



# OpenStreetMap

## Community Meets Cartography

Andy Robinson

# Why?

- Existing Data not Free & Open
  - Artificially Stifles Innovation
- Data as a Static Snapshot
  - Near Real-Time data use not possible
- Real-Time data
  - Interactive data editing by users the next step



# Quote 1

“If you don’t make [lower-resolution mapping data] publicly available, there will be people with their cars and GPS devices, driving around with their laptops .. They will be cataloguing every lane, and enjoying it, driving 4x4s behind your farm at the dead of night. There will, if necessary, be a grass-roots remapping.”

Tim Berners-Lee



## Quote 2

“You could have a community capability where you took the GPS data of people driving around and started to see, oh, there’s a new road that we don’t have, a new route .. And so that data eventually should just come from the community with the right software infrastructure.”

Bill Gates



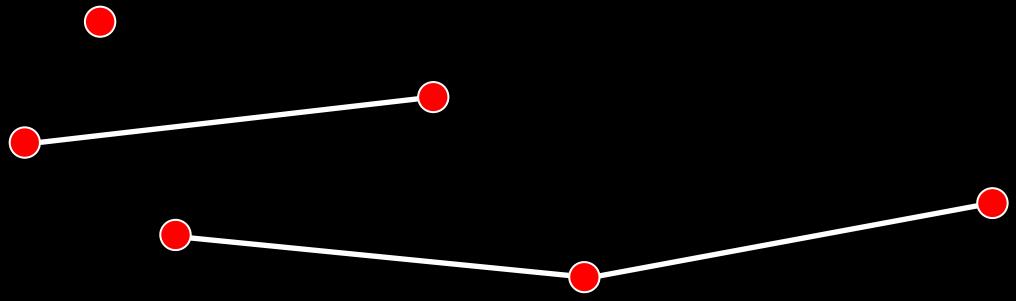
# How?

- **Provide an Open Platform**
  - OSM Users may freely input and extract data
- **Raw sources for OSM Basemap**
  - GPS track logs. Movement Breadcrumbs
  - Existing Free Data Sources (eg TIGER/LINE)
  - Historical Maps – Out of Copyright mapping
- **Users Create Basemap from Raw Sources**
  - Via Online and Offline Editing Software



# Building Blocks

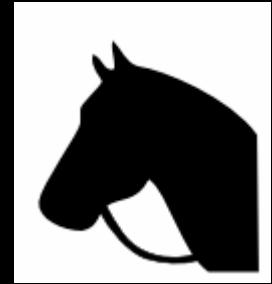
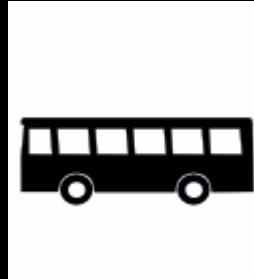
- **Minimal Data Set for Maximum Flexibility**
  - Nodes
  - Segments
  - Ways/Areas
  - Tags – Metadata as key/value pairs
- **Full User History and Rollback ability**

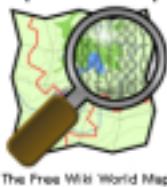


# Fancy a Go?



+





The Free Wild World Map

[Help & Wiki](#)  
[News blog](#)  
[Shop](#)**User**display name:  
blockadder [Make a Donation](#)

filename: AJR\_G\_260806.gpx

uploaded: 2006-08-26 20:58:00

description: B75 area

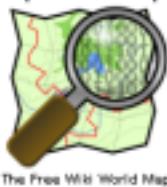
tags: midlands AJR

# Your GPS Traces

[see traces from all users](#)

## Editing the trace AJR\_G\_260806.gpx





# Your GPS Traces

[see traces from all users](#)

upload GPX file:

[Browse...](#)

description:

tags:

public?

[Upload](#) | [help](#)

Help & Wiki  
News blog  
Shop

## tags

midlands  
AJR  
Bath  
Midlands  
A46  
M5  
Avon

## User

display name:  
blackadder [save](#)

[Make a Donation](#)



Showing page 0 (1 - 20 of 201) | [next page](#)

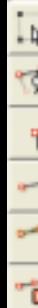
Public? Delete?

- |  |   |                                     |                          |
|--|---|-------------------------------------|--------------------------|
|  | AJR_G_020805.gpx ... (3,313 points) ... on 02-Sep <a href="#">more</a> / <a href="#">map</a><br>Sutton Coldfield and Erdington<br>by blackadder in: midlands AJR                    | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|  | AJR_G_290806.gpx ... (5,573 points) ... on 29-Aug <a href="#">more</a> / <a href="#">map</a><br>Sutton Coldfield to Fradley + Alrewas<br>by blackadder in: midlands AJR             | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|  | AJR_G_280806.gpx ... (2,701 points) ... on 28-Aug <a href="#">more</a> / <a href="#">map</a><br>Sutton Coldfield to Solihull rtm<br>by blackadder in: midlands AJR                  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|  | AJR_G_270806.gpx ... (8,749 points) ... on 27-Aug <a href="#">more</a> / <a href="#">map</a><br>Sutton Coldfield to Stoneleigh Park rtm<br>by blackadder in: midlands AJR           | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|  | AJR_G_260806.gpx ... (9,999 points) ... on 26-Aug <a href="#">more</a> / <a href="#">map</a><br>B75 area<br>by blackadder in: midlands AJR  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|  | AJR_G_240806b.gpx ... (4,750 points) ... on 25-Aug <a href="#">more</a> / <a href="#">map</a><br>Wylde Green and Boldmere areas<br>by blackadder in: midlands AJR                   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|  | AJR_G_240806.gpx ... (8,473 points) ... on 25-Aug <a href="#">more</a> / <a href="#">map</a><br>New Hall, Walkley and Mexworth - Sutton Coldfield<br>by blackadder in: midlands AJR | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|  | AJR_G_090805.gpx ... (2,800 points) ... on 23-Aug <a href="#">more</a> / <a href="#">map</a><br>Fradley Junction area<br>by blackadder in: midlands AJR                             | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|  | AJR_G_080806.gpx ... (2,059 points) ... on 23-Aug <a href="#">more</a> / <a href="#">map</a><br>Trent & Mersey Canal at Alrewas   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |



Files Connection Layer Edit

Help



Layers

GPS trackpoints[117].gpx

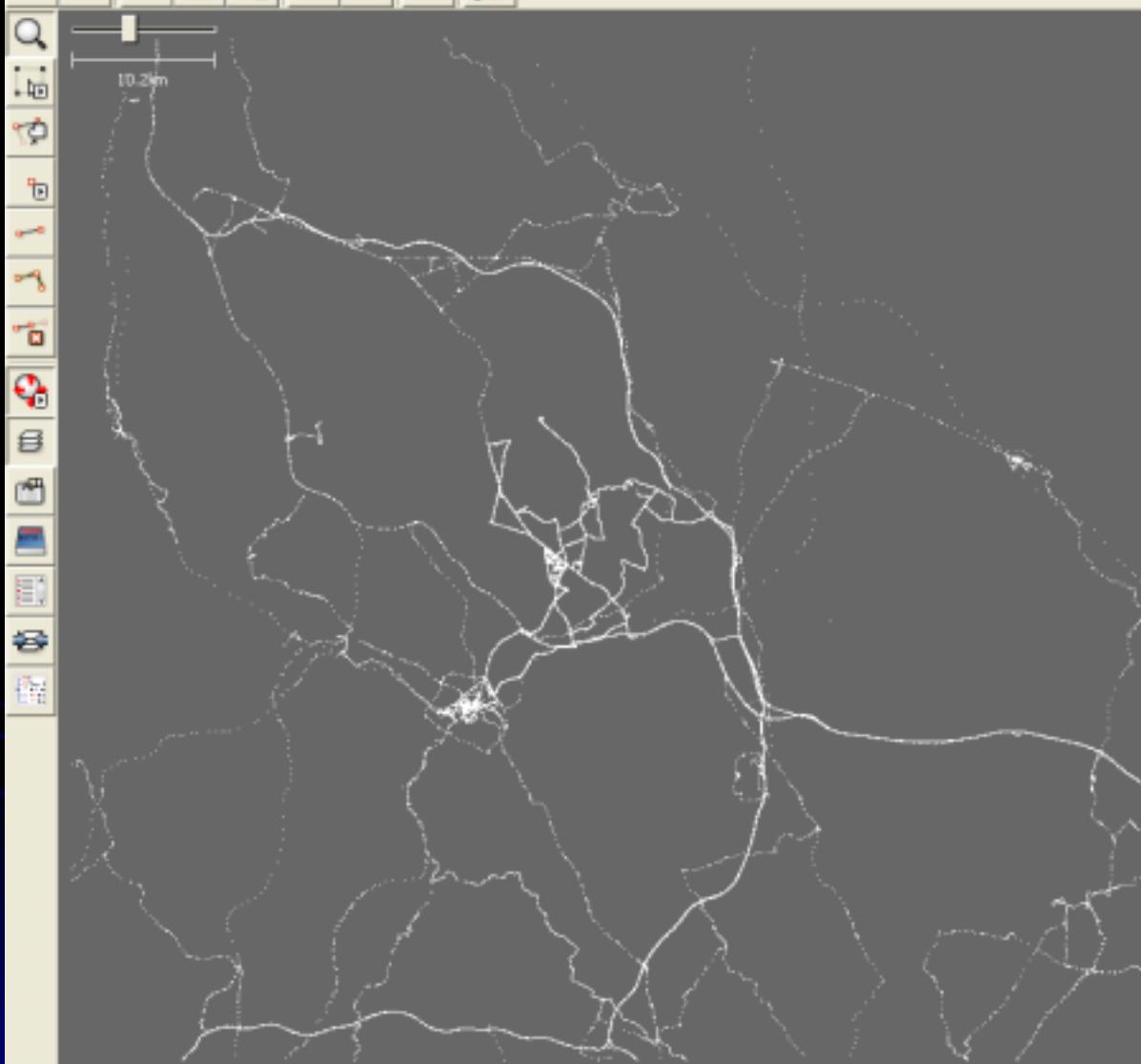


Lat/Lon 52.63277290611614 -2.1595375334640523

Object

West Midlands



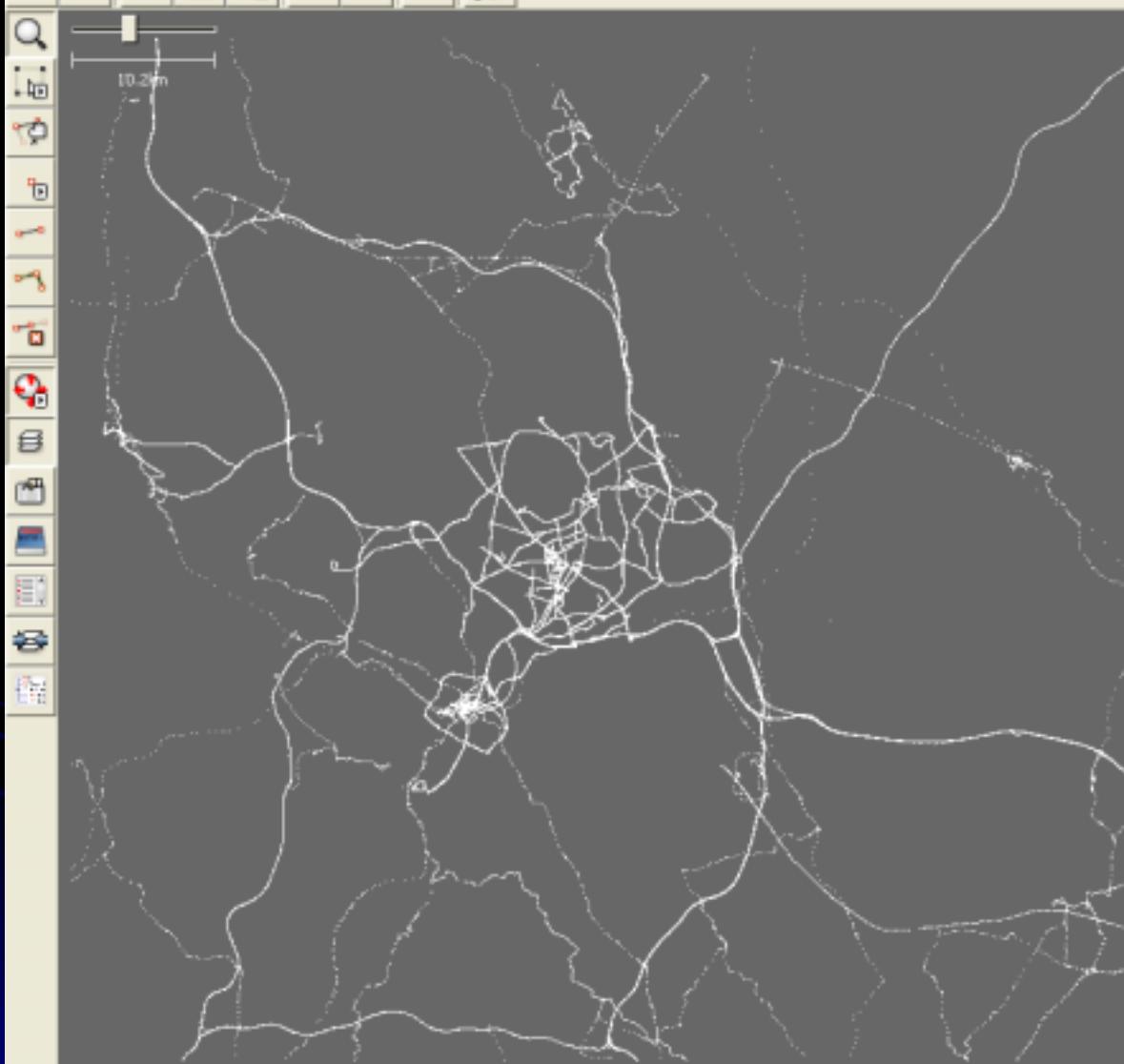


| Layers |                      |
|--------|----------------------|
| GPS    | trackpoints[110].gpx |
| GPS    | trackpoints[111].gpx |
| GPS    | trackpoints[112].gpx |
| GPS    | trackpoints[113].gpx |
| GPS    | trackpoints[114].gpx |
| GPS    | trackpoints[115].gpx |
| GPS    | trackpoints[116].gpx |
| GPS    | trackpoints[117].gpx |

