

**Ant Scott**

# **Analysing access to UK public rights of way with the QGIS Graphical Modeler**

FOSS4G:UK Local 2022 Bristol  
November 17th 2022

ramblers  
at the heart of walking

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● ●

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Processing Toolbox

Search... Recently used Cartography Database File tools GPS Interpolation Layer tools Mesh Network analysis Plots Raster analysis Raster creation Raster terrain analysis Raster tools Vector analysis Vector creation Vector general Vector geometry Vector overlay Vector selection Vector table Vector tiles GDAL GRASS

FOSS4G 2022

- NEF
  - 0 Prep codepoint
  - 1 RoW lengths in Centroid buffer
  - 2 Continuous RoW
  - 3 Wild RoW lengths inside Codepoint buffer
  - 4 RoW Greenness
  - 5 Continuous RoW analysis
  - 6 RoW Greenness Length over 80pc
  - 7 Merge additional RoW
  - 8 Landscape type RoW analysis
  - 9 Open Access Connection
  - 9 Open Access Connection: all outputs
- SAGA

Browser

- Favorites
- Spatial Bookmarks
- Project Home
- Home
- CA
- DA
- E:\
- GeoPackage
- Spatialite
- PostGIS
- SAP HANA
- MSSQL

Type to locate (Ctrl+K)

Coordinate 385239,277697 Scale 1:53429 Magnifier 100% Rotation 0.0° Render EPSG:27700

14:57 19/08/2022 ENG

Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh MMOGIS Processing Help

net\_astun — QGIS

**Model Designer - RoW Analysis with QGIS GM**

**Algorithms**

- Cartography
- Database
- File tools
- GPS
- Interpolation
- Layer tools
- Mesh
- Modeler tools
- Network analysis
- Plots
- Raster analysis
- Raster creation
- Raster terrain analysis

**Model Properties**

Name: RoW Analysis with QGIS GM  
Group: FOSS4G 2022

**Variables**

**Undo History**

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**Processing Toolbox**

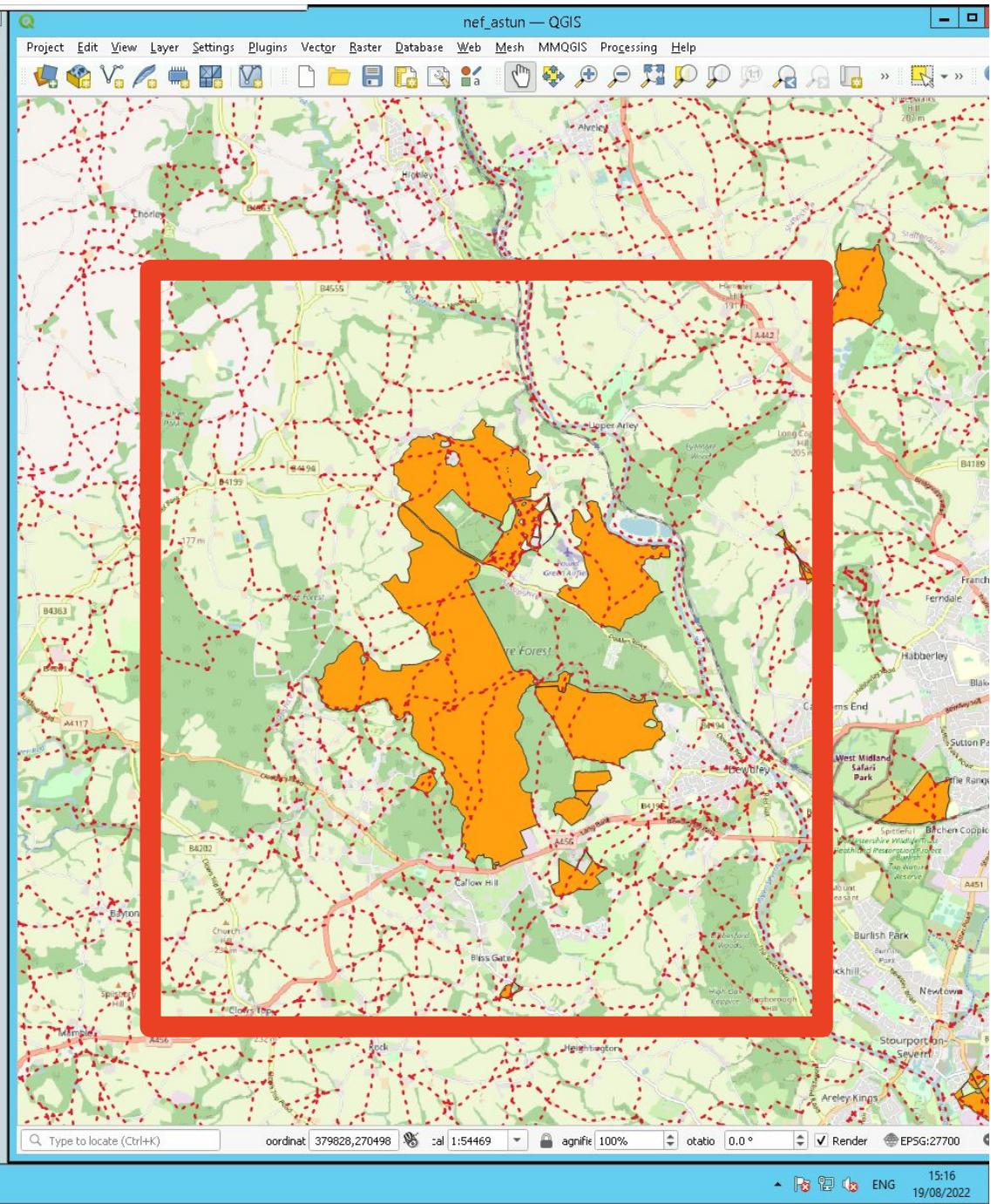
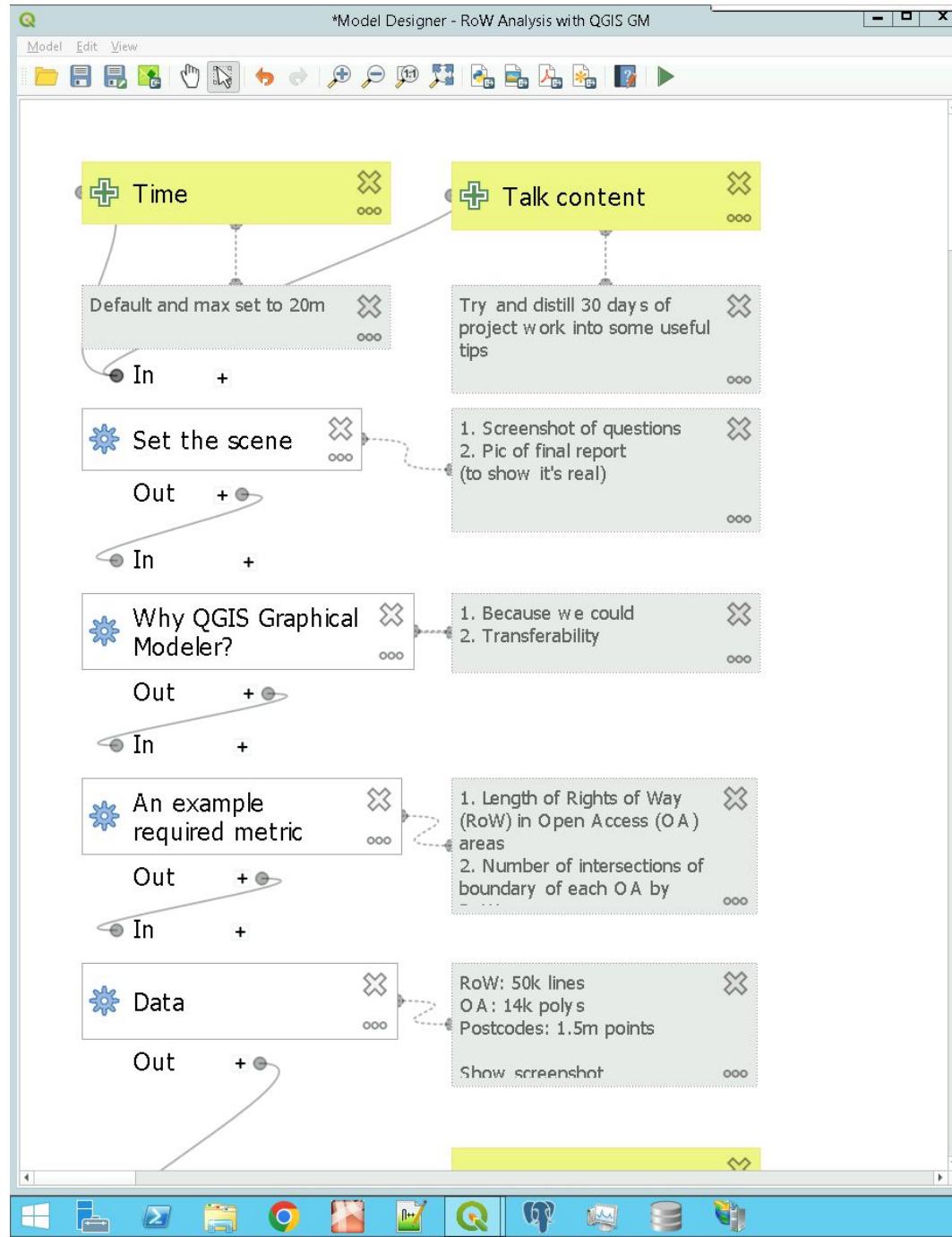
- Recently used
- Cartography
- Database
- File tools
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- Interpolation
- Layer tools
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- Network analysis
- Plots
- Raster analysis
- Raster creation
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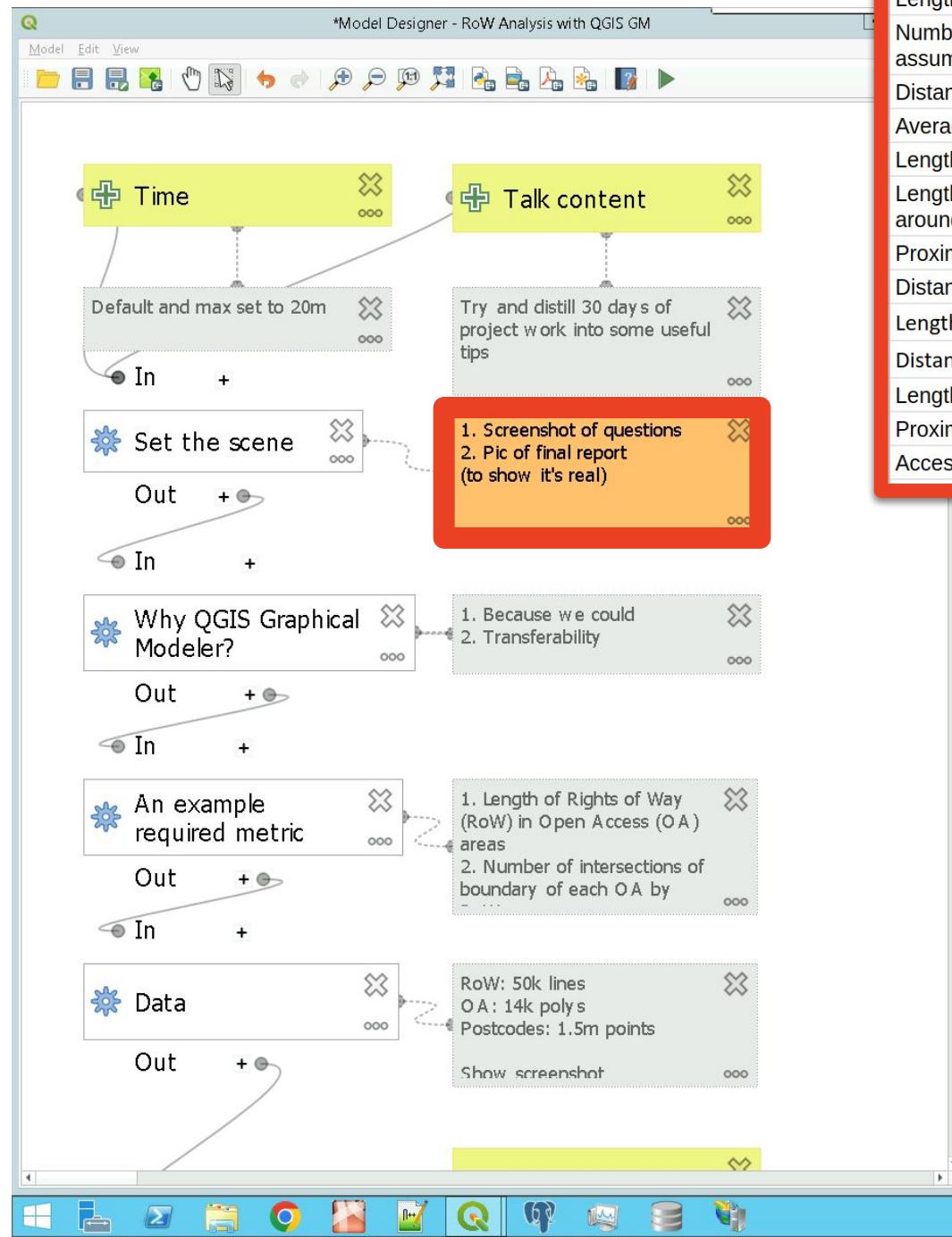
**Map View**

