



ORDNANCE SURVEY GB

# OS Open Identifiers - Overview

## Version History

Version	Date	Description
1.0	01/07/2020	Initial release
1.1	21/09/2020	Slight revision

## Purpose of this Document

This is the Overview for the OS Open Identifier products. It provides greater insight into the products and its potential applications. For information on the contents and structure of this Overview, please refer to the UPRN, USRN and TOID Technical Specifications.

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## Contact details

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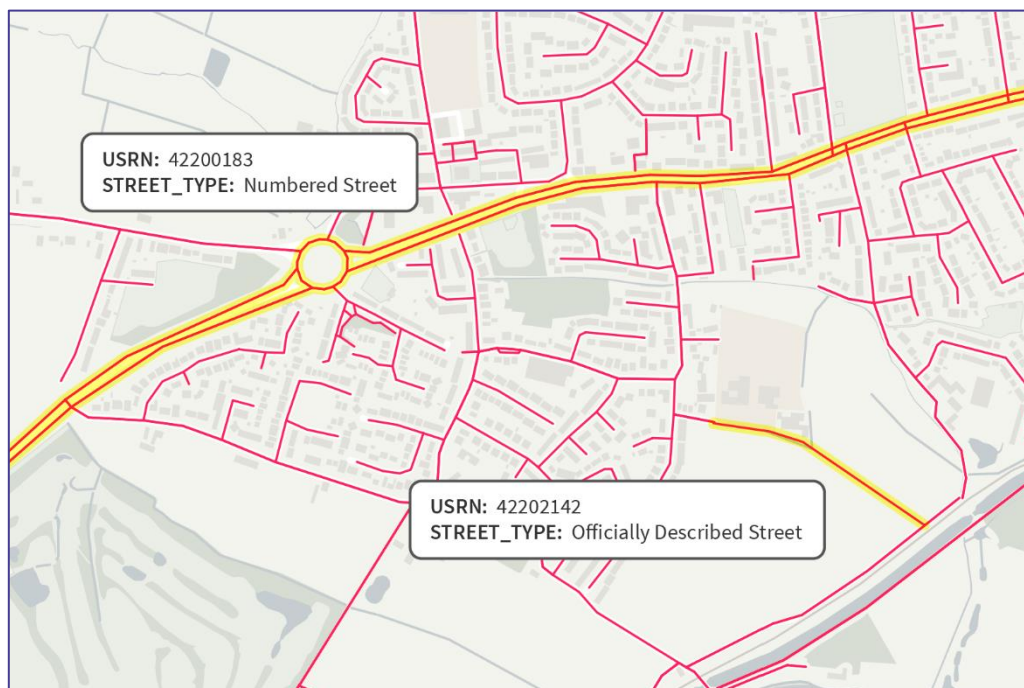
# 1. Introduction

## 1.1 What is an identifier?

Identifiers are vital to easily and uniquely identify something. For example, a blue Ford Fiesta is a very common car in Britain. Identifying one from another would be very difficult without using a license plate - one form of an identifier. The unique identifier is key to Automatic Number Plate Recognition (ANPR) for schemes such as electronic toll collection, traffic movement monitoring and checking if a vehicle is taxed, insured and road safe.

Identifiers are the 'golden thread' linking data together and can be used to effectively retrieve, reuse, publish and link multiple datasets together. NHS Numbers are an example of an identifier being used as the 'golden thread' for our historic health and care record. Our name and address are highly changeable personal details and cannot be relied on in isolation to access our health and care record. But our NHS Number can be used by healthcare providers across all NHS services to correctly retrieve our health records and link them with other datasets such as our hospital number.

There are many examples in our everyday lives where identifiers ensure accurate and efficient decisions are made on reliable data.



## 1.2 What are OS' identifiers

OS have three authoritative identifier schemes:

- Unique Property Reference Number (UPRN) - for every addressable location in Great Britain;

- Unique Street Reference Number (USRN) – for every street across Great Britain;
- Topographic Identifier (TOID) – for every feature in our large-scale geospatial database.

