



Office of the
Deputy Prime Minister

Creating sustainable communities

*National Land Use Database:
Land Use and Land Cover
Classification*



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Deputy Prime Minister

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National Land Use Database: Land Use and Land Cover Classification

Version 4.4

Report prepared by:
Dr Andrew R Harrison, LandInform
LandInform Ltd, 36 Walsingham Road, Bristol BS6 5BT

The findings and recommendations in this report are those of the consultant author and do not necessarily represent the views or proposed policies of the Office of the Deputy Prime Minister.

Office of the Deputy Prime Minister
Eland House
Bressenden Place
London SW1E 5DU
Telephone: 020 7944 4400
Website: www.odpm.gov.uk

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Preface

As part of the National Land Use Database (NLUD) project ODPM has developed a new classification of land use and land cover (Version 4.4). This report describes the classification and explains the stages in its development.

The classification is intended to provide a framework for harmonising existing classifications; to facilitate consistent collection and reporting of land use and land cover information; and to provide the basis for the creation of national data sets. It has been designed to serve as a standard classification available for adoption by bodies involved in the routine collection of land use and land cover data.

We plan to review the take-up and performance of the classification in practice and would therefore welcome feedback. Comments on the classification should be sent to National Land Use Database, Analytical Services Directorate, ODPM (e-mail: PLUS@odpm.gsi.gov.uk).

February 2006

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Overview of Report

This report presents the new National Land Use Database (NLUD) classification of land use and land cover (Version 4.4). The aim of the classification is to establish a national system (or nomenclature) for naming and defining groups of land use and land cover features. It has been designed to serve as a standard classification available for adoption by bodies involved in routine collection of land use and land cover data.

The report comprises six chapters and three appendices:

- Chapter 1 presents the background and purpose of the classification.
- Chapter 2 describes how the classification was developed and user consultation and test data collection exercises.
- Chapter 3 explains the process of defining and classifying land and the construction of the NLUD land use and land cover nomenclature.
- Chapter 4 describes the classification and provides guidance on its use.
- Chapter 5 presents findings and conclusions.
- Chapter 6 lists the references referred to within the text.
- Appendix A presents the land use nomenclature.
- Appendix B presents the land cover nomenclature.
- Appendix C presents correspondence tables for linking to other classifications.

1. Introduction

Need for information on land use

- 1.1 The United Kingdom is a highly urbanised and densely populated country in which pressures on land are extreme. Reliable and up-to-date geo-referenced information on land use is required to provide a basis for the sustainable development of land resources in both urban and rural contexts and to inform the development of policies across all areas of human activity at national, regional and local levels, including planning and regeneration, housing, employment, transport, agriculture, environment and recreation. Within government the need for information on land use is evident through published policy documents and through the large number of surveys sponsored by government and other bodies to collect such information since the mid 1970s.
- 1.2 Land use has been a central consideration of the town and country planning system in the UK for over 50 years. Official policy statements and guidance and best practice documents provide a framework for local planning authorities in determining issues of balance and priority on land use matters under Town and Country Planning legislation. However, despite the importance of and long-established nature of the land use planning process, it is widely acknowledged that the available information on land use is incomplete and does not add up to the national information base that is required.
- 1.3 Where information has been collected it is often not possible to combine different sources adequately due to inconsistencies in the land use categories and definitions used. Different methods of data collection and recording can also limit the use of information beyond the purpose for which it was collected. Despite numerous attempts over the past thirty years to develop a standard method of land use classification and to promote the collection of detailed data there is still a lack of up-to-date information about the extent and distribution of land use at the national level.
- 1.4 In response the Office of the Deputy Prime Minister (ODPM) has established the National Land Use Database (NLUD) project. The NLUD project provides a framework for land use research and the development of a comprehensive, complete and consistent source of land use information at the national level based on a standard land use classification.

Objectives

- 1.5 The new land use and land cover classification set out in this report has developed out of the NLUD project. The specific aims of this classification are:
 - to establish a national system (or nomenclature) for naming and defining groups of land use and land cover features;
 - to provide a nationally consistent basis for identifying, recording and reporting land use and land cover; and
 - to serve as a standard classification available for adoption by bodies involved in routine collection of land use and land cover data.

- 1.6 The realisation of these objectives will bring important organisational benefits and will enhance the provision of national land use information. A standard approach to land use classification:
- promotes communication between different users and sectors;
 - provides a basis for linking systems in common use;
 - enables wider use of data; and
 - avoids differences in terminology that can mask detection or measurement of change.

Existing land use classification systems

- 1.7 A number of classification schemes have been devised within government over the past thirty years for classifying and recording land use and the monitoring of land use change. These approaches stem from attempts to coordinate the collection of land use information on a national basis as well as the development of classifications for specific data collection initiatives. So far no standard or consistently applied classification has been adopted for reporting of national land use information and, despite differences in structure and level of detail and in naming and defining land use classes, a number of schemes are in concurrent use.
- 1.8 The National Land Use Classification (NLUC) was developed during the early 1970's by a team drawn from central and local government with the aim of devising a standard land use classification for the new style development plans introduced by the Town and County Planning Act 1968 (and equivalent Scottish Act 1969) (HMSO, 1975). The classification also formed the basis of a national data collection exercise set out in Department of Environment (DOE) Circular 71/74 (DOE, 1974). This requested annual returns on land use change from local authorities classified into the 15 major orders of the NLUC. However the slow and incomplete response from local authorities led to the exercise being abandoned in the late 1970s.
- 1.9 Despite the time that has elapsed since its publication the NLUC has not been withdrawn and is still occasionally cited by government as an official land use classification (Hansard, 1991). Although it has not been kept up-to-date, it arguably remains the most complete and detailed presentation of a nationally applicable land use classification. While not universally adopted at the local level the NLUC has provided the basis for a number of national land use classifications and is still used by a small number of local authorities today although usually in a modified form.
- 1.10 The Land Use Change Statistics (LUCS) classification was developed by DOE in the early 1980s (Selwood, 1987) and although influenced by the NLUC it is a significantly modified and simplified classification by comparison. The classification was designed for recording land use change by Ordnance Survey (OS) field surveyors during the course of map revision. It is a hybrid classification that uses both land use and land cover categories. Since 1985 the LUCS classification has provided the basis for recording land use and land cover change derived from OS mapping and is used in the preparation of annual statistics by ODPM (ODPM, 2004).
- 1.11 The NLUD Classification has progressed through a number of versions prior to the development of the nomenclature presented here. A prototype classification (subsequently presented in draft as Version 1.4) was proposed as part of NLUD feasibility and preparatory

work funded by the DOE in the 1990s (Dunn & Harrison, 1994; 1995). The classification was based on a modified and extended LUCS classification and designed to support data collection by ground survey in urban areas and air-photo interpretation (API) in rural areas. The design followed the LUCS approach and maintained a hybrid land use / land cover nomenclature.

- 1.12 Following formal consultation and field trials undertaken by OS the classification developed into an operational version (referred to as NLUD 3.2) and has been used by commercial organisations and local planning authorities to create land use data sets for a number of major cities and local authority areas. Up until 2004 it was also used by local authorities to classify the previous and current land use of sites recorded in the annual NLUD Previously-Developed Land (PDL) data collection exercise (NLUD, 2000). It has now been superseded by the new NLUD classification (Version 4.4) presented here.
- 1.13 The need for a rapid assessment of buildings and open space to support the launch of the ODPM Sustainable Communities Plan in early 2003 led to the development of a simplified classification, the Generalised Land Use Classification (GLUC), based on the new OS MasterMap[®] digital map product. Experimental statistics based on the GLUC were first released by ODPM for London and the South-East in 2003 and have recently been extended to England (ODPM, 2005a). GLUC is derived by generalising the land cover classification used to describe features (e.g. buildings, land parcels, fields, roads) within the topographic layer of the national large-scale mapping provided by OS MasterMap[®]. This yields a simplified land cover classification. Buildings are further classified as 'domestic' or 'non-domestic' by analysis and inference from the OS ADDRESS-POINT[®] data set.
- 1.14 As GLUC is based on the OS MasterMap[®] feature classification and database it can be used to generate land cover data at the land parcel level as well as aggregate statistics for geographical and administrative reporting areas. This approach has been used to develop a complete data set for England, referred to as the Generalised Land Use Database (GLUD), to meet immediate needs for comparable land use statistics on residential building density and urban green space at the regional, local and neighbourhood level.

Land use classification and planning

- 1.15 A multitude of classification schemes and approaches are employed in land use monitoring systems and surveys for local planning purposes. These have developed over time according to local needs and many can be traced back to earlier land use surveys and the emergence of development plans in response to Town and Country Planning legislation and circulars in the late 1940's and early 1950's.
- 1.16 Increasing computerisation, and the associated development of planning information systems and land and property gazetteers during the 1960's and 1970's, established the basis for more detailed and locally coordinated approaches to land use classification and survey. These surveys were often timed to coincide with other data collection exercises, such as population census or transportation surveys. Notable examples of these approaches include: the Tyne and Wear Joint Information System, the CLUSTER system adopted by a number of London Boroughs and forming a key element of the 1971 London-wide land use survey and LAMIS (Local Authorities Management Information System) developed in Leeds and subsequently implemented by other local authorities (Rhind, 1980).
- 1.17 At the same time, government set out to promote greater standardisation and joint-working in support of the new planning processes established by the Town and Country Planning Act 1968 (and subsequently in the 1971 Act). A joint study team, made up of central and

local government representatives, and drawing on developing practice and expertise at the local level (notably in Coventry, Liverpool and Newcastle upon Tyne), was set up to investigate the wider information framework for planning. The resulting General Information System for Planning (GISP) report (HMSO, 1972) was a progressive document, setting out a comprehensive approach to implementing local planning data collection and information systems, and preceded the work of the NLUC study team.

- 1.18 Despite the positive influence of these developments and initiatives on modern information systems for planning, the desired level of national standardisation and integration has still not been achieved. Further, in the absence of any nationally agreed standard or guidance following the abandonment of annual returns from local authorities based on NLUC, no standard approach has emerged for land use classification for local planning purposes.
- 1.19 The Town and Country Planning (Use Classes) Order 1987 (as amended) (UCO) sets out classes of uses to assist in determining whether a change of use requires an application for planning permission to be made. In order to relieve the planning system of a large number of unnecessary applications planning legislation excludes from the definition of development, and hence from planning control, any change of use where both existing and proposed uses fall within the same use class provided by the UCO. The provisions of the English UCO have recently been reviewed and amended in support of the Planning and Compulsory Purchase Act 2004 (HMSO, 2005; ODPM, 2005b).
- 1.20 While the UCO provides a grouping of uses which can be used to record land uses in this context, the purpose of the UCO is not to provide a detailed or comprehensive classification. Further, as noted above, the UCO is subject to amendment from time to time as the economy develops, new activities emerge and tastes change. However, and despite these limitations, it is widely used as a general tool for recording land use, even though this is beyond its primary purpose.
- 1.21 The lack of a standard approach to land use classification for planning purposes leads to much inefficiency and re-working of already classified material at the local level. For example differences between the UCO and the categories of land use underpinning quarterly statistical returns to ODPM – the PS1, PS2 and CPS1/2 General Development Control returns – can result in land and buildings being classified numerous times for different purposes. Reporting on decisions relating to mineral applications still refers to categories of use defined by the NLUC.

Development of a standard land use classification

- 1.22 Within government use of different land use classifications results in an uncoordinated approach and the collection of incompatible data. A standard and consistent approach to land use classification at the national level will improve the quality of data collected and promote a framework for a harmonised approach leading to the development of a nationally complete and consistent land use information base.
- 1.23 The classification presented here has been developed over the past five years as part of the NLUD research programme within the Planning and Land Use Statistics (PLUS) Division of ODPM. This developed from the need to harmonise the existing NLUD 3.2 and LUCS classification schemes and to link to other classifications in use locally, nationally and internationally. The aim was to provide a consistent nomenclature for land-based classification across government and a proposed national standard. The development of the classification is described in more detail in Chapter 2.

- 1.24 As noted above, both the NLUD 3.2 and LUCS classifications are hybrid in nature in that they mix land use and land cover categories. This is not uncommon in what purport to be classifications of land use but it confuses two quite different characteristics of the land surface and is prone to misinterpretation. The new NLUD classification (Version 4.4) presented here employs an approach to classification that establishes a clear division between land use and land cover as distinct dimensions of the land. Chapter 3 explains the process of defining and classifying land and the construction of the NLUD land use and land cover nomenclature.
- 1.25 The approach has been to design new land use and land cover nomenclatures to provide a complete and comprehensive specification suitable for the collection, collation and reporting of land use information on a nationally consistent basis. In doing so the aim has been to maximise correspondence with existing and widely-used classifications consistent with this design. The intention is that the classification will integrate with, rather than replace, other more detailed systems by providing a framework that other systems can incorporate or cross-reference.
- 1.26 The classification has been the subject of two rounds of consultation with potential users and organisations from central government departments, regional bodies, local authorities, other government bodies and agencies, private sector organisations and academia. There have been three trial data collections based on the classification for pilot sites across England, Wales and Scotland.

Dissemination and adoption

- 1.27 Publication of this report is the first step in the dissemination of the new NLUD classification (Version 4.4) presented here. The classification has been sponsored by ODPM (Planning and Land Use Statistics Division) to produce a consistent framework for data assembly available for adoption by all bodies involved in the collection and reporting of land use and land cover information.
- 1.28 To maintain consistency it will be important that the nomenclature and definitions are adopted 'as is' and are not adapted or modified in any way in practice. Chapter 4 presents a basic user guide for implementing and using the classification.

2. Development of the Classification

Development of prototype classification

- 2.1 The origins of the NLUD Classification lie in research established in the mid 1980s by DOE to develop a national land use stock survey to provide baseline data from which to measure land use change. Although this research successfully developed a means to record and report on land use change – subsequently implemented as the LUCS classification and data series – no corresponding methodology was established at that time for creating a baseline data set.
- 2.2 Later feasibility work commissioned by DOE in 1991 revisited and updated this research and proposed a prototype classification scheme based on the LUCS classification to support the creation of a national land use database (Dunn & Harrison, 1994). An important element of the design was that the classification should enable identification by ground survey in urban areas and air-photo interpretation (API) in rural areas which were the proposed modes of data collection at this time.
- 2.3 The prototype scheme was the outcome of an extensive assessment of user requirements across central government and related agencies and a detailed review of existing classification schemes. The classification was constructed by incorporating LUCS ‘urban’ land use categories and by developing an extended set of ‘rural’ categories based on LUCS but supplemented by new land cover categories based on the Monitoring Landscape Change (MLC) and UN/ECE classifications (HTS, 1986; UN/ECE, 1989).
- 2.4 Further review of the prototype classification was undertaken as part of preparatory work which commenced in 1993 (Dunn & Harrison, 1995a; 1995b). The review refined the classification nomenclature placing particular emphasis on development of detailed definitions for the land use and land cover categories. Land use definitions continued to follow the LUCS classification. Land cover definitions were further developed following the baseline land cover classification developed as part of Countryside Survey 1990 (Wyatt et al 1994).
- 2.5 The outcome of this work was the first full draft of the NLUD classification referred to as Version 1.4 (Dunn & Harrison, 1995a).

External review and field testing

- 2.6 At the outset of the preparatory work programme in 1993 DOE/PLUS invited around 50 individuals from a wide range of organisations, including government, academia and the private sector to participate in a Land Use Statistics Advisory Group (LUSAG). The aim of LUSAG was to provide advice across a range of methodological and potential user issues and it afforded a valuable source of expert and independent comment on the NLUD classification.
- 2.7 Two rounds of consultation with LUSAG were undertaken largely by correspondence, providing external peer review and advice on the draft and subsequent revisions of the classification nomenclature and definitions. Feedback from the group broadly supported the layout and structure of the classification but identified a number of detailed issues relating to definitions of categories. In response, two further revisions were undertaken to produce an intermediate and unpublished version of the classification (referred to as Version 2.2). This comprised a two-tier hierarchical structure of 12 divisions and 52 classes and was used as the

basis of the field trial and business planning consultation exercises carried out as part of the preparatory work.

- 2.8 Field testing of Version 2.2 was carried out by OS to assess the overall performance of the classification in an operational environment. The trial investigated accuracy and cost of alternative methods of capturing and mapping land use data and attribution of polygons in conjunction with experimental OS structured digital mapping (OS, 1996). Land use data were collected for a variety of test sites in Kent, Birmingham and upland Wales.
- 2.9 The trial demonstrated that Version 2.2 of the classification was suitable for operational use. No major problems were identified. However, a number of minor adjustments to the structure of the nomenclature and changes to definitions, relating to semi-natural vegetation, vacant land and buildings, agriculture and recreation, were recommended and subsequently implemented.
- 2.10 The trial also highlighted a number of issues associated with assigning land use and land cover to polygons in OS digital mapping. Rules for multiple use (e.g. in multi-floored buildings), multiple cover (e.g. where upland vegetation types intermix to form mosaics of land cover) and subsidiary uses (e.g. car parking) were investigated as part of the trial. The need to assess the most suitable data model to store and retrieve instances of multiple use and mosaics was recommended as requiring further research.
- 2.11 A further recommendation from the trial was that both land use and land cover should be recorded within urban areas. Responses from potential users to the results from the trial showed there was much interest in the ability to view both land use and land cover information in urban areas. For example, to highlight areas of open green space or to distinguish between the constituent land cover elements of urban land uses such as a school comprising buildings, playing fields and other areas such as car parks. This recommendation was an important outcome from the preparatory work and paved the way for the development of a dual classification approach in Version 4 of the NLUD classification.

NLUD classification Version 3.2

- 2.12 This first round of user consultation and field testing produced a final revised version of the NLUD classification (referred to as Version 3.2 or NLUD 3.2) comprising 13 divisions and 51 classes (see Figure 1).
- 2.13 NLUD 3.2 was effectively the first operational version of the NLUD land use classification. As noted above in Chapter 1, it has been used both by commercial organisations and local authorities in a number of urban data collection exercises. It has also been used to support data collection in the annual NLUD Previously-Developed Land (PDL) data collection exercise (NLUD, 2000).
- 2.14 The classification was implemented as a look-up-table within the NLUD PDL Data Entry Monitoring Tool (DEMT), developed using the Microsoft ACCESS™ database software. To assist local authority users assign land use to identified sites using NLUD 3.2, the classification was cross-referenced to the statutory Use Classes Order (UCO) and a glossary of over 400 functional land use descriptions. The UCO look-up table enabled rapid re-classification of sites with planning permission already classified by UCO. The detailed land use descriptions were derived from the OS Module 2/V manual used by OS surveyors to help them identify land use for LUCS data capture (OS, 1989) and effectively provided a thesaurus of land use terms to help classification of previous and current use.

Figure 1 **NLUD Classification (Version 3.2)****NLUD Classification (Version 3.2)**

- | | |
|--|---|
| <p>1 Agricultural</p> <p>1.1 Field crops</p> <p>1.2 Ploughed fields</p> <p>1.3 Fallow land</p> <p>1.4 Horticulture and orchards</p> <p>1.5 Improved pasture</p> <p>1.6 Field margin</p> <p>2 Woodland</p> <p>2.1 Conifer woodland</p> <p>2.2 Mixed woodland</p> <p>2.3 Broadleaved woodland</p> <p>2.4 Undifferentiated young woodland</p> <p>2.5 Scrub</p> <p>2.6 Felled woodland</p> <p>2.7 Land cultivated for afforestation</p> <p>3 Unimproved Grassland and Heathland</p> <p>3.1 Unimproved grassland</p> <p>3.2 Heathland</p> <p>3.3 Bracken</p> <p>3.4 Upland mosaic</p> <p>4 Water and Wetland</p> <p>4.1 Sea/Estuary</p> <p>4.2 Standing water</p> <p>4.3 Running water</p> <p>4.4 Freshwater marsh</p> <p>4.5 Salt marsh</p> <p>4.6 Bog</p> <p>5 Rock and Coastal Land</p> <p>5.1 Inland rock</p> <p>5.2 Coastal rocks and cliffs</p> <p>5.3 Inter-tidal sand and mud</p> <p>5.4 Dunes</p> <p>6 Minerals and Landfill</p> <p>6.1 Mineral workings and quarries</p> <p>6.2 Landfill waste disposal</p> | <p>7 Recreation</p> <p>7.1 Indoor recreation</p> <p>7.2 Outdoor recreation</p> <p>7.3 Allotments</p> <p>8 Transport</p> <p>8.1 Roads</p> <p>8.2 Car parks</p> <p>8.3 Railways</p> <p>8.4 Airports</p> <p>8.5 Docks</p> <p>9 Residential</p> <p>9.1 Residential</p> <p>9.2 Institutional and communal accommodation</p> <p>10 Community Buildings</p> <p>10.1 Institutional buildings</p> <p>10.2 Educational buildings</p> <p>10.3 Religious buildings</p> <p>11 Industrial and Commercial</p> <p>11.1 Industry</p> <p>11.2 Offices</p> <p>11.3 Retailing</p> <p>11.4 Storage and warehousing</p> <p>11.5 Utilities</p> <p>11.6 Agricultural buildings</p> <p>12 Vacant Land and Buildings</p> <p>12.1 Previously developed land which is now vacant</p> <p>12.2 Vacant buildings</p> <p>12.3 Derelict land and buildings</p> <p>13 Defence Land and Buildings</p> |
|--|---|

2.15 Similar links between NLUD 3.2 and other classification schemes have also been developed to enable translation to the NLUD land use classes. Correspondence tables were constructed to convert business use codes from the Valuation Office (VO) National Non-Domestic Rating (NNDR) lists and land cover codes from the satellite-derived Land Cover Map 2000 (LCM2000) data (Fuller et al, 2002) , OS TOPO 96 feature codes and Forestry Commission (FC) Woodland Inventory broad forest types (Forestry Commission, 2003). These correspondence tables provided the basis for deriving land use and land cover from existing data sources in the NLUD Baseline methodology described below.

