Orientation & Training

## Exercise 1: Table mode and data enrichment

Purpose

The purpose of this exercise is to teach you how to utilise the Table mode to enrich your data in your workspace. This exercise is based on analysing various nodal points along Madiba Drive in the Mbombela Municipality.

You will create the nodal areas through the drawing tool, load the drawing into your workspace, use the table mode to enrich the data and finally export the data.

*Please note that you can import your own data in the form of shapefiles or KML/Z. to your workspace utilising the "Add Layer from Spatial Database'.

Finding the site

The first step is to locate Madiba Drive in the Mbombela Municipality. Madiba Drive can be found by utilising a combination of the pan mode and zoom mode or the search and report tool in your MapAble workspace. The study area is shown in the image below.
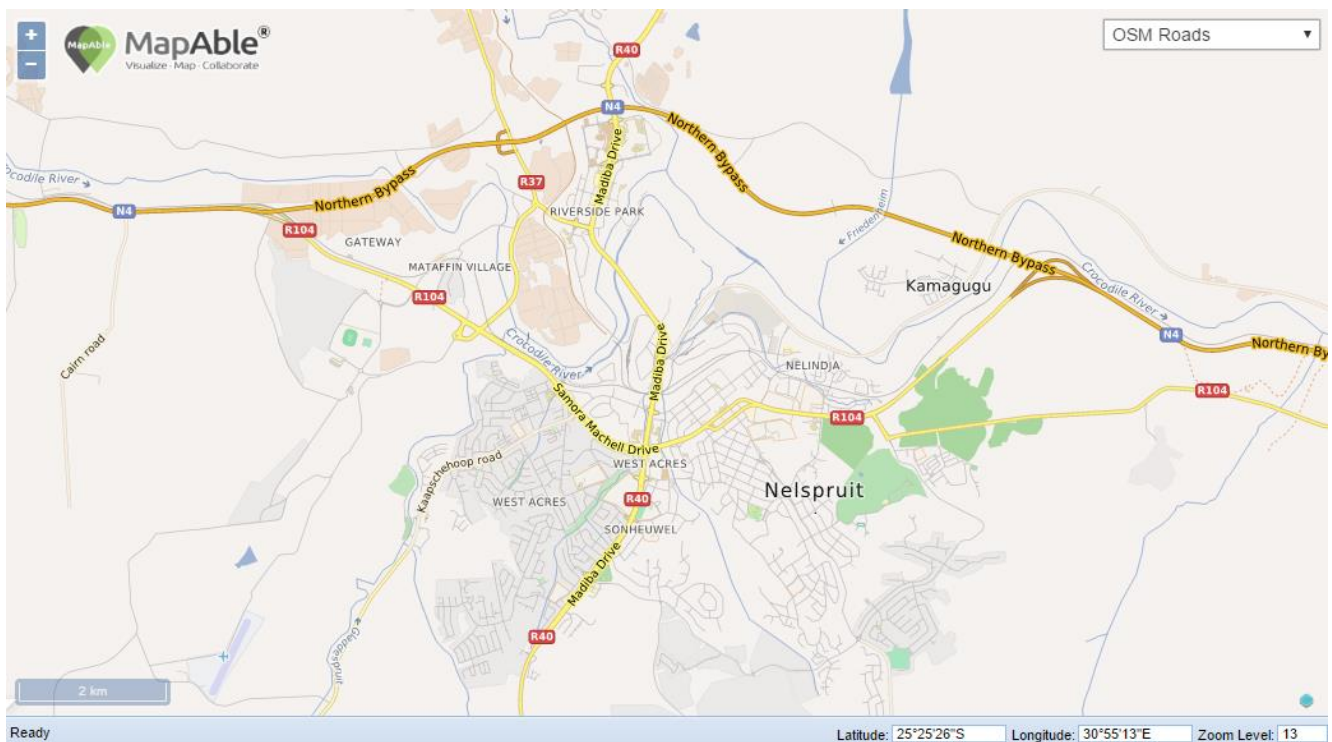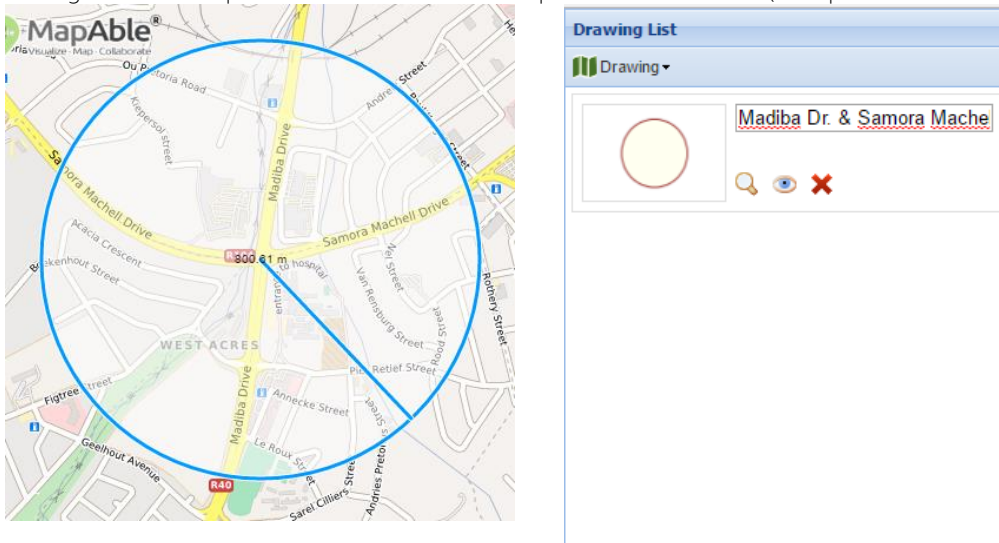

