports sustainable development. The move towards high-density, compact urban development raises concerns over town-cramming and garden-grabbing as well as the compatibility of new development with the character of the built environment in some mature residential neighbourhoods (such as tree-lined avenues of Victorian houses). There are also concerns that this policy has encouraged a focus on building flats in city-centre locations that may not be versatile enough to adapt to households going through different life stages (from getting married and having children to retirement) and thus may result in population churn and neighbourhood instability. The Environment Agency has also raised issues over the assessment and treatment of flood risk in brownfield land reuse, which may become more of a concern with the potential for increased flood risk in the future due to climate change. This means that we need to consider sustainable development in a more locally sensitive way to reflect the conditions and character of the site and its surrounding environment. It is also important to ensure that there is a variety of housing to meet with local housing demand and needs.

  - Third, the analysis of different neighbourhood types shows that brownfield reuse activities have helped to bring residents back into the most deprived neighbourhoods, injecting dynamics into the housing market and reducing the relative ranking of economic deprivation in these areas. While this is a sign of the success of targeted policies, it can also be interpreted as a function of how the housing market interacts with more general policy frameworks, with developers choosing areas with more favourable development potential for major brownfield reuse activities, especially when there has been much less prospect of gaining permission for greenfield housing development.

- The success of using brownfield targets has been to focus policy-makers and the development industry's attention over the past decade on the importance of conserving land resources and revitalising towns and cities. Notwithstanding the positive outcomes achieved in our most deprived neighbourhoods

under the brownfield residential reuse policy, concerns have been widely raised about the sustainability and appropriateness of continuing such a high-density brownfield regeneration approach to deliver the government's ambitious housing target in the future. At the turn of a new decade, it is, therefore, timely to reconsider housing planning strategy and targets in order to meet projected housing needs in the most sustainable manner.

1 Introduction

The reuse of brownfield land has been at the heart of successive government regeneration policies since the 1980s. Initially, this was a reaction to the legacy of deindustrialisation and provided a focus on the regeneration of former vacant and derelict industrial sites. However, it was not until the late 1990s that brownfield land reuse became a strategic objective of spatial planning and urban regeneration policies, aimed at reducing urban sprawl and greenfield development as well as promoting a more compact urban form.[1] In February 1998, the government announced a national target for at least 60% of all new housing to be built on brownfield land by 2008 (DETR, 2000), a target that was subsequently achieved eight years ahead of schedule. Since then, the share has been consistently rising to a provisional estimate of 80% in 2008 (DCLG, 2010).

The Urban Task Force published a report in 1999, setting out how to provide desirable towns and cities to accommodate an extra four million new households over the 25-year period (Urban Task Force, 1999). This was later revised by the Prime Minister, Gordon Brown, to a target of three million new dwellings (an annual target of 240,000) by 2020 (DCLG, 2007a). Since then, there has been continual debate over the number of new homes to be built and the physical capacity of areas to support new development. Government planning policy guidance on densities for new homes stipulates 30-50 dwellings per hectare, and even more in urban areas with good public transport links (DETR, 2000).

With the government's emphasis on urban renaissance and the importance of brownfield land reuse to deliver national new-build housing targets, this report examines the cumulative impact of these policies on housing and neighbourhood change across England, with a particular focus on the most deprived urban neighbourhoods. The policy impacts are examined in terms of these neighbourhoods' changing housing market conditions (house prices), population growth and relative economic deprivation. The report also considers whether the high-density brownfield development approach continues to be relevant for meeting national housing delivery targets under the current macroeconomic climate.

Brownfield land in this study refers to the government's definition in *Planning Policy Statement 3* (DCLG, 2006): 'previously-developed land is that which is or was occupied by a permanent structure, including the curtilage of the developed land and any associated fixed surface infrastructure' (DCLG, 2006, p. 26). Several key data sources were used in the analysis: the National Land Use Database of Previously Developed Land and Buildings (NLUD); the Land Use Change Statistics; the Land Registry Housing Transaction Data; the 2004 Index of Multiple Deprivation[2]; and the Economic Deprivation Index. Since the NLUD data is survey-based, the non-response of a few local authorities every year means that certain adjustments and estimations have to be made to allow consistent comparison.[3] As this report focuses on examining the reuse of brownfield sites and its associated neighbourhood change, it can only include sites that have been reported to NLUD with detailed information.[4] In order to maximise the coverage of the sites for consistent comparison, the analysis focuses on two separate periods of time: 2001–04 and 2005–08. A major GIS analytical exercise was carried out to link datasets of different spatial and temporal scales to a consistent data structure to allow very fine-grained analysis of the patterns and scale of brownfield reuse in different types of neighbourhood.

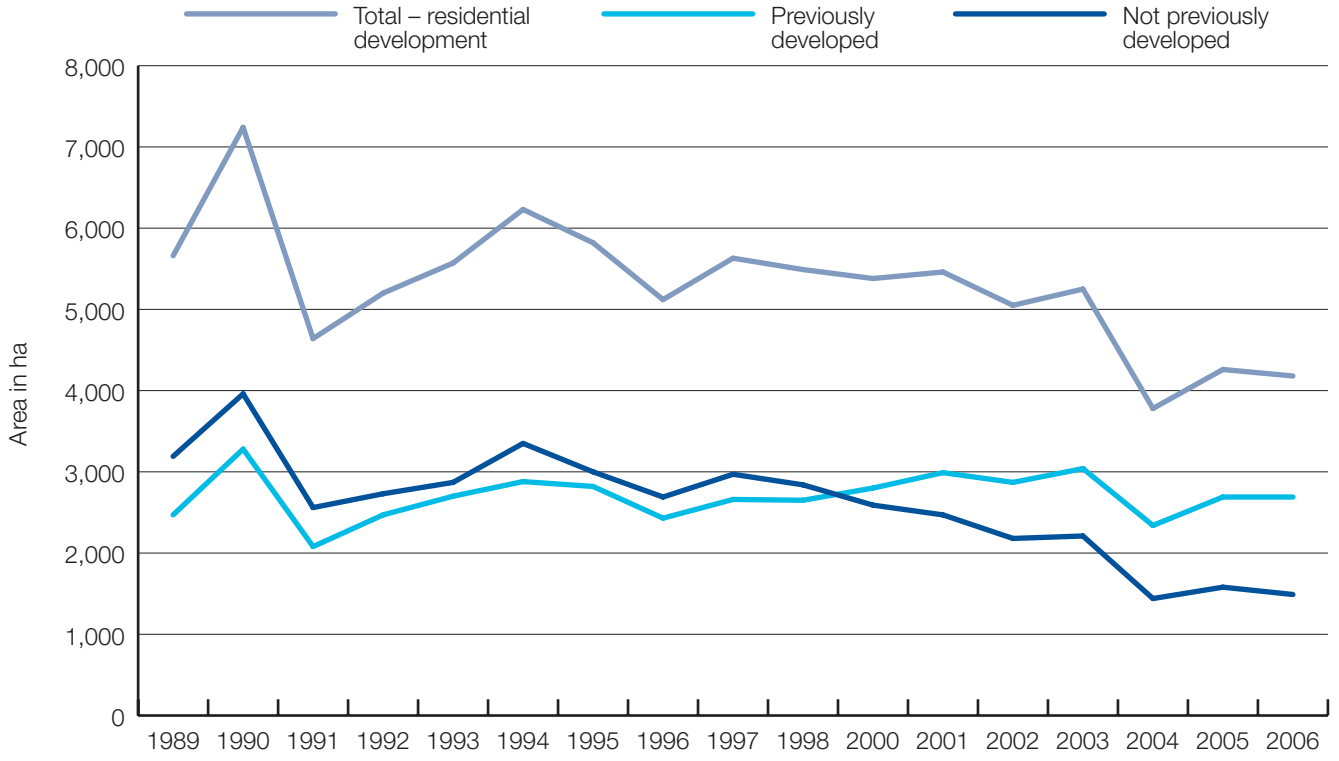
2 Patterns of brownfield residential reuse

National trends suggest that the ease in meeting the 60% brownfield housing development target may mean that there is scope to increase the capacity of development. However, the use of a percentage target can mask very different realities because we are measuring the *relative* relationship between changes in brownfield and greenfield land development.

