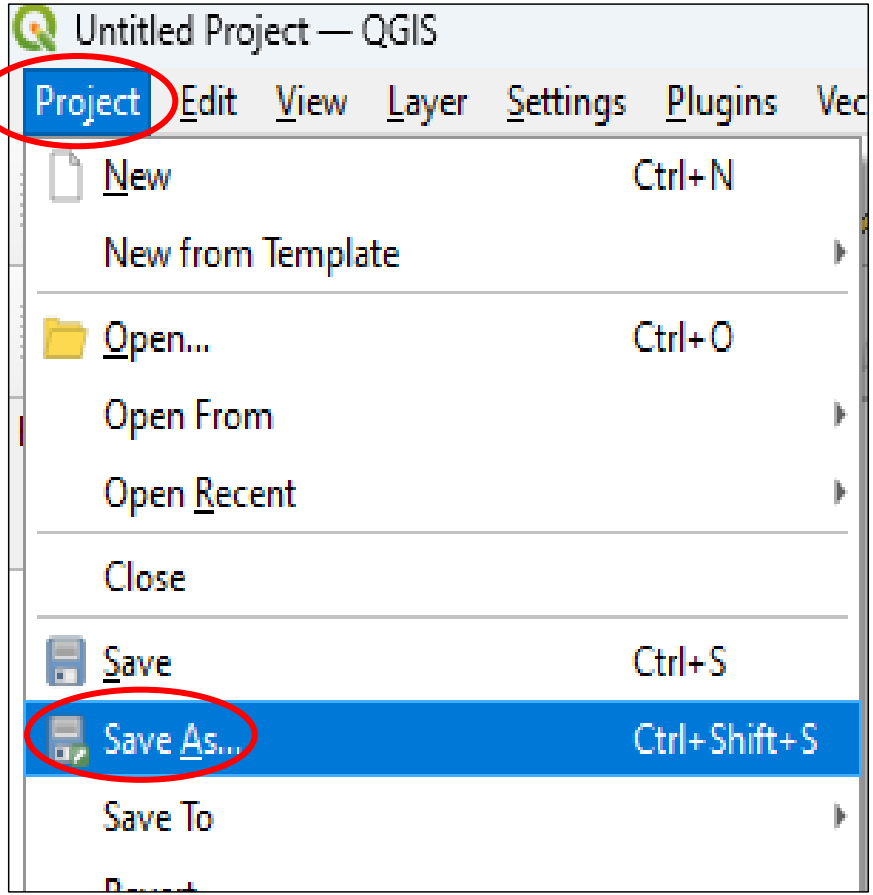
Edit Vector Data with *QGIS*: **Exercise**

University of Victoria Libraries

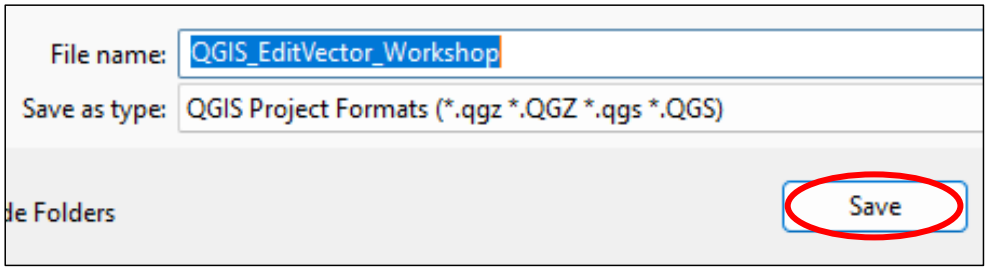
2026

Activity #1

Save new project

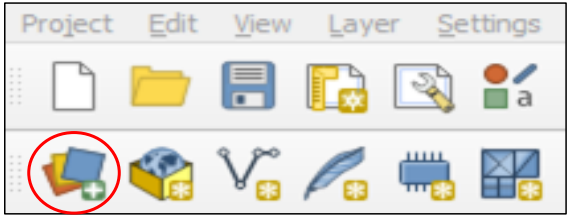


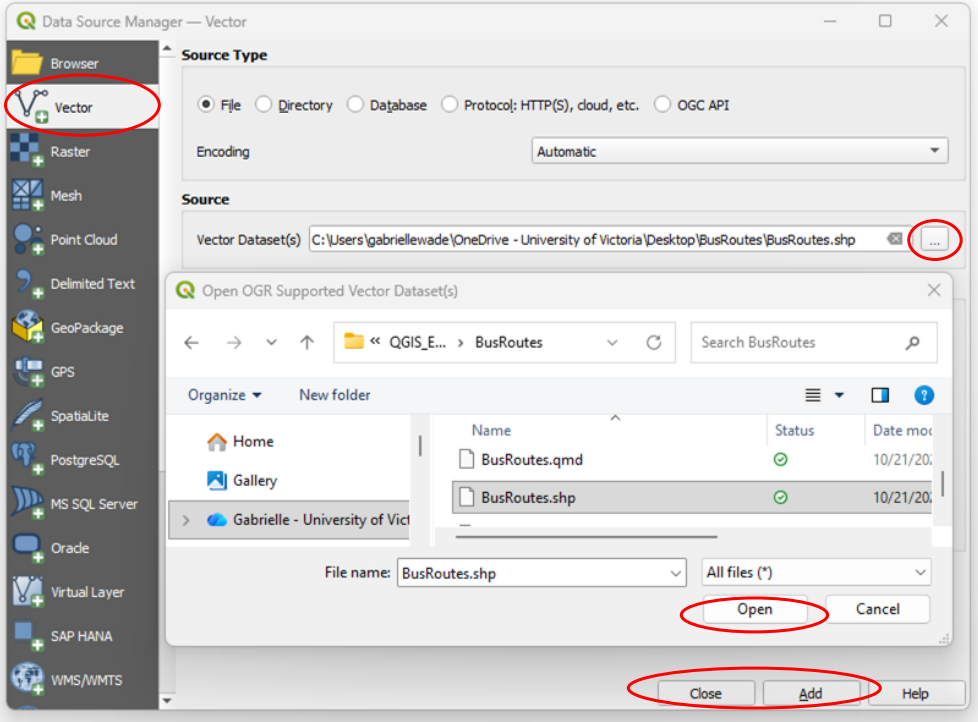
- In *QGIS* Menu Bar, select *Project* then *Save As*
- Name your project "**QGIS_EditVector_Workshop**"
- Save your project as **.qgz** to where you can find it



