Guidelines for BS 7666:2006 Part 2

Version 1

May 2007

Section 5. Creating a street gazetteer

Section 6. Creating a land and property gazetteer

Preface

These Guidelines are intended for use with BS 7666: 2006 *Spatial datasets for geographical referencing*. They complement the Standard with more detailed explanation of the content and a general approach to creation of gazetteers. They are not specific to any particular implementation, for which it is expected that data specifications and capture and maintenance rules will be produced.

The Guidelines are aimed at:

- gazetteer owners – those with ultimate responsibility for the gazetteer;
- gazetteer custodians – those responsible for the creation, maintenance and quality of gazetteers;
- suppliers of gazetteer software;
- those developing and implementing gazetteer systems;
- providers of gazetteer data;
- others who are responsible for aspects of the quality management of gazetteers.

The first part of the Guidelines, published previously, is in four Sections:

1. Introduction to BS 7666;
2. How to create a gazetteer of a new type of geographic object;
3. Quality assessment and reporting;
4. How to create a national gazetteer.

This part of the Guidelines provides further Sections covering:

5. How to create a street gazetteer;
6. How to create a land and property gazetteer.

No guidelines for public rights of way which form an informative annex to Part 1 of the Standard, or for how to create a delivery point gazetteer are planned at present, but they may be produced later.

These Guidelines have been produced under the auspices of BSI Committee IST/36 Geographic information who are responsible for BS 7666. They were written by Rob Walker and Les Rackham working under the guidance of a Steering Group comprising representatives of major stakeholders in the Standard. The work is sponsored by the Department for Communities and Local Government (DCLG), Ordnance Survey, Office for National Statistics and Mayrise Ltd.

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Section 5. Creating a street gazetteer

This Section provides detailed guidance on how to create a street gazetteer. It explains aspects of BS 7666 Part 1: Specification for a street gazetteer, and should be read in conjunction with that document. However it does not cover Public Rights of Way. It is aimed at those compiling such gazetteers, particularly in local authorities. The guidelines are general and not aimed at any particular implementation such as the National Street Gazetteer, for which specific guidelines will apply. A Glossary of Terms, list of abbreviations and references, and an explanation of the UML data modelling convention used in the Standard are given in Section 1 of these Guidelines.

1. Introduction

A street gazetteer is a list of streets in an area, together with information about their location. There is no simple definition of a street, and it is defined differently in different contexts. In BS 7666 it is defined as a "way or thoroughfare providing a right of passage on foot, by cycle or by motor vehicle". This is intended to be all-encompassing, allowing flexibility in what may be included in the gazetteer. Essentially the gazetteer contains records of street references. These references may be any of the following:

- a designated street name – provided by the Street Naming and Numbering Authority;
- a street description – usually used for streets that do not have names, such as country lanes and service roads;
- a street number – a Department for Transport or other Highway Authority route number[1];
- an unofficial street name – likely to be a locally used name that has not been adopted by the Street Naming and Numbering Authority.

2. Details of changes from previous edition and implications for implementation

The main changes to Part 1 from the previous (2000) edition of the Standard are as follows:

- Addition of a requirement to provide metadata:
    - This is important, especially the scope statement, as it aids understanding of the dataset. The requirements are described in **3.4 of** this Section of the Guidelines.
- Addition of a facility for recording descriptive identifiers in multiple languages:

[1] This may be a PROW (Public Right of Way) number or cycle track number where appropriate.

  - This will aid those creating multi-lingual gazetteers. It does not affect mono-lingual gazetteers. This is described in **3.3**.

- Addition of a facility for classification of streets:
  - For many purposes, it is desirable to classify the streets, for example according to their vehicle carrying capabilities. This addition is optional, and its usage is a decision for the implementation.
- Extension of facilities for cross-referencing to other datasets:
  - These have been added throughout the Standard. They are optional in all cases. Cross-referencing to other datasets is very useful, particularly to integrate existing datasets. How it is carried out is a matter for the implementation.
- Removal of the tolerance attribute and the replacement of the spatial locator by a pair of extremity points:
  - This is a simplification. The tolerance attribute was designed to enable snapping together of points in building up a topographic network of the streets. It defined a circle of influence whereby points that were near to each other could be considered to be the same. However, it was little used. The spatial locator, which positioned the street in a coordinate space is consequently replaced by a simple pair of extremity points.
- Removal of the requirement for the identifier of an elementary street unit to be the coordinates of a reference point, and its replacement with a general identifier:
  - Previously, the identifier of an elementary street unit was a coordinate. This was unnecessarily complicated, and has been replaced by a general identifier. The existing identifier can still be used, but the change allows a simpler approach for new street data.
- Addition of informative annex on Public Rights of Way:
  - Previously, Part 4: *Specification for recording data for public rights of way* was a previous part of BS 7666. This is closely linked to Part 1, and the content is now included as an informative Annex, as an example of how additional data about a street might be recorded.
- Other minor changes:
  - Clarification of state as logical state of street (see **3.2.6**);
  - Facility to include a textual description for an elementary street unit;
  - Removal of fixed formats for attributes;
  - Introduction of levels of conformance for gazetteers, formalising high-level options for level of detail recorded;
  - Revision of definitions to improve understanding.

3. Explanations of requirements

3.1 Gazetteer Scope

The scope is a description of the type of objects to be included in the gazetteer. In the case of a street gazetteer, it is the types of street. The scope statement defines the bounds of what should be included and what should not be included. For example a gazetteer might include all streets accessible to motor vehicles, but not those on which motor vehicles are prohibited or unable to pass. The scope statement should also include a statement of what level of detail the gazetteer contains, i.e.:

- Level 1: only streets;
- Level 2: streets and elementary street units with no intermediate points;
- Level 3: a full description of the elementary street units.

For further details see Annex A of BS 7666-1.

It is important to have a clear scope statement, because of the loose definition of a street, to ensure that compilers know what to include, and users know what to expect. It is also important that where gazetteers from different sources are combined, they have similar scopes, otherwise an inconsistent gazetteer will result.

Example of Gazetteer scope for a street gazetteer:
Level 1 Street Gazetteer for the county of Borsetshire, including all streets with designated street names, all streets with county Highway Authority numbers, Department for Transport numbered roads (class A and B), Motorways and any other streets used for accessing and addressing properties.

The statement of the gazetteer scope is recorded in the gazetteer metadata (see **3.4**).

3.2 Street records

3.2.1 Attributes

Details of the attributes of streets are defined in Clause 6 of BS 7666-1. Here some of the issues relating to them are described.

3.2.2 Unique street reference number (USRN)

The USRN uniquely identifies the street within the gazetteer, and is constant over the life of the street. It should not be changed when attributes of the street change. Where street gazetteers are to be merged to cover a wider area, there needs to be a central authority to allocate street number ranges to ensure uniqueness. This might be achieved by the addition of pre-fixes.

3.2.3 Descriptive identifier

The descriptive identifier is a spatial reference in the form of a description of the location of the street, for example ‘Green Street, Cam, Dursley, Gloucestershire’. Sufficient elements must be present to make the descriptive identifier unique within the territory of use of the gazetteer.

A street may have more than one descriptive identifier. Where the gazetteer is multi-lingual, the descriptive identifier will include a code to identify the particular language. Ordering of descriptive identifiers is not important. Note that the language is the nominal language. This may contain names in other languages, for example Welsh contains some English words and vice-versa.

All names should be given in full. Abbreviations and punctuation should not be used unless they appear in the designated name (e.g. 'Earl's Court Road'). Only single spaces should be used, and the use of leading spaces should be avoided.