Land Use Change Statistics in Figure 1 show the trend in use of different types of land for housing development since 1989. It is clear that the year 2000 was a turning point; since then more brownfield land and less greenfield land has been used for residential development. However, the rising share of brownfield housing development overall since 2000 is largely due to a major decrease in the use of greenfield land for residential development. While the government's brownfield housing target has been met consistently since 2000, documented in the regular reports on Land Use Change Statistics, the actual amount of brownfield land developed for residential use was only marginally higher in the 2000s than in the 1990s. Between 1989 and 1998, an average of 2,644 hectares a year of previously developed land had changed to residential use, while the figure was an average of 2,774 hectares a year between 2000 and 2006. Overall, this reflects the wider decline in house-building with a resultant fall in the total amount of land used for residential development from an annual average of 5,660 hectares in 1989–98 to 4,765 hectares in 2000–06.

The headline national figures also tend to conceal the regional dynamics of brownfield land development. While the proportion of residential development on brownfield land across England increased from 55% to 69% between 2001 and 2008, this was distorted by the situation in London. Being a highly urbanised conurbation, 89–94% of

Figure 1: Land changed to residential use



residential land in London came from brownfield sources between 2001 and 2008 (see Figure 2).

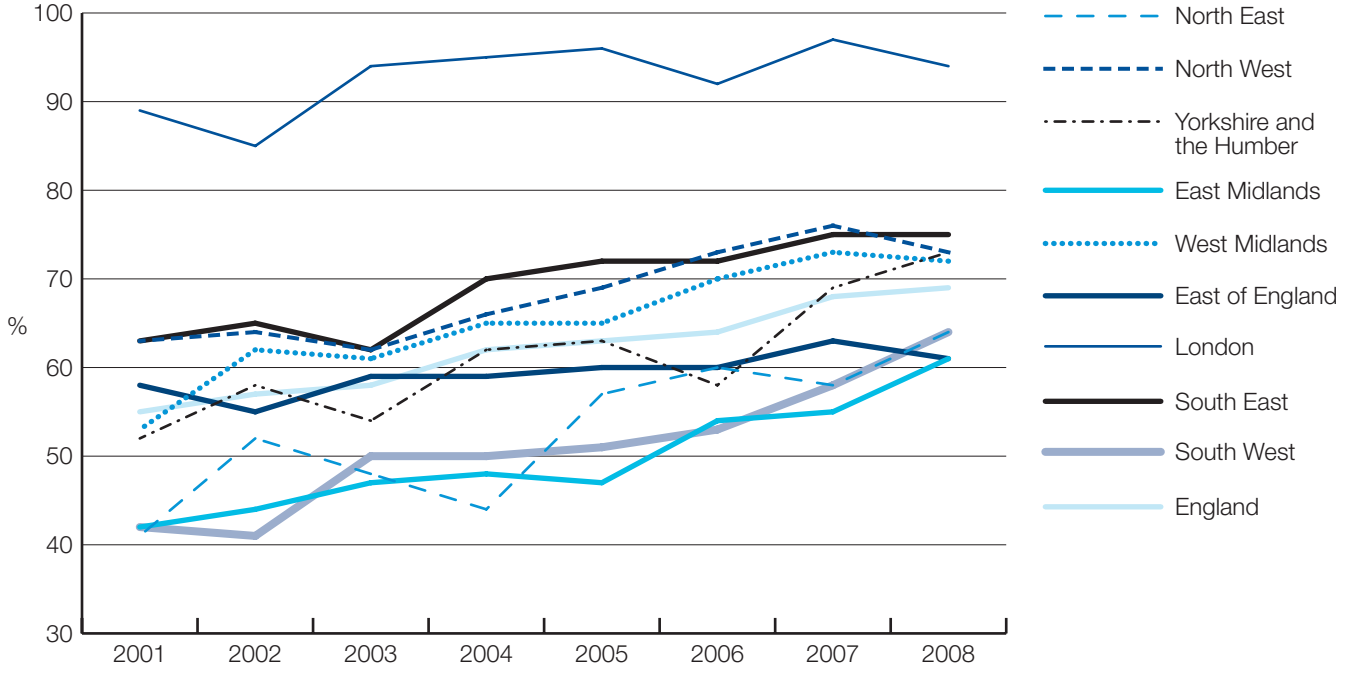
Besides London, the South East (which has high housing demand) and the North West and the West Midlands (both of which have a large amount of brownfield land in relation to their industrial legacy) have consistently experienced a large proportion of brownfield land reuse for residential development. It is, however, surprising to note that other regions with significant amounts of brownfield land, most notably the North East, do not show a similarly high proportion of brownfield land reuse. This is probably related to the fact that less than half of the brownfield sites in this region have been deemed as suitable for housing by the local authorities in the datasets provided for the National Land Use Database of Previously Developed Land. The situation of Yorkshire and the Humber has been fluctuating, although it has caught up with the North West recently.

The less industrialised regions, such as the East Midlands and the South West, tend to have lower levels of residential reuse of brownfield land, which is probably related to their lack of brownfield stock. It is, however, somewhat surprising to find that the East of England has outperformed the East Midlands in using brownfield land for housing development. Figure 2 also shows that there are early signs of a relative reduction in the use of brownfield land for housing development in most regions since the economic downturn in 2007.

The government's definition of brownfield land is rather broad, and includes any previously developed land, ranging from desirable public green space such as playing fields and gardens through to former housing sites and more problematic vacant and derelict land (in many cases including contaminated former industrial sites). This means that there may be differences in the extent of contamination of brownfield sites between different regions and thus varying levels of suitability for housing. Sites previously used for mining and related heavy industries such as coking plants, steelworks or chemical industries are more likely to be heavily contaminated than former cotton mills or manufacturing sites.

In light of this definition, a high proportion of brownfield land reuse does not necessarily indicate a major contribution towards sustainable urban regeneration, as the land reused will include more desirable green spaces as well as contaminated land. The use of urban green space can have negative consequences on environmental quality and result in town-cramming and garden-grabbing (House of Commons, 2010) as well as potential incompatibility of new developments with the character of some mature residential neighbourhoods (for example, tree-lined avenues

Figure 2: Brownfield land developed for residential use by region



of Victorian houses). Furthermore, many flats in city-centre locations lack adequate surrounding public space and amenities and are not versatile enough to adapt to households as they move through different stages of life (from getting married and having children to retirement), which may result in increased population turnover and introduce instability to neighbourhoods. The Environment Agency (2003) has also issued a position statement to highlight the fact that some brownfield and derelict land is a core part of urban green networks, providing wildlife habitats and public green space. It has also raised concerns over the assessment and treatment of flood risk in brownfield land reuse in the future. This suggests that there is a need to strike an appropriate balance in brownfield reuse to pursue the objective of sustainable development.

All this suggests, therefore, that it is important to explore the *types* of brownfield land being reused for housing (see Figure 3). Despite the fact that the North East has the lowest overall proportion of brownfield land for residential reuse in England, the region has been most successful in recycling vacant and derelict land (34% of all land used for residential purposes) and keeping land available for employment use. This is followed by the North West (30%) and London (27%). However, the West Midlands (22%) and Yorkshire and the Humber (14%) have not been performing that well in shifting vacant and derelict land. The South East (49%), the South West (36%) and the East of England's (36%) brownfield residential land sources have been dominated by former residential land, including garden space.

