

Creating GPX tracks from cycle routes in OpenStreetMap

Henry Miskin





Overview

1. Introduction
2. OpenStreetMap Data
3. Processing Cycle Routes
4. Complete Cycle Routes
5. Challenges & Next Steps



Introduction





Who I am

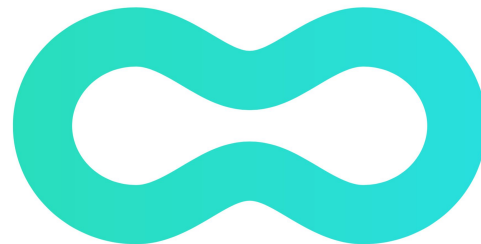
Henry Miskin



@hpgmiskin



hpgmiskin



Cytera



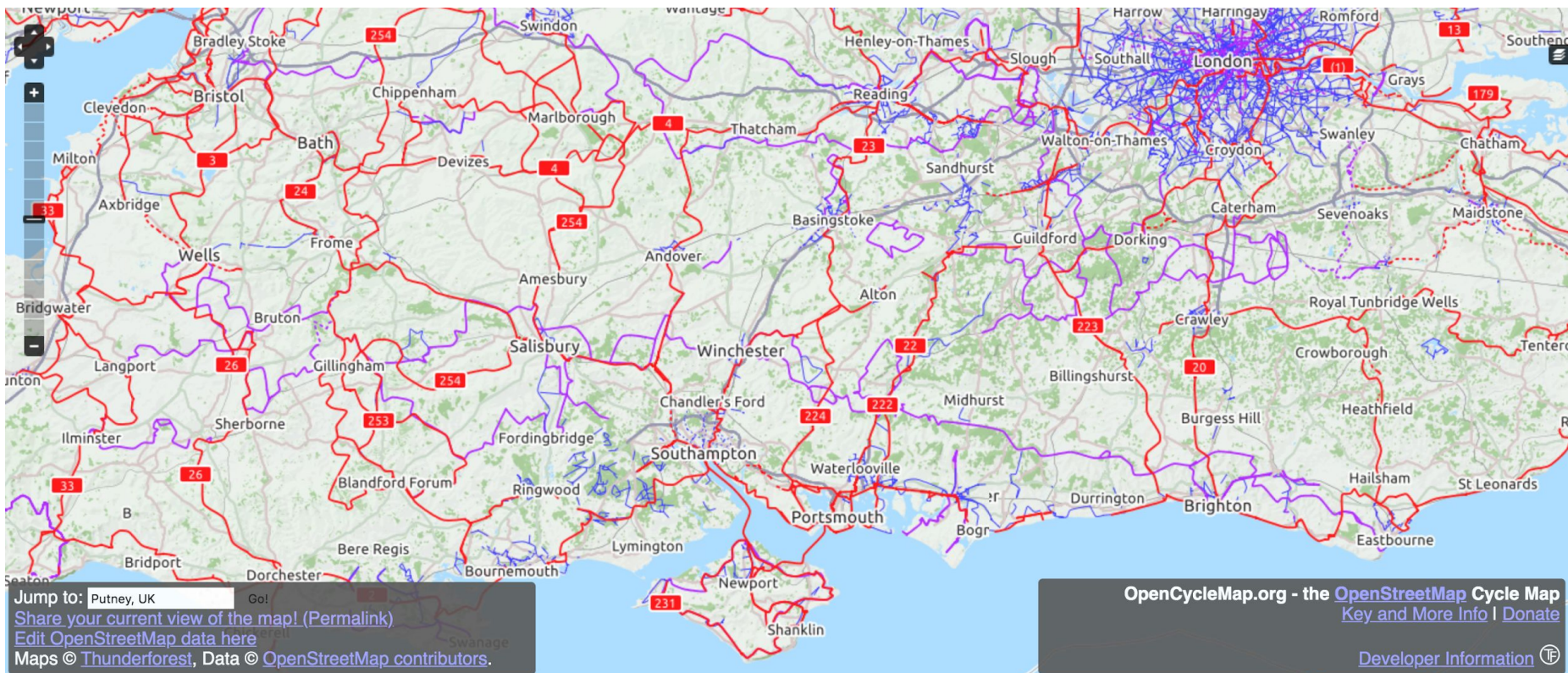
Cycling

Following cycle routes

- Poor or damaged signage
- Foliage covers signes
- Hard to recover when off route



OpenCycleMap




Jump to: Go

[Share your current view of the map! \(Permalink\)](#)
[Edit OpenStreetMap data here](#)

Maps © [Thunderforest](#), Data © [OpenStreetMap contributors](#).