Lat/Lon 52.41613225337731 -2.128040571520526

Object





## Layers

GPS trackpoints[100].gpx

GPS trackpoints[101].gpx

GPS trackpoints[102].gpx

GPS trackpoints[103].gpx

GPS trackpoints[104].gpx

GPS trackpoints[105].gpx

GPS trackpoints[106].gpx

GPS trackpoints[107].gpx

GPS trackpoints[108].gpx

GPS trackpoints[109].gpx

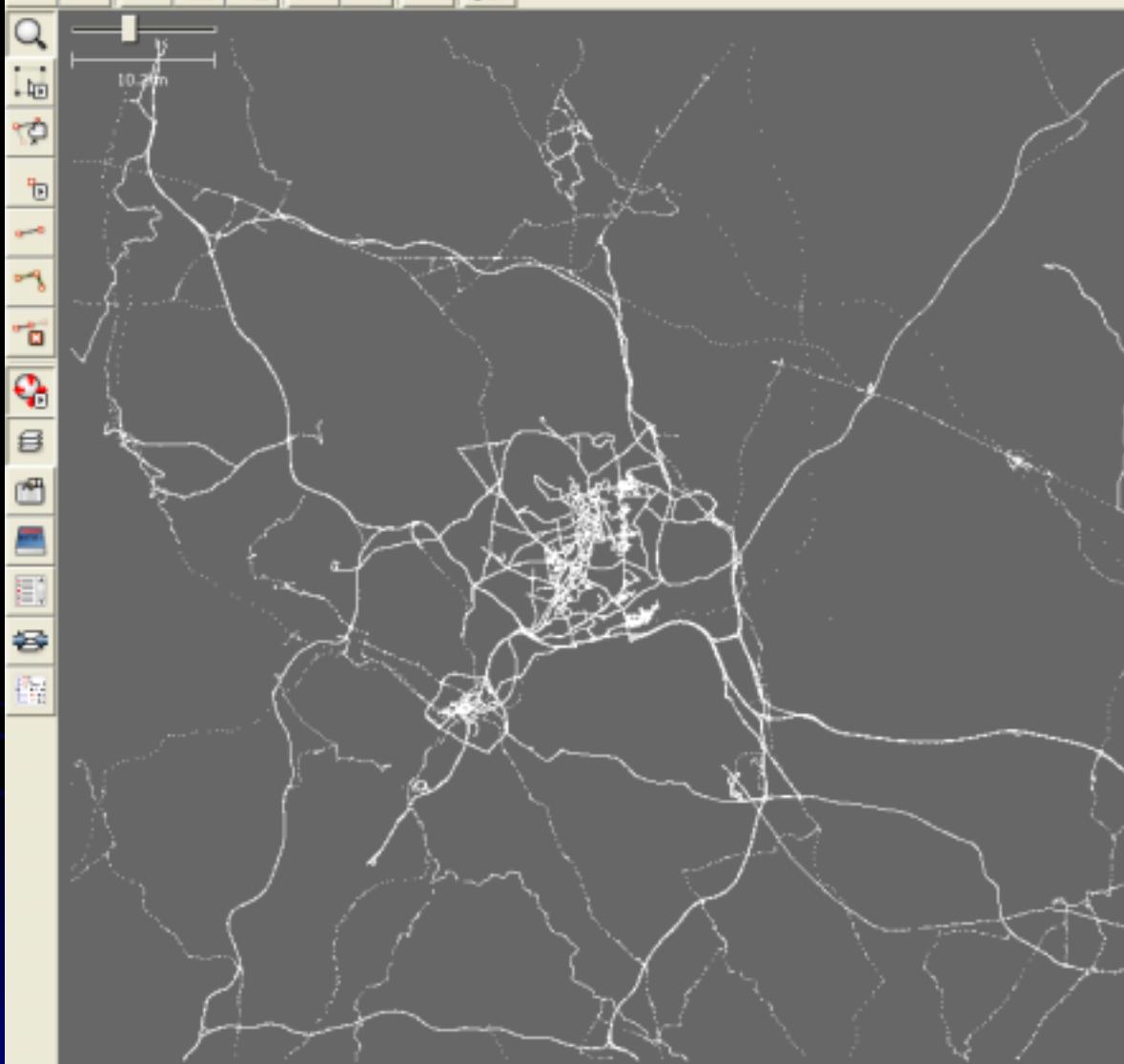
GPS trackpoints[110].gpx



Lat/Lon 52.48876118776718 -2.1307878773933715

Object





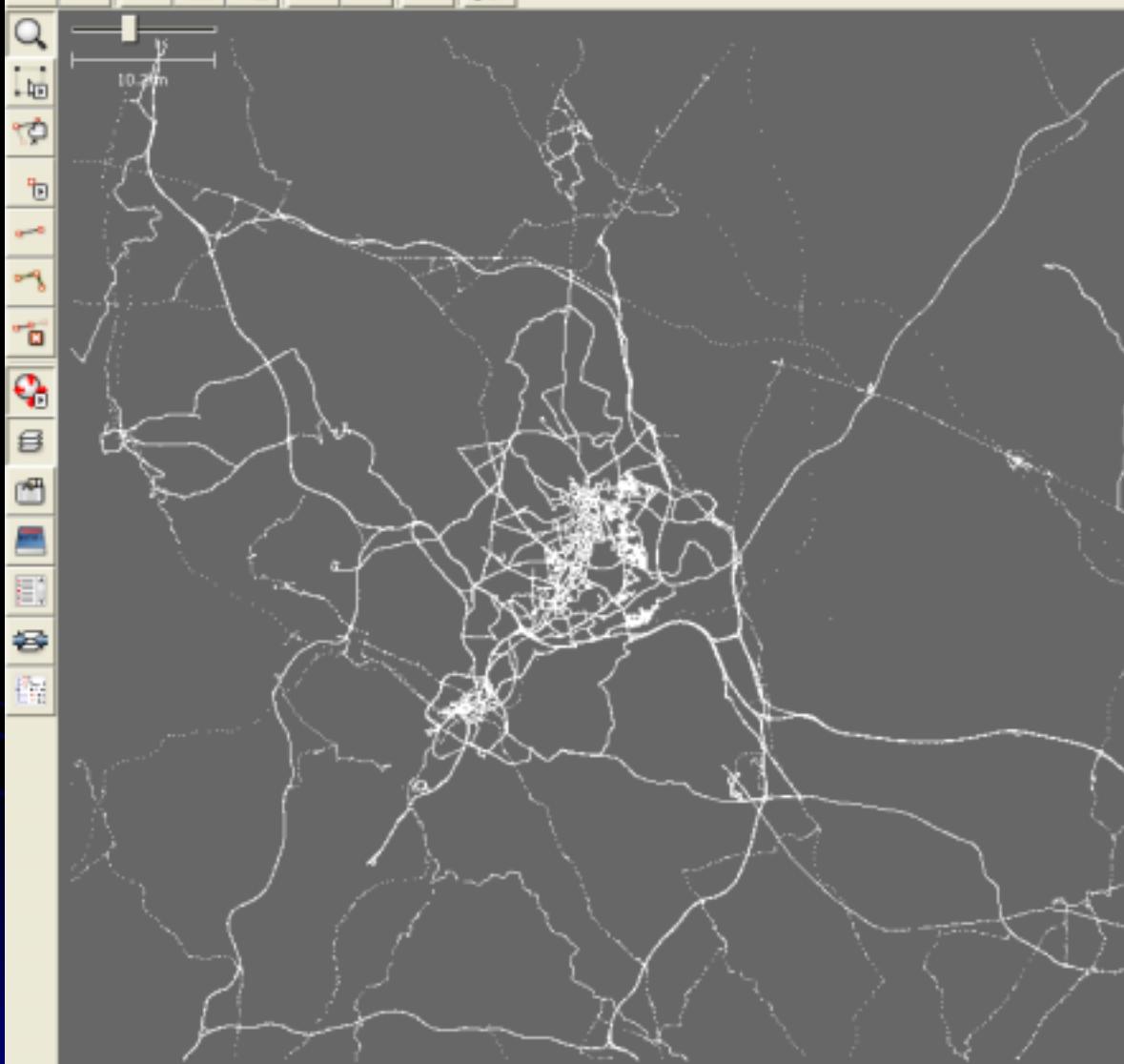
## Layers

- GPS trackpoints[90].gpx
- GPS trackpoints[91].gpx
- GPS trackpoints[92].gpx
- GPS trackpoints[93].gpx
- GPS trackpoints[94].gpx
- GPS trackpoints[95].gpx
- GPS trackpoints[96].gpx
- GPS trackpoints[97].gpx
- GPS trackpoints[98].gpx
- GPS trackpoints[99].gpx
- GPS trackpoints[100].gpx



Lat/Lon 52.470267830347844 -2.1534112209150327

Object



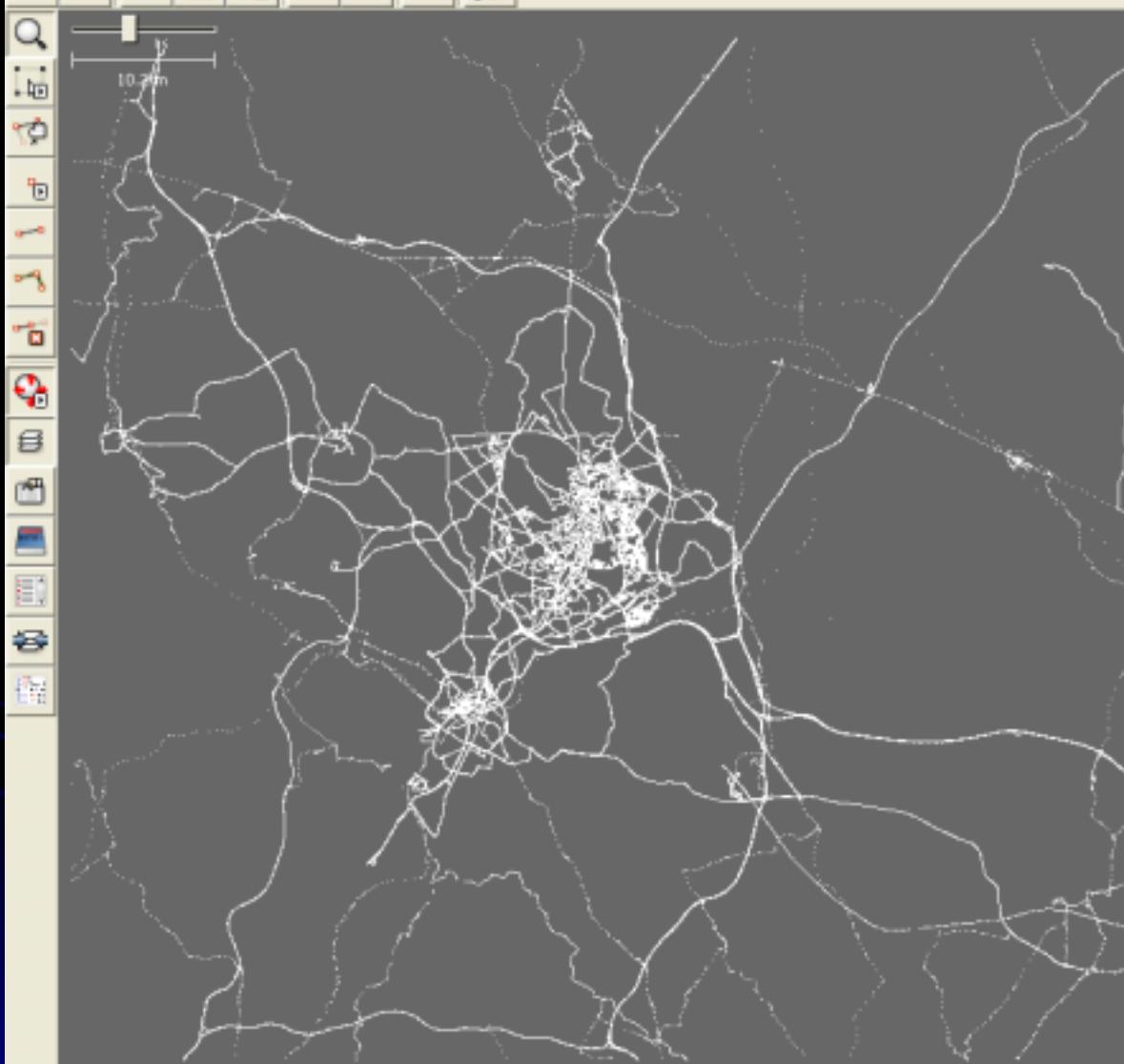
## Layers

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- GPS trackpoints[81].gpx
- GPS trackpoints[82].gpx
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- GPS trackpoints[84].gpx
- GPS trackpoints[85].gpx
- GPS trackpoints[86].gpx
- GPS trackpoints[87].gpx
- GPS trackpoints[88].gpx
- GPS trackpoints[89].gpx
- GPS trackpoints[90].gpx



Lat/Lon 52.64101590020989 -1.4522280000000003

Object



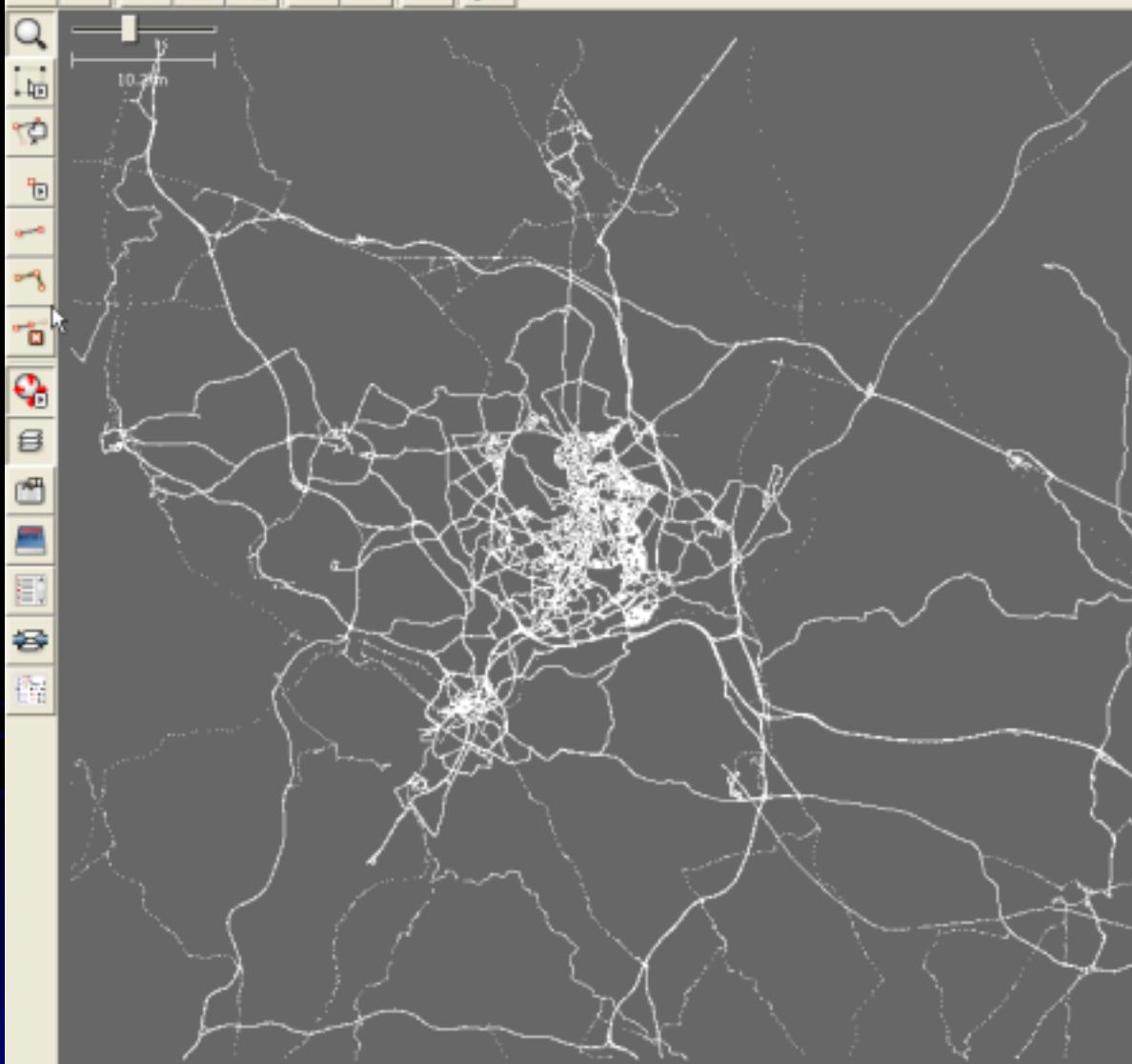
## Layers

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- GPS trackpoints[72].gpx
- GPS trackpoints[73].gpx
- GPS trackpoints[74].gpx
- GPS trackpoints[75].gpx
- GPS trackpoints[76].gpx
- GPS trackpoints[77].gpx
- GPS trackpoints[78].gpx
- GPS trackpoints[79].gpx
- GPS trackpoints[80].gpx



Lat/Lon 52.430554801884384 -2.113028941176471

Object



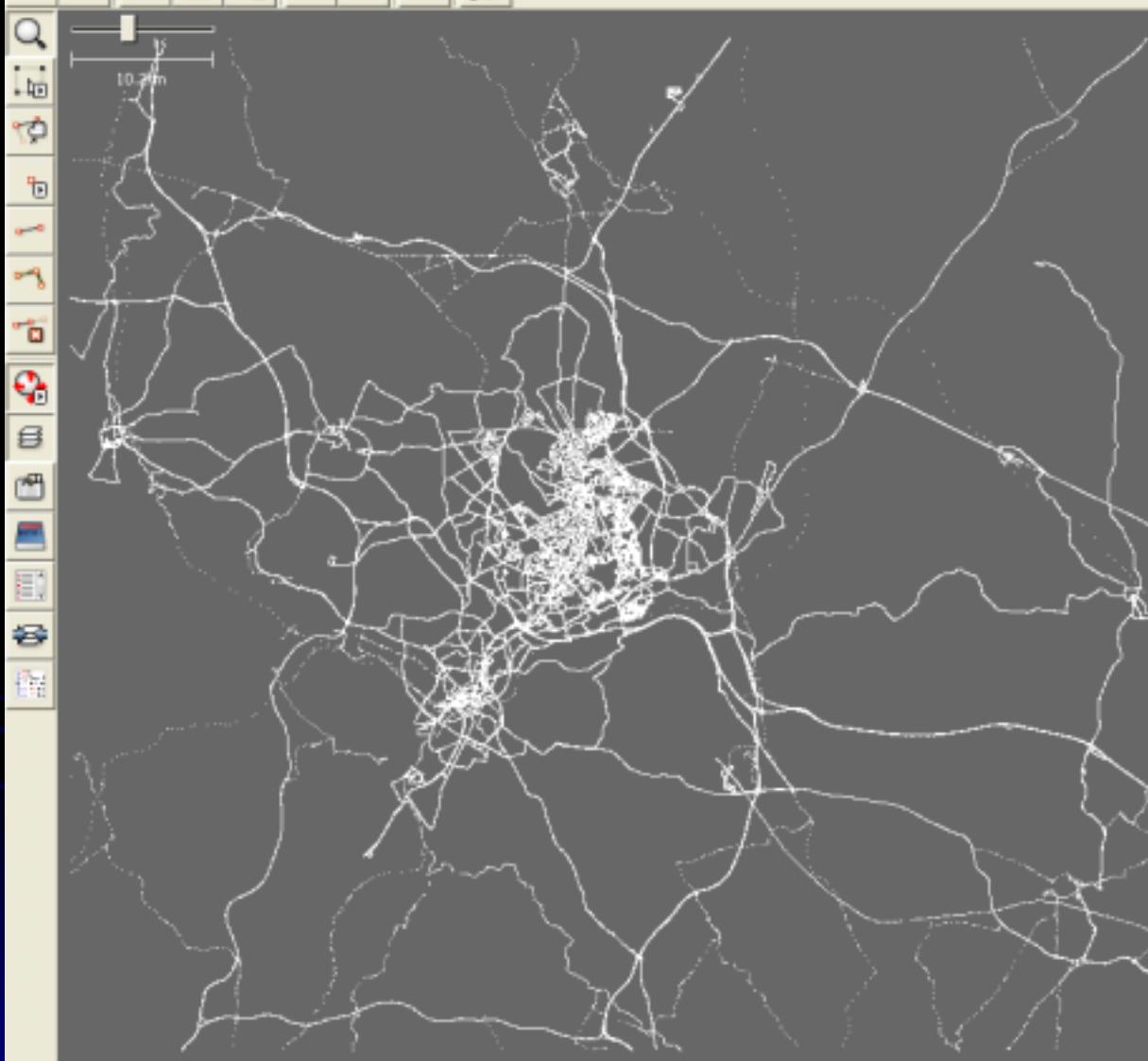
## Layers

- GPS trackpoints[60].gpx
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- GPS trackpoints[62].gpx
- GPS trackpoints[63].gpx
- GPS trackpoints[64].gpx
- GPS trackpoints[65].gpx
- GPS trackpoints[66].gpx
- GPS trackpoints[67].gpx
- GPS trackpoints[68].gpx
- GPS trackpoints[69].gpx
- GPS trackpoints[70].gpx