These can be found throughout our premium datasets including but not limited to OS MasterMap Topography Layer, OS MasterMap Highways Network and AddressBase offerings.

This overview document introduces you to four open data products which include these identifiers, these are:

- OS Open UPRN: This includes UPRNs and geometry from AddressBase Premium, such as residential and commercial dwellings, ponds, electricity substations and advertising hoardings.
- OS Open USRN: This includes USRNs from OS MasterMap Highways Network with a simplified line geometry.
- OS Open TOID: A dataset containing a generalised location for a wide range of features such as buildings without an address, road junctions, land cover and more. These are extracted from OS MasterMap premium products.
- OS Open Linked Identifiers: A dataset containing the relationship between UPRNs, USRNs and TOIDs. The relationships are extracted from AddressBase Premium and OS MasterMap Highways Networks products.

## 1.3 Background

OS Open Identifiers is a family of Open products including:

- OS Open TOID
- OS Open UPRN
- OS Open USRN
- OS Open Linked Identifiers

Unique Identifiers are the ‘golden thread’ linking data together and can be used to effectively retrieve, reuse, publish and link multiple datasets together. The products within this family allow you to easily share information held against a range of identifiers and to link together information associated with these identifiers.

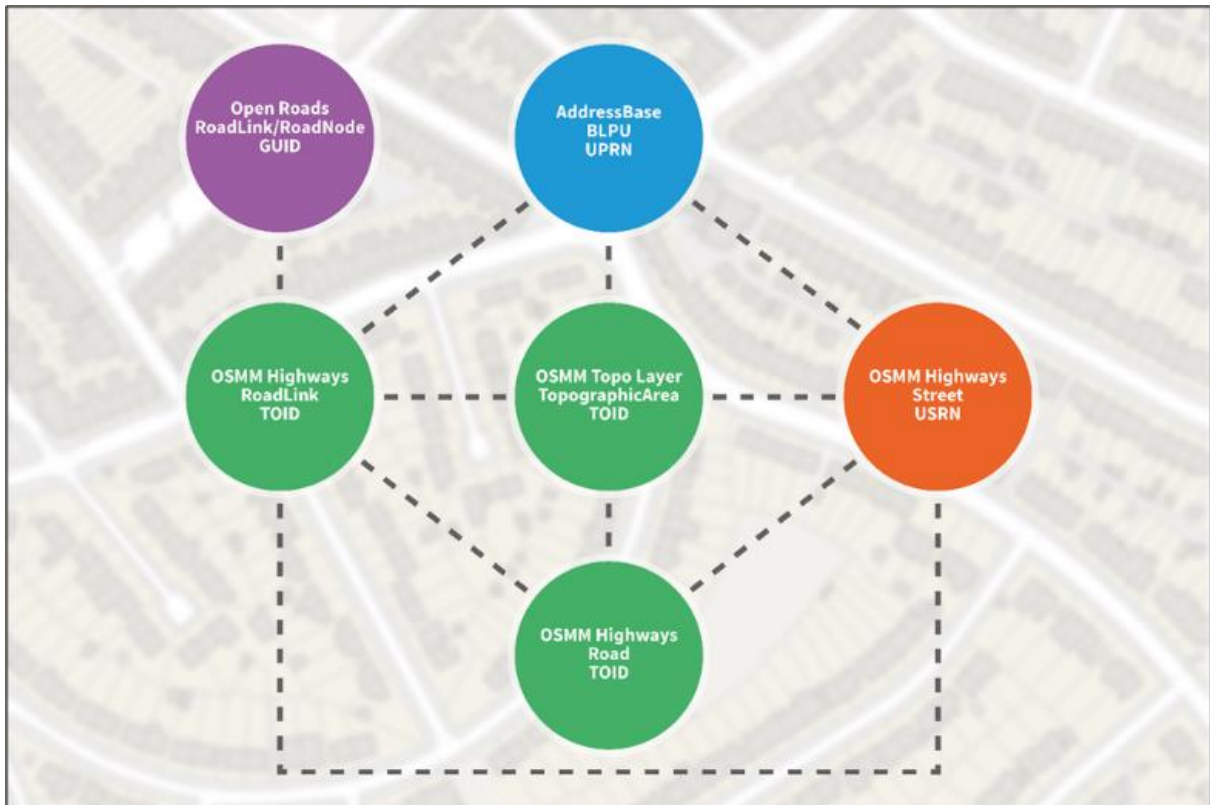
The OS Open Identifiers have been created to support the use of the OS Open ID Policy, which has been designed to remove barriers and allow organisations to publish more of their own data with OS identifiers, providing additional valuable data into the geospatial ecosystem.