Most brownfield sites are located in urban areas and deemed as suitable for high-density housing development. Under pressure to meeting housing targets, local authorities have supported high-density brownfield development as contributing to the urban renaissance agenda. Alongside established green belt policy, compact, high-density redevelopment has served as a tool for urban containment, reducing the extent of urban sprawl and relieving pressure on greenfield development. Figure 4 shows that the average dwelling density in England has increased from 31 dwellings per hectare in 2001–04 to 42 in 2005–08. However, the most stark increase in dwelling density was found on sites that were previously vacant and derelict (from 39 to 68), or used for

Figure 3: Brownfield land types residential use by region

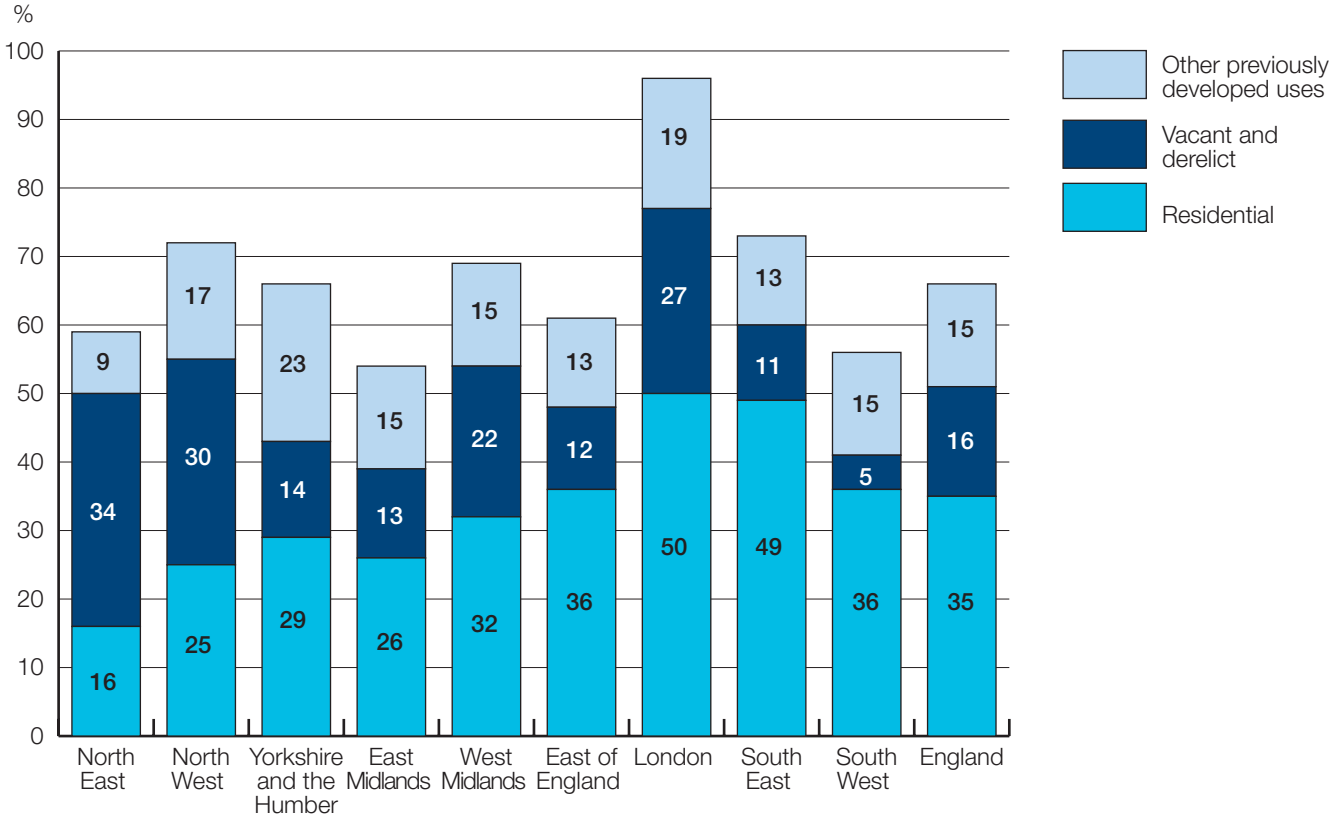
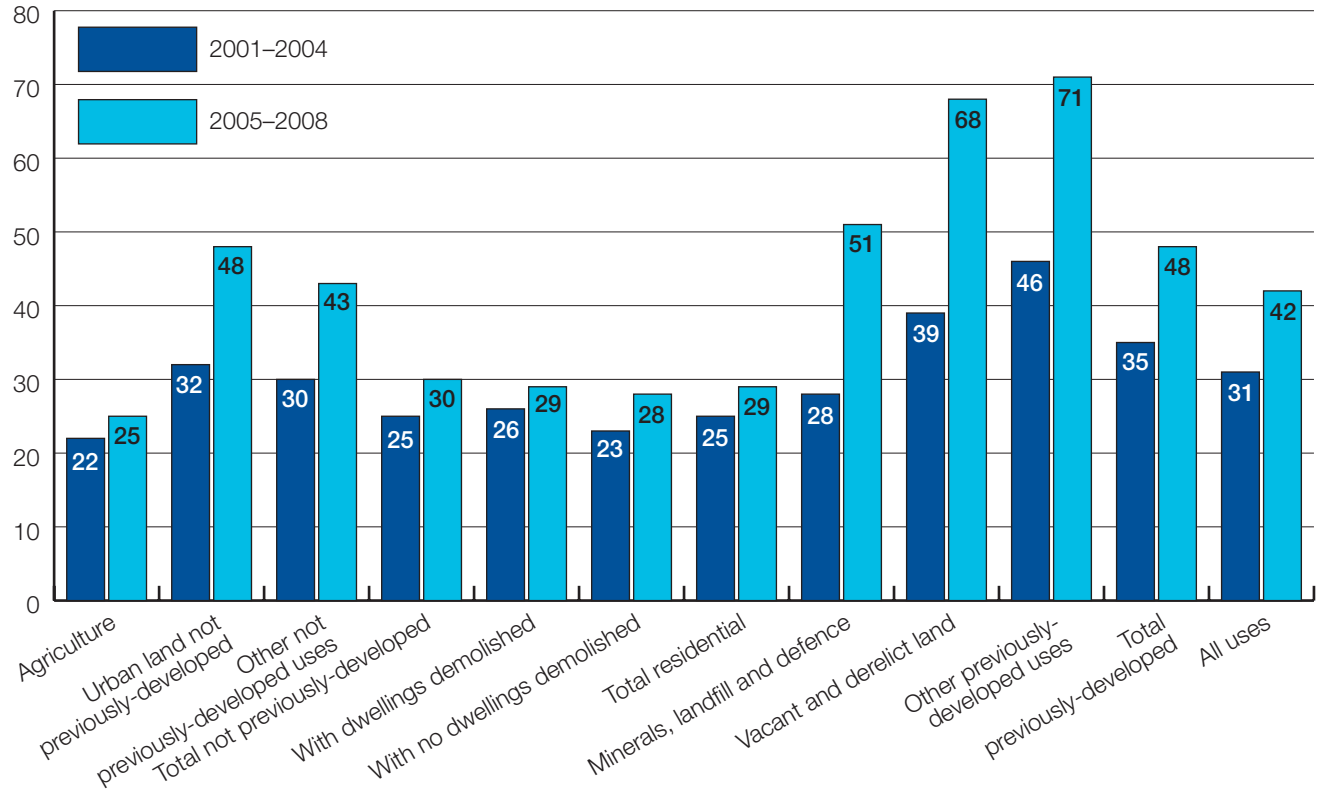


Figure 4: Average dwelling density per hectare by land types



other forms of development (such as transport and utilities, industrial and commercial use) (from 46 to 71) or for minerals, landfill and defence (from 28 to 51).