Lat/Lon 52.47250411862238 -2.157082337254902

Object



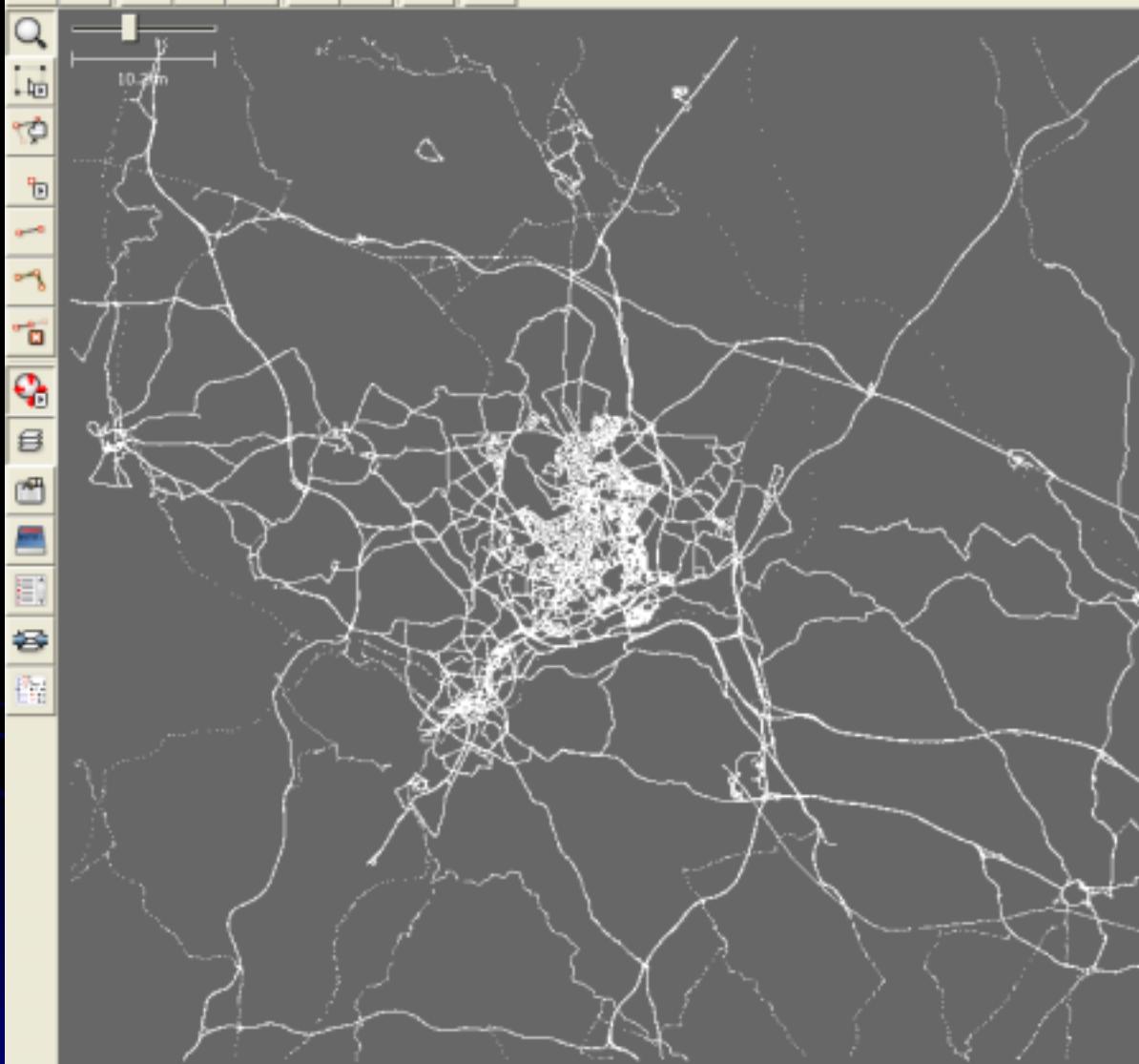
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- GPS trackpoints[56].gpx
- GPS trackpoints[57].gpx
- GPS trackpoints[58].gpx
- GPS trackpoints[59].gpx
- GPS trackpoints[60].gpx



Lat/Lon 52.39752658846005 -2.0845777895424837

Object



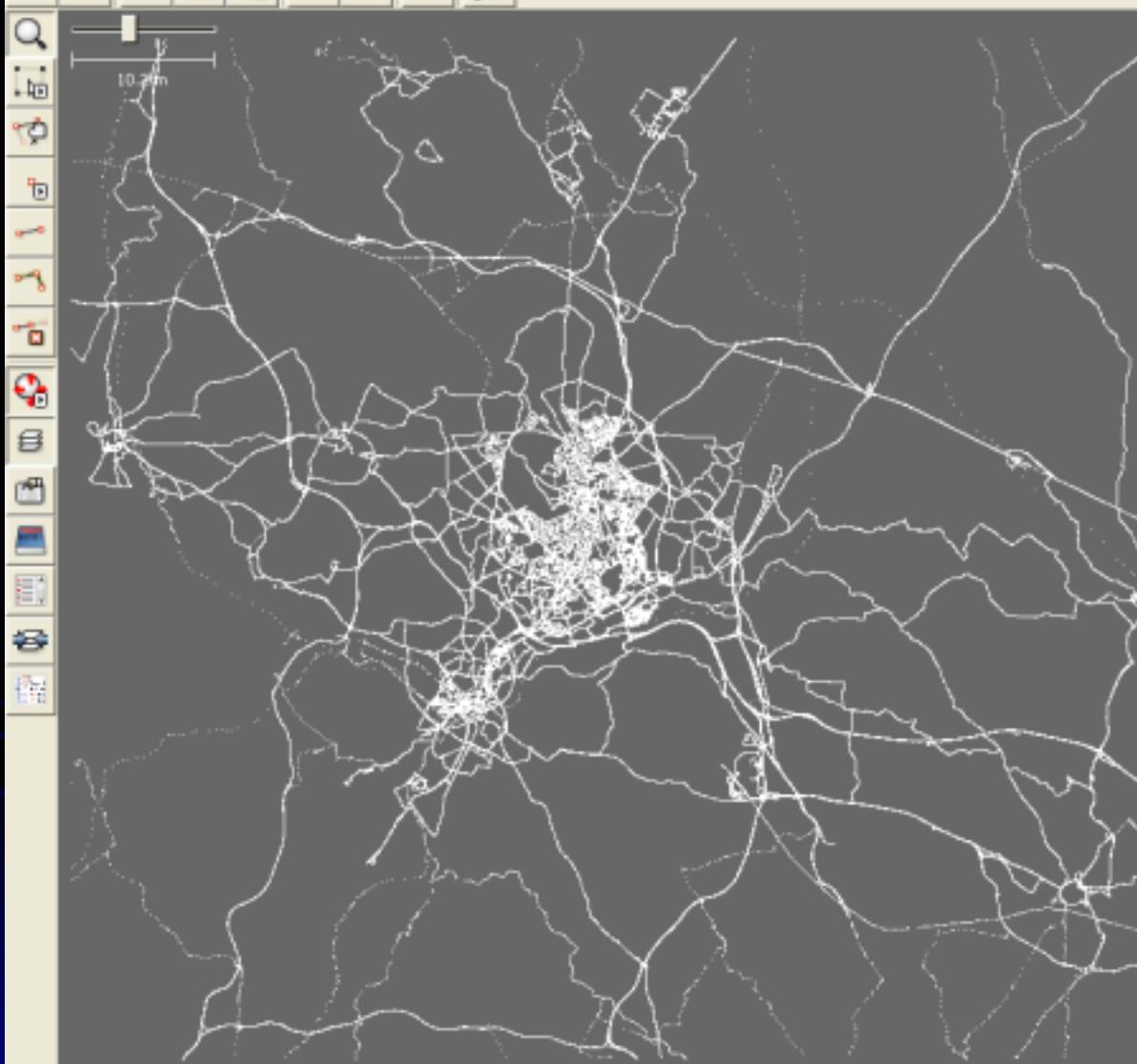
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- GPS trackpoints[43].gpx
- GPS trackpoints[44].gpx
- GPS trackpoints[45].gpx
- GPS trackpoints[46].gpx
- GPS trackpoints[47].gpx
- GPS trackpoints[48].gpx
- GPS trackpoints[49].gpx
- GPS trackpoints[50].gpx



Lat/Lon 52.65771868037226 -1.4586214073019608

Object



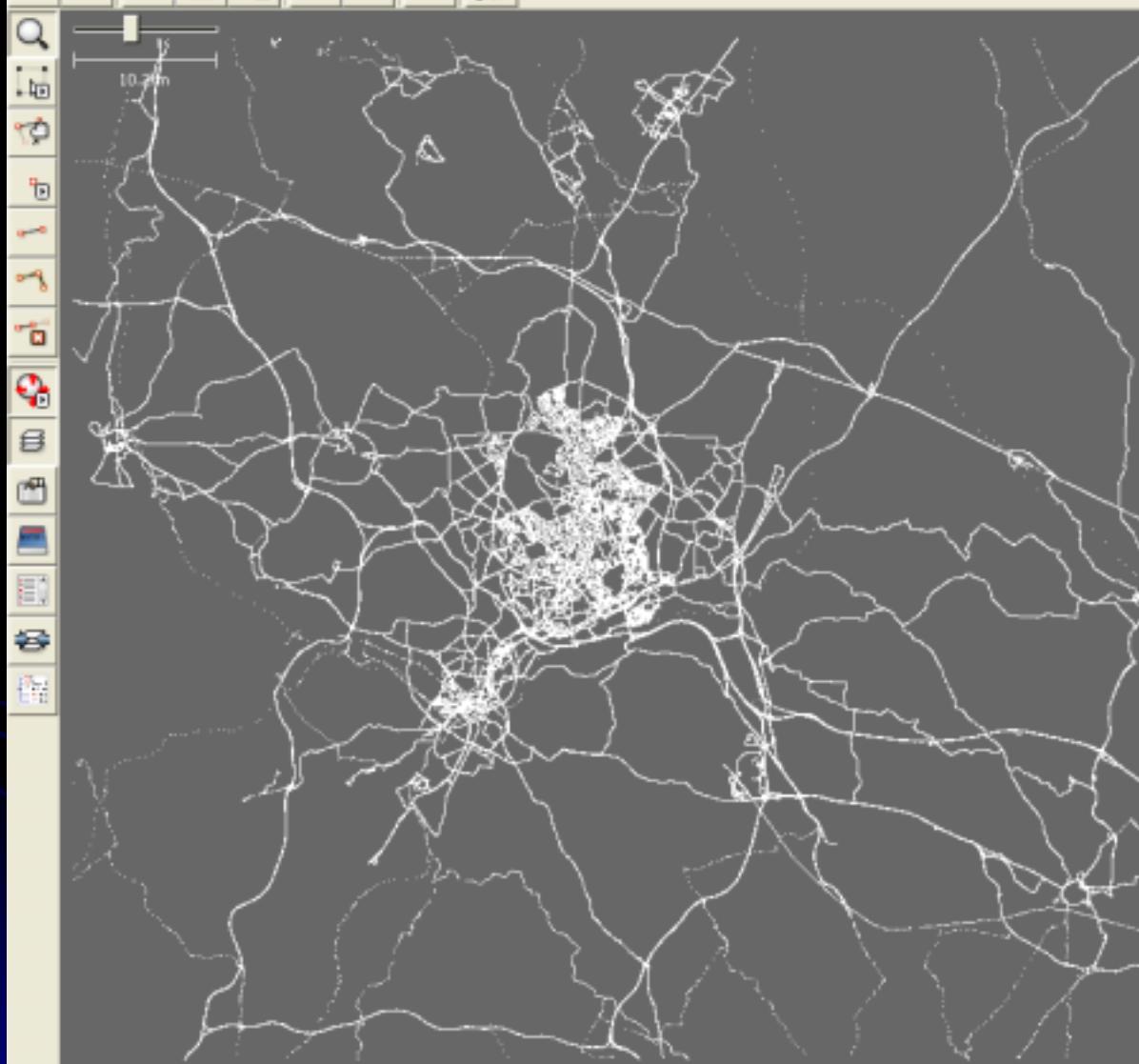
## Layers

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- GPS trackpoints[32].gpx
- GPS trackpoints[33].gpx
- GPS trackpoints[34].gpx
- GPS trackpoints[35].gpx
- GPS trackpoints[36].gpx
- GPS trackpoints[37].gpx
- GPS trackpoints[38].gpx
- GPS trackpoints[39].gpx
- GPS trackpoints[40].gpx



Lat/Lon 52.47473063195734 -1.456785767215686

Object



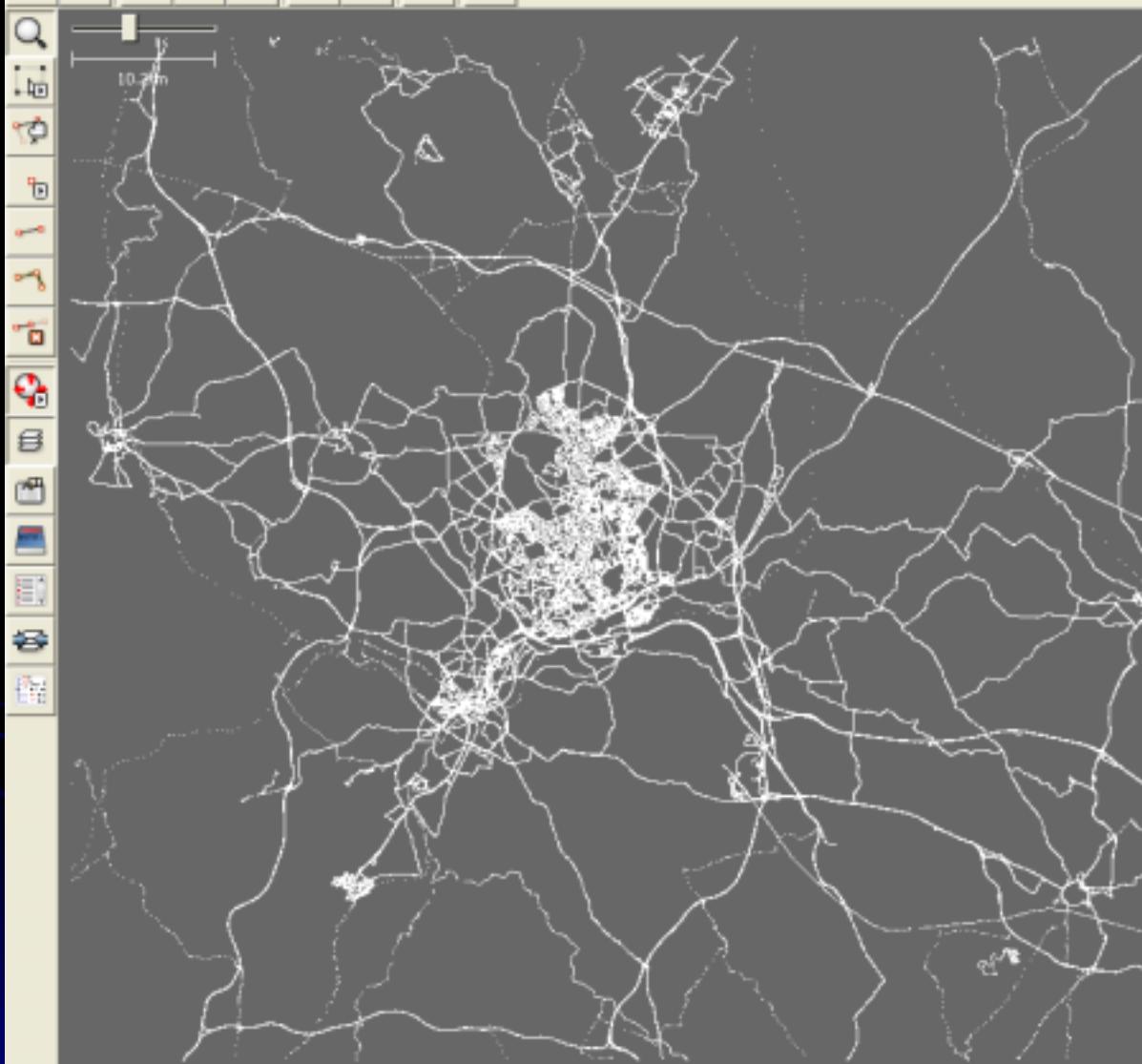
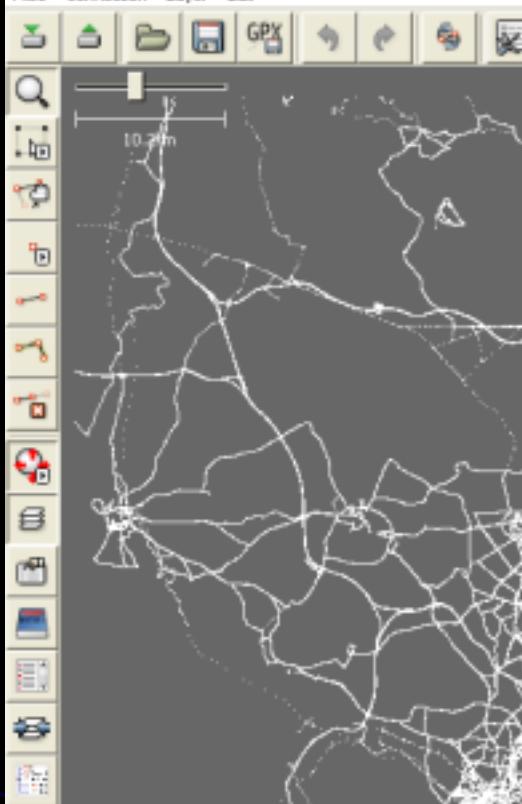
20

- GPS trackpoints[20].gpx  
GPS trackpoints[21].gpx  
GPS trackpoints[22].gpx  
GPS trackpoints[23].gpx  
GPS trackpoints[24].gpx  
GPS trackpoints[25].gpx  
GPS trackpoints[26].gpx  
GPS trackpoints[27].gpx  
GPS trackpoints[28].gpx  
GPS trackpoints[29].gpx  
GPS trackpoints[30].gpx