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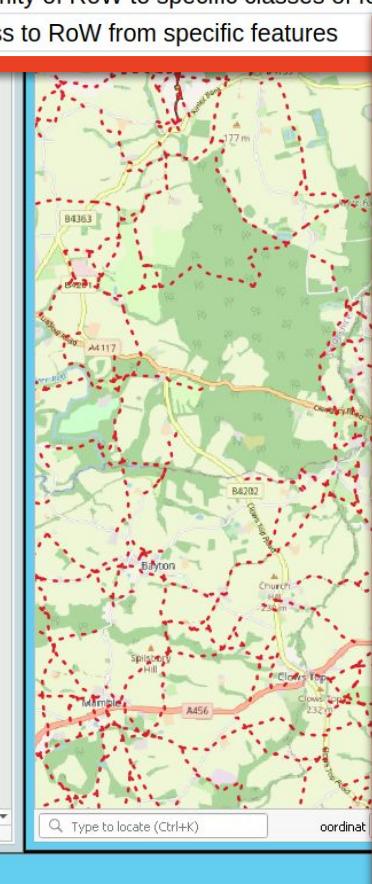
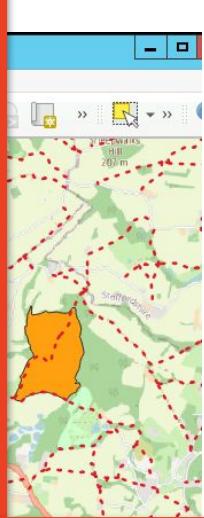
Type to locate (Ctrl+K)

Windows Taskbar icons: File Explorer, Edge, Google Chrome, FileZilla, QGIS, Python, File Manager, Database, Network, System Tray: ENG 15:08 19/08/2022





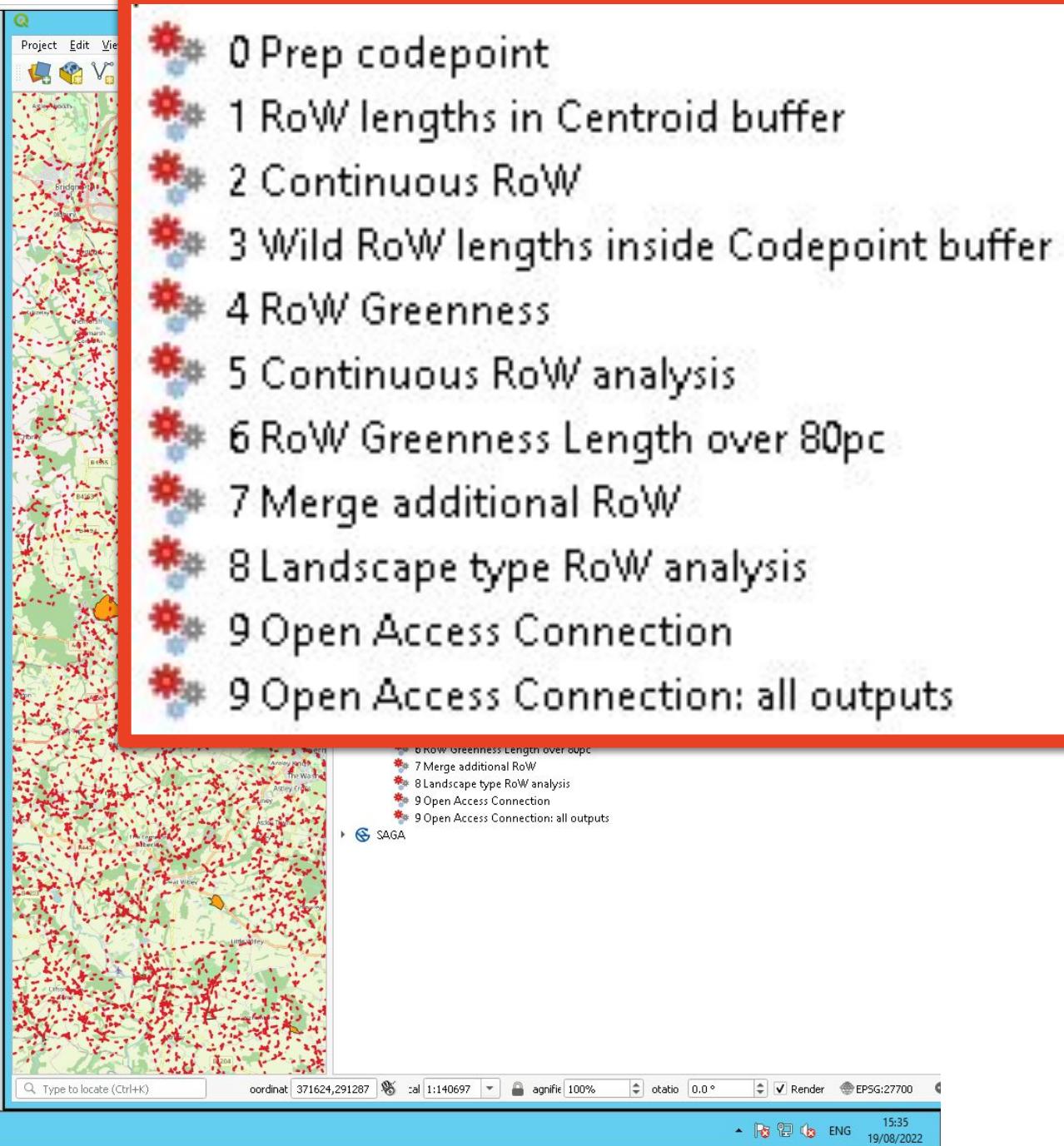
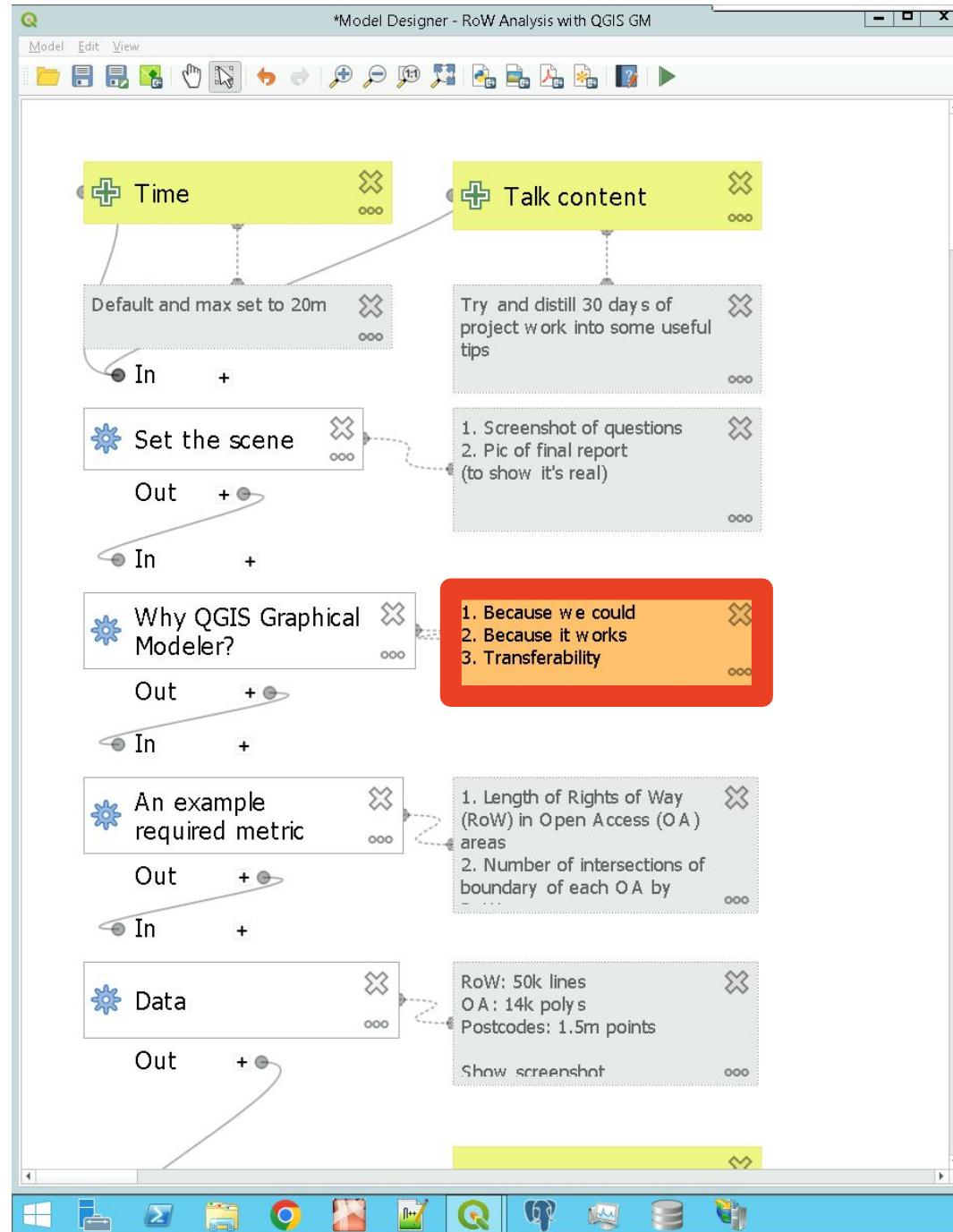
Length of ROW within Nkm radius of postcode centroid  
Number of ROW of over Nkm (3km?) continuous length within Nkm of postcode centroid assuming X/Y/Z buffer size  
Distance from postcode centroid to nearest ROW of 3km or more  
Average greenness of ROW within Nkm radius of postcode centroid  
Length of ROW within Nkm radius of postcode centroid at minimum greenness level of X  
Length of ROW within/near to wild areas within Nkm of postcode centroid, assuming a buffer around 'wild areas' of Nm (20m?) is also included  
Proximity of RoW to specific features  
Distance from postcode to nearest access land of at least a hectare in size  
Length of RoW in open access, and number of intersections of boundary by RoW  
Distance from postcode to nearest access land  
Length of DLYW paths within 800m of postcode centred  
Proximity of RoW to specific classes of features  
Access to RoW from specific features