Using the OS Open Identifiers products,

You can:

- Easily share information held against a range of identifiers.
- Link together information associated with a range of identifiers.

The relationship between these key identifiers can be obtained from the OS Open Linked Identifiers product.



The product consists of 11 relationships as shown in the diagram. Each relationship is available to download individually from the OS Data Hub. Please refer to the OS Open Linked Identifiers Overview document for further details.

## 2. OS Open UPRN

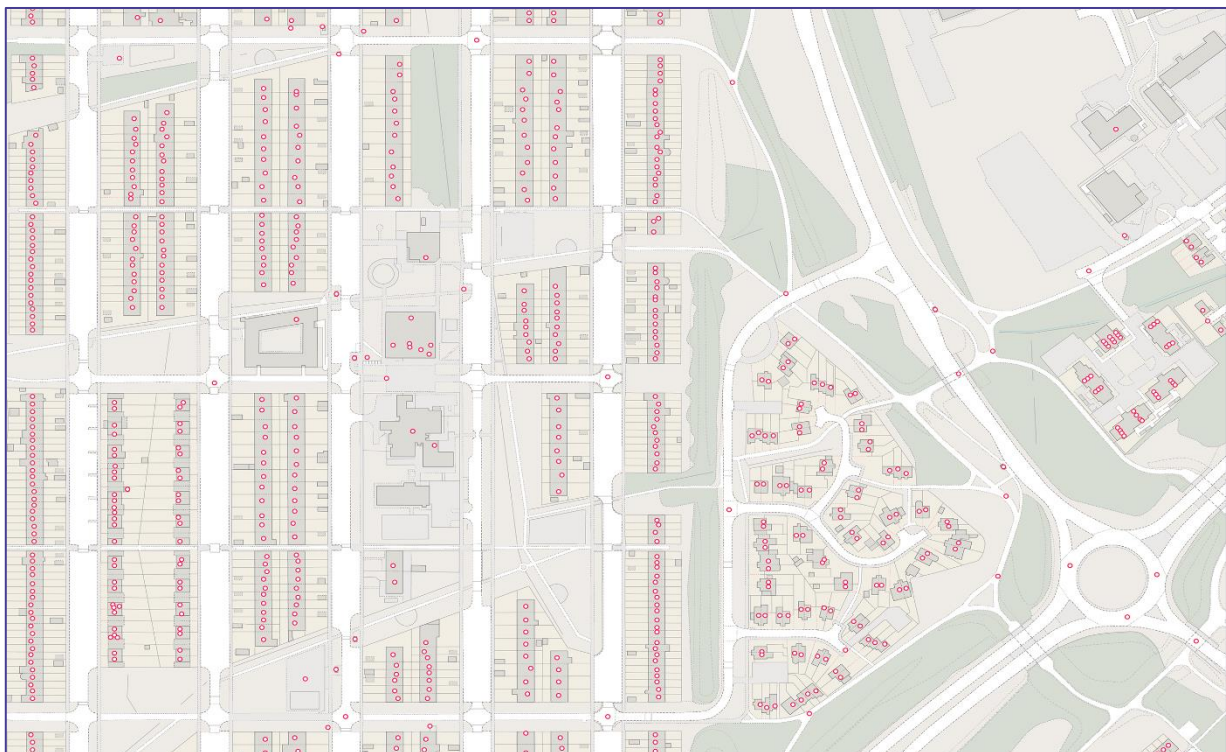
### 2.1 Overview

OS Open UPRN is an open dataset containing all Unique Property Reference Numbers (UPRN) and their associated geometry from AddressBase Premium for Great Britain (England, Wales and Scotland).

UPRNs are the authoritative identifier used to uniquely identify addressable locations in Great Britain. Essential for bringing property and address information together. Each addressable object has a UPRN, assigned by Local Authorities in England, Wales and Scotland or Ordnance Survey depending on the type of object.

Throughout its lifetime, information on the address of a property can change; for example, a property name could be added, the main type of use changed or even a new postcode could be allocated to the property. Independent of changes such as these, or any other being made, the UPRN associated with the address is never changed, meaning the unique identifier remains persistent and reliable.

OS Open UPRN has been designed to enable you to share and link data related to UPRNs, which you can visualise using the accurate location provided within the product.





## 2.2 Uses of OS Open UPRN

OS Open UPRN enables users to:

- Share information held against a UPRN with a location
- Link together information associated with UPRNs

The above core use cases will enable many more datasets to be published which include the authoritative UPRN as well as the precise geometry included in OS premium products. This will facilitate the wider adoption of the UPRN and make a critical identifier widely available.

## 2.3 Feature Overview

The key features of the OS Open UPRN product are:

- It will be synchronised to the release of AddressBase Premium in completeness and currency.
