

ORDNANCE SURVEY GB

OS DETAILED PATH NETWORK – OVERVIEW

Version history

Version	Date	Description
1.1	09/2015	Initial release.
1.2	09/2016	Minor updates.
1.3	07/2017	Minor updates.
1.4	10/2021	Addition of GeoPackage and vector tiles formats to the product.
1.5	02/2022	Minor updates to formatting.

Purpose of this document

This document provides information about and insight into the OS Detailed Path Network product and its potential applications. For information on the contents and structure of OS Detailed Path Network, please refer to the Getting Started Guide and Technical Specification.

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1:25 000 Scale Colour Raster
Explorer
OS MasterMap Topography Layer
OS MasterMap Highways Network
OS Terrain 5
OS Terrain 50

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 to the product

The OS Detailed Path Network (DPN) product is a digital representation of the roads, tracks and paths in the National Parks of Great Britain that the public may use to travel on and enjoy the great outdoors.

Whilst the product is indicative of the right of access along roads, paths and tracks within Great Britain's National Parks, it is not the legally definitive source of access information, including public rights of way.

I.1 Key features of the product

The product is designed to facilitate applications and services to provide routes for pedestrians, cyclists and horse riders, primarily for leisure purposes (see Figure I).

The key features of the OS DPN product are as follows:

- A connected link and node network that facilitates routing
- Heighted data
- A description of the type of route – road, track or path
- National and local cycle routes identified
- Named long distance routes
- Names of roads, tracks and paths
- Information on rights of way (England and Wales only)
- Routes within access land identified (England and Wales only)