OpenCycleMap.org - the [OpenStreetMap Cycle Map](#)
[Key and More Info](#) | [Donate](#)

[Developer Information](#) 



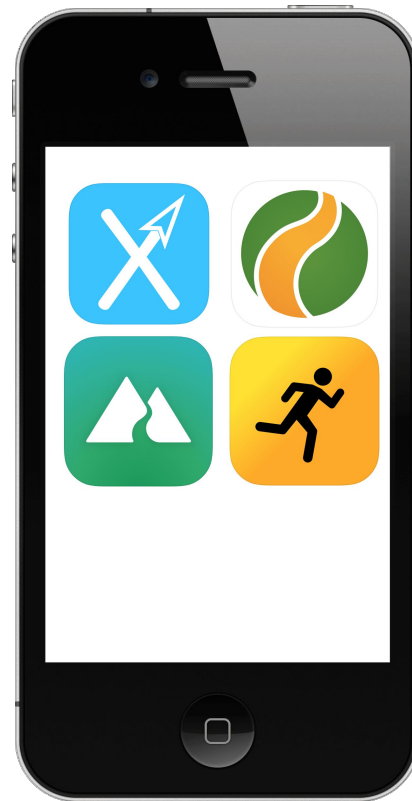
OpenCycleExport

Country
Cycle Route



github.com/hpgmiskin/OpenCycleExport

Why GPX files



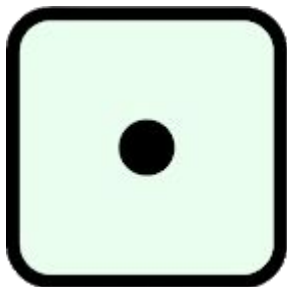


OpenStreetMap Data