3.2.4 Record type

The record type identifies the type of street reference. The allowable values are:

1. **Designated street name**: as allocated by the Street Naming and Numbering Authority;
2. **Street description**: a concise description of a street that does not have a name, e.g. 'King's Parade - service road behind numbers 101-119';
3. **Street number**: a number allocated by a highway authority, either the local Highway Authority or Department for Transport (or Scottish equivalent);
4. **Unofficial street name**: a name given by other than the Street Naming and Numbering Authority, for example a private street that has a name.

3.2.5 Street classification

A street classification code has been added to the 2006 edition of BS 7666-1. However this is optional. A recommended list of codes is given in Annex C of BS 7666-1. This does not have to be used. Where a different code list is used, it should be specified in the gazetteer metadata (see **3.4**).

3.2.6 State

The state is the logical state of the street, for example whether it is under construction, in use or stopped up. This is an optional attribute. A recommended list of codes is given in Annex C of BS 7666-1. This does not have to be used. Where a different code list is used, it should be specified in the gazetteer metadata (see **3.4**).

3.2.7 Geographic extent

The geographic extent of the street is described by a pair of extremity points. These are two points at the ends of the street, each represented by a coordinate pair. Some general rules for extremity points are as follows:

a) If the street has more than two ends, then the two points should be the two ends that are farthest apart.

b) If the street has only one identifiable end, then the second extremity point should be the identifiable point (e.g. a corner or junction) that is farthest from the identifiable end of the street.

c) If the street does not have ends (i.e. it is circular), then any identifiable point (e.g. a junction) should be used, and the same coordinated point may be taken for both extremity points.

d) Where properties in the street are numbered, the order of the extremity points should follow the order of progression of property numbers.

e) Coordinates should be measured to an accuracy of not less than 10 metres (where a metric grid is used) relative to the other recorded coordinates.

f) If the street is less than 10 metres long, then the two extremity points may have the same value.

Note that streets can overlap. Examples of extremity points are given in Figure 1.

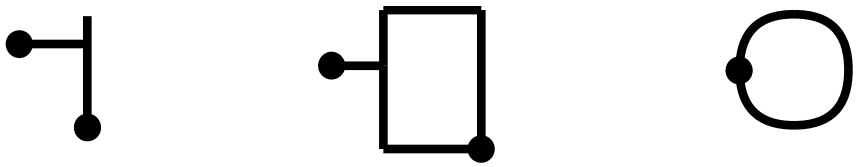


Figure 1. Extremity points for a street.

3.2.8 Dates

Dates should be recorded at an appropriate level of resolution. Normally this will be a day, but where this is not known, it may be only a month (e.g. '2006-08') or a year (e.g. '1900'). The dates should be recorded consistently either in the basic format (YYYYMMDD) or extended format (YYYY-MM-DD, YYYY-MM or YYYY), where YYYY is the year, MM the month and DD the day. The two formats should not be mixed, and for each implementation it will have to be decided which format is to be used.

Care needs to be taken to distinguish between actual dates, when something happened either in the real world or to a source of information, and capture and update dates, when changes are made to the data.

Actual dates:

- **start date:** the date when the street came into existence;
- **end date:** the date when the street ceased to exist;
- **current state date:** the date when the street came into its current state;
- **current date:** the date at which the gazetteer is considered to be current.

Capture and update dates:

- **entry date:** the date when the street record was entered into the gazetteer;
- **update date:** the date when the street record was last updated;
- **metadata date:** the date when the metadata was last updated.

Where dates are not known exactly, a notional date at which the date criterion was known to be correct should be used. This applies in particular to start date. Where the update date is not known or the record has not been updated, the update date should be same as the entry date.

3.2.9 Elementary street unit records

Details of the attributes of elementary street units are defined in Clause 7 of BS 7666-1. Much of the guidance for streets also applies to elementary street units.

3.3 Multi-lingual gazetteers

BS 7666 now contains explicit provision for multi-lingual entries (In previous editions of the standard, multi-lingual entries could be recorded through use of the 'alias' facility). The main requirement for this facility is in Wales, where many local authorities have bi-lingual gazetteers.

In a multi-lingual gazetteer, a record may have multiple descriptive identifiers, each in a different language. A code identifies the particular language used. These codes are listed in Table C.3 in Annex C of BS 7666-1.

It is not possible to mix languages in a descriptive identifier. However a Welsh language descriptive identifier may contain elements in English, and vice-versa. Ordering of descriptive identifiers is not important.

The languages used in addition to English should be recorded in the metadata (see **3.4**), together with any additional character sets used.

Where the gazetteer is mono-lingual, nothing extra need be done, and the language is assumed to be English.

3.4 Gazetteer Metadata

3.4.1 Requirements

The recording of metadata is a new requirement in the revised edition of BS 7666-1. The purpose of this is to provide users and potential users with information about the gazetteer. This metadata should be supplied with the gazetteer.

3.4.2 Mandatory elements

The mandatory metadata elements are as follows:

a) **Name**: of the gazetteer, e.g. 'Borsetshire County Council Street Gazetteer';

b) **Scope**: see **3.1**;

c) **Territory of use**: the geographic domain of the gazetteer, e.g. 'Borsetshire';

d) **Gazetteer owner**: with overall responsibility, e.g. ‘Borsetshire County Council Highways Department’;

e) **Custodian**: the practitioner who compiles the gazetteer, e.g. ‘the Borsetshire Street Gazetteer Custodian’;

f) **Coordinate system**: this will usually be the National Grid (NG) of Great Britain, or Irish Transverse Mercator (ITM);

g) **Current date**: the date at which the gazetteer can be considered to be current in relation to the real-world (not the date of last update of the data).

These are described in more detail in Clause 5 of BS 7666-1.

3.4.3 Optional elements

The following metadata elements are optional. They should be recorded where they are applicable.

a) **Coordinate axis units**: this will usually be ‘metres’;

b) **Metadata date**: when the metadata was last updated (not the date at which the data is deemed to be current);

c) **Street classification scheme:** where one is used, details should be given (see **3.2.5**);

d) **State coding scheme**: where one is used, details should be given (see **3.2.6**);

e) **Language(s):** any languages other than English that are used should be recorded, e.g. ‘CYM’;

f) **Character set(s):** any character sets other than English that are used should be recorded, e.g. "UNICODE UTF-8 character set" to support the full Welsh language;

g) **External cross-reference(s)**: If external cross-references are included in the gazetteer, they should be recorded, e.g. ‘Ordnance Survey TOIDs’.

These are described in more detail in Clause 5 of BS 7666-1.

3.4.4 Creation and maintenance

It is recommended that the metadata is collected as part of the gazetteer creation process. This requires little additional effort, and may aid the understanding of the creation process. The metadata should be updated periodically to reflect changes to the gazetteer, as part of the data maintenance process. Additional metadata elements may be recorded as required.

3.5 Data quality

The Standard specifies a requirement for a data quality report. This is an assessment of the quality of the data in terms of the following:

- Lineage
- Currency
- Positional accuracy

- Attribute accuracy
- Completeness
- Logical consistency

These general aspects are discussed in detail in Section 3 of these Guidelines. Additional specific guidance for street gazetteers is given in **4.8** of this section of the Guidelines.

4. Recommended approach

4.1 Planning and initiation

4.1.1 Scope

Before starting a gazetteer implementation, it is necessary to define the scope of the gazetteer. The scope is described in **3.1**. It should state what is to be included in the gazetteer and what is not included, including the level of detail (whether elementary street units are to be included, and if so whether their course is to be recorded). Note that only objects that are streets should be contained in a street gazetteer.