Development of a dual classification approach

2.16 During 2001 research commenced on the development of a new land use classification for the NLUD project. This work had three main objectives:

- to develop a new approach to land classification allowing land use and land cover to be separately identified and classified;

- to harmonise the new NLUD classification with other classifications in widespread use, in particular LUCS; and
- to undertake a further round of consultation and testing of the classification.

- 2.17 A primary objective of the harmonisation process was to establish a clear separation between land use and land cover in the new classification. Both the existing NLUD 3.2 and LUCS classifications comprise land use and cover terms. These nomenclatures describe different dimensions of the land surface: land use relates to the activity or socio-economic function for which land is used, whereas land cover relates to the physical nature or form of the land surface. Mixing these terms within a single nomenclature can lead to ambiguous interpretations and invalid comparisons by users.
- 2.18 To achieve this separation between land use and land cover a dual nomenclature for classifying the land was developed. This recognises that different users have different views of the land, and buildings upon it, in relation to their application or business requirements. The dual nomenclature approach offered the potential to develop a generic land-based classification capable of harmonising different classification schemes and satisfying the requirements of different users.
- 2.19 This multidimensional approach to land-based classification is now incorporated into a number of national classification schemes (APA, 1999; Eurostat, 2000 & 2001). Chapter 3 provides a detailed discussion of the concepts underpinning the dual nomenclature presented here and a consideration of the interrelationships between land use and land cover.
- 2.20 Following these principles, a new restructured and extended classification comprising separate nomenclatures for land use and land cover was prepared. The classification developed through a number of unpublished intermediate stages and revisions in response to a second round of field trials and user consultation.
- 2.21 The first draft harmonised classification (referred to as Version 4.1) presented a fundamental restructuring of the nomenclature based on the existing NLUD 3.2 divisions and classes which were allocated to either the land use or land cover dimension according to type. This resulted in a dual nomenclature comprising an essentially two-tier Group/Order hierarchy of land use and land cover although further subdivision below Order was required in a small number of cases to incorporate a number of the former NLUD 3.2 classes.
- 2.22 The land cover dimension was extended to incorporate a new set of categories describing buildings and structures and developed surfaces. These categories were derived from an analysis of the OS MasterMap[®] topographic area feature classification within urban areas, which provided a detailed description of urban morphology at the scale of individual buildings, structures and surfaces (OS, 2004a).
- 2.23 The restructuring of the NLUD classification provided the basis for a thorough review of completeness and compatibility of terms and definitions in relation to other existing national and European classification schemes in widespread use. Separate reviews of the land use and land cover dimensions were undertaken and put forward recommendations for revising and extending the classification. Chapter 3 briefly describes this process of harmonisation and the classification systems consulted.
- 2.24 As a result of this harmonisation a revised draft classification (referred to as Version 4.2) was prepared. Amongst other minor changes, this rationalised and removed the need for the

minor third-tier noted above and produced a balanced two-tier Group/Order hierarchy of land use and land cover. This classification formed the basis of a further technical evaluation and a final pre-publication consultation exercise with key users and organisations.

NLUD Baseline evaluation

- 2.25 During 2001 and 2002 ODPM established the NLUD Baseline programme through a sequence of commissioned research projects with the aim to develop and test a methodology for creating a national land use data set. The research built on previous work to develop baseline data and was given further impetus by the development of the Digital National Framework (DNF) programme within OS and the creation of structured digital topographic data which provided the base for the OS MasterMap[®] product released in November 2001.
- 2.26 The aim of the DNF is to facilitate integration of national data sets through a maintained and definitive geographic base with which information can be associated (OS, 2004b). Land use and land cover information are proposed as associated data 'layers' in the DNF. The key elements of DNF from a land use perspective are: a national topographic database providing a spatially contiguous and maintained set of polygons, and the allocation of a unique feature identifier (TOID) to each polygon. These elements provide the basis for building and maintaining land use data sets by using topographic features (polygons) as building blocks for delineating land parcels, and using TOIDs to associate land use information from other sources (Harrison, 2000).
- 2.27 The NLUD Baseline methodology assigns a land use and land cover attribute to each topographic feature within OS MasterMap[®] by deriving information either directly from the 'internal' OS MasterMap[®] feature descriptions or indirectly from 'external' data sources with national coverage (Harrison and Garland, 2001). Look-up tables were developed to translate the specific classifications used by these data resources into NLUD land use and land cover groups. Using this approach, baseline land use and land cover data sets utilising the NLUD Version 4.2 classification were produced and analysed for 12 urban and rural pilot sites across England (Harrison et al, 2001). Further testing of the methodology was undertaken through the creation of a more extensive data set for the former County of South Yorkshire, covering Sheffield, Barnsley, Rotherham and Doncaster (ODPM, 2005c).
- 2.28 Although the primary aim of the NLUD Baseline research was to test data capture and integration processes required to create a national baseline data set of land use and land cover information the research also provided an opportunity for the new NLUD classification to be evaluated in an operational context. The research demonstrated the interoperability of the classification through the look-up and correspondence tables established with OS MasterMap[®] feature descriptions and the classification schemes employed by existing data resources.
- 2.29 The South Yorkshire demonstration data set was well received by potential users and showed the capability of the classification to depict land use and land cover data at the land parcel level represented by OS MasterMap[®]. This was achieved through the demonstration of a series of potential policy and analytical applications of the baseline data and NLUD classification. The application areas demonstrated included:
- transport noise modelling;
 - statistical reporting by administrative and other geographical areas;
 - characterisation of urban living space;

- urban green space mapping; and
- rural areas multi-purpose mapping.

Pre-publication user consultation

- 2.30 User consultation on Version 4.2 was conducted by correspondence and through a series of consultation meetings and presentations between July 2003 and February 2004. The aim was to seek feedback on the restructured classification and to seek support from key policy areas and users prior to publication.
- 2.31 Around 50 individuals across 30 separate organisations were consulted – organisations included government departments, local authorities, other government agencies, private sector companies and consultancies and academia. To provide a GB-wide perspective there were also specific consultations in Scotland and Wales.
- 2.32 These consultations provided detailed feedback on the classification nomenclature and definitions and also raised a number of more conceptual and design-related issues. Most of the specific changes and requirements were incorporated into the new NLUD Classification (Version 4.4) without difficulty. However, it was not possible to accommodate all of the issues, particularly where suggested changes were incompatible with the dual nomenclature proposed or would have required adding a further more detailed level into the land use nomenclature. These issues are discussed further below.
- 2.33 A number of land-based categories and typologies were proposed for incorporation into the classification but were either wholly or partially incompatible with the land use and land cover nomenclatures. For example, the need for compatibility with UK Biodiversity Action Plan (UKBAP) habitat categories (see Appendix C8) was raised by a number of bodies. While it is possible to correlate habitat types with land cover, strictly habitats are a separate and independent dimension of the land surface and so a direct correspondence to land cover is not always achievable.
- 2.34 In a similar way, certain land-based typologies pertaining to specific policy or legislative initiatives cannot be directly related to land use or land cover categories and so are difficult to incorporate into either nomenclature. For example, the typology advanced by Planning Policy Guidance (PPG) Note 17 ‘Sport, open space and recreation’ defines categories that cut across or amalgamate conventional land use and land cover categorisations e.g. ‘amenity greenspace’, ‘green corridors’, ‘open space provision for children and teenagers’. A number of the urban housing capacity study typologies promoted by PPG3 ‘Housing’ are based on the concept of Typical Urban Areas (TUAs), generally based on a combination of the age, dwelling type, and density of an area, which effectively characterise the urban fabric based on its structure and character.
- 2.35 In other cases, some requirements for further detail or qualification of existing NLUD land use and land cover categories would have resulted in the development of an additional third-tier within the classification hierarchy and so were not incorporated. Examples include:
- qualification of vacant and derelict land definitions in relation to contamination;
 - further subdivision of minerals to include opencast coal, sand and gravel and aggregate workings;

- further subdivision of transport terminals and interchanges to better define operational components of airports;
- identification of Local Authority offices within the community services group;
- a more detailed categorisation of industrial and commercial activities within the manufacturing and offices groups;
- further subdivision of forestry uses; and
- expansion of the agriculture land use group to enable identification of ‘energy crops’ and ‘animal servicing and breeding’.

2.36 The NLUD Version 4.4 classification presented here has been specifically designed as a two-tier national nomenclature. As noted later in the classification guidance (Chapter 4) it is quite acceptable, where users require additional detail, to further subdivide the Group (or second-tier) categories to meet specific requirements or applications so long as they nest in a consistent and mutually exclusive manner with the national level nomenclature. In this way consistency in data collection, aggregation, reporting and comparisons is maintained.

2.37 At the same time, it is recognised that the changing and evolving nature of land use and land cover definitions and classification, along with related policy and legislation, will necessitate over time further review and revision of the NLUD classification. For the classification to maintain its usefulness and relevance it will need to be an evolving tool that responds and incorporates feedback, in a controlled way, on its use in practice.

3. Defining and Classifying the Land

Defining the land

- 3.1 'Land' is a widely-used and often loosely-defined term. For practical purposes it is usual to restrict the definition of land cover to the terrestrial surface and to allow land uses to be defined on, above or below this surface (e.g. buildings with shops at ground level, flats and offices above and car parking below ground level). For extractive industries, such as deep mining, and utilities with underground plant or resources, it is usual to restrict the extension of such activities to their physical impact at ground level.
- 3.2 A more critical issue is that there is no natural set of definitions for defining the land. Classifications are closely tied to the uses which will be made of land use data collected. Further, there are no natural 'units' or 'objects' to form the basis for identification and data collection. Where an object has a physical boundary (e.g. factory, dwelling, plot of grazing land) it is easily identifiable. However, identifying objects and delineating boundaries in semi-natural environments or complex buildings is more intractable. Other complicating factors include multiple uses of land and multiple occurrences of use above and below ground level at the same location.
- 3.3 The difficulty of defining suitable objects for classification gives rise to the concept of spatial 'mixing'. Three types of mixing can be identified:
- spatial mixing occurring in two dimensions, referred to as 'juxtaposition';
 - spatial mixing occurring in the third dimension, referred to as 'superposition'; and
 - temporal mixing.
- 3.4 Spatial mixing by 'juxtaposition' is strongly dependant on the scale and unit of observation. For example, the mixing of sports facilities with play and other recreational areas within an outdoor amenity space or an assemblage of uses within a defined industrial site. These configurations are usually handled through definition and application of rules. For land cover, a minimum mappable unit or 'pro rata' rule is often applied to characterise the land cover mosaic within the smallest unit of measurement. For land use, a 'dependency' rule is usually employed. An example is the 'main activity' rule which determines the activity on which other activities or uses depend and without which they would loose their purpose. This is illustrated by a manufacturing plant that accommodates several uses additional to, but dependent on, manufacturing, such as storage, car and lorry parking and offices.
- 3.5 Spatial mixing in the third dimension is caused by 'superposition' of different covers or uses. Mixing in the third dimension is independent of scale of observation and requires a rule so that elements are correctly identified and recorded. Blocks of offices and/or flats with shops at ground level provide a classic case of mixing by superposition. 'Mapping' rules such as 'majority use' or 'ground floor use' are sometimes used in land use surveys to enable use to be depicted cartographically. However, in both cases there is a loss of information which could be significant for planning purposes. Recording all uses at all levels provides a more generic approach that can serve multiple applications and still allows, if necessary, the subsequent application of a mapping rule to simplify the occurrence of multiple use for display purposes.
- 3.6 Temporal mixing is used to describe instances where the land accommodates more than one cover or use and is highly dependent on the time of observation. Temporal mixing can be

virtually simultaneous, for example, forestry and recreation, water storage and recreation, or can occur over longer cycles, for example, weekday car park and weekend market, agriculture and defence, vacant and shop. Again the application of a 'mapping' rule such as 'primary use' that seeks to identify a single or primary use for each piece of land will result in a loss of information. Recording all instances of use is usually preferred.

Multi-dimensional classification

- 3.7 Land use relates to the activity or socio-economic function for which land is used, whereas land cover relates to the physical nature or form of the land surface. Land use and land cover describe quite distinct dimensions of the land surface and should be separately defined and classified so as to prevent ambiguous interpretations. The singular task during development of the new NLUD classification presented here was to establish a clear separation between land use and land cover nomenclatures.
- 3.8 To achieve the desired separation between land use and land cover a dual nomenclature approach to classifying the land was developed. This recognises that different users will have divergent views of the land and will spontaneously create different classification systems. A multidimensional approach to classification can counteract this trend by decomposing the land into a set of fundamental and independent dimensions based on measurable characteristics which can then be used separately and in combination to provide a structured approach to classification. The approach offers the potential to develop a generic land-based classification capable of harmonising different classification schemes and satisfying the requirements of different users.
- 3.9 A number of national classification schemes in North America and Europe have incorporated a multidimensional approach to land-based classification (APA, 1999; Eurostat, 2001). The key features of the approach are that it is capable of supporting the requirements of different user communities; analytical relationships between dimensions may identify process change; and it offers the potential to harmonise different classification schemes.

Interrelationships between land use and land cover

- 3.10 Cover and use are the primary and secondary dimensions of the land surface and interrelationships between these dimensions offer the potential for a more extensive and analytical approach to classification.
- 3.11 Relationships between cover and use can be used to infer form from function and vice versa. For example, a parcel of land covered by field crops can reasonably be associated with agricultural use. Similarly, an area used for managed forestry would be expected to be covered by trees. If it were not, then it may be inferred that the woodland had been felled or the land was being prepared for afforestation. In this way, rules of inference could be established for different applications to identify trends or changes. Other rules could be developed to validate classification assignments when new data are added.
- 3.12 Relationships between cover and use can also be used to infer patterns or determine composition within analytical units. For example, a residential area will be made up of a mosaic of cover types including dwellings, other buildings, gardens, roads, paths, woodland and bare surfaces. These may be used to calculate statistics of housing density and green space, within and between different geographical areas, enabling assessments of capacity for new housing and the availability and accessibility of urban green space.

- 3.13 Associations between cover and use can assist in the definition of land types of policy interest. For example, the definition of previously-developed land (PDL), often referred to as ‘brownfield’ land, is predicated on the former or current existence of a permanent structure or developed surface on site. Recording land cover associated with the previous and current use of a site can be used to infer whether the site is previously-developed or not. Further guidance on identifying and recording land cover associated with land use is provided in Chapter 4.
- 3.14 The potential of exploiting the interrelationships between cover and use to extend the information content of the classification remains to be fully realised. However, analysis of pilot data acquired during field trials of the classification strongly suggests that there are methodological and technical benefits to be derived from the systematic separation of cover and use proposed here and these can offer significant gains in information content and analytical potential.

Integration with other systems

- 3.15 Development of the separate nomenclatures for use and cover has drawn on existing national and European systems as well as other classification schemes in widespread use. The approach used an iterative process of inter-comparison between these systems in order to create a baseline classification of land use and land cover that established the highest degree of correspondence with existing systems.
- 3.16 For development of the land use nomenclature the following classification systems were consulted:
- Land Use Change Statistics (LUCS) classification (see Appendix C2);
 - National Land Use Classification (NLUC) (see Appendix C3);
 - National Land Use Database (NLUD) Version 3.2 (see Appendix C4);
 - Eurostat LUCAS classification (Eurostat, 2001) (see Appendix C5); and
 - UNECE Standard Statistical Classification of Land Use (UN/ECE, 1989).
- 3.17 For the development of the land cover nomenclature the following classification systems were consulted:
- Baseline Classification of Land Cover Categories of National Importance (Wyatt et al, 1994) (see Appendix C6);
 - OS MasterMap® Topographic Area Feature Classification Attributes (OS, 2004a);
 - Land Cover of Scotland (LCS) classification (MLURI, 1993);
 - EEA CORINE land cover classification (EAA, 1993); and
 - Eurostat LUCAS classification.
- 3.18 Appendix C provides background information and correspondence tables between eight different classifications and the new NLUD classification presented here. In addition to the five

classifications indicated above, Appendix C also provides correspondence tables between the Town and Country Planning (Use Classes) Order (Appendix C1), Land Cover Map (LCM) 2000 classification (Appendix C7) and the UK Biodiversity Action Plan Broad Habitat classification (Appendix C8).

- 3.19 As noted in Chapter 2 the resulting nomenclatures for use and cover have been specifically designed to provide a system for classification and reporting that is appropriate to the national level. The expectation is that the two-tier nomenclature and coding system for use and cover presented here should be adopted 'as is' by prospective users and without any modifications to fit specific applications or requirements.
- 3.20 Where more detailed categorisation is required then additional tiers can be inserted below the group (or second tier) level to extend the 'depth' of the nomenclature. Where more detailed classifications are already in use it is recommended that they should be cross-referenced to the national level nomenclature so that they can be aggregated up to the national level classification if required.

4. Classification Description and Guidance

- 4.1 This Chapter describes the new NLUD Version 4.4 land use and land cover classification nomenclature. It provides guidance notes on how to implement and use the classification. The aim is to provide sufficient guidance to promote effective use of the classification but not to be so prescriptive as to discourage potential use.
- 4.2 The NLUD classification presented here is designed to provide a standard national nomenclature based on a dual two-tier hierarchical structure. It aims to provide a consistent basis for the collection, aggregation and reporting of land use and land cover information at the national level. Where further detailed categorisation is required then additional categories should be added below the existing Group (or second-tier) level. Classes defined below the Group level must nest in a consistent and mutually exclusive manner with the national nomenclature without modification to the existing two-tier hierarchy. In this way consistency in data collection, aggregation, reporting and comparisons is maintained.

Hierarchy

- 4.3 The dual nomenclature approach of the classification results in two separate hierarchies corresponding to each dimension: land use and land cover. The classification provides a two-tier hierarchy for each dimension.
- 4.4 The land use nomenclature comprises 13 Order names and 41 Group names (Appendix A1 and A2). The land cover nomenclature comprises 10 Order names and 32 Group names (Appendix B1 and B2).

Coding

- 4.5 The coding system is alphanumeric and consists of four characters. The single letter prefix identifies the dimension, where U identifies Use and C identifies Cover. After the prefix, the first two numbers represent the Order and the third number represents Group. For example, 'Restaurant and Cafes' are coded U093 and 'Mixed Woodland' is coded C032.

Index

- 4.6 Separate indexes are provided for the use and cover nomenclatures to help users identify categories of interest. The index of use (Appendix A3) is based on the detailed class names from the NLUC. The index of cover (Appendix B3) is based on the detailed subdivisions of the Baseline Classification of Land Cover Categories of National Importance.
- 4.7 The indexes also provide the original identification codes for the NLUC and land cover Baseline classifications for cross-referencing purposes.

Spatial units

- 4.8 As a general guide, the identification and recording of land use and land cover should be at the smallest spatial unit that resources will permit. This provides the greatest flexibility and ability to aggregate to larger spatial units if required by other applications.
- 4.9 The basic spatial unit of classification should usually be the land parcel i.e. a homogenous area of use or cover. Given the country-wide availability of large-scale digital topographic mapping

from OS it is feasible to consider classification at the land parcel level. The national database of topographic features provided by the OS MasterMap[®] product comprises a set of features representing real world 'objects' referenced to the National Grid with a unique identifier (TOID) on each feature.

- 4.10 As OS MasterMap[®] 'objects' are primarily defined by physical boundaries or features they readily equate to areas of land cover and can be aggregated as required to form functional land use parcels. In upland areas the lack of physical boundaries means that there may be insufficient land parcels defined to represent the mosaic of land covers in these areas adequately. The DNF concept referred to earlier provides a framework and set of principles for defining additional boundary features to delineate spatial units for specific applications (OS, 2004b).
- 4.11 In defining spatial units for land use there is a need to recognise the association between buildings and adjoining land and the dependency between activities taking place within functionally cohesive units. These issues are covered within the definition of curtilage.
- 4.12 Specific guidance and rules for defining suitable spatial units for classification in cases of 'juxtaposition' and 'superposition' are suggested below.

Curtilage

- 4.13 Curtilage in its strict definition applies to dwellings but is defined here as 'land associated with a building and necessary to its function and/or enjoyment'. It essentially defines a functional dependency between buildings and land. The boundary of a curtilage is usually unambiguous and well defined, often by a physical feature, but there are cases where it has to be inferred and delineated.
- 4.14 Figure 2 illustrates the different spatial units associated with a shop with offices on first level situated next to a road. Behind the shop is a yard used for storage. The yard is defined as within the curtilage of the building and its use is classified with the building. Figure 3 shows a shopping mall with a public car park and other associated land. The curtilage of the shopping mall includes the paved and landscaped areas associated with the building. Note that public car parks are separately classified (see below). In both figures note how the land cover elements are separately classified.
- 4.15 The definition of curtilage can be extended to help delineate composite sites where a number of dependent activities are treated as a single unit. For example, a factory complex, comprising a series of interdependent activities such as manufacturing, offices, storage, car parks and waterways may be classified as a functionally cohesive unit. This effectively defines the main use or the activity on which other activities depend and without which they would lose their purpose. Other examples of composite sites are hospitals, educational establishments and industrial estates.
- 4.16 Classification of residential use implies the definition of curtilage. All adjoining land, including garages, gardens, communal amenity areas, estate roads and pathways, should be classified as residential. Estate roads are defined as non thoroughfare service and distribution roads.
- 4.17 Exceptions to the curtilage definition include:
- public car parks (U053) – should be excluded from the curtilage of buildings and separately classified (see Figure 3); and

- cemeteries and graveyards (U064) – should be separately classified from any associated buildings or structures e.g. crematorium, church.