## Creating nodal zones along Madiba drive and importing the layer into your workspace

To start, activate the drawing mode in your workspace click on the drawing mode button

Zoom to the intersection between Madiba Dr. and Samora Machell Dr. To create the nodal zones, click on the . Click on the centre of the intersection and move the mouse pointer outwards from the centre, until you reach 800m radius (indicated in the centre

of the circle). This will create a new drawing in the drawing list. Edit the name of the drawing to 'Madiba Dr. & Samora Machell Dr.'. The 800m radius is significant as it represents the ideal nodal development area for a TOD (Transport Orientated Development).


Create four additional nodal zones along Madiba Dr. by either creating the zones as above or selecting the first zone that you created and duplicating the zone by clicking on the duplicate item as illustrated below.
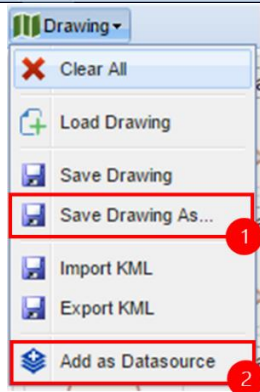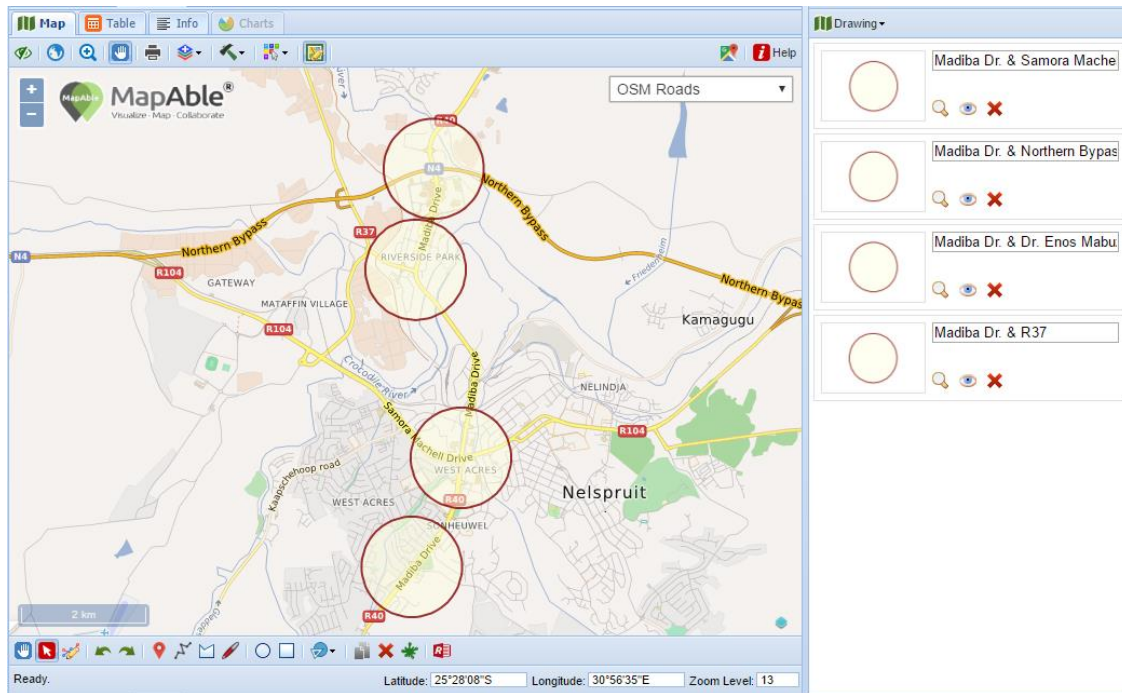