OpenStreetMap Data Model



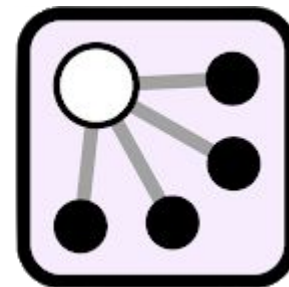
Node

Coordinate



Way

*Road
Footpath*

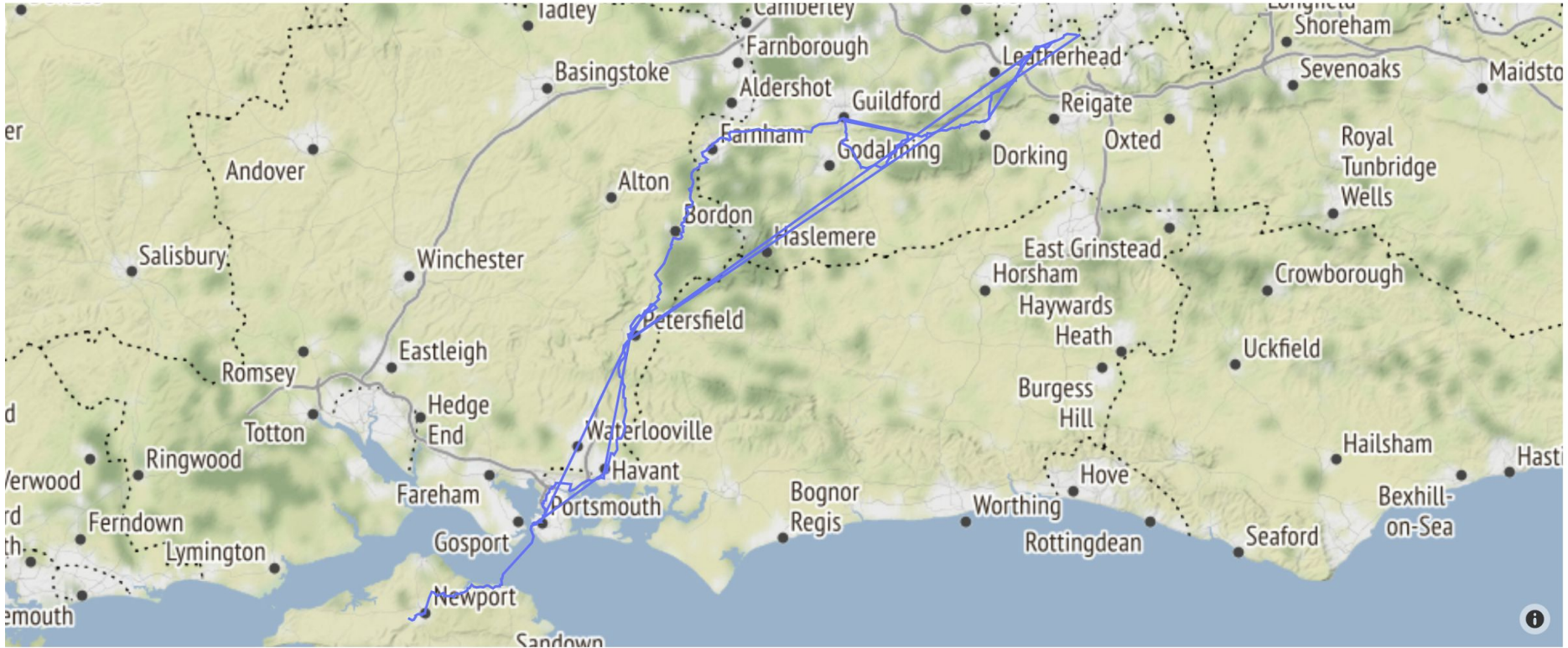


Relation

Cycle Route

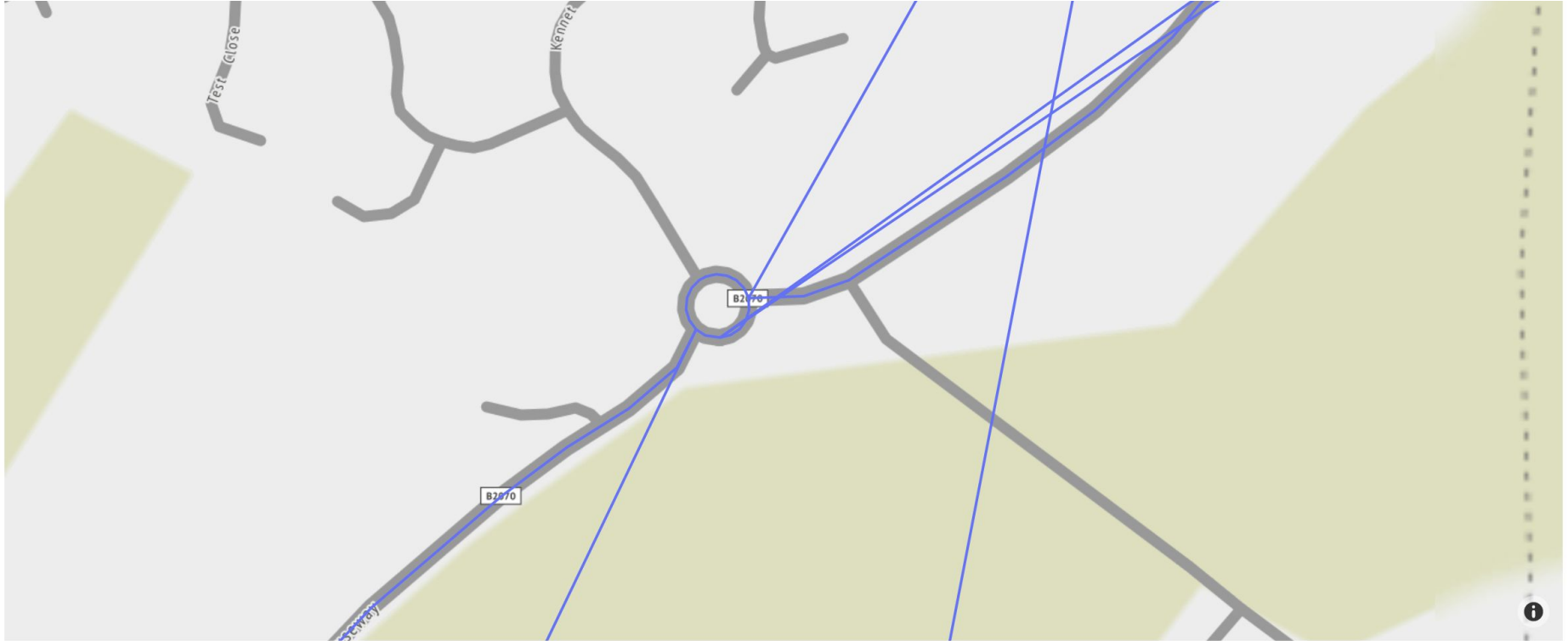


Shapely Linemerge



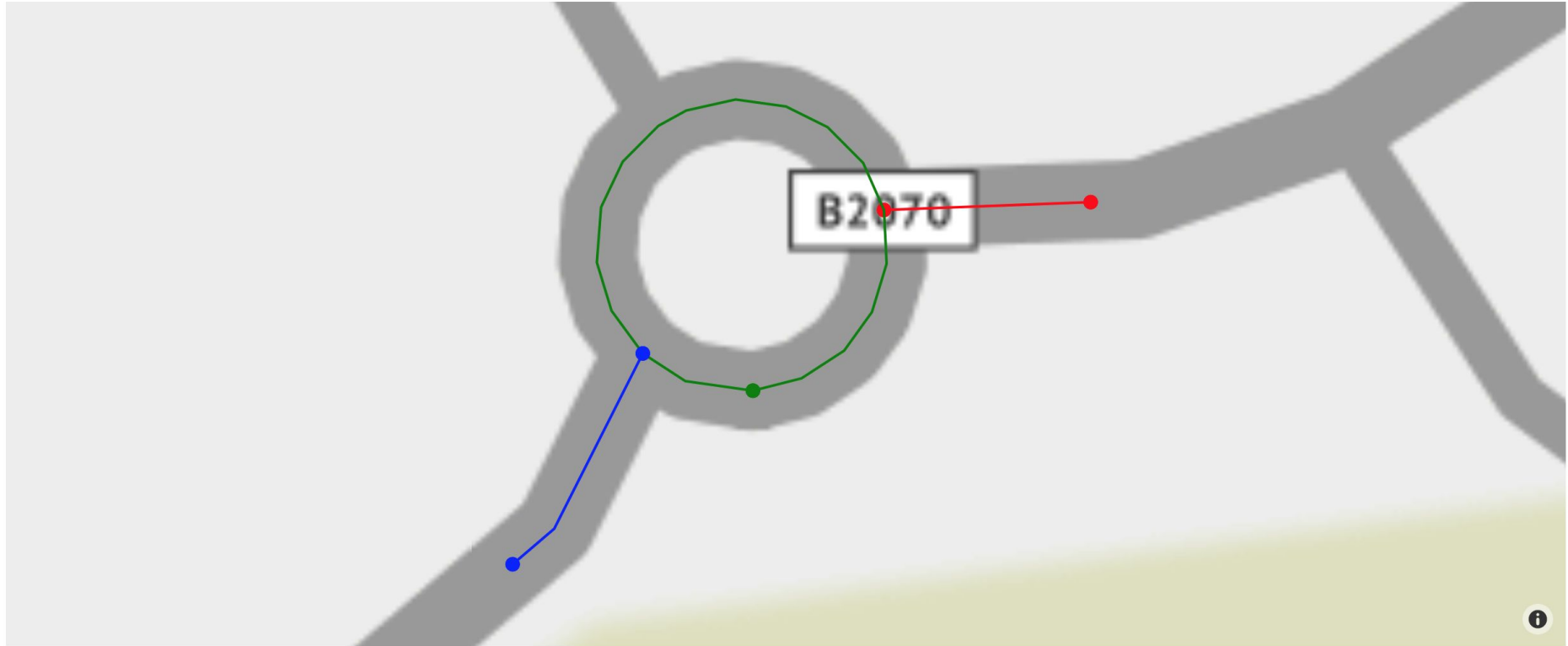


Shapely Linemerge Issues



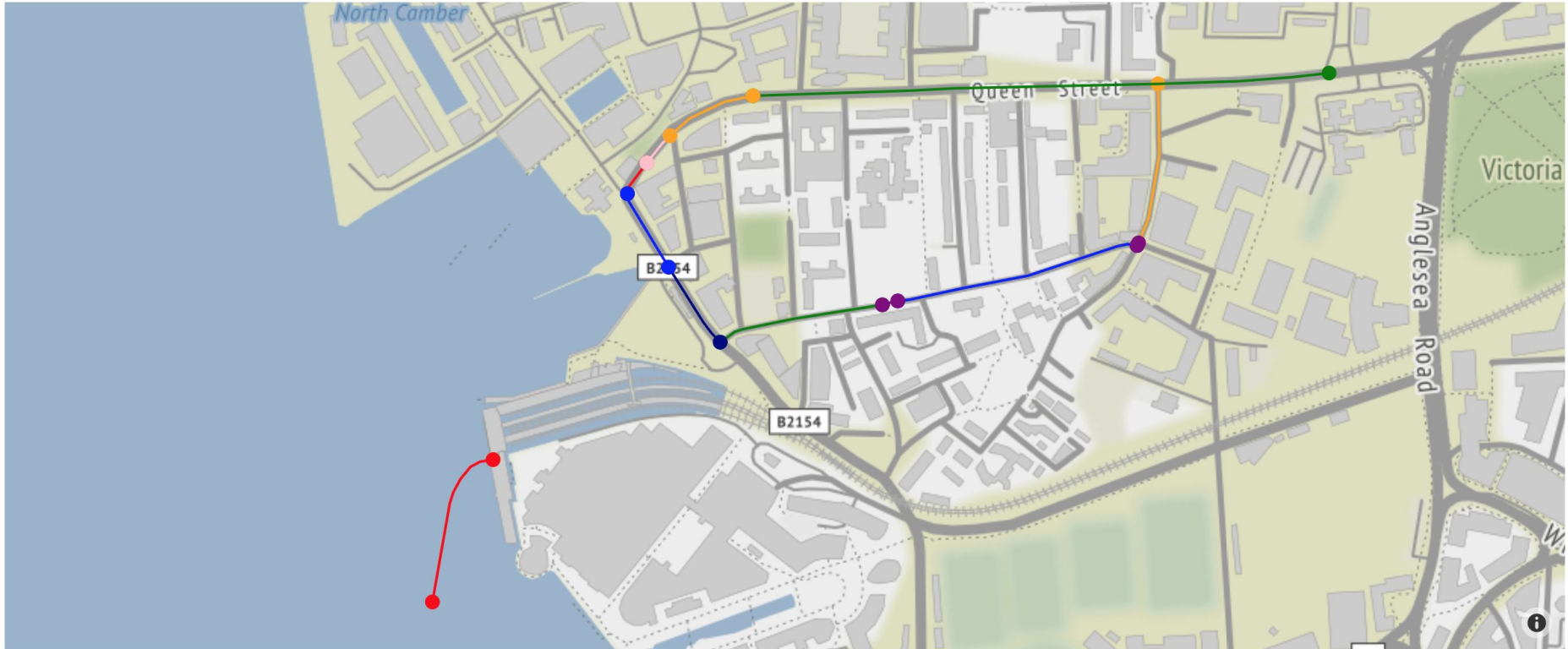


