

Consuming **Open Data** for Highly **Customizable** Route Planning

openrouteservice.



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- Around since ~ '08 and now part of the **Heidelberg Institute for Geoinformation Technology**
- Offers a **free** API consisting of Routing | Geocoding | Isochrones | Matrix
- Built **entirely** on free data sources

Architecture



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Tyk.io

Gateway

RESTful Interface



GET / POST Interface



Responds in JSON / GeoJSON

/directions

/matrix



MAPZEN

/isochrones

/geocoding



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Graphhopper



openroute
service

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REST-assured

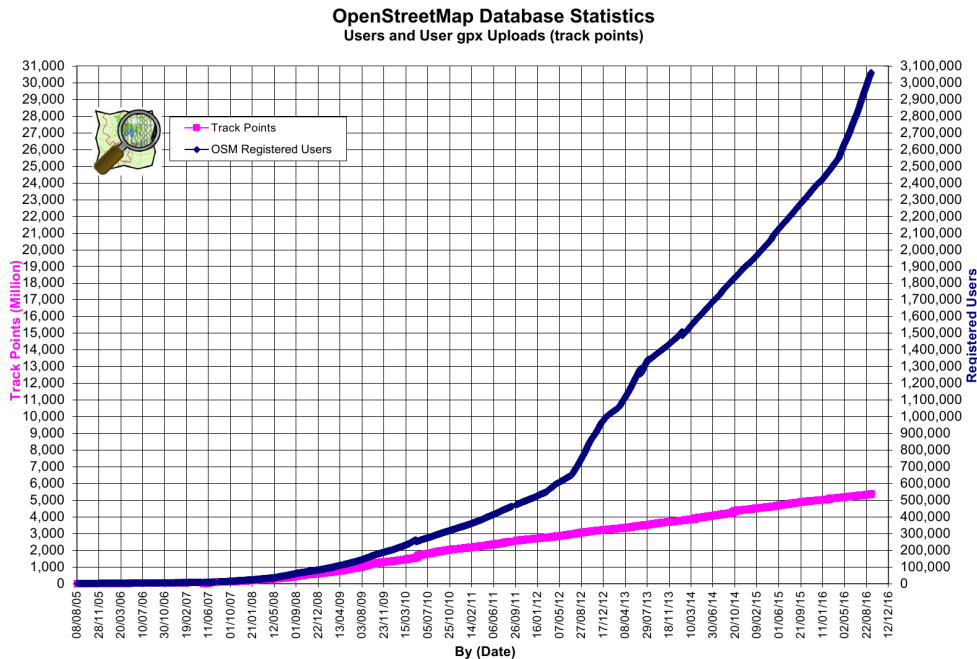
Klaus Tschira Stiftung
gemeinnützige GmbH





OpenStreetMap

A crowd-sourced map of the world in numbers



- Founded by **Steve Coast** (London) in **July 2004**
- #users **4.167.758**
- #uploaded GPS points **5.849.863.114**
- #nodes **4.063.208.543**
- #ways **435.508.879**
- #relations **5.217.071**

Graphs, vertices, edges:

