

ORDNANCE SURVEY GB

# OS MASTERMAP GREENSPACE LAYER™ – TECHNICAL SPECIFICATION

## Version history

Version	Date	Description
1.0	05/2017	Initial release.
1.1	04/2022	Introduction of GeoPackage and vector tiles formats to the product. Minor formatting updates to the document.

## Purpose of this document

This document provides information about and insight into the OS MasterMap Greenspace Layer product and its potential applications. For information on the contents and structure of OS MasterMap Greenspace Layer, please refer to the Overview and Getting Started Guide.

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## Contact details

[OS website 'Contact us' page \(https://www.ordnancesurvey.co.uk/contact-us\)](https://www.ordnancesurvey.co.uk/contact-us).

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# I. Introduction

## I.1 Product overview

OS MasterMap Greenspace Layer gives a comprehensive view of the greenspaces within an urban area. The dataset consists of topographic areas published in OS MasterMap Topography Layer, with additional greenspace-specific attribution to describe their function. It includes both publicly accessible and private greenspaces. This product has been designed for Public Sector Geospatial Agreement (PSGA) customers.

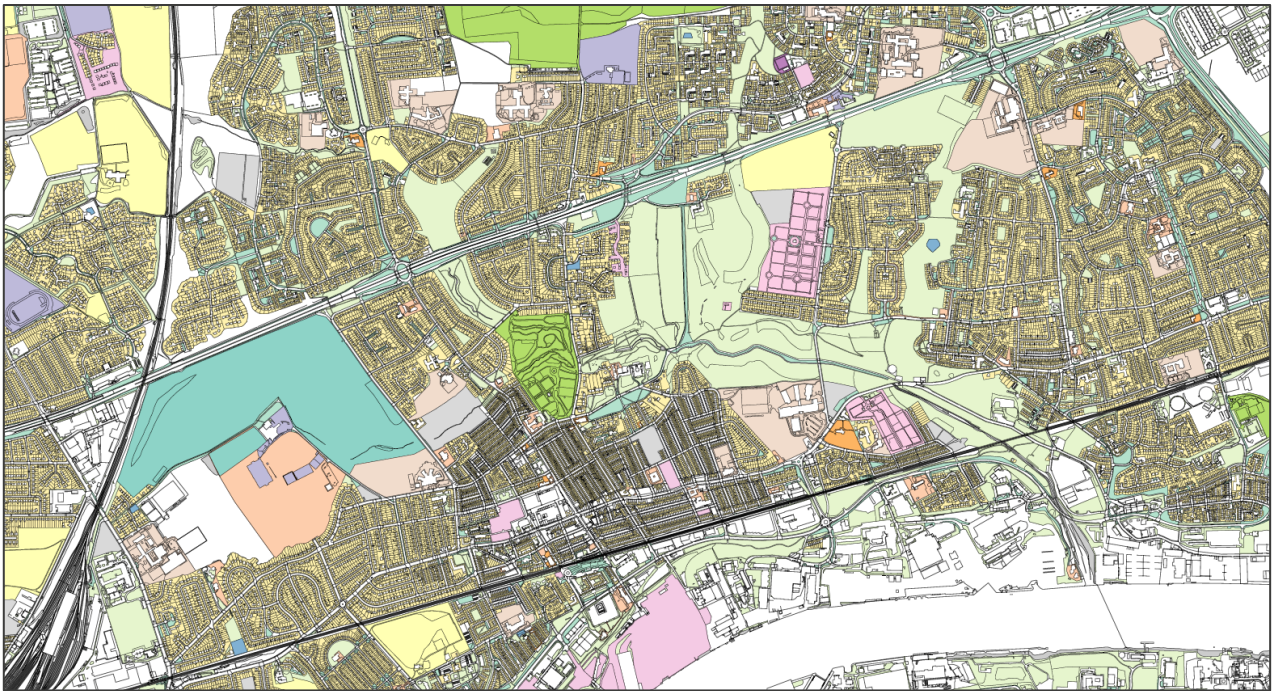


Figure 1: OS MasterMap Greenspace Layer data overlaid on OS MasterMap Topography Layer