Multiple use and levels

- 4.18 All uses occurring at a specific locality should be identified and recorded if possible. Where multiple uses occur in complex buildings then all identifiable uses should usually be recorded. If possible the level of use within the building should also be recorded. Examples of complex buildings are shopping malls and terminals and transport interchanges.
- 4.19 The illustration of a shopping mall in Figure 3 shows how all identifiable uses within the complex have been separately recorded.
- 4.20 Uses at all levels (e.g. within a building) should be identified and classified if possible. Different uses arising from independent activities at the same level should be identified and recorded separately. For example, in Figure 2 both the ground level shop and first level offices are separately identified and recorded.

Figure 2 Defining spatial units: shop with offices on first level next to a road

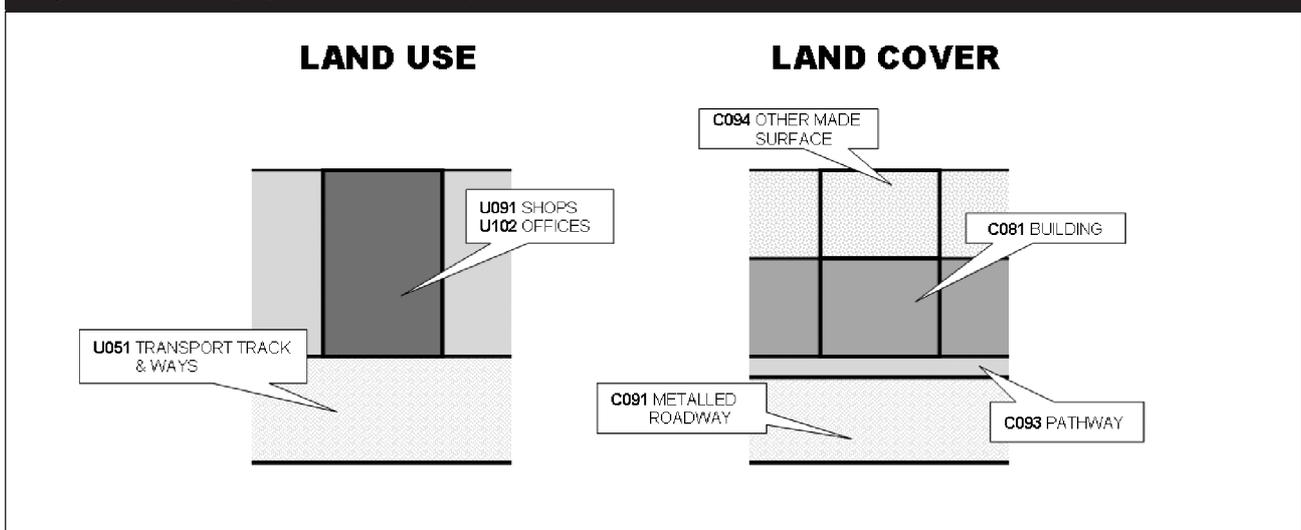
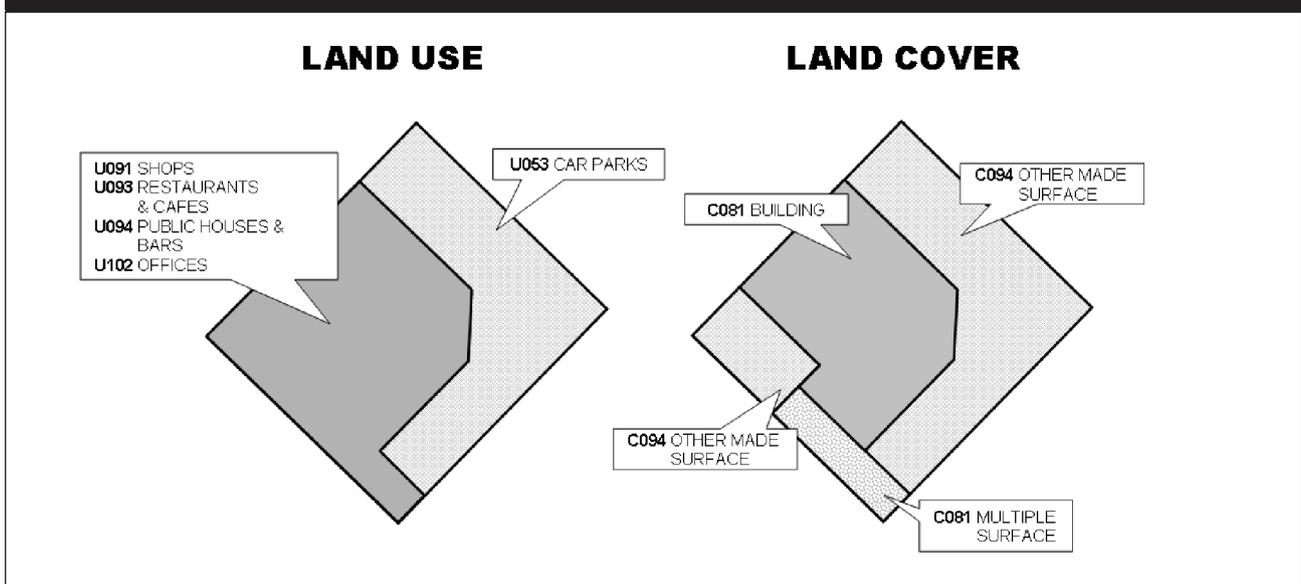


Figure 3 Defining spatial units: shopping mall with public car park and associated land



Method and level of classification

- 4.21 Current use or cover should be identified and recorded. Where possible both current land use and land cover should be identified and recorded.
- 4.22 The minimum level of classification of land use and land cover should be the Group level wherever possible. As a general rule classifications should be recorded at the most detailed level that resources will permit. Again this provides the greatest flexibility and ability to combine or reclassify at other levels of detail if required by other applications.
- 4.23 Consistency of identification and recording, both in terms of level of classification and definition of spatial units, is paramount. Combining data collected using different definitions and spatial units may have serious implications for subsequent analysis of data and result in spurious comparisons and statistics. It is vital that data collection exercises use standard methods of classification and provide explicit statements of spatial units employed.

Links to other classification systems

- 4.24 So as to maintain consistency of collection, aggregation and reporting at the national level, the Order and Group tiers of the NLUD land use and land cover classification should not be modified or adapted by users to meet specific requirements or applications.
- 4.25 There are essentially three options for using the nomenclature and providing links to other classification systems:
- adopt the complete NLUD classification nomenclature;
 - extend the NLUD Order and Group hierarchy, by further subdividing the Group (second tier) categories to create more detailed classes (by adding a third tier, and so on) – all new categories defined must nest in a consistent and mutually exclusive manner with the existing Order and Group hierarchy; and
 - develop and maintain a lookup table that matches and cross-references NLUD Order and Group categories and codes to the existing local classification categories and codes.

Previously-developed land

- 4.26 Promoting re-use of previously-developed land is central to the development of sustainable land use policy and requires a rigorous approach to assessing whether development has previously taken place or not.
- 4.27 Previously-developed land is defined as that which is or was occupied by a permanent structure and associated fixed surface infrastructure (DETR, 2000)¹. Land cover is a key determinant in assessing the existence and nature of any previous development on a site. From land cover it is possible to determine whether land is currently or has been previously developed. It can also allow the nature of any previous development to be assessed on the basis of the presence of buildings, structures and permanent made surfaces. It is important

¹ 'Planning Policy Guidance (PPG) Note 3: Housing' defines previously-developed land. The definition includes defence buildings, land used for mineral extraction and waste disposal sites where provision for restoration has not been made through development control procedures. It excludes land and buildings that are currently in use for agricultural or forestry purposes, and land in built-up areas which has not been developed previously (e.g. parks, recreation grounds, and allotments).

therefore that both land use and land cover are recorded wherever it is necessary to identify previously-developed land.

Insignificant use

- 4.28 In instances where there is so little use or the use is very infrequent and where the extent of the activity is difficult to define the land should be classified as unused (i.e. U131). For example, upland areas with low intensity grazing or recreation where there is no other significant activity present, and semi-natural areas which are not part of routine cultivation or grazing and which have never been developed.

5. Findings and Conclusions

- 5.1 The new NLUD classification of land use and land cover (Version 4.4) provides a national system (or nomenclature) for naming and defining groups of land use and land cover features. It has been designed to serve as a standard classification available for adoption by bodies involved in routine collection of land use and land cover data.
- 5.2 A key feature of the classification is the clear separation it establishes between land use and land cover nomenclatures. This dual nomenclature approach is capable of supporting the requirements of different user communities; it offers the possibility of establishing analytical relationships between dimensions leading to the identification of process change; and has the potential to provide a means of harmonising different classification schemes.
- 5.3 The classification is the outcome of an extensive programme of research and development funded under the auspices of the National Land Use Database (NLUD) project. The classification has been the subject of two rounds of consultation with potential user organisations and experts and has been evaluated as part of three trial data collection exercises. These consultations and data trials have extended across England, Scotland and Wales.
- 5.4 The pilot data sets from the field trials and County Demonstrator (ODPM, 2005c) have enabled the potential of a national land use database and classification to be demonstrated to a wide range of potential user organisations spanning central and local government, commercial organisations, environmental groups and academia.
- 5.5 Results from these consultations, data collection pilots and demonstrations have shown that the NLUD classification provides a standard nomenclature capable of national application and suitable for operational use for mapping and database creation at the land parcel level. Further, the dual nomenclature approach of the classification offers tangible methodological and technical benefits to mapping and database creation with significant gains in information content and analytical power.
- 5.6 The NLUD classification is a tool for representing the complexities of the land to enable consistent identification, recording, comparison and reporting of land use and land cover. It provides a tool both for detailed classification in its own right and also a cross-referencing tool in the form of a standard nomenclature that sits above other more detailed classifications. The classification has already been adopted by a number of national projects.
- Phase 1 of the local e-Gov Planning and Regulatory Services On-line (PARSOL) project has adopted the classification into its published schema for land use monitoring (Parsol, 2004). Parsol has extended the two-tier nomenclature by adding a third more detailed tier to support, in the first instance, the monitoring of all housing and employment land with planning allocations or permissions.
 - ODPM has incorporated the land use nomenclature into the revised data collection tool distributed to all local authorities in England for collecting information on previously-developed (PDL) sites available for development. Starting in 2005 the classification will be employed for identifying and recording previous and current use of PDL sites in the annual data collection exercise.

- OS has conducted further trials of the new classification for data collection in conjunction with OS MasterMap[®] and will adopt NLUD 4.4 for classification of objects in Address Layer Version 2.

5.7 Publication of this report is the first step in dissemination of the new NLUD classification. It also marks a point of departure for further development of the land use and land cover nomenclatures presented here. For the NLUD classification to remain useful and to serve as many potential applications as possible then it must also be capable of evolving and responding to feedback on its use in practice.

6. References

- APA (American Planning Association) (1999) *Land-Based Classification Standards*, APA: Chicago.
- DETR (2000) *Planning Policy Guidance (PPG) Note 3: Housing*, Cm 4667, HMSO: London.
- DOE (1974) *Statistics of Land Use Change, Circular 71/74*, HMSO: London
- Dunn, R. and Harrison, A.R. (1994) *Feasibility study for deriving information about land use stock*, Final Report to the Department of the Environment, DOE: London.
- Dunn, R. and Harrison, A.R. (1995a) *Preparatory work for land use stock system*, Final Report to the Department of the Environment, DOE: London.
- Dunn, R. and Harrison, A.R. (1995b) Working towards a National Land Use Stock System, *Proceedings of the Sixth National Conference of the Association of Geographic Information*, Birmingham, UK, 8.1.1-8.1.5.
- EEA (1993) *CORINE Land Cover Classification*, European Environment Agency: Copenhagen.
- Eurostat (2000) *Manual of Concepts on Land Cover and Land Use Information Systems*, Office for Official Publications of the European Communities: Luxembourg.
- Eurostat (2001) *LUCAS: Land Use/Land Cover Area Frame Statistical Survey*, Technical Document No 4, Instructions for Surveyors, Eurostat: Luxembourg.
- Forestry Commission (2003) *National Inventory of Woodland and Trees – Great Britain*, Forestry Commission: Edinburgh.
- Fuller, R.M., Smith, G.M., Sanderson, J.R., Hill, R.A., Thomson, A.G., Cox, R., Brown, N.J., Clarke, R.T., Rothery, P. and Gerard, F.F. (2002) *Countryside Survey 2000 Module 7: LAND COVER MAP 2000*, Final Report, Natural Environment Research Council (CEH): Monks Wood.
- Hansard (1991) Response by Secretary of State for the Environment to question on Government coordination of land use and economic activity classifications, 19th June 1991, HMSO: London.
- Harrison A.R. (2000) The National Land Use Database: developing a framework for spatial referencing and classification of land use features, *Proceedings of the AGI Conference at GIS 2000*, Olympia, London, 5.6.1 – 5.6.8.
- Harrison, A.R. and Garland, B. (2001) The National Land Use Database: building new national baseline data of urban and rural land use, *Proceedings of the AGI Conference at GIS 2000*, Olympia, London, t2.5.1 – t2 .5.11.
- Harrison A.R., D'Souza G. and Smith G.M. (2001) Integrated analysis of spatial data sets to create baseline urban and rural land use data, *Proceedings of First Annual Conference of Remote Sensing and Photogrammetry Society*, DTI, London, 485 – 495.
- Harrison, A.R. (2002) Extending the dimensionality of OS MasterMap[®]: land use and land cover, *Proceedings of the AGI Conference at GIS 2002*, Olympia, London, t2.1.1 – t2 .1.12.

- HMSO (1972) *General Information System for Planning*, HMSO: London.
- HMSO (1975) *National Land Use Classification*, HMSO: London.
- HMSO (2005) *The Town and Country Planning (Use Classes) (Amendment) (England) Order 2005*, Statutory Instrument 2005 No. 84, HMSO: London.
- HTS (Hunting Technical Survey) (1986) *Monitoring Landscape Change*, Final Report to the Department of the Environment, DOE: London.
- MLURI (The Macaulay Land Use Research Institute) (1993) *The Land Cover of Scotland 1988*, Macaulay Land Use Research Institute: Aberdeen.
- NLUD (2000) *NLUD-Previously Developed Land Data Specification v2.2*, NLUD/ODPM: London.
- ODPM (2004) *Land Use Change in England, No. 19*, ODPM: London.
- ODPM (2005a) *Generalised Land Use Database Experimental Statistics*, Statistical Release 2005/0042, ODPM: London.
- ODPM (2005b) *Changes of Use of Buildings and Land*, ODPM Circular 03/2005, 21st March 2005, ODPM: London.
- ODPM (2005c) *Full National Land Use Database: County Demonstrator*, ODPM: London
- OS (1989) *Recording of land use for DOE, Module 2/V*, Surveyors Instruction Manual, Ordnance Survey: Southampton.
- OS (Ordnance Survey) (1996) *Research trial for a land use stock system*, Final Report to the Department of the Environment, DOE: London.
- OS (2004a) Classification and attributes of OS MasterMap[®] features, Chapter 2 in *OS MasterMap[®] User Guide v5.1*, Ordnance Survey: Southampton.
- OS (2004b) *The Digital National Framework - evolving a framework for interoperability across all kinds of information*, OS White Paper, September 2004, Ordnance Survey: Southampton.
- Parsol (2004) PARSOL Deliverables - Co-ordination of Monitoring to Inform Policy, Parsol: Local e-Gov On-line, http://www.parsol.gov.uk/2_5.html.
- Rhind, D. and Hudson, R. (1980) *Land Use*, Methuen: London.
- Selwood, R. (1987) Statistics of Changes in Land Use: A New Series, *Statistical News*, 79, 79.11 – 79.16.
- UN/ECE (1989) *Standard Statistical Classification of Land Use*, Economic Commission for Europe of the United Nations: Geneva.
- Wyatt, B.K., Greateorex-Davies, J.N., Hill, M.O., Parr, T.W., Bunce, R.G.H. and Fuller, R.M. (1994) *Comparison of Land Cover Definitions*, DOE: London.

Appendix A. NLUD 4.4 Land Use

1. Land Use Nomenclature
2. Land Use Definitions
3. Index using NLUC Descriptions of Land Use

1. Land Use Nomenclature

ORDER		GROUP	
U010	AGRICULTURE AND FISHERIES	U011	Agriculture
		U012	Fisheries
U020	FORESTRY	U021	Managed forest
		U022	Un-managed forest
U030	MINERALS	U031	Mineral workings and quarries
U040	RECREATION AND LEISURE	U041	Outdoor amenity and open spaces
		U042	Amusement and show places
		U043	Libraries, museums and galleries
		U044	Sports facilities and grounds
		U045	Holiday parks and camps
		U046	Allotments and city farms
U050	TRANSPORT	U051	Transport tracks and ways
		U052	Transport terminals and interchanges
		U053	Car parks
		U054	Vehicle storage
		U055	Goods and freight terminals
		U056	Waterways
U060	UTILITIES AND INFRASTRUCTURE	U061	Energy production and distribution
		U062	Water storage and treatment
		U063	Refuse disposal
		U064	Cemeteries and crematoria
		U065	Post and telecommunications
U070	RESIDENTIAL	U071	Dwellings
		U072	Hotels, boarding and guest houses
		U073	Residential institutions
U080	COMMUNITY SERVICES	U081	Medical and health care services
		U082	Places of worship
		U083	Education
		U084	Community services
U090	RETAIL	U091	Shops
		U092	Financial and professional services
		U093	Restaurants and cafes
		U094	Public houses and bars
U100	INDUSTRY AND BUSINESS	U101	Manufacturing
		U102	Offices
		U103	Storage
		U104	Wholesale distribution
U110	VACANT AND DERELICT	U111	Vacant
		U112	Derelict
U120	DEFENCE	U121	Defence
U130	UNUSED LAND	U131	Unused land

2. Land Use Definitions

U010 AGRICULTURE AND FISHERIES

Agriculture includes horticulture, fruit growing, seed growing, dairy farming, the breeding and keeping of livestock (including any creature kept for the production of food, wool, skins or fur), the use of land as grazing land, meadow land, osier land, market gardens and nursery grounds, and the use of woodlands where that use is ancillary to the farming of land for other agricultural purposes.

U011 Agriculture

- + *Land under agricultural rotation whether for crops or grassland or left fallow.*
- + *Land under permanent crops, including orchards and other cultivated trees and flowering shrubs.*
- + *Land used for horticulture e.g. glass houses, nurseries, hop fields and market gardens.*
- + *Enclosed intensively managed improved pastures used for grazing and/or fodder production.*
- + *Enclosed unimproved or little-improved grasslands with little or no management used for grazing.*
- + *Set-aside and fallow land.*
- + *Low-intensity agricultural use (e.g. land used for intermittent grazing and foraging by livestock).*
- + *All ancillary land, e.g. uncultivated patches, banks, footpaths, ditches, headlands and shoulders.*
- + *All associated buildings and hard surface areas on farm holdings e.g. places for crop conditioning, grading and storage, and places for livestock (as defined above) servicing, breeding, rearing and animal product processing.*
- *Excludes farm dwellings (U071) and farm shops (U091).*

U012 Fisheries

- + *Places devoted to the operation of fish hatcheries and fish farms in inshore and fresh water areas.*
- + *Other fishing activities e.g. inshore or estuarial fishing using nets and pots (where these are the primary use of land and associated waters and can be clearly delineated).*

U020 FORESTRY

U021 Managed forest

- + *Forest and other wooded land managed (either wholly or in combination) for timber production, recreation and amenity, conservation and environmental uses e.g.*

Forestry Commission and Forest Enterprise plantations, woodland in official grant schemes, woodland certified to UK Woodland Assurance Scheme (UKWASS) standards.

