

Chapter 7

Selecting by Attributes and Location in ArcGIS Pro

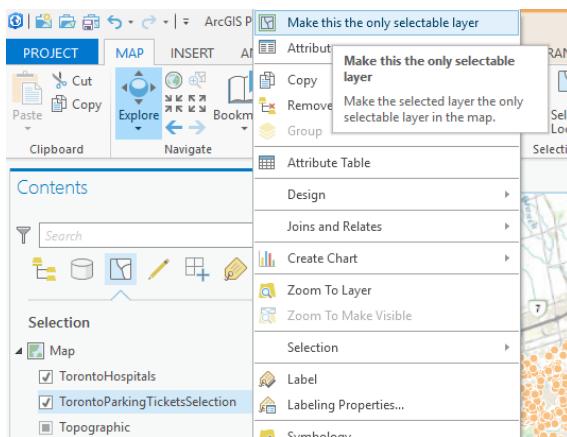
Skills you will learn: This tutorial covers selecting features in ArcGIS Pro. If you are unfamiliar with the basics of the ArcGIS Pro user interface, please read the tutorial [A Quick Tour of ArcGIS Pro](#).

Getting Started

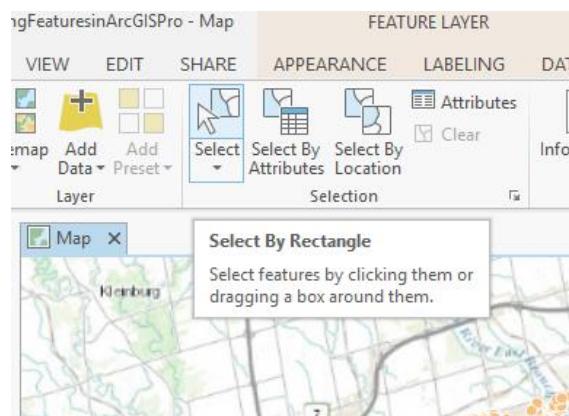
Selecting features on a map is similar in concept to selecting text in a word processing document, except that instead of highlighting words or sentences we highlight features in a map layer, so we can then do something with them, such as copy them, delete them, and so on.

The first step in selecting features is to ensure that the layer you want to select features in is selectable.

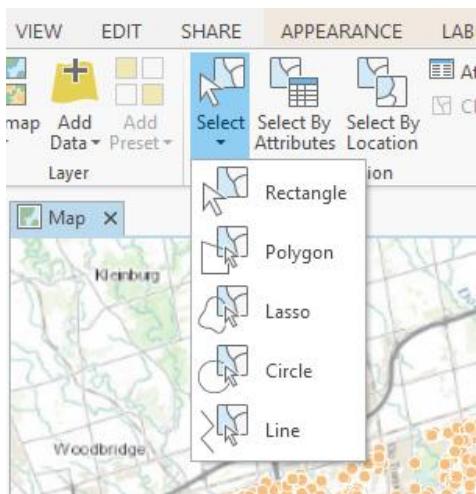
Click on the List by Selection icon in the Contents pane, and make sure the layer from which you want to select features is checked off. If you want it to be the only selectable layer, right click on the layer name and choose Make this the only Selectable Layer from the menu that appears.



The simplest way to select features in ArcGIS Pro is to select them manually with the select tool, which is found in the Selection area of the Map ribbon.