- It will include UPRNs for all addressable locations. An addressable location may be any kind of building, residential or commercial, or it may be an object that might not have a 'normal' address, such as a pond or bus shelter.
- All UPRNs will be included, independent of their lifecycle state. Therefore, under construction, in use and demolished UPRNs will all be included.

Both the CSV and the GeoPackage data formats will have five core attributes; UPRN, X\_COORDINATE, Y\_COORDINATE, LATITUDE and LONGITUDE. More information about the structure of the product can be found in the OS Open UPRN technical specification.

## 2.4 Coordinate Reference System

The OS Open UPRN product uses two Coordinate Reference Systems (CRS):

- British National Grid (BNG)
- European Terrestrial Reference System 89 (ETRS89).

BNG uses the OSGB36 (EPSG 27700) geodetic datum and a single Transverse Mercator projection for the whole of Great Britain. Positions on this projection are described using Easting and Northing coordinates in units of metres. The BNG is a horizontal spatial reference system only; it does not specify a vertical (height) reference system.

ETRS89 is the EU recommended frame of reference for European data and is represented as Latitude and Longitude values. ETRS89 is a horizontal spatial reference system only; it does not specify a vertical (height) reference system.

View our [guide](#) to coordinate systems in Great Britain.



## 2.5 Data Format

The OS Open UPRN product is available as a Comma-Separated Value (CSV) file or GeoPackage (GPKG).

### 2.5.1 CSV

Comma-Separated Value (CSV) files are a delimited text file that uses commas or other characters to separate individual elements of a feature. It is used to store data, often in the form of a table. These tables can be freely loaded into databases and programs allowing for the easy loading and updating of data holdings.

The supply of OS Open UPRN data in the CSV format means:

- The first row will contain header information.
- There will be one record per line in each file.
- Fields will be separated by commas.
- No comma will be placed at the end of each row in the file.
- Records will be terminated by Carriage Return / Line Feed.

The transfer will normally be one CSV file which will contain all records.