- + *Woodland used for seasonal grazing and foraging by livestock, and where timber is used on-farm, e.g. as a source of fencing material, or as a short-term crop in its own right (e.g. coppiced woodland for energy crops purposes).*
- + *Felled woodland and land cultivated for afforestation.*
- *Excludes woodland managed principally for agricultural purposes (U011).*

U022 Un-managed forest

- + *Un-managed forest and other wooded land.*

U030 MINERALS

U031 Mineral workings and quarries

- + *Surface mineral workings and quarries including waste disposal areas together with all buildings and installations for surface and underground mineral extraction and handling.*

U040 RECREATION AND LEISURE

U041 Outdoor amenity and open spaces

- + *Outdoor amenity and open spaces e.g. gardens, parks, zoos, picnic areas and play areas.*
- + *Civic spaces e.g. civic squares, plazas, sea fronts (including promenade).*
- + *Heritage sites and monuments.*
- *Excludes sports facilities (U044)*

U042 Amusement and show places

- + *Places for amusement and entertainment e.g. cinemas, theatres, concert halls and arenas, broadcast studios, dance halls, bingo halls, night-clubs, gaming and gambling clubs and premises.*
- + *Amusement arcades, fun fairs and circuses.*
- + *Visitor centres and interpretation centres.*

U043 Libraries, museums and galleries

- + *Buildings, places, or institutions devoted to the acquisition, conservation, study, exhibition, and educational interpretation of objects having scientific, historical, or artistic value e.g. museums, libraries, art galleries, public and exhibition halls.*

U044 Sports facilities and grounds

- + *Facilities for land and water sports e.g. football or rugby stadiums, sports centres, gymnasia, swimming pools, skating rinks, indoor shooting ranges, vehicle race tracks.*

- + *Sports grounds, including those in schools and industrial sites, and areas for outdoor sports e.g. football and rugby pitches, greens and courts for ball games, golf courses, athletics grounds, ski fields, hunting and shooting, boating and sailing lakes.*

U045 Holiday parks and camps

- + *Holiday park with chalets, hotels, entertainments for holidaymakers.*
- + *Camp site for tents, touring caravans and camper vans.*
- *Excludes caravan sites and mobile homes used as permanent dwellings (U071).*

U046 Allotments and city farms

- + *Allotments and city farms.*

U050 TRANSPORT

U051 Transport tracks and ways

- + *Roads, railway lines, cycle tracks, footpaths and bridleways.*

U052 Transport terminals and interchanges

- + *Terminals and transport interchanges for people e.g. airport, ship passenger terminal, railway station, bus station, coach station.*
- *Excludes car parks (U053).*

U053 Car parks

- + *Long and short stay car parks and 'Park and Ride' terminals.*

U054 Vehicle storage

- + *Storage places for vehicles (other than cars) e.g. lorry parks, bus and coach depots, railway sidings, aircraft hangars.*

U055 Goods and freight terminals

- + *Terminals and transshipment places for goods e.g. air freight terminals, rail freight terminals, container depots, docks, railway yards and depots, and customs depots.*
- + *Mechanised handling of goods and raw materials e.g. aerial ropeway, conveyor, lift.*

U056 Waterways

- + *Canals and navigable rivers.*
- + *Moorings, marinas, boat yards and anchorage for water craft.*
- *Excludes marine engineering and shipbuilding yards (U101)..*

U060 UTILITIES AND INFRASTRUCTURE

U061 Energy production and distribution

- + *Power stations, using thermal, nuclear, hydroelectric, gas turbine, diesel or renewable sources, for electricity production and generation.*

- + *Cableways and transformer stations for the distribution of electricity.*
- + *Gas manufacture and storage facilities.*
- + *Pipelines and pumping stations for oil and gas.*

U062 Water supply and treatment

- + *Water treatment and purification facilities, including extraction from springs, rivers or aquifers.*
- + *Water storage and distribution places e.g. reservoirs, water towers and pumping stations.*
- + *Sewage disposal and treatment works, including drains, pumping stations and sewage farms.*

U063 Refuse disposal

- + *Refuse disposal facilities, including tips, landfill sites and disposal plants.*

U064 Cemeteries and crematoria

- + *Places for storage and disposal of human remains e.g. mortuaries, chapels of rest, crematoria, cemeteries and church yards.*

U065 Post and telecommunications

- + *Postal service places, including depots and sorting and delivery offices.*
- + *Telecommunication facilities for transmitting and receiving messages by telephone, radio, radar, cable, television, microwave and satellite.*

U070 RESIDENTIAL

U071 Dwellings

- + *Houses and flats for individuals and families living as a single household, including adjoining garages, gardens, non-thoroughfare service and distribution roads and pathways.*
- + *Caravan sites and mobile homes used as permanent dwellings.*
- + *Sheltered residential accommodation with separate front entrances.*

U072 Hotels, boarding and guest houses

- + *Hotels, B&B's, boarding houses, and residential clubs (where no significant element of care is provided).*

U073 Residential institutions

- + *Residential accommodation for provision of care e.g. old peoples' homes, children's homes and other non-medical homes.*
- + *Residential schools and colleges and training centres, including university and hospital residences.*
- + *Communal residences e.g. barracks, monasteries and convents.*

U080 COMMUNITY SERVICES**U081 Medical and health care services**

- + *Medical and health care services e.g. medical diagnosis and treatment centres, auxiliary medical centres, clinics, day centres, health farms.*
- + *Hospitals and convalescent homes.*
- + *Other medical and health services e.g. dentist, doctor, chiropodist, and optician.*
- *Excludes associated residential accommodation (U073).*

U082 Places of worship

- + *Churches, mosques and synagogues.*

U083 Education

- + *Educational establishments e.g. schools, colleges, higher and further education centres, universities and other specialised learning places.*
- *Excludes associated residential accommodation (U073).*

U084 Community services

- + *Community protection and justice administration services e.g. police stations, fire stations, coastguard and life boat stations, and law courts.*
- + *Community protection and detention centres e.g. borstals, prisons, remand homes.*
- + *Community meeting places e.g. community centre, public hall, church hall, youth club.*
- + *Public sanitation facilities e.g. public baths and conveniences.*
- + *Animal welfare facilities e.g. animal treatment, veterinary surgery, animal quarantining, cattery, kennels*

U090 RETAIL**U091 Shops**

- + *Premises for the retail sale and display of goods to visiting members of the public e.g. shops, boutiques, department stores, retail warehouses and markets, supermarkets.*
- + *Shops where the primary use is the sale of food and drink for consumption off the premises e.g. sandwich bar, hot-food take-aways.*
- + *Other retail uses including hairdressers, travel and ticket agencies, post offices, pet shops, showrooms, hire of domestic or personal goods, launderettes and dry cleaners, undertakers and funeral directors, places for the reception of goods to be washed, cleaned or repaired.*
- + *Showrooms for retail sale and display of motor vehicles, car hire businesses, petrol filling stations and taxi businesses.*

- + *Internet shops/cafes, where primary purpose is sale of access to internet services.*
- *Excludes financial and professional services (U092).*

U092 Financial and professional services

- + *Financial and professional services e.g. banks, building societies, estate and employment agencies and insurance brokers.*
- + *Betting offices.*
- *Excludes health and medical services (U081).*

U093 Restaurants and cafes

- + *Places for the sale of food and drink primarily for consumption on the premises.*

U094 Public houses and bars

- + *Places for the sale of food and drink for consumption on the premises where the primary purpose is the sale of alcoholic drink e.g. pubs, wine bars, private clubs, other drinking establishments.*

U100 INDUSTRY AND BUSINESS

U101 Manufacturing

- + *Factories and refineries for processing of coal, petroleum, metals and other raw materials.*
- + *Manufacturing of food, drink, tobacco.*
- + *Manufacturing of chemical and allied products.*
- + *Mechanical, instrument and electrical engineering.*
- + *Marine engineering and shipbuilding yards.*
- + *Manufacturing of vehicles and other metal goods.*
- + *Textile and clothing manufacturing.*
- + *Brick, pottery, glass and cement manufacture.*
- + *Timber, furniture, paper and printing works.*
- + *Factory construction and demolition sites.*
- + *Places for packing agricultural and food products (separate from farm holding)*
- *Excludes utilities and infrastructure (U061 – U065).*
- *Excludes primary extractive industries e.g. coal mines, stone quarry, and gravel pits (U031).*

U102 Offices

- + *Offices of central and local government, company offices, and other general offices.*
- + *Offices for research and development and testing of products or processes.*
- + *Offices hosting scientific facilities and laboratories.*
- + *Business meeting places and centres.*
- + *Art studios, music recording and film studios.*
- *Excludes offices providing financial, professional and other services for the public (U092).*

U103 Storage

- + *Storage places and facilities for onward distribution (not sale) of equipment, bulk materials and goods e.g. warehouses, repositories, open storage land.*

U104 Wholesale distribution

- + *Places for bulk dealing of raw materials, industrial supplies and machinery and livestock.*
- + *Wholesale distribution places for food and drink, petroleum and other non-food products.*

U110 VACANT AND DERELICT**U111 Vacant**

- + *Land which is now vacant and could be redeveloped without treatment, where treatment includes any of the following: demolition, clearing of fixed structures or foundations and levelling.*
- + *Vacant buildings that are structurally sound and in a reasonable state of repair (i.e. capable of being occupied in their present state) where re-letting for their former use is not expected or that have been declared redundant.*
- *Excludes land previously used for mineral extraction or waste disposal which has been or is being restored for agriculture, forestry, woodland or other open countryside use.*

U112 Derelict

- + *Land so damaged by previous industrial or other development that it is incapable of beneficial use without treatment, where treatment includes any of the following: demolition, clearing of fixed structures or foundations and levelling.*
- + *Abandoned and unoccupied buildings in an advanced state of disrepair i.e. with unsound roof(s).*
- *Excludes land damaged by development which has been or is being restored for agriculture, forestry, woodland or other open countryside use.*

- *Excludes land damaged by a previous development where the remains of any structure or activity have blended into the landscape in the process of time (to the extent that it can reasonably be considered as part of the natural surroundings), and where there is a clear reason that could outweigh the re-use of the site - such as its contribution to nature conservation - or it has subsequently been put to an amenity use and cannot be regarded as requiring redevelopment.*

U120 DEFENCE

U121 Defence

- + *Defence establishments, including camps, airfields, live firing training areas and other defence facilities and places.*
- *Excludes residences for defence personnel (U071) and barracks (U073).*

U130 UNUSED LAND

U131 Unused Land

- + *Semi-natural areas of land which are not part of routine cultivations or being grazed and which have never been used for development, including scree, cliff, dunes, marsh and beach and reclaimed land which has not been grazed or developed.*
- + *Land or water bodies for which no specific primary use can be determined.*
- *Excludes vacant land (U111).*
- *Excludes low-intensity agricultural use (U011).*

3. Index using NLUC Descriptions of Land Use

NLUC (Level 4) Description		NLUD Land Use Classification
A		
Abandoned building	UL02 A -A	U112 Derelict
Abrasives and other building materials manufacturing place	MA06 A -A	U101 Manufacturing
Access road	TR01 E -A	U051 Transport tracks and ways
Adult education centre	ED01 F -A	U083 Education
Advertising hoarding	CM06 A -A	U084 Community services
Advertising places	CM06 A	U084 Community services
Aerial ropeway	TR05 A -A	U055 Goods and freight handling
Aerial ropeway passenger terminal	TR02 A -A	U052 Transport terminals and interchanges
Aerospace equipment manufacturing or repairing place	MA04 E -A	U101 Manufacturing
Aggregate and stone handling installation	MI01 D -A	U031 Mineral workings and quarries
Agricultural machinery store	ST01 A -A	U103 Storage
Agricultural machinery dealer's place	WH01 B -A	U104 Wholesale distribution
Agricultural machinery manufacturing place	MA04 A -A	U101 Manufacturing
Agricultural research establishment	AG05 A -A	U011 Agriculture
Agriculture and fisheries places	AG	U011 Agriculture
Air freight terminal	TR02 B -A	U055 Goods and freight handling
Air passenger terminal	TR02 A -B	U052 Transport terminals and interchanges
Aircraft hangar	TR02 C -A	U054 Other vehicle storage
Airport	TR02 A -C	U052 Transport terminals and interchanges
All purpose road	TR01 E -B	U051 Transport tracks and ways
Allotment gardens	AG06 B -A	U046 Allotments and urban farms
Aluminium and aluminium alloy manufacturing	MA01 B -A	U101 Manufacturing
Ambulance station	CM01 B -A	U081 Medical and health care services
Amenity, amusement and show places	LE01	U040 Recreation and leisure
Amusement places	LE01 C	U042 Amusement and show places
Anchorage	TR04 A -A	U056 Waterways
Ancient monument	LE01 B -A	U041 Outdoor amenity and open spaces
Animal and poultry food manufacturing place	MA02 A -A	U101 Manufacturing
Animal artificial insemination centre	AG01 A -A	U011 Agriculture
Animal boarding establishment	AG01 B -A	U011 Agriculture
Animal breeding places	AG02 A	U011 Agriculture
Animal clipping and manicure establishment	AG01 B -B	U011 Agriculture
Animal dipping place	AG01 A -B	U011 Agriculture
Animal living places	AG02	U011 Agriculture
Animal milking places	AG03 A	U011 Agriculture
Animal product processing places	AG03	U011 Agriculture
Animal product waste store	AG03 F -A	U011 Agriculture
Animal product waste treatment places	AG03 F -B	U011 Agriculture
Animal products waste handling places	AG03 F	U011 Agriculture
Animal rearing places	AG02 B	U011 Agriculture
Animal service places	AG01 A	U011 Agriculture
Animal service places	AG01	U011 Agriculture
Animal shearing places	AG03 B	U011 Agriculture
Animal slaughtering places	AG03 C	U011 Agriculture
Animal stunning and killing places	AG03 C -A	U011 Agriculture
Animal training and competing places	LE03 I	U044 Sports facilities
Animal welfare places	AG01 B	U011 Agriculture
Ante natal and post natal clinic	CM01 A -A	U081 Medical and health care services
Approved school	CM05 A -A	U084 Community services
Aquarium	LE01 C -A	U042 Amusement and show places
Arable farm places	AG06 A	U011 Agriculture
Arbitration court	CM08 A -A	U084 Community services
Archaeological site	ED02 A -A	U083 Education
Archery range	LE03 G -A	U044 Sports facilities
Art gallery	LE02 C -A	U043 Libraries, museums and galleries
Artificial limb and appliance hospital	CM01 C -A	U081 Medical and health care services
Association football ground	LE03 A -A	U044 Sports facilities
Athletic game courses	LE03 E	U044 Sports facilities
Athletic games arenas	LE03 D	U044 Sports facilities
Athletic ground	LE03 D -A	U044 Sports facilities
Auxiliary service centres medical	CM01 B	U081 Medical and health care services
B		
Bacon curing, meat and fish product manufacturing place	MA02 A -B	U101 Manufacturing
Badminton court	LE03 B -A	U044 Sports facilities
Baker's shop	RT01 A -A	U091 Shops
Ball game courses	LE03 C	U044 Sports facilities

NLUC (Level 4) Description		NLUD Land Use Classification
Ball game greens and courts	LE03 B	U044 Sports facilities
Ball game pitches and grounds	LE03 A	U044 Sports facilities
Bank	OF02 A -A	U092 Financial and professional services
Barracks	RS01 B -A	U073 Residential institutions
Baseball ground	LE03 A -B	U044 Sports facilities
Beach or sand dune	UL01 A -A	U131 Unused land
Beauty salon	RT01 B -A	U091 Shops
Bedding and soft furnishings manufacturing place	MA07 A -A	U101 Manufacturing
Bedding and waste removal	AG02 B -A	U011 Agriculture
Betting office	LE01 C -B	U092 Financial and professional services
Bingo club	LE01 C -C	U042 Amusement and show places
Biscuit manufacturing	MA02 A -C	U101 Manufacturing
Blacksmith premises	AG01 A -C	U011 Agriculture
Blood transfusion centre	CM01 B -B	U081 Medical and health care services
Boarding house	RS01 A -A	U072 Hotels, boarding and guest houses
Boating facilities	LE04 B -A	U044 Sports facilities
Boatyard	TR04 A -B	U056 Waterways
Bobsleigh course	LE03 E -A	U044 Sports facilities
Bolts, nuts, screws, rivets etc. manufacturing place	MA04 F -D	U101 Manufacturing
Boot and shoe repair establishment	RT02 B -A	U091 Shops
Borstal institution	CM05 A -B	U084 Community services
Botanical garden	LE01 A -A	U041 Outdoor amenity and open spaces
Bowling green	LE03 B -B	U044 Sports facilities
Branch line	TR01 F -A	U051 Transport tracks and ways
Bread and flour confectionery manufacturing place	MA02 A -D	U101 Manufacturing
Brewery	MA02 A -E	U101 Manufacturing
Bricks, fireclay and refractory goods manufacturing place	MA06 A -B	U101 Manufacturing
Bricks, pottery, glass, cement manufacturing places	MA06 A	U101 Manufacturing
Bridleway	TR01 C -A	U051 Transport tracks and ways
Broadcast receiving and sound reproducing equipment manufacturing place	MA04 C -A	U101 Manufacturing
Broadcasting, filming and sound recording studio	LE01 D -A	U042 Amusement and show places
Brushes and brooms manufacturing place	MA08 A -A	U101 Manufacturing
Builders merchant's place	WH01 A -C	U104 Wholesale distribution
Builders yard	ST02 A -A	U103 Storage
Building converted to more than one dwelling	RS02 A -A	U071 Dwellings
Building equipment store	ST01 A -B	U103 Storage
Building society office	OF02 A -B	U092 Financial and professional services
Bulk dealing places	WH01 A	U104 Wholesale distribution
Bulk material stores	ST02 A	U103 Storage
Bungalow	RS02 A -B	U071 Dwellings
Bus depot	TR02 C -B	U054 Other vehicle storage
Bus only way	TR01 D -A	U051 Transport tracks and ways
Bus station	TR02 A -D	U052 Transport terminals and interchanges
Bus stop	TR02 A -E	U052 Transport terminals and interchanges
Bus way	TR01 D -B	U051 Transport tracks and ways
Business discussion places	OF03 A -A	U102 Offices
Business meeting places	OF03 A	U102 Offices
Business meeting places	OF03	U102 Offices
Butcher's shop	RT01 A -B	U091 Shops
C		
Camping site	LE05 A -A	U045 Holiday camps
Can and metal box manufacturing place	MA04 F -A	U101 Manufacturing
Canal (unused)	UL01 C -A	U131 Unused land
Canal	TR03 A -A	U056 Waterways
Canoeing water	LE04 B -B	U044 Sports facilities
Car park	TR02 A -F	U052 Transport terminals and interchanges
Car storage place	TR02 C -C	U053 Car parks
Caravan sales place	RT01 D -A	U091 Shops
Carpet manufacturing place	MA05 A -A	U101 Manufacturing
Cash and carry store	RT01 F -A	U091 Shops
Catering places	RT03 B	U093 Restaurants and cafes
Catering service places	RT03	U090 Retail
Cats meat shop	RT01 A -C	U091 Shops
Caving place	LE03 F -A	U044 Sports facilities
Cement manufacturing place	MA06 A -C	U101 Manufacturing
Cemetery	UT07 B -A	U064 Cemeteries and crematoria
Central government administration office	OF01 A -A	U102 Offices

NLUC (Level 4) Description	NLUD Land Use Classification
Cereal crops	AG06 A -A U011 Agriculture
Cereal crops store	AG07 A -A U011 Agriculture
Chalk working	MI01 A -A U031 Mineral workings and quarries
Chapel of rest	UT07 A -A U064 Cemeteries and crematoria
Chemical and allied industries manufacturing places	MA03 A U101 Manufacturing
Children's home	CM04 A -A U073 Residential institutions
Children's playground	LE01 C -D U042 Amusement and show places
China clay working	MI01 A -B U031 Mineral workings and quarries
China clay waste tip and settlement lagoon	MI01 C -A U031 Mineral workings and quarries
Church hall	CM06 B -A U084 Community services
Cinema	LE01 D -B U042 Amusement and show places
Circus	LE01 D -C U042 Amusement and show places
Civil Defence centre	CM05 B -A U084 Community services
Clay and shale working	MI01 A -C U031 Mineral workings and quarries
Cleaning materials store	ST02 A -B U103 Storage
Cleared site	UL01 B -A U111 Vacant
Cliff or natural outcrop	UL01 A -B U131 Unused land
Climbing, rambling and caving places	LE03 F U044 Sports facilities
Clothing and footwear manufacturing places	MA05 C U101 Manufacturing
Clothing and footwear shop	RT01 B -C U091 Shops
Clothing, textiles, leather, footwear and fur goods manufacturing places	MA05 U101 Manufacturing
Club meeting place	CM06 B -B U084 Community services
Coach depot	TR02 C -D U054 Other vehicle storage
Coach station	TR02 A -G U052 Transport terminals and interchanges
Coal mine working	MI01 A -D U031 Mineral workings and quarries
Coal and oil dealer's place	WH01 A -A U104 Wholesale distribution
Coal and petroleum processing places	MA01 A U101 Manufacturing
Coal handling installation	MI01 D -B U031 Mineral workings and quarries
Coal waste tip and settlement lagoon	MI01 C -B U031 Mineral workings and quarries
Coal, oil and metal processing places	MA01 U101 Manufacturing
Coastguard station	CM05 B -B U084 Community services
Cocoa, chocolate and sugar confectionery manufacturing place	MA02 A -F U101 Manufacturing
Coke ovens and solid fuel manufacturing place	MA01 A -A U101 Manufacturing
College of further education	ED01 F -B U083 Education
College of technology	ED01 F -C U083 Education
Colliery headgear	MI01 B -A U031 Mineral workings and quarries
Combative sports place	LE03 D -B U044 Sports facilities
Communal homes	RS01 B U073 Residential institutions
Communication places	CM06 U084 Community services
Community and health services	CM U080 Community services
Community centre	CM06 B -C U084 Community services
Community protection services	CM05 U084 Community services
Concert arena	LE01 D -D U042 Amusement and show places
Confectionery, tobacco and newspaper shop	RT01 B -B U091 Shops
Coniferous forest	AG08 B -A U020 Forestry
Construction and demolition site	MA09 A -A U101 Manufacturing
Construction and earth moving equipment manufacturing place	MA04 A -B U101 Manufacturing
Construction places	MA09 U101 Manufacturing
Construction places	MA09 A U101 Manufacturing
Container depot	TR02 B -B U055 Goods and freight handling
Convalescent home	CM01 D -A U081 Medical and health care services
Conveyor	TR05 A -B U055 Goods and freight handling
Copper, brass and other copper alloy manufacturing place	MA01 B -B U101 Manufacturing
Coppice	AG08 B -B U021 Managed forest
Coppice with standards	AG08 B -C U021 Managed forest
Corn, seed and agricultural supplies dealer's place	WH01 A -B U104 Wholesale distribution
Counselling agency	CM04 B -A U081 Medical and health care services
Counselling places	CM04 B U081 Medical and health care services
Country park	LE01 A -B U041 Outdoor amenity and open spaces
Countryside interpretation centre	LE01 D -E U042 Amusement and show places
Courts	CM08 A U084 Community services
Crematorium	UT07 B -B U064 Cemeteries and crematoria
Cricket ground	LE03 A -C U044 Sports facilities
Crop conditioning grading and storage places	AG07 A U011 Agriculture
Crop processing places	AG07 U011 Agriculture
Croquet lawn	LE03 B -C U044 Sports facilities
Cross country horse trial course	LE03 I -A U044 Sports facilities
Cross country running course	LE03 E -B U044 Sports facilities

