Zoning: Technical Guidance Note 3

The Zoning Process

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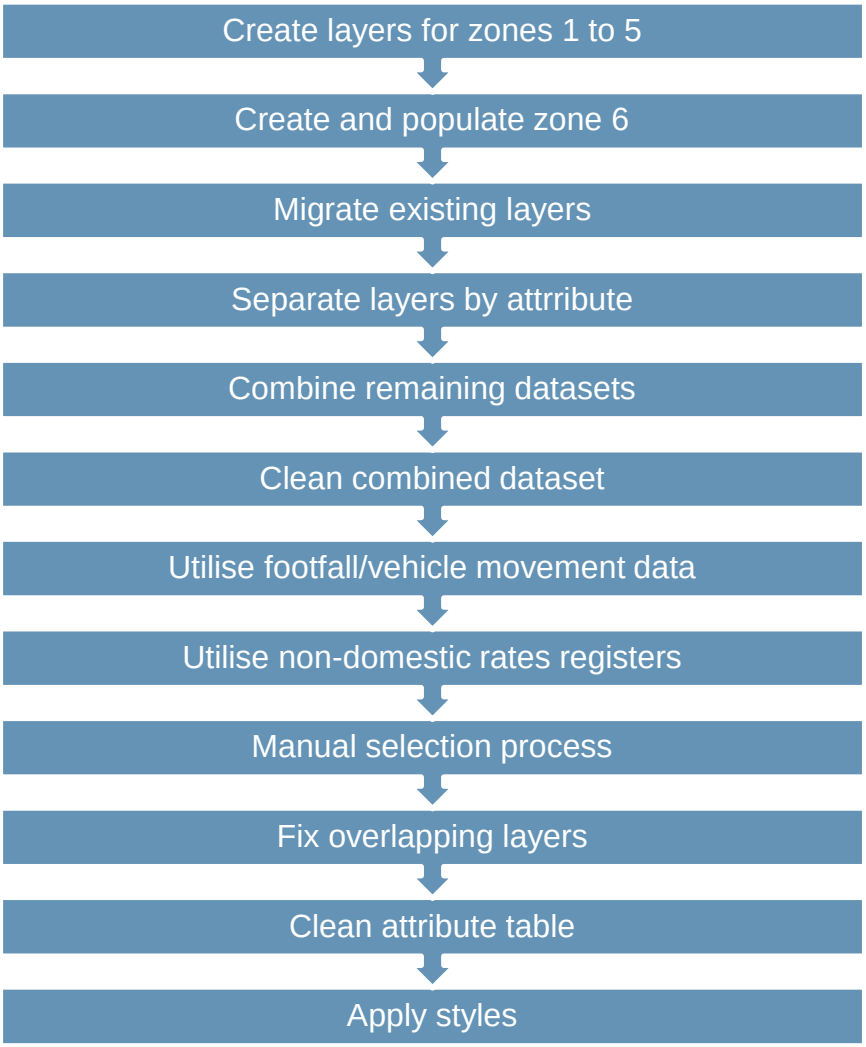
1 Introduction

This guidance note details a potential process for zoning land. However, it is recognised that the exact approach is likely to vary on a case-by-case basis. This document focuses on the process; the 'Zoning: Introductory Guidance Note' should be referred to for advice regarding the categorisation of zones.

2 The Process

An overview of the proposed process is provided below:



It is recommended that you **do not** use master copies when following the process to avoid loss of data.

2.1 Create Layers for Zones 1 to 5

To create the layers for zones 1 to 5:

- Use new shapefile layers for each zone category;
- Create the layers as polygons and set British National Grid as the CRS;
- The 'Attribute Table' for each zone includes the Headers:

- Org;
- Land_Type;
- Department;
- Zone;
- H_and_S; and
- Reason (if 'H_&_S' is marked 'Y').

Note: It is important to set up the fields at this stage to ensure attribute data is not lost later in the process. Remember that attributes are lost if copying and pasting between layers that do not have the same field names.

2.2 Create and Populate Zone 6

Zone 6 is specifically used for roads **over** 40mph and operational railway land more than 100m from the station platform.