### 2.5.2 GeoPackage

GeoPackage (GPKG) is an open, standards-based data format 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. Please be advised that older versions of GIS software may need updating before being able to display and interact with GeoPackage files.

GeoPackage offers 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 it user friendly.
- No file size limit so lots of data can be easily accommodated.
- Supports raster, vector and database formats making it a highly versatile solution.
- It is an OGC Standard.
- In most cases, it is a plug-in-and-play format.

## 2.6 Supply and Update

Both formats are supplied as a Full Supply only and can be downloaded from the [OS DataHub website](#). The product will be refreshed on a six-weekly basis aligned to the relevant AddressBase Premium release. The dates for product release can be found on the [AddressBase Epoch dates webpage](#).

## 3. OS Open USRN

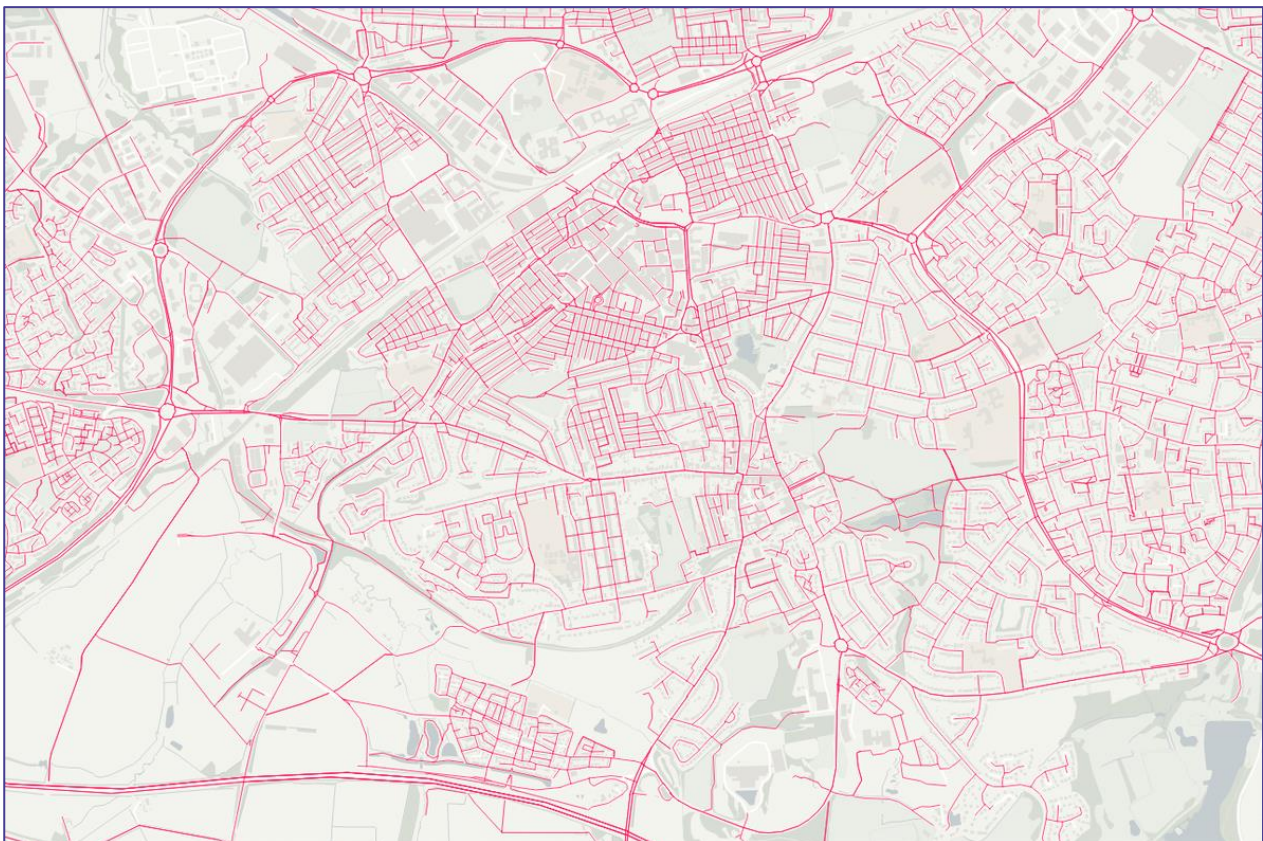
### 3.1 Overview

OS Open USRN is an open dataset of all Unique Street Reference Numbers (USRNs) within OS MasterMap Highways Network, with an associated simplified line geometry representing the geographic extent of each USRN.

This product has been designed to enable users to easily share information held against a USRN with a location and to link together information associated with USRNs, enabling location-specific visualisation and analysis.

A USRN is a unique and persistent identifier for a street contained in either the National or Scottish Street Gazetteer. Every street, road, track, path, cycle track or way is assigned a USRN by a Roads Authority, Local Highway Authority or Highways England.

Local authorities have a statutory responsibility that means they are the source of information for both street naming and managing the highways/roads network. Each authority is provided a USRN range, that is centrally allocated and managed by GeoPlace in England and Wales, and Improvement Service in Scotland.



## 3.2 Uses of OS Open USRN

OS Open USRN enables users to:

- Share information held against a USRN with a location.
- Link together information associated with USRNs.

This product has not been designed to be used for the street or road works statutory processes where the necessary additional detail for coordination is found in the National Street Gazetteer (NSG) for England and Wales or the Street Gazetteer for Scotland. Nor does the product provide a topologically structured network suitable for road routing, where the additional detail and complexity provided in the OS MasterMap Highways Network is required.