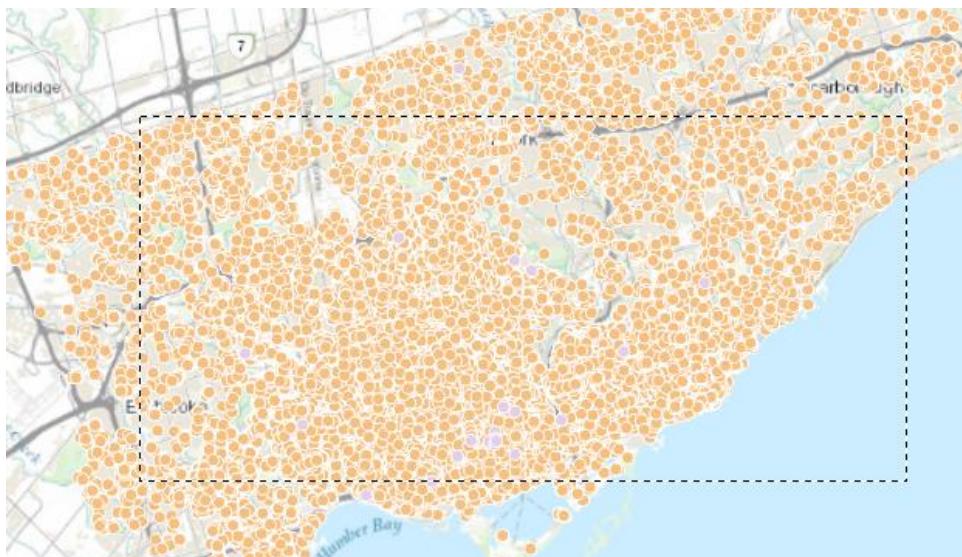


If you click on the downward pointing arrow under the Select icon, you will be presented with a variety of ways the Select tool can behave.

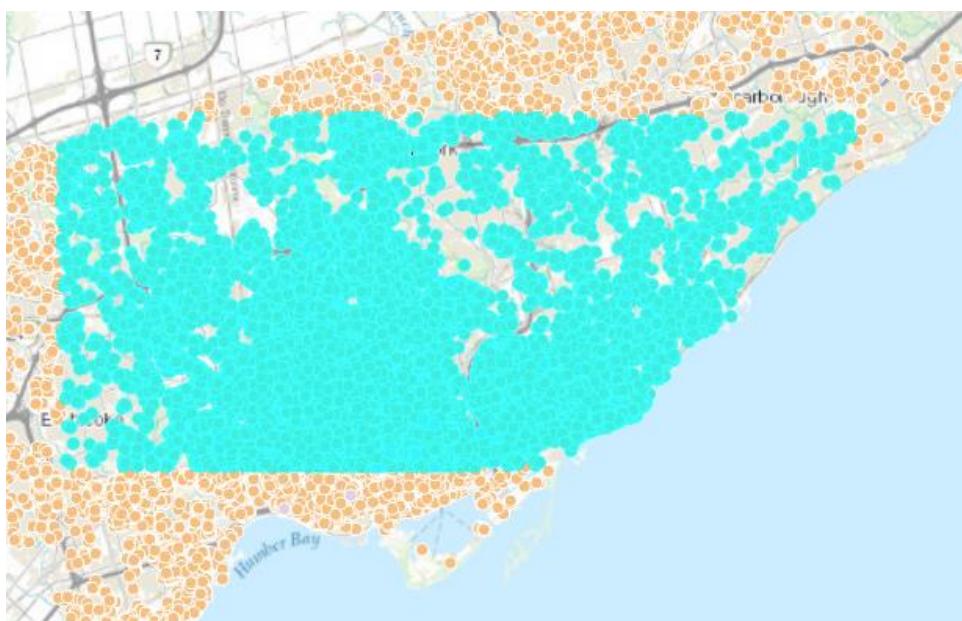


Each tool allows you to trace a particular shape with the mouse pointer. Anything inside or intersecting the shape will be selected.

Choose the select tool you want to use, then define the area on the map where you would like to select features. For example, with the Select by Rectangle tool, draw a rectangle on the map. When the defaults for how these tools behave are set, any feature that you touch or enclose with the rectangle will be selected. Here, you see a rectangle defined by the selection tool. The map layer shows parking tickets issued in the City of Toronto, Canada.



And this image shows the resulting selected features.



Selecting from the attribute table

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

FID	Shape	tag_number	date_of_in	infraction	infracti_1	set_fine_a	time_of_in	location1
210942	Point	***72227	2014-07-10	5	PARK-SIGNED HWY-...	40	2254	OPP
210943	Point	***72229	2014-07-10	5	PARK-SIGNED HWY-...	40	2256	OPP
210944	Point	***75204	2014-07-10	5	PARK-SIGNED HWY-...	40	2240	OPP
210945	Point	***72228	2014-07-10	5	PARK-SIGNED HWY-...	40	2255	OPP
210946	Point	***88609	2014-07-10	5	PARK-SIGNED HWY-...	40	2314	NR
210947	Point	***94679	2014-07-10	5	PARK-SIGNED HWY-...	40	2308	NR
210948	Point	***88610	2014-07-10	5	PARK-SIGNED HWY-...	40	2324	NR
210949	Point	***88611	2014-07-10	5	PARK-SIGNED HWY-...	40	2327	NR
210950	Point	***73430	2014-07-10	5	PARK-SIGNED HWY-...	40	2332	NR
210951	Point	***88612	2014-07-10	5	PARK-SIGNED HWY-...	40	2332	OPP