2.2.1 Roads Over 40mph

If the dataset containing your road responsibilities also contains accurate and comprehensive speed limit data, you should consider selecting all of your roads with a speed limit greater than 40mph using a simple expression to assign them Zone 6. Checks will be required to ensure roads have been zoned correctly.

Caution is required where two separately sourced layers are used for road responsibility and speed limits. Figure 1 demonstrates some of the potential issues caused by combining OS Open Data with Local Authority data:

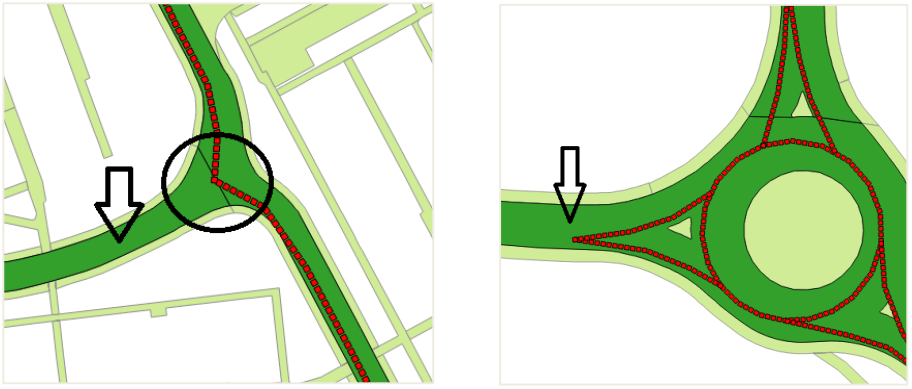


Figure 1: Issues caused by over-sail (left image) and an undivided polygon (right image)

The left image in Figure 1 illustrates how the OS Open Data road slightly over-sails the split in the Local Authority polygon, resulting in the road marked with an arrow being incorrectly selected.

The right image above illustrates how the westward bound road has been incorrectly selected due to there not being a split in the Local Authority polygon. The arrow indicates where a split could be added to fix this error.

If the two separate datasets do not closely match, you can either make amendments to the datasets, or you can revert to a manual process.

2.2.2 Removing Zone 6 From Other Datasets

It is important to remove Zone 6 from the other datasets before using them (geoprocessing 'Difference' tool – see Technical Guidance Note 1; section 4.2). This is to avoid having zones that overlap.

2.3 Migrate Existing Layers

If you have an existing layer in which all of the features relate to a single zone, you should copy and paste the entire layer into the relevant zone. For example, you may have a layer that only contains cemeteries, and it may be that you want all cemeteries to be categorised as Zone 4. In this case, you would:

- 'SelectAll' of the cemeteries;
- Copy them (Control+C);
- Left click on 'Zone 4' and make the layer editable;
- Paste (Control+V) into 'Zone 4' and save changes; and
- Remove the cemeteries layer from the workspace.

Please note the above example is purely for illustrative purposes, it is not a suggestion that all cemeteries are Zone 4.

2.4 Separating Layers by Attribute

Certain attributes within an existing layer may relate to specific zones. In these cases, you can:

- Use 'Select feature using an expression' to select the relevant feature;
- Cut (Control+X) the selected features from the layer;
- Make the relevant zone editable and paste (Control+V) in the features; and
- Save the changes.

2.5 Combine Remaining Datasets

Once you have utilised all of the attributes of your existing datasets, it is recommended that you combine all of these datasets into a single layer. This will allow you to zone areas more quickly.

You can combine shapefiles via Vector Data > Data Management > Merge Shapefiles to One.

The exact name of the tool does vary between versions of QGIS, but the symbol and location under 'Data Management' remains the same.

2.6 Clean Combined Dataset

Before using the combined dataset make sure any already zoned areas are removed to avoid creating overlapping zones. To do this, use the geoprocessing tool 'Difference' (see Technical Guidance Note 1; section 4.2) for each of the six zones.

2.7 Utilise Footfall/Vehicle Movement Data

Consideration should be given to utilising any existing footfall and vehicle movement data that may be available to help assign minimum Zone categories to areas.