The analysis so far suggests that the patterns and extent of brownfield land reuse for housing development vary greatly across the regions. The North West and London have been performing well in terms of shifting development from greenfield to brownfield land as well as making use of more problematic vacant and derelict land. The North East has been particularly good at recycling vacant and derelict land, but the overall proportion of land used for residential development that is brownfield rather than greenfield land is lower. By contrast, brownfield land reuse in the South East and the East of England tends to be related to the redevelopment of previous residential sites. In the southern part of the country, the reuse of brownfield land has a stronger environmental focus on reducing urban sprawl. This means that it is more concerned with managing household growth rather than pursuing urban regeneration objectives (Carmona, 2001).

3 Brownfield residential reuse in deprived neighbourhoods

The brownfield land housing development target has been closely entwined with the government's wider urban regeneration and housing policy agenda. This includes the introduction in 1998 of the ten-year New Deal for Communities programme, an integrated area-based programme with a £2 billion budget. In addition, an £800 million Neighbourhood Renewal Fund (NRF) was established to support 88 local authorities containing the most deprived neighbourhoods, identified on the basis of the 2000 Index of Multiple Deprivation (IMD), for the period 2001–04. A total of nine Housing Market Renewal Pathfinders were created in the North of England and the Midlands in April 2002 to target areas of urban decline for major housing redevelopment through the use of brownfield land. It is therefore important for policy to assess whether the push towards high-density brownfield development has changed the dynamics of housing development in England's most deprived neighbourhoods, which tend to be located in declining urban areas.

The analysis here focuses on examining the characteristics of brownfield housing development in the most deprived 10% and 20% neighbourhoods as ranked by the 2004 IMD. Figure 5 shows the brownfield sites that have been reused for residential development between 2001 and 2008. Table 1 shows that the reuse of brownfield land in England, in terms of number of sites and land area, decreased during 2005–08 compared with 2001–04, which is probably due to the exhaustion of the most viable and profitable brownfield land supply. However, in the most deprived neighbourhoods, the development trend reversed; more sites and land area were recycled for housing use in 2005–08. More importantly, about 24% of England's brownfield land reused for housing development was located in the 20% most deprived neighbourhoods in 2005–08, compared with 17% in 2001–04. Indeed, the amount of recycled brownfield land for housing use increased most rapidly in the 10% most deprived neighbourhoods, with a 25% increase between 2001–04 and 2005–08.

The increase in brownfield housing development activities, both in absolute and relative terms, in the most deprived neighbourhoods is mirrored by the strong performance of the housing market in these areas (see Table 2). In spite of the absolute increase in the price differential between the most deprived areas and the national average in England, the relative house price gap between them has narrowed since 2001 (see Figure 6). This is due to a relatively higher level of house price increase between 2001 and 2008 in deprived areas: an increase of 102% in the 10% most deprived neighbourhoods and 96% in the 20%

Table 1: Brownfield land residential reuse in the most deprived neighbourhoods

	2001–04	2005–08
England:		
Number of reused brownfield sites	9,834	8,668
Amount of reused brownfield land (hectares)	8,259	6,479
2004 IMD 10% most deprived areas:		
Number of reused brownfield sites	881	1,178
Amount of reused brownfield land (hectares)	723	905
Share of England's reused brownfield sites	9.0%	13.6%
Share of England's reused brownfield land	8.8%	14.0%
2004 IMD 20% most deprived areas:		
Number of reused brownfield sites	1,702	2,053
Amount of reused brownfield land (hectares)	1,288	1,532
Share of England's reused brownfield sites	17.3%	23.7%
Share of England's reused brownfield land	15.6%	23.7%

Note: These figures cover only those local authorities included in this analysis and those sites where detailed site data was reported.

Source: NLUD

Figure 5: Brownfield sites reused for residential development, 2001–08

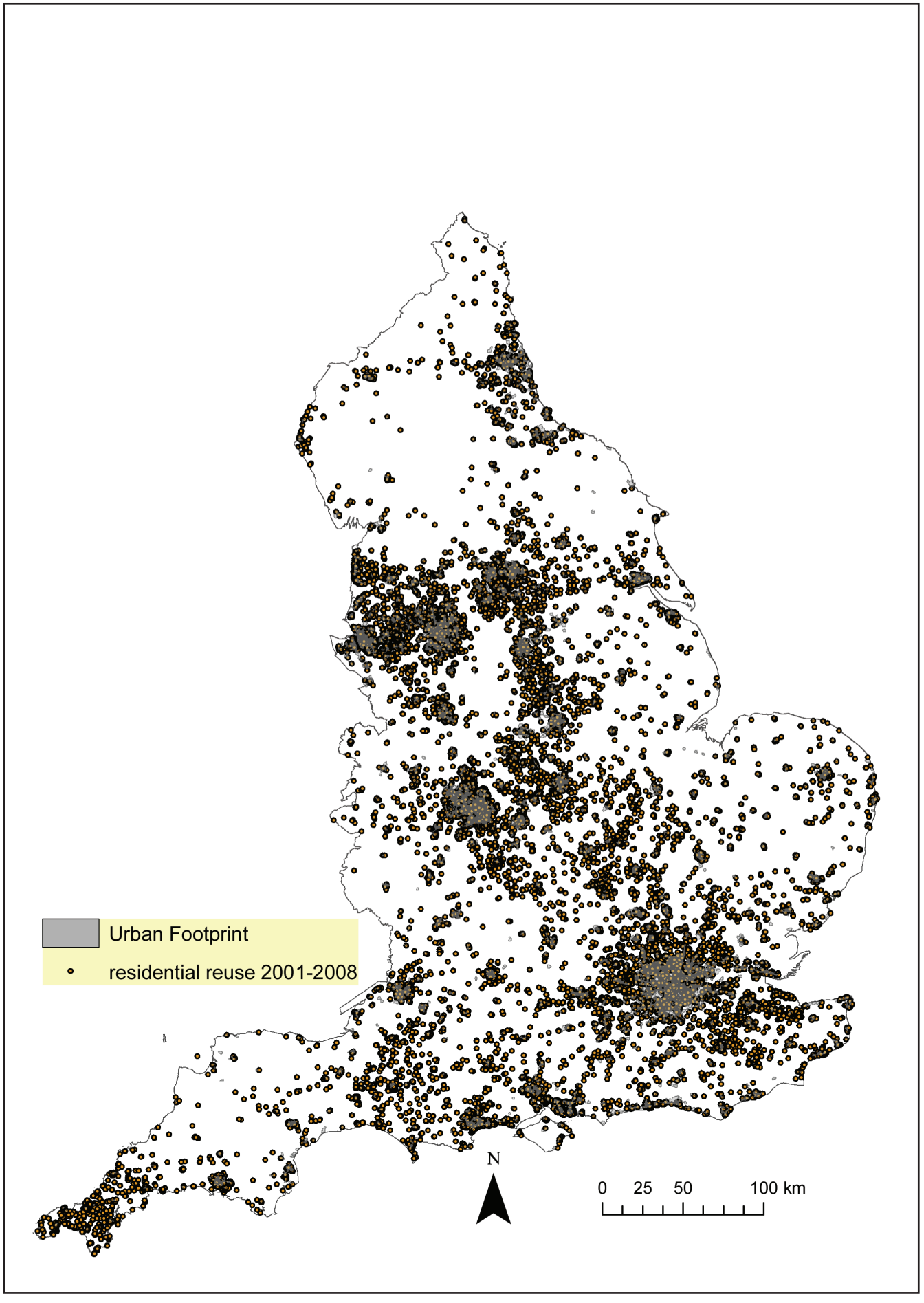


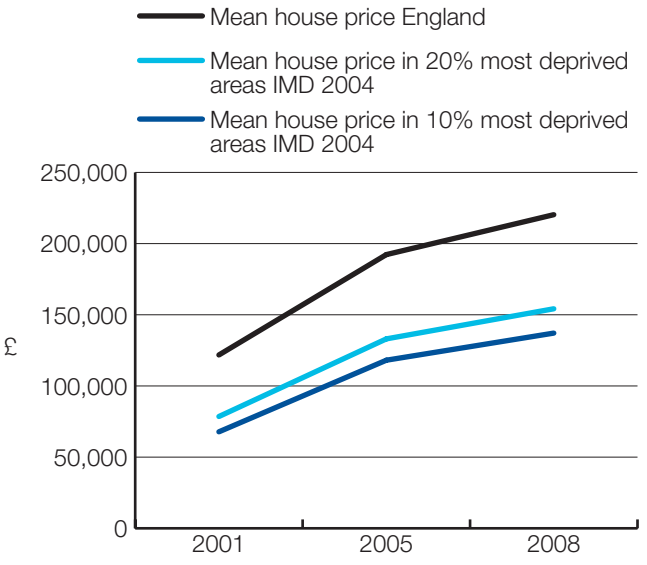
Table 2: Mean house prices in the most deprived neighbourhoods

	England	10% most deprived neighbour-hoods	20% most deprived neighbour-hoods
2001 (£)	121,769	67,780	78,536
2005 (£)	192,274	118,087	133,065
2008 (£)	220,310	137,125	154,211
2001–05 (% change)	57.9	74.2	69.4
2005–08 (% change)	14.6	16.1	15.9
2001–08 (% change)	80.9	102.3	96.4

Note: These figures cover only those local authorities included in this analysis and those sites where detailed site data was reported.