Note: .qgz is the project file format for *QGIS*

Add BusRoutes line shapefile

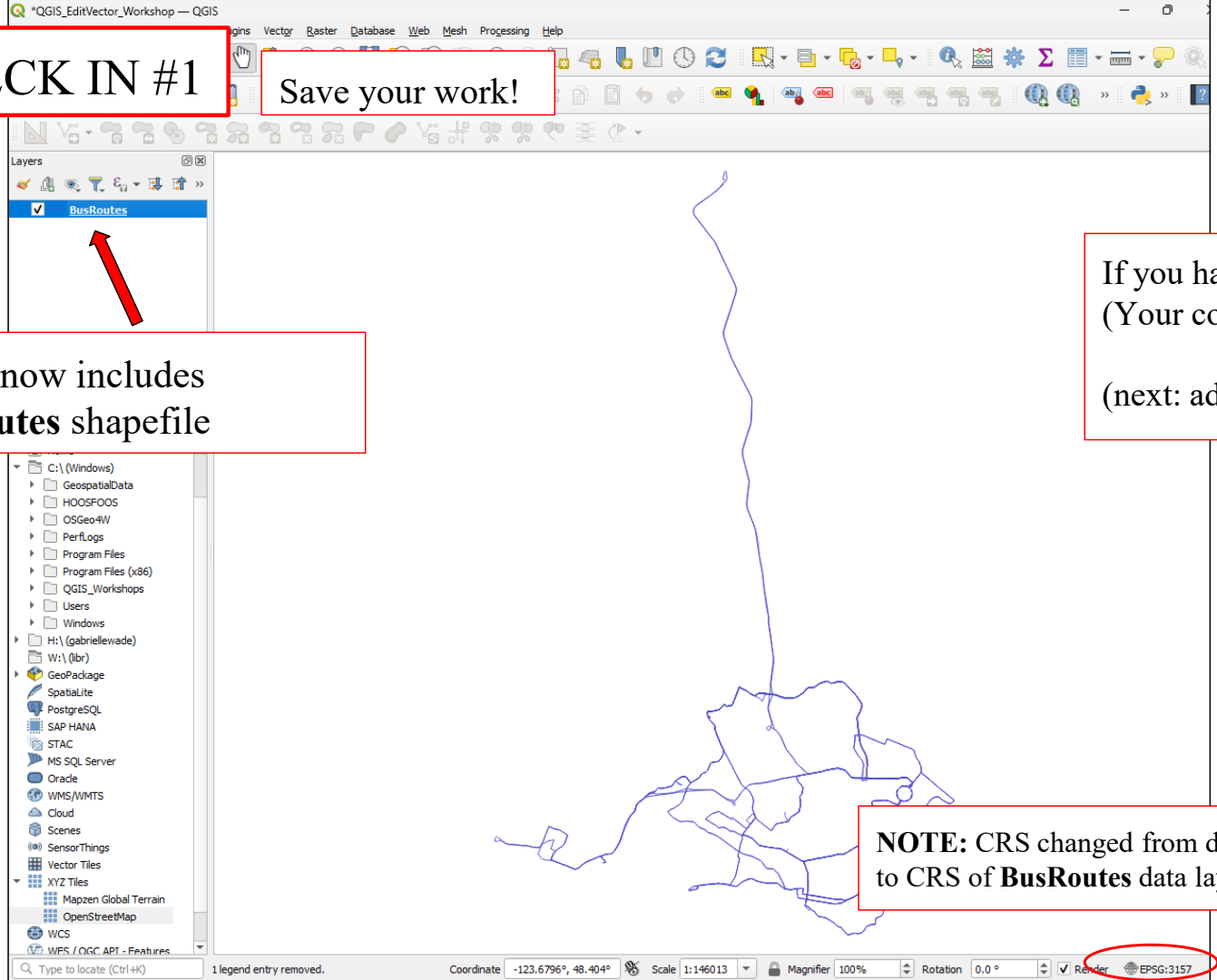




- Select *Open Data Source Manager* 
- Select the *Vector* tab
- Under the *Source* heading click the 
- Navigate to workshop data
- Select **BusRoutes.shp**, Open
- **Add** and **Close**

CHECK IN #1

Save your work!



