



Routable Shape Files from OpenStreetMap

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This document describes the format and options of Geofabrik Routable Shape Files from OpenStreetMap.

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1 Road types in routable shape files

The following OpenStreetMap road types are present in routable shape files:

code	fclass	Description	OSM Tags
511x		Major roads	
5111	motorway	Motorway/freeway	highway=motorway
5112	trunk	Important roads, typically divided	highway=trunk
5113	primary	Primary roads, typically national.	highway=primary
5114	secondary	Secondary roads, typically regional.	highway=secondary
5115	tertiary	Tertiary roads, typically local.	highway=tertiary
512x		Minor Roads	
5121	unclassified	Smaller local roads	highway=unclassified
5122	residential	Roads in residential areas	highway=residential
5123	living_street	Streets where pedestrians have priority over cars	highway=living_street
5124	pedestrian	Pedestrian only streets	highway=pedestrian
5125	busway	Dedicated roads for bus, usually closed for any mode of transport except public transport.	highway=busway



code	fclass	Description	OSM Tags
513x		Highway links (sliproads/ramps) connect from one road to another of the same or lower category	
5131	motorway_link		highway=motorway_link
5132	trunk_link		highway=trunk_link
5133	primary_link		highway=primary_link
5134	secondary_link		highway=secondary_link
514x		Very small roads	
5141	service	Service roads for access to buildings, parking lots, etc.	highway=service
5142	track	For agricultural use, in forests, etc. Often gravel roads.	highway=track without tracktype specification
5143	track_grade1		... with tracktype=grade1
5144	track_grade2		... with tracktype=grade2
5145	track_grade3		... with tracktype=grade3
5146	track_grade4		... with tracktype=grade4
5147	track_grade5		... with tracktype=grade5
515x		Paths unsuitable for cars	
5151	bridleway	Paths for horse riding	highway=bridleway or highway=path with horse=designated
5152	cycleway	Paths for cycling	highway=cycleway or highway=path with cycle=designated
5153	footway	Footpaths	highway=footway or highway=path with foot=designated
5154	path	Unspecified paths	highway=path without cycle/foot/horse=designated
5155	steps	Flights of steps on footpaths	highway=steps
		Unknown	
5199	unknown	Unknown type of road or path	highway=road

Roads/paths highlighted in blue are not usually open for normal motorised traffic, and will only be included in routable shape files if explicitly requested.

2 DBF columns in routable shape files

column	data type	Description
osm_id	string(10)	OSM ID taken from the way ID of this feature in the OSM database. In case several features in the OSM database are joined into one feature, this is one of the IDs. This ID is not unique because one OSM object will often result in several geometry objects. This is exported as a string type since shape files don't support long integers.
lastchange	string(20)	date of last change of the OSM way
code	string(4)	road type code and feature class as per previous page
fclass	string(20)	
name	string(40)	street name
ref	string(20)	street number (e.g. "E 20")
oneway	string(1)	whether the street is one-way (see note below)



column	data type	Description
maxspeed	integer(3)	the maximum speed, in kilometres per hour as given in the “maxspeed” tag
layer	integer(2)	the layer (z-order) as given in OSM, from -5 to +5, only used for drawing, not routing relevant
ete	integer(5)	the estimated travel time, in seconds, on this segment
speed	integer(4)	the estimated speed, in kilometres per hour, for a normal motor vehicle on this segment, derived from the road type and adjusted by the maxspeed value if any
length	integer(5)	the length of this segment in metres
bridge	string(1)	whether this segment is on a bridge, ‘T’ for true, ‘F’ for false
tunnel	string(1)	whether this segment is in a tunnel, ‘T’ for true, ‘F’ for false
maxwidth	float	maximum vehicle width in metres
maxheight	float	maximum vehicle height in metres
maxweight	float	maximum vehicle weight in tonnes (1,000 kilograms)
surface	string(40)	the surface property specified in OSM. Frequent values are “asphalt”, “paved”, “unpaved”, “ground”, “gravel”, and “concrete”; see https://taginfo.openstreetmap.org/keys/surface#values for details
lanes	integer(2)	number of lanes (sum of both directions)
edge_id	string(10)	unique ID of this segment (edge), starting at 1 for the first edge in the file. Note that this ID is not constant across deliveries, i.e. a later similar export will have different IDs.
start_lat	double(11,7)	latitude and longitude of the start and end points of this segment. Adding these columns unnecessarily duplicates information already contained in the geometry but may make some forms of processing easier.
start_lon		
end_lat		
end_lon		
start_node	string(10)	OSM node IDs of the start and end points of this segment (may be used in routing graph construction – same ID means there's a link). These fields are strings, not integers because the shape file format does not support long integers but node IDs in OSM do not fit into a unsigned 32 bit integer.
end_node		
toll	string(1)	whether this road segment is a toll road (directly derived from the OSM tag toll=yes/no). Uses the values “F” for false and “T” for true.
motorroad	string(1)	whether this road segment is a motorroad (directly derived from the OSM tag motorroad=yes/no). Uses the values “F” for false and “T” for true. This field is usually not set for motorways because they imply motorroad=yes.
roundabout	string(1)	whether this road segment is a roundabout (directly derived from the OSM tag junction=roundabout). Uses the values “F” for false and “T” for true.
a_foot	string(1)	whether this road segment is accessible to pedestrians, cyclists, motorists, heavy goods vehicles (trucks/lorries), or public service vehicles (buses). Uses the values “F” for false, “T” for true, “P” for private (same as “F” for most purposes), and “D” for delivery/destination (meaning this mode of transport is only allowed if going to or coming from an address in the immediate vicinity).
a_cycle		
a_motor		
a_hgv		
a_psv		