**NEW  
ECONOMICS  
FOUNDATION**

## PATHS AND ACCESS AN ANALYSIS OF PROVISION AND INEQUITY IN ENGLAND AND WALES

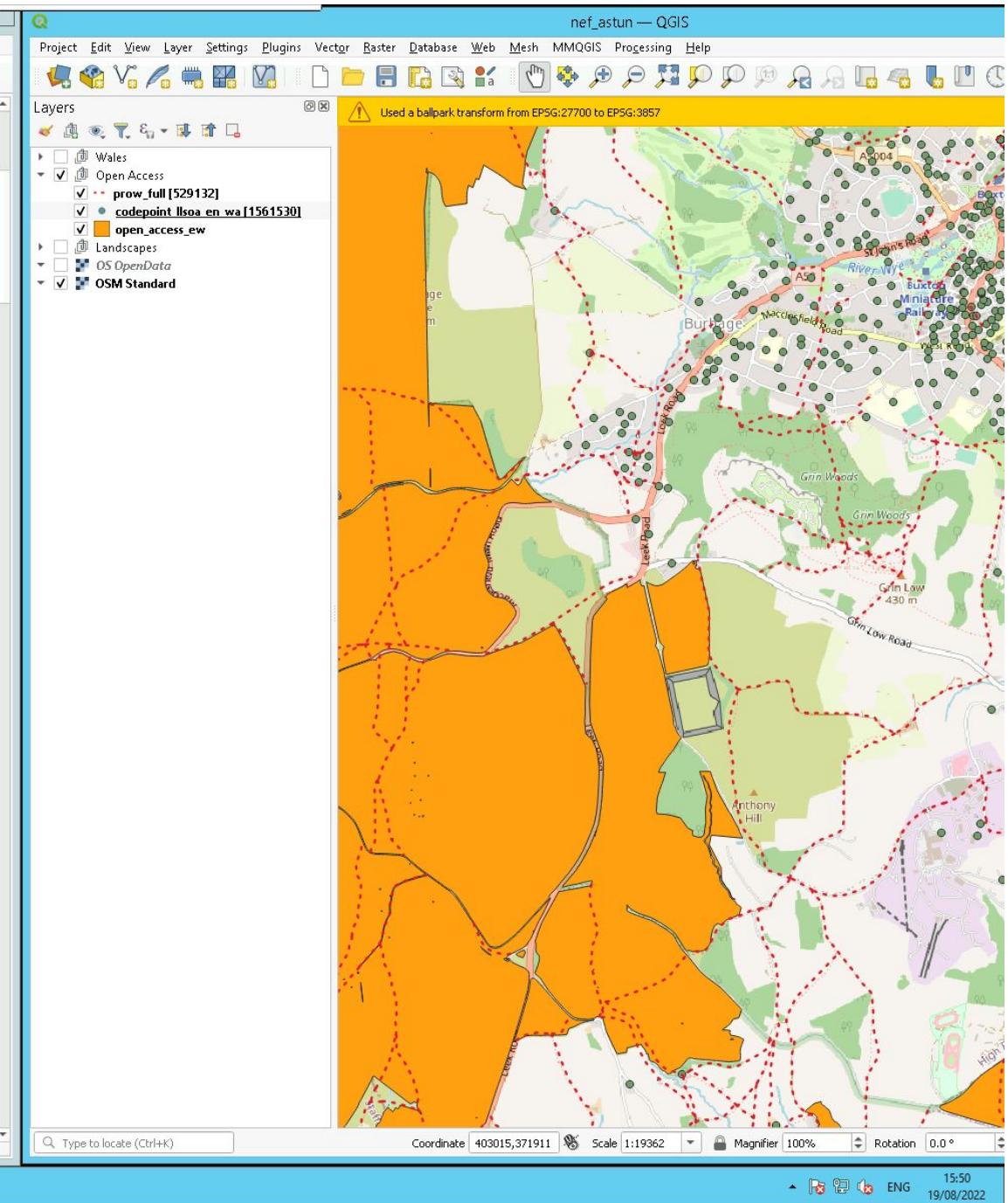
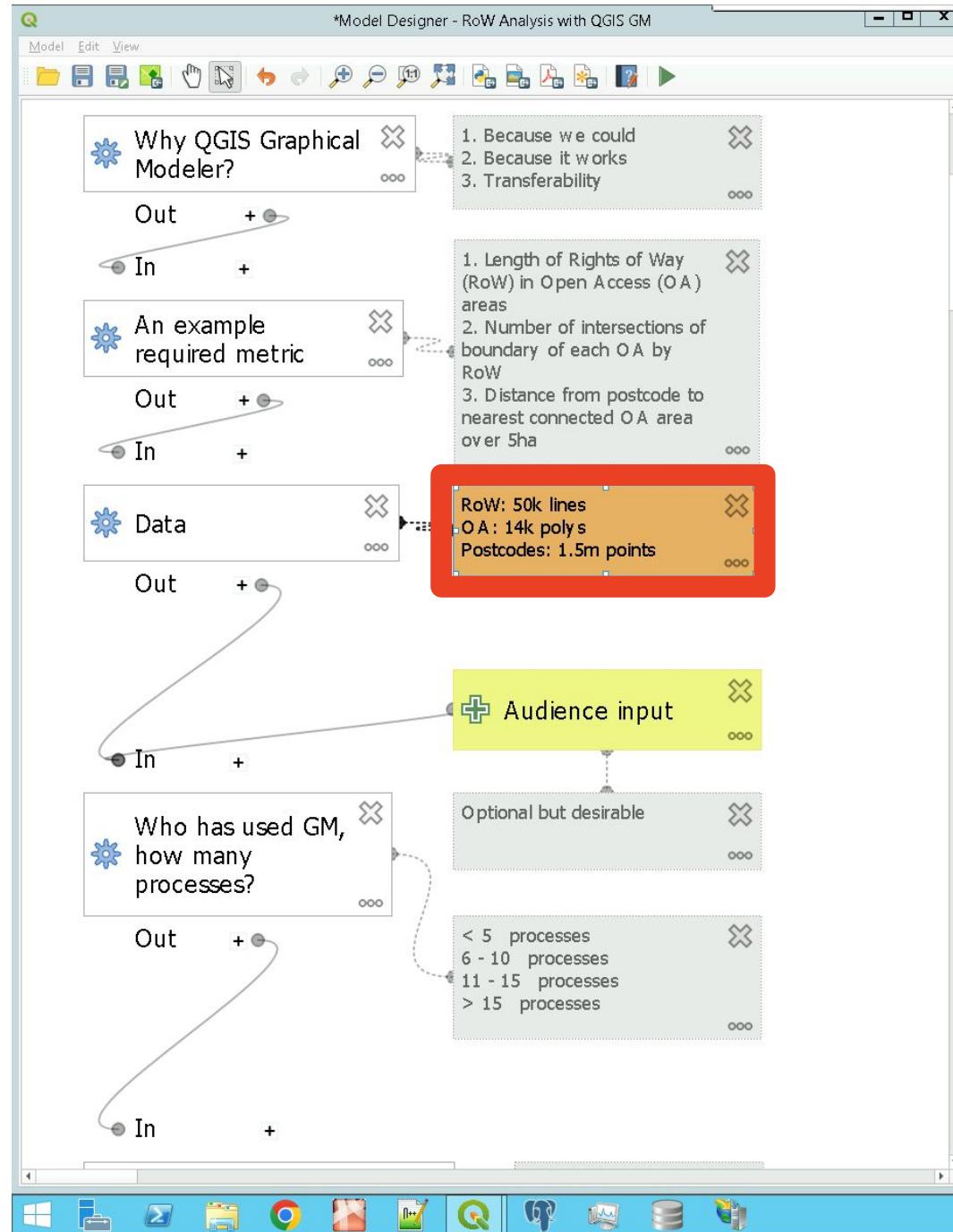
**Written by:** Dr Alex Chapman (NEF), Poorva Prabhu (NEF), and Antony Scott (ASTUN Technology)  
**Published:** August 2022