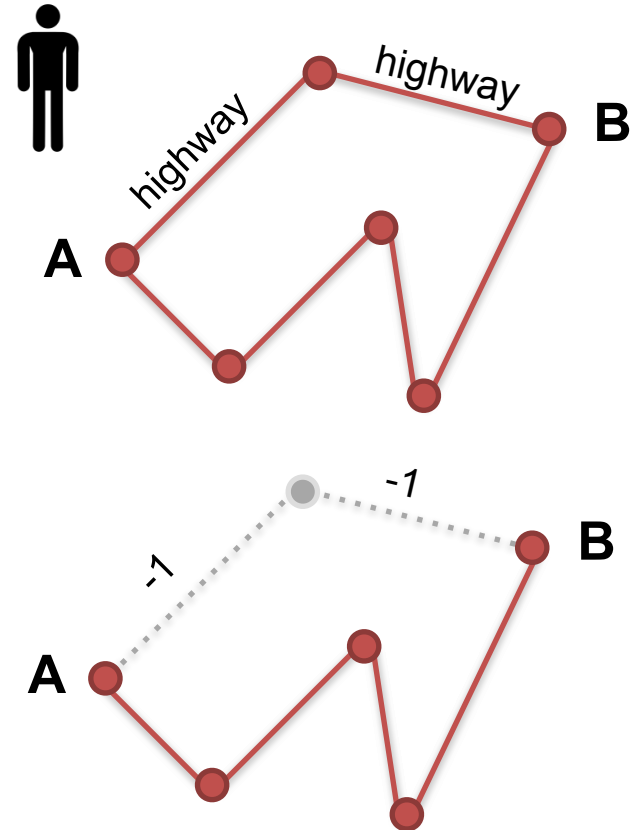
A road network.



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- 1 graph
- **162.319.083** vertices
- **219.865.627** edges
- Between **15-45 gb** for each mode of transport
- **In-memory** database

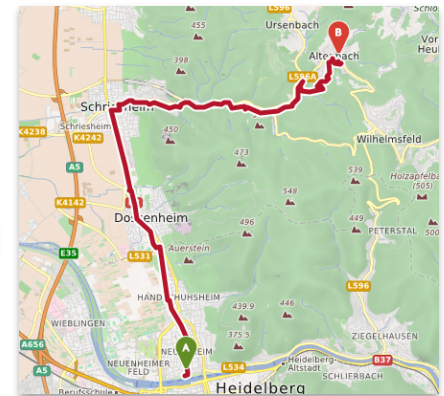
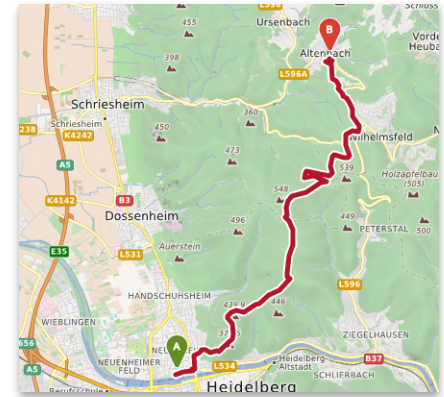


Example #1 Hills? No thanks!



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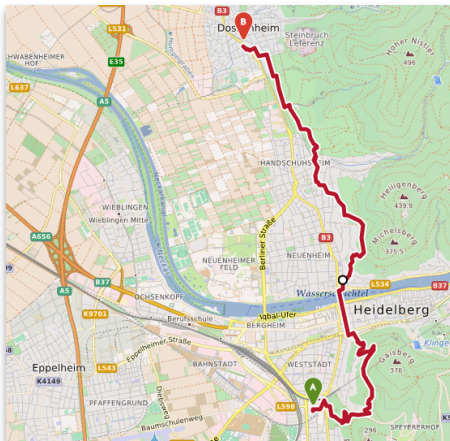
```
https://api.openrouteservice.org/directions?  
coordinates = 8.34234,48.23424 | 8.34423,48.26424  
&profile = cycling-tour  
&preference = shortest  
&geometry = true  
&geometry_format = encodedpolyline  
&options = {  
    avoid_features: [ ferries | hills | unpavedroads ]  
}
```



Example #2 Green, yes please!



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<https://api.openrouteservice.org/directions?>

coordinates = 8.34234,48.23424 | 8.34423,48.26424

&profile = foot-walking

&preference = recommended

&geometry = true

&geometry_format = encodedpolyline

&options = {

green_routing: true

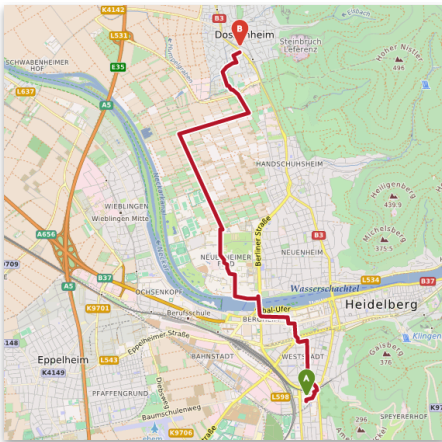
green_weighting_factor: [0.1 - 1]

}

Example #3 Keep it quiet.