Lat/Lon 52.620957586156564 -1.753241641149019

Objet



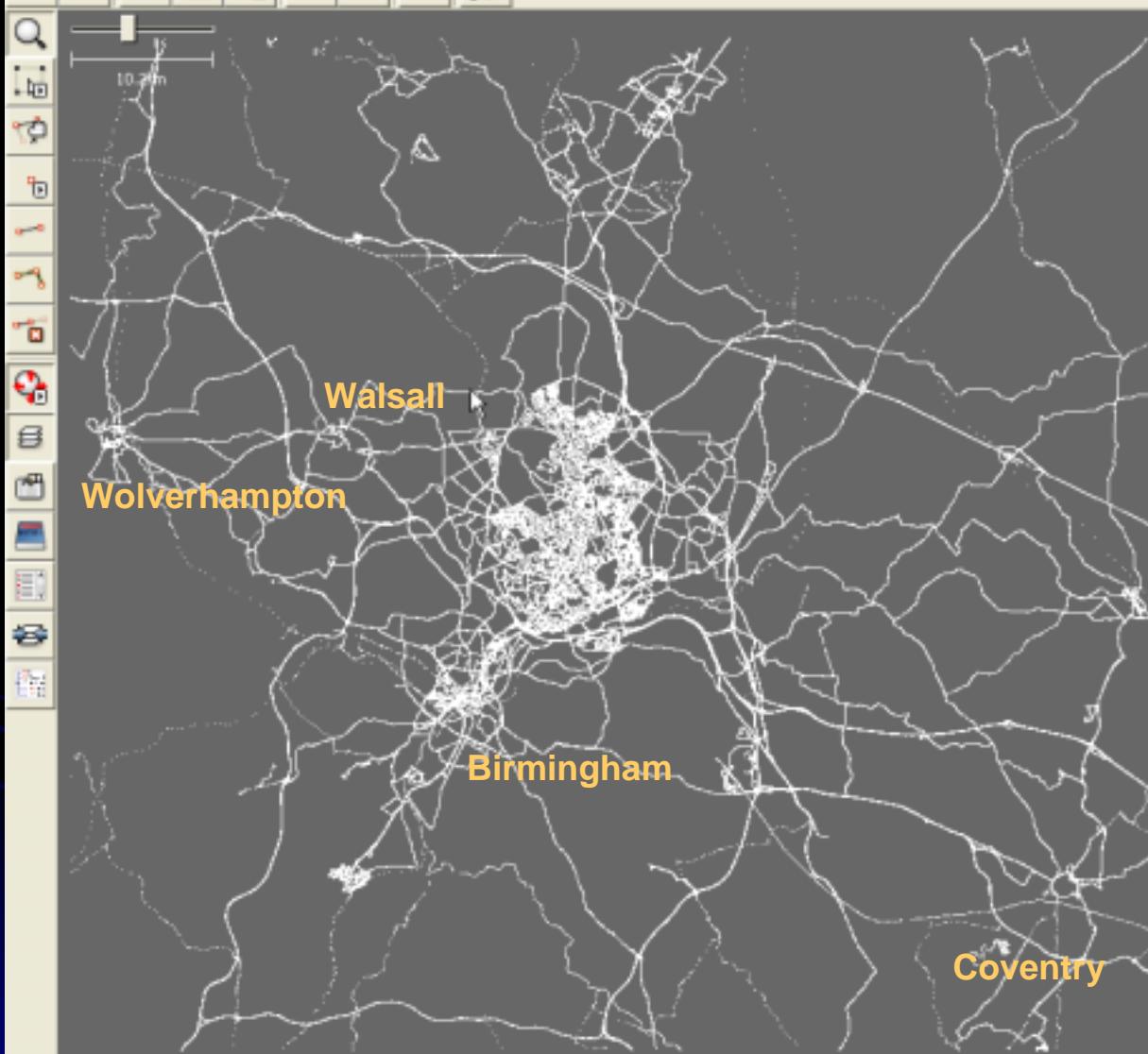
## Layers

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- GPS trackpoints[1].gpx
- GPS trackpoints[02].gpx
- GPS trackpoints[03].gpx
- GPS trackpoints[4].gpx
- GPS trackpoints[05].gpx
- GPS trackpoints[06].gpx
- GPS trackpoints[07].gpx
- GPS trackpoints[8].gpx
- GPS trackpoints[9].gpx
- GPS trackpoints[10].gpx



Lat/Lon 52.56799205176665 -2.153411179956863

Object



| Layers |                     |
|--------|---------------------|
| GPS    | trackpoints[00].gpx |
| GPS    | trackpoints[1].gpx  |
| GPS    | trackpoints[02].gpx |
| GPS    | trackpoints[03].gpx |
| GPS    | trackpoints[4].gpx  |
| GPS    | trackpoints[05].gpx |
| GPS    | trackpoints[06].gpx |
| GPS    | trackpoints[07].gpx |
| GPS    | trackpoints[8].gpx  |
| GPS    | trackpoints[9].gpx  |
| GPS    | trackpoints[10].gpx |

Lat/Lon 52.66495386009186 -2.098341977368628

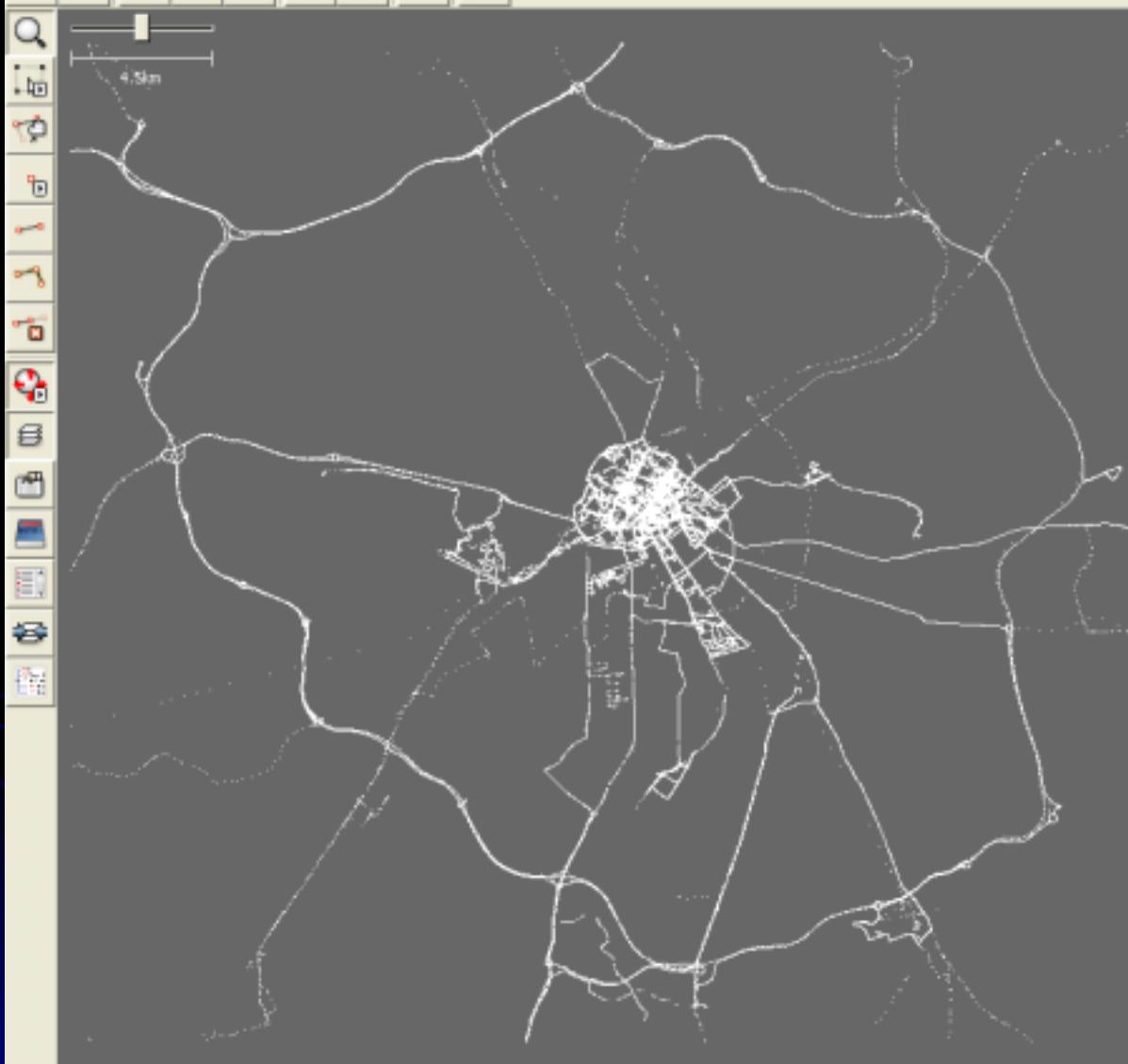
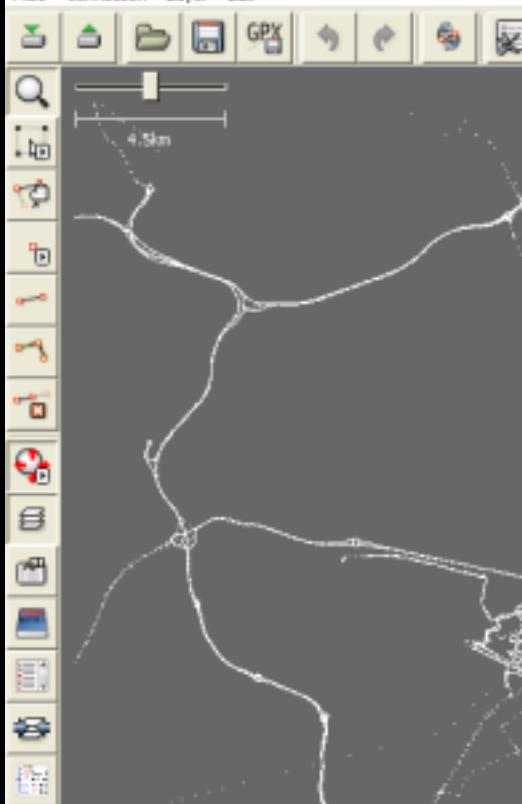
Object

600,000 track points



Files Connection Layer Edit

Help



Layers

GPS

53.38579204525405 -2.4066278580876323 x 53.55



Lat,Lon 53.560260688468276 -2.3495327890222223

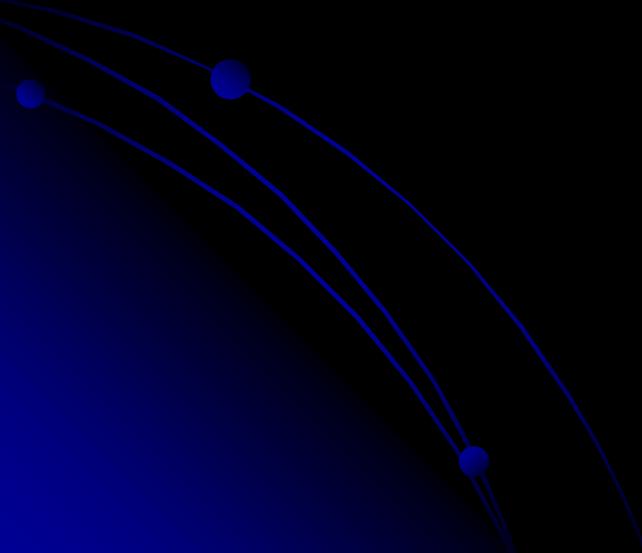
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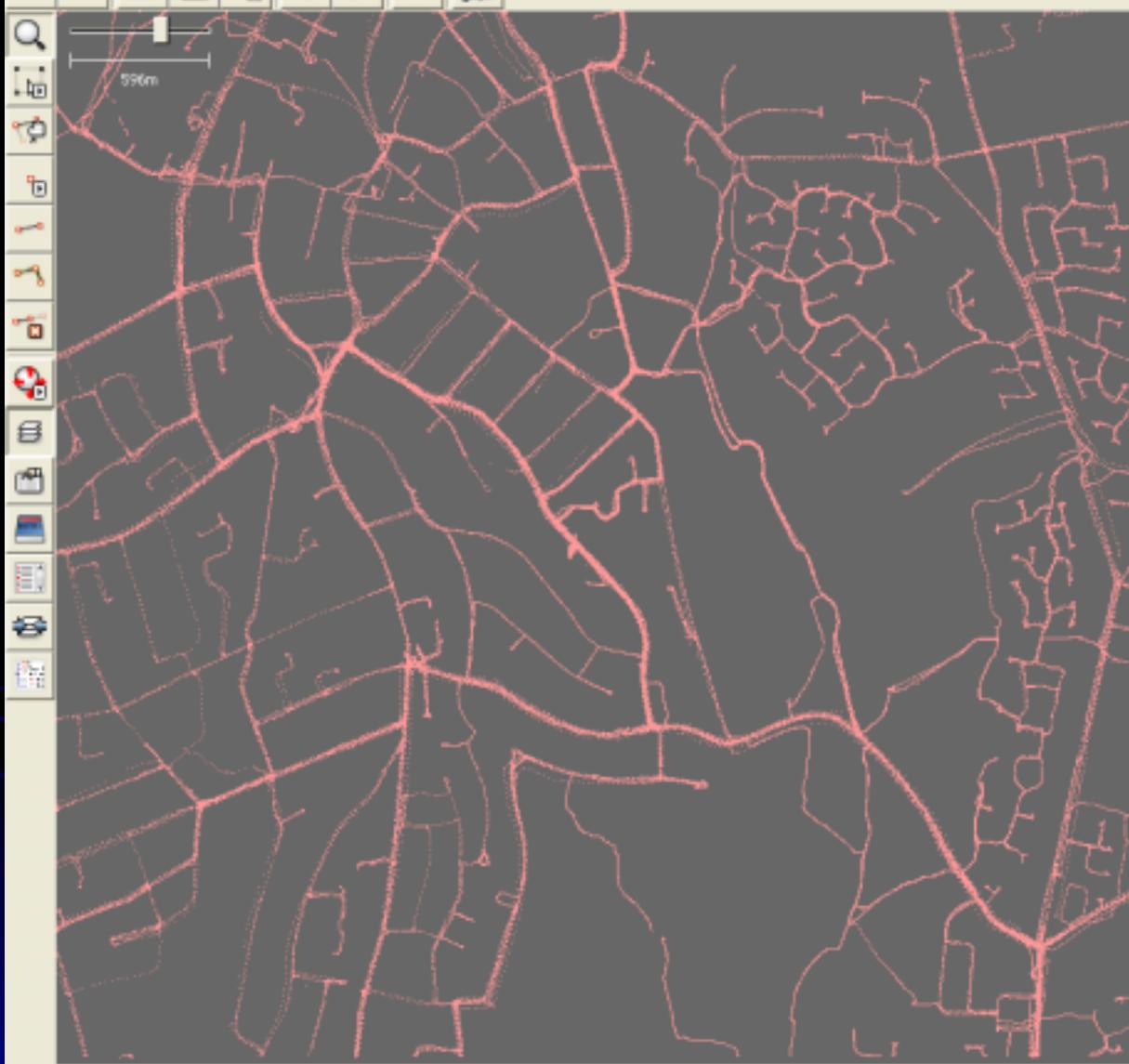
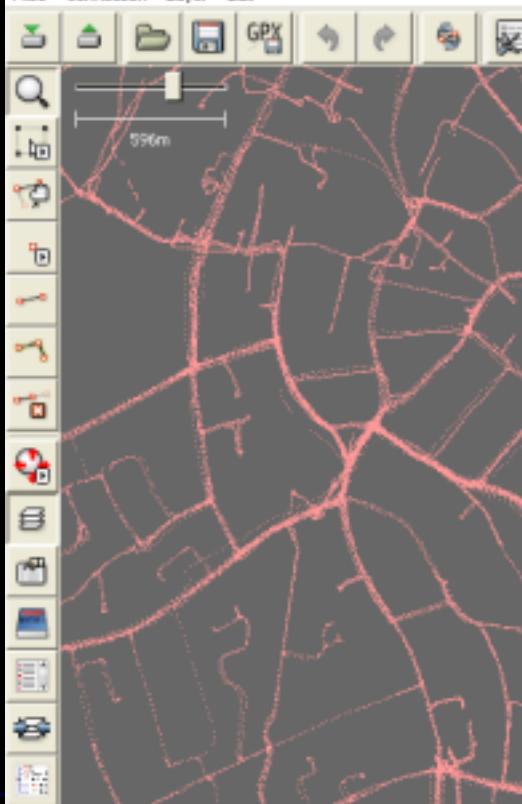
Manchester





# Editing Map Data





Layers

**GPS** 52.53912190336605 -1.8384098309572716 x 52.56

Data Layer

A panel titled "Layers" on the right side of the interface. It lists a single data source named "GPS". Below the name, there is a thumbnail icon of a globe with a magnifying glass over it, followed by the text "Data Layer". There are also standard window control buttons (minimize, maximize, close) at the bottom of the panel.