2.8 Utilise of Non-Domestic Rates Registers

Zones categories should also take account of the number of Potential Litter Sources (PLS). The zone categories associated with numbers of PLS are in Table 1.

Table 1: Zone Categories Based on the Number of Potential Litter Sources

Category	No. of Potential Litter Sources
1	20 or more high risk potential litter sources
2	15-19 high risk potential litter sources
3	10-14 high risk potential litter sources
4	5-9 high ris potential litter sources
5	<5 high risk potential litter sources
6	N/A

The type of PLS are divided into two categories - high risk and moderate-low risk, where 4 moderate-low risk PLS equate to 1 high risk PLS. Definitions of high and moderate-low risk are stated in Tables 2 and 3 of the 'Zoning: Introductory Guidance'.

The majority of the PLS sites may be captured by the non-domestic rates register. It is therefore envisaged that a heatmap could be generated and used as a quick and clear visual aid during the zoning process.

2.9 Manual Selection Process

A number of approaches could be used for a non-attribute driven selection process. The approach below is consistent with earlier parts of the process and involves minimal steps:

- Make the combined layer editable;
- Use the 'Select feature by freehand' tool ;
- Select the areas you want to zone (if you select an area accidentally, hold down Control and drag over the area to remove from selection);
- Cut (Control+X) the selection;
- Make the target zone layer editable and paste (Control+V);
- Save changes to the zone; and
- Continue this process until all of your combined layer has been reallocated to a zone.

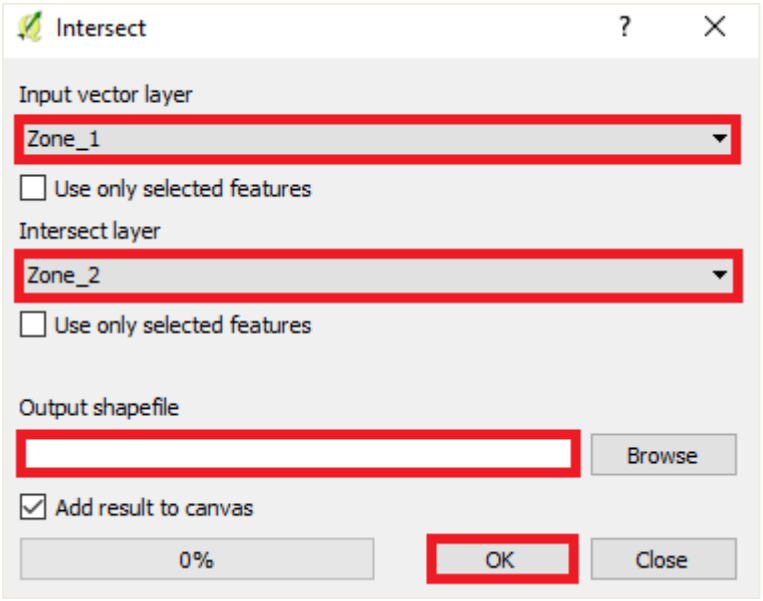
2.10 Fix Overlapping Layers

It is important for both the zoning and dividing process that there are no overlapping zoned layers. The exception to this is where the overlaps don't occupy the same physical space (e.g. bridges, underpasses, etc.).

The 'Topology Checker' in QGIS is extremely sensitive and does not allow the user to set a tolerance. Therefore, if used to identify overlaps between large datasets, the 'Topology Checker' is likely to produce a huge list of results, many of which will be so small as to be insignificant.