Finish your drawing by saving it. To save your drawing click the 'Save Drawing As...' icon from the drawing dropdown. Save the drawing as 'Madiba Dr. Nodal Zones'.

To add the drawing to your workspace, click on the 'Add as Data source', the 'select folder' box will open. To add the drawing to your workspace click on your workspace on the left then click on the 'Create Data Source here' item. After the file is loaded to your workspace select the 'Madiba Dr. Nodal Zones' and click OK.
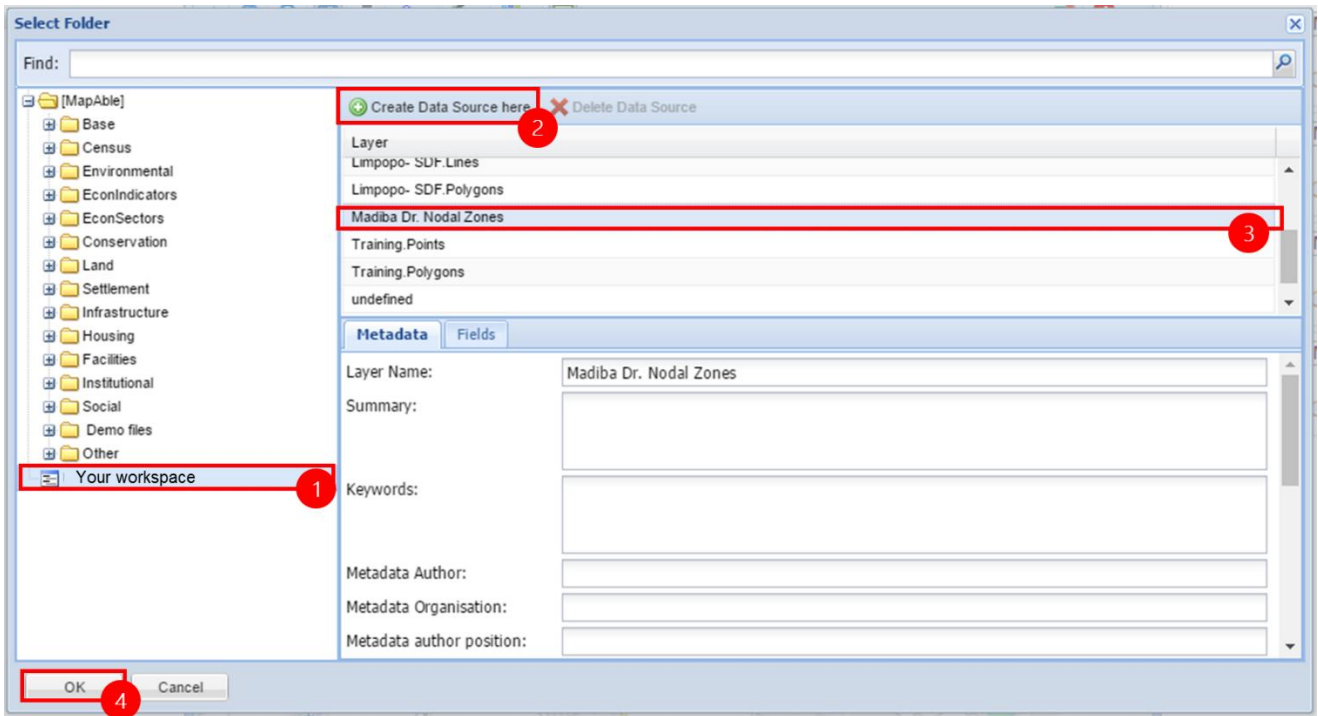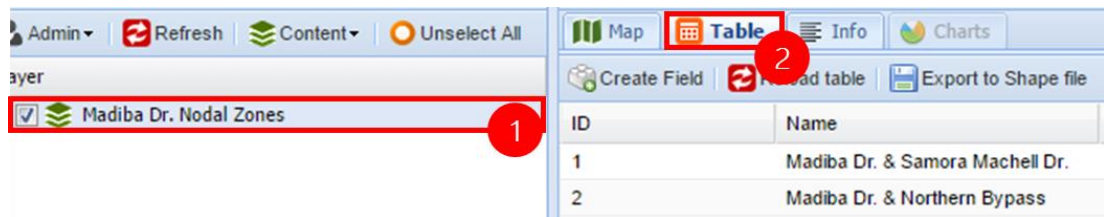
Visualising and activating the Table mode