Layers now includes **BusRoutes** shapefile

If you have questions, **ask**!
(Your colour may be different)

(next: add a basemap…)

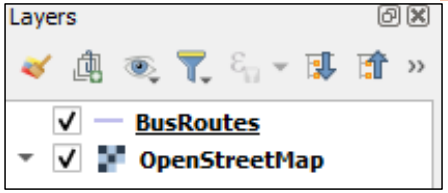
NOTE: CRS changed from default (**EPSG:4326**) to CRS of **BusRoutes** data layer (**EPSG:3157**)

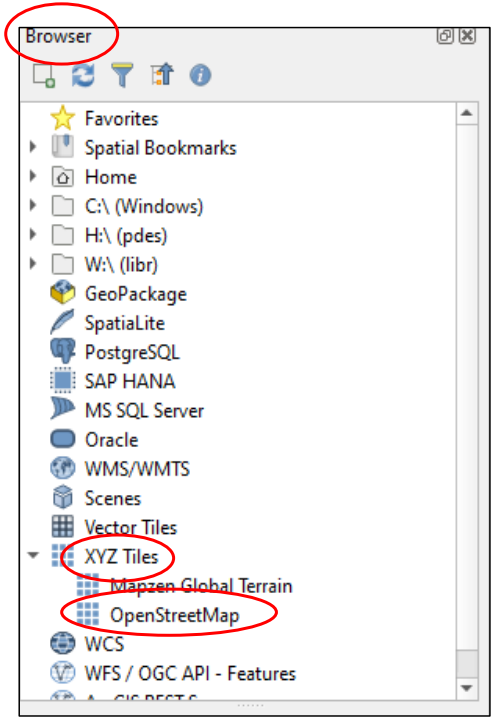
Activity #2

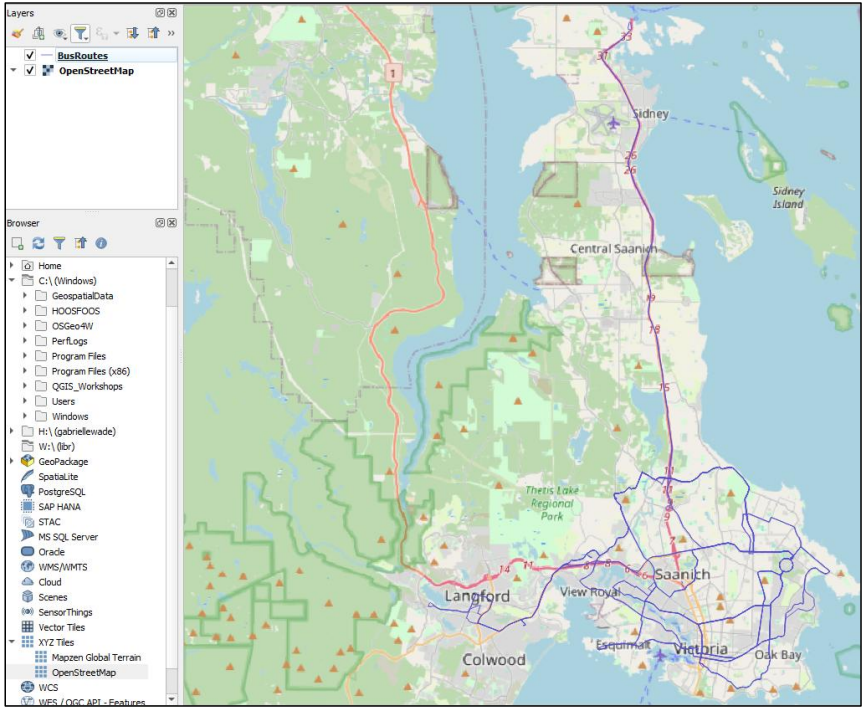
Add a Basemap

Add a **basemap** for location context

- In the ‘Browser’, expand *XYZ Tiles*
- Double-click *OpenStreetMap* to add to map (if a warning appears, press OK)
- Click and drag to move *OpenStreetMap* layer below **BusRoutes**