4.1.2 Data specification

Any gazetteer implementation should have a data specification. BS 7666-1 defines a general structure for a street gazetteer, and allows several options. It does not define the detail of the content of the gazetteer. As part of any implementation, it is necessary to specify in detail the data to be included. This should include the following:

- **Description of the details of the implementation of the Standard:** definition of the data structures to be used, including referencing schemes (e.g. unique street number references), street classifications and state coding schemes;
- **Identification of attributes of each entity**: for streets and elementary street units (if included), the attributes need to be defined, including whether attributes identified in BS 7666-1 as optional are to be included, and if so the rules for their inclusion, any additional attributes to be recorded, field lengths and domains (allowable values);
- **Links to other datasets**: any cross-references to other datasets, and how they are to be established**;**
- **Rules for inclusion of instances of streets and elementary street units:** and in particular how they are identified and referenced;
- **Identification of the life-cycle of a street:** the stages in the life of a street, and how these affect gazetteer entries;
- **Identification of the source of the data**: a process needs to be established to collect the data. It should include the creation of new instances including how they are referenced, for example the process of street naming.

4.1.3 Acceptable quality levels

BS 7666 does not specify acceptable quality levels (AQLs), threshold values applied to the results of testing data quality to determine whether the data meets criteria determined from the data specification. These need to be established as part of the gazetteer implementation. In setting AQLs, the user and usage of the gazetteer should always be borne in mind. AQLs are discussed in 4.2 of Section 3 of these Guidelines.

4.2 Definition and identification of streets

A fundamental issue in building a gazetteer is identification of a street and elementary street unit, and where these start and end.

A street is a "way or thoroughfare providing a right of passage on foot, by cycle or by motor vehicle". A street instance is identified initially by a street name, a highway authority street number, or identification of a piece of unnamed street on a map. The following rules should be used:

- **Roundabouts**: these should be included, and may also be part of streets that pass around them, but mini-roundabouts should not normally be included, unless named (e.g. the Magic Roundabout, Swindon);
- **Dual carriageways**: these should normally be a single street, unless the two carriageways have different names or route numbers[2];
- **Link and slip roads**: these should be included as part of the street to which they relate, unless separately named. Where the slip road relates to two streets, it should be considered as part of the one onto which it leads[3];
- **Cycle routes beside carriageways**: these should only be recorded where they are separated from the carriageway
- **Non-streets**: things that do not fit the definition of a street should not be included in a street gazetteer, e.g. waterways, railways, buildings, groups of buildings.

Streets may need to be subdivided in the gazetteer. In general, a street instance should extend to:

a) The end of a street where it is a close or a cul-de-sac;

b) The point at which there is a change of designated street name;

c) The limit of a street description;

d) The point at which a street number ceases to apply;

e) A change of locality, town or administrative area (note that a street need not end at these boundaries – see **4.4**);

f) The boundary of the territory of use.

[2] The individual carriageways will be held as separate elementary street units (see 4.3).
[3] The individual link or slip roads will be held as separate elementary street units (see 4.3)

4.3 Identification of elementary street units

Elementary street units (ESUs) are subsets of streets forming a continuous length. They are recorded primarily to relate the street reference to a physical extent, and to enable the recording of overlaps between different street references. They also enable the construction of street network topology.

The following rules should be used:

a) where there is a junction, the street should be broken into separate ESUs;

b) where there is a change in the characteristics of the street (e.g. the introduction of access restrictions), the street should be broken into separate ESUs;

c) where ESUs are recorded for a roundabout, there will be one ESU between each pair of adjacent streets coming into the roundabout;

d) the two carriageways of a dual carriageway should be recorded as separate ESUs;

e) link and slip roads should be recorded as ESUs.

It is important that elementary street units end at features that are identifiable in the real world. In some remote rural areas where it is required to break a long street, this might be a stream, bridge, bend, or boundary marker.

4.4 Street names and descriptions

4.4.1 Street names

The designated street name is usually to be found on the name plate on the street. However, these may not always be correct, and may differ between the ends of the street. Unofficial street names are ones that have not been adopted by the appropriate Highways Authority but may be in common usage, e.g. “The Great North Road”. Street names, whether designated or unofficial, should be recorded in full. Abbreviations and punctuation should not be used unless they appear in the designated name, e.g. “Dr Newton’s Way”. Only single spaces should be used.

4.4.2 Street descriptions

Street descriptions should only contain what is necessary to identify the street, such as the type of street, a description of the end locations or identifiable landmarks. Where the street lies within a large public or private establishment or estate, it should be identified to that site.

Examples of street descriptions
- Underhill Lane, track to South Farm;
- Smith Street, alley behind houses on the north side;
- Southmoor Trading Estate service road;
- M1 from junction 3 to junction 4;
- Grand Canal towpath on north side between Old Bridge and New Bridge.

4.4.3 Street numbers

A street number shall comprise the road or route number allocated to a street by a relevant authority such as the Department for Transport, the Scottish Executive, the Welsh Assembly Government, Northern Ireland Roads Service or the local highway authority. A county/highway authority reference should be prefixed by the additional character "Z".

4.5 Descriptive identifiers

4.5.1 Components

The descriptive identifier holds the key to street references. It is there to give the street an address and to distinguish between streets with the same name.

The descriptive identifier has three components:

- **Locality name**: the formal or informal name of the local area where people live or where certain activities take place, e.g. East Wellow, Maybush, Chiswick;
- **Town name**: the name of a city or town, or a suburb of an administrative area that does not form part of another town, e.g. Luton, Gosforth, Ealing;
- **Administrative area name**: the formal name of the highest level local administrative area (i.e. a County, Unitary Authority, Metropolitan District, Council Area (Scotland) or District Council (Northern Ireland)), or Greater London, or an island or group of islands (e.g. 'Shetland Islands'). The name of the area should be used rather than the name of the administrative authority.

The issue is how to identify these for a particular street, given that locality and town are not necessarily well-defined in terms of their existence and extent. Whilst it is only necessary to provide sufficient of locality name, town name and administrative area name to make the street name unique, there is merit in providing more than the minimum where this helps to locate the street. For example, even where there is only one occurrence of a particular street name in the administrative area, it will be helpful to have either a locality name or a town name to locate that street in the real world. Because a town is usually more well-defined, a town name should be used where possible.

Streets normally do not need to be broken at locality boundaries, but it may sometimes be helpful to do so for addressing purposes, where properties are numbered separately in each section, and it is necessary to identify the locality in order to identify the properties uniquely.

There are essentially two different approaches to creation of descriptive identifiers, the top-down approach and the bottom-up approach.

4.5.2 Identification of components

Whilst it is possible to identify the locality, town and administrative area for each street on an ad hoc basis, this approach is not recommended, apart from where deemed necessary to deal with problem areas. Instead, it is recommended that a structured approach to identifying the areas is adopted. The territory of use of the gazetteer is broken down into a set of levels as follows:

1. the administrative areas are identified:
   These will be contiguous, as they all have well-defined boundaries;
2. towns are identified:
   The definition of these will vary from place to place, as what is a town in a rural area will be too small to be a town in an urban area. Towns are disjoint, and will not together cover the whole of the territory of use. Typically there will be 10-50 towns in an administrative area.
3. localities are identified:
   These will be local area names identified from address records, maps or other sources. They will include villages, suburbs of towns, housing estates, industrial estates (e.g. Park Royal), large trading estates (e.g. Bluewater Shopping Centre), airports (e.g. Heathrow) and university campuses (e.g. Nottingham University). Localities may be sub-divisions of towns, associated with towns, or stand alone within the context of an administrative area.