After the layer has been imported into your workspace, the layer will need to be rendered. Visualise the layer as shown below.
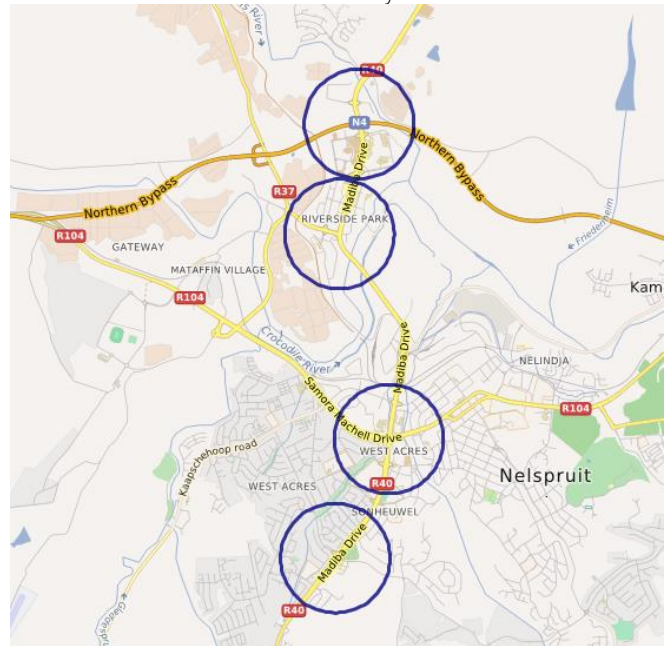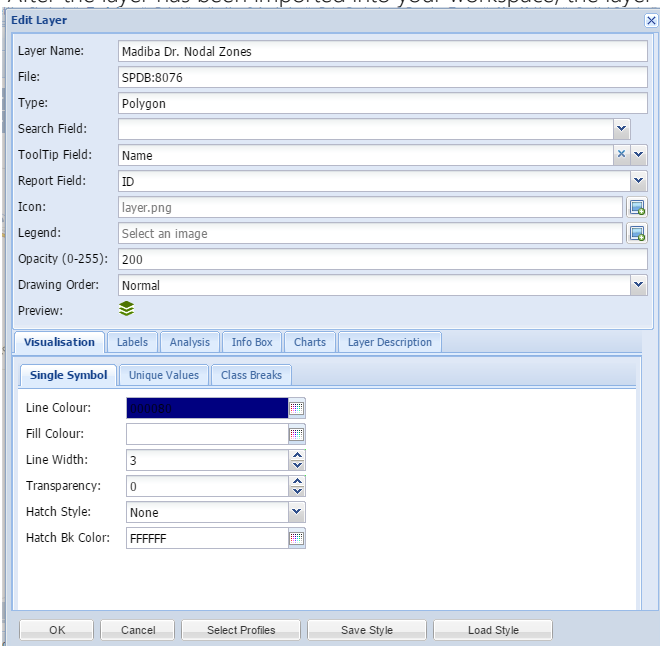
To activate the Table mode highlight the layer which you just loaded into your workspace by clicking on the layer. Then click on the Table mode tab above the viewpane.