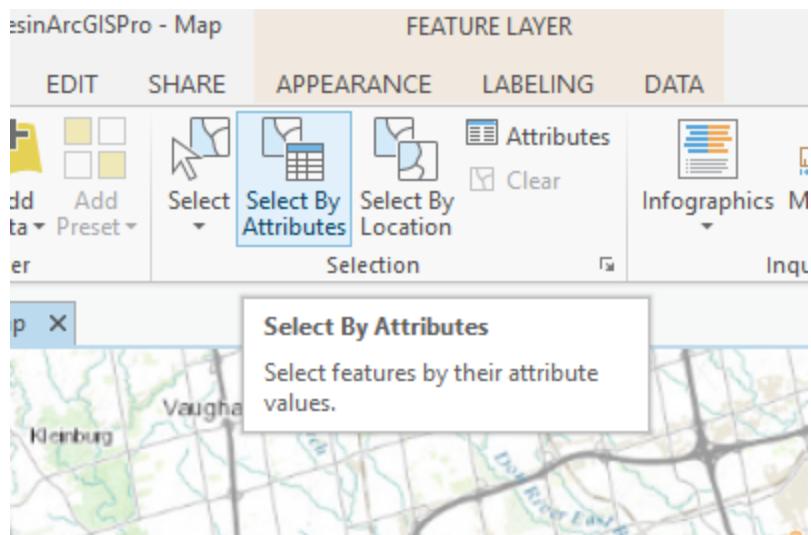
The features will be selected on the map.



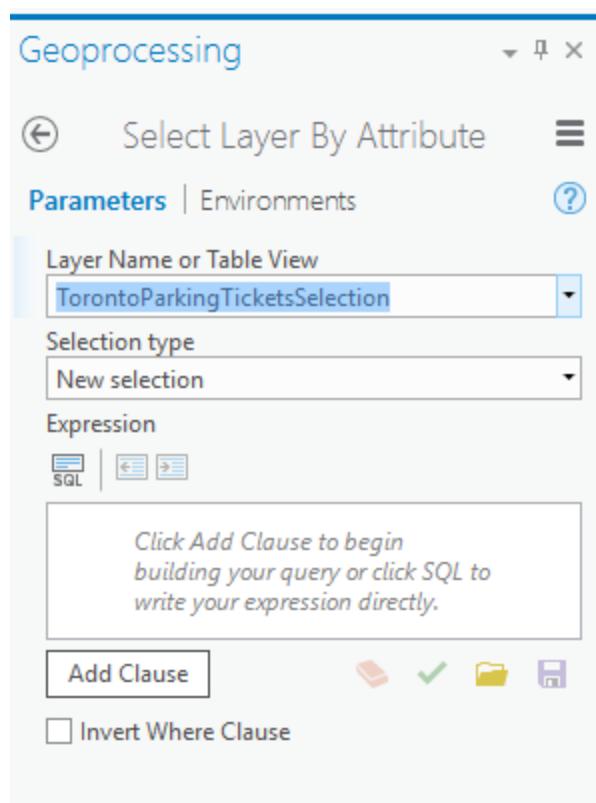
Selecting by Attributes

As discussed in chapter 7 of *The Data Journalist*, a GIS program is a specialized form of database program, one that happens to be able to work with geographic data. And just as you can use SQL queries in a relational database to select records, you can use SQL in ArcGIS Pro to select map features. This is called Selecting by Attributes.

This feature can be accessed by clicking on the Select by Attributes icon in the Selection area of the Map ribbon.