It is therefore recommended that the following process is used to identify and remove overlapping zoned layers:

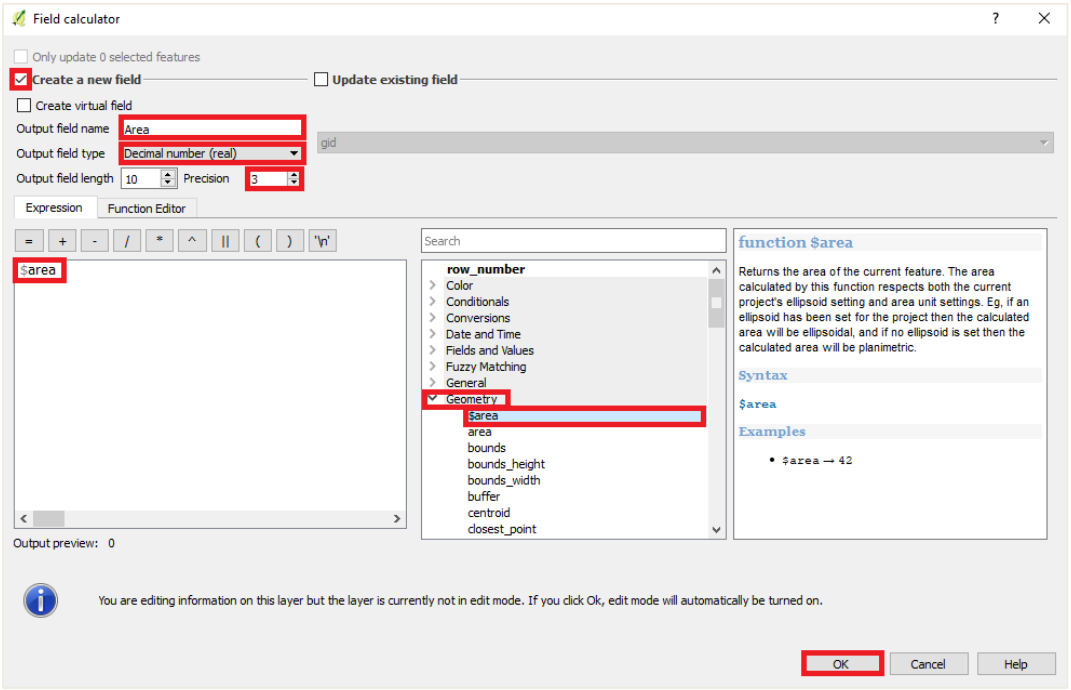
- Use the 'Intersect…' tool (Vector > Geoprocessing Tools > Intersect…) to create new layers where the zones overlap;



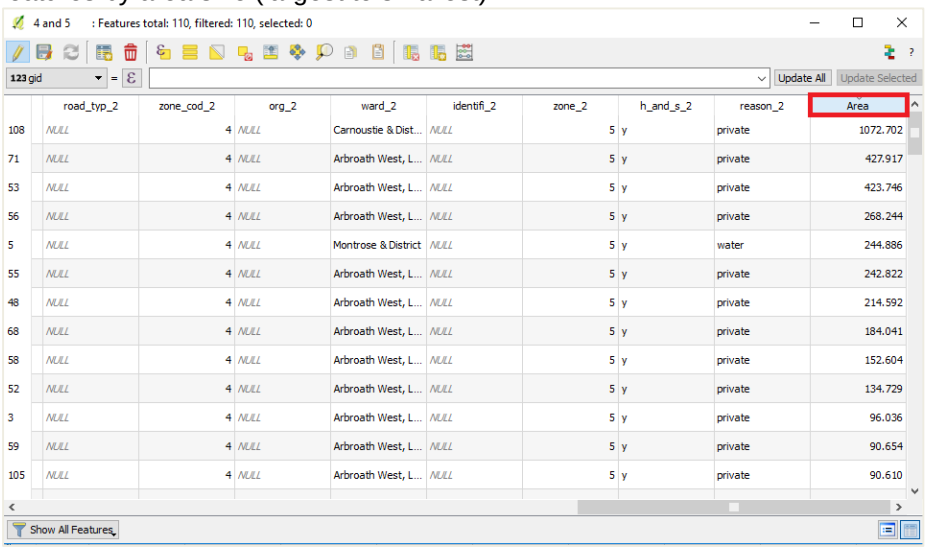
- Repeat the above step for all zone combinations. In other words, the following layers should be produced:
    - Zones 1 & 2
    - Zones 1 & 3
    - Zones 1 & 4
    - Zones 1 & 5
    - Zones 1 & 6
    - Zones 2 & 3
    - Zones 2 & 4
    - Zones 2 & 5
    - Zones 2 & 6
    - Zones 3 & 4
    - Zones 3 & 5
    - Zones 3 & 6
    - Zones 4 & 5
    - Zones 4 & 6
    - Zones 5 & 6