It is recommended that lists of allowable values be established, and that only these are used in creation of addresses. It is likely that in rural areas, some additions will have to be made in order to identify unnamed streets that provide access to properties.

4.6 Linking to other datasets

The Standard explicitly allows links between street records in the gazetteer and other datasets. How this is implemented will depend on the form of the other dataset and the nature of the corresponding related object. The linkage will be geographical in nature, but the other object does not have to be exactly the same nor coincident spatially. The relationships may involve time as well as space.

In all cases, the link will take the form of the identifier or identifiers of the related object or objects in the other dataset being recorded in the street gazetteer. The nature of the relationship and the dataset to which the data is cross-referenced should be identified in the metadata (see **3.4.3**). This relationship need not be one-to-one (i.e. an object in one dataset may be related to more than one object in the other dataset, and the two objects may not correspond exactly).

Possible types of cross-references to streets are:

- direct cross-references to other street records to link other data, such as topographic map data, with the corresponding street identified by the appropriate identifier or identifiers. An example of this would be Ordnance Survey TOIDs.
- Identifiers of street records in other systems in the same organisations, for example historic gazetteers or highway records;
- Links to other related objects, for example Public Rights of Way.

Streets and street references are used in many applications. BS 7666-2 contains explicit links to a street as recorded in a street gazetteer and referenced by Unique Street Reference Number or full descriptive identifier, for purposes of addressing Basic Land and Property Units.

4.7 Data maintenance

A street gazetteer is not a static dataset, but a continually changing description of a set of real-world objects. Consequently, it is essential that a maintenance regime is established. There are three main stages in the life-cycle of a street record in the gazetteer, creation, change and closure. Different procedures are required for each.

- **Creation**: a business process needs to be devised to identify new instances of streets, and to collect the necessary data about them. This will involve some level of interaction with the life-cycle of the street, including with the Street Naming and Numbering process. It will need to be decided at what point in the life-cycle, the street is entered into the street gazetteer.
- **Change**: change to a gazetteer record can occur for many reasons. They essentially fall into two categories, those representing real-world change, for example as a result of changes to the alignment of the street, and those due to correction of data or insertion of missing data. The changes should include the date information. The USRN should not be changed. The metadata will need to be updated at regular intervals.
- **Closure**: a street ceases to exist when it is physically closed, or it ceases to exist as a named entity (e.g. where it is merged into another named street). The gazetteer record for this instance is amended to change its state, and to input a value for the end date. Historic records should not be deleted, as they may still be of interest, but may be archived.

4.8 Data quality

4.8.1 Requirements

BS 7666-1 specifies a requirement for a data quality report. This is an assessment of the quality of the data in terms of the following:

- Lineage
- Currency
- Positional accuracy
- Attribute accuracy
- Completeness
- Logical consistency

The data quality report should contain details of any tests carried out, including the test methods, the date of the test, the name of the tester and details of any source material or other information used. Where tests are carried out on samples of the data, these should be chosen at random, and the method of generation of the sample recorded. The general aspects of reporting data quality are discussed in Section 3 of these Guidelines. This section provides some additional specific guidance for street gazetteers.

4.8.2 Lineage

The lineage statement should describe how the gazetteer was created and how it is updated. These should include details of the processes and the sources of information.

4.8.3 Currency

The currency statement should describe the date at which the data was considered to be current. Tests should be carried out to check if this is actually so, as it may be that in certain areas, updates have not been carried out. Where this is the case, it should be recorded in the quality report.

4.8.4 Positional accuracy

Detailed positional accuracy checks can only be carried out on samples of the data, comparing the recorded position of extremity points with the true position as defined on a map, or by GPS survey. However, simple checks of coordinates can be carried out to determine whether the points are within the geographic extent of the gazetteer, and the locale of the various spatial units (administrative area, town, locality) identified in the descriptive identifier.

4.8.5 Attribute accuracy

It is not generally possible to test the accuracy of all attributes. However, some key attributes should be checked on a sample basis, especially the street names and other key identifiers. It is also possible to test attributes for valid values. In particular, the following should be tested:

- Any identifier, such as a cross-reference, to confirm that it exists;
- Designated Street Names and Highway Authority road numbers with other official records;
- Dates as being within pre-defined ranges;
- Codes having valid values from code lists.

4.8.6 Completeness

Completeness errors can be of omission (missing items) or commission (additional items). The following should be checked and reported on:

- Whether all streets have been included (testing for this is probably best done on a sample area);
- Whether there are any duplicate streets (including whether there are duplicate records with minor differences in attribute values, for example extremity point coordinates);
- If elementary street units are included, that all streets have elementary street units;
- That all mandatory attributes of streets and elementary street units (if recorded) have values.

4.8.7 Logical consistency

The particular aspects of logical consistency that are important for a street gazetteer are as follows:

- streets recorded in the gazetteer are actually streets as defined by the gazetteer scope;
- street references (unique street reference numbers and descriptive identifiers) are unique within the territory of use;

- associations between an elementary street unit (ESU) and a street: for every ESU there must be one or more streets associated with it (and identified by a valid USRN);
- ESUs with the same street reference, when combined make up the complete street;
- attributes are in the prescribed format;
- attribute values are consistent with the domain set out in the data specification;
- descriptive identifiers are recorded consistently in terms of whether optional fields have values;
- dates are consistent with respect to each other (e.g. end date, if it exists, is not before start date).

4.8.8 Quality management and Quality improvement

It is essential that a formal quality management system is introduced for the gazetteer creation and maintenance process. A simple flow model of gazetteer creation and maintenance is given in Section 3 of these Guidelines. Built in to this scheme should be the maintenance and improvement of the quality of the data. Users will be looking for continuing improvements in data and this means that there will be a requirement for further quality improvement. To achieve this there will need to be a mechanism for the following:

- Feeding back and acting on errors found in the data;
- Feeding back on improvement to processes by operators of those processes;
- Learning and applying lessons from the use of current processes;
- Managing change whether to the data specification or the acceptable quality levels (AQLs).

5. Common misunderstandings and errors

Because of the nature of street gazetteers, certain types of errors tend to be prevalent. Many of these errors can be overcome by a more rigorous approach to managing quality. These errors include the following:

- Objects being entered into a street gazetteer that are not streets, such as canals, railway lines, high-rise buildings and cycle lanes within carriageways;
- Entering the same street in the gazetteer several times, leading to duplicate records, often with slightly different data – for example the same street having several “unique” street reference numbers (USRNs);
- Excessive sub-division of streets (as separate streets) adding little or no value for the user and complicating the maintenance of the gazetteer;
- Elementary street units that when combined do not make up the whole of the street;
- Missing mandatory attributes, such as extremity points;

- Inconsistent descriptive identifiers, for example where two neighbouring streets in the same locality have different entries for locality, town and administrative area, even though there are no area boundaries interceding.

6. Conformance issues

Annex A of BS 7666-1 defines a set of conformance levels for street gazetteers. Three conformance levels are defined:

- Level 1 - a gazetteer containing only streets;
- Level 2 - a gazetteer containing streets and elementary street units with no intermediate points;
- Level 3 – a gazetteer containing a full description of the elementary street units.

Each of these is progressively more detailed than the level below.

To claim conformance to the Standard, it is necessary to demonstrate that a gazetteer fulfils all the requirements outlined in the conformance statement. Such claims should be independently verifiable.

