

Postcode**Anywhere**

Distances and Directions  
Web Service Technical Document

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## Introduction

This document explains, in detail, how to use Postcode Anywhere's Distances and Directions web services. It will describe each of the different services, what their inputs are and how to interpret the outputs. It will give you the best possible understanding of which services you need to be calling, in what order, and with what parameters.

For a less detailed overview of these web services, please see the relevant product pages on [postcodeanywhere.com](https://postcodeanywhere.com). On the website you will also find language-specific code samples and tutorials showing how to interface with any of our web services. You'll also find full documentation on each specific web service you require.

The service names and service version numbers this document is written for are as follows. If this is a saved copy it may not be up to date; please check our website for the latest edition. As with all of our web services, if the service is updated, all previous versions will still remain live. (The online documentation may be found in the API section under the heading 'Deprecated Web Services'.) Any programs written to use old versions of our web services will always continue to function. However, newer versions will invariably have improved features, so you should always try to use the latest version.

- `DistancesAndDirections/Interactive/Distance` (v 1.00)
- `DistancesAndDirections/Interactive/Directions` (v 2.00)
- `DistancesAndDirections/Interactive/FreightDirections` (v 2.00)
- `DistancesAndDirections/Interactive/DirectionsAndLines` (v 2.00)
- `DistancesAndDirections/Interactive/FreightDirectionsAndLines` (v 2.00)

## Overview

These services allow you to calculate distances and times between two or more locations. If required, you can also generate turn by turn directions for a road route, or get a polyline for display of the route on a map.

Please note that the Postcode Anywhere mapping API and route optimisation (the process of re-sequencing a set of waypoints in the optimal order) is not covered by this document – please visit [postcodeanywhere.com](https://postcodeanywhere.com) for more information on these type of services.

There now follows a brief description of the kinds of things that you can do with our Distances and Directions services, followed by a more in-depth technical look at the individual services involved.

## Features

Features of Postcode Anywhere's Distances and Directions services include the following:

### Distance

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Obtain an accurate distance between two locations. This can either be the crow's flight (straight line) distance, or a distance along the road network, using the quickest or fastest route.

### Time

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This is an estimate of the time taken to drive between the start and end locations. The actual time may vary due to differing driving styles and traffic density, but this time serves as a good estimate.

### Turn by turn directions

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These are a list of instructions to follow to take you from the start point to the end point, for example "turn left", "take the 3rd exit of the roundabout" and so on.

### Polylines

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If you wish to display your directions on a map, then you can use the polyline output to render that line. The output is delivered in turn by turn sections, allowing you to locate the positions in the line for each of the driver instructions, should you wish.

### Logistics data

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We have access to a special data set that contains road restriction information for vehicle dimensions. For example, if you enter your vehicle height, we can generate you a route that will avoid any low bridges that are lower than your vehicle. Specific dimensions supported are height, weight, width, length and maximum axle weight.

### Speed profiles data

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This is a revolutionary new data set that is automatically generated by thousands of TomTom devices in the field. Using highly accurate historic speed information, we can predict the expected speed for roads, down to each 5 minute interval in a week. Using this data, we can deliver much more realistic time estimates for your journey, so long as you supply the expected start time for the route.

## Distance

The simplest web service is "Distance". Use this if you are only interested in obtaining the distance and/or time between locations, and do not need any of the more advanced outputs. A call to the Distance web service consumes 1 standard credit for crow's flight distances or 2 standard credits for road-based distances. Additional waypoints, if entered, consume 1 extra credit per waypoint. The input parameters are as follows:

### Start, Finish

Provide the locations of the start and the end of the route. These two parameters are compulsory, so the web service will return an error if both these parameters are not provided. Postcodes can be just entered in as is, but you can also provide coordinates in comma-separated format. OS coordinates should always be given in whole metres from the Origin of the national grid system (E.g. the coordinate SO 123456 should be entered as "312300,245600".) Lat/Long values should be given using the WGS84 reference frame in fractional degrees North and East (E.g. the location 55°12'34"N, 2°56'07"W should be entered as "55.2094,-2.9353").