Ways not terminating together





Ways not connected

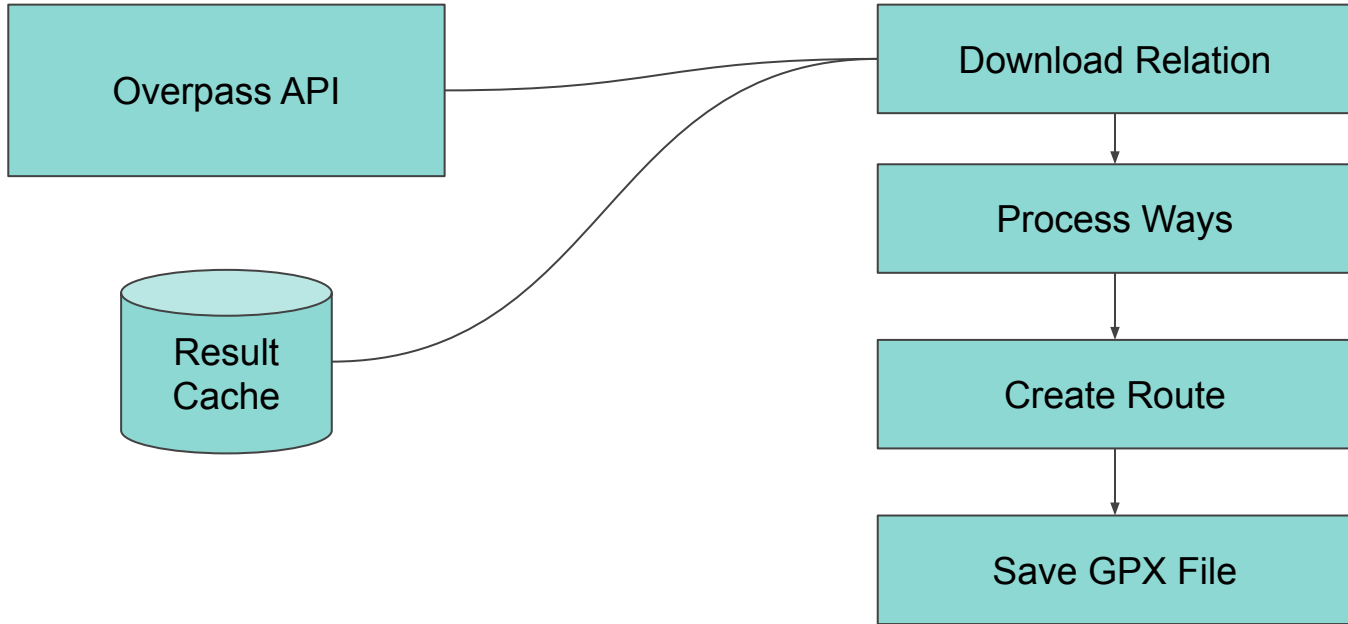


The image features a solid orange background. In the top-left corner, there are three vertical bars of varying heights, each composed of three overlapping rounded rectangular segments. In the bottom-right corner, there are four