Lat/Lon 52.55315346724071 -1.836825455260609

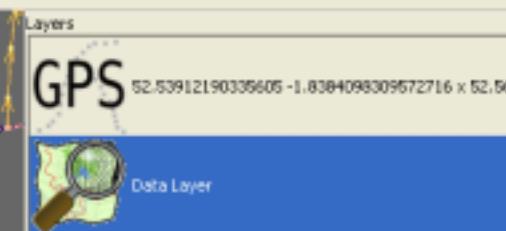
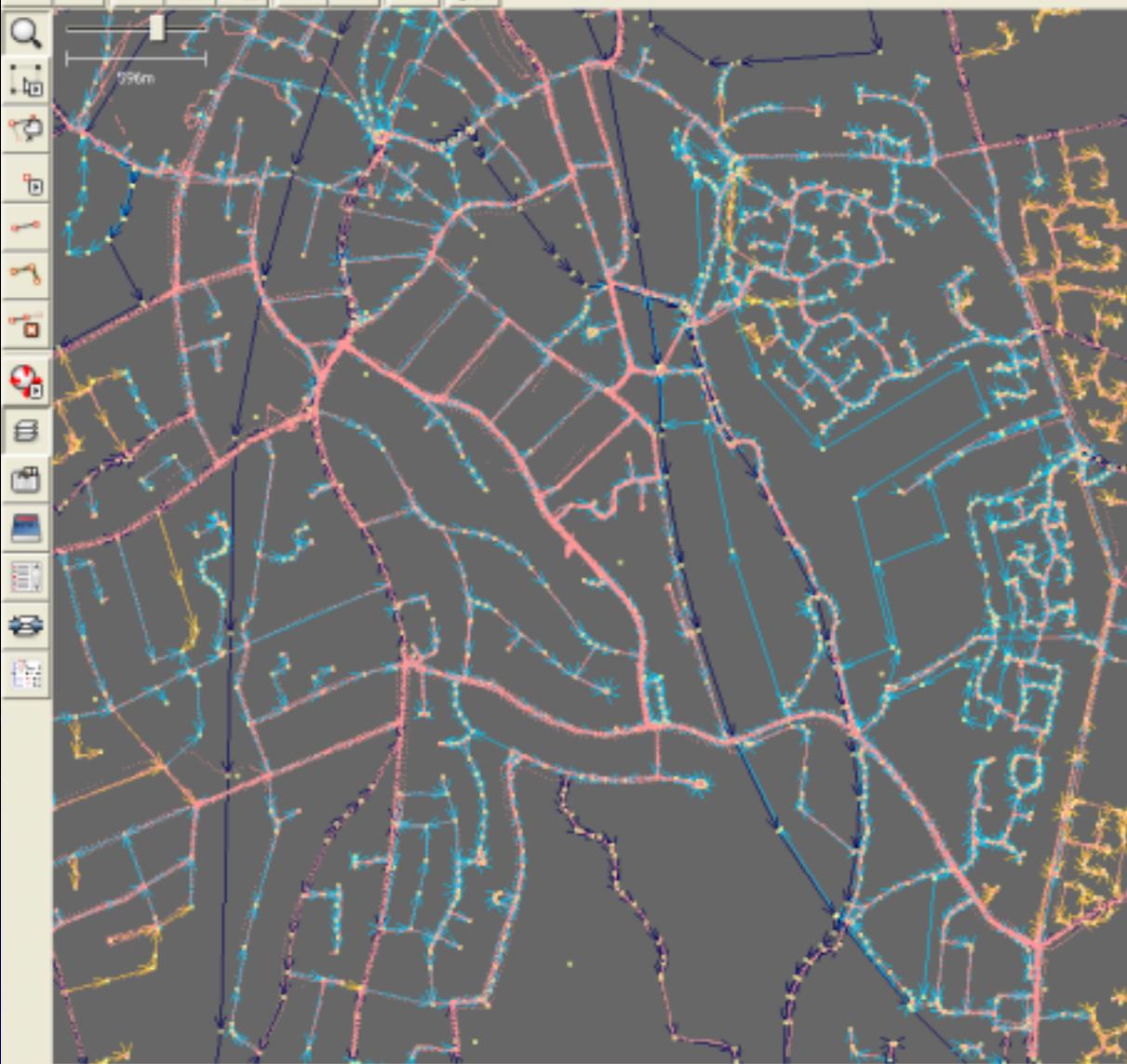
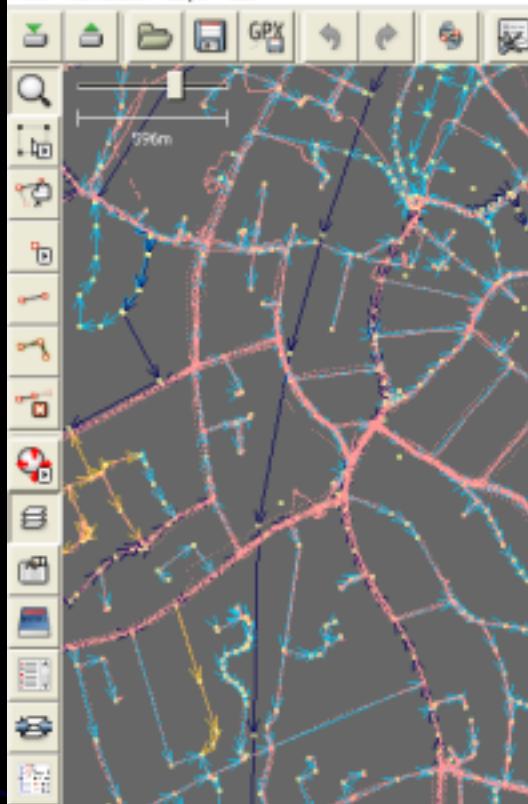
Object 358682 (52.561384670897, -1.83926582336426)

Local - GPS Trackpoints



Files Connection Layer Edit

Help

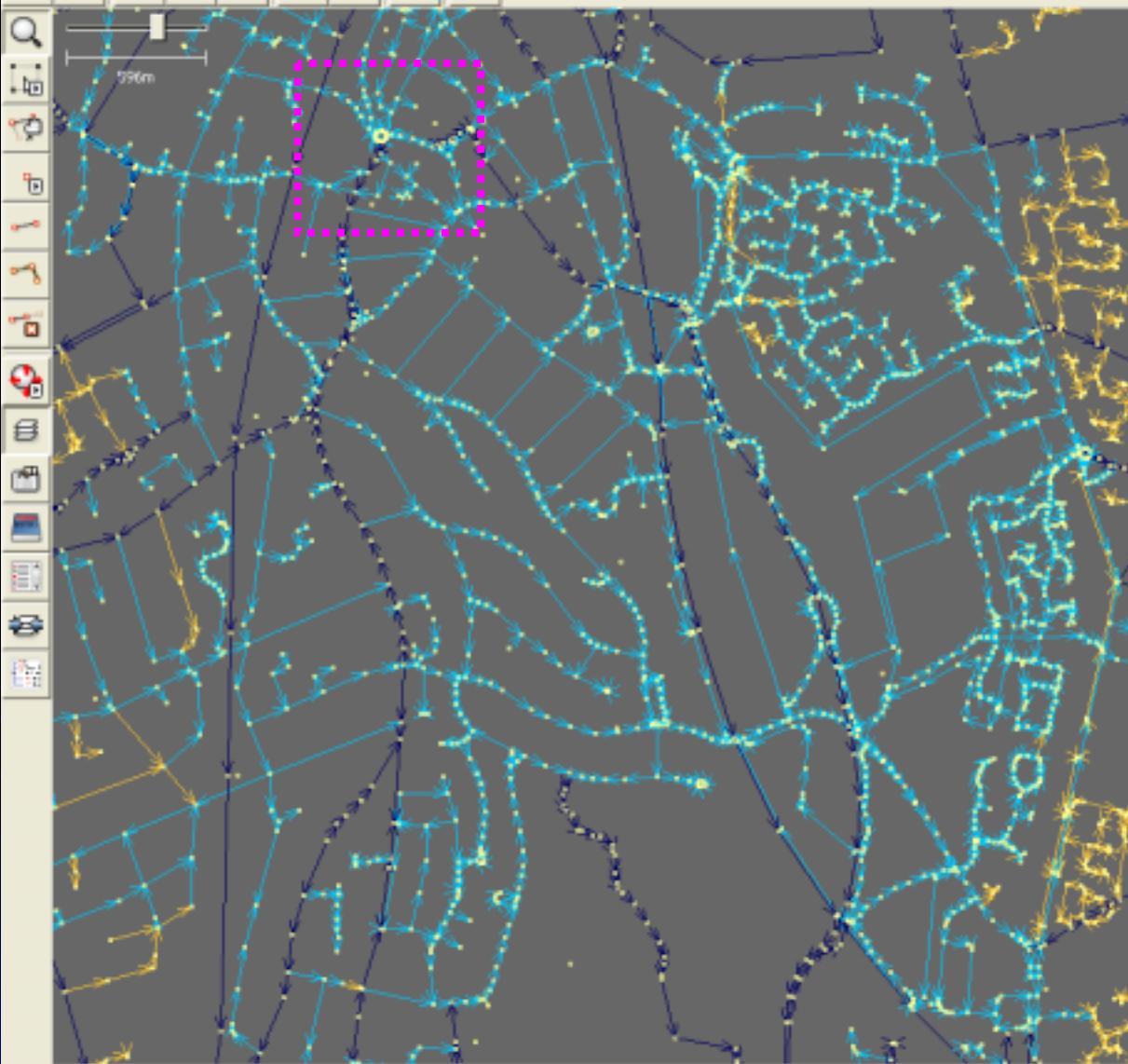
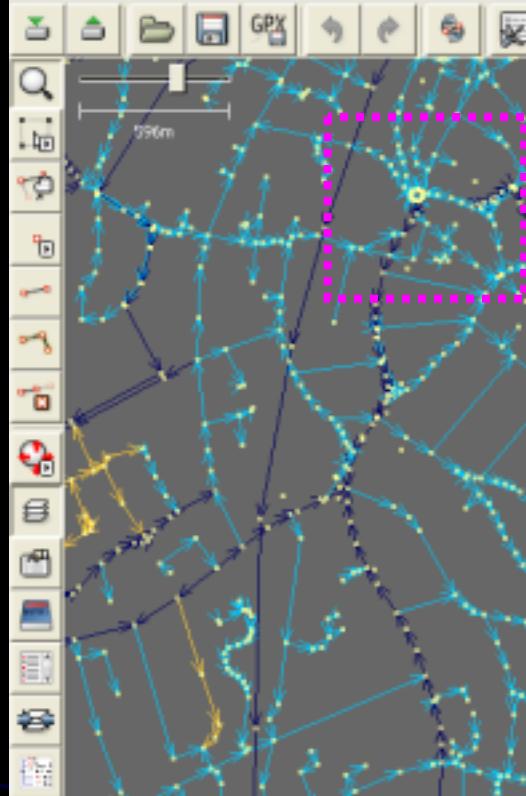


Lat/Lon 52.54579290200859 -1.830468181445159

Object

Local - GPS Trackpoints & Map Data





Layers

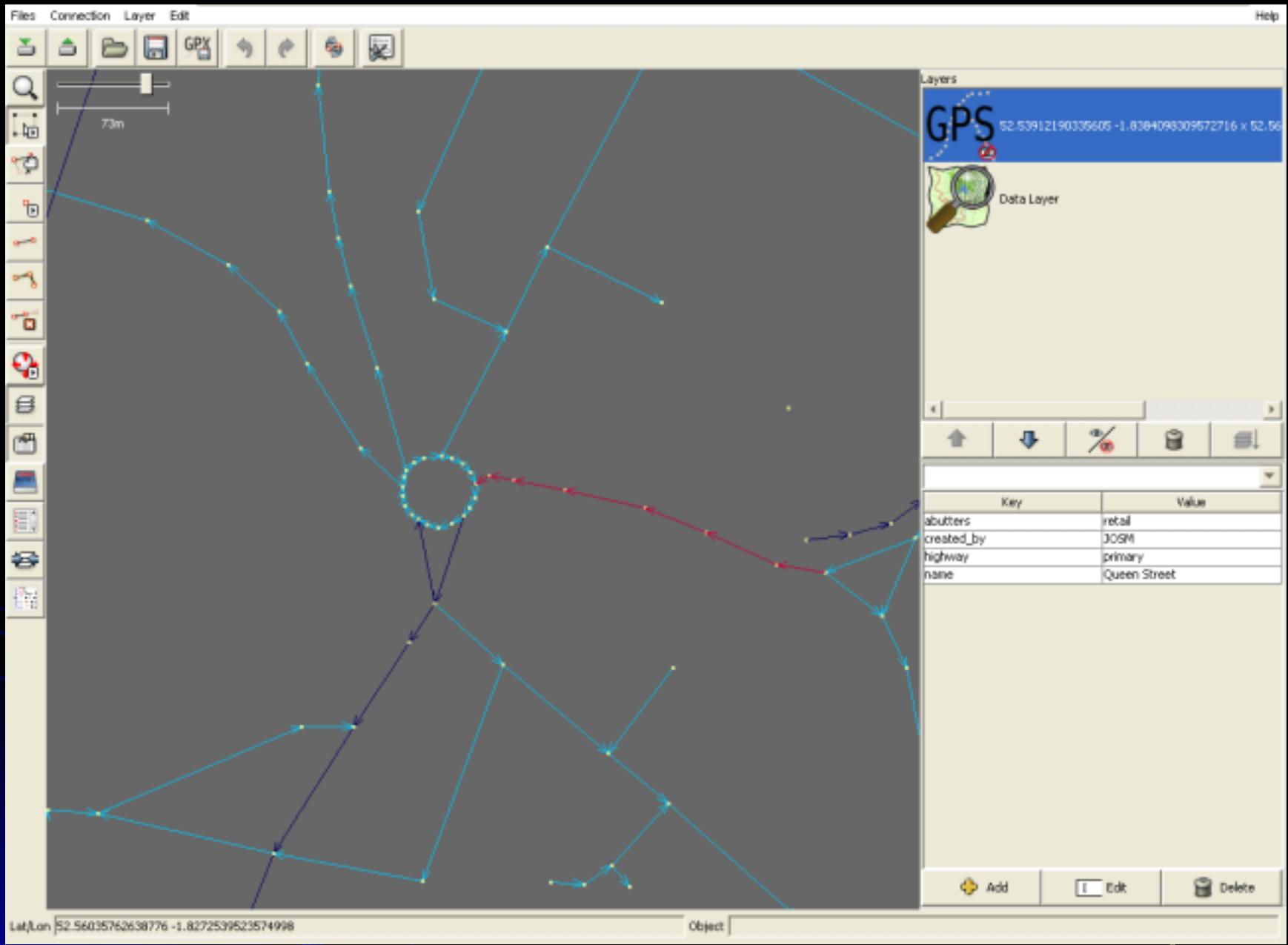
GPS 52.53912190336605 -1.8384098309572716 x 52.56

Data Layer



Local – Map Data Alone





Local – Editing & Annotation





The Free Wiki World Map

[Help & Wiki](#)  
[News blog](#)  
[Shop](#)

User

display name:

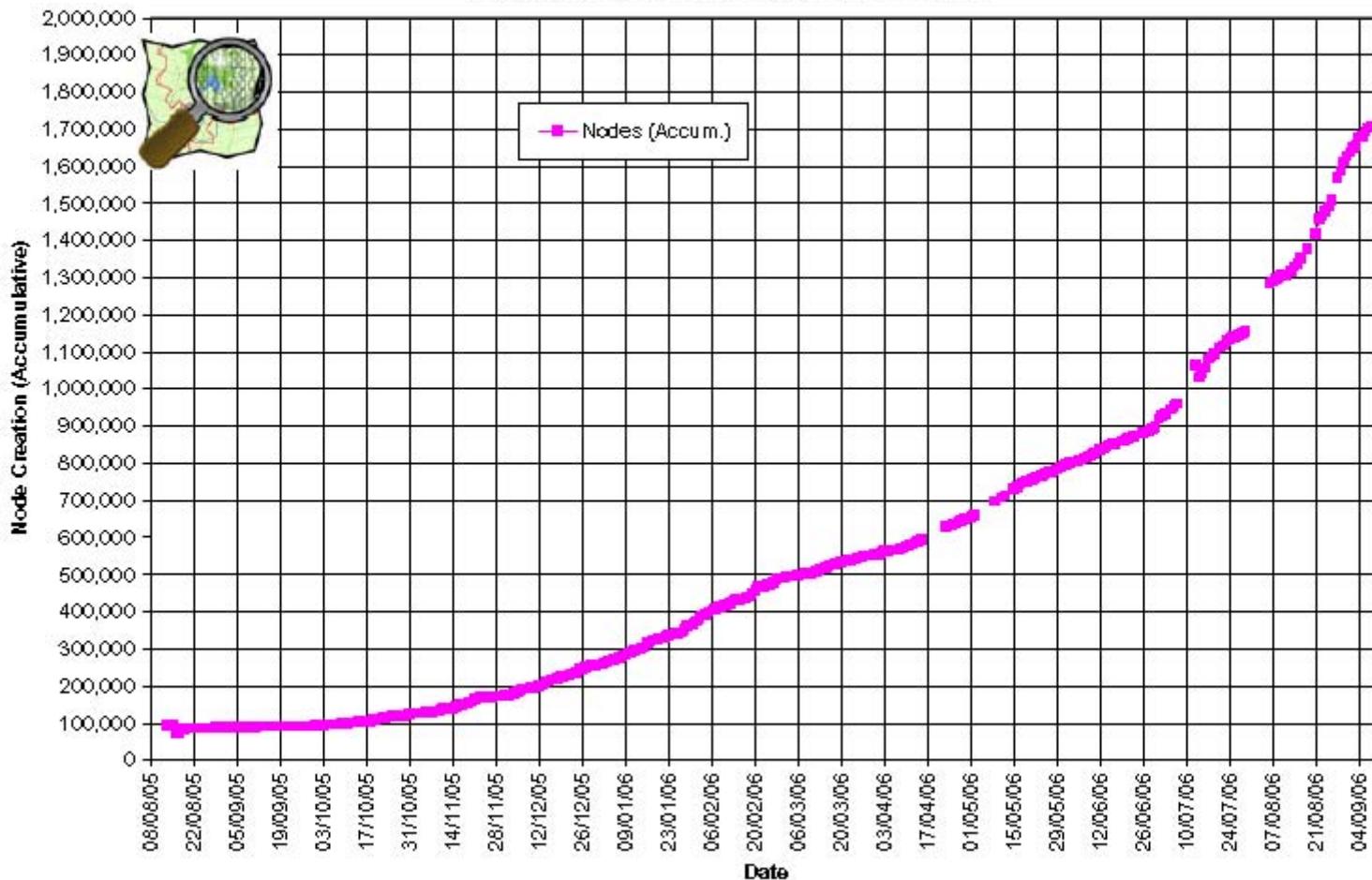
blackadder

[save](#)[Make a Donation](#)