## 3.3 Feature Overview

The key features of the OS Open USRN product are:

- Inclusion of all live USRNs published within the OS MasterMap Highways Network, including Type 1, 2, 3 and 4 streets.
- A simplified line geometry representing the geographic extent of each street with a single line feature for each USRN.
- Attribution including the USRN identifier and Street Type (see table below).

It is mandatory for all USRNs to be assigned a Street Type. All streets must have a Type 1 or a Type 2 USRN assigned, but a Type 3 or Type 4 USRN can also represent the same sections of carriageway as the Type 1 or 2 are assigned.

*Table 1: Street Type definitions*

Value	Definition	Type	Example
Designated Street Name	Official Street Name approved by the relevant authority.	Type 1	High Street, Main Street
Officially Described Street	Description of a street where an official street name has not been provided.	Type 2	Road from the Littleton to Fred Farm
Numbered Street	A route or road number allocated by a highway or roads authority.	Type 3	A11
Unofficial Street Name	Street Name that references a Street or part of a Street that is an unofficial local name not designated by the authority.	Type 4	Lovers Lane

A JSON file (JavaScript Object Notation file) containing version information will also be supplied with the product.

## 3.4 Coordinate Reference System

The OS Open USRN product uses the British National Grid (BNG) coordinate reference system.

BNG uses the OSGB36 (EPSG 27700) geodetic datum and a single Transverse Mercator projection for the whole of Great Britain. Positions on this projection are described using Easting and Northing coordinates in units of metres. The BNG is a horizontal spatial reference system only; it does not specify a vertical (height) reference system.

View our [guide](#) to coordinate systems in Great Britain.

## 3.5 Data Format

This product is available in a GeoPackage format only.

GeoPackage (gpkg) is an open, standards-based data format 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. Please be advised that older versions of GIS software may need updating before being able to display and interact with GeoPackage files.

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- It is an OGC Standard.
- In most cases, it is a plug-in-and-play format.

## 3.6 Supply and Update

OS Open USRN is supplied as a Full Supply only and can be downloaded from the [OS DataHub website](#). The product is available monthly and will be available in alignment to the OS MasterMap Highways Network product release on the first working day of each month.