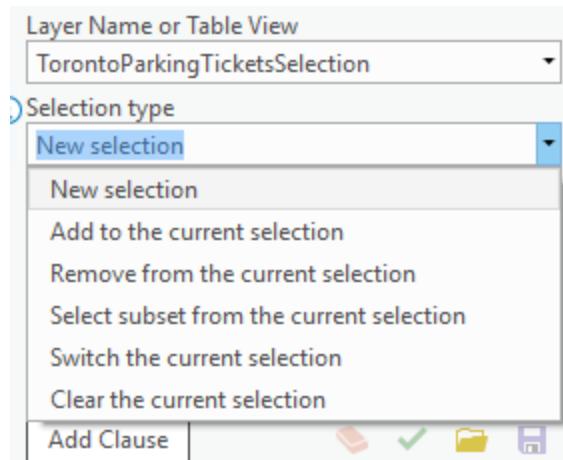


This will open the Select Layer by Attribute pane.

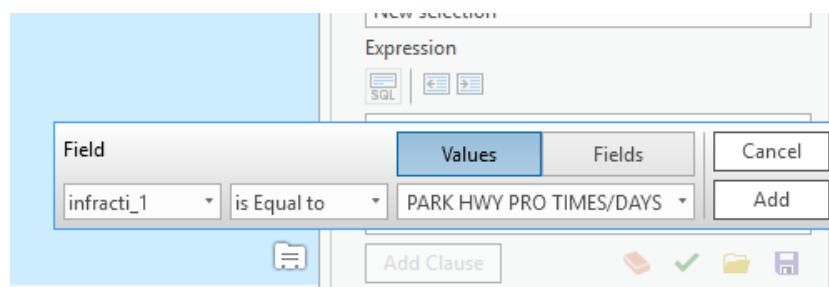


In the Layer Name or Table View box choose the layer or data table from which you would like to make a selection.

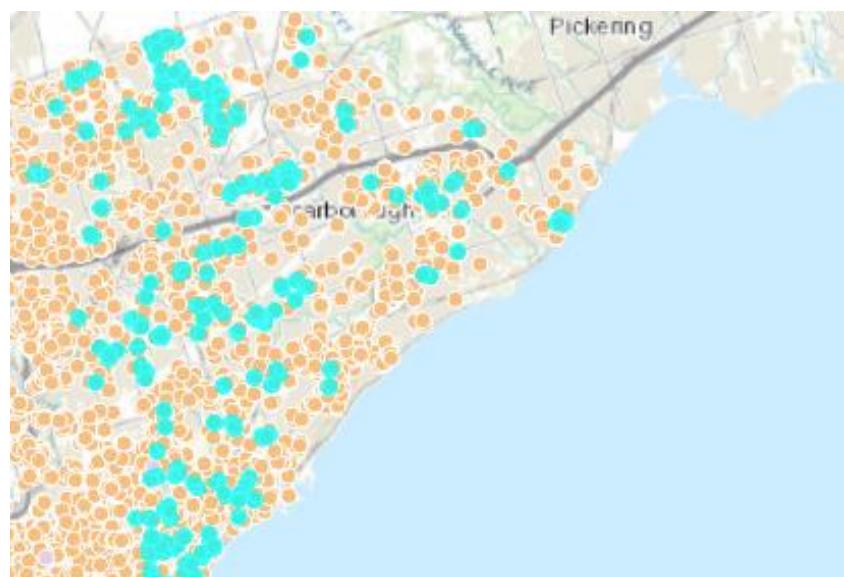
Selection Type is one of several choices, each with its own particular behaviour, which are mostly self explanatory.



By clicking on Add Clause, you can build a selection statement by making choices from dropdown menus.



Clicking on Run will apply the selection to the map.



You can also write the selection as an SQL query by clicking on the small SQL icon.



If you click on the small green checkmark, you can test if the SQL statement is valid and if it will return any records. Again, click Run to execute the selection.

The SQL used is a variant of the standard SQL language discussed in detail in Chapter 5 of *The Data Journalist*.