vertical bars of increasing height from left to right, each also composed of three overlapping rounded rectangular segments. The text 'Processing Cycle Routes' is centered in the middle of the page in a white, bold, sans-serif font.

Processing Cycle Routes



How it works





Processing ways

1. Find all places ways intersect
2. Split ways at all intersecting points
3. Create cost matrix between all intersections

$$\text{COST} = \text{DISTANCE} * \text{COEFFICIENT}$$

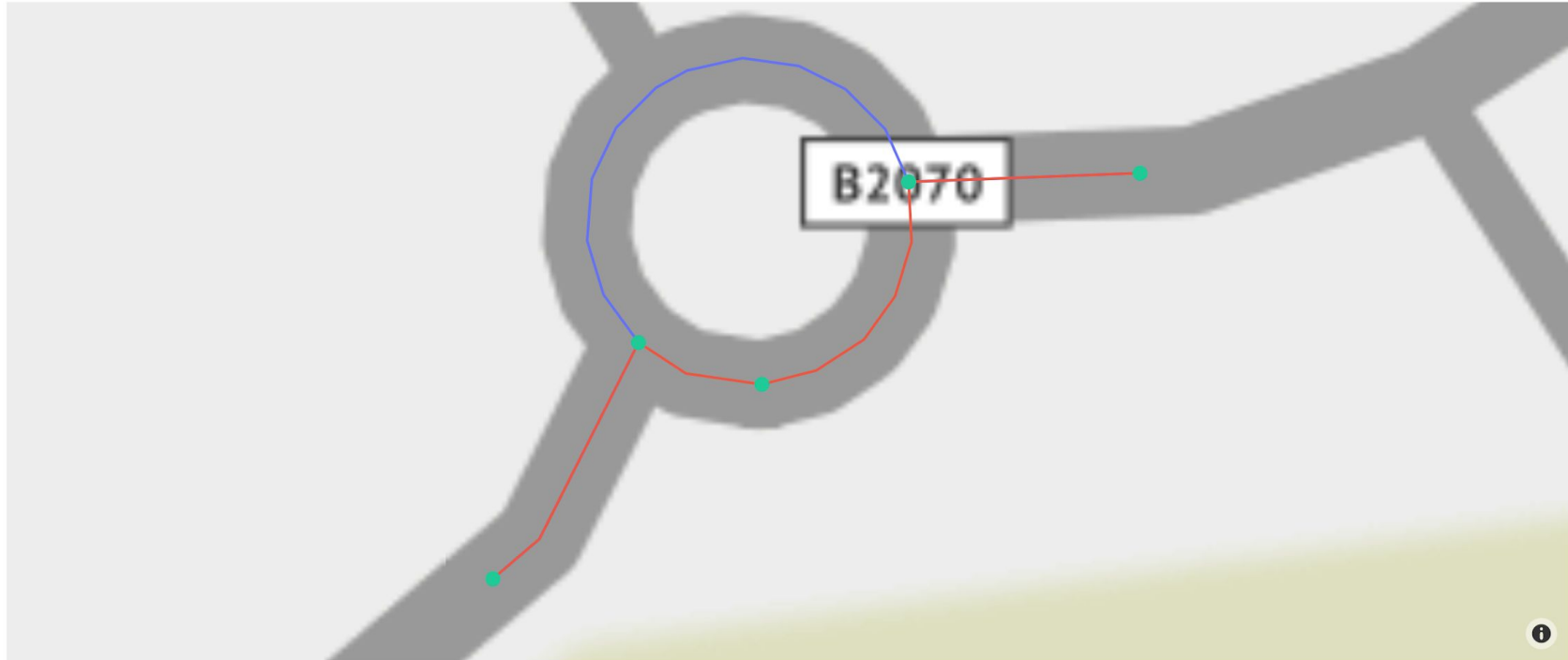


Creating a route

1. Find furthest points from one another
2. Use Dijkstra's algorithm to find shortest path
3. Compute route in both directions