Enriching your data with the table mode

One of the most powerful functions within MapAble is to enrich your own data. This is done through field calculator and spatial query functions in MapAble. To begin simply activate the table mode for the layer you want to work on. After the table mode is selected, you can add and edit the attributes of your layer. The following attribute fields will be added:

- Total area of the nodal zone;
- Neighbourhood in which the nodal zone is in;
- Ward in which the nodal zone is in;
- Population within the nodal zone; and
- Population density within the nodal zone.

The table mode has various attribute fields, including the name you gave the drawing earlier as well as various administrative fields.

Cleaning up your table

Sometimes there are some irrelevant fields in the data that you have loaded. To clean up your data some attributes can be removed so that you can work more efficiently with your data. Typically, these fields are administrative fields that have little use or value. Once in Table mode you can delete a field by clicking on the field dropdown list and click "Delete field".
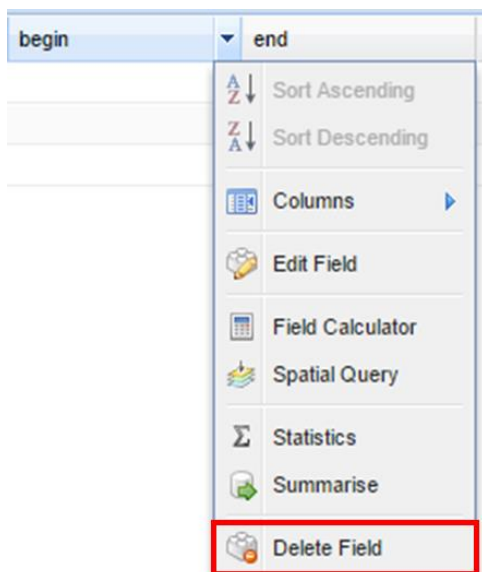
Please note:

Make sure you want to delete the attribute or field because once deleted it cannot be recovered.

Area Calculation of the nodal zone

To create a field, click on the 'Create Field' item, the create field box will open. For the Total Area Calculation name the field "Area" select the type as "Float", which means a numerical value that can have decimal values and click OK.

The new field is located at the end of the existing fields. The 'Area' field currently has no information in it. To calculate the area, click on the dropdown list to the right of the field. Click on the 'Field Calculator' and the box will open. Click on the Geometry folder in the Functions section, then select the function, 'CalcHectares'. This will automatically be fill the expression, then click OK and the area, in hectares, will be calculated for all the feature in the table.

The 'Area' attribute field will now be filled with the area of the nodal zones in hectares. To round the hectares to two decimal numbers, open the field calculator again and in the expression box (the middle box) type ROUND (CalcSquareMeters, 2) and click OK.

Neighbourhood in which the nodal zone is in

To create the field, click on the 'Create Field' item, then the create field box will open. For the Neighbourhood field name the field 'Neighbourhood' and select the field type as 'String', which means text data, then click OK.

After the field, has been created double click on each of the lines and manually type in neighbourhood in which the nodal zone is located (you can switch back to the map mode of your workspace and utilise the various background maps to determine what the neighbourhood is for each nodal zone).