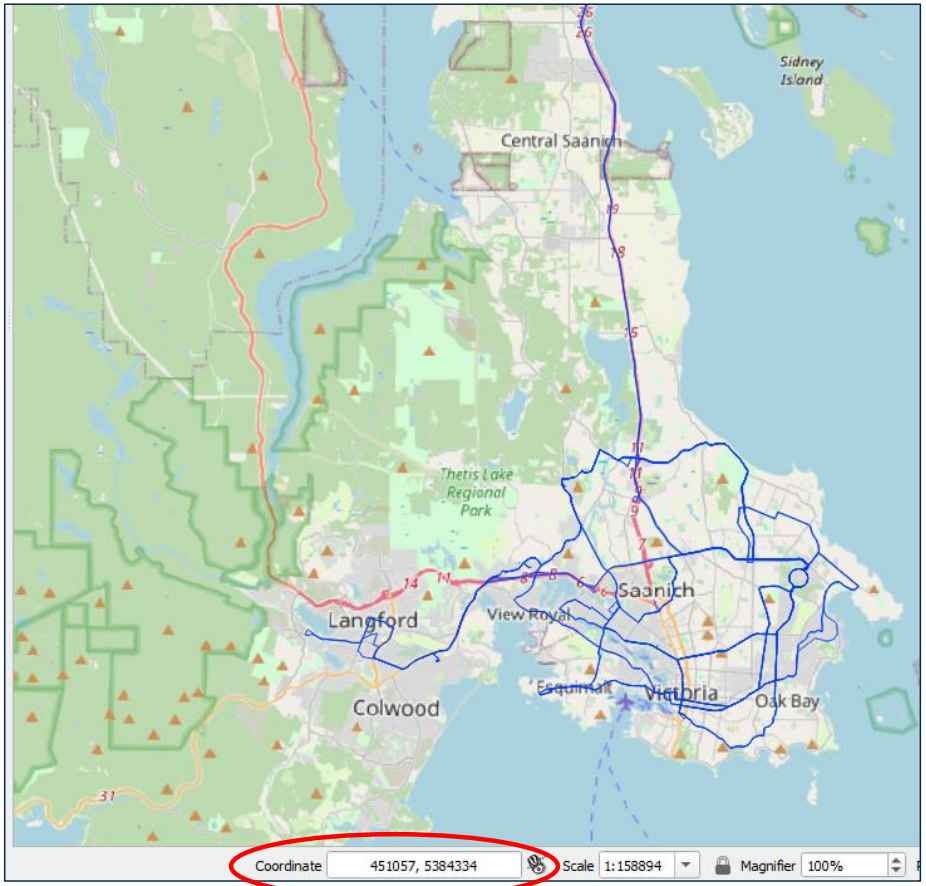


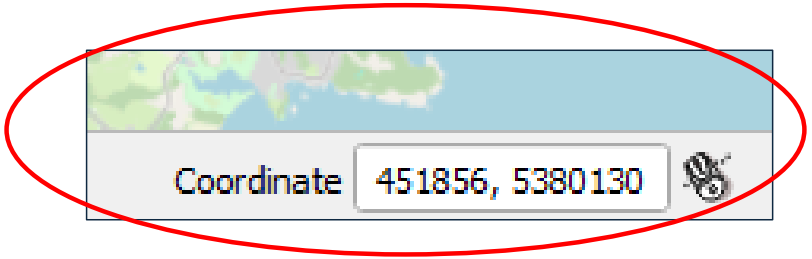




Change coordinate settings

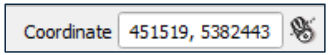
QGIS default setting for *Coordinate* is in metres

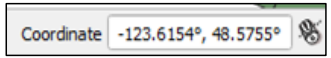




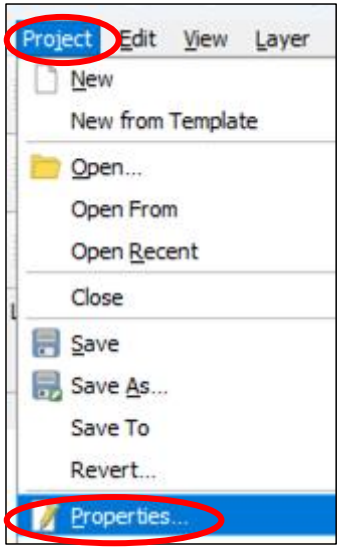
Change coordinate settings

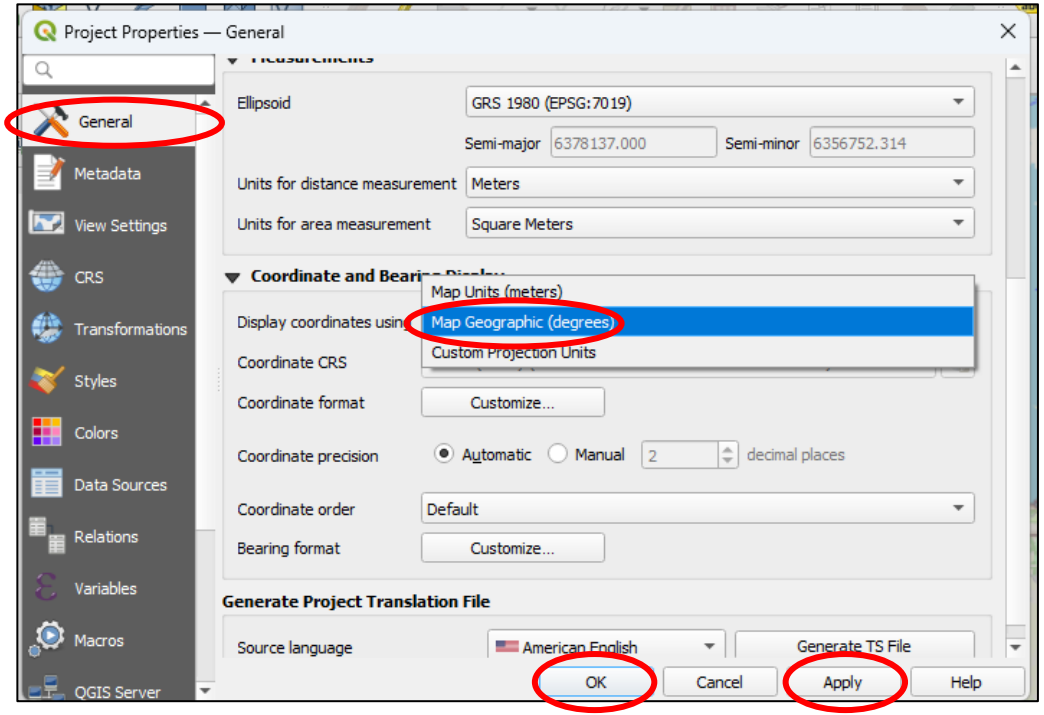
Change coordinate settings from metres to decimal degrees

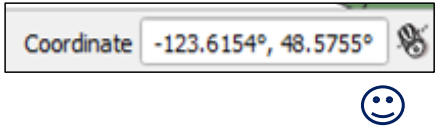




- In the *Menu Bar*, select *Project* then *Properties*
- In the *General* tab, scroll down to *Coordinate and Bearing Display* and use the drop-down to change *Display coordinates using* to **Map Geographic (degrees)**
- **Apply** and **OK**