Basic routing example



- A to B
- B to A
- Waypoints

Missing link example

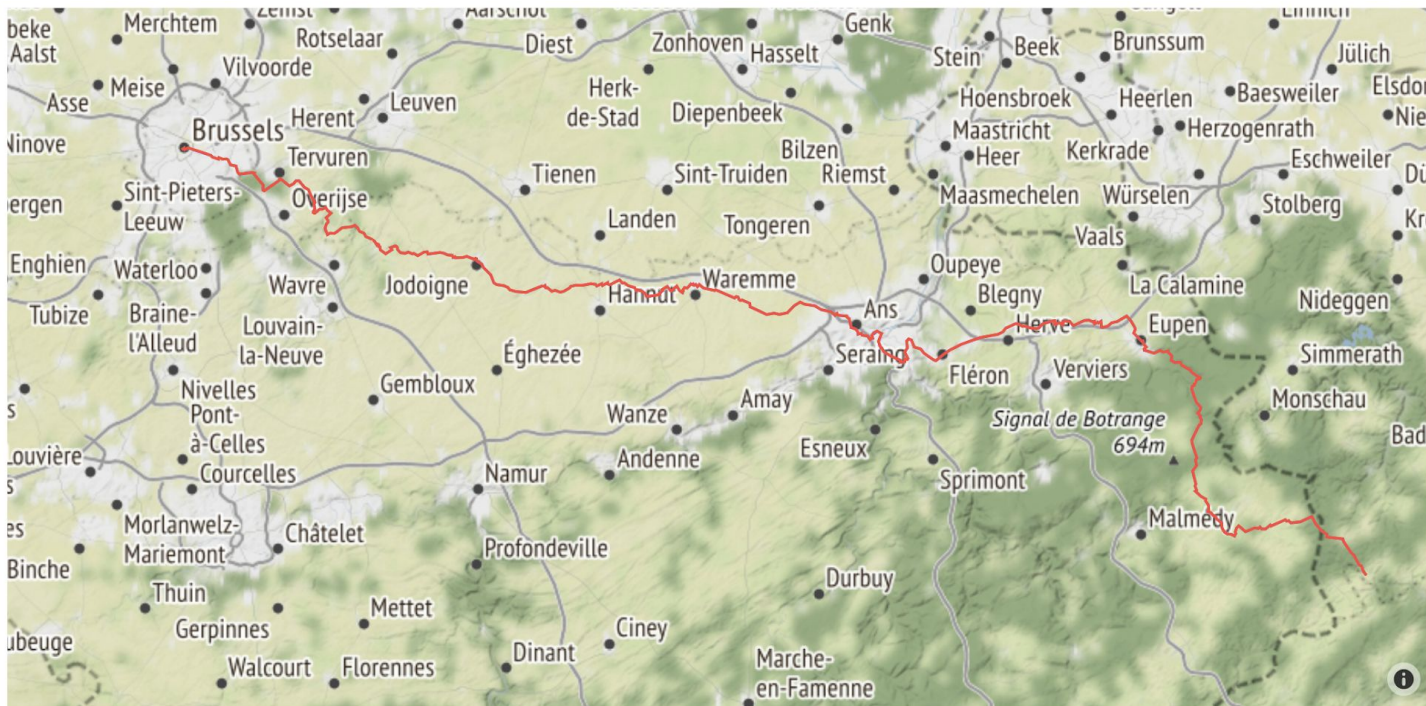


- A to B
- B to A
- Waypoints

The background is a solid orange color. In the top-left corner, there are three vertical bars of varying heights, each composed of several overlapping semi-transparent orange circles. In the bottom-right corner, there are four vertical bars of increasing height from left to right, each also composed of several overlapping semi-transparent orange circles.