## 2. Product classification and structure

### 2.1 OS MasterMap Greenspace Layer classification scheme

OS MasterMap Greenspace Layer consists of the following general classifications:

- Public parks or gardens
- Private gardens or grounds
- Amenity greenspace
- Play spaces
- Sports areas and playing fields
- Natural or semi-natural greenspaces
- Allotments or community growing spaces
- Churchyards or burial grounds
- Camping or caravan sites
- Areas undergoing land use change

A full list of the definitions of these classifications is included in the Code lists below.

## 2.2 Model overview

OS MasterMap Greenspace Layer is constructed as per the following UML diagram:



Figure 2: UML model of OS MasterMap Greenspace Layer

## 2.3 Feature type and geometry

OS MasterMap Greenspace Layer is comprised of a subset of the *TopographicArea* polygons from OS MasterMap Topography Layer (which represent topographic objects that have a polygon-based geometry). Only polygons which have been classified as a type of greenspace will be supplied. This subset of polygons will have the Topographic Identifier (TOID) and version number from OS MasterMap Topography Layer (to enable the datasets to be used in conjunction) plus additional attributes providing the greenspace-specific information.

OS MasterMap Greenspace Layer data contains one feature type with the following attribution:

<b>«FeatureType» GreenspaceArea</b>		
Definition: Polygon defining the area of the feature		
<b>Attribute: toid</b>		
Definition: The unique reference number of the feature in OS MasterMap Topography Layer. Combined with the version number, this enables joins with the Topography Layer dataset.		
Type: CharacterString	Length: 20	Multiplicity: [1]
<b>Attribute: version</b>		
Definition: The version number of the feature in OS MasterMap Topography Layer. This identifies the specific version of Topography Layer feature this dataset was created from. Combined with the TOID, this enables joins with the Topography Layer dataset.		
Type: Integer	Length: 3	Multiplicity: [1]
<b>Attribute: primaryFunction</b>		
Definition: The main function of the greenspace area.		
Type: Function	Length: 40	Multiplicity: [1]
<b>Attribute: secondaryFunction</b>		
Definition: The secondary function of the greenspace area, if applicable.		
Type: Function	Length: 40	Multiplicity: [0..1]
<b>Attribute: primaryForm</b>		
Definition: Type of land cover present.		
Type: Form	Length: 20	Multiplicity: [0..1]
<b>Attribute: secondaryForm</b>		
Definition: Secondary type of land cover present, if applicable.		
Type: Form	Length: 20	Multiplicity: [0..1]
<b>Attribute: geometry</b>		
Definition: The geometry of the greenspace area.		
Type: GM_Surface	Length:	Multiplicity: [1]

## 2.4 Code lists

### 2.4.1 Primary and secondary function types

All features will have a primary function. Where appropriate for the feature, a secondary function may also be recorded.

