Chapter 7

Selecting Attributes and Location in QGIS Desktop

Summary: This tutorial covers selecting features in QGIS. If you are unfamiliar with the basics of the QGIS user interface, please read the tutorial A Quick Tour of QGIS Desktop.

Selecting features on a map is similar in concept to selecting text in a word processing document, except that instead of highlighting words or sentences, we focus on features in a map layer. We may want to select features for specific reasons. For example, a particular contaminated site may have recently made headlines. A city of Ottawa park that contains a high number of discarded needles within a 50-metre walking distance is the subject of an upcoming public meeting. Or, as may be the case with this tutorial, a hospital suddenly finds itself in the middle of a city block that has suddenly become a hot spot for parking tickets.

What you will learn:

1. Selecting features manually.
2. Selecting from the attribute table.
3. Selecting by attributes.
4. Selecting by location.
5. Working with selected features.

Task 1: Selecting features manually.

The simplest way to select features in Qgis is manually with the select tool on the Tools toolbar. We’ll work with three layers, hospitals in Toronto
(“TorontoHospitals”), parking tickets handed out in 2015 (“ParkingTickets2015”) and the city’s ward boundaries (“TorontoWards” - 2010 ward map, with the NAD27 data)

You can obtain the options for selecting by going to “View” in the menu, and then choosing the “Select” option from the drop-down menu.
You can also obtain the options by selecting the “Select Features” icon on your menu.

The first option, “Select Feature(s)” allows you to do what its name suggests, select the desired features. Click on the layer on the left that contains the features you want to select. Let’s go with “TorontoHospitals”. Once it’s selected, go to “View”, “Select”, and then the first option, “Select Feature(s)”. 
Clicking on one location selects, and assigns it a new colour, in the yellow circle in the middle of the screen grab below.

The selection also appears in the layer’s attribute table. The selected row is highlighted in blue at the bottom.
While the first option under “Select” is fine, it only permits one choice at a time. Click on another hospital location, and that one is highlighted.

The next three selection options (polygon, freehand and radius, respectively) allow you to select multiple locations by drawing shapes around the areas of interest. So, for instance, with the freehand option, you can draw a radius around several locations.
Open the attribute table reveals the locations we’ve selected.

You can also achieve more precision by enlarging the area of your map that contains lots of parking tickets near hospitals, and using polygon, freehand or radius options to define the area of interest.
Opening the attribute table reveals that the Women’s College Hospital and the Toronto General Hospital Site, University Health Network, are among the institutions close to clusters parking-ticket locations. We will explore ways to accomplish this task with more precision a little later in this tutorial.
To de-select the locations, return to your drop-down menu and select the “Deselect Features from All Layers” option.

You can also de-select the features by clicking on the same icon located on your menu bar.
Task 2: Selecting from the attribute table

You can also select data by opening the attribute table for a map layer in question, and manually selecting rows in the table.

To do this, click on the desired row numbers consecutively, either holding down your “Ctrl” key for PCs or your apple key for Macs.
You may choose this option if you are familiar with the dataset, and are interested in specific locations that may have been in the news. For instance, the Ontario government has expressed concerns about hospitals raising revenues by charging patients and visitors to park. You may be interested in a hospital that has been notorious for charging high rates to see if drivers have been taking their chances parking for free on neighboring streets, only to end up with nasty surprises. If you close the attribute table, you can see the features selected on the map.

Task 3: Selecting by Attributes.

As discussed in Chapter 7 of *The Data Journalist*, a GIS program is a specialized form of database program, one that also works with geographic data. And just as you can use SQL queries in a relational database to select records, you can use SQL in Qgis to select map features.
This feature can be accessed either from the Selection menu.

Or you can find the “Select By Expression” option by choosing a layer – in this case, “ParkingTickets2015” – and opening attribute the table.
Selecting this option produces a “Select by expression” dialogue box. The drop-down menu on the right contains the columns in the parking-ticket table.

This interface looks similar to the MySQL front-end programs discussed in Chapter 5 on pages 86 to 87. The queries in Qgis – and ArcMap – are similar to the select queries and clauses discusses on pages 90-91.
Select “Fields and Values” from the menu on the right, and double-click on the column “location2”.
If you’ve read Chapter 5, this query should look familiar. To make sure we understand, let’s break it down.

The first part of the SQL statement -- the SELECT and FROM clauses -- is created automatically. In the above example, we are selecting all records from the column “location2”. We’ve used the LIKE operator to identify addresses that contain the name “SPADINA”, which should give us all the parking locations on that street.

We’ve used the “%” as our wild card, and made sure that the expression is in single quotes. Statements in the WHERE clause are case-sensitive. So, for this example make sure that the term SPADINA is in caps.

Neglecting to use single quotes, produces an error message instead of the “Output preview” at the bottom left of the dialogue box in the screen grab above.

All standard operators, including the Boolean operators AND, OR and NOT, are available for queries.
Select the arrow to the right of the “Select” tab at the bottom of the dialogue box.

Choose “Select”, and then close the dialogue box to return to the attribute table. To ensure that the selection has been made, click on the arrow to the right of the “Show All Features” tab at the attribute table’s bottom left-hand corner, and select the “Show Selected Features” option.
The number of cars that got nabbed on Spadina was 871. If you want to once again see all the features in the attribute table, you can select the “Show All Features” option. Don’t worry, though. The selections you obtained using your expression remain.

Close the attribute table and return to the map.
You can see the selected features along Spadina highlighted in yellow.

The selected features can be copied, put into a layer file, and exported to a new map layer, in the same way other selections can be.

**Select by Location**

Select by location selects features based on their relationship to features in another map layer in the data frame. Features are selected from what is called the target layer, depending on their relationship to features in the source layer.

The map document used as an illustration for this tutorial which shows the locations of certain parking tickets in the City of Toronto, and of hospitals.

Select the “TorontoHospitals” layer and go to the “Vector” section in the menu above.
Go to “Geoprocessing Tools” and “Buffers”. We cover buffering in more detail in the 7_10_BufferinginQgis tutorial, and in Chapter 7 on page 155.

![](image)

Toronto hospitals is your input vector layer.

To the right of “Buffer distance”, enter 500 (measures in metres). Because the Toronto parking tickets dataset is so large, let’s only create buffers around those locations we’ve selected along Spadina. So, make sure the box to the left of “Use only selected features” is checked.
QGIS will create a new layer.

As you can see, the selected features appear on the map.

Select by location, like any tool that relies on area or distances, is affected by the coordinate system used on the map.

**Task 5: Working with Selected Features**

Once you have selected features, you are not limited to just looking at them.

So, let’s say that we wanted to create a layer of parking ticket locations on Spadina. We could save a layer that has only those coordinates.

Right-click on the layer name in the table of contents, and choose the “Save as” option.
This produces a dialogue box.

Call the new layer something like “Parking Tickets On Spadina”.

Browse to the location on your hard drive where you want to save the file, which should be in the same folder as the other layers for this tutorial.

Make sure the box to the left of the “Save only selected features” is selected, as well as the box to the left of the “Add saved file to map.”
Hit OK.
Now deselect the other layers to see the new one in the data frame to the right.

Selecting features is an excellent way to pull vital pieces of information out of your maps. As we’ve learned in *The Data Journalist*, the deeper you drill into the data, the more stories you’ll find.