Complete Cycle Routes

Belgium - RV4



- RV4 - Bruxelles - Brussel to Sankt Vith
- RV4 - Sankt Vith to Bruxelles - Brussel



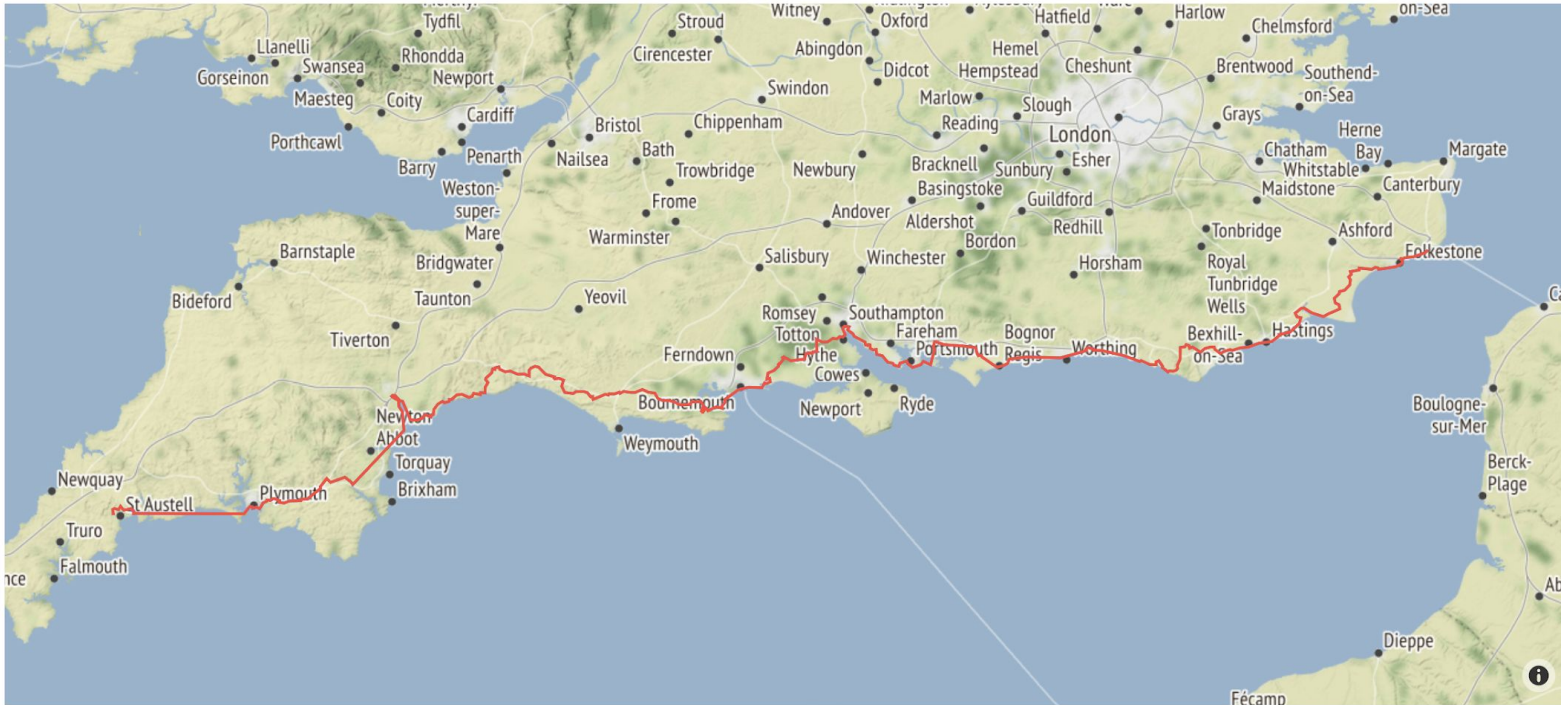
France - V86



- V86 - Mende to Marmande
- V86 - Marmande to Mende



United Kingdom - Route 2



- 2 - Dover to St Austell
- 2 - St Austell to Dover



Challenges & Next Steps





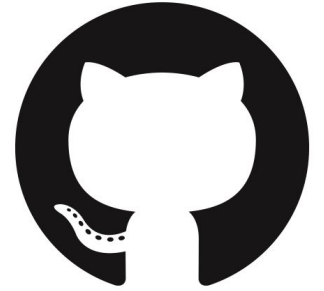
Current challenges

- Finding elevation data for routes
- Continuity of cycle routes or route data
- Finding the true start and end points





Next Steps



- Release GPX files on GitHub
- Declare which routes are not continuous
- Split routes by the towns they pass through



Any questions?