For all zone combinations the following steps should be taken:

- Left click on the newly created layer in the 'Map Legend' and click on the 'Open Attribute Table' button in the top toolbar.
- Click on the 'Open Field Calculator' button in the 'Attribute Table' toolbar and populate as illustrated below:

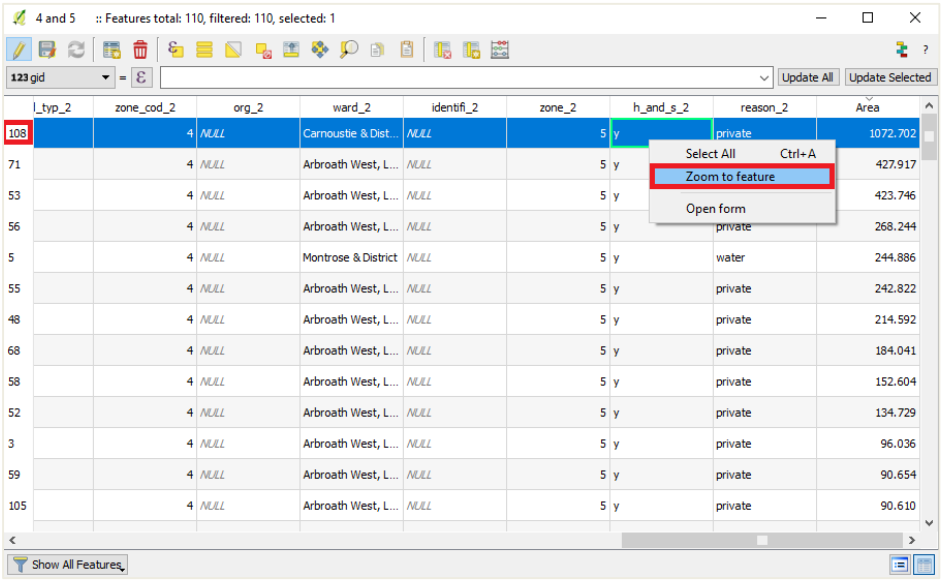


- Click twice on the newly created field heading ('Area') in the 'Attribute Table'. This will sort the features by area size (largest to smallest).



	road_typ_2	zone_cod_2	org_2	ward_2	identifi_2	zone_2	h_and_s_2	reason_2	Area
108	NULL	4	NULL	Carnoustie & Dist...	NULL	5	y	private	1072.702
71	NULL	4	NULL	Arbroath West, L...	NULL	5	y	private	427.917
53	NULL	4	NULL	Arbroath West, L...	NULL	5	y	private	423.746
56	NULL	4	NULL	Arbroath West, L...	NULL	5	y	private	268.244
5	NULL	4	NULL	Montrose & District	NULL	5	y	water	244.886
55	NULL	4	NULL	Arbroath West, L...	NULL	5	y	private	242.822
48	NULL	4	NULL	Arbroath West, L...	NULL	5	y	private	214.592
68	NULL	4	NULL	Arbroath West, L...	NULL	5	y	private	184.041
58	NULL	4	NULL	Arbroath West, L...	NULL	5	y	private	152.604
52	NULL	4	NULL	Arbroath West, L...	NULL	5	y	private	134.729
3	NULL	4	NULL	Arbroath West, L...	NULL	5	y	private	96.036
59	NULL	4	NULL	Arbroath West, L...	NULL	5	y	private	90.654
105	NULL	4	NULL	Arbroath West, L...	NULL	5	y	private	90.610

- Starting at the top of the table (i.e. the largest overlap), left click on the row number to select the row. Then right click anywhere on the row and click on 'Zoom to feature'.