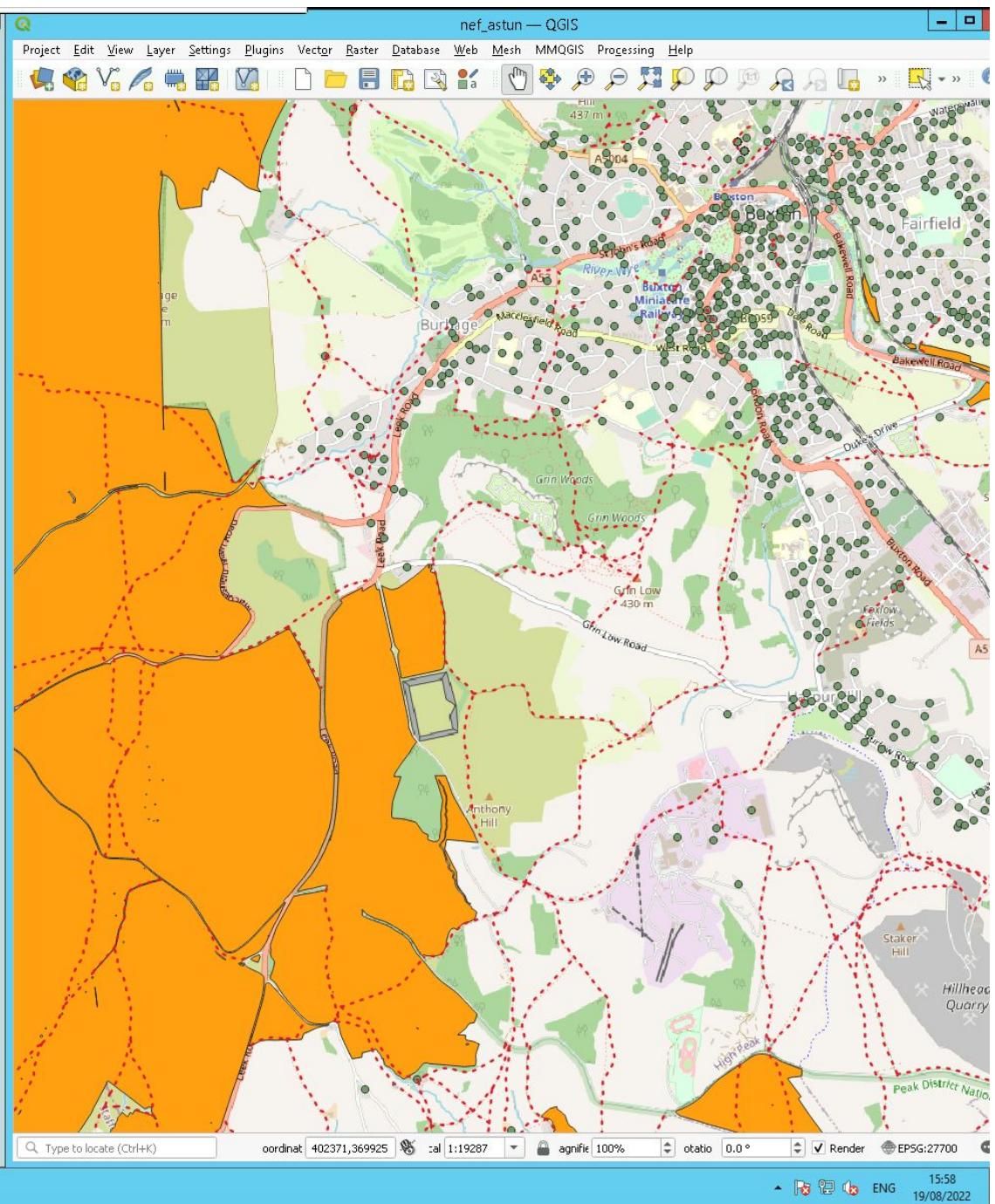
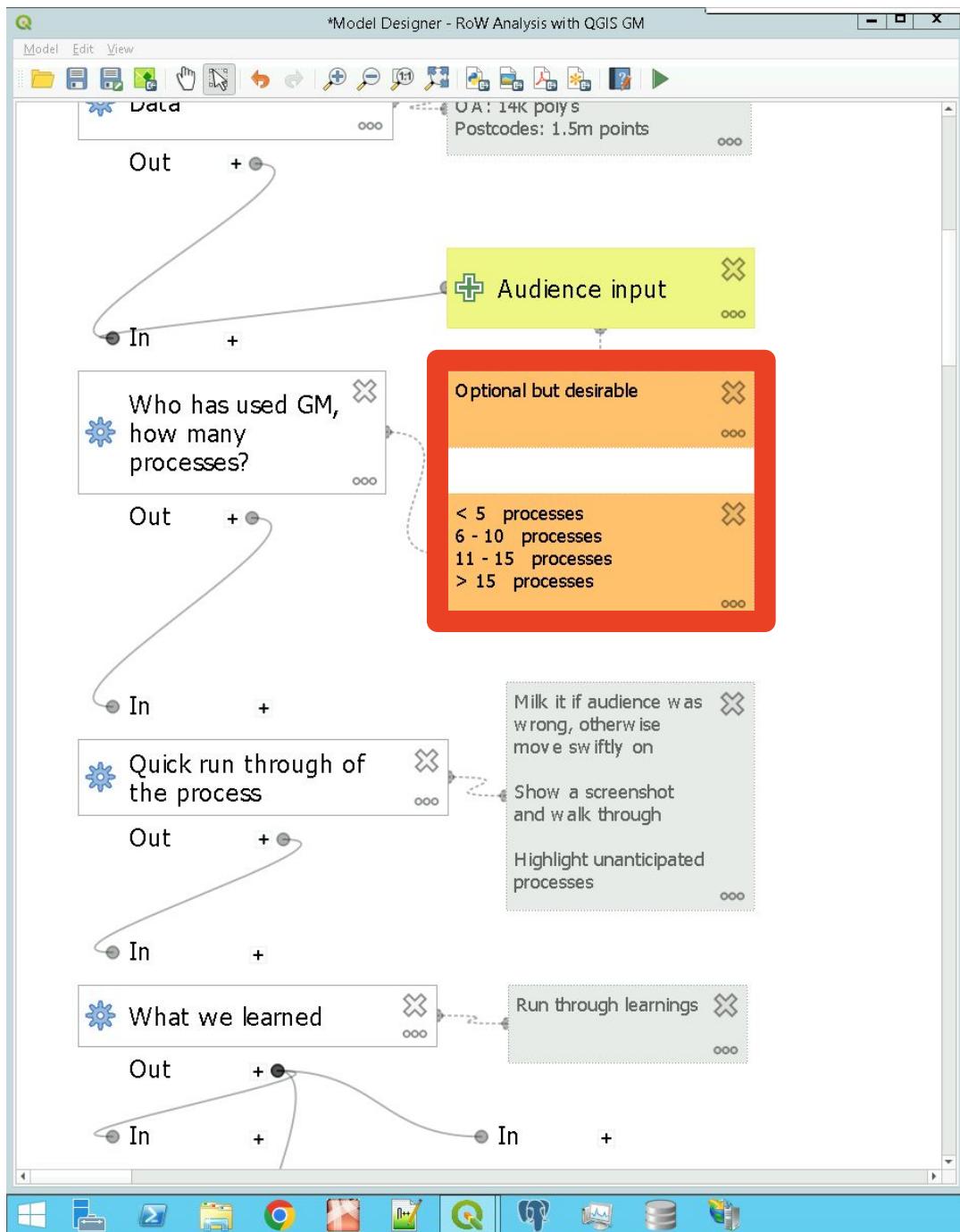