Essentially, a level 1 gazetteer must have:

- a record of all streets within the scope of the gazetteer;
- all the mandatory attributes for each street record;
- gazetteer metadata;
- a quality report.

For a level 2 gazetteer, in addition to meeting all the requirements of level 1, the gazetteer must also have:

- a record of elementary street units for each street;
- all the mandatory attributes for each elementary street unit.

For a level 3 gazetteer, in addition to meeting all the requirements of level 2, the gazetteer must also have:

- street centre lines for each elementary street unit.

Section 6. Creating a land and property gazetteer

This Section provides detailed guidance on how to create a land and property gazetteer. It explains aspects of BS 7666 Part 2: Specification for a land and property gazetteer, and should be read in conjunction with that document. It is aimed at those compiling such gazetteers, particularly in local authorities. The guidelines are general and not aimed at any specific implementation such as the National Land and Property Gazetteer[4], for which specific guidelines will apply. A Glossary of Terms, list of abbreviations and references, and an explanation of the UML data modelling conventions used in the Standard are given in Section 1 of these Guidelines.

1. Introduction

A land and property gazetteer is a list of land and property units in an area, together with information about their location. BS 7666-2 is based upon the concept of a Basic Land and Property Unit (BLPU), defined as an "area of land, property or structure of fixed location having a uniform occupation, ownership or function". This definition is intended to be broad, and what is considered to be a BLPU is to a certain extent dependent on the user perspective. There is no single correct view, and different user communities will record BLPUs at different levels of granularity. For example, where one will see a block of flats, another will see a set of individual residences. Both views are equally valid.

Each BLPU is identified by one or more Land and Property Identifier (LPI), which is based on the concept of an address. A BLPU can have more than one LPI, but an LPI can only identify a single BLPU. Thus a corner property might be both 25 High Street, and 1 Side Road.

2. Details of changes from previous edition and implications for implementation

The main changes to Part 2 from the previous (2000) edition of the Standard are as follows:

- Addition of a requirement to provide metadata for all gazetteers:
    - This is important, especially the scope statement, as it aids understanding of the gazetteer. The requirements are described in **3.6** of this section of the Guidelines.
- Addition of a facility for recording descriptive identifiers in multiple languages.
    - This will aid those creating multi-lingual gazetteers. It does not affect mono-lingual gazetteers. This is described in **3.5** of this section**.**
- Addition of a facility for classification of BLPUs:

[4] See "LLPG and SN & N Data Entry Conventions and Best Practice for the NLPG" at www.nlpg.org.uk

  - For many purposes, it is desirable to classify BLPUs, for example identifying whether they are residential, commercial or public. This addition is optional, and its usage is a decision for the implementation. For further details, see **3.2.3** of this section.

- Clarification of street references for a BLPU:
  - A street no longer has to be referenced from a street gazetteer, but can be described by a descriptive identifier in full. For further details, see **3.3.3** of this section.
- Extension of facilities for cross-referencing to other datasets:
  - These have been added throughout the Standard. They are optional in all cases. Cross-referencing to other datasets is very useful, particularly to integrate existing datasets. How it is carried out is a matter for the implementation.
- Addition of a requirement for a data quality report:
  - This is a major new requirement, and a significant additional task. For general information on this, see Section 3 of these Guidelines. For specific details see **3.7** of this section.
- Changes to the role of provenance:
  - Provenance is now associated with the BLPU Extent rather than BLPU itself. This change reflects the normal practice.
- Other minor changes:
  - Addition of an identifier for a Land and Property Identifier (LPI) - this is always done in implementations, but is now explicit.
  - Field lengths are no longer prescribed – these are not necessary with current database technology, but may be useful in implementing rules.
  - Changes to some of the definitions to improve understanding.

3. Explanations of requirements

3.1 Gazetteer Scope

The scope is a description of the type of objects to be included in the gazetteer. In the case of a land and property gazetteer, it is the types of property and land. The scope defines the bounds of what should be included and what should not be included. For example a gazetteer might include all individual residential property eligible for Council Tax and all individual commercial property eligible for Non-Domestic Rates but not ‘grouped’ commercial properties, and exclude land parcels. The scope statement should also include a statement of what level of detail the gazetteer contains, e.g. whether communal properties are broken down into sub-units.

It is important to have a clear scope statement, because of the flexible definition of a BLPU, to ensure that compilers know what to include, and users know what to expect. It is also important that where gazetteers from different sources are combined, they have similar scopes, otherwise an inconsistent gazetteer will result.

Example of Gazetteer scope for a land and property gazetteer:
Land and Property Gazetteer for the county of Borsetshire, including:

- *all individual properties registered for Council Tax,*
- *blocks of residencies sharing a common address,*
- *all individual commercial properties registered for non-domestic rates, but not grouped commercial properties,*
- *blocks of commercial properties,*
- *residential blocks such as university and nursing accommodation, but not individual units,*
- *community and public buildings and other facilities, including halls and major monuments,*

but excluding unoccupied land .

The statement of the gazetteer scope is recorded in the gazetteer metadata (see **3.6**).

3.2 BLPU records

3.2.1 Attributes

Details of the attributes of a land and property unit are defined in Clause 6 of BS 7666-2. Some of the issues relating to them are described here.

3.2.2 Unique Property Reference Numbers (UPRN)

The UPRN uniquely identifies the BLPU within the gazetteer, and is constant over the life of the BLPU. It should not be changed when attributes of the BLPU change. Where land and property gazetteers are to be merged to cover a wider area, there needs to be a central authority to allocate UPRN ranges to ensure uniqueness. This might be achieved by the addition of pre-fixes.

3.2.3 BLPU classification

BLPUs are not homogeneous. A BLPU classification code has been added to the requirements in the 2006 edition of the Standard. However, this is optional. The purpose of this is to provide a high-level description of the type of BLPU. A recommended list of codes is given in Annex C of BS 7666-2. This does not have to be used. Where a different code list is used, this should be specified in the metadata (see **3.6**). A more detailed classification (secondary classification) may be added as an additional user-defined attribute.

3.2.4 Representative point

The BLPU is required to have a coordinate reference of a representative point and a corresponding representative point code. The representative point should normally lie within the BLPU but in some circumstances may lie outside, for example where information about the exact limits of the BLPU or the precise position is lacking. Where the representative point lies outside the BLPU, it may be given the coordinate of either:

a) the south-west corner of the 100m grid square (when using a metric grid) containing the BLPU, or

b) the start point of the street in which the BLPU lies.

The representative point code identifies the choice of representative point. Allowable values are given in Table 3 in BS 7666-2.

3.2.5 Dates

Dates should be recorded at an appropriate level of resolution. Normally this will be a day, but where this is not known, it may be only a month (e.g. '2006-08') or a year (e.g. '1900'). The dates should be recorded consistently either in the basic format (YYYYMMDD) or extended format (YYYY-MM-DD, YYYY-MM or YYYY), where YYYY is the year, MM the month and DD the day. The two formats should not be mixed, and for each implementation of the Standard it will have to be decided which format is to be used.

Care needs to be taken to distinguish between actual dates, when something happened either in the real world or to a source of information, and capture and update dates, when changes are made to the data.

Actual dates:

- **start date:** the date when the BLPU came into existence;
- **end date:** the date when the BLPU ceased to exist;
- **current state date:** the date when the BLPU came into its current state;
- **current date:** the date at which the gazetteer is considered to be current.

Capture and update dates:

- **entry date:** the date when the BLPU record was entered into the gazetteer;
- **update date:** the date when the BLPU record was last updated;
- **metadata date:** the date when the metadata was last updated.