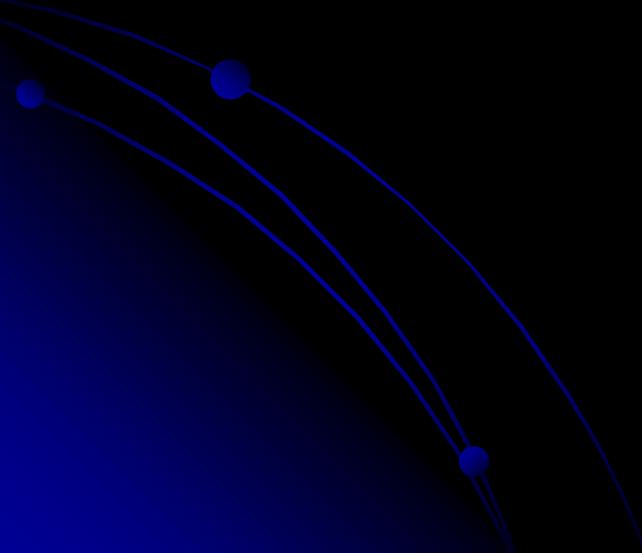
# Current Statistics

- 3100+ registered users
- 200 active contributors per month
- 30 Million+ gps trackpoints
- 250,000+ km of Linear features created

**OpenStreetMap Database Statistics**  
**Node Creation**  
**(EXCLUDES TIGER NODE DATA FROM 16/04/06)**

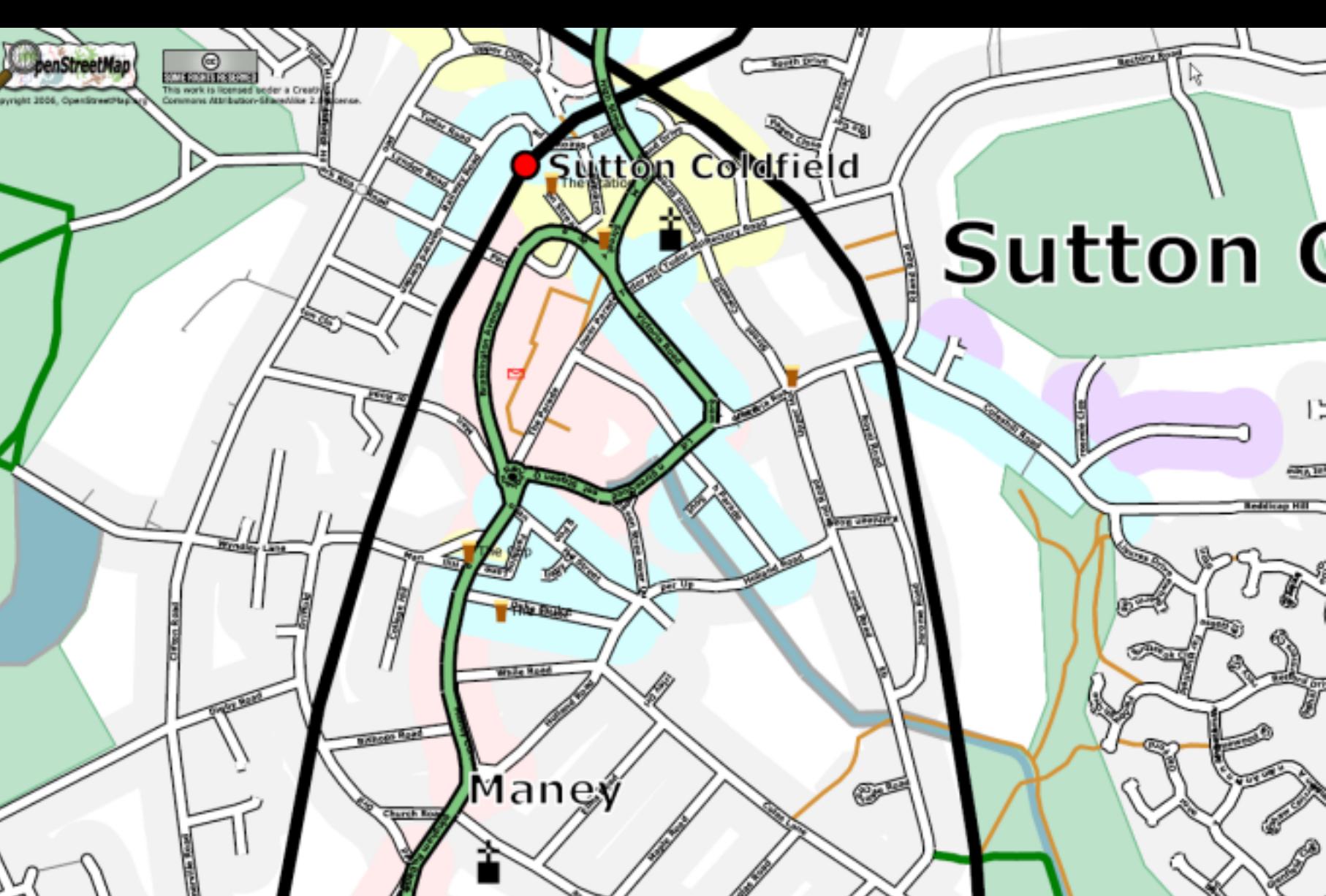


# Rendering Data



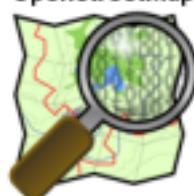


Rendering – stage 1

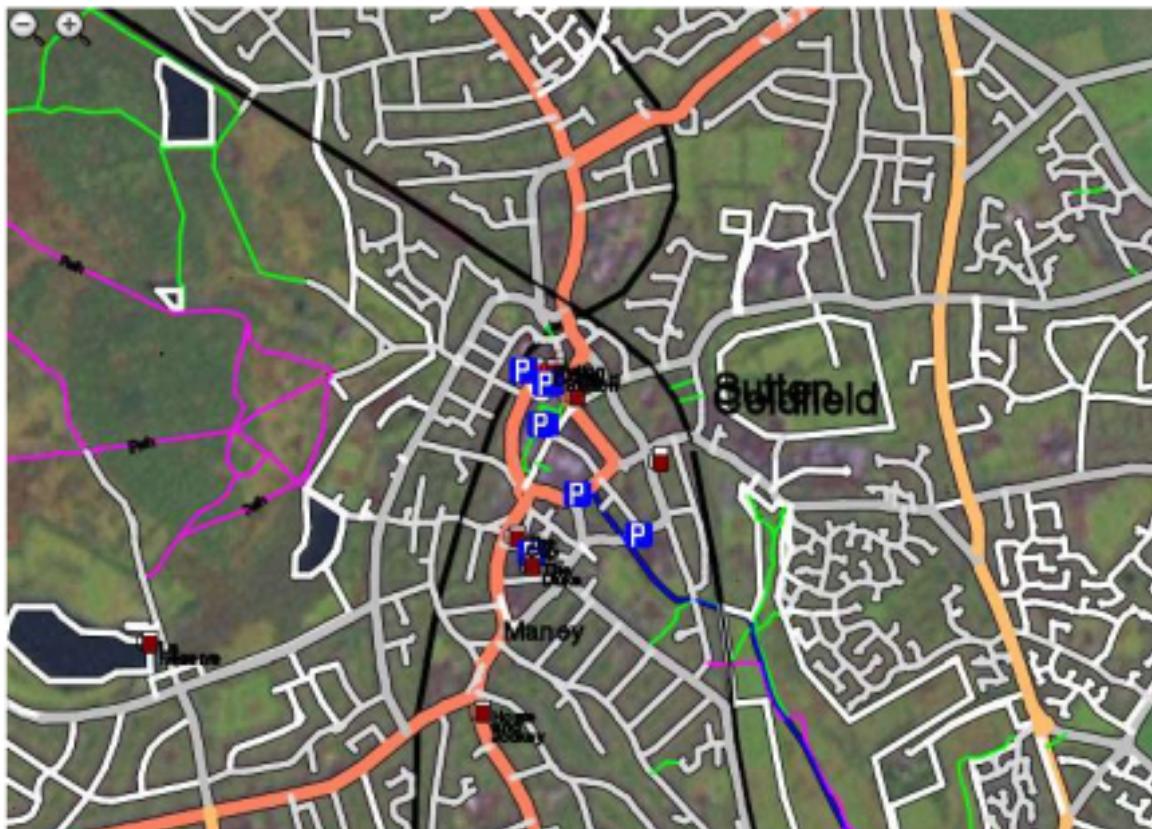


Rendering – stage 2



[OpenStreetMap](#)

The Free Wiki World Map

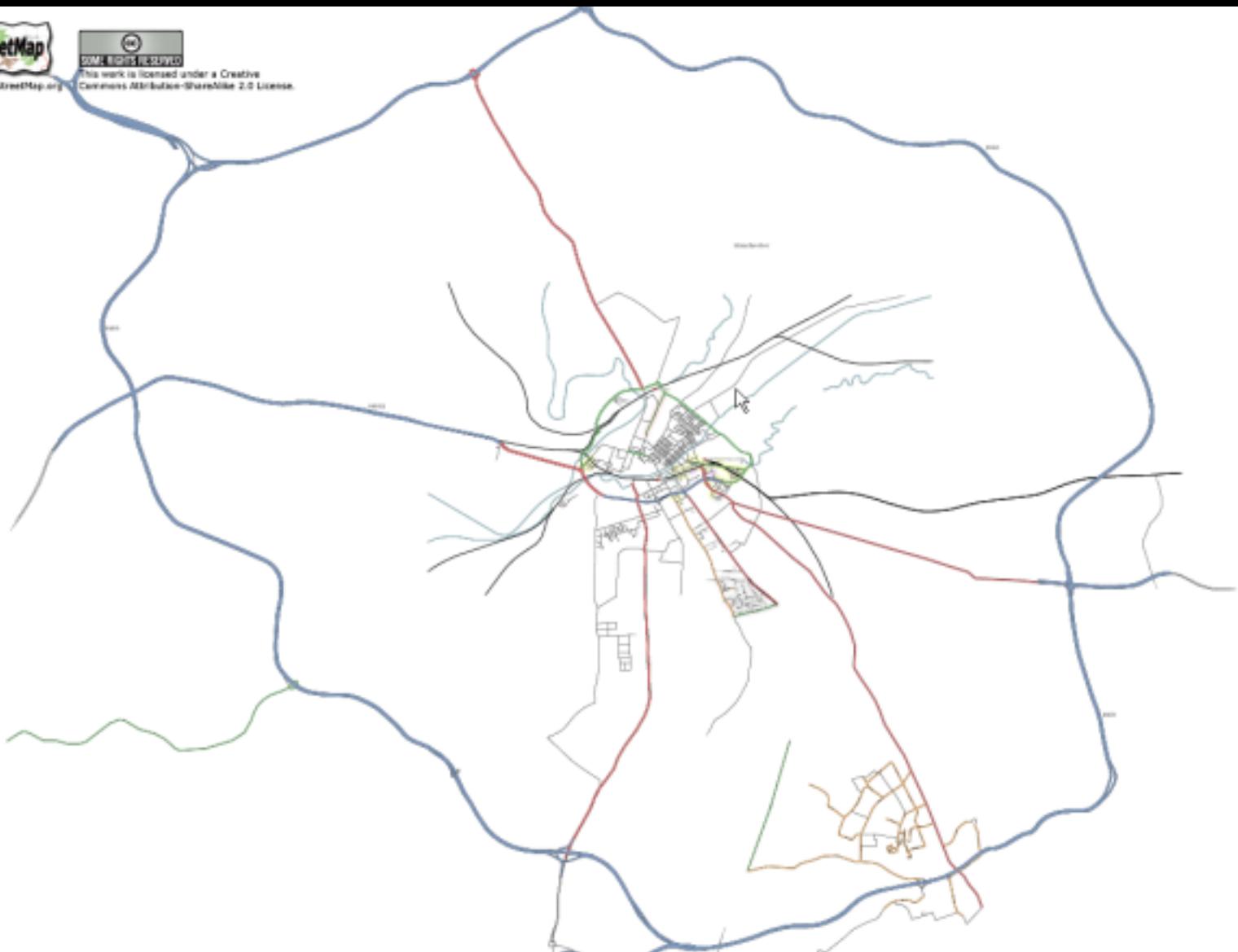
[Help & Wiki](#)  
[News blog](#)  
[Shop](#)**User**display name:  
blackadder 