<b>Code List: Function</b> <a href="http://www.os.uk/xml/codelists/GreenspaceFunctionValue.xml">http://www.os.uk/xml/codelists/GreenspaceFunctionValue.xml</a> Value defining the function of the greenspace feature.	
Code	Description
Allotments Or Community Growing Spaces	Areas of land for growing fruit, vegetables, and other plants, either in individual allotments or as a community activity. Produce is for the growers' own consumption and not primarily for commercial activity.
Amenity – Residential or Business	Landscaped areas providing visual amenity or separating different buildings or land uses for environmental, visual or safety reasons. Where the area is better described by another category this will be used in preference (for example, playing field, public park, play space).
Amenity – Transport	Landscaped areas providing visual amenity or separating different buildings or land uses for environmental, visual or safety reasons when related to a transport function, such as a road, or within a transport hub.
Land Use Changing	Areas of land that are currently under development or awaiting redevelopment.
Bowling Green	A specially prepared area intended for playing bowls.
Camping Or Caravan Park	An organised area of ground designated for tents or caravans, intended for temporary occupation by holidaymakers.
Cemetery	Areas of land associated with burial areas or crematoriums.
Golf Course	A specially prepared area intended for playing golf
Institutional Grounds	Areas of land normally enclosed and associated with institutions. Grounds may be reserved for private use or have restricted access. Includes: Universities, Hospitals, Nursing homes, Emergency Services, Prisons, Military Sites, Government and Community Buildings providing public services, Libraries, Museums, Zoos and Theatres.
Natural	Land use areas with no other greenspace function but with Form attribute of woodland, open semi-natural, open water, beach or foreshore.
Other Sports Facility	Land used for other sports not specifically described by other categories. Includes facilities for sports spectating (for example, stadiums) as well as participation.
Religious Grounds	Areas of land associated with churches and other places of worship.
Play Space	A specially prepared area intended for children's play, usually linked to housing areas or parks and containing purpose-built equipment. Not captured if within schools or paid-for tourist attractions.



<b>Code List: Function</b> <a href="http://www.os.uk/xml/codelists/GreenspaceFunctionValue.xml">http://www.os.uk/xml/codelists/GreenspaceFunctionValue.xml</a> Value defining the function of the greenspace feature.	
Code	Description
Playing Field	Large, flat areas of grass or specially designed surfaces, generally with marked pitches, used primarily for outdoor sports (i.e. football, rugby, cricket).
Private Garden	Areas of land normally enclosed and associated with private residences and reserved for private use.
Public Park or Garden	Areas of land designed, constructed, managed and maintained as a public park or garden. These normally have a defined perimeter and free public access, and generally sit within or close to urban areas.  Access is granted for a wide range of uses and not usually restricted to paths or tracks within the area. May include areas with managed facilities such as benches and flowerbeds, and more natural areas.
School Grounds	Areas of land normally enclosed that is associated with a school and primarily reserved for their use.
Tennis Court	A specially prepared area intended for playing tennis.

## 2.4.2 Primary and secondary form types

Features may have up to two of the following forms:

<b>Code List: Form</b> <a href="http://www.os.uk/xml/codelists/FormValue.xml">http://www.os.uk/xml/codelists/FormValue.xml</a> Value defining the land cover of the greenspace feature.	
Value	Description
Woodland	Areas of land covered with trees with an area size larger than 0.1 hectares and width greater than 5m.
Open Semi-Natural	Areas of undeveloped or previously developed land with natural habitats (except woodland) for example, scrub, heath and rough grassland.
Inland Water	Static water bodies (for example, reservoirs, lakes and ponds) and rivers above the normal tidal limit.
Beach Or Foreshore	Areas of beach above the tidal minimum low tide (for example, sand and shingle).
Manmade Surface	Manmade areas within sites used for exercise and recreation (for example, paths and car parks within a public park).
Multi-Surface	Polygons which may be comprised of multiple surface types, such as grass, decking and hard standing making up a private garden polygon. This applies to Private Gardens* and is generated from the Topography Layer Descriptive Term of Multi-Surface for the corresponding polygon.

\* While most polygons with this form will have a primary function of Private Gardens, this will not always be the case due to the Function Hierarchy (see following section).

## 2.5 Function hierarchy

The population of Primary Function and Secondary Function attributes is driven by a hierarchy. This hierarchy is applied to the data to determine which function is primary and secondary in cases where more than one function applies for a single topographic area polygon. Not every polygon will have more than one function due to the nature of the primary function, for example, cemeteries and bowling greens are not likely to have secondary functions. This hierarchy only applies where more than one function exists.

The hierarchy has been developed to ensure the process applies the appropriate functions and does not imply any level of priority.

