

CQC Phase 4 : Module 13
**Land Use Change at the Urban : Rural Fringe and in the Wider
Countryside**

January 2006

Department of Town and Regional Planning
University of Sheffield

Executive Summary

This document reports on a series of data analyses commissioned by The Countryside Agency in support of its second assessment of change in countryside quality in England. It plays a part in extending the work of the Countryside Quality Counts project (CQC) to cover the period 1998 to 2003, and more generally contributing to addressing long-term concerns with change in countryside character and quality. The principal focus of the work reported here enriching understanding of land-use change at the urban-rural fringe and considering development and settlement-change in the wider countryside.

The work centres on analyses of the Land Use Change Statistics (LUCS) and the Postcode Address File (PAF). The key output of the work is a series of grids which can be used within an appropriate proprietary GIS to provide a variety of measures of development and settlement change and contribute to a wide range of further analyses. Each grid partitions England into tiles each representing an area a hectare in extent (ie 100m x 100m).

The LUCS data are collected by Ordnance Survey for the Office of the deputy Prime Minister as an adjunct to the process of updating basic scale maps. They are both national in scope and recorded at a very high level of geographical resolution, and provide an unparalleled resource for characterizing particular aspects of landscape change.

The Postcode Address File (PAF) is very different in character to LUCS. It is not a statistical source in any usual sense, but rather a list of postal addresses, supplemented by grid references and in the case of non-residential property by occupier names.

PAF allows highly detailed examinations of land use and of property utilisation. The pattern of new building which LUCS records is normally tempered by some demolitions. PAF allows investigation of overall change in the stock of dwellings, and allows any tendency towards intensification of existing settlements to be addressed. Comparison of PAF data for different times allows a range of inferences to be made about physical development and changing settlement. Nevertheless, the computation needed to derive such insights is substantial in scale, and the natural language processing required to draw inferences about property and about change is highly complex.

Throughout this report, reference is made to the settlement classification developed for the Countryside Agency and its collaborators and embodied within the Government's Rural Strategy. (This classification also depends upon PAF). By reporting results for settlement types and for Joint Character Areas (JCAs) it is

possible to give a fairly rich picture of change in settlement and development between 1998 and 2003.

While the prime concern of the work reported here is with reporting on these aspects of change, a series of new and innovative techniques were also developed which have broad application in analysing settlement and land use change.

Section 2 (Settlement and Development 1998-2003: Grids from the Land-Use Change Statistics) relies on the Land Use Change Statistics (LUCS) collected by Ordnance Survey for ODPM in the process of updating basic scale maps. LUCS data have been used to create six key grids showing for the years 1998-2003

- the area of land developed or re-developed for built uses
- the area of land developed or re-developed for residential use
- the area of land developed or re-developed for industrial, retail or commercial purposes
- the total extent of greenfield development
- the extent of greenfield housing development
- the extent of greenfield development for industrial, retail or commercial uses

LUCS data reveal a strong tendency for development between 1998 and 2003 to be concentrated within the urban areas. Substantial greenfield development has occurred near (though not necessarily abutting) many urban areas (with the marked exception of London and Birmingham). Significant policy-driven greenfield development occurred at key growth points, but also in former coalfield belts. This latter growth seems to reflect complex settlement structures rather than representing physical expansion of the principal towns.

Much greenfield development has involved construction of housing. Such growth was particularly marked to the east of Reading (in the Thames Valley JCA) and in parts of the South West (to the south of Stroud (Cotswolds JCA); north of Swindon (Midvale Ridge, and Upper Thames Clay Vales JCAs); east and south of Weston-Super-Mare (Somerset Levels and Moors JCA); surrounding Trowbridge / Westbury (Avon Vale JCA) and within the Lancashire and Amounderness Plain JCA,

Generally the extent of commercial and industrial development on greenfield land was limited. Clustered areas of greenfield development are apparent at particular growth points (eg around Bristol's north fringe (Bristol, Avon Valleys and Ridges, and Severn and Avon Valleys JCAs); the southern fringe of Northampton (Northamptonshire Vales JCA), Swindon (Upper Thames Clay Vales, and Midvale Ridge JCAs) and Ashford (Wealden Greensand, and Low Weald JCAs). They also are found on greenfield sites adjoining coalfield areas (eg to the southwest of Leeds (Nottinghamshire, Derbyshire and Yorkshire Coalfield JCA; and in the Southern Magnesian Limestone, and Sherwood JCAs).