CHECK IN #2

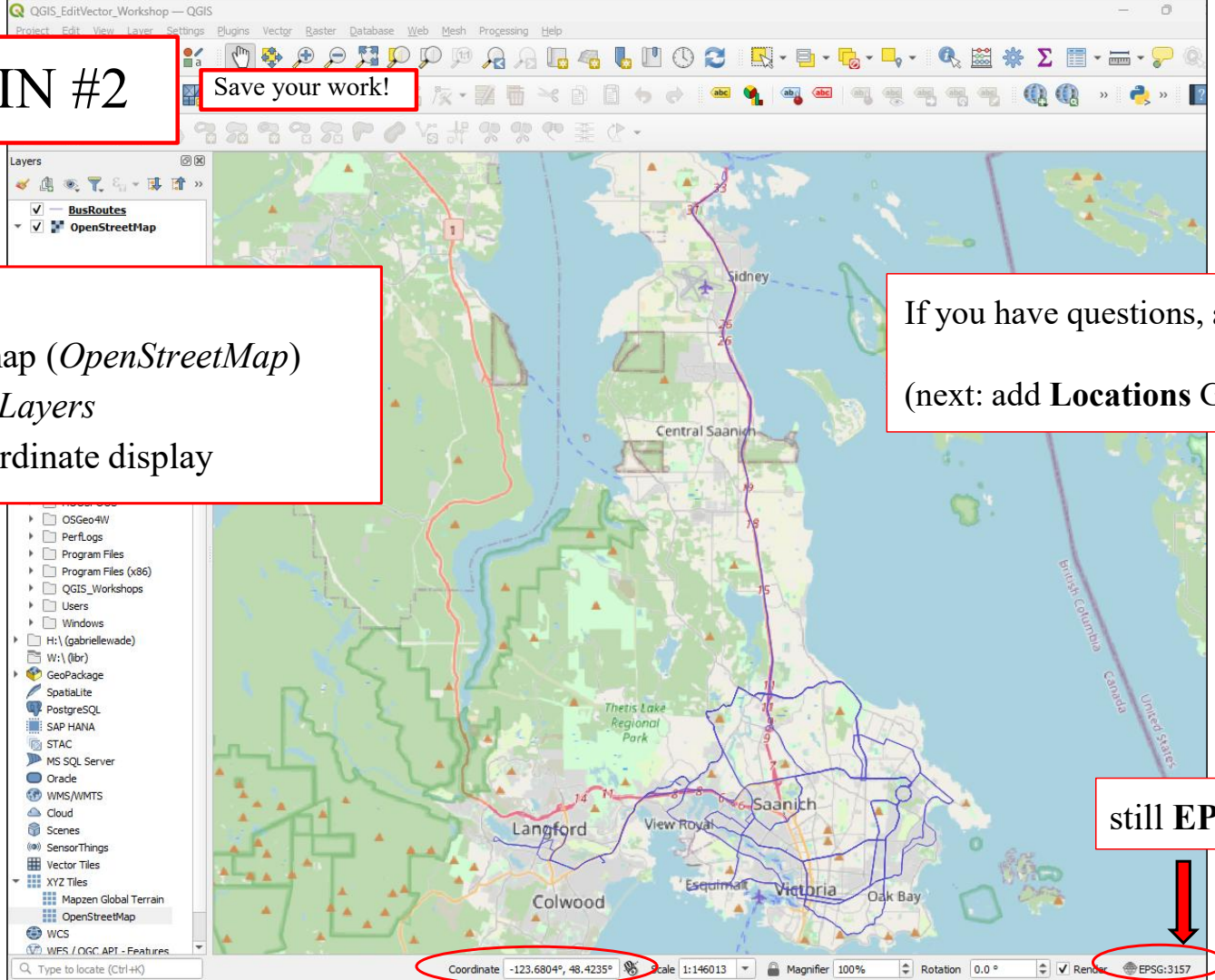
Save your work!

You have:

- added Basemap (*OpenStreetMap*)
- Re-arranged *Layers*
- Changed coordinate display

If you have questions, **ask**!

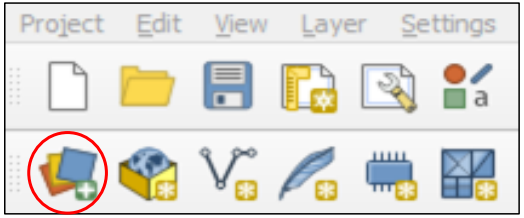
(next: add **Locations** GeoJSON…)