NLUC (Level 4) Description		NLUD Land Use Classification
Cultivated places	AG06	U011 Agriculture
Customs depot	TR06 A -A	U055 Goods and freight handling
Cutlery and plated tableware manufacturing place	MA04 F -B	U101 Manufacturing
Cycle track	TR01 B -A	U051 Transport tracks and ways
Cycling circuit	LE03 H -A	U044 Sports facilities
D		
Dairy shop	RT01 A -D	U091 Shops
Dance hall	LE01 C -E	U042 Amusement and show places
Day nursery school	ED01 A -A	U083 Education
Dead bodies disposal places	UT07 B	U064 Cemeteries and crematoria
Dead bodies storage places	UT07 A	U064 Cemeteries and crematoria
Dealing in industrial materials, machinery and livestock places	WH01	U104 Wholesale distribution
Deciduous forest	AG08 B -D	U020 Forestry
Defence establishments	DF01	U121 Defence
Defence training places	DF01 A	U121 Defence
Dental hospital	CM01 C -B	U081 Medical and health care services
Dentist's surgery and consulting room	CM01 A -B	U081 Medical and health care services
Department store	RT01 F -B	U091 Shops
Detached house	RS02 A -C	U071 Dwellings
Detention places	CM05 A	U084 Community services
Direction finding places	UT08 F	U065 Post and telecommunications
Direction finding transmitter	UT08 F -B	U065 Post and telecommunications
Dispensary	CM01 A -C	U081 Medical and health care services
Display arena	LE01 D -F	U042 Amusement and show places
District heating places	UT06 A	U061 Energy production and distribution
District heating plant	UT06 A -A	U061 Energy production and distribution
Dock (unused)	UL01 C -B	U131 Unused land
Docks	TR02 B -C	U055 Goods and freight handling
Doctor's surgery and consulting room	CM01 A -D	U081 Medical and health care services
Dog racing track	LE03 I -B	U044 Sports facilities
Dog trials area	LE03 I -C	U044 Sports facilities
Dresses, lingerie, infants wear etc. manufacturing place	MA05 C -A	U101 Manufacturing
Drover's way	TR01 C -B	U051 Transport tracks and ways
Dry cleaning and clothing repair establishment	RT02 B -B	U091 Shops
Duplicating and copying centre	RT01 B -D	U091 Shops
Dwellings	RS02 A	U071 Dwellings
Dyestuffs and pigments manufacturing place	MA03 A -A	U101 Manufacturing
E		
Ear, nose and throat hospital	CM01 C -C	U081 Medical and health care services
Education places	ED01	U083 Education
Egg grading place	AG03 D -A	U011 Agriculture
Electric appliances primarily for domestic use manufacturing places	MA04 C -B	U101 Manufacturing
Electrical engineering places	MA04 C	U101 Manufacturing
Electrical machinery manufacturing place	MA04 C -C	U101 Manufacturing
Electricity showroom	RT01 C -A	U091 Shops
Electricity cableway	UT02 B -A	U061 Energy production and distribution
Electricity distribution places	UT02 B	U061 Energy production and distribution
Electricity production places	UT02 A	U061 Energy production and distribution
Electricity supply places	UT02	U061 Energy production and distribution
Electricity transformer station	UT02 B -B	U061 Energy production and distribution
Electronic computers manufacturing place	MA04 C -D	U101 Manufacturing
Engineering equipment store	ST01 A -C	U103 Storage
Engineering places	MA04	U101 Manufacturing
Equipment stores	ST01 A	U103 Storage
Explosives and fireworks manufacturing place	MA03 A -B	U101 Manufacturing
Eye hospital	CM01 C -D	U081 Medical and health care services
Eye clinic and optician's surgery and consulting room	CM01 A -E	U081 Medical and health care services
F		
Fallow land	AG06 A -B	U011 Agriculture
Family planning clinic	CM01 B -C	U081 Medical and health care services
Feed handling places	AG03 E	U011 Agriculture
Feed preparation place	AG03 E -A	U011 Agriculture
Feed storage place	AG03 E -B	U011 Agriculture
Feeding	AG02 B -B	U011 Agriculture
Fertilizer manufacturing place	MA03 A -C	U101 Manufacturing
Financial service offices	OF02 A	U092 Financial and professional services

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Fire station	CM05 B -C	U084 Community services
Fish shop	RT01 A -E	U091 Shops
Fish farm	AG02 A -A	U012 Fisheries
Fish sorting place	AG03 D -B	U011 Agriculture
Fishery places	AG04 A	U012 Fisheries
Flower bed	AG06 B -B	U011 Agriculture
Food and drink shops	RT01 A	U091 Shops
Food and drink wholesaling places	WH02 A	U104 Wholesale distribution
Food, drink and tobacco manufacturing place	MA02 A	U101 Manufacturing
Foot clinic and chiropodist's surgery and consulting room	CM01 A -F	U081 Medical and health care services
Footpath	TR01 A -A	U051 Transport tracks and ways
Footwear manufacturing place	MA05 C -B	U101 Manufacturing
Forensic medicine centre	CM01 B -D	U081 Medical and health care services
Forestry places	AG08 B	U020 Forestry
Fried fish shop	RT01 A -F	U091 Shops
Frozen food shop	RT01 A -G	U091 Shops
Fruit and vegetable product manufacturing place	MA02 A -G	U101 Manufacturing
Fruit crops	AG07 A -B	U011 Agriculture
Fun fair	LE01 C -F	U042 Amusement and show places
Fur goods manufacturing place	MA05 B -A	U101 Manufacturing
Furniture and upholstery manufacturing place	MA07 A -B	U101 Manufacturing
Furniture depository	ST03 A -A	U103 Storage
G		
Galleries	LE02 C	U043 Libraries, museums and galleries
Gaming club	LE01 C -G	U042 Amusement and show places
Gardens	LE01 A -C	U041 Outdoor amenity and open spaces
Gas showroom	RT01 C -B	U091 Shops
Gas distribution places	UT01 B	U061 Energy production and distribution
Gas holder	UT01 A -A	U061 Energy production and distribution
Gas pressure control station	UT01 B -A	U061 Energy production and distribution
Gas production and storage places	UT01 A	U061 Energy production and distribution
Gas supply places	UT01	U061 Energy production and distribution
Gas works	UT01 A -B	U061 Energy production and distribution
General hospital	CM01 C -E	U081 Medical and health care services
General chemical manufacturing place	MA03 A -D	U101 Manufacturing
General goods store	ST03 A -B	U103 Storage
General offices	OF01 A	U102 Offices
General stores	RT01 B -E	U091 Shops
Geriatric hospital	CM01 C -F	U081 Medical and health care services
Glass house	AG06 B -C	U011 Agriculture
Glass manufacturing place	MA06 A -D	U101 Manufacturing
Golf course	LE03 C -B	U044 Sports facilities
Golf driving range	LE03 C -A	U044 Sports facilities
Goods handling places	TR06	U055 Goods and freight handling
Grain mill	MA02 A -H	U101 Manufacturing
Grass land	UL01 A -C	U131 Unused land
Grazing places	AG08 A	U011 Agriculture
Green forage crops place	AG06 A -C	U011 Agriculture
Green forage crops store	AG07 A -C	U011 Agriculture
Green grocer's shop	RT01 A -H	U091 Shops
Grocery and provision	RT01 A -I	U091 Shops
Grocery and provisions confectionery and drinks wholesaling	WH02 A -A	U104 Wholesale distribution
Group residences	RS01	U072 Hotels, boarding and guest houses
Gymnasium	LE03 D -C	U044 Sports facilities
Gypsum/Anhydrite working	MI01 A -E	U031 Mineral workings and quarries
H		
Hairdresser's shop	RT01 B -F	U091 Shops
Handicapped and disabled people's home	CM04 A -B	U073 Residential institutions
Hatchery	AG02 A -B	U012 Fisheries
Hats, cap and millinery manufacturing place	MA05 C -C	U101 Manufacturing
Health care places	CM01	U081 Medical and health care services
Health centre	CM01 A -G	U081 Medical and health care services
Hearing aid centre	CM01 A -H	U081 Medical and health care services
Heath and moorland	UL01 A -D	U131 Unused land
Hides, skin and leather dealer's place	WH01 B -B	U104 Wholesale distribution
Hockey ground	LE03 A -D	U044 Sports facilities
Holiday camp site	LE05 A -B	U045 Holiday camps

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Holiday camps	LE05 A	U045 Holiday camps
Holiday caravan site	LE05 A -C	U045 Holiday camps
Hop field	AG06 B -D	U011 Agriculture
Horse racing course	LE03 I -D	U044 Sports facilities
Horse show jumping, dressage and trotting arena	LE03 I -E	U044 Sports facilities
Horse training area	LE03 I -F	U044 Sports facilities
Horses and livestock dealer	WH01 C -A	U104 Wholesale distribution
Horses and livestock dealing places	WH01 C	U104 Wholesale distribution
Horticultural places	AG06 B	U011 Agriculture
Hosiery and other knitted goods manufacturing place	MA05 A -B	U101 Manufacturing
Hospitals	CM01 C	U081 Medical and health care services
Hot food shop	RT01 A -J	U091 Shops
Hotel	RS01 A -B	U072 Hotels, boarding and guest houses
Household goods shop	RT01 C -C	U091 Shops
Household goods shops and showrooms	RT01 C	U091 Shops
Hunting place	LE03 J -A	U044 Sports facilities
Hunting and shooting places	LE03 J	U044 Sports facilities
Hurling or shinty grounds	LE03 A -E	U044 Sports facilities
Hybrid shops and stores	RT01 F	U091 Shops
Hydro electricity generating station	UT02 A -A	U061 Energy production and distribution
Hypermarket	RT01 F -C	U091 Shops
I		
Ice rink	LE03 D -D	U044 Sports facilities
Igneous rock working	MI01 A -F	U031 Mineral workings and quarries
Industrial and office machinery store	ST01 A -D	U103 Storage
Industrial materials and other machinery dealing places	WH01 B	U104 Wholesale distribution
Industrial research laboratory	MA10 A -A	U101 Manufacturing
Industrial services equipment manufacturing place	MA04 A -C	U101 Manufacturing
Infant school	ED01 B -A	U083 Education
Instrument engineering places	MA04 B	U101 Manufacturing
Insulated wires and cables manufacturing place	MA04 C -E	U101 Manufacturing
Insurance office	OF02 A -C	U092 Financial and professional services
Iron and steel manufacturing place	MA01 B -C	U101 Manufacturing
Iron ore handling installation	MI01 D -C	U031 Mineral workings and quarries
Isolation (animal living place)	AG02 B -C	U011 Agriculture
Isolation hospital	CM01 C -G	U081 Medical and health care services
J		
Jewellery and precious metal manufacturing place	MA04 F -C	U101 Manufacturing
Junior school	ED01 B -B	U083 Education
Justice administration places	CM08	U084 Community services
Jute manufacturing place	MA05 A -C	U101 Manufacturing
K		
Knackering place	AG03 C -B	U011 Agriculture
Knitted goods manufacturing place	MA05 A -B	U101 Manufacturing
L		
Lace manufacturing place	MA05 A -D	U101 Manufacturing
Lacrosse ground	LE03 A -F	U044 Sports facilities
Land sailing area	LE03 H -B	U044 Sports facilities
Land sport places	LE03	U044 Sports facilities
Land transport places	TR02	U052 Transport terminals and interchanges
Land transport tracks	TR01	U051 Transport tracks and ways
Land vehicle performance places	LE03 H	U044 Sports facilities
Launderette	RT02 B -C	U091 Shops
Laundry (cleaning only)	RT02 B -D	U091 Shops
Laundry, cleaning and repairing shop (receiving)	RT01 B -G	U091 Shops
Law court	CM08 A -B	U084 Community services
Lead manufacturing place	MA01 B -D	U101 Manufacturing
Leather (tanning and dressing) and fellmongery place	MA05 B -C	U101 Manufacturing
Leather and fur goods manufacturing places	MA05 B	U101 Manufacturing
Leather goods manufacturing place	MA05 B -B	U101 Manufacturing
Lending library	LE02 A -A	U043 Libraries, museums and galleries
Libraries	LE02 A	U043 Libraries, museums and galleries
Libraries, museums and galleries	LE02	U043 Libraries, museums and galleries
Life boat station	CM05 B -E	U084 Community services
Lift	TR05 A -C	U055 Goods and freight handling
Light railway	TR01 F -B	U051 Transport tracks and ways

NLUC (Level 4) Description		NLUD Land Use Classification
Limestone working	MI01 A -G	U031 Mineral workings and quarries
Linoleum, plastics floor covering, leather cloth manufacturing place	MA08 A -B	U101 Manufacturing
Live firing military training area	DF01 A -A	U121 Defence
Local distributor road	TR01 E -C	U051 Transport tracks and ways
Local government administration office	OF01 A -B	U102 Offices
Locomotives and railway track equipment manufacturing place	MA04 E -B	U101 Manufacturing
Long stay lorry park	TR02 C -E	U054 Other vehicle storage
Lorry transhipment park	TR02 B -D	U055 Goods and freight handling
Lubricating oil and grease manufacturing place	MA01 A -B	U101 Manufacturing
M		
Made up textile manufacturing place	MA05 A -E	U101 Manufacturing
Main drain	UT04 A -A	U062 Water storage and treatment
Main line	TR01 F -C	U051 Transport tracks and ways
Maintenance and repair places	RT02	U091 Shops
Maisonette	RS02 A -D	U071 Dwellings
Man made fibre production manufacturing place	MA05 A -F	U101 Manufacturing
Manufacturing administration office	OF01 A -C	U102 Offices
Manufacturing research establishments	MA10 A	U101 Manufacturing
Manufacturing storage place	MA12 A -A	U101 Manufacturing
Manufacturing storage places	MA12 A	U101 Manufacturing
Manufacturing waste disposal places	MA11 A	U101 Manufacturing
Manufacturing waste tip	MA11 A -A	U101 Manufacturing
Marina	TR04 A -C	U056 Waterways
Material stores	ST02	U103 Storage
Maternity hospital	CM01 C -H	U081 Medical and health care services
Mechanical engineering places	MA04 A	U101 Manufacturing
Mechanical handling equipment manufacturing place	MA04 A -D	U101 Manufacturing
Mechanical handling places	TR05 A	U055 Goods and freight handling
Medical auxiliary service centres	CM01 B	U081 Medical and health care services
Medical diagnosis and treatment centres	CM01 A	U081 Medical and health care services
Medical research establishments	CM02 A	U081 Medical and health care services
Medical research laboratory	CM02 A -A	U081 Medical and health care services
Mental hospital	CM01 C -I	U081 Medical and health care services
Mental clinic	CM01 A -I	U081 Medical and health care services
Metal processing places (basic forms)	MA01 B	U101 Manufacturing
Metal working machine tools manufacturing place	MA04 A -E	U101 Manufacturing
Middle school	ED01 C -A	U083 Education
Milk and milk product manufacturing place	MA02 A -I	U101 Manufacturing
Milk extraction place	AG03 A -A	U011 Agriculture
Milk treatment place	AG03 A -B	U011 Agriculture
Mill and mix building	AG07 A -F	U011 Agriculture
Mineral excavation or pit (dry)	UL01 B -B	U112 Derelict
Mineral excavation or pit (wet)	UL01 C -C	U131 Unused land
Mineral extraction places	MI01	U031 Mineral workings and quarries
Mineral fertiliser handling installation	MI01 D -E	U031 Mineral workings and quarries
Mineral line	TR01 F -D	U051 Transport tracks and ways
Mineral oil refinery	MA01 A -C	U101 Manufacturing
Miniature golf course	LE03 B -D	U044 Sports facilities
Miscellaneous goods manufacturing place	MA08 A -C	U101 Manufacturing
Miscellaneous stationers goods manufacturing place	MA08 A -D	U101 Manufacturing
Miscellaneous wood and cork manufacturing place	MA07 A -C	U101 Manufacturing
Mixed forest	AG08 B -E	U020 Forestry
Mixed market garden	AG06 B -E	U011 Agriculture
Monument	LE01 B -B	U041 Outdoor amenity and open spaces
Mooring	TR04 A -D	U056 Waterways
Mortuary	UT07 A -B	U064 Cemeteries and crematoria
Motor cycle, tricycle and pedal cycle manufacturing place	MA04 E -C	U101 Manufacturing
Motor vehicle dealer display area	RT01 D -C	U091 Shops
Motor vehicle goods shops and filling stations	RT01 D	U091 Shops
Motor vehicle maintenance and repair places	RT02 A	U091 Shops
Motor vehicle manufacturing place	MA04 E -D	U101 Manufacturing
Motor vehicle practice circuit	TR01 E -E	U051 Transport tracks and ways
Motor vehicle racing track	LE03 H -C	U044 Sports facilities
Motor vehicle repair garage	RT02 A -A	U091 Shops
Motor vehicle sales	RT01 D -D	U091 Shops
Motor vehicle spare parts and accessories	RT01 D -B	U091 Shops
Motor vehicle testing circuit	TR01 E -D	U051 Transport tracks and ways
Motor vehicle testing station	RT02 A -B	U091 Shops

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Motorway (special road)	TR01 E-F	U051 Transport tracks and ways
Movable dwelling site	RS01 C-A	U071 Dwellings
Museum	LE02 B-A	U043 Libraries, museums and galleries
N		
Narrow fabric manufacturing place	MA05 A-G	U101 Manufacturing
Nature reserve	ED02 B-A	U083 Education
Nature reserves and sanctuaries	ED02 B	U083 Education
Navigational light beacon	UT08 F-A	U065 Post and telecommunications
Nervous disorders clinic	CM01 A-J	U081 Medical and health care services
Net fishery place	AG04 A-A	U012 Fisheries
Night club	LE01 C-H	U042 Amusement and show places
Non cultivated places	AG08	U011 Agriculture
Non ferrous ore handling installation	MI01 D-D	U031 Mineral workings and quarries
Non medical care places	CM04	U073 Residential institutions
Non medical homes	CM04 A	U073 Residential institutions
Non residential plus single dwelling	RS02 A-E	U071 Dwellings
Nursery	AG06 B-F	U011 Agriculture
Nursery school	ED01 A-B	U083 Education
O		
Observatory	ED02 A-B	U083 Education
Occupational therapy and physiotherapy clinic	CM01 A-K	U081 Medical and health care services
Off licence	RT01 A-K	U091 Shops
Office machinery manufacturing place	MA04 A-F	U101 Manufacturing
Offices	OF	U102 Offices
Oil and gas handling installation	MI01 D-F	U031 Mineral workings and quarries
Oil and gas well head	MI01 B-B	U031 Mineral workings and quarries
Oil pumping station	TR05 B-A	U061 Energy production and distribution
Old people's home	CM04 A-C	U073 Residential institutions
Orchard with arable land	AG06 B-G	U011 Agriculture
Orchard with grass	AG06 B-H	U011 Agriculture
Orchard with market garden	AG06 B-I	U011 Agriculture
Ordnance and small arms manufacturing place	MA04 A-G	U101 Manufacturing
Orthopaedic hospital	CM01 C-J	U081 Medical and health care services
Orthopaedic and rheumatic clinic	CM01 A-L	U081 Medical and health care services
Outdoor amenity places	LE01 A	U041 Outdoor amenity and open spaces
Overalls and men's shirts and underwear manufacturing place	MA05 C-D	U101 Manufacturing
P		
Packaging products of paper and associated materials manufacturing place	MA07 B-B	U101 Manufacturing
Packing and sorting (crop processing place)	AG07 A-G	U011 Agriculture
Packing places (animal products)	AG03 D	U011 Agriculture
Paint manufacturing place	MA03 A-E	U101 Manufacturing
Paper and board manufacturing place	MA07 B-C	U101 Manufacturing
Paper, printing and publishing works	MA07 B	U101 Manufacturing
Park	LE01 A-D	U041 Outdoor amenity and open spaces
Parturition place	AG02 A-C	U011 Agriculture
Peat, bog, freshwater marsh and swamp	UL01 A-E	U131 Unused land
Periodical and newspaper printing and publishing works	MA07 B-D	U101 Manufacturing
Permanent pasture	AG08 A-A	U011 Agriculture
Personal and household goods repair and cleaning places	RT02 B	U091 Shops
Pet animal and bird shop	RT01 B-H	U091 Shops
Petrol and oil filling station	RT01 D-E	U091 Shops
Petroleum products wholesaling place	WH02 B-A	U104 Wholesale distribution
Pharmaceutical chemicals and preparation manufacturing place	MA03 A-F	U101 Manufacturing
Photographic and document copying equipment manufacturing place	MA04 B-A	U101 Manufacturing
Photographic service shop	RT01 B-I	U091 Shops
Picnic site	LE01 A-E	U041 Outdoor amenity and open spaces
Pipeline	TR05 B-B	U061 Energy production and distribution
Places of worship	CM07 A	U082 Places of worship
Police station	CM05 B-D	U084 Community services
Polo ground	LE03 A-G	U044 Sports facilities
Polytechnic	ED01 F-D	U083 Education
Pond or lake	UL01 C-D	U131 Unused land
Pony trekking route	TR01 C-C	U051 Transport tracks and ways
Post office	RT01 B-J	U091 Shops
Postal service places	UT08 A	U065 Post and telecommunications