Hectare tiles have been classified in terms of their relation to existing urban areas and transport routes. Simple rules are used to identify 'pressured facets'. Overall, between 1998 and 2003, 1.17% of the area of pressured facets was converted from greenfield to developed uses-a rate 13.6 times higher than that which prevailed across the country as a whole. The rate was highest in facets on the very edge of the urban

area which are less than 30 hectares in extent (16.16 times higher than typical of the country as a whole).

Section 3 (Settlement and Development 1998-2003: Grids from the Postcode Address File) uses PAF and LUCS together to appreciate both the extent of new building and the rather different pattern of net change in dwelling stocks. Between 1998 and 2003,

the stock of dwellings in the rural domain increased by 5.9%, compared with 2.2%, in the urban domain and 3% across England as a whole.

The impact of this growth is not reducible to 'urban sprawl'. Three houses in every five were accommodated within the urban domain, and just one new dwelling in seven

was built at the urban margin (in the 'fringe' and 'periurban' zones of the 2001 settlement typology). Even this overstates the impact of new housebuilding on expansion of the contiguous urban area. Two new indicators of residential growth at the urban fringe were developed for this project. New indicators based on PAF and LUCS were also developed to gauge new non-residential development at the urban fringe, and charting the growth of new property objects such as 'retail parks'. This section tabulates these indicators at JCA level, together with a composite indicator of urban expansion. The various indicators highlight the extent of new business and leisure development on the fringe of medium sized towns, usually associated with policy driven growth.

The broader countryside beyond the urban fringe has not been left unaffected, at least in terms of residential development. In absolute terms, it has accommodated far more newly built dwellings and seen a greater net increase in the dwelling stock than has the urban margin. In some JCAs such as the Bedfordshire and Cambridgeshire Claylands new building alone has driven substantial increases in dwelling stock. Far less commonly, conversion activity has combined with new build to generate substantial increases in dwellings as in the Vale of York and Vale of Pickering JCAs. Elsewhere, especially in areas of marked planning restraint, conversions alone have yielded relatively significant increases in dwellings).

Particular localities within the broader countryside have shown a high degree of settlement intensification. This has been particularly marked in hamlets and isolated farms, where gains from conversion and subdivision have exceeded that of new building by a factor of four. Numbers of residential 'barn' properties within hamlets increased by more than 50%.

Only some JCAs, however, showed any tendency to settlement intensification. Many tracts of upland of high landscape quality showed no such tendency. Rural settlement intensification seems to have been most marked in three circumstances. First, in JCAs that adjoin some of the northern and midland conurbations, especially in areas historically characterized by dispersed settlement. A second circumstance is in the rural environs of planned growth centres. The third set of circumstances have to be understood in terms of accessibility to more distant locations in road and rail corridors and at a considerable distance from London.

Section 4 (Moving Forward: Integrating Datasets, Drawing Inferences, Characterizing Change) considers the possibility of developing ways of understanding change in settlement and development that characterize the types of locality that are disappearing and the types of locality that are emerging.

The approach developed uses the concept of a 'facility' –a space organized to facilitate a particular type of activity, characterized by particular patterns of behaviour, owned by or leased to single legal entity and subject to a single management. In Section 3, natural language processing methods and other techniques

from artificial intelligence were used to infer the presence and extent of particular facilities. It proves extremely difficult to develop convincing descriptions or categories for objects broader than the facility.

In the work described here, the idea of characterizing broader areas was not taken further. Instead, this section considers the possibility of examining both the portfolio of facilities being created and the portfolio of facilities being lost. Extending the type of technique introduced in Section 3, it is potentially possible to move from consideration of particular instances of individual facilities such as dwellings, workshops, airfields or country houses to the JCA or national level. At the same time the sort of approach developed in Section 3 might be complemented by devoting more attention to units of development and bringing together economic and historical approaches. A range of data can be brought together, reducing the gap between macroscopic and microscopic analyses and forming the basis for considering possible future landscapes.

The first step in the type of approach outlined would start be examination of the supply of land for particular uses, but paying specific regard to a pre-existing mosaic of facilities inferred from PAF. Second, tendencies underlying supply conditions would be identified, potentially prompting the release of these facilities to other uses. The third step would be to examine the extent to which these facilities come to be recognized within the planning system as land available for particular forms of development (evident in NLUD PDL and LDFs). In the fourth and final step, former facilities may become units of development and new facilities are created. The nature of these new facilities might be inferred using LUCS and PAF (together other sources).

The section attempts to show that this type of approach might prove useful in working through the implications for the countryside of de-industrialisation, de-militarization, shifting approaches to health and social care and changes in the organization of electricity generation.