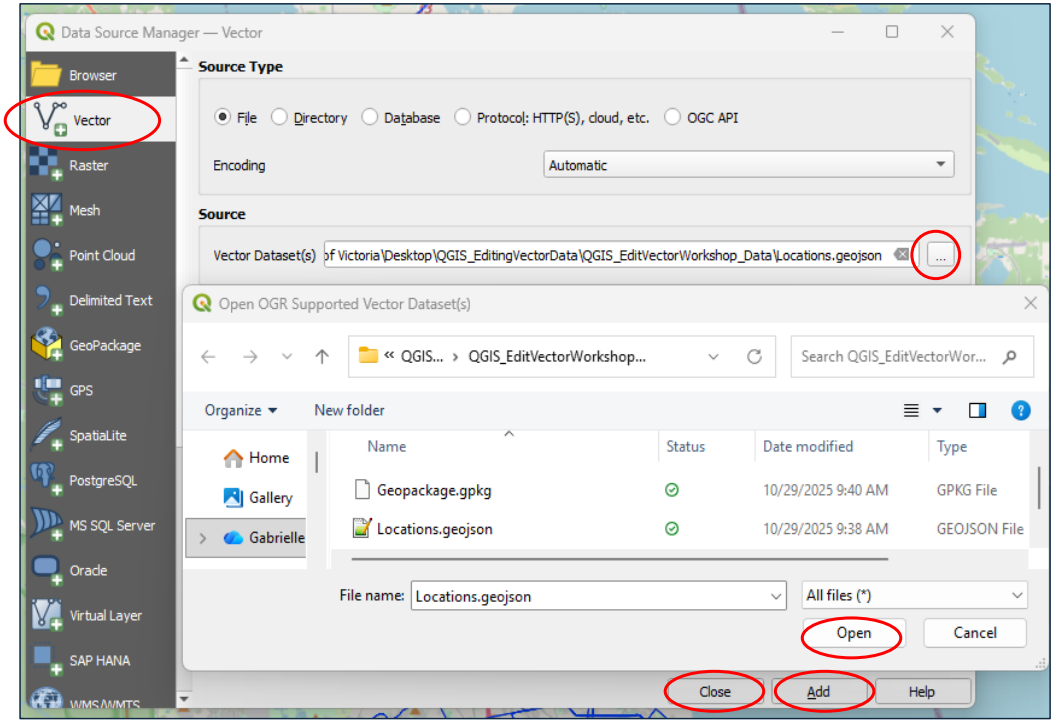


still **EPSG:3157**

Activity #3

Add Locations GeoJSON





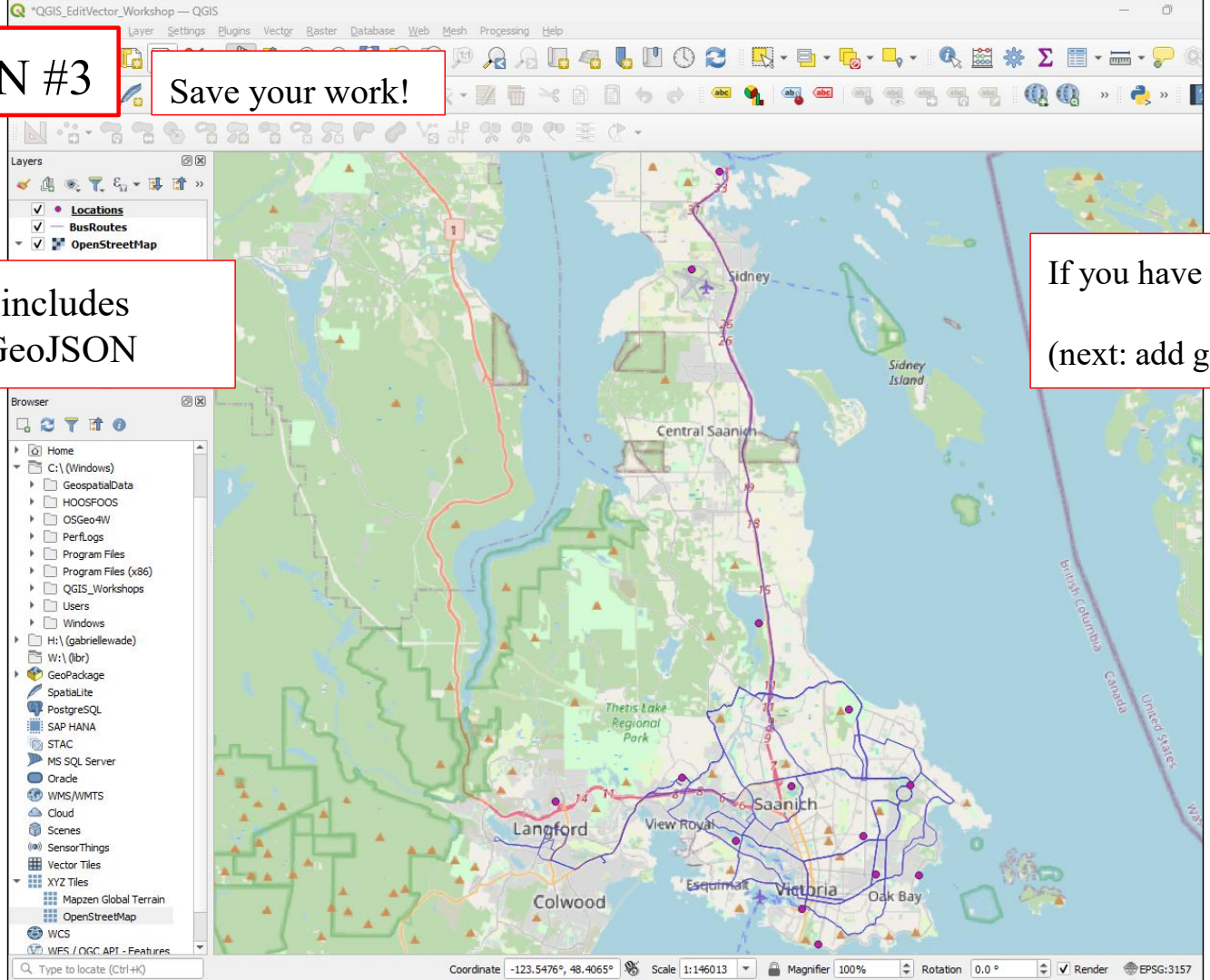
- Select *Open Data Source Manager* 
- Select the *Vector* tab
- Under the *Source* heading click the 
- Navigate to workshop data
- Select **Locations.geojson**, Open

  (if a warning pops up, press OK)
- **Add** and **Close**

CHECK IN #3

Save your work!