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<https://api.openrouteservice.org/directions?>

coordinates = 8.34234,48.23424 | 8.34423,48.26424

&profile = foot-walking

&preference = recommended

&geometry = true

&geometry_format = encodedpolyline

&options = {

quiet_routing: true

quiet_weighting_factor: [0.1 - 1]

}

Example #4 Accessible, yes.



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<https://api.openrouteservice.org/directions?>

coordinates = 8.34234,48.23424 | 8.34423,48.26424

&profile = **wheelchair**

&preference = recommended

&geometry = true

&geometry_format = encodedpolyline

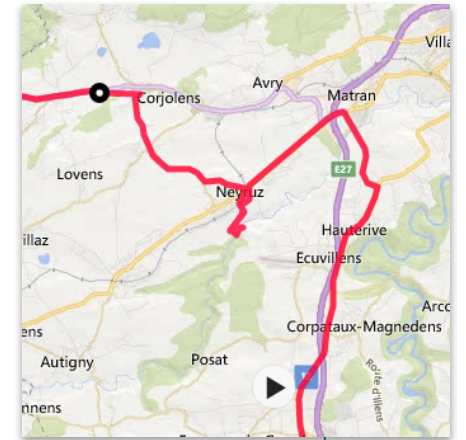
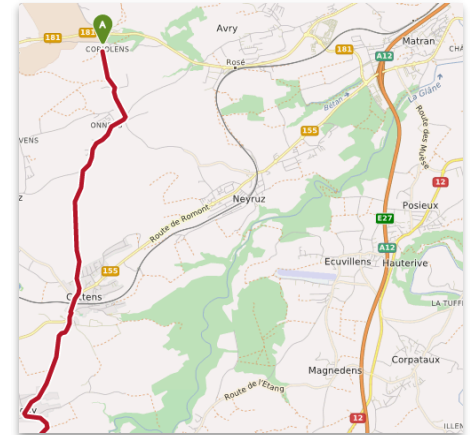


Example #5 Is it really paved?



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```
https://api.openrouteservice.org/directions?  
coordinates = 8.34234,48.23424 | 8.34423,48.26424  
&profile = cycling-road  
&preference = shortest  
&geometry = true  
&geometry_format = encodedpolyline
```



Customize & run your setup



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```
routing: {  
  mode: "normal",  
  sources: ["planet-latest.osm.pbf"],  
  init_threads: 1,  
  storage_format: "LZ4",  
  attribution: "OpenStreetMap, ..",  
  profiles: {  
    active: ["vehicles", "bike", "bike2", "pedestrian"],  
    default_params: {  
      encoder_flags_size: 8,  
      graphs_root_path: "/graphs",  
      elevation_provider: cgjar,  
      elevation_cache_path: "/home/data/cgjar_cache",  
      instructions: true,  
      maximum_distance: 6000000,  
      maximum_waypoints: 50  
    },  
  },  
},  
isochrones: { ...
```

1. **mvn build**
2. **docker-compose up -d**

Thank you!



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<https://www.openrouteservice.org>

*Sign up for the API for 5.000
free requests per day.*



<https://github.com/GIScience/openrouteservice-app>

<https://github.com/GIScience/openrouteservice-core>



<https://app.swaggerhub.com/apis/OpenRouteService/ors-api/>

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Just some lessons learnt.



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- You shouldn't compare **“track types”** globally!
- **Data quality** definitely does vary.
- **highway:trunk** **!=** **highway:trunk**
- ...