Source: Land Registry Housing Transaction Data

Figure 6: Mean house price in most deprived neighbourhoods

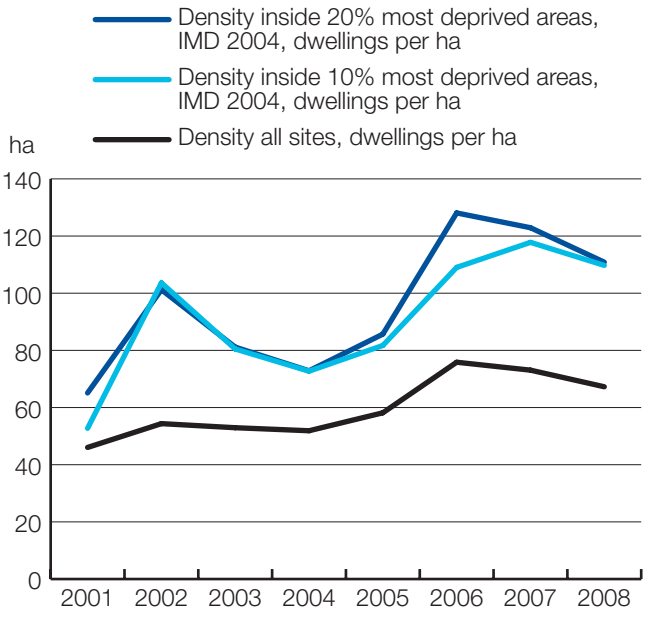


most deprived neighbourhoods. Between 2005 and 2008, bearing in mind that there was a major slowdown in the property market, the level of house price increase in the deprived neighbourhoods was successful in outperforming the England average.

The NLUD database does not report the actual built density of individual redeveloped brownfield sites. Figure 7, therefore, shows the planned dwelling density of brownfield sites reported in previous NLUD surveys for those sites that have been redeveloped. Brownfield residential development in England has been characterised by an increase in planned dwelling density since 2001, although this trend has halted since the downturn in the property market in 2007. The level of planned density has been much higher in the most deprived neighbourhoods (98 dwellings per hectare and 93 per hectare for the 20% and 10% most deprived neighbourhoods respectively) than the England average (59 per hectare) between 2001 and 2008. Nevertheless, the patterns of planned density change tend to be more erratic in the most deprived areas, with a decrease in the early 2000s, followed by an increase in 2005 and 2006 and a decline after 2007.

The findings show that throughout the 2000s, particularly since the mid-2000s, there has been a higher level of brownfield housing development in the most deprived neighbourhoods compared with the England average. These areas also have higher-density housing developments and have experienced major house price increases. These patterns suggest signs of policy success in regenerating our declining neighbourhoods through brownfield residential redevelopment, although this may have a negative impact on local housing affordability.

Figure 7: Planned density of brownfield residential reuse in most deprived neighbourhoods



4 Differential impacts of brownfield residential reuse in deprived neighbourhoods

The positive signs of housing development in the most deprived neighbourhoods imply that they have undergone some major restructuring process in their housing market and wider neighbourhood dynamics. The analysis here examines the nature of change and how this varies between different types of deprived neighbourhood with different socioeconomic compositions and dynamics.

Researchers at the Centre for Urban Policy Studies (Robson, *et al.*, 2008) developed a dynamic typology of deprived neighbourhoods for an evaluation study of the national Neighbourhood Renewal initiative, which was subsequently applied in the government's national framework for regeneration (DCLG, 2008). Based on the 2004 IMD, the 20% most deprived areas were classified into four area types (see Figure 8) according to their migration characteristics (based on the 2001 Census). By knowing where people come from and go to in relation to the most deprived neighbourhoods, we can gain a better grasp of the roles played by different neighbourhoods in the wider housing and labour markets. The four dynamic neighbourhood types are as follows:

- *Escalator*: in these areas, the incomers come from similar or more deprived areas and the out-movers go to less deprived areas. This neighbourhood type represents upward progression through housing and labour markets. Examples are areas in the north of Sefton Park in Liverpool, in the east of Oxford Road (around Manchester University) in Manchester and Bordeslay in Birmingham (1,212 areas).

- *Gentrifier*: the social composition of these areas is altered by incomers from less deprived areas and out-movers to similar or more deprived locations. Examples are those areas around Liverpool's Anglican Cathedral, the southern area of Manchester city centre and Castlefield and Brookfields in Birmingham (521 areas).

- *Isolate*: these are areas with fewer inward and outward migration links to other less deprived areas; hence they are socially more isolated. Examples are Anfield in Liverpool, Moss Side in Manchester and Newtown in Birmingham (2,030 areas).

- *Transit*: in these areas, most incomers and out-movers – typically young people moving on to housing ladder – come from and go to less deprived areas. Examples are areas in northern Liverpool city centre, the Northern Quarter in Manchester and Birmingham city centre (2,519 areas).

A total of 2,833 hectares of brownfield land was recycled for housing development in the most deprived neighbourhoods between 2001 and 2008, based on those sites with detailed data reported by local authorities (see Table 3). The data in Table 3 shows that most brownfield land recycled for residential activities was concentrated in isolate and transit areas, which partly relates to the fact that 72% of the most deprived neighbourhoods fall into these two categories. Gentrifiers (9.8%) and isolates (36.1%) were doing relatively well in their share of recycling brownfield land in 2001–04, although only isolates (45.3%) continued the momentum during 2005–08. Meanwhile, the activities in transit areas (with a 41.2% share) accelerated in 2005–08. This probably reflects the fact that developers cherry-picked areas with stronger gentrification potential and the highest profit yields in the earlier period. When the more desirable land ran out, together with the incentives of government regeneration initiatives, developers