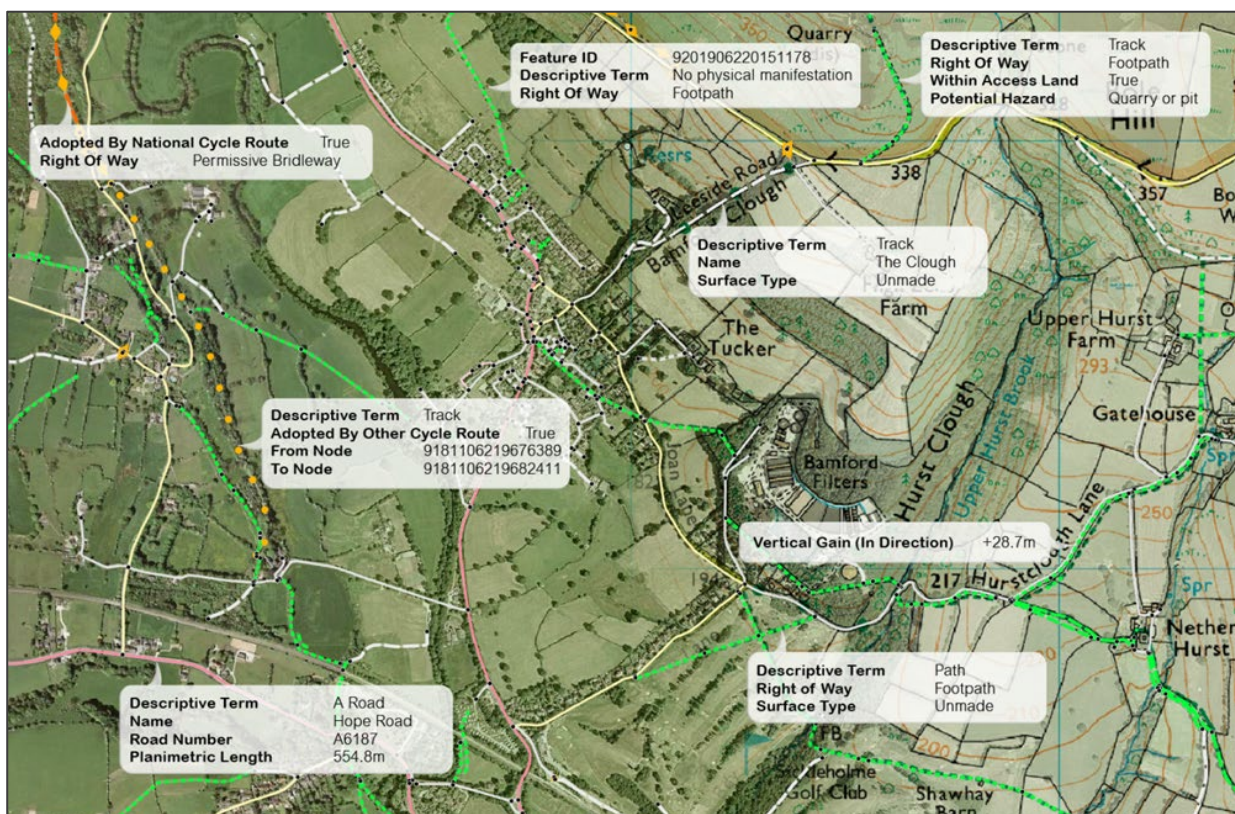


Figure I: An extract of the OS Detailed Path Network product with attribution displayed; the attribution is overlain upon OS MasterMap Imagery Layer and 1:25 000 Scale Colour Raster.

1.2 Product applications

The OS DPN product has been created to allow partners and developers to design and provide bespoke applications to provide routes within Great Britain's National Parks for pedestrians, cyclists and horse riders, including:

- Advanced route planning
- Live route planning
- Turn-by-turn instructions

The data is not designed to be a definitive record of rights of way or other access rights.

The data can also be used by those responsible for assessing public access to areas as the product provides information on the levels of access available to different users.

1.3 Use of the product

This product is intended to be used only as a travel aid and must not be used for any purpose requiring precise measurement of direction, distance, location or topography. Ordnance Survey makes no warranty as to the accuracy or completeness of data in this product.

When using OS DPN for navigation and routing, carefully compare information displayed on the device to all available navigation sources, including warning signs for danger areas, road signs, road closures, road conditions, traffic congestion and weather conditions.

For safety, always resolve any discrepancies before continuing navigation, and defer to posted local signage and conditions. OS DPN is designed to provide route suggestions. It is not a replacement for user attentiveness and good judgement.

Do not follow route suggestions if they propose an unsafe option or would place the user in a potentially dangerous situation.

When using the data in a portable electronic device, it is recommended that a suitable hard copy map be carried by the user in case of failure of the device.

1.4 Third-party data in the product

Public rights of way represented within the OS DPN product have been taken from Ordnance Survey 1:25 000 Scale Colour Raster that was created from local authority definitive maps and later amendments. Rights of way are liable to change and may not be clearly defined on the ground. Please check with the relevant local authority for the latest information.

Portrayal of access land on this map is intended as a guide to land which is normally available for access on foot, for example, access land created under the Countryside and Rights of Way Act 2000 and land managed by the National Trust, Forestry Commission, and Woodland Trust. Access for other activities may also exist. Some restrictions will apply, and some land may be excluded from open access rights. The depiction of rights of access does not imply or express any warranty as to its accuracy or completeness.

1.5 Identifying difficult routes

OS DPN is designed to facilitate off road routing in applications for consumers. After discussions with members of the outdoor community, it is strongly recommended that developers make use of all the attribution contained within the product to identify potentially difficult routes.

OS DPN has the functionality to highlight challenging or hazardous routes. It is for the developer to decide whether to advise the user that the created route is difficult or not to return the route at all.

The main product attribution that contains information on difficulty and hazards lies within the following attributes:

- **DescriptiveTerm** – This attribute indicates the nature of the route on the ground or identification that there is not a clear route to follow (specific value 'No Physical Manifestation') but a legal right exists.
- **surfaceType** – This attribute can indicate that a route is 'Unmade', meaning that the route may be more difficult to traverse than a made path. Examples are contained within the specification.
- **potentialHazard** – This attribute indicates whether the route passes over specific types of terrain, for example, Rock or Scree.
- **Geometry** – Using the three-dimensional geometry to establish steep routes or steep sections of a route.
- **crossesDangerArea** – This attribute indicates links that pass through Ministry of Defence (MOD) firing ranges. Routes generated using these links should be flagged and should refer to external sources of information to identify access restrictions.

For example, a public right of way that is not evident on the ground and which crosses steep terrain could be represented by a RouteLink with the following attributes:

- **routeLinkDescriptiveTerm** value of No Physical Manifestation
- **surfaceType** of null in this instance because the route is not evident on the ground
- **potentialHazard** values of Rock and Scree
- **Three-dimensional geometry** which indicates a steep gradient

It is strongly recommended that any generated routes that include combinations of attributes indicating difficulty should either present the user with a warning or be excluded as a route option based upon the target user.