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Rendering – Manchester

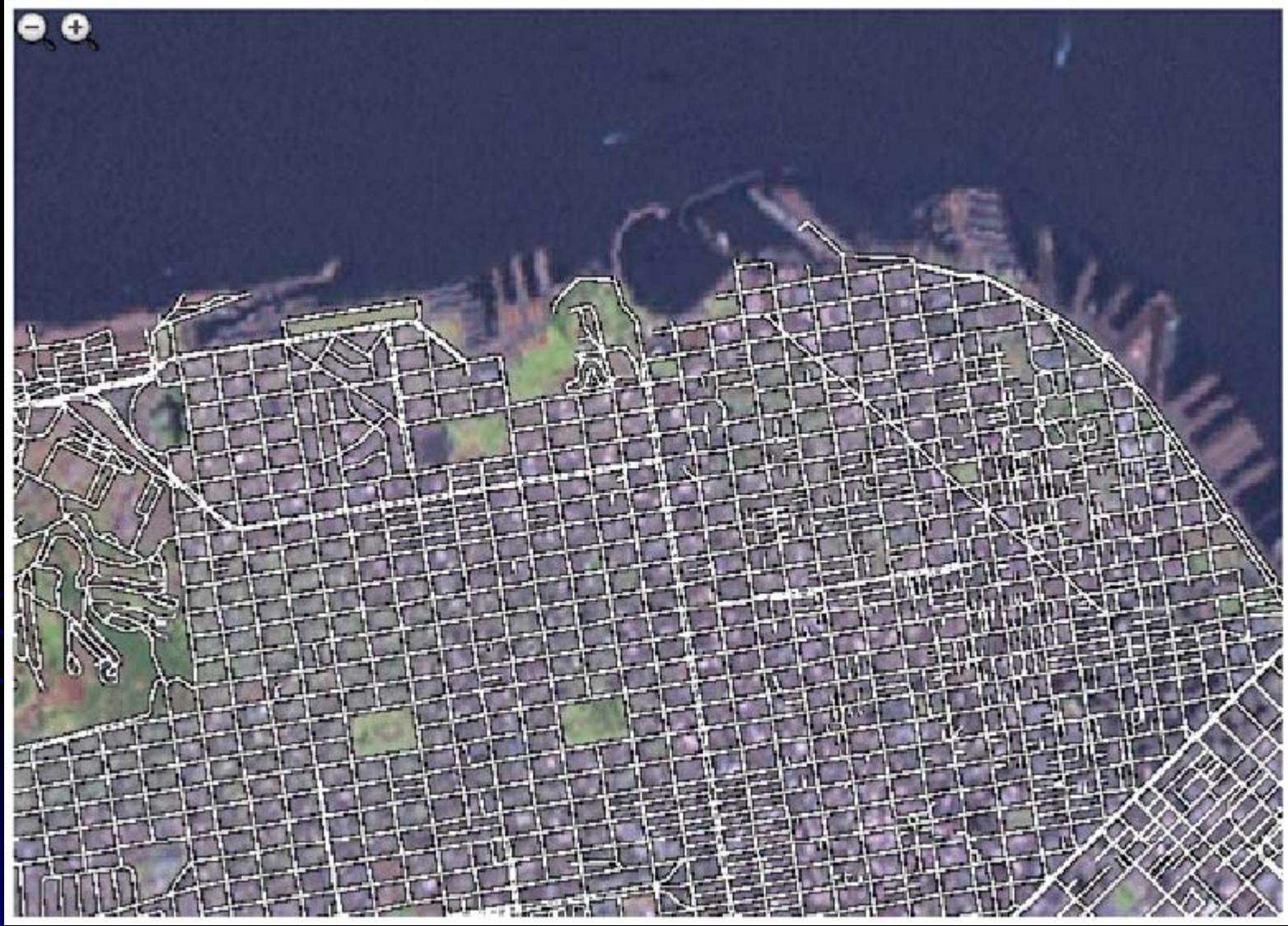


# Imported Data

- **TIGER/LINE**

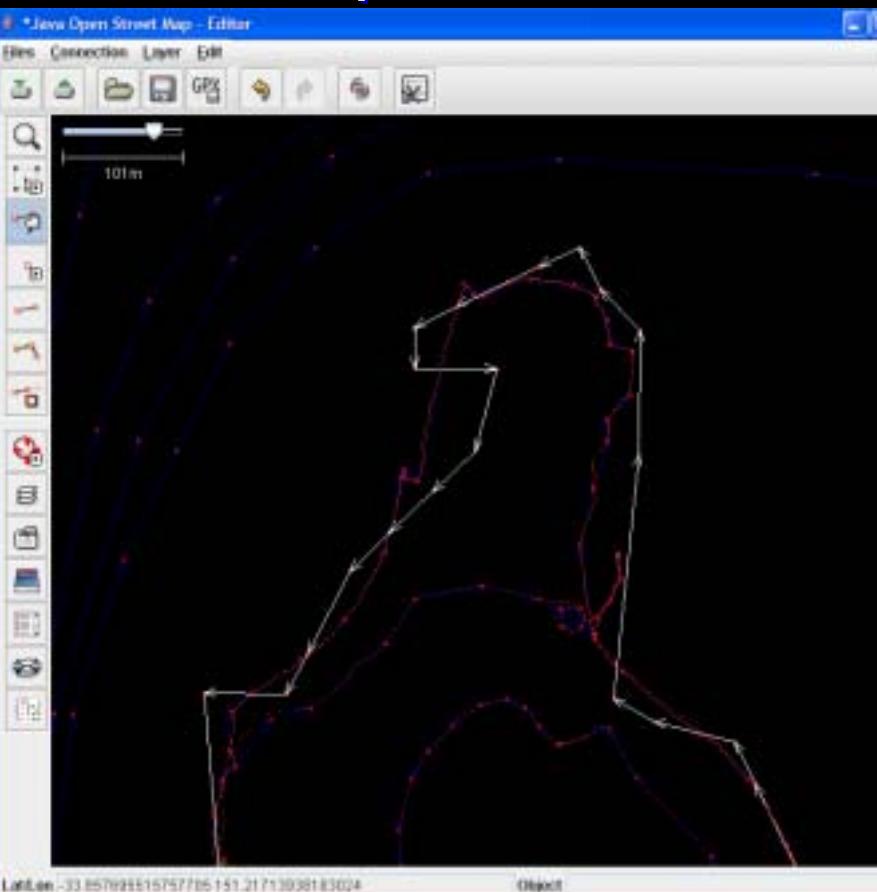
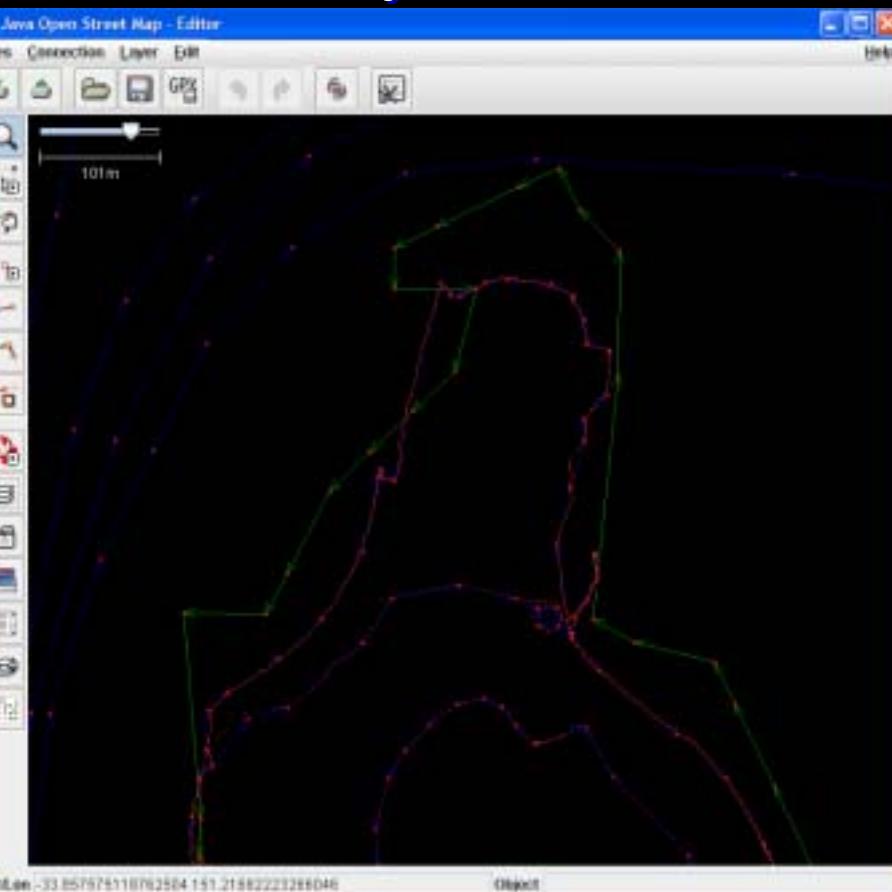
**§ 105. Subject matter of copyright: United States Government works**

Copyright protection under this title is not available for any work of the United States Government, but the United States Government is not precluded from receiving and holding copyrights transferred to it by assignment, bequest, or otherwise.



# Prototype Global Shoreline Data (PGS)

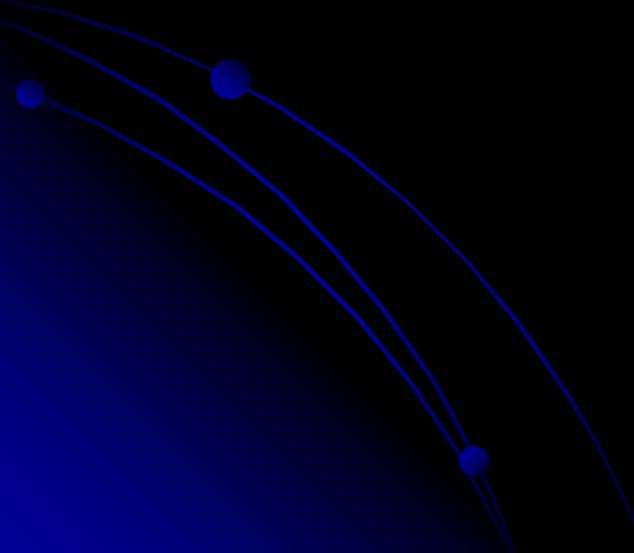
- Before adjustment



(NGA - Satellite Derived High Water Line Data)

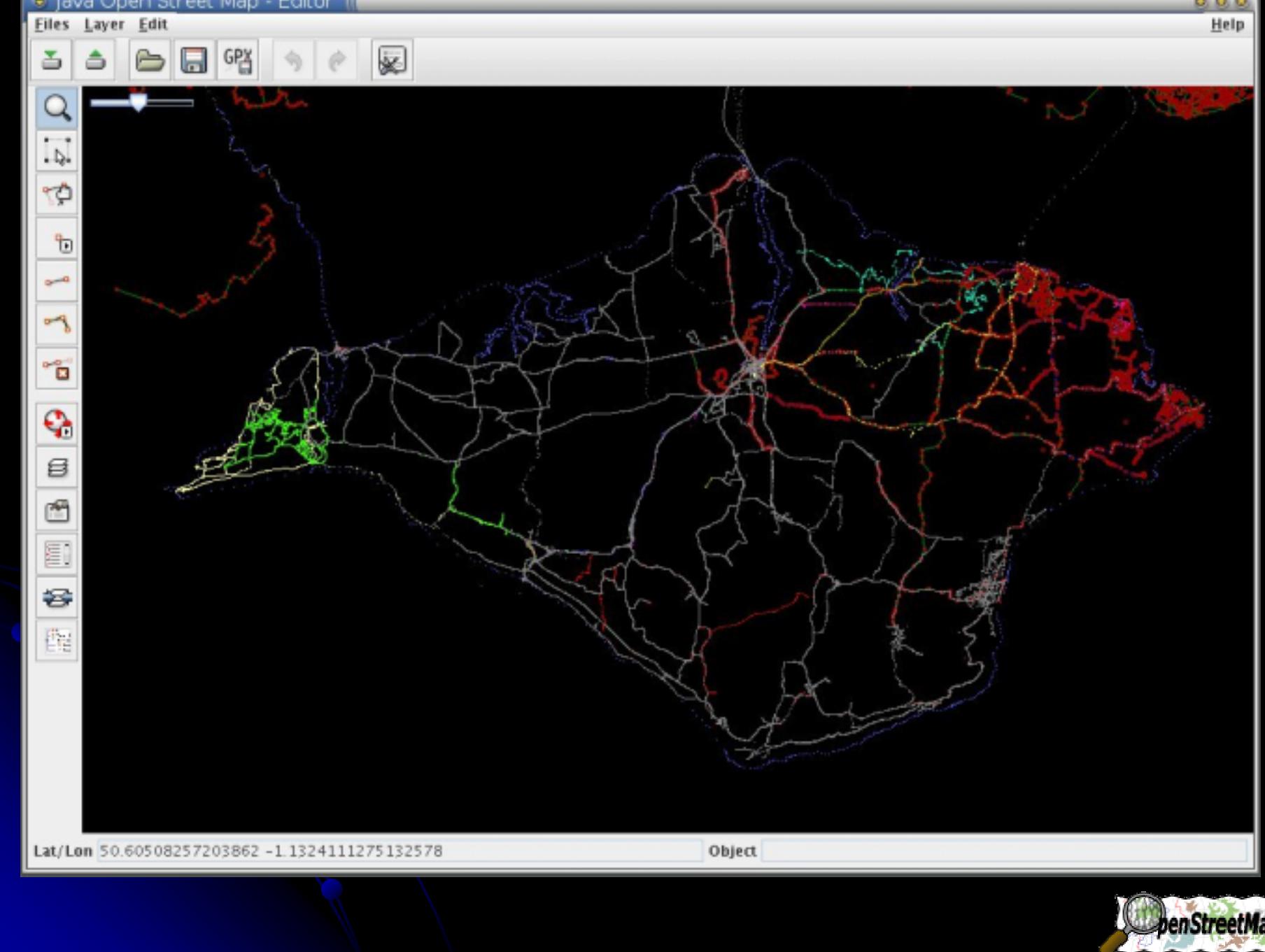
# Mapping Parties

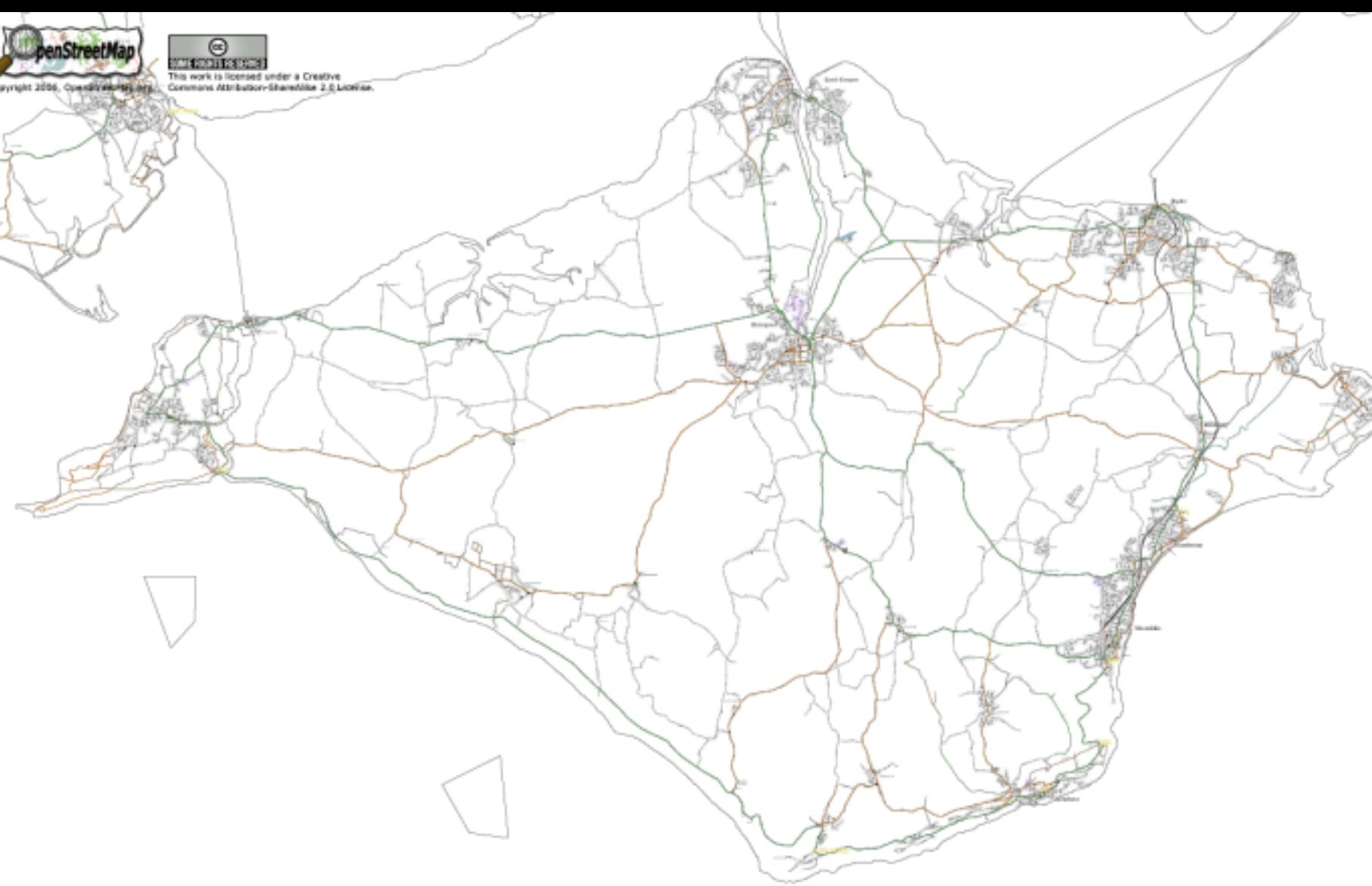
OSM Workshops cum Community Mapping cum  
Social Event