The following table declares this hierarchy:

Hierarchy	Function
1	Public Park Or Garden
2	School Grounds
3	Institutional Grounds
4	Golf Course
5	Amenity – Residential Or Business*
6	Amenity – Transport
7	Camping Or Caravan Park
8	Religious Grounds
9	Cemetery
10	Private Garden
11	Playing Field
12	Other Sports Facility
13	Tennis Court
14	Allotments Or Community Growing Spaces
15	Play Space
16	Bowling Green
17	Land Use Changing
18	Natural (features with no other function but with Form attribute of woodland, open semi-natural, open water, foreshore)

\*Due to the way Amenity – Residential or Business function is defined (see Code lists), features classified as this primary function would not be expected to have a secondary function.

## 2.6 Form hierarchy

Where more than one Form value applies for a single topographic area polygon, the population of Primary Form and Secondary Form attributes is driven by a hierarchy. This hierarchy is applied to the data to determine which form is primary and secondary in cases where more than one form applies for a single topographic area polygon. Not all polygons will have a form and this hierarchy only applies where more than one form exists.

The hierarchy has been developed to ensure the process applies the appropriate forms consistently and does not imply any level of priority.

The following table declares this hierarchy:

Hierarchy	Form
1	Open Semi-Natural
2	Inland Water
3	Woodland
4	Beach Or Foreshore*
5	Manmade Surface
6	Multi-Surface

\*Due to the way beach and foreshore polygons are located, areas with this form would not be expected to have a secondary form.

## 2.7 Precision

OS MasterMap Greenspace Layer geometry is published with a precision of three decimal places.

## 3. OS Open Greenspace lookup table

OS has published two related products on greenspaces, OS Open Greenspace and OS MasterMap Greenspace Layer. For some applications, it is intended that these products are used together as they contain different information.

OS Open Greenspace is part of Ordnance Survey's Open Data portfolio and depicts the location and extent of exercise and recreation facilities likely to be open to the public. It includes access points locating entrances and exits from greenspace sites and proper names. Full information regarding OS Open Greenspace can be found on our website and in the technical specification for that product.

A lookup table exists to link between the two products. Where an OS Open Greenspace polygon and an OS MasterMap Greenspace Layer polygon exist in the same location, the lookup table provides this information. This can be used to join the two products together, where appropriate, if the user wishes to use both datasets. OS MasterMap Greenspace Layer and OS Open Greenspace will be maintained and released with the same currency to ensure that these datasets are synchronised and allowing them to be easily used together.

Records will only be included in the lookup file where an appropriate match between an OS MasterMap Greenspace Layer TOID and OS Open Greenspace ID can be made.

### 3.1 Attributes

OS Open Greenspace Lookup Table
Attribute: TOID
Definition: The OS MasterMap Greenspace Layer TOID.
Attribute: GREENSPACESITEID
Definition: The OS Open Greenspace ID for a polygon which intersects with the relevant TOID.

### 3.2 Format

The lookup table is provided as a comma-separated value (.csv) file. The file will be supplied with headers and the information contained is detailed in the attributes above. It will only be supplied to customers taking full Great Britain (GB) supply of OS MasterMap Greenspace Layer. If you are taking AOI supply and would like access to the lookup table, please contact the customer service centre ([CustomerServices@os.uk](mailto:CustomerServices@os.uk)) to request this. Please note that as the Lookup Table is only generated for full GB supply, there will be additional records within the table that won't match-up with an AOI data supply – these additional records exist outside your AOI and should be ignored.

## 4. GML overview

The OS MasterMap Greenspace Layer product is supplied in Geography Markup Language (GML) version 3.2.1. This section describes how OS MasterMap Greenspace Layer is defined in GML. An understanding of XML (eXtensible Mark-up Language) and XML schemas is required.

### 4.1 GML

GML is an XML grammar for expressing geographic features. GML serves as a modelling language for geographic systems as well as an open interchange format for geographic transactions on the Internet. More information can be found on the Open Geospatial Consortium (OGC).

<http://www.opengeospatial.org/standards/gml>.