2. Product details

2.1 Data lineage

The OS DPN product has been created from a number of existing Ordnance Survey data sources:

- Roads, tracks and paths – The geometry and information about the physical nature of a route has been sourced from the Ordnance Survey large-scale data which is used to create the OS MasterMap Topography Layer and OS MasterMap Highways Network products.
- Rights of way, long distance paths, cycle routes, access land and danger areas – These have been extracted from [1:25 000 Scale Colour Raster \(www.os.uk/25k\)](http://www.os.uk/25k).
- Hazardous terrain – Attribution relating to selected potential difficulties along a route (for example, scree / cliffs) has been interpolated by overlaying the network on the Ordnance Survey large-scale data used to create the OS MasterMap Topography Layer product.
- Height values – These have been interpolated from the source data used for the [OS Terrain 5 \(www.os.uk/terrain5\)](http://www.os.uk/terrain5) and [OS Terrain 50 \(www.os.uk/terrain50\)](http://www.os.uk/terrain50) products.

The raw data used to create the product has undergone extensive data re-engineering, manual editing and validation.

2.2 Coverage

The OS DPN product includes all roads (except motorways), tracks and paths that the public are allowed to use within the 15 National Parks of England, Scotland and Wales (Table 1).

Full details as to the locations of Britain’s National Parks can be found on the [National Parks UK website \(https://www.nationalparks.uk/\)](https://www.nationalparks.uk/). The 15 National Parks covered in the OS Detailed Park Network product (and hyperlinks to the official website of each National Park) are as follows:

- [Brecon Beacons](#)
- [Broads](#)
- [Cairngorms](#)
- [Dartmoor](#)
- [Exmoor](#)
- [Lake District](#)
- [Loch Lomond and the Trossachs](#)
- [New Forest](#)
- [North York Moors](#)
- [Northumberland](#)
- [Peak District](#)
- [Pembrokeshire Coast](#)
- [Snowdonia](#)
- [South Downs](#)
- [Yorkshire Dales](#)

2.3 Product update schedule

This product is supplied annually each October, incorporating updates from Ordnance Survey core data and [1:25 000 Scale Colour Raster](http://www.os.uk/25k) (www.os.uk/25k).

The product will be resupplied as a complete dataset; change-only updates (COUs) will not be available.

The product contains identifiers and feature versions; however, identifiers will not persist, and versions will not increment. They have been included for future, potential product enhancements.

2.4 Feature types included in the product

The data is supplied as a link and node model, similar to the OS MasterMap Highways Networks and OS Open Roads products. Links represent the general alignment of roads, tracks, paths and rights of way; nodes are used to record the connectivity between links explicitly. Named routes are represented as collections of links.

The OS DPN product contains three feature types: Route, RouteLink and RouteNode. These feature types are defined in the following sub-section.

2.4.1 Route

A Route is a feature representing a named entity that forms a recognised and signed route that the public can use. For example, a [National Trail](https://www.nationaltrail.co.uk/) (<https://www.nationaltrail.co.uk/>), such as the Pennine Way, or one of [Scotland's Great Trails](https://www.scotlandsgreattrails.com/) (<https://www.scotlandsgreattrails.com/>), such as the West Highland Way.

A Route feature can include references to different types of RouteLink. For example, a Route feature may include sections of paths, tracks and public roads to create a continuous named trail.

2.4.2 RouteLink

A RouteLink is a feature that represents all or part of a road, track, path or right of way that can be used by pedestrians, cyclists or horse riders.

RouteLink features are split in the following circumstances:

- Where the classification changes
- Where the name changes (or ceases to apply)
- Where there is a junction at the same physical level

2.4.3 RouteNode

A RouteNode is a feature at the end of one or more RouteLink features. It allows software to quickly identify connections by using references to the unique identifier. The RouteNode also indicates:

- The junction of three or more RouteLink features
- A change in real world information, for example, the route type that requires the creation of two RouteLink features with different attribution
- The start or end of a RouteLink feature

2.5 Attribution

OS DPN attribution is designed to provide partners and developers with the detailed information required to enable the selection of a suitable route for specific users and their chosen method of travel. Dependent on the type of user, the attribution also enables journey time estimation.

Detailed information on OS DPN attribution can be found in the OS Detailed Path Network Technical Specification document which is available on the [OS DPN Product Support page of the OS website](https://www.ordnancesurvey.co.uk/business-government/tools-support/path-network-support) (<https://www.ordnancesurvey.co.uk/business-government/tools-support/path-network-support>).