Figure 8: Dynamic typologies of the 20% most deprived neighbourhoods

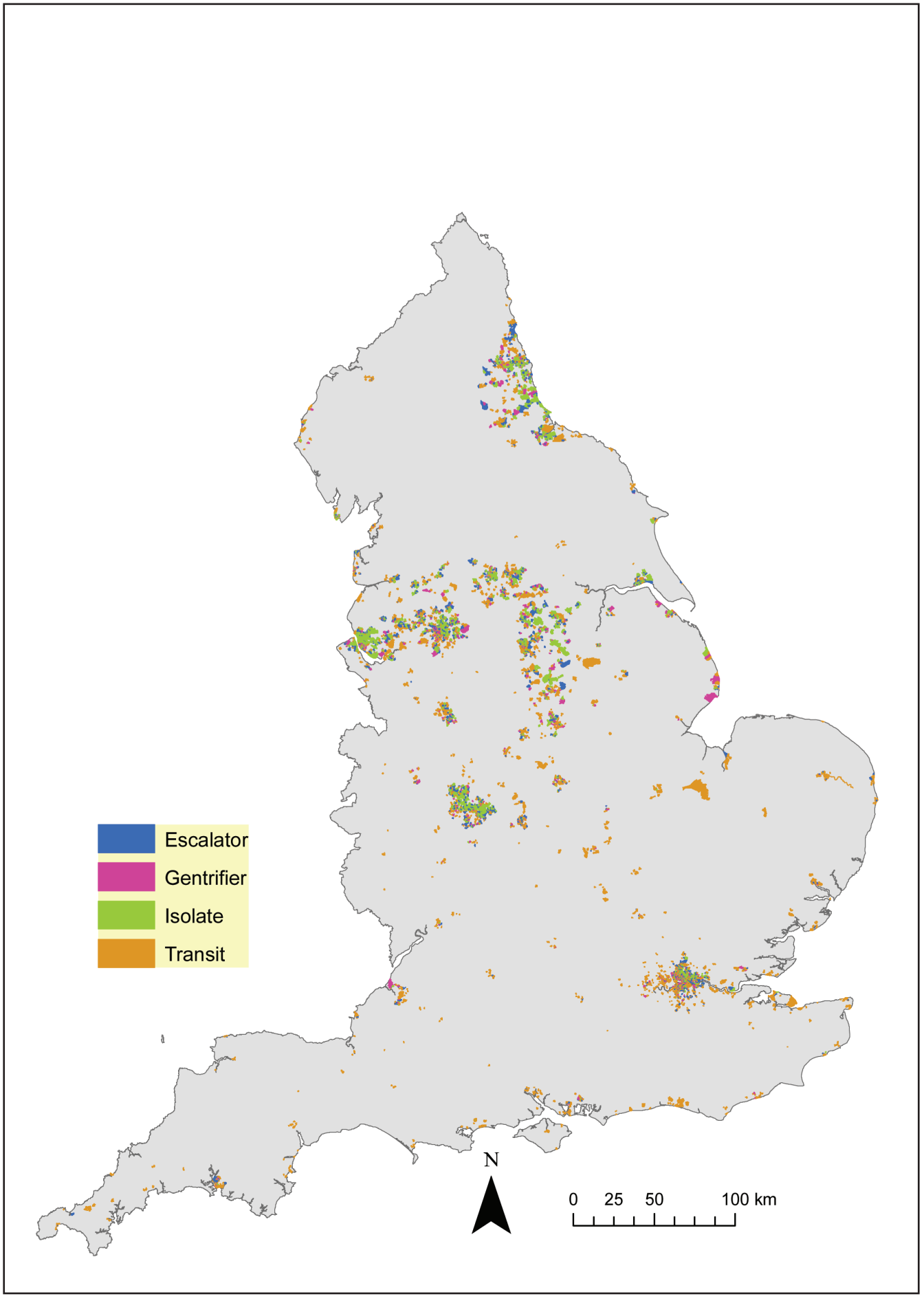


Table 3: Brownfield residential reuse by dynamic neighbourhood type

	Land reuse 2001–04		Land reuse 2005–08		Long-term land reuse 2001–04		Long-term land reuse 2005–08	
	Hectares	%	Hectares	%	Hectares	%	Hectares	%
Escalator 19.3%	214	16.2	257	9.5	109.4	14.5	40.4	9.5
Gentrifier 8.3%	130	9.8	104	4.0	70.1	9.3	16.9	4.0
Isolate 32.3%	479	36.1	492	45.3	295.3	39.2	193.7	45.3
Transit 40.1%	504	38.0	652	41.2	278.4	37.0	176.1	41.2
Total 100%	1,328	100.0	1,505	100.0	753.2	100.0	427.2	100.0

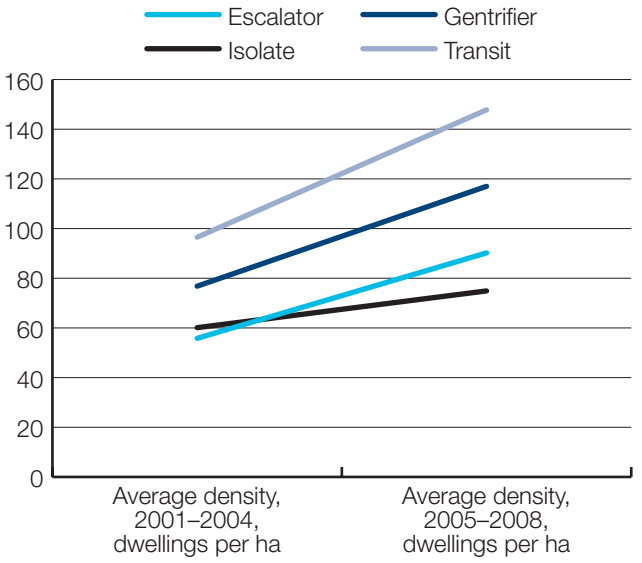
Note: Long-term land includes sites registered since the NLUD 1998 survey or earlier.

Source: NLUD

started venturing into the wider market of transit and isolate areas. It is also interesting to examine the level of residential reuse of long-term brownfield land, which is deemed as difficult to shift, in different types of neighbourhoods. As Table 3 shows, the patterns are indeed very similar to those of total brownfield reuse.

While brownfield residential reuse in the most deprived areas tends to be at a higher planned density than the England average, Figure 9 shows that transit neighbourhoods had the highest planned density among all deprived areas, with 96.5 dwelling per hectares during 2001–04 and a sharp increase to 147.8 dwellings per hectare during 2005–08. When considering the large amount of brownfield land uptake and the extreme high density of residential development, transit neighbourhoods have undergone major physical transformation throughout the last decade. These areas tend to be associated with rental locations for students and young professionals in high-rise flats. Gentrifer areas also have very high-density development, which probably relates to the market potential in these areas as up-and-coming locations. It is also interesting to note that although isolate areas recycle a large amount of brownfield land, the density of development in these areas tends to be at the lower end of the spectrum when compared with other deprived area types. This may be attributed to the fact that new-build schemes in these areas have focused more on renewing family homes for existing residents rather than building new flats, which is more common elsewhere.

Figure 9: Planned density of residential reuse by neighbourhood types



House prices

The house price data in Table 4 shows that all deprived neighbourhoods with residential brownfield development experienced a high level of house price inflation (an increase of over 110% of all house types) between 2001 and 2008, while the figure was only 80.9% for England (see Table 2). Isolate areas, in particular, had the highest level of house price increase of 120%, rising from £53,000 to £118,000 between 2001 and 2008 (see Figure 10). On the other hand, transit areas had the lowest level of house price inflation compared with the other neighbourhood types, which is probably due to the fact that these areas commanded the highest house price level among the most deprived locations. What is counterintuitive is that neither

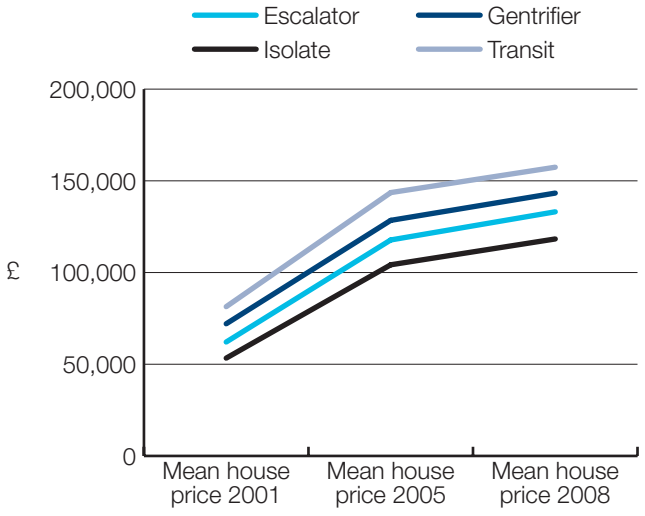
Table 4: Mean house prices by dynamic neighbourhood type

	2001 (£)	2005 (£)	2008 (£)	2001–05 (% change)	2005–08 (% change)	2001–08 (% change)
All house types:						
Escalator	62,117	117,761	133,116	89.6	13.0	114.3
Gentrifier	72,057	128,446	143,316	78.3	11.6	98.9
Isolate	53,333	104,223	118,310	95.4	13.5	121.8
Transit	81,388	143,586	157,431	76.4	9.6	93.4
Flats only:						
Escalator	62,939	113,159	126,275	79.8	11.6	100.6
Gentrifier	73,047	120,103	136,306	64.4	13.5	86.6
Isolate	56,471	102,222	110,808	81.0	8.4	96.2
Transit	73,010	120,248	138,964	64.7	15.6	90.3

Note: This only includes areas with residential brownfield reuse.