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Postal service, signalling and telecommunications places	UT08	U065 Post and telecommunications
Postal sorting depot	UT08 A -A	U065 Post and telecommunications
Pot and other inshore or estuarial fishing place	AG04 A -B	U012 Fisheries
Pottery manufacturing place	MA06 A -E	U101 Manufacturing
Power craft water	LE04 B -C	U044 Sports facilities
Pre primary schools	ED01 A	U083 Education
Precinct	TR01 A -B	U051 Transport tracks and ways
Primary distributor road	TR01 E -G	U051 Transport tracks and ways
Primary schools	ED01 B	U083 Education
Prime movers manufacturing place	MA04 A -H	U101 Manufacturing
Prison	CM05 A -C	U084 Community services
Prison rehabilitation centre	CM05 A -D	U084 Community services
Processing place (animal slaughtering place)	AG03 C -C	U011 Agriculture
Processional route (road)	TR01 E -H	U051 Transport tracks and ways
Processional route (walking or marching)	TR01 A -C	U051 Transport tracks and ways
Professional services office	OF01 A -D	U102 Offices
Protected land (unused)	UL01 B -C	U111 Vacant
Protection places	CM05 B	U084 Community services
Public bath	CM03 A -A	U084 Community services
Public convenience	CM03 A -B	U084 Community services
Public house	RT03 A -A	U094 Public houses, bars and nightclubs
Pulse crops place	AG06 A -D	U011 Agriculture
Pulse crops store	AG07 A -D	U011 Agriculture
Pumps, valves and compressor manufacturing place	MA04 A -I	U101 Manufacturing
Purpose built block of flats	RS02 A -F	U071 Dwellings
Q		
Quarantine place, animal	AG01 B -C	U011 Agriculture
R		
Radar beacon	UT08 C -A	U065 Post and telecommunications
Radar places	UT08 C	U065 Post and telecommunications
Radar station	UT08 C -B	U065 Post and telecommunications
Radio and electronic capital goods manufacturing place	MA04 C -F	U101 Manufacturing
Radio and television mast	UT08 D -B	U065 Post and telecommunications
Radio station	UT08 D -A	U065 Post and telecommunications
Radio, radar and electronic capital goods manufacturing place	MA04 C -G	U101 Manufacturing
Radiography centre	CM01 B -E	U081 Medical and health care services
Railway carriages and wagons and trams manufacturing place	MA04 E -E	U101 Manufacturing
Railway goods siding	TR02 B -E	U055 Goods and freight handling
Railway goods yard	TR02 B -F	U055 Goods and freight handling
Railway sidings	TR02 C -F	U054 Other vehicle storage
Railway sorting depot	TR02 B -G	U055 Goods and freight handling
Railway station	TR02 A -H	U052 Transport terminals and interchanges
Railways	TR01 F	U051 Transport tracks and ways
Rambling and fell walking	LE03 F -B	U044 Sports facilities
Rearing pond	AG02 B -D	U012 Fisheries
Recreation and leisure places	LE	U040 Recreation and leisure
Recreational open space	LE01 A -F	U041 Outdoor amenity and open spaces
Reference	LE02 A -B	U043 Libraries, museums and galleries
Refrigerated store	ST03 A -C	U103 Storage
Refuse disposal places	UT05 A	U063 Refuse disposal
Refuse disposal plant	UT05 A -A	U063 Refuse disposal
Refuse tip	UT05 A -B	U063 Refuse disposal
Remand centre	CM05 A -E	U084 Community services
Remand classifying centre	CM05 A -F	U084 Community services
Remand home	CM05 A -G	U084 Community services
Research establishments	ED02 A	U083 Education
Research places	ED02	U083 Education
Reservoir	UT03 A -A	U062 Water storage and treatment
Residences	RS	U070 Residential
Residential caravan site	RS01 C -B	U071 Dwellings
Residential club	RS01 A -C	U072 Hotels, boarding and guest houses
Residential retreat	RS01 B -B	U073 Residential institutions
Restaurant	RT03 B -A	U093 Restaurants and cafes
Retail distribution places	RT01	U090 Retail
Retail distribution and servicing places	RT	U090 Retail
Retail market place	RT01 E -A	U091 Shops
Ride	TR01 C -D	U051 Transport tracks and ways

NLUC (Level 4) Description		NLUD Land Use Classification
River	TR03 A -B	U056 Waterways
Road running and walking course	LE03 E -C	U044 Sports facilities
Roads	TR01 E	U051 Transport tracks and ways
Rock climbing	LE03 F -C	U044 Sports facilities
Rod and line fishery place	AG04 A -C	U012 Fisheries
Rod/recreational fishing place	LE04 C -A	U044 Sports facilities
Roller skating rink	LE03 D -E	U044 Sports facilities
Rooming house	RS01 A -D	U072 Hotels, boarding and guest houses
Root crops place	AG06 A -E	U011 Agriculture
Root crops store	AG07 A -E	U011 Agriculture
Rope, twine and net manufacturing place	MA05 A -H	U101 Manufacturing
Rough grazing	AG08 A -B	U011 Agriculture
Rowing water	LE04 B -D	U044 Sports facilities
Rubber goods manufacturing place	MA08 A -E	U101 Manufacturing
Rugby football ground	LE03 A -H	U044 Sports facilities
Ruined building	UL02 A -A	U112 Derelict
S		
Sailing	LE04 B -E	U044 Sports facilities
Salt and brine pumping installation	MI01 B -C	U031 Mineral workings and quarries
Salt marsh (unused)	UL01 A -F	U131 Unused land
Sand and gravel working	MI01 A -H	U031 Mineral workings and quarries
Sandstone working	MI01 A -I	U031 Mineral workings and quarries
Sanitation places	CM03	U084 Community services
Sanitation places	CM03 A	U084 Community services
Satellite communication station	UT08 E -A	U065 Post and telecommunications
School boarding house	RS01 B -C	U073 Residential institutions
Scientific and industrial instruments and systems manufacturing place	MA04 B -C	U101 Manufacturing
Scrap and waste dealer	WH01 B -C	U104 Wholesale distribution
Secondary school	ED01 D -A	U083 Education
Secondary distributor road	TR01 E -I	U051 Transport tracks and ways
Secondary schools	ED01 D	U083 Education
Self contained residences	RS02	U071 Dwellings
Semi detached house	RS02 A -G	U071 Dwellings
Service pen	AG02 A -D	U011 Agriculture
Sewage disposal places	UT04	U062 Water storage and treatment
Sewage draining places	UT04 A	U062 Water storage and treatment
Sewage farm	UT04 B -A	U062 Water storage and treatment
Sewage pumping station	UT04 A -B	U062 Water storage and treatment
Sewage treatment places	UT04 B	U062 Water storage and treatment
Sewage treatment works	UT04 B -B	U062 Water storage and treatment
Ship passenger terminal	TR02 A -I	U052 Transport terminals and interchanges
Shipbuilding and marine engineering place	MA04 D -A	U101 Manufacturing
Shooting and stalking area	LE03 J -B	U044 Sports facilities
Shop and office fittings manufacturing place	MA07 A -D	U101 Manufacturing
Show places	LE01 D	U042 Amusement and show places
Signalling station	UT08 F -C	U065 Post and telecommunications
Silica and moulding sand working	MI01 A -K	U031 Mineral workings and quarries
Site of special scientific interest	ED02 B -B	U083 Education
Sixth form college	ED01 D -B	U083 Education
Skiing and tobogganing run	LE03 E -D	U044 Sports facilities
Slate working	MI01 A -L	U031 Mineral workings and quarries
Slate waste tip	MI01 C -C	U031 Mineral workings and quarries
Small arms range	LE03 G -B	U044 Sports facilities
Small tools, implements and gauges manufacturing place	MA04 F -E	U101 Manufacturing
Soap, detergent and fat splitting and distillation manufacturing place	MA03 A -G	U101 Manufacturing
Social meeting places	CM06 B	U084 Community services
Soft drinks manufacturing place	MA02 A -J	U101 Manufacturing
Soft fruit place	AG06 B -J	U011 Agriculture
Special school	ED01 E -A	U083 Education
Specialised, higher and further education centres	ED01 F	U083 Education
Spinning and doubling (cotton and flax systems) manufacturing place	MA05 A -I	U101 Manufacturing
Spoilt land	UL01 B -D	U112 Derelict
Sports equipment store	ST01 A -E	U103 Storage
Squash court	LE03 B -E	U044 Sports facilities
Staff hostel	RS01 B -D	U073 Residential institutions

NLUC (Level 4) Description		NLUD Land Use Classification
Stationery manufacturing place	MA07 B -A	U101 Manufacturing
Storage	ST	U103 Storage
Storage places for vehicles	TR02 C	U050 Transport
Storage places for water craft	TR04 A	U056 Waterways
Studio	OF04 A -A	U102 Offices
Sugar refinery	MA02 A -K	U101 Manufacturing
Supermarket	RT01 F -D	U091 Shops
Surface installations for underground mineral workings	MI01 B	U031 Mineral workings and quarries
Surface mineral workings	MI01 A	U031 Mineral workings and quarries
Surgeon's surgery and consulting room	CM01 A -M	U081 Medical and health care services
Surgical instruments and appliances manufacturing place	MA04 B -B	U101 Manufacturing
Swimming and bathing	LE04 A	U044 Sports facilities
Swimming baths	LE04 A -A	U044 Sports facilities
Synthetic resins, plastics and synthetic rubber manufacturing place	MA03 A -H	U101 Manufacturing
T		
Tailored outerwear manufacturing place	MA05 C -E	U101 Manufacturing
Target shooting places	LE03 G	U044 Sports facilities
Teacher training college	ED01 F -E	U083 Education
Technical college	ED01 F -F	U083 Education
Telegraph and telephone apparatus and equipment manufacturing place	MA04 C -H	U101 Manufacturing
Telephone cableway	UT08 B -A	U065 Post and telecommunications
Telephone exchange	UT08 B -B	U065 Post and telecommunications
Telephone kiosk	UT08 B -C	U065 Post and telecommunications
Television and radio broadcasting places	UT08 D	U065 Post and telecommunications
Television station	UT08 D -C	U065 Post and telecommunications
Ten pin bowling alley	LE03 B -G	U044 Sports facilities
Tennis court	LE03 B -F	U044 Sports facilities
Terminals and interchanges for goods	TR02 B	U055 Goods and freight handling
Terminals and interchanges for people	TR02 A	U052 Transport terminals and interchanges
Terraced house	RS02 A -H	U071 Dwellings
Textile finishing place	MA05 A -J	U101 Manufacturing
Textile machinery and accessories manufacturing place	MA04 A -J	U101 Manufacturing
Textile manufacturing places	MA05 A	U101 Manufacturing
Theatre	LE01 D -G	U042 Amusement and show places
Thermal electricity generating station	UT02 A -B	U061 Energy production and distribution
Ticket agency	RT01 B -K	U091 Shops
Timber and furniture works	MA07 A	U101 Manufacturing
Timber dealer's place	WH01 B -D	U104 Wholesale distribution
Timber furniture, paper, printing and publishing works	MA07	U101 Manufacturing
Timber works	MA07 A -E	U101 Manufacturing
Tobacco manufacturing place	MA02 A -L	U101 Manufacturing
Toilet preparation manufacturing place	MA03 A -I	U101 Manufacturing
Toys, games, children's carriages and sports equipment manufacturing place	MA08 A -F	U101 Manufacturing
Tramway	TR01 F -E	U051 Transport tracks and ways
Transport tracks and places	TR	U050 Transport
Travel agency	RT01 B -L	U091 Shops
Tree nursery	AG08 B -F	U021 Managed forest
Tribunal place	CM08 A -C	U084 Community services
Tripe shop	RT01 A -L	U091 Shops
Tyre retailing and fitting place	RT01 D -F	U091 Shops
U		
Underground line	TR01 F -F	U051 Transport tracks and ways
Undertaker	RT01 B -M	U091 Shops
University teaching establishment	ED01 F -G	U083 Education
Unused buildings	UL02 A	11.0 Previously developed land
Unused formerly developed land	UL01 B	11.0 Previously developed land
Unused land and water	UL01	U131 Unused land
Unused land in natural or semi natural state	UL01 A	U131 Unused land
Unused water	UL01 C	U131 Unused land
Utility services	UT	U060 Utilities and infrastructure
V		
Vacant building	UL02 A -B	U111 Vacant
Vegetable (crop conditioning and storage)	AG07 A -H	U011 Agriculture
Vegetable field	AG06 B -K	U011 Agriculture

NLUC (Level 4) Description		NLUD Land Use Classification
Vegetable, animal oil and fat manufacturing place	MA02 A-M	U101 Manufacturing
Vehicle engineering places	MA04 E	U101 Manufacturing
Vein mineral working	MI01 A-M	U031 Mineral workings and quarries
Vein mineral waste tip and settlement lagoon	MI01 C-D	U031 Mineral workings and quarries
Veterinary hospital	AG01 B-D	U011 Agriculture
Veterinary surgery	AG01 B-E	U011 Agriculture
View point	LE01 A-G	U041 Outdoor amenity and open spaces
W		
Walkway	TR01 A-D	U051 Transport tracks and ways
Waste disposal areas from mineral working and processing	MI01 C	U031 Mineral workings and quarries
Waste heap or tip	UL01 B-E	U112 Derelict
Watches and clocks manufacturing place	MA04 B-D	U101 Manufacturing
Water course	UL01 C-E	U131 Unused land
Water distribution places	UT03 B	U062 Water storage and treatment
Water extraction places	UT03 C	U062 Water storage and treatment
Water intake from rivers or streams	UT03 C-B	U062 Water storage and treatment
Water intake from springs	UT03 C-A	U062 Water storage and treatment
Water intake from underground sources	UT03 C-C	U062 Water storage and treatment
Water pipeline	UT03 B-B	U062 Water storage and treatment
Water pumping station	UT03 B-A	U062 Water storage and treatment
Water recreation places	LE04 C	U044 Sports facilities
Water skiing place	LE04 B-F	U044 Sports facilities
Water sport places	LE04	U044 Sports facilities
Water storage and treatment places	UT03 A	U062 Water storage and treatment
Water supply places	UT03	U062 Water storage and treatment
Water tower	UT03 A-B	U062 Water storage and treatment
Water tracks	TR03 A	U056 Waterways
Water transport places	TR04	U056 Waterways
Water transport tracks	TR03	U056 Waterways
Water treatment works	UT03 A-C	U062 Water storage and treatment
Watercraft places	LE04 B	U044 Sports facilities
Weatherproof outerwear manufacturing place	MA05 C-F	U101 Manufacturing
Weaving of cotton, linen and man made fibres manufacturing place	MA05 A-K	U101 Manufacturing
Weighing place	AG02 B-E	U011 Agriculture
Wheeled tractor manufacturing place	MA04 E-F	U101 Manufacturing
Wholesale distribution places	WH02	U104 Wholesale distribution
Wild life capturing places	AG04	U012 Fisheries
Wire manufacturing place	MA04 F-F	U101 Manufacturing
Wooden containers and baskets manufacturing place	MA07 A-F	U101 Manufacturing
Woodland and scrub	UL01 A-G	U131 Unused land
Wool grading place	AG03 B-A	U011 Agriculture
Wool removal place	AG03 B-B	U011 Agriculture
Woollen and worsted manufacturing place	MA05 A-L	U101 Manufacturing
Y		
Youth hostel	LE05 A-D	U045 Holiday camps
Z		
Zoological garden	LE01 A-A	U041 Outdoor amenity and open spaces

Appendix B. NLUD 4.4 Land Cover

1. Land Cover Nomenclature
2. Land Cover Definitions
3. Index using Land Cover Baseline Descriptions of Land Cover

1. Land Cover Nomenclature

ORDER		GROUP	
C010	CROPPED LAND	C011	Field crops
		C012	Fallow land
		C013	Horticulture
		C014	Orchards
C020	GRASS	C021	Improved grass
		C022	Unimproved grass
		C023	Recreational and amenity grass
C030	WOODLAND AND SHRUB	C031	Conifer woodland
		C032	Mixed woodland
		C033	Broad-leaved woodland
		C034	Shrub
C040	HEATHLAND AND BOG	C041	Heathland
		C042	Bracken
		C043	Bog
		C044	Montane
C050	INLAND ROCK	C051	Inland rock
C060	WATER AND WETLAND	C061	Standing water
		C062	Running water
		C063	Freshwater marsh
C070	COASTAL FEATURES	C071	Sea and coastal waters
		C072	Inter-tidal sand and mud
		C073	Salt marsh
		C074	Dunes
		C075	Coastal rock and cliffs
C080	BUILDINGS AND STRUCTURES	C081	Building
		C082	Other built structure
C090	PERMANENT MADE SURFACES	C091	Metalled roadway
		C092	Railway
		C093	Pathway
		C094	Other made surface
C100	GENERAL LAND SURFACES	C101	Multiple surface
		C102	Bare surface

2. Land Cover Definitions

C010 CROPPED LAND

C011 Field crops

- + *Land under annual tillage including cereals, brassicas, root crops, legumes and other non-horticultural field crops (i.e. linseed, sunflower).*
- + *Includes land ploughed in readiness for sowing.*

C012 Fallow land

- + *Land left untilled or unsown. Includes fallow land unused as part of agricultural rotation.*
- + *Agricultural land for which there is no obvious intended change of use, but where the former use has been temporarily neglected (for up to 3 years).*

C013 Horticulture

- + *Small plots of widely differing crop types within a small area, often several crops within one field e.g. soft fruit (e.g. currants, blackberries, raspberries), vegetables, vineyards, hops, flowers.*
- + *Includes crops grown under cloches, low plastic tunnels and greenhouses.*
- *Excludes cabbage, potatoes, sugar beet and legumes classified as field crops (C011).*

C014 Orchards

- + *Areas with planted trees which are, or have been, used for the harvesting of tree fruit crops. Often forming a distinctive block and displaying a highly organised (often grid) pattern of planting.*
- + *Includes trees and shrubs grown as nursery stock for transplanting.*

C020 GRASS

C021 Improved grass

- + *Areas of intensively managed grass that show evidence of enclosure for stock control purposes and/or use for fodder/hay, and evidence of improvement by use of fertilisers, pesticides, drainage or re-seeding, usually being dominated by a single grass species. Species such as rushes, thistles and bracken are normally eradicated.*
- + *Includes recently sown grass leys, within the last five years at most, characterised by evidence of ploughing and bare soil between grass plants.*

C022 Unimproved grass

- + *Areas of unimproved and natural grass which have not undergone agricultural improvement by way of application of fertilisers, pesticides, drainage or re-seeding so as to significantly alter the sward composition although may be subject to intermittent grazing. May be enclosed or unenclosed and may occur in both lowland and upland settings. In upland areas includes semi-natural 'downland' grass and coarse 'moorland' and mountain grass.*

C023 Recreational and amenity grass

- + *Areas of recreational and amenity grass e.g. parks, grassed surfaces, large lawns, playing fields, golf courses.*
- + *Areas of non-agricultural mown grass e.g. airfields, race courses, gallops and grassed camp sites and caravan parks.*

C030 WOODLAND AND SHRUB

Woodland is defined as an area of trees, where a tree is a woody species capable of achieving >5m in height and 25% canopy cover under favourable growing conditions.