The following sub-sections detail the types of information that OS DPN attribution provides.

2.5.1 Names

The names of sections of road, track or path are included, where known, to provide the partner or developer with the means to deliver additional information to the user. For example, walk along “High Street” and turn into “Canal Walk”.

2.5.2 Usability of a route

The physical usability of a route, for example, the type of route:

- Description of route – For example, an A or B road classification, a track or a path.
- Surface type – The nature of the material the route is made of, for example, sealed or unmade surfaces.

2.5.3 Access rights for a route

The access rights for a route reflect the permissions granted to travel along it. This is usually based upon the mode of travel, for example:

- Public rights of way (England and Wales only)
- Access land (England and Wales only)

2.5.4 Difficulty of a route

The difficulty of a route depends upon many factors; some of these factors have been included within the data. This attribution allows a developer or partner to select routes appropriate for specific users, dependent upon their level of fitness and expertise in outdoor navigation.

Attribution is provided to inform the user as to the potential difficulty of the route in the following way:

- Geometry – Provided as three-dimensional coordinates.
- Planimetric length – The two-dimensional length.
- Surface length – The three-dimensional length.
- Cumulative vertical gain – Total ‘climb’ when travelling along a RouteLink.
- Problematic terrain – An indication of when a route may pass through an area that could pose a risk or impediment to passage, for example, proximity to a cliff or a scree slope.

2.6 Coordinate reference system

Coordinates in the OS DPN product are provided in three dimensions.

The Geography Markup Language (GML) and GeoPackage product formats enable the use of the British National Grid (BNG) coordinate reference system for the planimetric element of the geometry. The BNG spatial reference system uses the OSGB36 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 include a vertical (height) reference system.

The height element is provided using the same datum (i.e. Ordnance Datum Newlyn) used for other Ordnance Survey products that contain height.

In the GML data, this combination of BNG and Ordnance Datum Newlyn is represented by reference to its entry in the EPSG registry, as <https://epsg.io/7405>.

The vector tiles product format is in the Web Mercator (EPSG:3857) projection. This projection is a global coordinate reference system.

2.7 Using the data with GPS devices

GPS devices may only provide coordinates using the WGS84 coordinate reference system (EPSG code 4979, although 4326 is often used also). The OS DPN data is supplied using a combination of coordinates in the OSGB36 BNG system and heights relative to Ordnance Datum Newlyn (EPSG code 7405) for both the GML and GeoPackage formats.

To allow the data to be used with positions from GPS devices, a transformation is required. The transformation can be applied to the OS DPN data (to move it on to WGS84) or to the GPS coordinates (to provide positions in OSGB36 BNG). The choice may depend on the coordinate systems of any other datasets in use.

Given the difference that can ensue from using the incorrect coordinate reference system, care must be taken to use the appropriate transformation. A recommended transformation is the seven parameter one published in [A Guide to Coordinate Systems in Great Britain](https://www.ordnancesurvey.co.uk/documents/resources/guide-coordinate-systems-great-britain.pdf) (<https://www.ordnancesurvey.co.uk/documents/resources/guide-coordinate-systems-great-britain.pdf>), which is available on the OS website. This transformation is EPSG code 1314.

[Further information on coordinate systems and transformations is available on the OS website](http://www.ordnancesurvey.co.uk/business-and-government/help-and-support/navigation-technology/os-net/surveying.html) (<http://www.ordnancesurvey.co.uk/business-and-government/help-and-support/navigation-technology/os-net/surveying.html>).

3. Product supply

3.1 Available formats for the product

The OS DPN product is available in the following formats:

- Data: Geography Markup Language (GML) v3.2 Simple Features, compressed using gzip
- Vector: GeoPackage file, zipped using gzip
- Vector: Vector tiles (MBTiles) file, zipped using gzip

3.2 Product supply mechanism

The OS DPN product is supplied as an online download only. You can download data in various formats from the [OS Data Hub \(https://osdatahub.os.uk/\)](https://osdatahub.os.uk/).

3.3 File sizes

For GML and GeoPackage product formats, one file is supplied for each National Park (i.e. you will receive 15 files when ordering the product in one of these formats).

The vector tiles product format is supplied as a single file that contains all National Parks.

Each file will contain up to three feature types.