	l_typ_2	zone_cod_2	org_2	ward_2	identifi_2	zone_2	h_and_s_2	reason_2	Area
108		4	NULL	Carnoustie & Dist...	NULL	5	y	private	1072.702
71		4	NULL	Arbroath West, L...	NULL	5	y		427.917
53		4	NULL	Arbroath West, L...	NULL	5	y		423.746
56		4	NULL	Arbroath West, L...	NULL	5	y	private	268.244
5		4	NULL	Montrose & District	NULL	5	y	water	244.886
55		4	NULL	Arbroath West, L...	NULL	5	y	private	242.822
48		4	NULL	Arbroath West, L...	NULL	5	y	private	214.592
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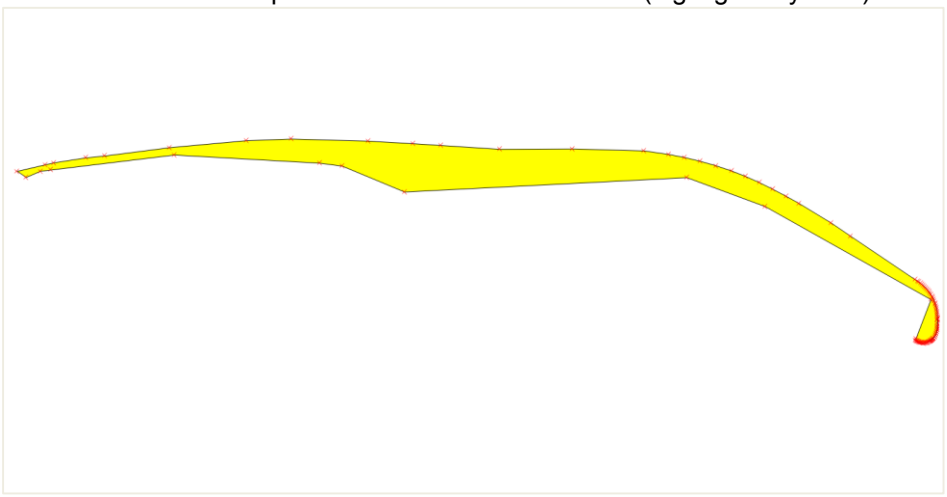
58		4	NULL	Arbroath West, L...	NULL	5	y	private	152.604
52		4	NULL	Arbroath West, L...	NULL	5	y	private	134.729
3		4	NULL	Arbroath West, L...	NULL	5	y	private	96.036
59		4	NULL	Arbroath West, L...	NULL	5	y	private	90.654
105		4	NULL	Arbroath West, L...	NULL	5	y	private	90.610

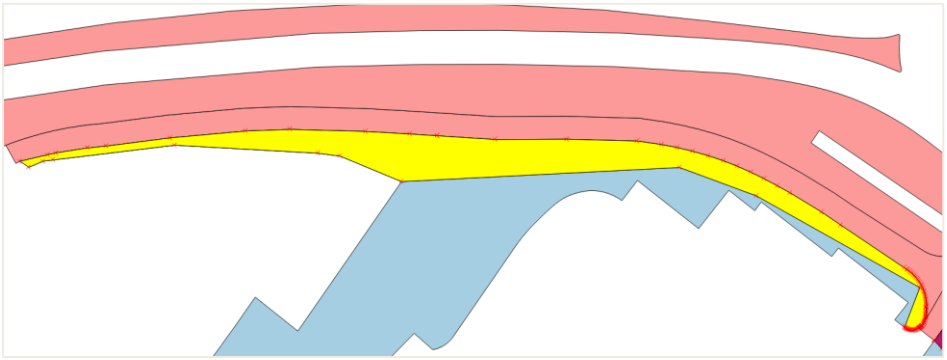
- This will centre the ‘Map View’ on the selected feature (highlighted yellow).