Where dates are not known exactly, a notional date at which the date criterion was known to be correct should be used. This applies in particular to start date. Where update date is not known, or the record has not been updated, the update date should be same as the entry date.

3.2.6 BLPU logical status

The BLPU logical status, identified by a code, gives an indication of the confidence level of the BLPU record. These are shown in Table 1.

Table 1. BLPU logical status codes

BLPU record status	BLPU logical status	Description	Notes
Approved	1	BLPU identified by at least one approved LPI and confirmed by the gazetteer custodian as the most appropriate spatial identification	
Candidate	5	BLPU posted for inclusion in the gazetteer but awaiting approval by the gazetteer custodian	A candidate BLPU is only identified by a 'candidate' LPI
Provisional	6	BLPU held in the gazetteer on a temporary basis	An example is a building plot. The purpose of a provisional BLPU is to assist in the matching or reconciliation of identifiers.
Historic	8	BLPU no longer in use	An end date should be recorded. The purpose of an historic BLPU is to facilitate the maintenance of cross-references to historic datasets. An example is where a building has been demolished.
Rejected	9	BLPU not approved by the gazetteer custodian and awaiting deletion	The BLPU should be deleted as soon as possible. The associated LPIs should also be 'rejected'.

3.3 Land and Property Identifier records

3.3.1 Attributes

Details of the attributes of a land and property identifier are given in Clause 7 of BS 7666-2. Some of the issues relating to them are described here.

3.3.2 Object name

Primary Addressable Objects

The object name identifies the BLPU within the context of a street. Where the BLPU is directly addressable in its own right (i.e. without reference to any other BLPU), it is called a Primary Addressable Object. The Primary Addressable Object Name (PAON) is defined according to the following order of priorities:

1. a designated premises number for the BLPU;
2. a premises name for the BLPU;
3. an organisation name for the corporate occupier of the BLPU;
4. a description of the BLPU.

Examples of Primary Addressable Object Names
- 221b
- Bush House
- Tesco
- Development site bounded by Church Land and Priory Avenue
- Terminal 1
- Greyfriars School

Secondary Addressable Objects

Where a BLPU can only be addressed by reference to another BLPU, because it forms a part of it, or is associated with it by physical proximity or route of access, it is called a Secondary addressable Object (SAO). The secondary object name identifies the BLPU by reference to the Primary Addressable Object.

Examples of Secondary Addressable Object Names
- Flat 4
- The cyber shed
- Fourth floor
- Room 101
- Annex
- Unit 17

3.3.3 Spatial references

The spatial reference of the BLPU is a street reference, in the form of either:

a) the unique street reference number of the street, as recorded in a street gazetteer, or

b) a descriptive identifier for the street, comprising the street name and sufficient of names of locality, town and administrative area to create a unique identifier for the street as defined in BS 7666-1.

In the previous edition of BS 7666-1, only the first of these was allowed. The second should only be used where no street gazetteer is available.

3.3.4 LPI logical status

The logical status, identified by a code gives an indication of the confidence level of the LPI record. These are shown in Table 2.

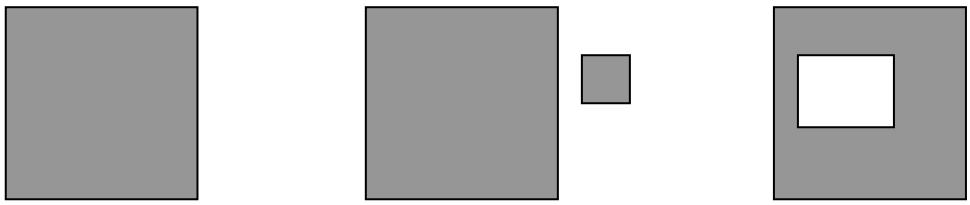
Table 2. LPI Logical status codes.

LPI record status	LPI logical status	Description	Maximum number of occurrences [5]	Notes
Approved preferred	1	An identifier or address corresponding to the entry in the official street name and numbering register (if such exists); otherwise the address deemed by the Gazetteer Custodian to be correct or the most commonly used	1	For any BLPU, only one LPI can have 'approved' status for any particular language (identified by the language code)
Approved alternative	2	An identifier or address recognised by the Gazetteer Custodian as being in common use but differing from the official/preferred LPI	1	An approved alternative LPI may be used for alternative spelling or local naming custom. This status should only be applied to one LPI record for each BLPU, and there should be a corresponding LPI with logical status 1
Alternative	3	An identifier or address that is not the approved preferred or approved alternative	N	Examples are special interest identifiers and additional descriptions (e.g. First floor flat)
Candidate	5	An identifier or address posted for inclusion in the gazetteer and awaiting confirmation or approval by the Gazetteer Custodian	N	
Provisional	6	An identifier or address held on a temporary basis	N	An example is a plot number. A 'provisional' LPI should not be used where there is an 'approved preferred', 'approved alternative' or 'alternative' LPI.
Historical	8	An identifier or address no longer in use	N	This facilitates the maintenance of cross-references to historic data, for example where a postcode has changed or where the property has been demolished.
Rejected	9	An identifier or address that has not been approved by the Gazetteer Custodian and is awaiting deletion.	N	An example is a candidate that is found to be a duplicate or misspelled entry. The LPI should be deleted as soon as possible.

[5] Per BLPU, per language. 1 = should be only one; N = could be many

3.4 BLPU Extents

BLPU Extents may be included in the gazetteer, with a BLPU represented by one or more BLPU Extents, each representing a different BLPU provenance. A BLPU Extent may be discontinuous or have "holes" in it, and is represented by one or more polygons. BS 7666-2 provides a means for recording these polygons (BLPU Extent Polygons). An alternative way of recording extents is by use of external cross-references to topographic datasets. This has the advantage of reducing the complex task of maintenance of the data and is preferable where applicable (i.e. where the BLPU is identified as an object in the topographic dataset).



a) contiguous b) discontinuous c) hole

Figure 2. Types of BLPU extent

BLPU Provenances are the "world views" which determine the extent of the BLPU. The different views may lead to different extents, for example the extent of a residential building may be different from the extent of the land on which it is situated (which may include a garden). The allowable Provenance Codes are shown in Table 3. For some specific purposes it may be necessary to introduce additional provenance codes. Where this occurs, the additional Provenance Codes should be recorded in the metadata. An example of this would be a major land owner or user who wanted to define BLPUs subject to their jurisdiction.

Table 3 Provenance codes

BLPU provenance	BLPU provenance code	BLPU provenance description	Example of BLPU
Registered land title	T	Title registered by a land registry	residential property
Unregistered land title	L	Title deeds or similar (but not registered)	farm land
Formal tenancy agreement	F	Subject of formal tenancy agreement	rented or leased residential property
Rental agreement	R	Subject of rental agreement	sub-unit of a large office block
Physical features	P	Defined by physical extent	land parcel bounded by a fence
Occupancy	O	Defined by identified occupancy	local authority department
Use	U	Defined by established use	public space

3.5 Multi-lingual gazetteers

BS 7666 now contains explicit provision for multi-lingual entries[6]. In a multi-lingual gazetteer, a record may have multiple LPIs, each in a different language. A code identifies the particular language used. These codes are listed in Table C.3 in Annex C of BS 7666-2.

It is not possible to mix languages in an LPI. However a Welsh language descriptive identifier may contain elements in English, and vice-versa. Ordering of LPIs is not important.

The languages used in addition to English should be recorded in the metadata (see **3.6**), together with any additional character sets used. Where the gazetteer is mono-lingual, nothing extra need be done, as the language is assumed to be English.