Source: Land Registry Housing Transaction Data

Figure 10: Mean house price (all house types) by dynamic neighbourhood types



the house price level nor the relative price change was particularly high in gentrifier areas. This shows that gentrification has not necessarily had a negative impact on housing affordability in these neighbourhoods (as they tend to be small enclaves of development) when compared with other deprived neighbourhood types.

Since many brownfield housing developments are very high density and tend to be apartments and flats, it is important to examine the patterns of house price change for flats in these neighbourhoods. The price of flats across all four neighbourhood types was fairly similar to the average price of all house types, although escalator areas had the highest level of price increase between 2001 and 2008. It is also noticeable that significant house price appreciation was found for flats during 2005–08 across the neighbourhood types, but that was not the case for all house types.

Socioeconomic change

In addition to changes in house price, there have been socioeconomic impacts arising from major brownfield residential development in the most deprived neighbourhoods. When compared with all other area types, transit areas experienced most (estimated) population growth between 2001 and 2007, followed by gentrifiers and neighbourhoods outside the 20% most deprived areas (see Table 5). Despite major uptake of brownfield land for residential reuse, isolate areas showed less than 1% population growth.

The government's Economic Deprivation Index (EDI), derived from the Index of Multiple Deprivation, allows us to make meaningful analysis of both absolute and relative changes of income and employment conditions across different types of neighbourhood. For each neighbourhood group, we can compare all areas (with or without brownfield residential reuse) with those that have experienced brownfield residential development. When examining changes in the mean rank of the EDI and its income and employment domains between 2001 and 2005 (see Table 5), some very consistent patterns emerge (see Figure 11). Across all neighbourhood categories, areas with brownfield

Table 5: Estimated population change and change in Economic Deprivation Index

	Population change 2001–07 (%)	EDI mean rank change		Income domain, mean rank/ score change 2001–05				Employment domain mean rank/score change 2001–05			
				All		BF*		All		BF*	
		All	BF*		% point		% point		% point		% point
Escalator	1.6	91.3	167.9	168.5	–2.86	259.3	–2.98	–1.10	–1.19	89.7	–1.34
Gentrifier	3.5	196.8	541.6	184.5	–2.97	493.2	–3.31	215.7	–1.50	555.7	–1.73
Isolate	0.9	207.2	260.7	227.0	–3.47	264.6	–3.85	191.7	–1.86	261.1	–2.15
Transit	4.5	122.4	390.4	242.4	–2.85	458.2	–3.26	–20.8	–1.02	338.6	–1.62
Other	3.5	–36.8	91.9	–53.7	–0.71	40.7	–0.81	–17.5	–0.27	142.0	–0.36

Note: the larger the change in the mean rank, the bigger the improvement made in an area's relative position; a negative change means an area is getting more deprived in relative terms. The shaded fields show the percentage point change for the income and employment domains. Here a larger negative figure indicates a bigger average improvement.

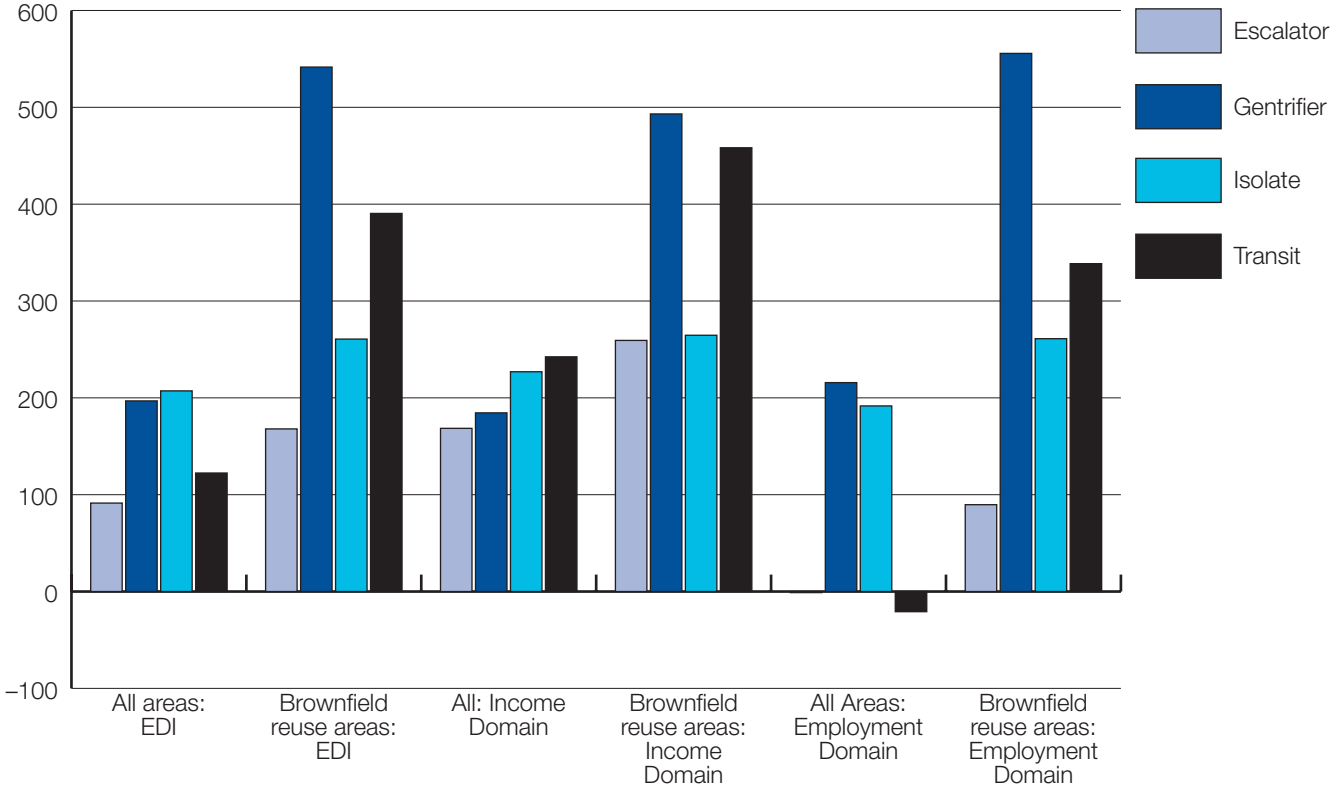
* Areas with residential brownfield development

Source: Office for National Statistics Small Area Population Estimates, Economic Deprivation Index

reuse activities tended to see more improvement in their mean deprivation rank than the average in that neighbourhood group. Very similar patterns were found when comparing absolute changes in the score of both income and employment domains (shaded in Table 5).

Of the four dynamic neighbourhood types, most improvement in the overall ranking was found in gentrifiers, which also experienced high levels of brownfield reuse activities between 2001 and 2005. Employment deprivation in transit areas has got relatively worse (as reflected from the negative change in the mean rank), but saw some marginal improvement in the absolute score. However, what is interesting is that those transit areas with brownfield reuse activities shifted their position

Figure 11: Mean rank change of the Economic Deprivation Index, 2001–05



significantly in a positive direction. Isolates also made major improvements in their relative position on income and employment conditions, particularly in areas with brownfield reuse development. Escalator areas had the least improvement among the most deprived neighbourhoods, but out-performed the other less severely deprived locations in terms of improvement in income deprivation mean rank and the overall EDI.