### Waypoints

This is an optional parameter, and mostly you won't need it. However, if you do wish to provide waypoints along the route, then you can enter as many as you like here. The returned route will start at the start, then visit the 1st waypoint, then the 2nd and so on, and finally the Finish. Note that the waypoints will be visited in the order in which they are input. (If you are interested in re-ordering the waypoints in an optimal fashion, then consider using our route optimisation web services.) Comma separate each waypoint in the list if you are entering more than one waypoint.

## DistanceType

Again, this is an optional parameter. You can choose what type of distance to return. Selecting "StraightLine" will give you the crow's flight distance, whereas selecting "Fastest" or "Shortest" will compute the fastest or shortest distance following the road network. Note that often the Fastest and Shortest will be the same, but they'll sometimes differ by quite a bit. The default DistanceType is "Fastest".

## Output

The output is simply the distance (TotalDistance) and time (TotalTime) taken for the route. Bear in mind:

- If you select "StraightLine" distance, the TotalTime will not be returned, because a road route was not computed.
- If you entered waypoints, you will get a multi-row output. In this case, each TotalDistance / TotalTime value will be a cumulative value representing the current route step plus all previous route steps. The final row will contain the total distance and time for the entire route.
- It's possible that you'll get an error response, and this will be the case if one of your locations is invalid, or indeed if you select "Fastest" or "Shortest" and one of your coordinates is not anywhere near the road network. Remember to handle error responses gracefully!

## Directions

This web service will generate turn by turn driver directions for the route. The input is the same as for Distance, with the exception of the option "StraightLine" for the parameter DistanceType being invalid. A call to the Directions web service consumes 2 standard credits, plus one additional credit for each waypoint you enter (if you enter any). There are two optional parameters in addition to those used for the Distance service, but these are only to be used if you wish to use Speed Profiles data for more accurate timings:

### StartDay

This should be the day of the week that the route is to be run on. The format is simply an enumerated type.

### StartTime

This is the time of day the vehicle running the route is due to start. The time should be input as the number of whole minutes since midnight. (Hence 2:30pm should be input as 870.)

### Output

The response should be pretty self-explanatory, but a few of the output parameters merit further details...

### SegmentNumber, StepNumber

If you provided waypoints in the input, the SegmentNumber is a zero-based number that can be used to distinguish each leg of the journey (otherwise, it's just always 0). The Step number is just a zero-based counter showing the row number of that leg; it resets to zero for each new leg of the journey if you have entered waypoints.

### Action

This is a short code that you can use to quickly determine the type of driver instruction being given. This is very useful if you wish to show an icon for each route step. For a complete description of action codes see the [appendix](#). If you use this effectively, you will not need to perform any fiddly text matching on the Description field to be able to assign appropriate icons to the steps! There's an exhaustive set of arrows and directions icons available for download on our website, if you'd like a head start.

## Description, Road

Description is the textual instruction to the driver. Road is the road name or number that we are turning on to (or continuing on). Road names are always enclosed in square brackets, whereas road numbers are not. Note that some roads will have only a name, some will have only a number, some will have neither and some will have both. We provide no more than one road number per step, so where a road has more than one number only one of them will be shown (this tends to happen often near cities where two roads join up for a while, say around a bypass, then split up the other side of the city.) Note that the road name or number is correct only at the point at which the driver instruction is generated, and it may not be correct for the whole length of the step; for example, if Willow Road turns into Ashfield Way with no turn offs, then we won't need to generate a new driver instruction at the join, and so the name Ashfield Way will not appear in any description.

## StepTime, StepDistance

This is the estimated time and actual distance for the section of road from the current driver instruction to the next one. (Hence the instruction "Arrive at destination" will have a StepTime and StepDistance of 0.)

## TotalTime, TotalDistance

This is the estimated time and actual distance from the very start of the route to the next driver instruction. It is cumulative, so to find the total time and total distance of the entire route, simply read off the TotalTime and TotalDistance from the final row.

## DirectionsAndLines

This service will give you everything that the Directions service gives with the addition of a polyline for display on a map. The service costs exactly the same amount as the Directions service, but you should only use this one if you really do need the polyline, because the polyline does take up a significant amount of space in the response – for this reason, you can expect the web service call for DirectionsAndLines to take a little longer than the call to Directions.