[6] In previous editions of the Standard, multi-lingual entries could be recorded through the use of the 'alias' facility. Now, the explicit provision for multi-lingual entries enables Welsh implementations to meet local requirements.

3.6 Gazetteer Metadata

3.6.1 Requirements

The recording of metadata is a new requirement in the revised edition of BS 7666-2. The purpose of this is to provide users and potential users with information about the gazetteer. This metadata should be supplied with the gazetteer.

3.6.2 Mandatory elements

The mandatory metadata elements are as follows:

a) **Name**: of the gazetteer, e.g. 'Borsetshire County Council Land and Property Gazetteer';

b) **Scope**: see **3.1**;

c) **Territory of use**: the geographic domain of the gazetteer, e.g. 'Borsetshire';

d) **Gazetteer owner**: with overall responsibility, e.g. 'Borsetshire County Council';

e) **Custodian**: the practitioner who compiles the gazetteer, e.g. 'the Borsetshire Land and Property Gazetteer Custodian';

f) **Coordinate system**: this will usually be the National Grid (NG) of Great Britain, or Irish Transverse Mercator (ITM);

g) **Current date**: the date at which the gazetteer can be considered to be current (not the date of last update of the data).

These are described in more detail in Clause 5 of BS 7666-2.

3.6.3 Optional elements

The following metadata elements are optional. They should be recorded where they are applicable.

a) **Coordinate axis units**: this will usually be 'metres';

b) **Metadata date**: when the metadata was last updated (not the date at which it is deemed to be current);

c) **BLPU classification scheme:** where one is used, details should be given (see **3.2.3**);

d) **State coding scheme**: where one is used, details should be given;

e) **Language(s):** any languages other than English that are used should be recorded, e.g. 'CYM';

f) **Character set(s):** any character sets other than English that are used should be recorded, e.g. "UNICODE UTF-8 character set" to support the full Welsh language;

g) **External cross-referencing scheme(s)**: If external cross-references are included in the gazetteer, the scheme should be recorded, e.g. 'Ordnance Survey TOIDs'.

These are described in more detail in Clause 5 of BS 7666-2.

3.6.4 Creation and maintenance

It is recommended that the metadata is collected as part of the gazetteer creation process. This requires little additional effort, and may aid the understanding of the creation process. The metadata should be kept up to date as part of the data maintenance process. Additional metadata elements may be recorded as required.

3.7 Data quality

The Standard specifies a requirement for a data quality report. This is an assessment of the quality of the data in terms of the following:

- Lineage
- Currency
- Positional accuracy
- Attribute accuracy
- Completeness
- Logical consistency

These general aspects are discussed in detail in Section 3 of these Guidelines. Additional specific guidance for land and property gazetteers is given in **4.6** of this section of the Guidelines.

4. Recommended approach

4.1 Planning and initiation

4.1.1 Scope

Before starting a gazetteer implementation, it is necessary to define the scope of the gazetteer. The scope is described in **3.1**. It should state what is to be included in the gazetteer, and what is not included, including the level of detail. Note that only objects that are BLPUs should be contained in a land and property gazetteer.

4.1.2 Data specification

Any gazetteer implementation should have a data specification. BS 7666-2 defines a general structure for a land and property gazetteer, and allows many options. It does not define the detail of the content of the gazetteer. As part of any implementation, it is necessary to specify in detail the data to be included. This should include the following:

- **Description of the details of the implementation of the Standard**: definition of the data structures to be used, including referencing schemes (e.g. unique property reference numbers) and BLPU classifications;
- **Identification of attributes of each entity**: for BLPUs and LPIs, the attributes need to be defined, including whether attributes identified in BS 7666-2 as optional are to be included, and if so the rules for their inclusion, any additional attributes to be recorded, field lengths and domains (allowable values);

- **Links to other datasets**: any cross-references to other datasets, and how they are to be established**;**
- **Rules for inclusion of instances of BLPUs**: in particular how they are identified and referenced;
- **Identification of the source of the data**: a process needs to be established to collect the data. It should include the creation of new instances including how they are referenced, for example the process of street naming.

4.1.3 Acceptable quality levels

BS 7666 does not specify acceptable quality levels (AQLs), threshold values applied to the results of testing data quality to determine whether the data meets criteria determined from the data specification. These need to be established as part of the gazetteer implementation. In setting AQLs, the user and usage of the gazetteer should always be borne in mind. AQLs are discussed in 4.2 of Section 3 of these Guidelines.

4.2 Identification of BLPUs

A fundamental issue in the building of a gazetteer is identification of a BLPU. A BLPU is defined in BS 7666 as an "area of land, property or structure of fixed location having uniform occupation, ownership and function". This is intended to include most objects that can be referenced by means of an address (i.e. are an addressable object). The structure of the addressable object name into primary and secondary addressable object names (see **3.3.2**) implies that that BLPU should not be broken down excessively in the land and property gazetteer, i.e. should not go beyond one level of decomposition of an identifiable object. Further decompositions are often better recorded in other ways, for example in a GIS.

Examples of BLPUs

The following could be BLPUs:

- building (residential, commercial or public)
- land on which a building is situated
- land parcel
- block of flats
- individual residential unit within a block (e.g. a flat)
- business premises
- office block
- office within a block
- public hall
- sports facility
- school
- church
- cemetery
- park
- theatre, cinema etc
- car park
- significant monument

The following general guidelines apply to BLPU identification:

- In general, a geographic object is **likely** to be a BLPU if any of the following are true:
  - it has a street address (in the everyday sense), i.e. has a number or name that enables it to be located on a street;
  - it is commonly referred to in its own right (e.g. a recreation or leisure facility);
  - it is a piece of land on which events do or will take place (e.g. a field, development site).
- A geographic object is **unlikely** to be a BLPU if any of the following are true:
  - it cannot be readily identified in the real world through a simple address or description (e.g. an individual parking place, street furniture);
  - it is only identifiable by reference to two or more 'parent' objects, i.e. it is a sub-division of a sub-division (e.g. a kiosk, an ATM or advertising hoarding, for which the BLPU is likely to be the building to which they are attached);
  - it is transient (e.g. a market stall, recycling point).
- Pieces of equipment are not BLPUs, rather the site or kiosk at which they are situated is the relevant BLPU, e.g. for telecommunications masts, the BLPU is likely to be the enclosure rather than the mast itself.

4.3 Creating Land and Property Identifiers

The main issue in creating Land and Property Identifiers (LPIs) is how to create an address, i.e. object name and spatial reference. Addressable object names comprises a primary addressable object name (PAON) and, optionally, a secondary object name (SAON), as described in **3.3.2**. Where possible, the object name should comprise only a PAON. Where it is necessary to use a SAON (i.e. where the BLPU can only identified by reference to a SAO), then it is essential that the PAO is created first.

Examples of addressable object names	
Secondary Addressable Object Name	**Primary Addressable Object Name**
	42
10	Albert Mansions
3	Railway Terrace[7]
Flat 6	436
Chemists shop	Tesco
Ticket Office	Victoria Station
Intelligent Addressing	Ivybridge House

[7] where Railway Terrace is a group of properties, not a street.

As stated in 3.3.3, the Spatial Reference of the BLPU is a street reference, in the form of either the unique street reference number (USRN) of the street, as recorded in a street gazetteer, or a descriptive identifier for the street, comprising the street name and sufficient of locality, town and administrative area to create a unique identifier for the street as defined in BS 7666-1.