The XML specifications that GML is based on are available from the World Wide Web Consortium (W3C): <http://www.w3.org>.

Information about Unicode and UTF-8, the character encoding we have chosen, is available on the Unicode Consortium website: <http://www.unicode.org>.

### 4.2 Use of examples

Any use of examples in this chapter that mention specific data content are to be taken as examples only.

### 4.3 Schema overview and location

XML schemas are used to define and validate the format and content of the GML. The GML v3.2.1 specification provides a set of schemas that define the GML feature constructs and geometric types. These are designed to be used as a basis for building application-specific schemas, which define the data content.

The schema document defines the namespace,

<http://namespaces.ordnancesurvey.co.uk/OSMM/Greenspace/1.0>, this is defined in the XSD at:  
<https://www.ordnancesurvey.co.uk/xml/open/ogsp/1.0/OSMMGreenspace.xsd>.

### 4.4 Code list dictionaries

The code list dictionaries for the OS MasterMap Greenspace Layer can be found at the following URLs:

<http://www.os.uk/xml/codelists/GreenspaceFunctionValue.xml>

<http://www.os.uk/xml/codelists/FormValue.xml>

## 4.5 Example record

### 4.5.1 Greenspace area

```
<os:featureMember>
  <gsp:GreenspaceArea gml:id="osgb100000171855396">
    <gsp:toid>osgb100000171855396</gsp:toid>
    <gsp:version>2</gsp:version>
    <gsp:primaryFunction
codeSpace="http://www.os.uk/xml/codelists/GreenspaceFunctionValue">Public Park Or
Garden</gsp:primaryFunction>
      <gsp:secondaryFunction
codeSpace="http://www.os.uk/xml/codelists/GreenspaceFunctionValue">Institutional
Grounds</gsp:secondaryFunction>
        <gsp:primaryForm codeSpace="http://www.os.uk/xml/codelists/FormValue">Open
Semi-Natural</gsp:primaryForm>
          <gsp:secondaryForm
codeSpace="http://www.os.uk/xml/codelists/FormValue">Woodland</gsp:secondaryForm>
            <gsp:geometry>
              <gml:Surface gml:id="osgb100000171855396-0"
srsName="urn:ogc:def:crs:EPSG::27700" srsDimension="2">
                <gml:patches>
                  <gml:PolygonPatch>
                    <gml:exterior>
                      <gml:LinearRing>
                        <gml:posList>393705.6 808506.55
393705.85 808519.5 393705.85 808525.3 393705.9 808525.85 393706.37 808532.46 393706.6 808535.75
393706.7 808536.6 393706.8 808538.6 393706.75 808539.65 393706.2 808541.65 393706 808542.2
393705.7 808542.95 393705.6 808543.55 393705.7 808544.75 393705.7 808549.35 393705.3 808554.25
393705.25 808554.75 393704.9 808559.75 393704.55 808562.9 393703.9 808566.2 393703.4 808568.3
393702.25 808577.95 393696.05 808582.35 393694.4 808580.3 393692.87 808579.97 393692 808579.79
393694.05 808567.55 393693.54 808567.45 393692.63 808567.28 393691.7 808567.1 393696.9 808536.55
393694.26 808521.44 393698.98 808520.59 393698.8 808519.55 393698.4 808517.1 393697.6 808513.25
393697.18 808510.73 393696.95 808509.35 393700.1 808508.6 393699.75 808507.08 393705.6
808506.55</gml:posList>
                      </gml:LinearRing>
                    </gml:exterior>
                  </gml:PolygonPatch>
                </gml:patches>
              </gml:Surface>
            </gsp:geometry>
          </gsp:GreenspaceArea>
        </os:featureMember>
```

## 5. ESRI Shapefile overview

ESRI Shapefile is a simple, non-topological format for storing the geometric location and attribute information of geographic features. A Shapefile is one of the spatial data formats that can be utilised in ArcGIS.

The Shapefile format defines the geometry and attributes of geographically referenced features in as many as six files with specific file extensions that should be stored in the same project workspace.