Layers now includes **Locations** GeoJSON



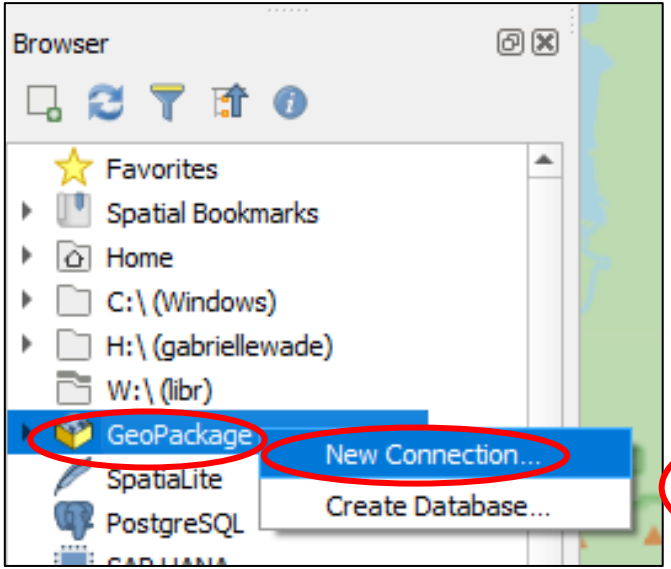
If you have questions, **ask**!

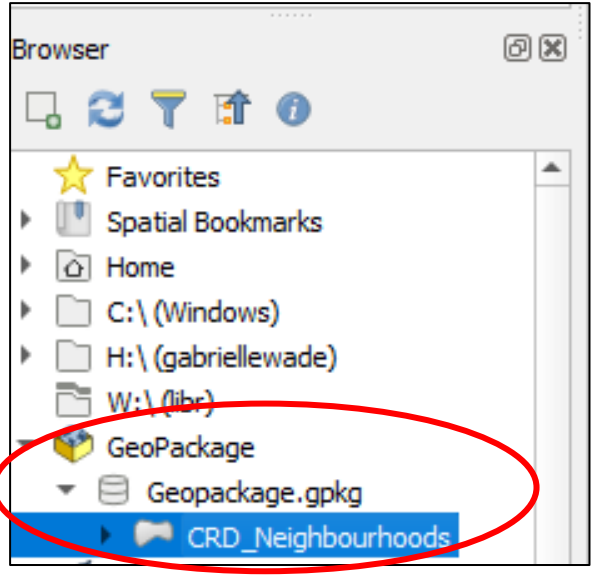
(next: add geopackage…)

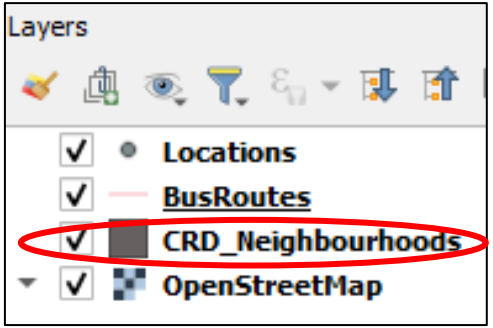
Activity #4

Add CRD_Neighbourhoods Geopackage

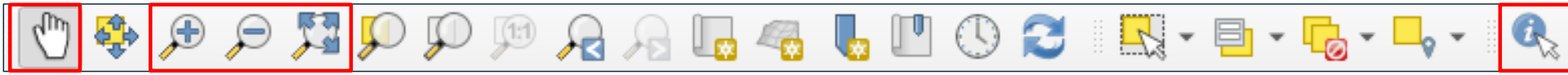
- In *Browser,* right-click on *GeoPackage* and select *New Connection*
- Navigate to workshop data and select **Geopackage.gpkg**, Open
- In *Browser*, expand GeoPackage heading, expand **Geopackage.gpkg**, and double-click **CRD_Neighbourhoods**
- Click and drag **CRD_Neighbourhoods** below **Locations** and **BusRoutes**







Navigate / Examine BusRoutes, Locations, CRD_Neighbourhoods



Navigate map with the *Pan* tool

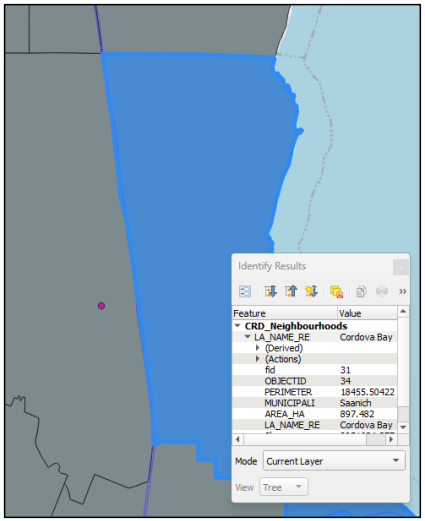
Zoom in and out

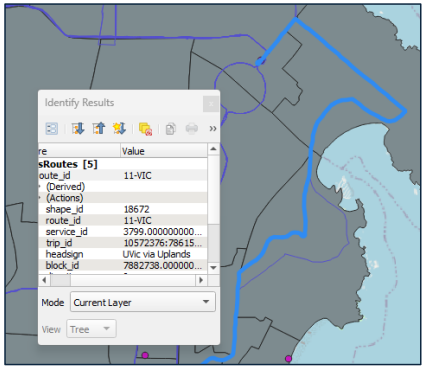
Use *zoom full* to see full data extent

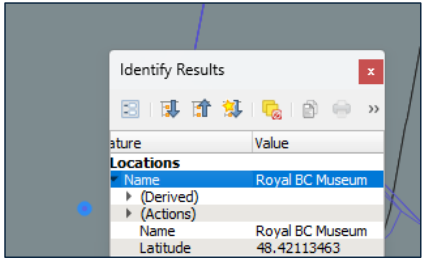
Select the *Identify Features* tool to examine the layers