Neighbourhood
Riverside Park
Riverside Park
West Acres
West Acres

The ward in which the nodal zone is in

Create a new field. To determine what Ward the nodal zone is located name the field 'Ward' select the field type as 'String' and click OK.

	ID	Name	descrip
	1	Madiba Dr. & Samora Machell Dr.	Madiba
	2	Madiba Dr. & Northern Bypass	Madiba
	3	Madiba Dr. & Dr. Enos Mabuza Dr.	Madiba
	4	Madiba Dr. & R37	Madiba

Create Field

Field Name:	Ward
Field Type:	String
Field Length:	80

OK   Cancel

To determine the 'ward' name, click on the properties dropdown of the field and select the 'Spatial Query'. This will open the 'add query' box. In the query type select 'DRILL DOWN ON POINT'. Now select the layer that should be queried click on the magnifying glass and search for the layer 'Wards 2016'. Next, select 'Field Value' in the Percentage/Ratio option, then select the attribute field called 'Ward name' in the Wards 2016 layer. Lastly select 'DEFAULT' in the 'Output mode' option that will determine how the query will appear.

Add Query

Query Type:	DRILL DOWN ON POINT
Query Layer:	16725
Percentage / Ratio:	Field Value
Query Field 1:	Ward Name
Output Mode:	DEFAULT
Mask:	%1

The results shouold be as shown below

Ward
MP326-16
MP326-14
MP326-15
MP326-14

Population within the nodal zone

To create the field, click on the 'Create Field' item, then the create field box will open. To determine population within the nodal zone, name the field 'Population' and select the type as 'Float', which means a numerical value that can have decimal values, then click OK.

To determine the Population, click on the properties dropdown of the field and select the 'Spatial Query'. This will open the 'add query' box. In the query type select 'DATA PARTITIONING'. Now the layer that should be queried should be selected. Click on the magnifying glass and search for the layer 'Population (Individuals per SAL) (2011)'. Next select 'Field Value' in the Percentage/Ratio option, then select the attribute field called 'Total Population' in the Wards 2016 layer (Query field 1). Then select the aggregation 'sum'. Lastly select 'DEFAULT' in the 'Output mode' option that will determine how the query will appear and select 2 decimals.

The results shouold be similar to those shown below.

Total Population
3,096
180
3,116
175

Calculating population density within the nodal zone

To create the field, click on the 'Create Field' item, then the create field box will open. Name the field 'Pop Density' select the type as 'Float' and click OK.


To calculate population density, click on the dropdown list to the right of the field. Click on the 'Field Calculator' and the box will open. To determine the population density, you should divide the population of the nodal zone with the total hectares to determine the population per hectare or pop/ha. Sometime one may encounter a problem if some values have 0 values, as you cannot divide by 0. To get around this problem an 'IIF Statement' is required. In the expression box type in: *IIF (AREA=0,0, [Population]/[Area])*. What this does is that it askes, if the area of the polygon equals 0 then the answer should be 0 else it should divide population by the area. Click OK to run the expression.
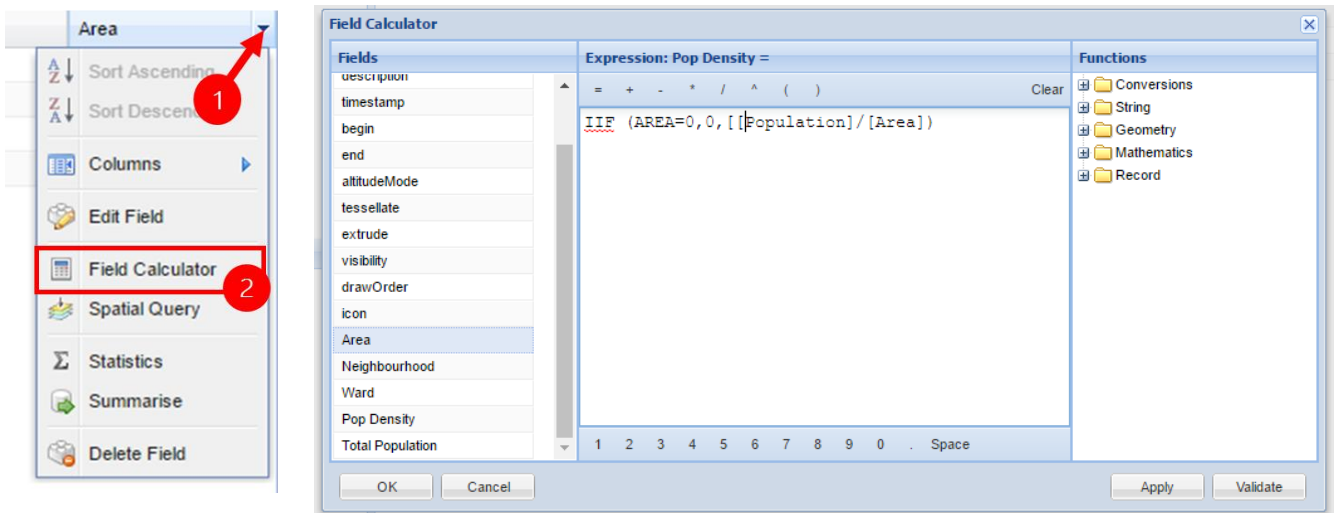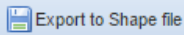
Statistics function