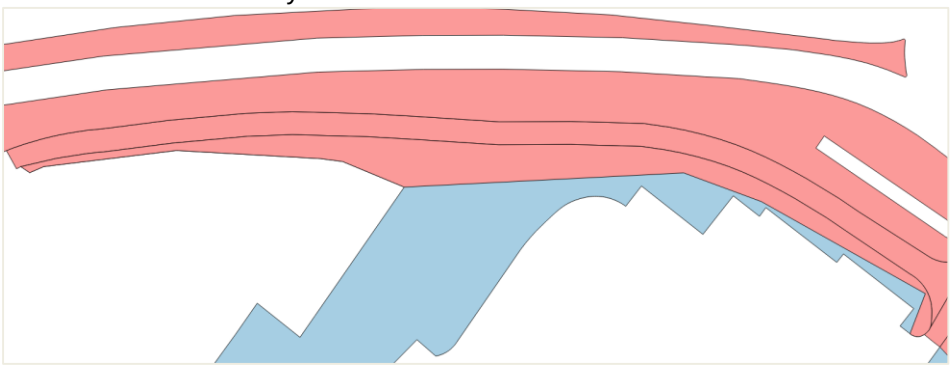
- At this point the measurement tool can be used to further check the significance of the overlap and a judgement can be made as to whether adjustments are necessary.
- Once the overlap has been fixed (see below), repeat the process for all features where the ‘Area’ is greater than 1m2 and repeat for all of the zone combinations created by the intersect tool.

To then fix the layers that overlap:

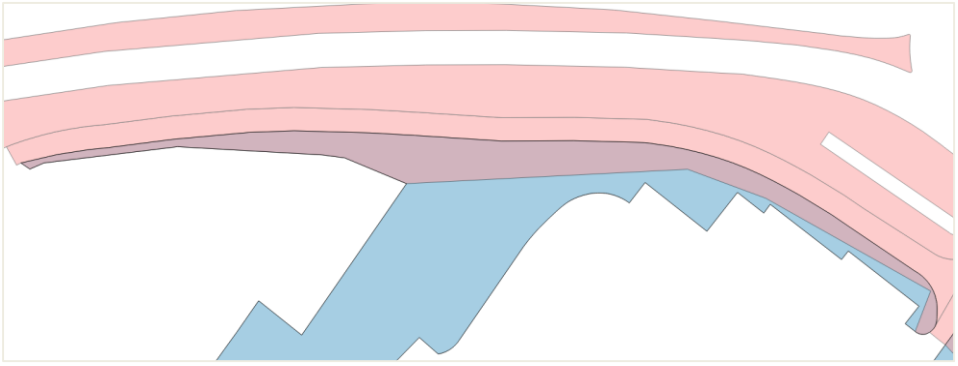
- Make the overlapping layers visible:



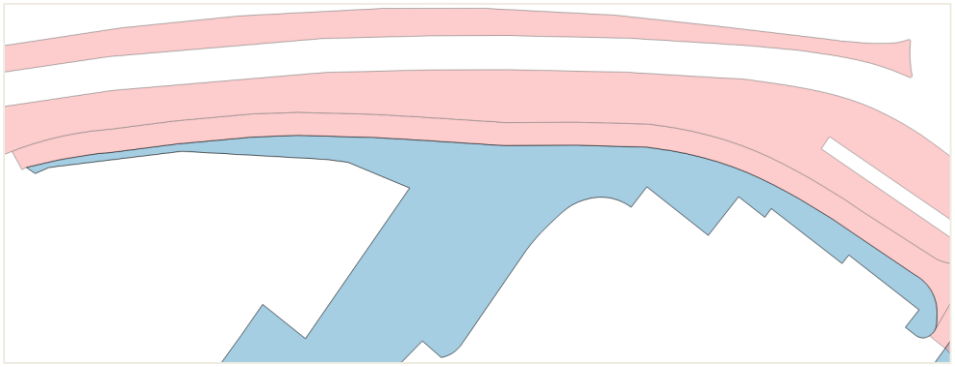
- Turn off the intersects layer:



- Make the layer that is highest in the ‘Map Legend’ transparent (in this example 50%) and change the colours of the layers if there is insufficient contrast:



- Establish which zones boundary is incorrect (i.e. which layer needs amending);
- Go to snapping options (Settings > Snapping Options…) and set the snapping tolerances for the two layers;
- Make the layer you wish to amend editable ;
- If the feature sits entirely within the boundary of the other layer delete the incorrect polygon (this was the case with this example):



- If the overlapping polygon is part of a larger polygon that you wish to keep, you will want to amend the boundary to remove the area of overlap. One way of achieving this would be to:
    - Click on the 'Node Tool' ;
    - Drag the offending nodes near to the boundary of the other layer (they should snap back to the boundary line);
    - You may need to create new nodes to accurately amend the boundary. New nodes are created by double clicking on the segment whilst the 'Node Tool' is active;
    - Once you are happy with the amendments, save the layer and turn off editing .