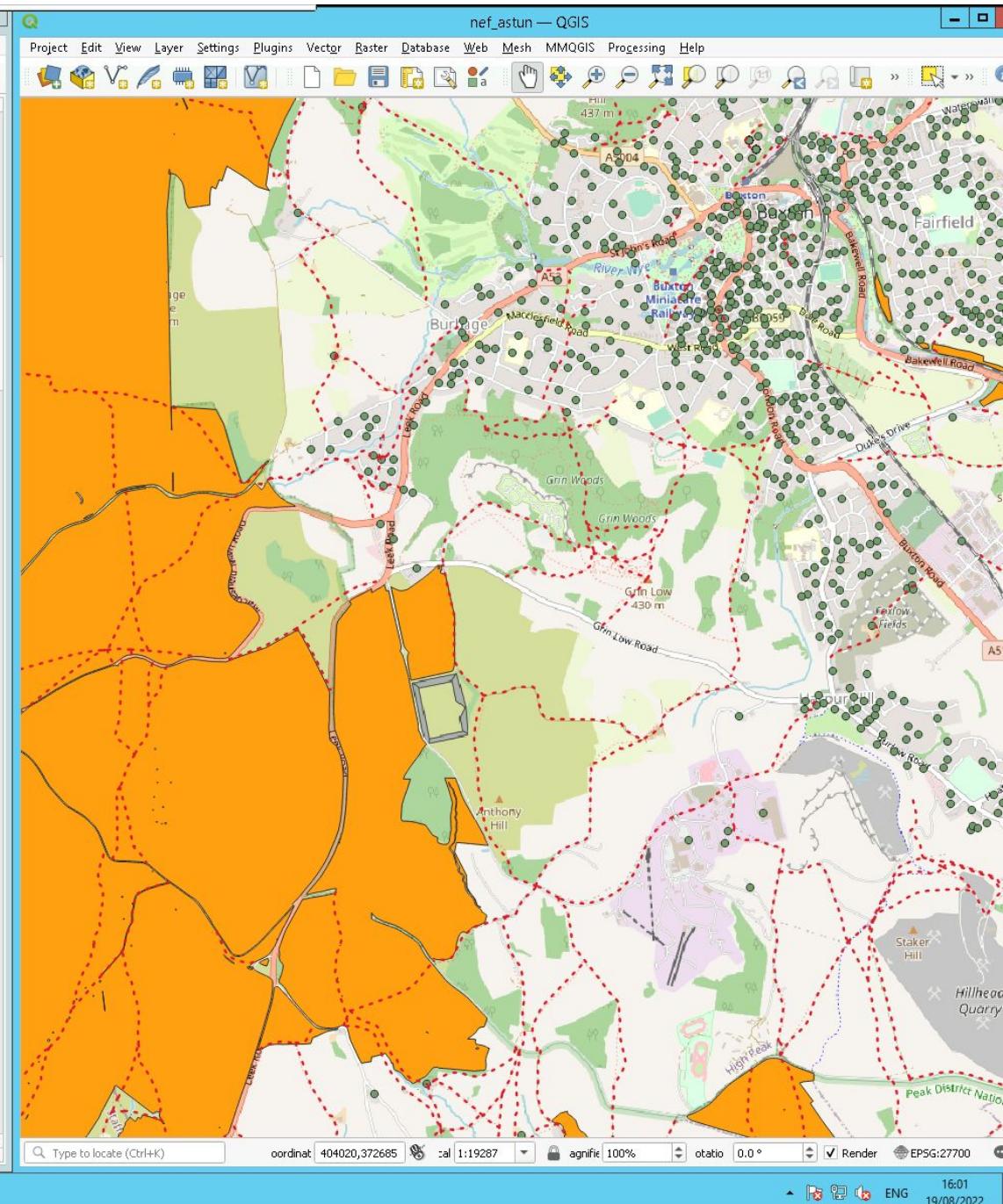
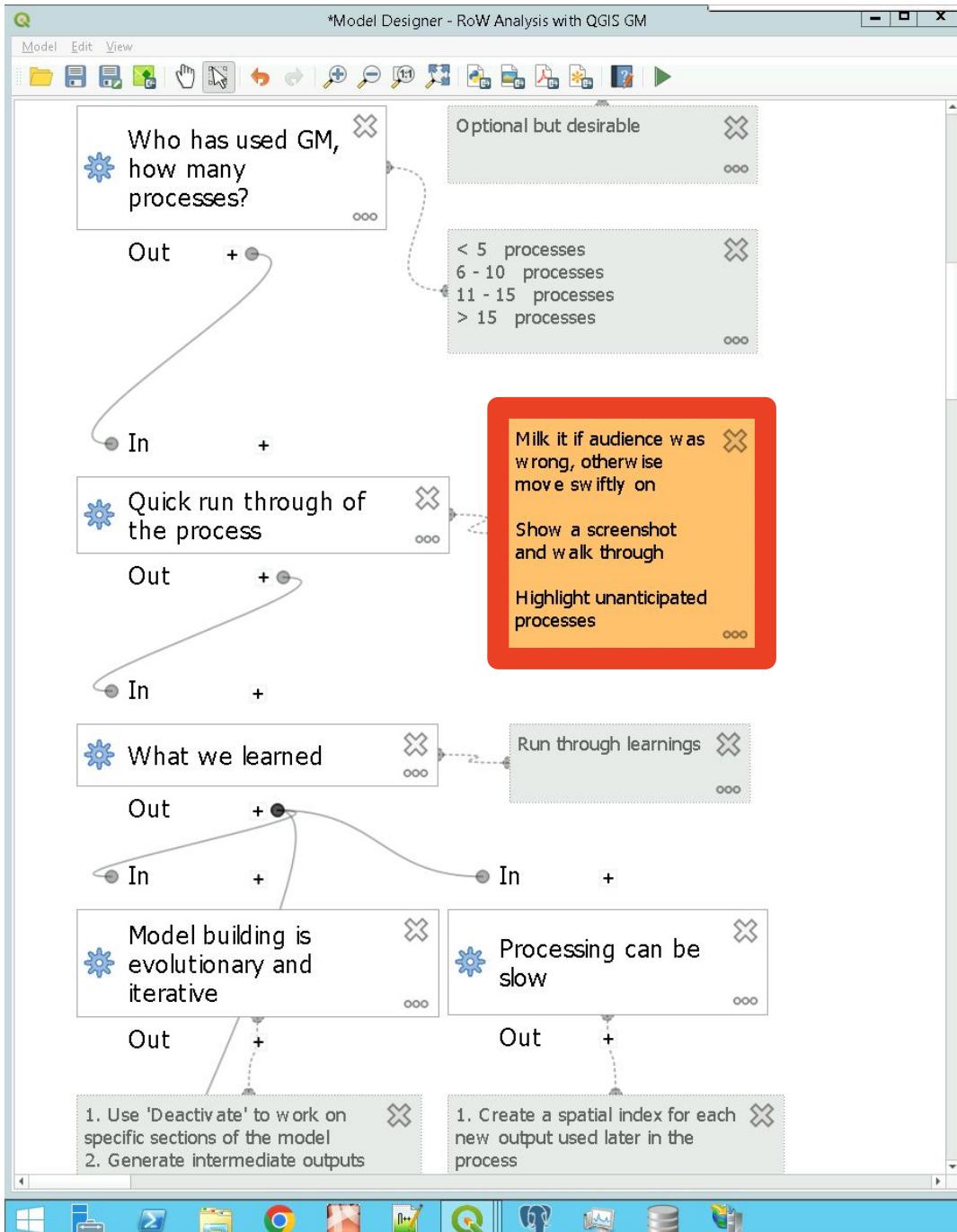
\*Model Designer - RoW Analysis with QGIS GM

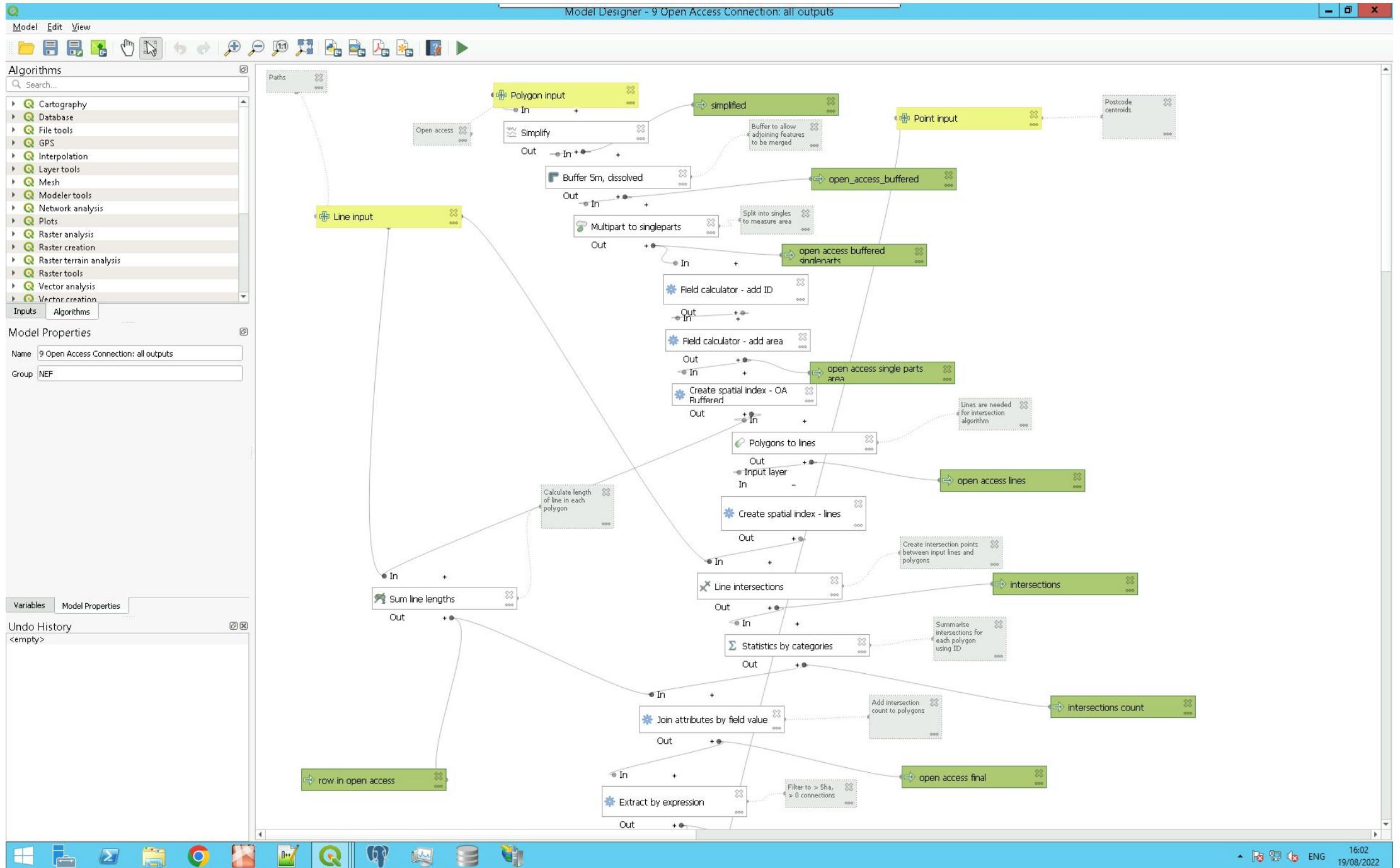
Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh MMQGIS Processing Help