The street is the one that provides access to the BLPU, or is the last street on a route providing access to the BLPU, where no street provides direct access to the BLPU. Note that this street:

- will not necessary be the one closest to the BLPU (which may not provide access);
- may stop some way short of the BLPU (for example in remote areas).

4.4 Linking to other datasets

The UPRN is designed to be used for referencing the BLPU in other systems as well as the Land and Property Gazetteer. In addition, the Standard explicitly allows other links between BLPU records in the gazetteer and other datasets. How this is implemented will depend on the form of the other dataset and the nature of the corresponding related object. The linkage will be geographical in nature, but the other object does not have to correspond exactly or be exactly coincident spatially. The relationships may involve time as well as space.

In all cases, the link will take the form of the identifier or identifiers of the related object or objects in the other dataset being recorded in the gazetteer. The nature of the relationship and the dataset to which the data is cross-referenced should be identified in the metadata (see **3.6**). This relationship need not be one-to-one (i.e. an object in one dataset may be related to more than one object in the other dataset, and the two objects may not correspond exactly). The corresponding object in the other dataset is identified by the appropriate identifier or identifiers (where the object is made up of several smaller ones). Examples of this would be the property reference number in another system, or a set of Ordnance Survey TOIDs defining the BLPU extent.

4.5 Data maintenance

A land and property gazetteer is not a static dataset, but a continually changing description of a set of real-world objects. Consequently, it is essential that a maintenance regime is established. There are three main stages in the life-cycle of a land and property record in the gazetteer, creation, change and closure. Different procedures are required for each.

- **Creation**: a business process needs to be devised to identify new instances of BLPUs, and to collect the necessary data about them. This will involve some level of interaction with the life-cycle of the BLPU, including with the development control function. It will need to be decided at what point in the life-cycle a new development is entered into the gazetteer.
- **Change**: change to a gazetteer record can occur for many reasons. They essentially fall into two categories, those representing real-world change, and those due to correction of data or insertion of missing data. The changes

should include the date information. The UPRN is not changed. The metadata will need to be updated at regular intervals.

- **Closure**: a BLPU ceases to exist in the gazetteer when it is either physically demolished, or it ceases to exist as a named entity (e.g. where it is merged into another BLPU). The gazetteer record for this instance is amended to change its state, and to input a value for the end date. Historic records should not be deleted, as they may still be of interest, but may be archived.

The following general rules apply:

- **BLPU subdivision**:
  - When a BLPU is subdivided, at least one new BLPU (which may be a Secondary Addressable Object) is created. The old BLPU should be retained, with changed data, if it is substantially the same, either physically, or in terms of its address.
- **Merging of BLPUs**:
  - A new BLPU is created with a new LPI, and the old ones are closed.
- **Changes to the address** (e.g. change in name of a property, or the postcode):
  - A new LPI is created, and the old one is given an end date and has its status changed to 'historic'.
- **Change to the function of the BLPU** (e.g. from commercial to residential)
  - The BLPU record is updated, with a new BLPU Classification. The LPI may be changed.

4.6 Data quality

4.6.1 Requirements

BS 7666-2 specifies a requirement for a data quality report. This is an assessment of the quality of the data in terms of the following:

- Lineage
- Currency
- Positional accuracy
- Attribute accuracy
- Completeness
- Logical consistency

The data quality report should contain details of any tests carried out, including the test methods, the date of the test, the name of the tester and details of any source material or other information used. Where tests are carried out on samples of the data, these should be chosen at random, and the method of generation of the sample recorded. The general aspects of reporting data quality are discussed in Section 3 of these Guidelines. This section provides some additional specific guidance for land and property gazetteers.

4.6.2 Lineage
The lineage statement should describe how the gazetteer was created and how it is updated. This should include details of the processes and the sources of information.

4.6.3 Currency
The currency statement should describe the date at which the data was considered to be current. Tests should be carried out to check if this is actually so, as it may be that in certain areas, updates have not been carried out. Where this is the case, it should be recorded in the quality report.

4.6.4 Positional accuracy
Detailed positional accuracy checks can only be carried out on samples of the data, comparing the coordinate of the representative point for the BLPU with a true position as defined on a map, or by GPS survey. However, simple checks of coordinates can be carried out to establish whether the points are within the geographic extent of the gazetteer, and the locale of the various spatial units (administrative area, town, locality) identified in the spatial reference.

4.6.5 Attribute accuracy
It is not generally possible to test the accuracy of all attributes. However, some key attributes should be checked on a sample basis, especially the object names and other key identifiers. It is also possible to test attributes for valid values. In particular, the following should be tested:

- any identifier, such as a cross-reference, to confirm that it exists;
- dates as being within pre-defined ranges;
- codes have valid values from code lists.

4.6.6 Completeness
Completeness errors can be of omission (missing items) or commission (additional items). The following should be checked and reported on:

- whether all BLPUs have been included (testing for this is probably best done on a sample area);
- whether there are any duplicate BLPUs;
- that all BLPUs have LPIs;
- that all mandatory attributes of BLPUs and LPIs have values.

4.6.7 Logical consistency
The particular aspects of logical consistency that are important for a land and property gazetteer are as follows:

- BLPUs recorded in the gazetteer are actually BLPUs as defined by the gazetteer scope;
- UPRNs and object names are unique;
- for every Secondary Addressable Object, there is a Primary Addressable Object;

- every BLPU has at least one LPI;
- for every LPI, there is a BLPU;
- attributes are in the prescribed format;
- attribute values are consistent with the domain set out in the data specification;
- dates are consistent with respect to each other (e.g. end date is not after start date).

4.6.8 Quality management and Quality improvement

It is essential that a formal quality management system is introduced for the gazetteer creation and maintenance process. A simple flow model of gazetteer creation and maintenance is given in Section 3 of these Guidelines. Built into this scheme should be the maintenance and improvement of the quality of the data. Users will be looking for continuing improvements in data and this means that there will be a requirement for further quality improvement. To achieve this there will need to be a mechanism for:

- feeding back and acting on errors found in the data;
- feeding back on improvement to processes by operators of those processes;
- learning and applying lessons from the use of current processes;
- managing change whether to the data specification or the acceptable quality levels (AQLs).

5. Common misunderstandings and errors

Because of the nature of land and property gazetteers, certain types of errors tend to be prevalent. Many of these errors can be overcome by a more rigorous approach to managing quality. These errors include the following:

- Objects being entered into a land and property gazetteer which are not BLPUs, such as street furniture, attachments to buildings (e.g. ATMs, advertising hoardings), virtual objects (e.g. parking places, planning applications[8]). Those objects are better held in a GIS;
- Duplicate entries, often with slightly different data – for example the same BLPU held more than once with different LPIs (e.g. object name of ‘Flat 1’ and ‘Ground floor flat’);
- Excessive sub-division of BLPUs adding little or no value for the user and complicating the maintenance of the gazetteer;
- Street references that do not exist,
- Street references that reference non-streets (e.g. waterways and railways).

[8] The site to which a planning application applies is the BLPU.

6. Conformance issues

Annex A of BS 7666-2 defines a set of conformance levels for a land and property gazetteer. To claim conformance to the Standard, it is necessary to demonstrate that a gazetteer fulfils all the requirements outlined in the conformance statement. Such claims should be independently verifiable.

Essentially, a land and property gazetteer must have:

- a record of all BLPUs within the scope of the gazetteer;
- all the mandatory attributes for each BLPU record;
- at least one LPI for each BLPU;
- all the mandatory attributes for each LPI;
- gazetteer metadata;
- a quality report.