C031 Conifer woodland

- + *An area of trees (with a minimum width of 20m) where 80% or more of the tree canopy is of coniferous species. Includes conifer woodland on dunes.*

C032 Mixed woodland

- + *An area of mixed coniferous and broadleaved trees (with a minimum width of 20m) where both comprise >20% of the tree canopy. Includes mixed woodland on dunes.*

C033 Broadleaved woodland

- + *An area of trees (with a minimum width of 20m) where 80% or more of the tree canopy is of broadleaved species. Includes broadleaved woodland on dunes. Includes stands of coppiced trees.*

C034 Shrub

- + *Consisting predominantly of low woody plants and bushes, often with tree regeneration and brambles where canopy cover is >50%.*

C040 HEATHLAND AND BOG

C041 Heathland

- + *Land dominated by dwarf shrubs and heath species (>25%) such as heather, gorse and bilberry; occurring in both lowland and moorland settings. Includes dune heath which occurs on consolidated and flattened dunes and areas of exposed peat.*
- *Excludes montane heath (C044)*

C042 Bracken

- + *Areas dominated by continuous bracken.*
- *Excludes areas of unimproved grassland with patches of bracken (C022)*

C043 Bogs

- + *Bogs occur on deep peat where the water table is usually at or just below the surface. Includes the vegetation of blanket bogs on hills and uplands and raised bogs of the lowlands, and is often characterised by the presence of sphagnum moss*

C044 Montane

- + *Dwarf heath, sedge, rush and snow bed vegetation communities at high elevations (i.e. above the 'treeline') usually with a wind-cut or prostrate appearance. Includes moss and lichen dominated heaths of mountain summits.*

C050 INLAND ROCK**C051 Inland rock**

- + *Vertical or near vertical inland rock cliffs.*
- + *Areas where >50% of land surface is covered by rock, including rock outcrops, limestone pavement, scree, block litter and mountain-top debris.*

C060 WATER AND WETLAND**C061 Standing water**

- + *Areas of still open water e.g. lakes, canals, ponds, mere, water filled gravel pits and reservoirs.*
- + *Includes silted-up areas with associated vegetation of reeds, rushes and willow (as long as the area of open water is >40% of the total).*

C062 Running water

- + *Channels of moving water, including rivers and streams.*

C063 Freshwater marsh

- + *Land with water-tables at or near the surface for prolonged periods of the year, generally low lying and frequently in association with stretches of open water. The range of vegetation is very wide and can include reeds, reedgrass, sedges and rushes, often with tall herbs. Some scattered alder and/or willow can also be present.*

C070 COASTAL FEATURES**C071 Sea and coastal waters**

- + *Open sea and coastal waters. Includes estuaries inland to the point where the waterway becomes strongly constricted to the normal width of the river.*
- *Excludes inter-tidal sand and mud (C072)*

C072 Inter-tidal sand and mud

- + *Unvegetated areas of sand and mud between the mean high and low water marks.*
- + *Includes sandy and pebble/gravel shores.*
- *Excludes rocky shores (C075).*

C073 Salt marsh

- + *Vegetated inter-tidal sand, silt or mud with many sinuous creeks and channels colonised by salt tolerant grasses.*
- + *Includes all flowering plant communities which are submerged by high tides at some stage of the annual cycle.*

C074 Dunes

- + *Onshore wind-carried sand deposits arranged in cordons of ridges parallel to the coast.*
- + *Includes inland wind blown sand deposits. Either open or with semi-natural grassland.*
- *Excludes wooded dunes, classified as woodland (C031-C033), dune grassland used as unimproved grass (C022), and dune heath, classified as heathland (C041).*

C075 Coastal rocks and cliffs

- + *Applies to shores where the rocks and cliffs comprise outcropping base-rock.*
- + *Includes unvegetated rocky/boulder shores (possibly seaweed-covered) consisting of shattered rocks or boulders.*

C080 BUILDINGS AND STRUCTURES

C081 Building

- + *A substantial and permanent construction with a roof and walls for giving shelter e.g. house, office, shop, warehouse, factory, church, barn.*

C082 Other built structure

- + *Any built structure without a roof e.g. pylon, water tower, telecommunications mast.*
- + *A minor construction which may be roofed but that is not intended for habitation e.g. covered walkway, bridge, kiosk.*

C090 PERMANENT MADE SURFACES

C091 Metalled roadway

- + *Permanent metalled way for cars, buses, lorries and other road vehicles. Metalling includes any artificial surface including asphalt, concrete/brick pavements, granite sets and gravel.*

C092 Railway

- + *Specially prepared strip of ground and supporting formation (ballast etc) on which metal rails are laid on sleepers for trains to run on i.e. the permanent way.*
- + *Includes land essential to enable the track to operate e.g. cuttings, embankments and the full extent of bridges.*

C093 Pathway

- + *Paved surface by the side of the carriageway for use by pedestrians. Includes any made strip of ground specifically for pedestrian or bicycle use.*

C094 Other made surface

- + *Extensive and permanently developed surfaces (excluding roadways, railways and pathways) e.g. areas of tarmac or concrete, all-weather surfaces, paved civic spaces.*

C100 GENERAL LAND SURFACES

C101 Multiple surface

- + *Any composite surface comprising a mixture of artificial and natural elements e.g. a garden or landscaped area adjacent to a building.*

C102 Bare surface

- + *Areas with no dominant vegetation cover.*
- *Excludes tilled land (C011) and fallow land (C012).*

3. Index using Land Cover Baseline Descriptions of Land Cover

Baseline Classification of Land Cover		NLUD Land Cover Classification	
Tilled and fallow land	1.0	C010	Cropped land
Land parcels with a single crop species	1.1	C011	Field crops
Horticulture	1.2	C013	Horticulture
Non-cropped	1.3	C012	Fallow land
Cropland with woody perennial crops	2.0	C014	Orchards
Orchard	2.1	C014	Orchards
Vineyard	2.2	C014	Orchards
Hops	2.3	C014	Orchards
Soft fruit	2.4	C014	Orchards
Trees and shrubs – nursery stock	2.5	C014	Orchards
Grass	3.0	C020	Grass
Recreational and similar non-agricultural mown grass	3.1	C023	Recreational and amenity grass
Intensive and agriculturally improved grass	3.2	C021	Improved grass
Permanent non-intensive grass	3.3	C021	Improved grass
Semi-natural calcareous grass	3.4	C022	Unimproved grass
Acid grass (non-moorland) and bracken	3.5	C022	Unimproved grass
Moorland and mountain grass	3.6	C022	Unimproved grass
Unmanaged lowland grassland and tall herbs	3.7	C022	Unimproved grass
Heathland and bog	4.0	C040	Heathland and bog
Heathland	4.1	C041	Heathland
Bogs	4.2	C043	Bog
Drier northern bogs	4.2.1	C043	Bog
Saturated bogs	4.2.2	C043	Bog
Woodland and shrubland	5.0	C030	Woodland and shrub
Woodland	5.1	C030	Woodland and shrub
Conifer Woodland	5.1.1	C031	Conifer woodland
Mixed woodland	5.1.2	C032	Mixed woodland
Broadleaved woodland	5.1.3	C033	Broad-leaved woodland
Managed coppice	5.2	C033	Broad-leaved woodland
Coppice-with-standards	5.2.1	C033	Broad-leaved woodland
Pure coppice	5.2.2	C033	Broad-leaved woodland
Shrub	5.3	C034	Shrub
Shrub on dry or moist ground	5.3.1	C034	Shrub
Swampy shrub and carr	5.3.2	C034	Shrub
Felled woodland	5.4	C030	Woodland and shrub
Land ploughed for afforestation	5.5	C030	Woodland and shrub
Inland rocks and screes	6.0	C051	Inland rock
Wetland and water	7.0	C060	Water and wetland
Still water	7.1	C061	Standing water
Lake	7.1.1	C061	Standing water
Reservoir	7.1.2	C061	Standing water
Pond	7.1.3	C061	Standing water
Running water	7.2	C062	Running water
River	7.2.1	C062	Running water
Canal	7.2.2	C062	Running water
Wetland	7.3	C063	Freshwater marsh
Fen and marsh	7.3.1	C063	Freshwater marsh
Flush	7.3.2	C063	Freshwater marsh
Coastal features	8.0	C070	Coastal features
Sea/Estuary	8.1	C071	Sea and coastal waters
Inter-tidal soft coast without vegetation	8.2	C072	Inter-tidal sand and mud
Vegetated soft coast	8.3	C070	Coastal features
Salt marsh	8.3.1	C073	Salt marsh
Dune	8.3.2	C074	Dunes
Hard coast with little or no vascular vegetation	8.4	C075	Coastal rock and cliffs
Maritime vegetation	8.5	C070	Coastal features
Transport, built, urban and industrial	9.0		No match to single NLUD land cover
Transport	9.1	C090	Permanent made surfaces
Discontinuously built land	9.2		No match to single NLUD land cover
Agricultural buildings	9.2.1		No match to single NLUD land cover
Residential buildings with gardens	9.2.2		No match to single NLUD land cover
Commercial and industrial buildings	9.2.3		No match to single NLUD land cover
Public services and facilities	9.2.4		No match to single NLUD land cover
Continuously built land	9.3	C081	Building
Residential buildings without gardens	9.3.1	C081	Building
Commercial and industrial buildings	9.3.2	C081	Building
Public services and facilities	9.3.3	C081	Building
Vegetated waste land, derelict land, allotments	9.4	C101	Multiple surface
Hard areas without buildings	9.5	C094	Other made surface
Quarries and other extractive industries	9.6		No match to single NLUD land cover

Appendix C. Links to Other Classifications

1. Town and Country Planning (Use Classes) Order 1987
2. Land Use Change Statistics (LUCS)
3. National Land Use Classification (NLUC) 1975
4. National Land Use Database (NLUD) Version 3.2
5. Eurostat Land Use/Land Cover Area Frame Statistical Survey (LUCAS)
6. Baseline Classification of Land Cover Categories of National Importance
7. Land Cover Map (LCM) 2000 Classification
8. UK Biodiversity Action Plan Broad Habitat Classification

1. Town and Country Planning (Use Classes) Order 1987

Description

The Town and Country Planning (Use Classes) Order 1987 (as amended)¹ defines classes of uses for the purpose of establishing material change of use in connection with an application for planning permission.

Reference

HMSO (1987) *The Town and Country Planning (Use Classes) Order 1987*, Statutory Instrument 1987/764, HMSO: London.

Use Classes Order		NLUD 4.4 Land Use	
Class	Class Description	Code	Group Name
A1	Shops	U091	Shops
	a Sale of goods (other than hot food)		
	b Post office		
	c Travel and ticket agencies		
	d Sale of cold food for consumption off the premises		
	e Hairdressers		
	f Funeral directors		
	g Display of goods for sale		
	h Domestic hire shops		
	i Washing or cleaning of clothes or fabrics on the premises		
	j Reception of goods to be washed, cleaned or repaired		
	k Internet café (where primary purpose is to provide Internet access)		
A2	Financial and professional services	U092	Financial and professional services
	a Financial services (banks and building societies)		
	b Professional services (excluding health and medical services)		
	c Other services (including use as a betting shop) appropriate in a shopping area		
A3	Restaurants and cafes	U093	Restaurants and cafes
A4	Drinking establishments	U094	Public houses and bars
A5	Hot food takeaways	U091	Shops
B1	Business	U102	Offices
	a Offices other than financial and professional services providing for the visiting members of the public	U102	Offices
	b Research and development	U101	Manufacturing
	c Other industrial processes appropriate in a residential area		
B2	General industrial	U101	Manufacturing
B8	Storage or distribution	U103	Storage
		U104	Wholesale Distribution
C1	Hotels	U072	Hotels, boarding and guest houses
C2	Residential institutions	U073	Residential institutions
C3	Dwelling houses	U071	Dwellings
	Dwelling houses for individuals, families and up to six individuals living as a single household		

D1	Non-residential institutions	a	Medical or health services	U081	Medical and health care services
		b	Crèche, day nursery or day centre	U084	Community services
		c	Educational establishment	U083	Education
		d	Art gallery	U043	Libraries, Museums and galleries
		e	Museum		
		f	Public library or public reading room	U084	Community services
		g	Public hall or exhibition hall	U082	Places of worship
		h	Public worship or religious instruction		
D2	Assembly and leisure	a	Cinema	U042	Amusement and show places
		b	Concert hall		
		c	Bingo hall or casino		
		d	Dance hall		
		e	Swimming bath, skating rink, gymnasium or area for other indoor or outdoor sports or recreations	U044	Indoor sports facilities
				U044	Outdoor sports facilities
	Sui Generis	a	Theatre	U042	Amusement and show places
		b	Amusement arcade or centre, or a funfair	U042	Amusement and show places
		c	Launderette	U091	Shops
		d	Sale of fuel for motor vehicles	U091	Shops
		e	Sale or display for sale of motor vehicles	U091	Shops
		f	Taxi business or business for the hire of motor vehicles	U091	Shops
		g	Scrap yard, or a yard for the storage or distribution of minerals or the breaking of motor vehicles	U104	Wholesale Distribution
		h	Work registerable under the Alkali, etc. Works Regulation Act 1906	U101	Manufacturing
		i	Hostels	U073	Residential institutions
		j	Waste disposal installation for the incineration, chemical treatment or landfill of waste	U063	Refuse disposal
		k	Retail warehouse club being a retail club where goods are sold, or displayed for sale, only to persons who are members of that club	U091	Shops
		l	Night-club	U042	Amusement and show places

Notes:

¹ Town and Country Planning (Use Classes) Order S.I. 1987/764 as amended by S.I. 1991/1567, S.I. 1992/610, S.I. 1992/657, S.I. 1994/724, S.I. 1995/297, S.I. 1999/293 and S.I. 2005/84.

2. Land Use Change Statistics (LUCS)

Description

The Land Use Change Statistics (LUCS) classification was developed by DOE in the early 1980s for recording land use change by Ordnance Survey (OS) field surveyors during the course of map revision. Since 1985 the LUCS classification has provided the basis for recording land use and land cover change derived from OS mapping and is used in the preparation of annual statistics by ODPM.

LUCS is a hybrid classification that uses both land use and land cover categories. The table below therefore provides a cross-reference to both NLUD 4.4 land use and land cover dimensions¹.

Reference

ODPM (2004) *Land Use Change Statistics (LUCS) Guidance*, ODPM: London.

	LUCS Classification	NLUD 4.4 Land Use		+/-	NLUD 4.4 Land Cover	
	DEVELOPED LAND					
	Residential					
R	Residential	U071	Dwellings			
Q	Institutional and Communal Accommodation	U072	Hotels, boarding and guest houses			
		U073	Residential institutions			
	Transport and Utilities					
H	Highways and Road Transport	U051	Transport tracks and ways	+	C091	Metalled Roadway
				+	C093	Pathway
				+	C094	Other made surface
		U053	Car parks			
T	Transport (other)	U051	Transport tracks and ways	+	C092	Railway
		U052	Transport terminals and interchanges			
		U054	Vehicle storage			
		U055	Goods and freight terminals			
U	Utilities	U060	Utilities			
	Industry and Commerce					
I	Industry	U101	Manufacturing			
J	Offices	U102	Offices			
K	Retailing	U090	Retail			
S	Storage and Warehousing	U103	Storage			
		U104	Wholesale distribution			
	Community Services					
C	Community Buildings	U080	Community Services			
L	Leisure and Recreational Buildings	U040	Recreation and Leisure	+	C080	Buildings ²
	Vacant					
V	Vacant Land previously developed	U111	Vacant			
Z	Derelict Land	U112	Derelict			
	Minerals and Landfill					
M	Minerals	U031	Mineral workings and quarries			
Y	Landfill Waste Disposal	U063	Refuse disposal			
	Defence					
D	Defence	U121	Defence			
	UNDEVELOPED LAND					
	Agriculture					
A	Agricultural Land	U010	Agriculture and Fisheries	-	C022	Unimproved grass ³
B	Agricultural Buildings	U010	Agriculture and Fisheries	+	C080	Buildings and Structures ⁴

	Forestry, Open Land and Water					
F	Forestry/Woodland	U020	Forestry	-	C034	Shrub ⁵
G	Rough Grassland and Bracken	U010 U130	Agriculture and Fisheries Unused Land	+ + +	C022 C042 C034	Unimproved grass Bracken Shrub
N	Natural and Semi-natural Land	U130	Unused Land	+ + + + + +	C041 C043 C044 C051 C063 C070	Heathland Bog Montane Inland rock Freshwater marsh Coastal features
W	Water	U056	Waterways	+ +	C061 C062	Standing water Running water
	Outdoor Recreation					
O	Outdoor Recreation	U040	Recreation and Leisure	-	C080	Buildings and Structures ⁶
	Vacant					
X	Urban Land not previously developed					All non-developed land covers ⁷

Notes:

¹ The table uses plus and minus (+/-) symbols to indicate where NLU 4.4 land cover groups are required in addition to land use to establish a correspondence with LUCS categories. The plus (+) symbol shows where land cover should be identified and included. The minus (-) symbol shows where land cover should be identified and excluded.

² Distinguishes Leisure and Recreational Buildings from Outdoor Leisure.

³ Included in LUCS G 'Rough Grassland and Bracken'.

⁴ Distinguishes Agricultural buildings from other Agricultural land.

⁵ Included in LUCS G 'Rough Grassland and Bracken'.

⁶ Distinguishes Leisure and Recreational Buildings from Outdoor Recreation.

⁷ Requires definition of urban area to identify LUCS X 'Urban Land not previously developed'.

3. National Land Use Classification (NLUC) 1975

Description

The National Land Use Classification (NLUC) was developed during the early 1970's by a study team drawn from central and local government and the Local Authorities Management Services and Computer Committee (LAMSAC). The aim was to devise a standard land use classification to meet the needs of planners and other users and to provide the basis for a standard approach to the creation of local development plans.

It is a hierarchical activity-based classification of land use comprising: 15 orders at Level 1, 78 groups at Level 2, 150 sub-groups at Level 3 and over 600 classes at Level 4.

Reference

HMSO (1975) *National Land Use Classification*, HMSO: London.

NLUC Order		NLUC Group			NLUD 4.4 Land Use
AG	Agriculture and fisheries	AG01	Animal service places	U010	Agriculture and fisheries
		AG02	Animal living places		
		AG03	Animal product processing places		
		AG04	Wildlife capturing places		
		AG05	Agricultural research		
		AG06	Cultivated places		
		AG07	Crop processing places		
		AG08	Non-cultivated places		
MI	Mineral extraction	MI01	Mineral extraction places	U031	Mineral workings and quarries
UT	Utility services	UT01	Gas supply places	U061	Energy production and distribution
		UT02	Electricity production places		
		UT03	Water supply places	U062	Water storage and treatment
		UT04	Sewage disposal places		
		UT05	Refuse disposal places	U063	Refuse disposal
		UT06	District heating places	U061	Energy production and distribution
		UT07	Dead bodies storage and disposal places	U064	Cemeteries and crematoria
		UT08	Postal service, signalling and telecommunications places	U065	Post and telecommunications
LE	Recreation and leisure	LE01	Amenity, amusement and show places	U041	Outdoor amenity and open spaces
				U042	Amusement and show places
		LE02	Libraries, museums and galleries	U043	Libraries, museums and galleries
		LE03	Land sport places	U044	Sports facilities
		LE04	Water sport places		
LE05	Holiday camps	U045	Holiday parks and camps		
TR	Transport tracks and places	TR01	Land transport tracks	U051	Transport tracks and ways
		TR02	Land transport places	U052	Transport terminals and interchanges ¹
				U053	Car parks
				U054	Vehicle storage ²
		TR03	Water transport tracks	U056	Waterways
		TR04	Water transport places	U052	Transport terminals and interchanges ¹
U054	Vehicle storage ²				
TR05	Mechanical handling places	U055	Goods and freight terminals		
TR06	Goods handling places				

RS	Residences	RS01	Group residences	U072	Hotels, boarding and guest houses
				U073	Residential institutions
		RS02	Self-contained residences	U071	Dwellings
CM	Community and health services	CM01	Health care places	U081	Medical and health care services
		CM02	Medical research		
		CM03	Sanitation places	U081	Community services
		CM04	Non-medical care places		
		CM05	Community protection services		
		CM06	Communication places		
		CM07	Places of worship	U082	Places of worship
		CM08	Justice administration places	U081	Community services
ED	Education	ED01	Education	U083	Education
		ED02	Research places		
MA	Manufacturing	MA01	Coal, oil and metal processing places	U101	Manufacturing
		MA02	Food, drink and tobacco manufacturing		
		MA03	Chemical and allied industries manufacturing places		
		MA04	Engineering places		
		MA05	Clothing, textiles, leather, footwear and fur goods manufacturing places		
		MA06	Bricks, pottery, glass, cement manufacturing places		
		MA07	Timber furniture, paper, printing and publishing works		
		MA08	Other manufacturing places		
		MA09	Construction places		
		MA10	Manufacturing research		
		MA11	Manufacturing waste disposal places		
		MA12	Manufacturing storage places		
OF	Offices	OF01	General offices	U102	Offices
		OF02	Financial service offices	U092	Financial and professional services
		OF03	Business meeting places	U102	Offices
		OF04	Studios		
RT	Retail distribution and servicing	RT01	Retail distribution places	U091	shops
		RT02	Maintenance and repair places		
		RT03	Catering service places	U093	Restaurants and cafes
				U094	Public houses and bars
ST	Storage	ST01	Equipment stores	U103	Storage
		ST02	Material stores		
		ST03	Other stores		
WH	Wholesale distribution	WH01	Dealing in industrial materials, machinery and livestock places	U104	Wholesale distribution
		WH02	Wholesale distribution places		
UL	Unused land, water and buildings	UL01	Unused land and water ³	U111	Vacant
				U131	Unused land
		UL02	Unused buildings	U111	Vacant
				U112	Derelict
DF	Defence	DF01	Defence establishments	U121	Defence

Notes:

¹ NLUD 4.4 does not distinguish between water and land transport for 'Transport terminals and interchanges'.

² NLUD 4.4 does not distinguish between water and land transport for 'Vehicle storage'.

³ NLUC does not distinguish between unused land and vacant previously developed land.

4. National Land Use Database (NLUD) Version 3.2

Description

The NLUD Classification (Version 3.2) developed out of research funded by the DOE in the 1990s to establish a methodology for creating a national baseline land use data set. The classification modified and extended the LUCS classification and was designed to support data collection by ground survey in urban areas and air-photo interpretation (API) in rural areas which were the proposed modes of data collection at that time.

NLUD 3.2 is a hybrid classification that uses both land use and land cover categories. The table below therefore provides a cross-reference to both NLUD 4.4 land use and land cover dimensions¹.

Reference

Dunn, R. and Harrison, A.R. (1995a) *Preparatory work for land use stock system*, Final Report to the Department of the Environment, DOE: London.

Key

- Indicates where correspondence to land cover only is recommended.
- Indicates where NLUD 4.4 'developed' land cover groups (i.e. C080 'Buildings and structures', C090 'Permanent made surfaces' and C100 'General land surfaces') may be identified in addition to land use.