## 4. OS Open TOID

### 4.1 Overview

OS Open TOID is an open dataset of unique identifiers, the Topographic Identifier (TOID), assigned by OS to real world features extracted from the following OS MasterMap products:

- OS MasterMap Topography Layer
  - TopographicArea
  - TopographicLine
  - TopographicPoint
- OS MasterMap Sites Layer
  - Site Extent
- OS MasterMap Highways Network – Roads
  - RoadNode
  - RoadLink
  - PathLink

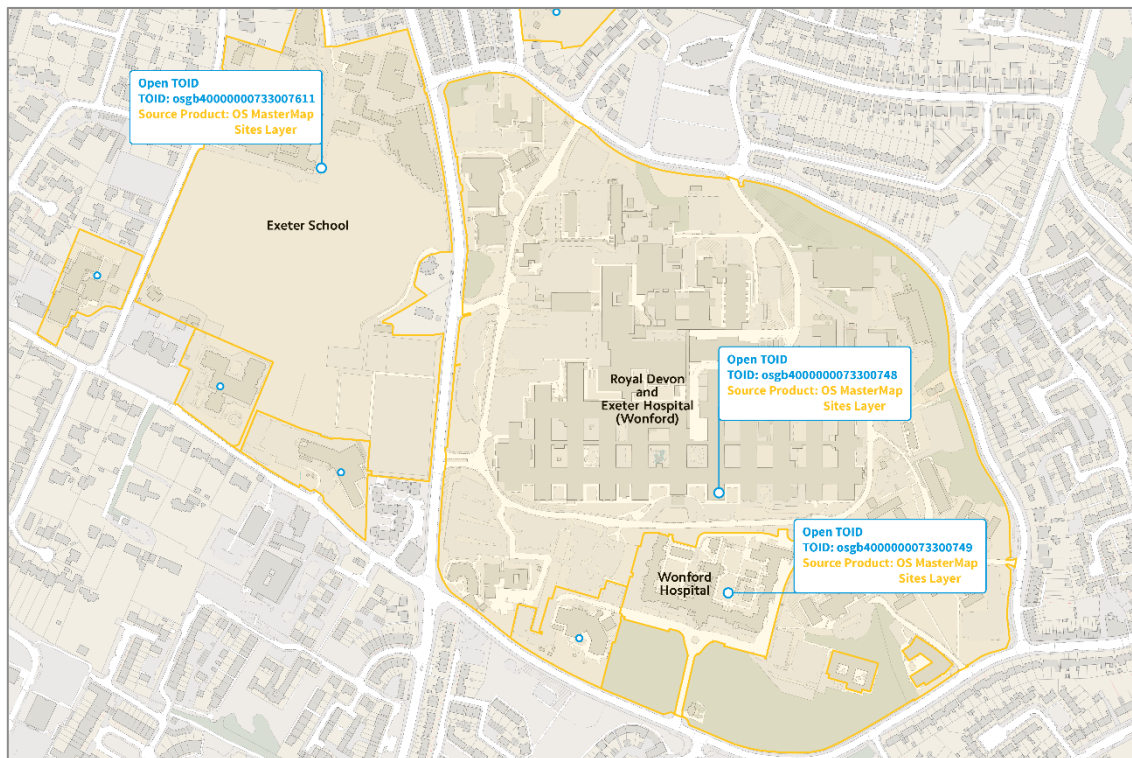
This product allows users to share and link information related to a wide range of landscape and built environment features with a unique identifier and generalised location which will allow them to be used easily by everyone.

TOIDs are unique and persistent identifiers, assigned by OS, for real-world features that have a physical presence in the world around you, such as a building or a road. A TOID consists of the letters 'osgb' and either thirteen or sixteen digits between 0 and 9. The TOID is allocated sequentially, when a feature is created by Ordnance Survey and is never reassigned to a different feature. For the TOID to be fully effective, it is essential that the OS appointed TOID reference is not altered in any way.