They are:

- **.shp** – the file that stores the feature geometry.
- **.shx** – the file that stores the index of the feature geometry.
- **.dbf** – the dBASE file that stores the attribute information of features.
- **.prj** – the projection file that provides the information on the coordinate reference system.\*
- **.sbn** and **.sbx** – the files that store the spatial index of the features.\*\*

\*When a Shapefile is added as a theme to a view, this file is displayed as a feature table.

\*\*These two files will only exist if you perform theme on theme selection, spatial joins, or create an index on a theme's SHAPE field.

*Note: The shapefile has two attributes (FID and SHAPE) that are virtual columns created by ArcGIS when accessing the table contents but are not visible in the attribute table. The FID column uniquely identifies each object stored in the table. The SHAPE column provides information about the feature geometry.*

## 6. GeoPackage overview

OS MasterMap Greenspace Layer is supplied as a single GeoPackage for the whole of Great Britain. GeoPackage (\*.gpkg) is an open, non-proprietary, platform-independent, standards-based data format for geographic information systems (GIS), as defined by the Open Geospatial Consortium (OGC). It is designed to be a lightweight format that can contain large amounts of varied and complex data in a single, easy to distribute and ready to use file. GeoPackage is natively supported by numerous software applications.

GeoPackage offers users the following benefits:

- The single file is easy to transfer and offers the end-user a rich experience.
- Attribute names are not limited in length, making the format user-friendly.
- The file size limit is very large at 140 TB<sup>1</sup>.
- It supports raster, vector and database formats, making it a highly versatile solution.
- It is an OGC standard.
- In most cases, it is a plug-and-play format.

For information on how to open, use and understand a GeoPackage dataset, please refer to our '[Getting Started with GeoPackage](https://www.ordnancesurvey.co.uk/documents/getting-started-with-geopackage.pdf)' guide (<https://www.ordnancesurvey.co.uk/documents/getting-started-with-geopackage.pdf>), which is available on the OS website. Further detailed information on GeoPackage can be taken from the GeoPackage website (<https://www.geopackage.org/>).

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<sup>1</sup> A file size limit might be imposed by the file system to which the file is written.



## 7. Vector tiles overview

OS MasterMap Greenspace Layer is supplied as a national vector tiles set in a single MBTiles file. This is a lightweight set of tiles that is efficient and fast to render in your software, and which provides high resolution data and gives a seamless experience when zooming in and out. The data is supplied in Web Mercator projection (ESPG:3857).

### 7.1 Vector tiles schema

The vector tiles schema is detailed in the following table. In the zoom levels columns within the table, the letter *N* indicates that the specified layer and attribute are not mapped within that zoom level, whereas the letter *Y* indicates that the specified layer and attribute are mapped within that zoom level.

Layer	Attribute	Zoom Levels				
		0 to 12	13	14	15	16
greenspace_area	toid	N	Y	Y	Y	Y
	primary_function	N	Y	Y	Y	Y
	polygon	N	Y	Y	Y	Y

## 8. Attribute mapping

The naming of attributes will be different between the various formats due to the differing naming conventions associated with each format (for example, presence of underscores, character limitations and capitalisation). Therefore, the following table maps the differing format attribute names to one another.

### 8.1 Greenspace area

GML	ESRI Shapefile	GeoPackage	Vector tiles
GreenspaceArea	GreenspaceArea	greenspace_area	greenspace_area
N/A	FID	fid	N/A
Toid	toid	toid	Toid
Version	version	version	N/A
primaryFunction	priFunc	primary_function	primary_function
secondaryFunction	secFunc	secondary_function	N/A
primaryForm	priForm	primary_form	N/A
secondaryForm	secForm	secondary_form	N/A
MultiPolygon	polygon	MultiPolygon	polygon

*Note: Some attributes are not mapped to all formats; the absence of an attribute field is represented by 'N/A' in the preceding table.*