Select by Location

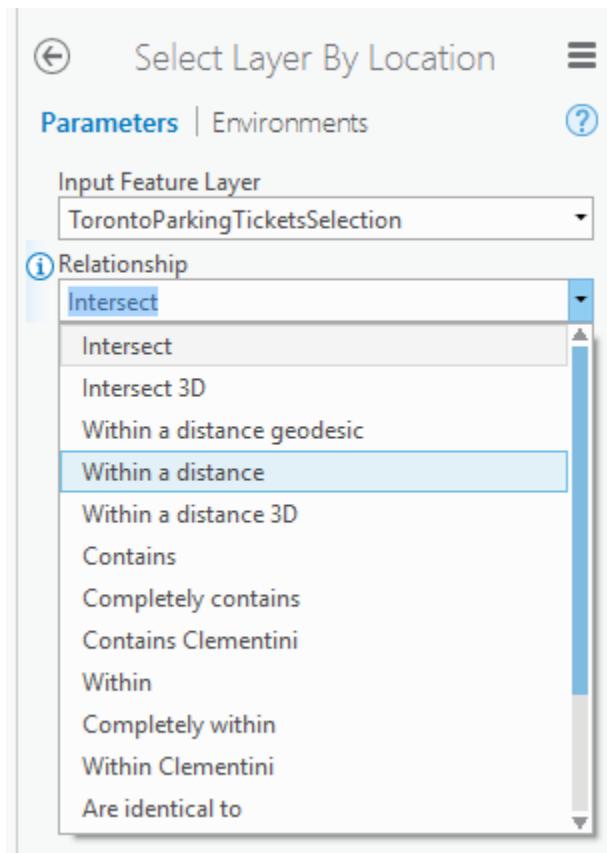
Select by location selects features based on their relationship to features in another map layer in the map. Features are selected from what is called the **target** layer depending on their relationship to features in the **source** layer.

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

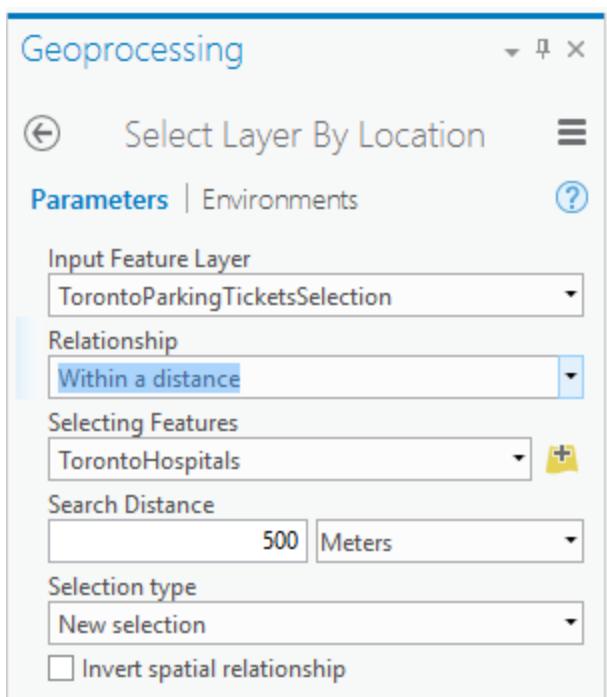
Begin by adding the layers you wish to use to your map.

Next, click on the Select by Location icon in the Selection area of the Map ribbon.

In the Select Layer by Location pane, the Input Feature Layer is the layer from which the selection will be made, in this case the layer of parking tickets. The dropdown list under Relationship allows you to choose from an extensive list of ways that the features in the two layers are related. In this image, we are choosing the Within a Distance option.



Once the method is selected, you can make addition choices to complete the selection.