OS Open TOID provides the identifiers for these features along with their generalised location:

- Point Features: the original location round to the nearest meter.
- Lines Features: the midpoint of the line rounded to the nearest meter.
- Polygons Features: use a point of inaccessibility algorithm to find a point that is guaranteed to be within the polygon which is farthest from all edges. This location is then rounded to the nearest meter.
- Multi Polygon Features (Site Extent): use the same method as for polygon features on the largest of the polygons.





## 4.2 Uses of OS Open TOID

OS Open TOID offers a range of opportunities to link and share disparate datasets against a unique identifier, with a location.

For example, a local authority may use OS Open TOID to link unaddressed buildings captured within the OS MasterMap Topography Layer with information such as ownership or planning permission in order to build a richer picture of land and property in their remit.

OS Open TOID is a dataset that is designed to use the OS MasterMap product family as a basis to create your own rich, comprehensive dataset that caters to your specific needs. It is not designed to be used as a geospatial selector for features.

## 4.3 Feature Overview

The key features of the OS Open TOID products are:

- The comprehensive inclusion of all Ordnance Survey's capture of the physical features across Great Britain.
- Access to our unique topographic identifiers, allowing you to link OS's MasterMap products.
- A guide to which products the features are sourced from.
- The ability to reference between a feature and qualitative data using a unique identifier.

OS Open TOID provides unique identifiers and generalised coordinates for point, line and polygon features from a range of source products. These are represented by a single point with associated information attached. Both the CSV and the GeoPackage data formats contain:

- TOID (unique identifier).
- Source Product (the product the feature can be found in).
- Version Number (indication of how many times the feature has been edited).
- Version Date (when the feature was last updated).
- XY (location derived for the feature).

A JSON file (JavaScript Object Notation file) containing version information will also be supplied with the product.

## 4.4 Coordinate Reference System

The OS Open TOID and its associated geometry data layer uses the British National Grid (BNG) coordinate reference system.

BNG uses the OSGB36 (EPSG 27700) geodetic datum and a single Transverse Mercator projection for the whole of Great Britain. Positions on this projection are described using Easting and Northing coordinates in units of metres. The BNG is a horizontal spatial reference system only; it does not specify a vertical (height) reference system.

View our [guide](#) to coordinate systems in Great Britain.

## 4.5 Data format

The OS Open TOID and Associated Geometry data will be available in 100km tiles and distributed in two product formats using British National Grid (EPSG 27700) projection:

- Comma-Separated Value (CSV)
- GeoPackage (GPKG)

These formats allow the data to be easily integrated and ingested with either a database or a GIS application, respectively.

### 4.5.1 GeoPackage

GeoPackage (GPKG) is an open, standards-based data format as defined by the Open Geospatial Consortium (OGC). It is designed to be a lightweight format that contains both spatial (vector) and metadata tables in a single, ready to use file. Please be advised that older versions of GIS software may need updating before being able to display and interact with GeoPackage files.



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#### 4.6 Supply and Update

OS Open TOID will be updated through a fully supply on a 6-weekly basis, in line with the OS MasterMap Topography Layer COU (Change Only Update) releases and will maintain consistency with OS's MasterMap products.

## Appendix 1 – Glossary

Table 2: Terms & Abbreviations

AddressBase	The addressing product family produced by Ordnance Survey and Geoplace, and created using Royal Mail PAF matched addresses.
BNG	British National Grid (EPSG 27700) is a map coordinate projection system commonly used in Great Britain.
CRS	Coordinate Reference System, the most common of which is BNG and Web Mercator.
CSV	Comma Separated Value, a type of data format.
GeoPackage	A type of data packaging designed for use within a GIS which allows for geospatial data to be appended to other data in a similar manner to SQL lite.
GIS	Geographical Information System.
TOID	Topographic Identifier.
UPRN	Unique Property Reference Number.
USRN	Unique Street Reference Number.

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