The Table mode provides you with functions that can help in the analysis of the data contained in the table. One of the functions is that of Statistics, which gives a quick statistical analysis of the data contained in the data set. To activate the statistics function simply click on the properties drop-down of the attribute field you want to know the statistics about, and then click on the "Statistics" item. This will activate the "Field Statistics" box that displays various statistics related to the attribute fields. This data can be downloaded by clicking on the "Save to CSV" button.
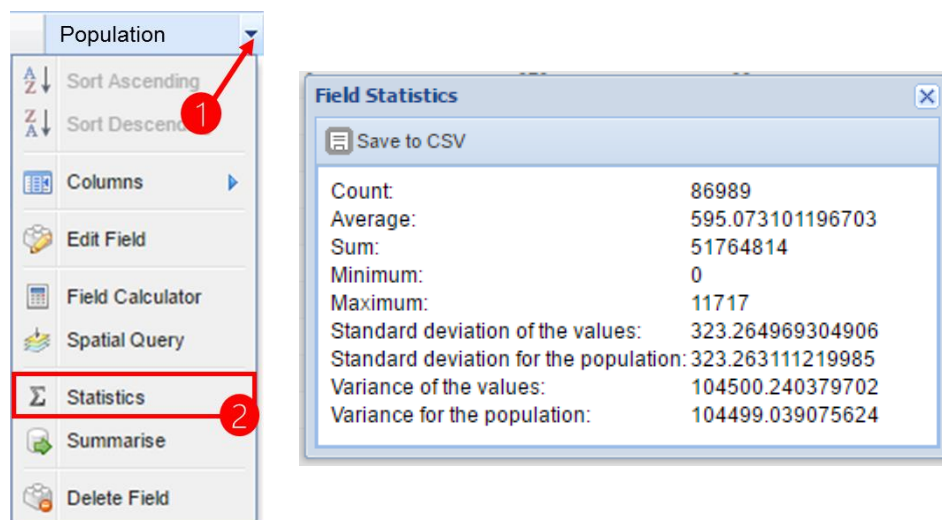
Exporting your data

To export your newly "enriched" data simply access the table mode and click on the 'Export to Shape file" item .

Click on the 'Export to Shape file' item above the layer's table:

The Shapefile of the selected layer will be downloaded to your default download folder.

Please note:

Pop-ups should be allowed for map.mapable.co.za to download the selected layer/data.

The Shapefile (which includes all the files that comprises a Shapefile) will be downloaded in a Zip folder and can be outside of MapAble in GIS programs or alternatively brought back into MapAble using MapAble loader or directly importing the file into your workspace via the spatial database.

Need to know more?

If you have any questions about these training sessions, please contact us by email on info@mapable.co.za for more information