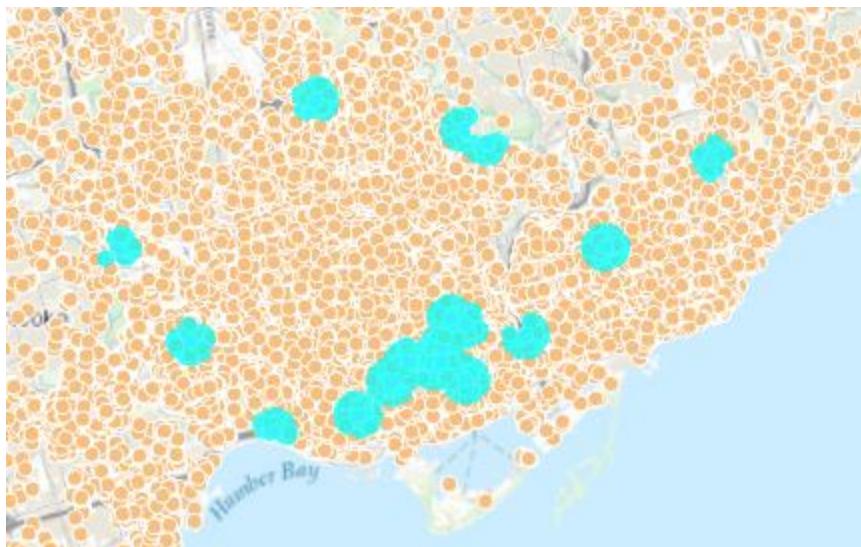
In this example, we have chosen the Selecting Features layer as TorontoHospitals. This means that the selection will be made in relationship to the location of features in this layer.

As we are using Within a Distance as the relationship, we set a search distance, here 500 metres.

Finally, the selection type is set as the default, a new selection. The choices in the dropdown are the same as are offered in the Select by Location method.

If you check the Invert spatial relationship checkbox, the effect will be to reverse the meaning of the selection, so in this case, all tickets not within 500 metres of hospitals would be selected.

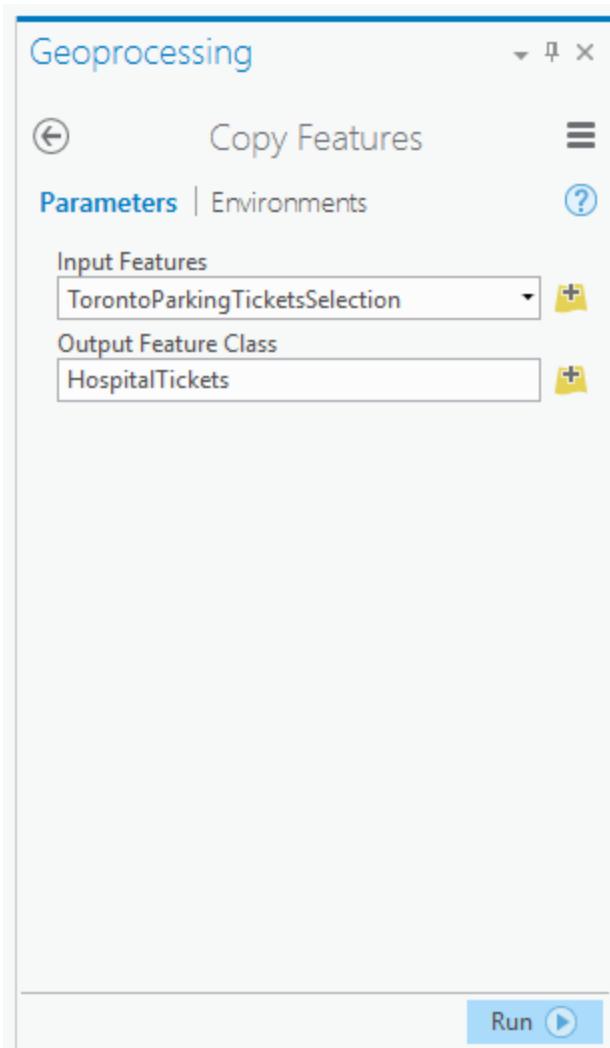
To execute the selection, click Run at the bottom of the pane. The tickets matching the selection criteria are selected.



Working with Selected Features

Once you have selected features, you are not limited to just looking at them. Often, you will want to work with just the selected features, such as when you select part of a larger polygon layer, or when you have isolated a number of points within a distance of another feature, the exercise we just completed.

If you right click on the layer name in the contents pane, and choose Data>Export Features, you can open the Copy Features pane.



The Input Features box is populated with the map layer from which you are exporting features. If features are selected on the map, using any of the methods we have discussed in this tutorial, only those features will be copied.

The Output Feature Class is the new feature class or shapefile to be created. It can be a feature class in the project's default geodatabase, or a shapefile.

Click run to create the feature class or shapefile. The new feature class can now be used just like any other.