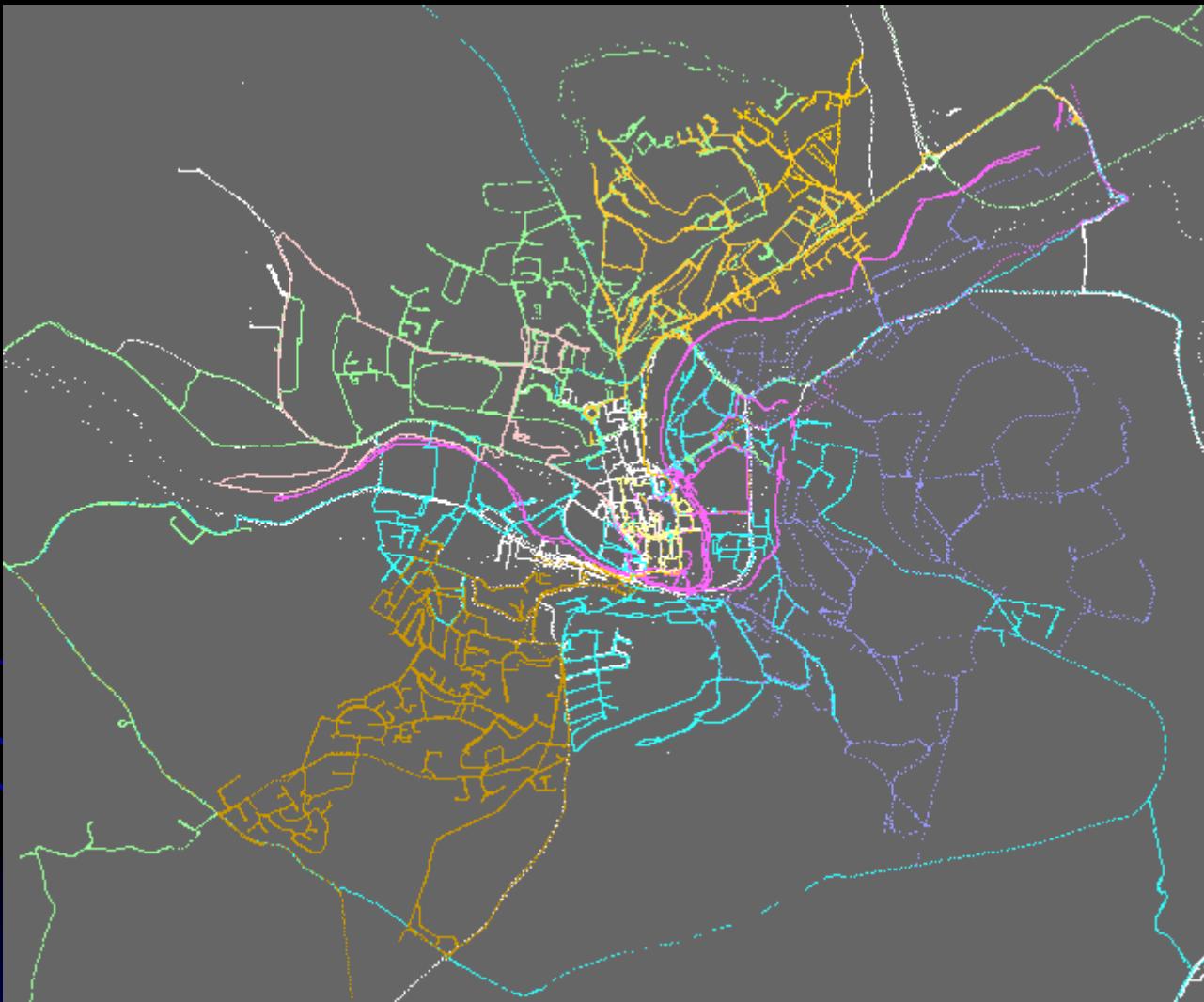
# Isle of Wight







# Bath

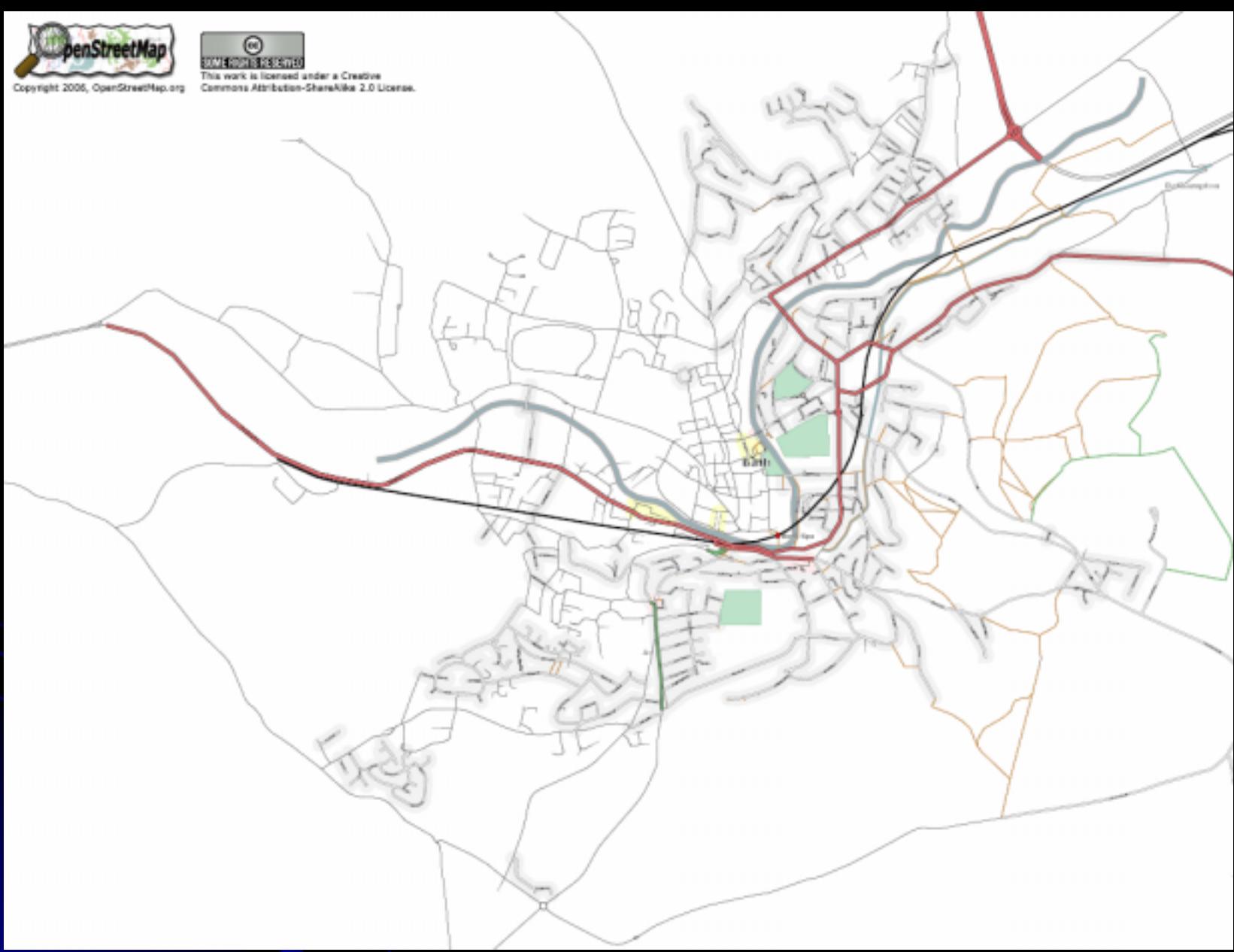




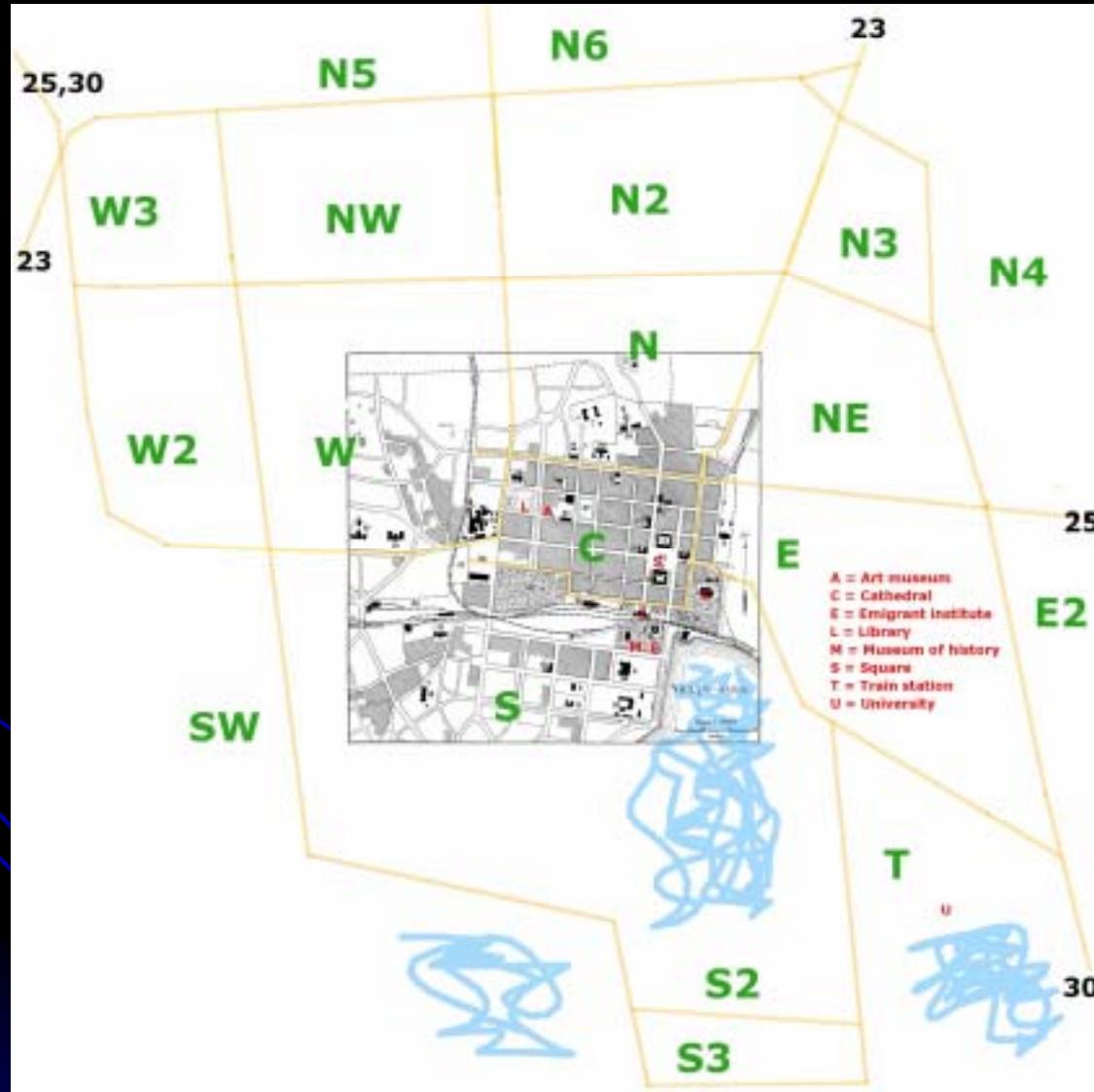
Copyright 2006, OpenStreetMap.org



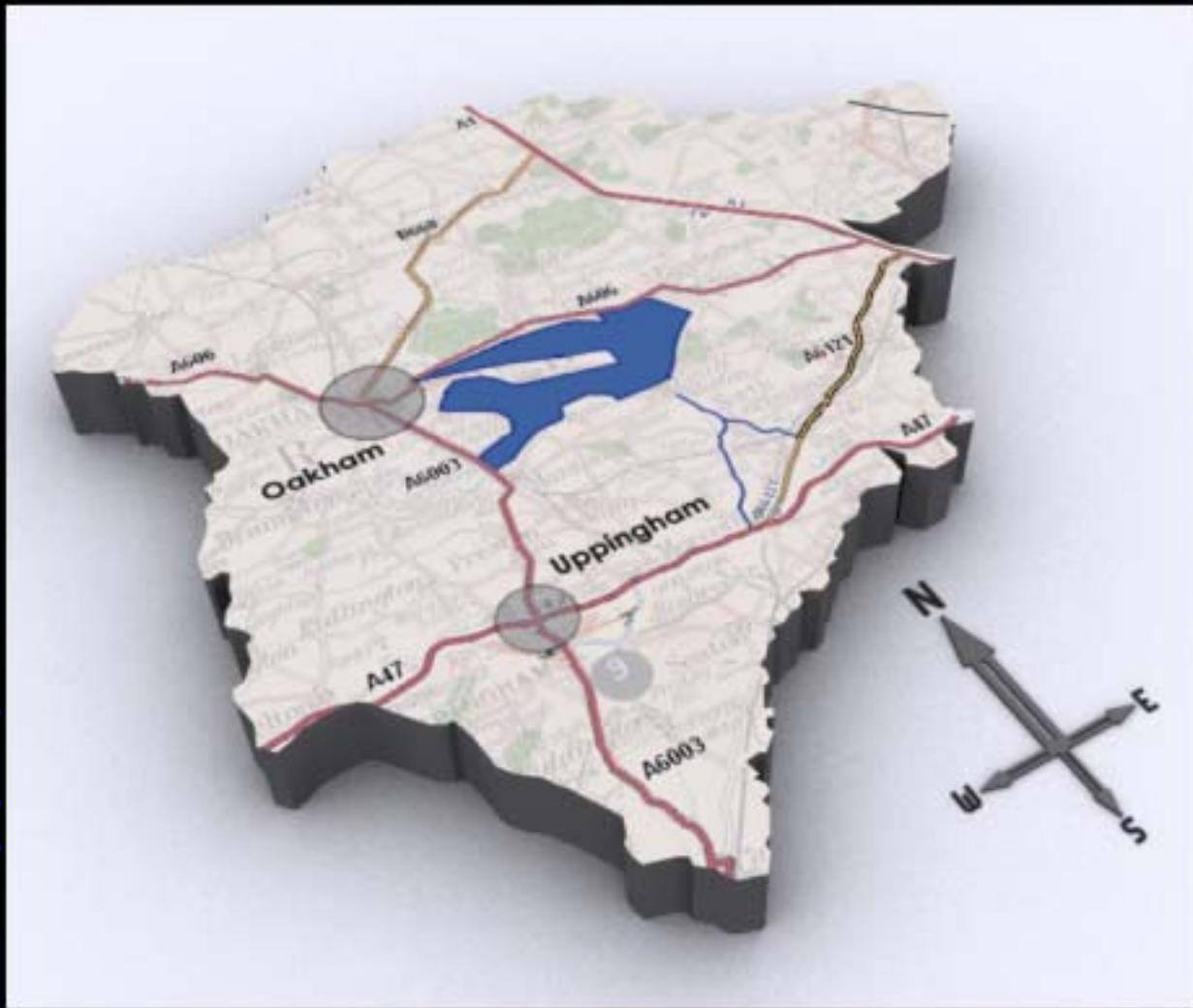
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# Växjö, Sweden



# Rutland



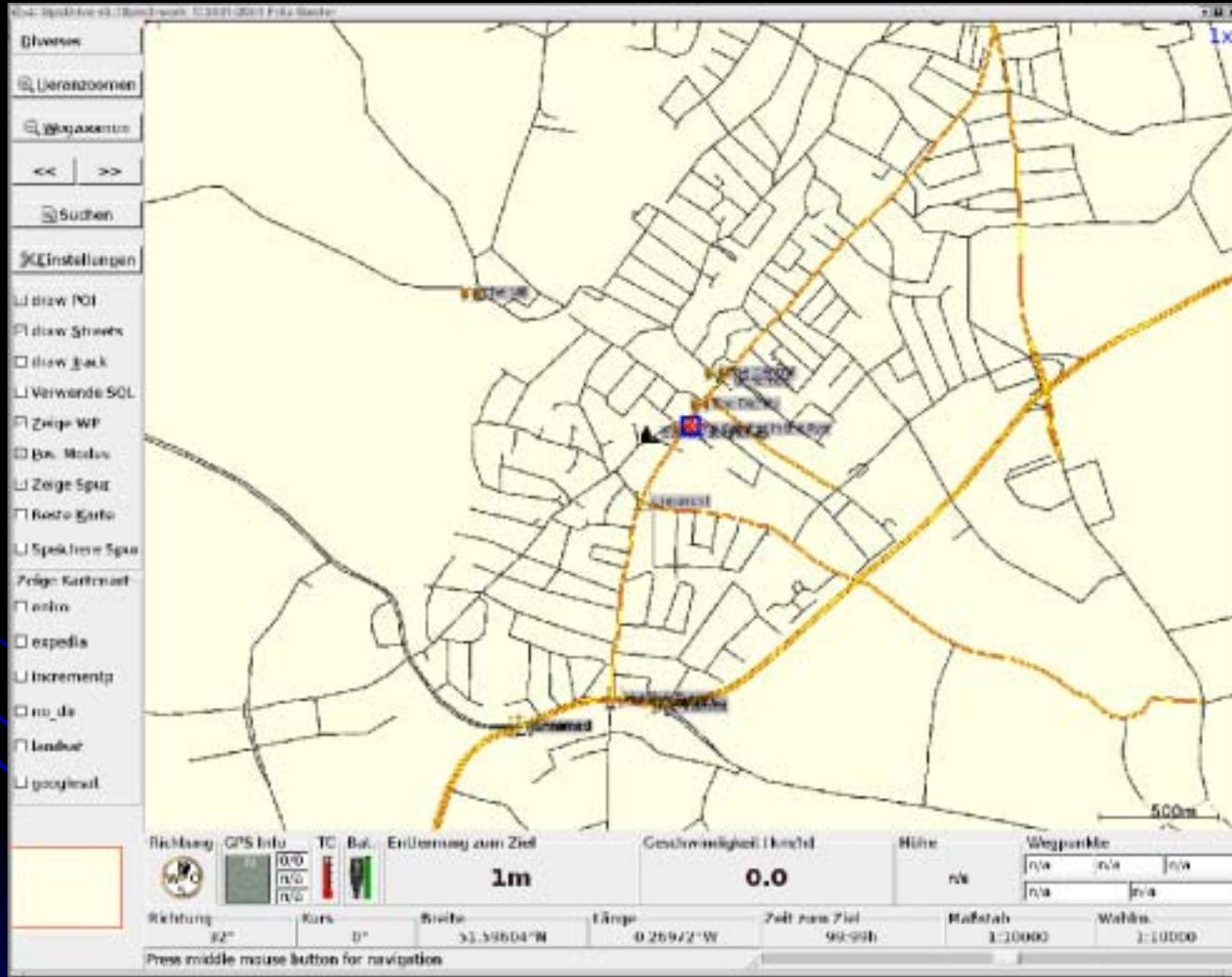
Sources - Geographia1920s.png  
Rutland 20060824.png  
RutlandCake.png

# Beyond Cartography

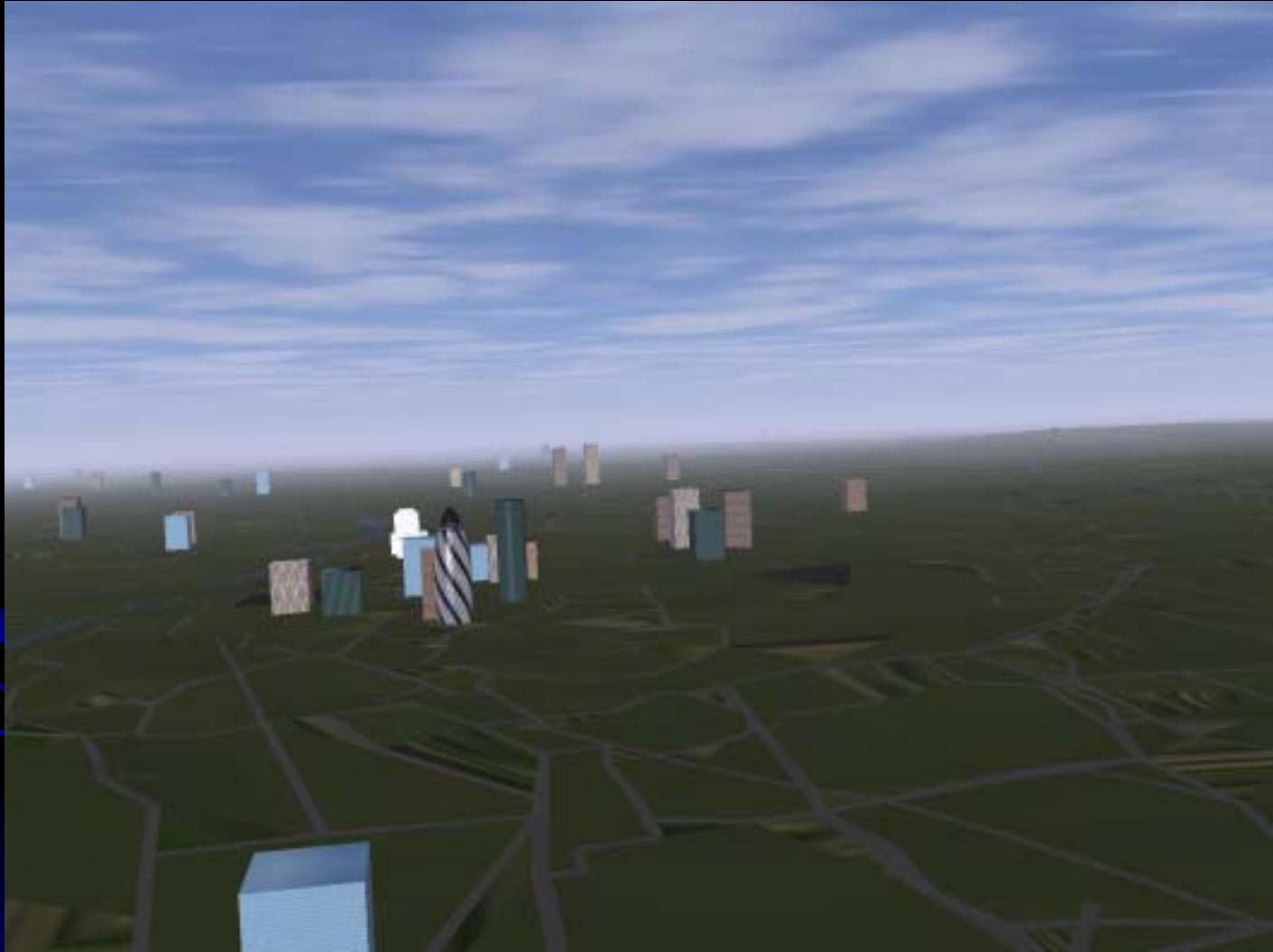
- REAL TIME DATA
  - RESTful API,
  - XML
- STATIC DUMP
  - planet.osm
  - XML
  - Binary



# Navigation



# Simulation



[www.openstreetmap.org](http://www.openstreetmap.org)

[wiki.openstreetmap.org](http://wiki.openstreetmap.org)

Thanks for Listening

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