Simply provide the “LineStyle” parameter, which can be “WKTLatLong”, “WKTEastNorth”, “JSLatLong”, “JSEastNorth” or “PCACompressable”, and the line in the chosen format will be returned in the output field “Line”. A separate polyline is output for each step of the route – in this way it is easy to figure out which point on the map each driver instruction relates to; this is nice if you want to do more fancy stuff, like clicking on a textual step to zoom into the place in the map that it refers to.

Most of the different line style outputs should be self-explanatory. The final one “PCACompressable” is our own format which we use to display routes on our own maps; it takes up less space to transmit than the other types of polyline, and so the response tends to be a little quicker to download. Each point in the PCACompressable line is simply given as an Easting / Northing offset from the previous point, so it’s easy to reconstruct the original polyline from this representation.

## FreightDirections, FreightDirectionsAndLines

These services allow you to generate routes for larger vehicles than cars. There are many restrictions along roads, like low bridges, narrow roads and various types of weight restriction; these services allow you to plan a route that avoids these restrictions.

### Input

The inputs are the same as for Directions / DirectionsAndLines, with the addition of 5 new (optional) parameters, those being "Height", "Weight", "Width", "Length" and "AxleWeight". For these, you should enter the dimensions of your vehicle. The route planner can then decide which restrictions you need to avoid and which restrictions you can get away with, and can generate an appropriate route. The size parameters should be given in centimetres and the weight parameters should be given in kilograms. (For reference, 1 foot = 30.48cm, 1 inch = 2.54cm, 1 (English, Imperial) ton = 1,016kg and 1 pound = 0.4536kg.) You can provide as many or as few vehicle dimension parameters as you wish; if you provide none, you will still receive restriction warnings in the output directions, but these restrictions will not be avoided.

### Output

The output will be very similar to that of Directions / DirectionsAndLines; the one difference being the addition of "warning" steps in the results. A restriction that your vehicle is small enough to get past is marked in the results as a "warning". A restriction that your vehicle is too big for, but is impossible to avoid is marked with "critical warning" – these critical warnings will only appear if there is literally no other way to reach your destination than to go through the warning signs. This will often be the case if your destination road has a sign with, say, a weight limit and the subtext "except for access". However, at all times, driver discretion about the nature of the critical warning should be observed and the rules of the road obeyed!

#### Do remember that:

- Logistics is an advanced feature for which we incur additional transactional data costs. For this reason, these services consume 4 standard credits plus 1 per waypoint.
- The restriction data only captures actual signed restrictions on the road; therefore, a normal bridge that is not signed as a 'low bridge' will not be captured and cannot be avoided. In the UK, all bridges under 16 feet (487 cm) are generally signed, but higher bridges do not tend to be. For this reason, Logistics data is not suitable for routing highly unusual vehicles, for example, boats on trailers with masts still attached.
- We cannot guarantee 100% data accuracy, so the driver of the vehicle is ultimately responsible for deciding whether or not to drive down a particular road – signs on the road take precedence over our directions in all cases. But, we do our best!

## Appendix: Directions Action Codes

This is a full list of the various action codes you may encounter in the results of any of the “Directions” web services, along with their meanings. These can be used, for example, to assign an icon to each step. (A useful set of directions and arrow icons is downloadable from our website.)

ActionCode	Meaning
D	Depart from start or waypoint.
A	Arrive at the end or waypoint.
Lx	(where x is a number from 1 to 6) Turn left. Number indicates the severity of the turn, with 1 being a slight turn, 3 being a right angle, and 6 being a hairpin.
Rx	Turn right. Number as above.
S	Continue straight on.
EyLx, EyRx, EyS	Roundabout, where y is the exit number and Lx, Rx or S indicates the direction of the turn, as above.
M	Merge. This is generated when we merge onto another road but we have no choice of ways.
F	Ferry crossing.
W	Logistics warning message, when the restriction is acceptable to the given vehicle dimensions. (FreightDirections/FreightDirectionsAndLines only.)
CW	Logistics critical warning message, when the restriction is not acceptable to the given vehicle dimensions. (FreightDirections/FreightDirectionsAndLines only.)

## Contact

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