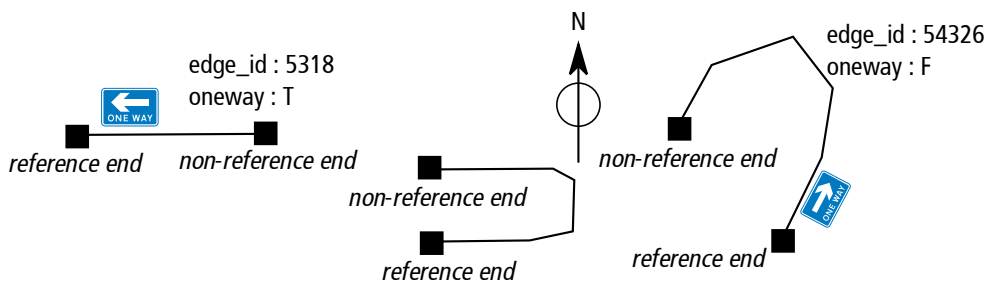
All columns can be omitted on request. Columns highlighted in blue are not included by default but can be added on request.



3 Oneway Streets

The “oneway” column is available in three different forms. By default, it will be filled with a Navteq-style oneway marker, where F (for “from”) means the street is oneway from the first point to to the last point, and T (for “to”) means the street is oneway from the last point to to the first point. A Navteq marker of “B” (“both”) means the street is usable in both directions. “T” occurs very rarely only.

Optionally, we can also export a simpler oneway column that contains T for true (street is oneway) and F for false (street is not oneway).



As a third alternative, the oneway column can contain the oneway marker according to the product specifications of NAVSTREETS product by HERE (formerly known as Navteq). This scheme is based on HERE's definition of the so-called reference end. The reference end of an edge is the end which has the lower latitude. If both ends have the same latitude, the end with the lower longitude is called reference end. A road with “F” (like “from”) in the oneway column may only be used from the reference end to the opposite end. A “T” (like “to”) is the exact opposite – this edge may only be used towards the reference end. Edges with “B” may be used in both directions. This definition of the oneway column might be an option for you, if the software you use already supports NAVSTREETS data.

4 Motorcar, bicycle, and pedestrian routing

Our shape files will by default use speeds for motorcars, and even when you ask us to include those types of ways only accessible for bicycles or pedestrians, the basic shape file will still be that for motorized traffic. We can add access columns (the five columns beginning with “a_” in the previous table) that tell you which edges are deemed accessible by various modes of transport.

On demand, we can also create “explicit” bicycle or pedestrian files. An “explicit” bicycle routing file will not contain any motorways or motorway links, unless OSM has information about there being a cycleway next to it. It will also not contain any roads explicitly marked as disallowed for bicycles in OSM. Essentially, it will only contain those edges for which the “a_cycle” column would be “T” or “D”. An explicit bicycle routing file contains estimated speeds for bicycles, not cars.

An “explicit” pedestrian routing will not contain any motorways or trunk roads or their links, unless OSM has information about there being a sidewalk; and will not contain any



ways explicitly marked as disallowed for pedestrians or marked as “designated” for bicycles. Essentially, it will only contain those edges for which the “a_foot” column would be “T” or “D”. An explicit pedestrian routing file contains estimated speeds for pedestrians, not cars.

5 Crossings

The “crossings” layer contains traffic lights and marked pedestrian crossings.

column	data type	Description
osm_id	string(15)	ID of this crossing point in OpenStreetMap
zebra	string(1)	Is it a zebra crossing (“Y”) or not (“N”)?
light	string(1)	Is it controlled by traffic lights (“Y”) or not (“N”)?
type	string(20)	subtype of the crossing, details see next table

crossing type	Description
zebra	zebra crossing (white stripes on the road, traffic has to stop if a pedestrian wants to cross the street)
tiger	tiger crossing (used in Hong Kong), similar to zebra crossing but may also be used by cyclists
pelican	crossing for pedestrians with traffic lights, might be button-operated
toucan	crossing for pedestrians and cyclists with traffic lights, might be button-operated
pegasus	crossing for pedestrians, cyclists and horse riders with traffic lights, might be button-operated
traffic_signals	the crossing is located at a crossing of two streets and controlled by traffic lights

6 Turn Restrictions

On request, our shape files will contain turn restrictions in NAVSTREETS format. Turn restrictions can be found in the “Cdms” and “Rdms” layers. These two layers contain no geometry. You need the Roads layer to be able to draw the geometry.