	NLUD 3.2		NLUD 4.4 Land Use	+/-		NLUD 4.4 Land Cover
	1 Agricultural					
1.1	Field crops				C011	Field crops
1.2	Ploughed fields				C011	Field crops
1.3	Fallow land				C012	Fallow land
1.4	Horticulture and orchards				C013	Horticulture
					C014	Orchards
1.5	Improved pasture				C021	Improved grass
1.6	Field margins			C102	Bare surface	
	2 Woodland					
2.1	Conifer woodland				C031	Conifer woodland
2.2	Mixed woodland				C032	Mixed woodland
2.3	Broadleaved woodland				C033	Broadleaved woodland
2.4	Undifferentiated young woodland				C032	Mixed woodland
2.5	Scrub				C034	Shrub
2.6	Felled woodland	U021	Managed forest			
2.7	Land cultivated for afforestation	U021	Managed forest			
	3 Unimproved Grassland and Heathland					
3.1	Unimproved grassland				C022	Unimproved grass
3.2	Heathland				C041	Heathland
3.3	Bracken				C042	Bracken
					C044	Montane
3.4	Upland mosaics					
	4 Water and Wetland					
4.1	Sea/Estuary				C071	Sea and coastal waters

4.2	Standing water	U131	Unused land		C061	Standing water
4.3	Running water	U056	Waterways		C062	Running water
4.4	Freshwater marsh	U131	Unused land		C063	Freshwater marsh
4.5	Salt marsh	U131	Unused land		C073	Salt marsh
4.6	Bog	U131	Unused land		C043	Bogs
5 Rock and Coastal Land						
5.1	Inland rock	U131	Unused land		C051	Inland rock
5.2	Coastal rocks and cliffs	U131	Unused land		C075	Coastal rocks and cliffs
5.3	Inter-tidal sand and mud	U131	Unused land		C072	Inter-tidal sand and mud
5.4	Dunes	U131	Unused land		C074	Dunes
6 Minerals and Landfill						
6.1	Mineral workings and quarries	U031	Mineral workings and quarries			
6.2	Landfill waste disposal	U063	Refuse disposal			
7 Recreation						
7.1	Indoor recreation	U042	Amusement and show places			
		U043	Libraries, museums and galleries			
		U044	Sports facilities	+	C080	Buildings ²
		U045	Holiday camps and parks	+	C080	Buildings ³
7.2	Outdoor recreation	U041	Outdoor amenity and open spaces	-	C080	Buildings
		U044	Sports facilities	-	C080	Buildings ²
		U045	Holiday camps and parks	-	C080	Buildings ³
7.3	Allotments	U046	Allotments and city farms			
8 Transport						
8.1	Roads	U051	Transport tracks and ways	+	C091	Metalled roadway ⁴
					+	C093
		U052	Transport terminals and interchanges			
8.2	Public car parks	U053	Car parks			
8.3	Railways	U051	Transport tracks and ways	+	C092	Railway ⁵
		U052	Transport terminals and interchanges			
		U054	Vehicle storage			
		U055	Goods and freight terminals			
8.4	Airports	U052	Transport terminals and interchanges			
8.5	Docks		U054	Vehicle storage		
			U055	Goods and freight terminals		
9 Residential						
9.1	Residential	U071	Dwellings			
9.2	Institutional and communal accommodation	U072	Hotels, boarding and guest houses			
		U073	Residential institutions			
10 Community Buildings						
10.1	Institutional buildings	U081	Medical and health care services			
		U084	Community services			
10.2	Educational buildings	U083	Education			
10.3	Religious buildings	U082	Places of worship			
11 Industrial and Commercial						
11.1	Industry	U101	Manufacturing			
11.2	Offices	U102	Offices			
		U092	Financial and professional services			
11.3	Retailing	U091	Shops			
		U093	Restaurants and cafes			
		U094	Public houses and bars			

11.4	Storage and warehousing	U103	Storage			
		U104	Wholesale distribution			
11.5	Utilities	U061	Energy production and distribution			
		U062	Water supply and treatment			
		U064	Cemeteries and crematoria			
		U065	Post and telecommunications			
11.6	Agricultural buildings	U011	Agriculture	+	C080	Buildings
		U012	Fisheries	+	C080	Buildings
12	Vacant Land and Buildings					
12.1	Vacant land previously developed	U111	Vacant			
12.2	Vacant buildings	U111	Vacant			
12.3	Derelict land and buildings	U112	Derelict			
13	Defence Land and Buildings	U121	Defence			

Notes:

¹ The table uses plus and minus (+/-) symbols to indicate where NLU 4.4 land cover groups are required in addition to land use to establish a correspondence with LUCS categories. The plus (+) symbol shows where land cover should be identified and included. The minus (-) symbol shows where land cover should be identified and excluded.

² Discriminates between indoor and outdoor sports facilities.

³ Discriminates between holiday parks and holiday camps.

⁴ Enables discrimination of roads.

⁵ Enables discrimination of railways.

5. Eurostat Land Use/Land Cover Area Frame Statistical Survey (LUCAS) Classification

Description

The Land Use/Land Cover Area Frame Statistical Survey (LUCAS) classification was developed by the Statistical Office of the European Communities (Eurostat), in close collaboration with the Directorate-General for Agriculture and Rural Development, to provide the basis for a harmonised European area frame sample survey of land use and land cover to support agricultural and environmental policy formulation.

LUCAS is a multidimensional classification comprising land use and land cover dimensions. The land use nomenclature is organised as a two-tier hierarchy with 14 classes at the second level and the land cover nomenclature is specified as a three-tier hierarchy with 57 classes at the third level. Separate cross-reference tables for land use and land cover are presented below.

Reference

European Communities (2003) *The LUCAS Survey: European Statisticians Monitor Territory*, Office for Official Publications of the European Communities: Luxembourg.

Land Use

	LUCAS Land Use Level 2 (14 Classes)		NLUD 4.4 Land Use	
U1	U11	AGRICULTURE	U011	Agriculture
	U12	FORESTRY	U021	Managed forest
			U022	Un-managed forest
	U13	FISHING	U012	Fisheries
U14	MINING, QUARRYING	U031	Mineral workings and quarries	
U2	U21	ENERGY PRODUCTION	U061	Energy production and distribution
	U22	INDUSTRY, MANUFACTURING	U101	Manufacturing
U3	U31	TRANSPORT, COMMUNICATION, STORAGE, PROTECTIVE WORKS	U051	Transport tracks and ways
			U052	Transport terminals and interchanges
			U053	Car parks
			U054	Vehicle storage
			U055	Goods and freight terminals
			U056	Waterways
			U065	Post and telecommunications
			U103	Storage
	U32	WATER, WASTE TREATMENT	U062	Water storage and treatment
			U063	Refuse disposal
			U064	Cemeteries and crematoria
	U33	CONSTRUCTION ¹		
	U34	COMMERCE, FINANCE, BUSINESS	U072	Hotels, boarding and guest houses
U091			Shops	
U092			Financial and professional services	
U093			Restaurants and cafes	
U094			Public houses and bars	
U102			Offices	
		U104	Wholesale distribution	

	U35	COMMUNITY SERVICES	U073	Residential institutions
			U081	Medical and health care services
			U082	Places of worship
			U083	Education
			U084	Community services
			U121	Defence
	U36	RECREATION, LEISURE, SPORT	U041	Outdoor amenity and open spaces
			U042	Amusement and show places
			U043	Libraries, museums and galleries
			U044	Sports facilities
			U045	Holiday parks and camps
	U37	RESIDENTIAL	U046	Allotments and city farms
			U071	Dwellings
U4	U40	UNUSED	U111	Vacant
			U112	Derelict
			U131	Unused land

Notes:

¹ NLUD 4.4 does not distinguish land or buildings undergoing conversion from one use or cover category to another e.g. construction sites.

Land Cover

LUCAS Level 1		LUCAS Land Cover Level 2		LUCAS Land Cover Level 3 (57 classes)		NLUD 4.4 Land Cover	
A	ARTIFICIAL LAND	A1	BUILT-UP AREAS	A11	Buildings with 1 to 3 floors	C081	Building
				A12	Buildings with more than 3 floors		
				A13	Greenhouses		
		A2	ARTIFICIAL NON BUILT-UP AREAS	A21	Non built-up area features	C094	Other made surface
				A22	Non built-up linear features	C091	Metalled roadway
						C092	Railway
				C093	Pathway		
B	CROPLAND	B1	CEREALS	B11	Common wheat	C011	Field crops
				B12	Durum wheat		
				B13	Barley		
				B14	Rye		
				B15	Oats		
				B16	Maize		
				B17	Rice		
				B18	Other cereals		
				B2	ROOT CROPS		
		B22	Sugar beet				
		B23	Other root crops				
		B3	NON PERMANENT INDUSTRIAL CROPS	B31	Sunflower	C011	Field crops
				B32	Rape seeds		
				B33	Soya		
				B34	Cotton		
				B35	Other fibre and oleaginous crops		
				B36	Tobacco		
		B37	Other non-permanent industrial crops				

		B4	DRY PULSES, VEGETABLES AND FLOWERS	B41	Dry pulses	C011	Field crops		
				B42	Tomatoes	C013	Horticulture		
				B43	Other fresh vegetables				
				B44	Floriculture and ornamental plants				
		B5	TEMPORARY, ARTIFICIAL PASTURES	B50	Temporary, artificial pastures	C021	Improved grass		
		B6	FALLOW LAND	B60	Fallow land	C012	Fallow land		
		B7	PERMANENT CROPS: FRUIT TREES, BERRIES	B71	Apple fruit	C014	Orchards		
				B72	Pear fruit				
				B73	Cherry fruit				
				B74	Nuts trees				
				B75	Other fruit trees and berries				
				B76	Oranges				
				B77	Other citrus fruit				
		B8	OTHER PERMANENT CROPS	B81	Olive groves	C013	Horticulture		
B82	Vineyards								
B83	Nurseries								
B84	Permanent industrial crops			C011	Field crops				
C	WOODLAND ¹	C1	FOREST AREA	C11	Broadleaved forest	C033	Broad-leaved woodland		
				C12	Coniferous forest	C031	Conifer woodland		
				C13	Mixed forest	C032	Mixed woodland		
		C2	OTHER WOODED AREA	C21	Other broadleaved wooded area	C033	Broad-leaved woodland		
				C22	Other coniferous wooded area	C031	Conifer woodland		
				C23	Other mixed wooded area	C032	Mixed woodland		
		C3	POPLARS, EUCALYPTUS	C30	Poplars, eucalyptus	C032	Mixed woodland		
		D	SHRUBLAND ²			D01	Shrubland with sparse tree cover	C034	Shrub
						D02	Shrubland without tree cover	C034	Shrub
C041	Heathland								
C042	Bracken								
E	PERMANENT GRASSLAND ³			E01	Permanent grassland with sparse tree/shrub cover	C021	Improved grass		
						C022	Unimproved grass		
				E02	Permanent grassland without tree/shrub cover	C021	Improved grass		
						C022	Unimproved grass		
						C044	Montane		
F	BARE LAND			F00	Bare land	C051	Inland rock		
						C072	Inter-tidal sand and mud		
						C074	Dunes		
						C075	Coastal rock and cliffs		
						C102	Bare surface		
G	WATER AND WETLAND			G01	Inland water bodies	C061	Standing water		
				G02	Inland running water	C062	Running water		
				G03	Coastal water bodies	C071	Sea and coastal waters		
				G04	Wetland	C043	Bog		
						C063	Freshwater marsh		
						C073	Salt marsh		
G05	Glaciers, permanent snow ⁴								

Notes:

¹ NLUD 4.4 does not distinguish between the terms 'forest' and 'woodland'.

² NLUD 4.4 does not distinguish between shrub with or without tree cover.

³ NLUD 4.4 does not distinguish between grassland with or without tree/shrub cover.

⁴ These land cover types do not occur in the British Isles and are therefore not recognised by NLUD 4.4.

6. Baseline Classification of Land Cover Categories of National Importance

Description

The Baseline Classification of land cover categories of national importance was developed as part of Countryside Survey 1990 to provide a single integrating classification of land cover. The work involved a detailed study and systematic comparison of 17 nationally and internationally important classifications used in the UK.

Reference

Wyatt, B.K., Greatorex-Davies, J.N., Hill, M.O., Parr, T.W., Bunce, R.G.H. and Fuller, R.M. (1994) *Comparison of Land Cover Definitions*, DOE: London.

Baseline Classification of Land Cover						NLUD 4.4 Land Cover
Level 1	Level 2		Level 3			
1 Tilled and fallow land	1.1	Land parcels with a single crop species			C011	Field crops
	1.2	Horticulture			C013	Horticulture
	1.3	Non-cropped			C012	Fallow land
2 Cropland with woody perennial crops	2.1	Orchard			C014	Orchards
	2.2	Vineyard				
	2.3	Hops				
	2.4	Soft fruit				
	2.5	Trees and shrubs – nursery stock				
3 Grass	3.1	Recreational and similar non-agricultural mown grass			C023	Recreational and amenity grass
	3.2	Intensive and agriculturally improved grass			C021	Improved grass
	3.3	Permanent non-intensive grass			C022	Unimproved grass
	3.4	Semi-natural calcareous grass				
	3.5	Acid grass (non-moorland) and bracken				
	3.6	Moorland and mountain grass				
	3.7	Unmanaged lowland grassland and tall herbs				
4 Heathland and bog	4.1	Heathland			C041	Heathland
	4.2	Bogs	4.2.1	Drier northern bogs	C043	Bogs
			4.2.2	Saturated bogs		
5 Woodland and shrubland	5.1	Woodland	5.1.1	Conifer woodland	C031	Conifer woodland
			5.1.2	Mixed woodland	C032	Mixed woodland
			5.1.3	Broadleaved woodland	C033	Broad-leaved woodland
	5.2	Managed coppice	5.2.1	Coppice-with-standards	C034	Shrub
			5.2.2	Pure coppice		
	5.3	Shrub	5.3.1	Shrub on dry or moist ground	C034	Shrub
			5.3.2	Swampy shrub and carr		
	5.4	Felled woodland				1
	5.5	Land ploughed for afforestation				
6	Inland rocks and screes				C051	Inland rock
7 Wetland and water	7.1	Still water	7.1.1	Lake	C061	Standing water
			7.1.2	Reservoir		
			7.1.3	Pond		
	7.2	Running water	7.2.1	River	C062	Running water
			7.2.2	Canal		
	7.3	Wetland	7.3.1	Fen and marsh	C063	Freshwater marsh
7.3.2			Flush			
8 Coastal features	8.1	Sea/Estuary			C071	Sea and coastal waters
	8.2	Intertidal soft coast without vegetation			C072	Inter-tidal sand and mud
	8.3	Vegetated soft coast	8.3.1	Salt marsh	C073	Salt marsh
			8.3.2	Dune	C074	Dunes
	8.4	Hard coast with little or no vascular vegetation			C075	Coastal rocks and cliffs
8.5	Maritime vegetation				2	

9	Transport, built, urban and industrial	9.1	Transport		C091	Metalled roadway	
					C092	Railway	
		9.2	Discontinuously built land	9.2.1	Agricultural buildings	C080 C101	Buildings and structures ³ Multiple surfaces
				9.2.2	Residential buildings with gardens		
				9.2.3	Commercial and industrial buildings		
				9.2.4	Public services and facilities		
		9.3	Continuously built land	9.3.1	Residential buildings without gardens		
				9.3.2	Commercial and industrial buildings		
				9.3.3	Public services and facilities		
		9.4	Vegetated waste land, derelict land, allotments				⁴
		9.5	Hard areas without buildings			C090	Permanent made surfaces
9.6	Quarries and other extractive industries				⁴		

Notes:

¹ NLUD 4.4 does not recognise these transitional cover types within the woodland life-cycle.

² No equivalent land cover.

³ These Baseline categories are a mixture of land use and land cover and would be recorded in combination with the NLUD 4.4 Land Use nomenclature.

⁴ These are land use categories and would be recorded by the NLUD 4.4 Land Use nomenclature.

7. Land Cover Map (LCM) 2000 Classification

Description

Land Cover Map (LCM) 2000 provides a digital land cover data set of Great Britain. It was derived by analysis and classification of spectral reflectance data from Earth observation satellites. LCM 2000 identified 16 Target classes (Level-1) to be mapped with 90% accuracy; it subdivided these into 27 Subclasses (Level-2) allowing construction of the widespread Broad Habitats.

Reference

Fuller, R.M., Smith, G.M., Sanderson, J.R., Hill, R.A., Thomson, A.G., Cox, R., Brown, N.J., Clarke, R.T., Rothery, P. and Gerard, F.F. (2002) *Countryside Survey 2000 Module 7: LAND COVER MAP 2000*, Final Report, Natural Environment Research Council (CEH): Monks Wood.

LCM 2000 Class Level-1 (16 Classes)	LCM 2000 Subclass Level-2 (27 Subclasses)		NLUD 4.4 Land Cover	
1 Sea / Estuary	22.1	Sea / Estuary	C071	Sea and coastal waters
2 Water (inland)	13.1	Water (inland)	C061	Standing water
			C062	Running water
3 Littoral rock and sediment	20.1	Littoral rock	C075	Coastal rock and cliffs ¹
	21.1	Littoral sediment	C072	Inter-tidal sand and mud
	21.2	Salt marsh	C073	Salt marsh
4 Supra-littoral rock and sediment	18.1	Supra-littoral rock	C075	Coastal rock and cliffs ¹
	19.1	Supra-littoral sediment	C074	Dunes ²
5 Bog	12.1	Bog	C043	Bogs
6 Dwarf shrub heath	10.1	Dwarf shrub heath	C041	Heathland
	10.2	Open dwarf shrub heath		
7 Montane habitats	15.1	Montane habitats	C044	Montane
8 Broad-leaved / mixed woodland	1.1	Broad-leaved / mixed woodland	C032	Mixed woodland
			C033	Broad-leaved woodland
			C034	Shrub
9 Coniferous woodland	2.1	Coniferous woodland	C031	Conifer woodland
10 Arable and horticulture	4.1	Cereals	C011	Field crops
	4.2	Horticulture / non-cereal or unknown	C013	Horticulture
	4.3	Not annual crop	C012	Fallow land
11 Improved grassland	5.1	Improved grassland	C021	Improved grass
			C023	Recreational and amenity grass
12 Abandoned and derelict grasslands	5.2	Set-aside grass	C022	Unimproved grass
	6.1	Rough grass		
13 Semi-natural & natural grasslands and bracken	6.2	Managed neutral grass	C042	Bracken
	7.1	Calcareous grass		
	8.1	Acid grass		
	9.1	Bracken		
14 Fen, marsh, swamp	11.1	Fen, marsh, swamp	C063	Freshwater marsh
			C061	Standing water ³
15 Built-up areas, gardens	17.1	Suburban/rural developed	C080	Buildings and structures ⁴
	17.2	Continuous urban	C090	Permanent made surfaces ⁴
			C101	Multiple surfaces ⁴
16 Inland bare ground	16.1	Inland bare ground	C051	Inland rock
			C102	Bare surface

Notes:

¹ Definition does not distinguish between Littoral and Sub-littoral rock.

² Excludes sandy shores above high water mark and vegetated shingle and machair.

³ Includes silted up areas with associated vegetation.

⁴ Can occur in urban or rural setting.

8. UK Biodiversity Action Plan (BAP) Broad Habitat Classification

Description

The UK Biodiversity Action Plan (BAP) Broad Habitat Classification was originally published as part of the UK Biodiversity Action Plan in 1995. The Broad Habitats are the framework through which the Government is committed to meet its obligations for monitoring the wider countryside. A recent review of the classification resulted in a revised list of 27 Broad Habitats. The correspondence table below compares habitats and definitions for the 22 land-based habitats with NLUD 4.4 land cover.

Reference

Jackson, D.L. (2000) *Guidance on the interpretation of the Biodiversity Broad Habitat Classification (terrestrial and freshwater types): definitions and the relationships with other habitat classifications*. JNCC Report No. 307, Joint Nature Conservation Committee: Peterborough.

UK BAP Broad Habitats		NLUD 4.4 Land Cover	
1	Broad-leaved, mixed and yew woodland	C032	Mixed woodland
		C033	Broad-leaved woodland
		C034	Shrub
2	Coniferous woodland	C031	Conifer woodland
3	Boundaries and linear features		
4	Arable and horticulture	C011	Field crops
		C012	Fallow land
		C013	Horticulture
		C014	Orchards
5	Improved grassland	C021	Improved grass
		C023	Recreational and amenity grass
6	Neutral grassland	C022	Unimproved grass
7	Calcareous grassland		
8	Acid grassland		
9	Bracken	C042	Bracken
10	Dwarf shrub heath	C041	Heathland
11	Fen, marsh and swamp	C063	Freshwater marsh
		C061	Standing water ¹
12	Bog	C043	Bogs
13	Standing open water and canals	C061	Standing water ²
14	Rivers, streams	C062	Running water ³
15	Montane habitats	C044	Montane
16	Inland rock	C051	Inland rock
		C102	Bare surface
17	Built-up areas and gardens	C080	Buildings and structures
		C090	Permanent made surfaces
		C101	Multiple surfaces
18	Supra-littoral rock	C075	Coastal rock and cliffs ⁴
19	Supra-littoral sediment	C074	Dunes ⁵
20	Littoral rock	C075	Coastal rock and cliffs ⁴
21	Littoral sediment	C072	Inter-tidal sand and mud
		C073	Salt marsh
22	Inshore sub-littoral	C071	Sea and coastal waters

Notes:

¹ Includes silted up areas with associated vegetation.

² Excludes canals.

³ Includes canals.

⁴ Definition does not distinguish between Littoral and Supra-littoral rock.

⁵ Excludes sandy shores above high water mark and vegetated shingle and machair.