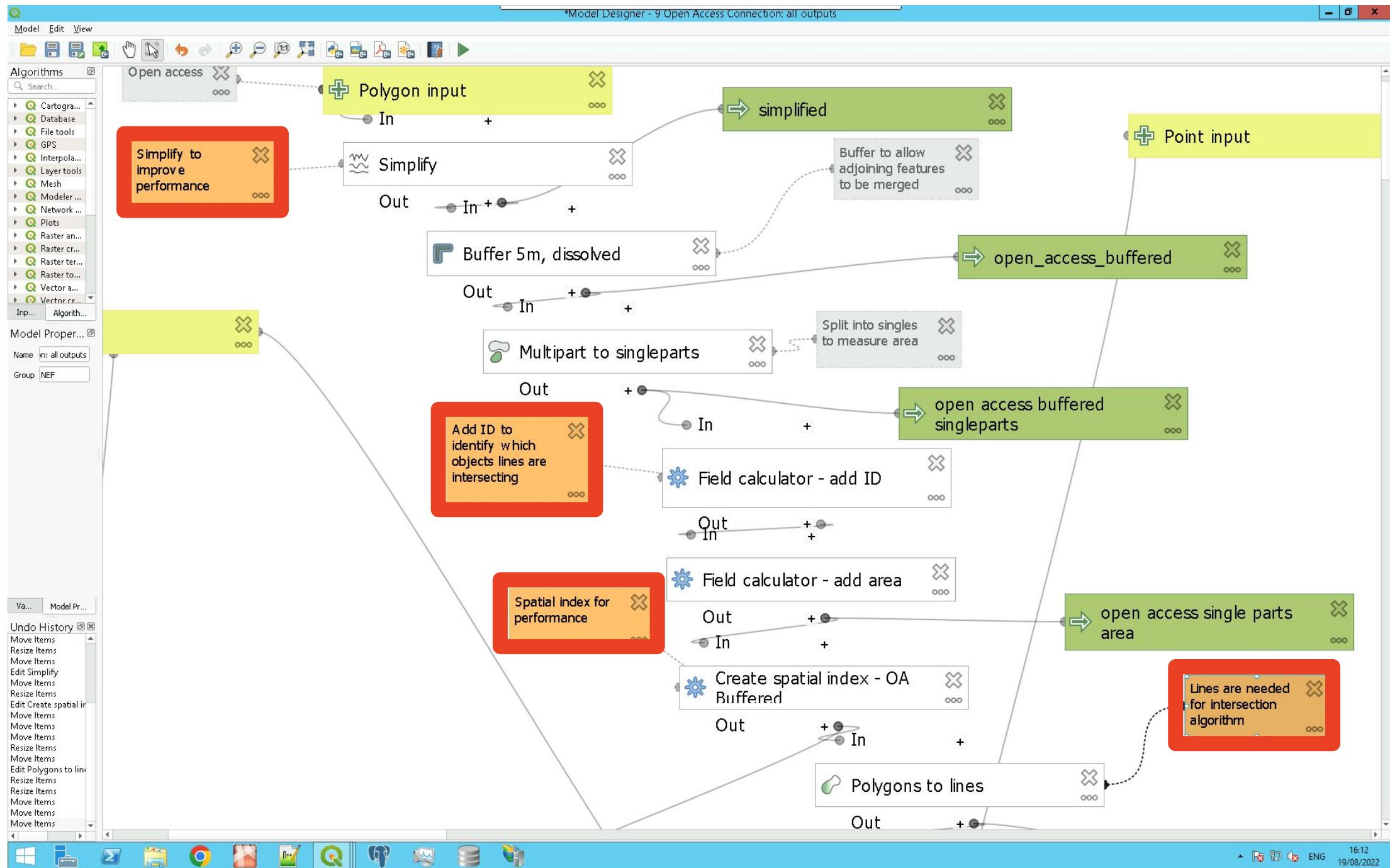
Description	Precise definition
Length of RoW in open access, and number of intersections of boundary by RoW	<ul style="list-style-type: none"> <li>- Create buffer of 5m round all access land, with overlapping buffers joined</li> <li>- Merge polygons which fall inside a single buffer polygon (note that this will merge polygons 10m apart)</li> <li>- Calculate the area of the each merged polygon</li> <li>- For all merged polygons, count no and length of RoW inside, and no of RoW intersections of boundary</li> </ul>
Distance from postcode to nearest access land	Calculate distance from postcode centroid to nearest open access land polygon over 5ha with connections to RoW network, using buffered/merged polygons from output 11