The analysis shows that the uptake of brownfield land (including difficult-to-shift land) for housing development in areas with severe deprivation problems has been high since 2001. These development activities have successfully reignited the housing market in these neighbourhoods and led to house price increases. There has also been a relatively high level of improvement in the EDI and its associated income and economic domains in areas with brownfield residential regeneration activities across different neighbourhood types. However, different neighbourhood types exhibited different characteristics of change.

As expected, the gentrifier areas performed best in terms of the uptake of brownfield land in the early 2000s and the improvement in their EDI. This was probably related to a change in the social composition of these areas by incomers, as these areas experienced the highest level of population growth. However, it is surprising to find that overall house prices and house price change in gentrifier areas were not as high as in other deprived areas. This may partly be related to the fact that gentrifier areas tended to have small enclaves of development. Transit areas tended towards a high level of brownfield reuse development, particularly from the mid-2000s when high density house-building was extremely prevalent. Like gentrifiers, transit areas on the whole experienced high population growth. In transit areas with brownfield redevelopment activities, economic deprivation rankings improved, especially in terms of absolute scores. These areas, however, did not experience the highest level of house price inflation, as they commanded relatively high house prices throughout the 2000s.

While there were major brownfield recycling activities in isolate areas, the density level of new residential development was lower than in gentrifier and transit neighbourhoods. The relatively low-density development here indicates that the population stabilised rather than grew between 2001 and 2007. Nevertheless, these areas enjoyed the highest levels of house price inflation compared with other deprived areas, and from an extremely low base. A major improvement in the EDI was also found in isolate areas with brownfield regeneration activities. Of the four neighbourhood types, escalator areas tended to perform at a more modest level in terms of house price increases across different house types and improvement in the EDI rankings. Escalators, however, experienced the highest level of price increase in the flats market between 2001 and 2008.

5 Conclusion

The analysis of brownfield reuse trends raises three sets of key issues for consideration in national policy-making.

First, the ease of reaching the 60% target for new-build housing on brownfield (previously developed) land ahead of time was the result of an absolute decline in greenfield land development combined with high-density residential development on certain types of brownfield land. In absolute terms, the amount of brownfield land used for housing between 2000 and 2006 was only marginally higher than during the 1990s. There has actually been a decline in the total amount of land used for residential development. The meeting of the brownfield target has, therefore, been a function of a parallel decrease in the use of greenfield land. This raises the question of whether a blanket national percentage target, with a very broad definition, is sufficiently meaningful in informing us about the progress made to deliver new homes. The uptake of brownfield land for housing development, which has been falling in most regions across England since the economic downturn in autumn 2007, is likely to continue. While brownfield reuse policy has been successful in the past, any future targets should adopt a more nuanced and contextualised approach to reflect local circumstances. For example, brownfield development in areas where land is hard to develop because of contamination or low demand could be supported by government gap funding. Alternatively, in areas that have no sustainable brownfield sites, more greenfield land could be released for housing development.

Second, the government's very broad definition of brownfield land means that a high proportion of brownfield land reuse not only has the effect of achieving regeneration goals by bringing long-term vacant and derelict land back to use, but also encourages high-density, compact urban development. This in turn raises concerns about town-cramming and garden-grabbing, as well as creating the potential for new developments to be incompatible with the character of some mature residential neighbourhoods (such as tree-lined avenues of Victorian houses). There also are concerns in some areas about the focus on building flats in city-centre locations that may not be versatile enough to adapt to households going through different life stages; this may result in increased population turnover and neighbourhood instability. The Environment Agency has also highlighted the need to strike an appropriate balance between brownfield reuse and sustainable development. This is of particular concern in high flood-risk areas, as increased flooding is expected to be one of the consequences of climate change in the future. This means that we need to consider sustainable development in a more locally sensitive way to reflect the needs and character of each site and its surrounding environment. It is also important to ensure that there is a mix of housing types to meet with local housing demand and needs.

Third, the analysis of different neighbourhood types shows that the high level of brownfield reuse has successfully accomplished the objective of injecting dynamics into the housing market, particularly the market for flats, since the mid-2000s. This shift is probably related to the activities of the national Neighbourhood Renewal initiatives and the Housing Market Renewal Pathfinder programmes. Recycling brownfield land for housing has also altered the socioeconomic dynamics of redeveloped neighbourhoods, with population growth evident in the most deprived areas between 2001 and 2007. There have also been improvements in EDI and its associated income and economic domains in brownfield reuse areas across different deprived neighbourhood types. House price increases, population growth and improvements in deprivation indices are broad signs of brownfield regeneration policy success in deprived neighbourhoods. However, the brownfield housing market in these areas has been the result of selective activities of developers who have targeted areas where there is greatest development potential within the constraints of the planning framework that restricts greenfield development.

In conclusion, the brownfield target has been very successful in focusing policy-makers and the development industry's attention over the last decade on the importance of conserving land resources and the need to revitalise our towns and cities. Notwithstanding the positive outcomes achieved in our most deprived neighbourhoods under the brownfield residential reuse policy, concerns have been widely expressed about the sustainability and appropriateness of continuing such a high-density brownfield approach to deliver the government's ambitious national housing targets in the future. It is, therefore, timely at the turn of a new decade to reconsider the strategy and targets of housing planning to meet the projected housing need and demand in the most sustainable manner.

There is now a need to debate more fully the different types of brownfield land and their associated relevance for biodiversity, flood risk and neighbourhood character, which may be important in relation to future development. Sir Peter Hall[5] raised questions about the appropriateness of high-density brownfield development in the second Urban Task Force Report. Again, the debate over high density has to be more refined to take into account other needs, including the public realm and the provision of amenities that are important for supporting quality of life for local residents. More importantly, since the economic downturn, developers have already signalled a declining interest in brownfield development. The issue is whether a change of policy is needed to support a strategic and sustainable approach that can deliver new homes in the near future. While brownfield reuse policy has been successful in the past, any future targets should adopt a more nuanced and contextualised approach to reflect local circumstances.

Notes

1 The scope of the National Brownfield Strategy was confirmed in ODPM (2003).

2 2004 IMD is used, as it is largely based on the 2001 Census data.

3 For example, in addition to some rural areas, major urban areas such as Leeds, York and Walsall failed to submit their returns in 2008 and Bristol, Leeds and Gateshead in 2004. Where local authorities fail to return the data, estimates are produced on the last available data. In addition, all authorities are asked to provide completeness estimates for the different NLUD categories, as not all sites are recorded in detail. The average completeness is estimated at 83% according to the NLUD 2007 report for the Department for Communities and Local Government, *Previously-Developed Land that may be Available for Development* (DCLG, 2007b). It is also important to note that not all local authorities provide detailed information on sites being reused once they have left the database.

4 The analysis only includes those authorities that have NLUD reuse data reported for 2003 or 2004 as well as for 2007 or 2008. As a consequence, the following local authorities were excluded from the analysis: Allerdale, Aylesbury Vale, Barrow-in-Furness, Bracknell Forest, Bradford, Broadland, Broxtowe, Camden, Caradon, City of London, Colchester, Derbyshire Dales, Dudley, East Devon, Eastbourne, Erewash, Gateshead, Greenwich, Hart, High Peak, Isles of Scilly, Leeds, Lewes, Maldon, North Shropshire, North Tyneside, North Wiltshire, Nuneaton and Bedworth, Oadby and Wigston, Ryedale, South Oxfordshire, St Edmundsbury, Teesdale, Torridge, Vale of White Horse, West Devon.

5 'I am therefore concerned that the proposals on brownfield and densities, however well-intentioned, would – if implemented – deepen the well-documented housing crisis that faces us and our government' (footnote by Sir Peter Hall in Urban Task Force, 2005, p. 19).

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