2.11 Clean Attribute Table

It is important that the 'Attribute Table' for each zone layer is cleaned so that only the exact headers detailed below are included (see Table 2):

- Organisation responsible for the identified land (Header: **Org**);
- Department (Header: **Department**);
- Zone number classification (Header: **Zone**);
- Health & safety or access issues present which prevent **monitoring** of the site (Header: **H_and_S and populate with 'Y'**);
- Named health & safety or access reason (Header: **Reason**).

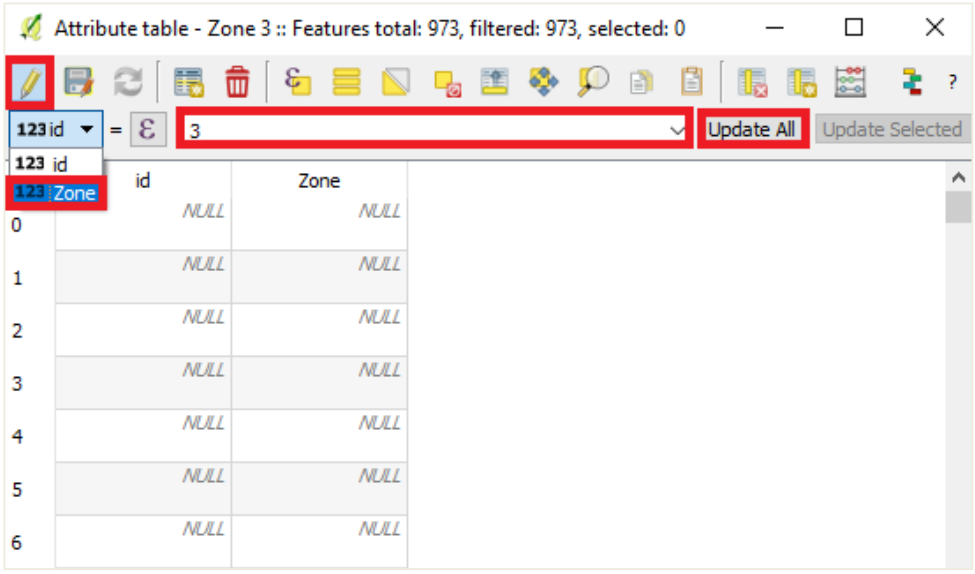
Table 2: Example Attribute Table

Org	Department	Zone	H_and_S	Reason
East Renfrewshire Council	Children's Services	2		
East Renfrewshire Council	Street Cleaning	2	Y	Very steep embankment
East Renfrewshire Council	Parks & Open Spaces	4		

It may be that some of the above attributes have been assigned prior to the zoning process, with the exception of ‘Zone’.

To assign a value to the zone field of your layers:

- Left click on zone layer in the ‘Map Legend’;
- Click on ‘Attribute Table’ button on top toolbar;
- Make the layer editable ;
- Select ‘Zone’ from the pulldown menu;
- Type the zone number of the layer in the box;
- Click ‘Update All’;
- Save the changes and make uneditable and



- Repeat for all layers.

2.12 Apply Styles

The following styles should be attributed to each zone:

Table 3: Style Guidance for Zone Layers

Zone Category	Colour	Hex Number	RGB Code
1		#8c510a	140, 81, 10
2		#d8b365	216, 179, 101
3		#f6e8c3	246, 232, 195
4		#c7eae5	199, 234, 229
5		#5ab4ac	90, 180, 172
6		#01665e	1, 102, 94

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