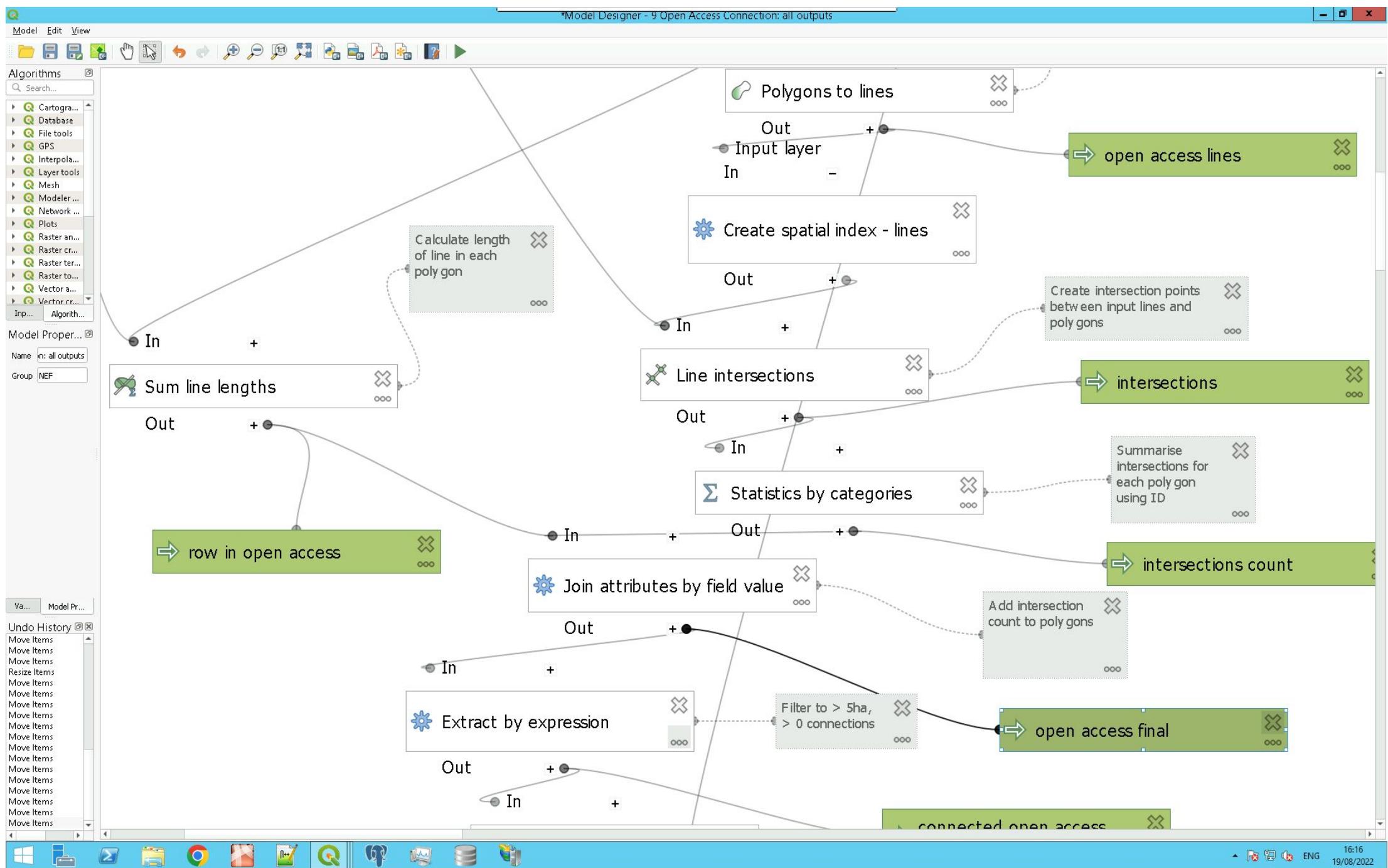


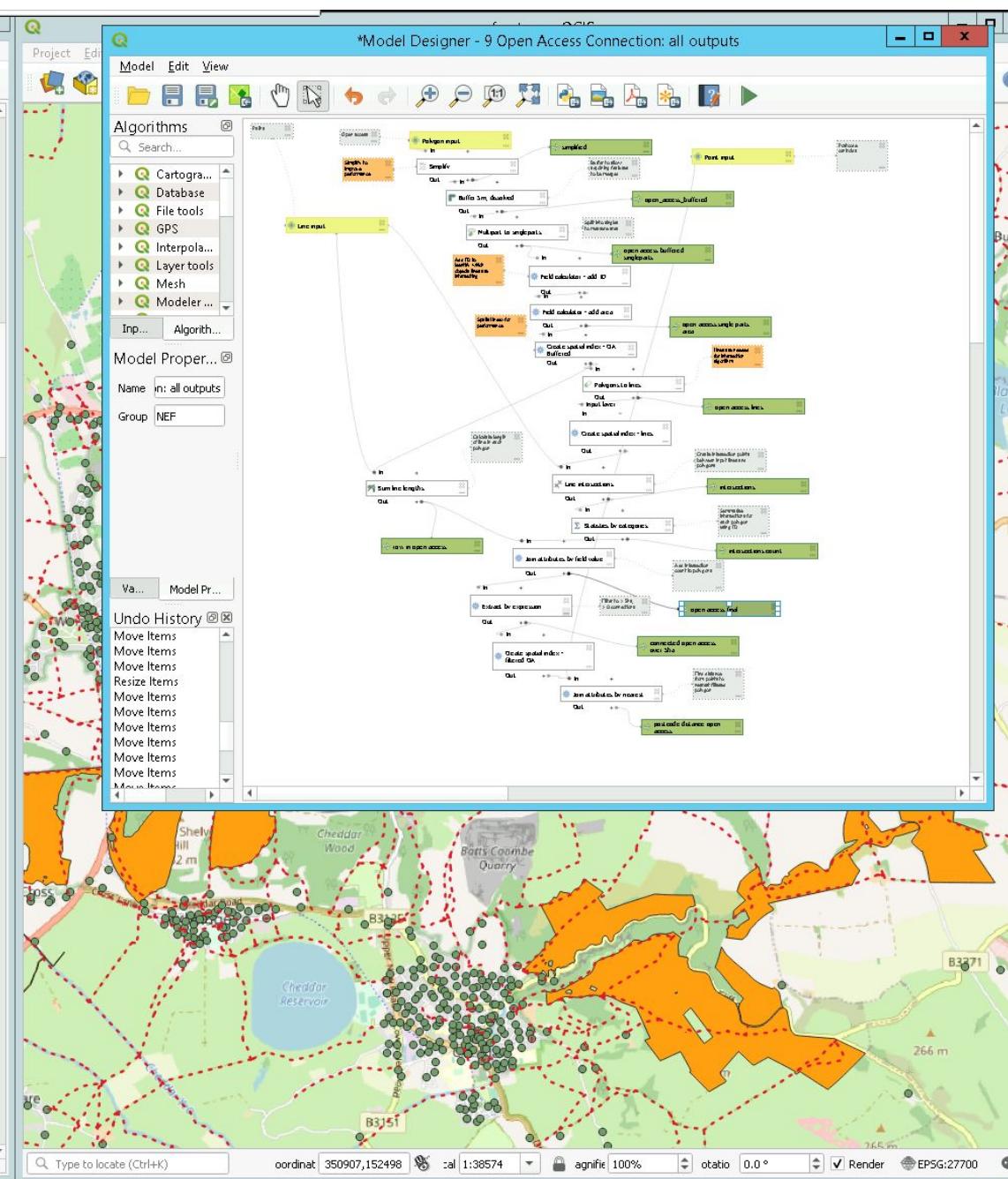
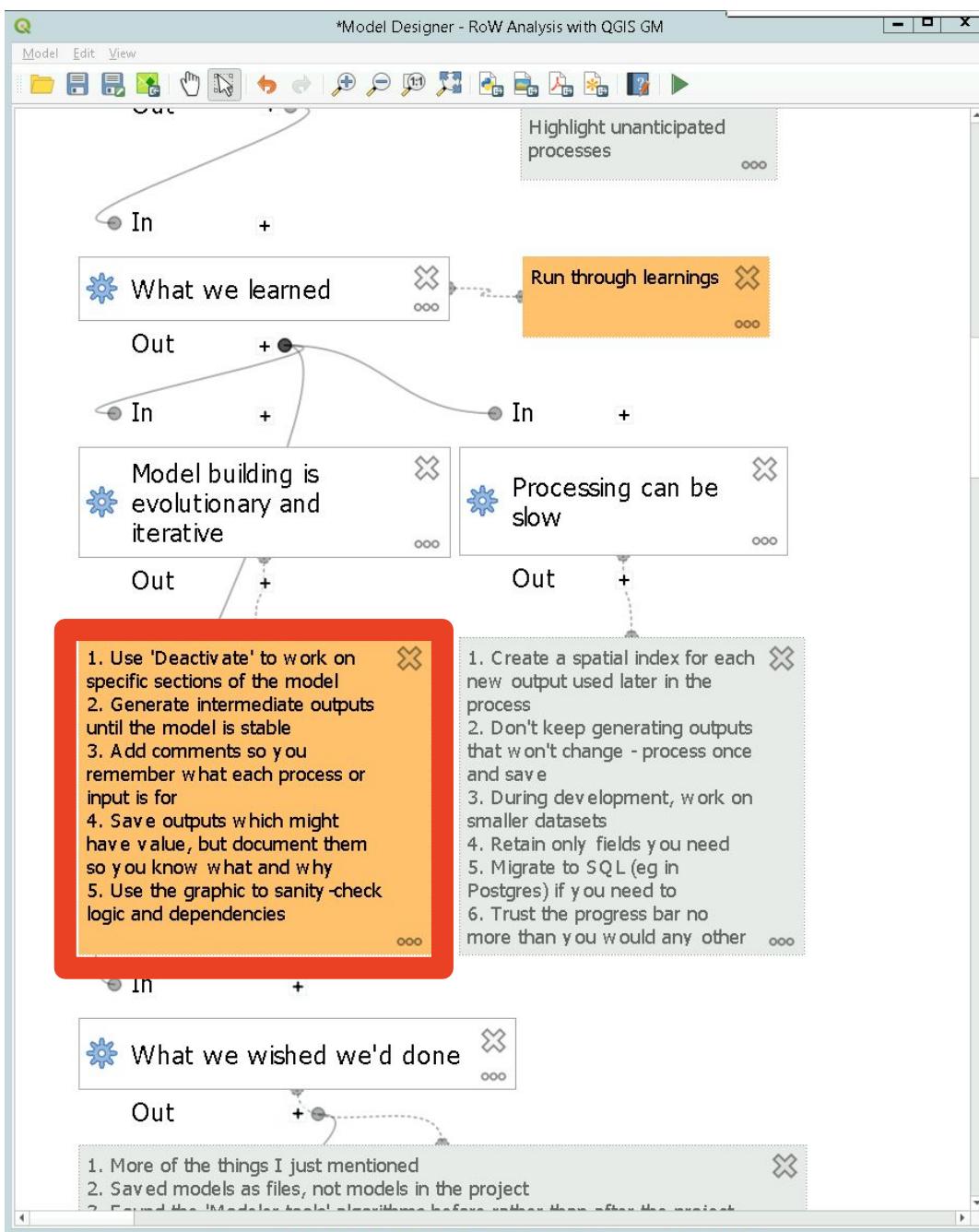


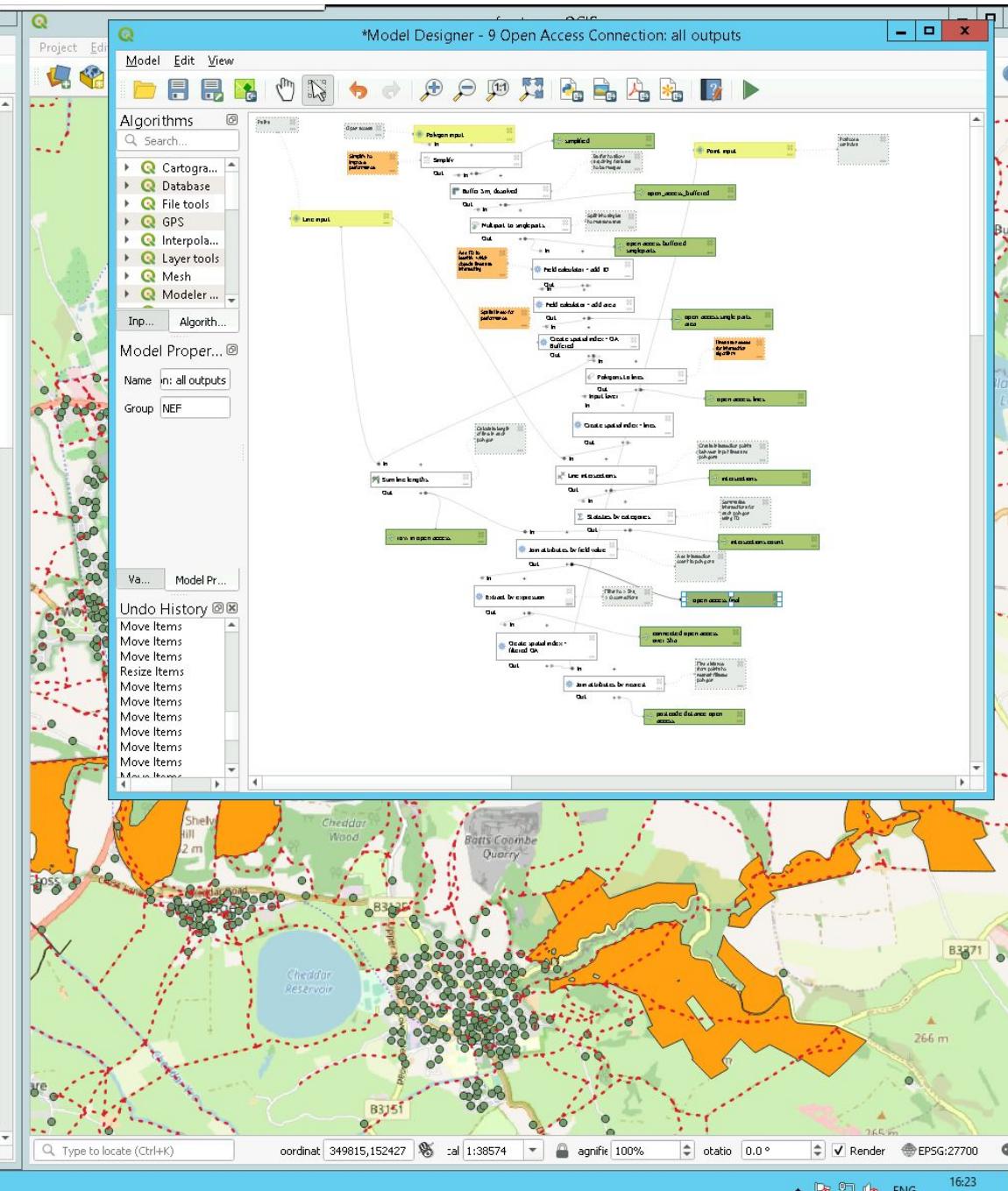
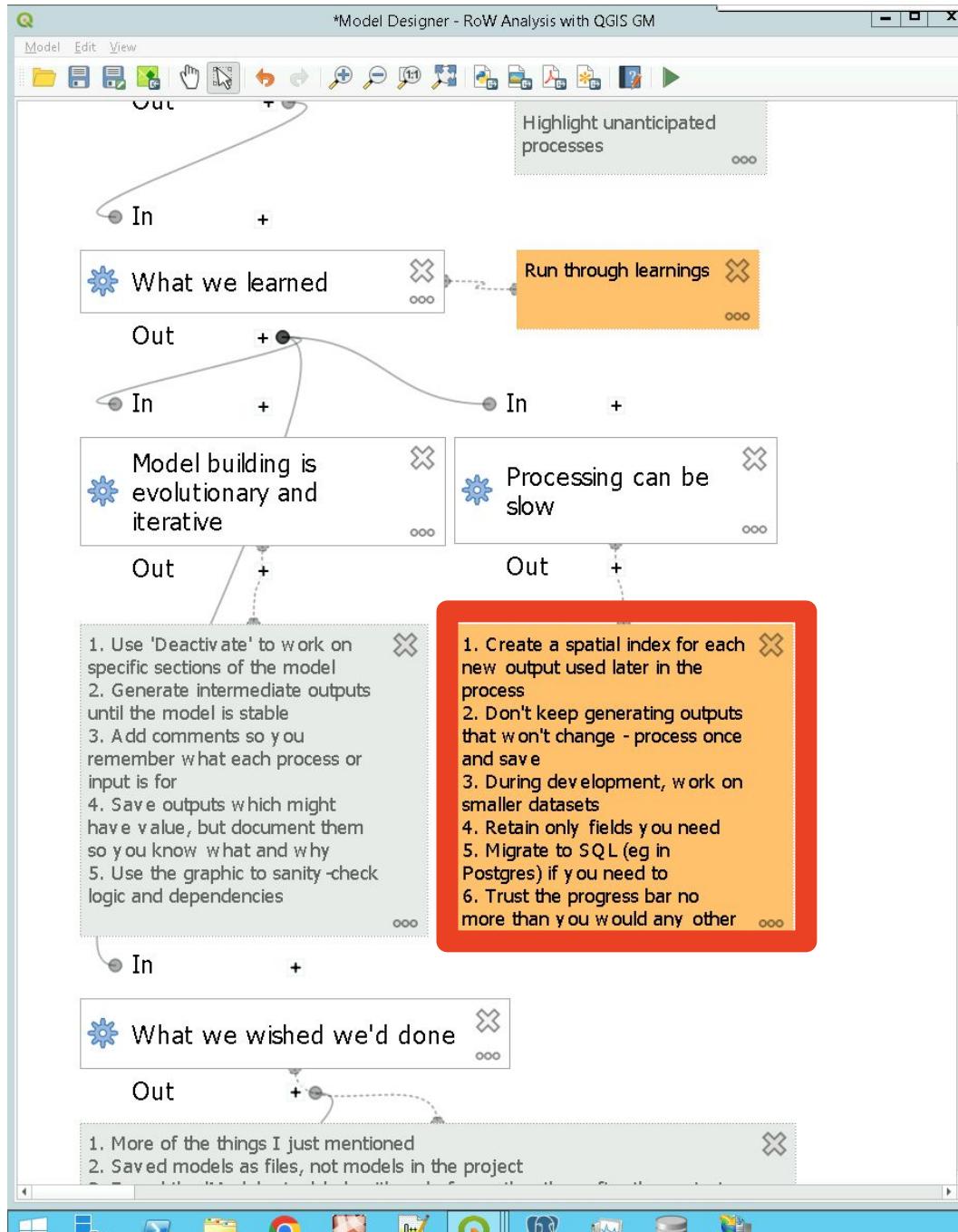