If your shape file contains turn restrictions, the “edge_id” column will be always included (otherwise it is optional).

Columns of the Cdms layer:

column	data type	Description
LINK_ID	integer(10)	ID of the edge. This is the same ID as used in “edge_id” column at Roads layer.
COND_ID	integer(10)	ID of this turn restriction
OSM_ID	integer(10)	ID of the relation object in OpenStreetMap which is the source of this turn restriction. Multiple turn restrictions at the shape file can originate from the same turn restriction in OpenStreetMap.
COND_TYPE	integer(5)	always 7 (means “restricted driving manoeuvre”)
COND_VAL1	string(30)	always “LEGAL”

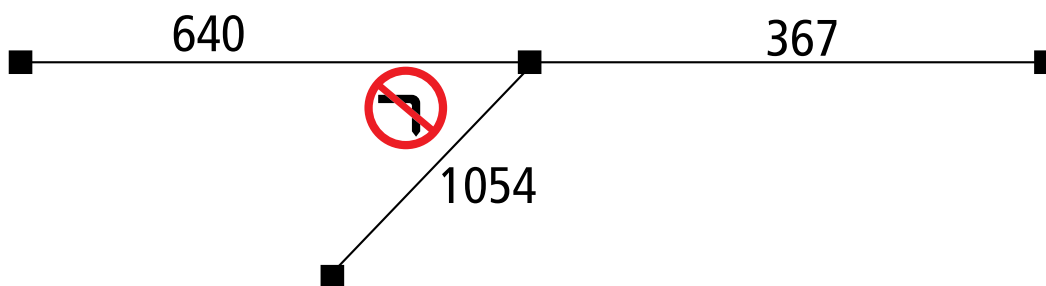


column	data type	Description
AR_AUTO	string(1)	“Y” (yes) or “N” (no). Does this restriction apply to cars?
AR_BUS	string(1)	“Y” (yes) or “N” (no). Does this restriction apply to buses?
AR_TAXI	string(1)	“Y” (yes) or “N” (no). Does this restriction apply to taxis?
AR_CARPOOL	string(1)	“Y” (yes) or “N” (no). Does this restriction apply to carpools?
AR_PEDSTRN	string(1)	Always “N”. All restrictions do not apply to pedestrians.
AR_TRUCKS	string(1)	“Y” (yes) or “N” (no). Does this restriction apply to trucks?
AR_THRUTR	string(1)	“Y” (yes) or “N” (no). Does this restriction apply to through traffic?
AR_DELIVER	string(1)	“Y” (yes) or “N” (no). Does this restriction apply to deliveries?
AR_EMERVEH	string(1)	“Y” (yes) or “N” (no). Does this restriction apply to emergency vehicles?
AR_MOTOR	string(1)	“Y” (yes) or “N” (no). Does this restriction apply to motorcycles?
END_OF_LK	string(1)	Does the turn restriction apply to the reference end (“Y”) or the non-reference end (“N”) of the edge?

The Rdms layer contains the destination edges for all turn restrictions.

column	data type	Description
LINK_ID	integer(10)	ID of the edge the vehicle comes from. This is the same ID as used in “LINK_ID” column of Cdms layer and “edge_id” column in the Roads layer.
COND_ID	integer(10)	ID of this turn restriction (the same as “COND_ID” column of the Cdms layer)
OSM_ID	integer(10)	ID of the relation object in OpenStreetMap which is the source of this turn restriction. (the same as “OSM_ID” column of the Cdms layer)
MAN_LINKID	integer(10)	ID of the destination edge This is the same ID as used in “edge_id” column in the Roads layer.
SEQ_NUMBER	integer(4)	always “1”. Currently turn restrictions which consist of more than two edges (i.e. you must not turn from edge 1 via 2 to 3) are not supported.

Example:



LINK_ID	COND_ID	OSM_ID	COND_TYPE	COND_VAL1	AR_AUTO	...	END_OF_LK
640	65	531425	7	LEGAL	Y	...	N

LINK_ID	COND_ID	OSM_ID	MAN_LINKID	SEQ_NUMBER
640	65	531425	1054	1



7 Railway and Ferry Lines

The inclusion of railways and ferry lines is possible on request.

8 English vs. National/Local Names

Instead of including just one “name” column, we can also provide shape files where one column (“loc_name”) contains the name as used locally (possibly including non-roman script) and a second column (“int_name”) has the international name (usually English). Both columns are the same where OpenStreetMap does not contain an explicit international or English name.