\*Model Designer - RoW Analysis with QGIS GM

Model Edit View

In +

**What we wished we'd done**

Out +

1. More of the things I just mentioned  
 2. Saved models as files, not models in the project  
 3. Found the 'Modeler tools' algorithms before rather than after the project  
 4. Built some models where I didn't bother  
 5. Not built some models where I did bother  
 6. Documented at model level as well as at process level  
 7. Saved the logs more often and read them more closely

In +

**Outcomes**

Out +

The 'Graphical Modeler' is robust, well-built and incredibly useful (though not necessarily the right tool for presentations....)  
 It allowed us to develop, finesse, document and pass on the models which analysed the data used to support the work of this report  
 Including these conclusions  
 Any questions?

4. Save outputs which might have value, but document them so you know what and why  
 5. Use the graphic to sanity-check logic and dependencies  
 6. Retain only fields you need  
 5. Migrate to SQL (eg in Postgres) if you need to  
 6. Trust the progress bar no more than you would any other

nef\_astun — QGIS

File Edit View Layer Settings Plugins Vector Raster Database Web Mesh MMOGS Processing Help

Algorithms

Search...  
 Cartography  
 Database  
 File tools  
 GPS  
 Interpolation  
 Layer tools  
 Mesh  
**Modeler tools**  
 Conditional branch  
 Create directory  
 Feature filter  
 Filter by geometry type  
 Filter layers by type  
 Load layer into project  
 Raise exception  
 Raise warning  
 Rename layer  
 Save log to file  
 Set project variable  
 String concatenation  
 Network analysis  
 Plots  
 Raster analysis  
 Raster creation

Inputs

Map Layer  
 Map Theme  
 Matrix  
 Mesh Dataset Groups  
 Mesh Dataset Time  
 Mesh Layer  
 Multiple Input  
 Number  
 Point  
 Point Cloud Layer  
 Print Layout  
 Print Layout Item  
 Range  
 Raster Band  
 Raster Layer  
 Scale  
 String  
 TIN Creation Layers  
 Vector Features

Help Editor

The UK national walking organisation, Ramblers, are working to improve the public rights of way network, and in particular improve access to it for people who are less advantaged, and may not have access to vehicles. The research project described in this talk undertaken an analysis of the national paths network using publicly available data supplied by hundreds of individual local authorities across the UK. This was done by setting up a series of models in the QGIS Graphical Modeler to generate six key indicators aggregated to census area level, including distance to nearest continuous path from each small area unit of population, length of available path within a series of buffers, and access to paths of specific types – for example those passing through protected or designated areas. The talk will look at some of the challenges of the project, including scaling the modeler to work with millions of path features and tens of thousands of point locations, and building processes to combine path segments and then disaggregate them to an appropriate level.

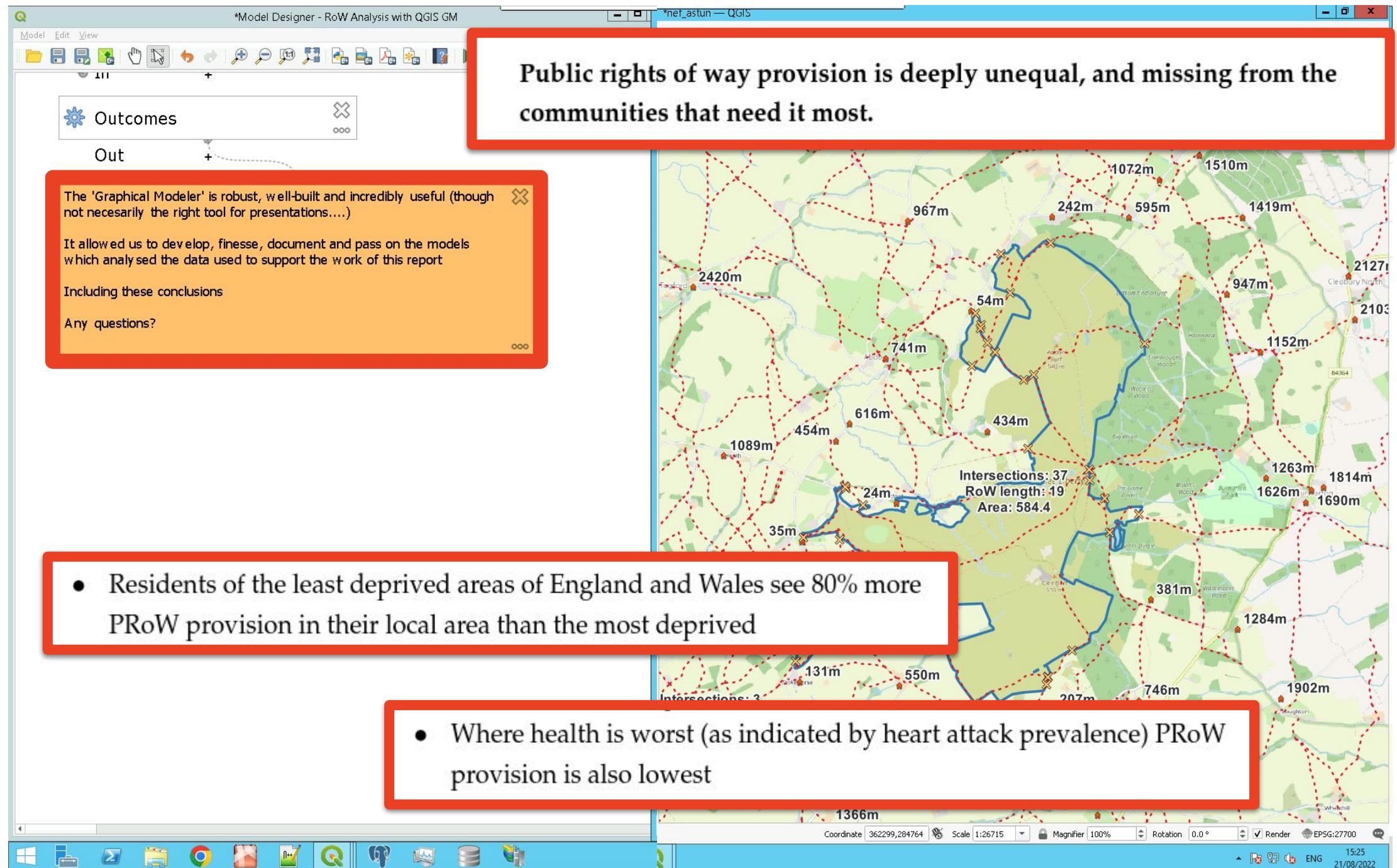
The main goal of the project was to inform and support specific policy proposals, but it is also intended that the QGIS models should be passed on to Ramblers and used in the longer term, to monitor the impact of changes to the paths network and of population patterns over time, and also to support analysis of how additions to the network,

Select element to edit  
 Algorithm description  
 Short description  
 Input parameters  
 Outputs  
 Algorithm author  
 Help author  
 Algorithm version  
 Documentation help URL (for help button)

Element description  
 The UK national walking organisation, Ramblers, are working to improve the public rights of way network, and in particular improve access to it for people who are less advantaged, and may not have access to vehicles. The research project described in this talk undertaken an analysis of the national paths network using publicly available data supplied by hundreds of individual local authorities across the UK. This was done by setting up a series of models in the QGIS Graphical Modeler to generate six key indicators aggregated to census area level, including distance to nearest continuous path from each small area unit of population, length of available path within a series of buffers, and access to paths of specific types – for example those passing through protected or designated areas. The talk will look at some of the challenges of the project, including scaling the modeler to work with millions of path features and tens of thousands of point locations, and building processes to combine path segments and then disaggregate them to an appropriate level.

OK Cancel

Type to locate (Ctrl+K) coordinate 343967,162664 scale 1:38574 magnify 100% rotation 0.0° Render ENG 16.29 19/08/2022





Thanks and questions...

Ant Scott

@antscott