Select a layer in *Layers* panel

Click on features of layer to display their associated attributes



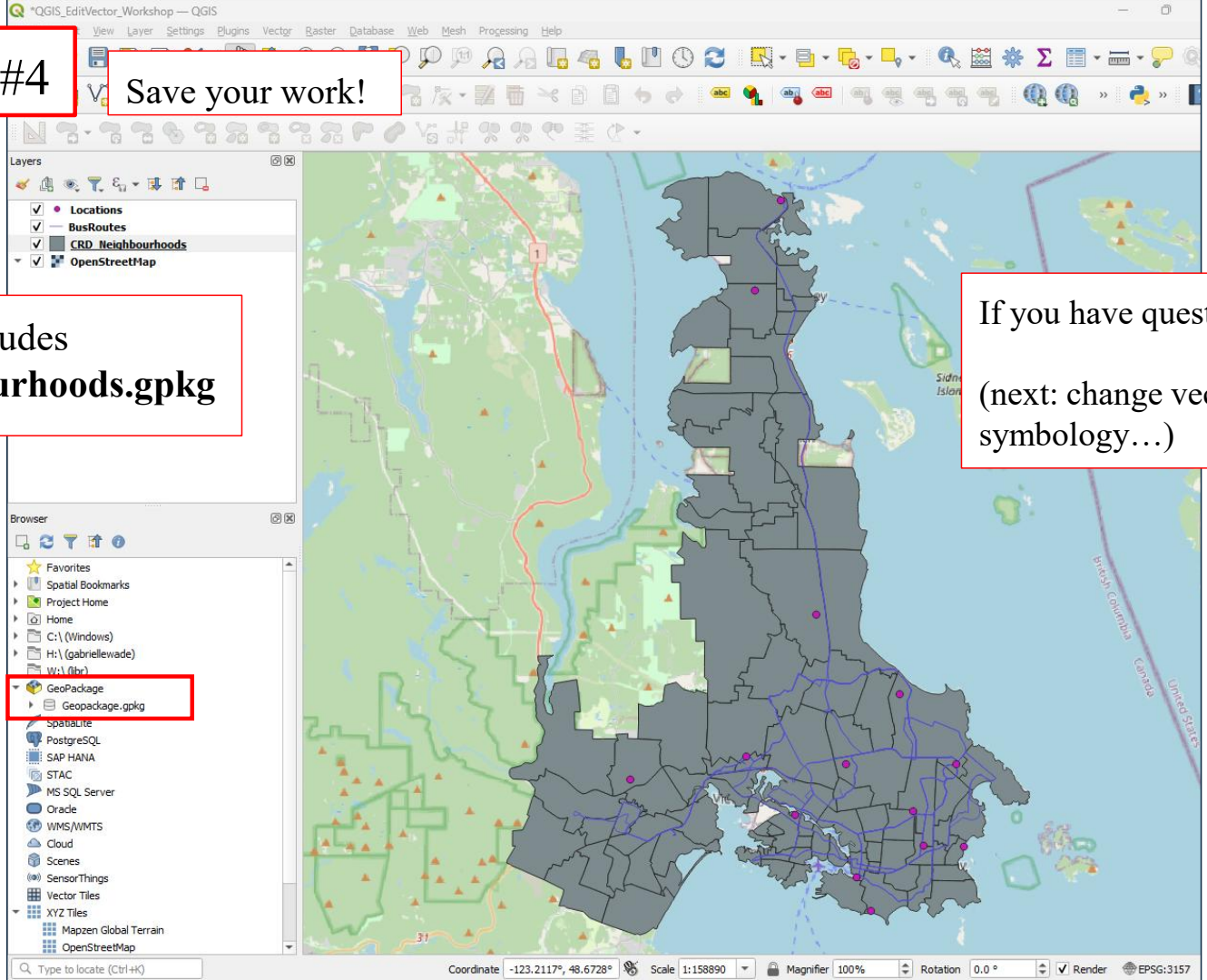




CHECK IN #4

Save your work!

Layers now includes **CRD_Neighbourhoods.gpkg**



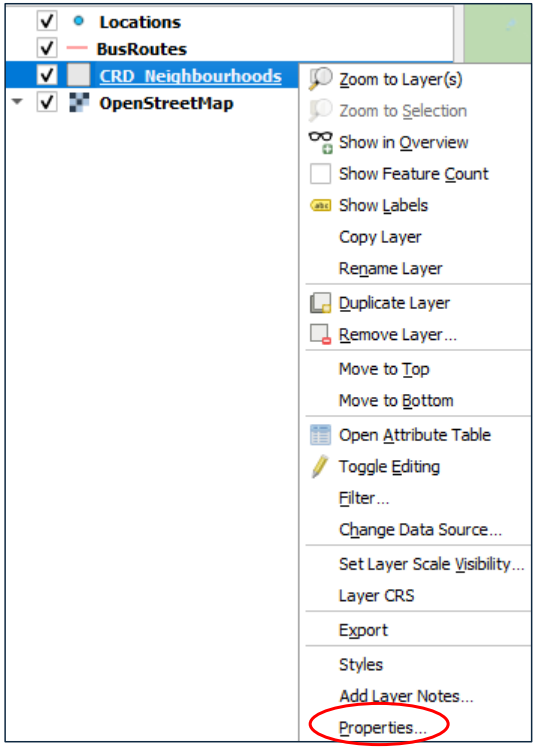
If you have questions, **ask**!

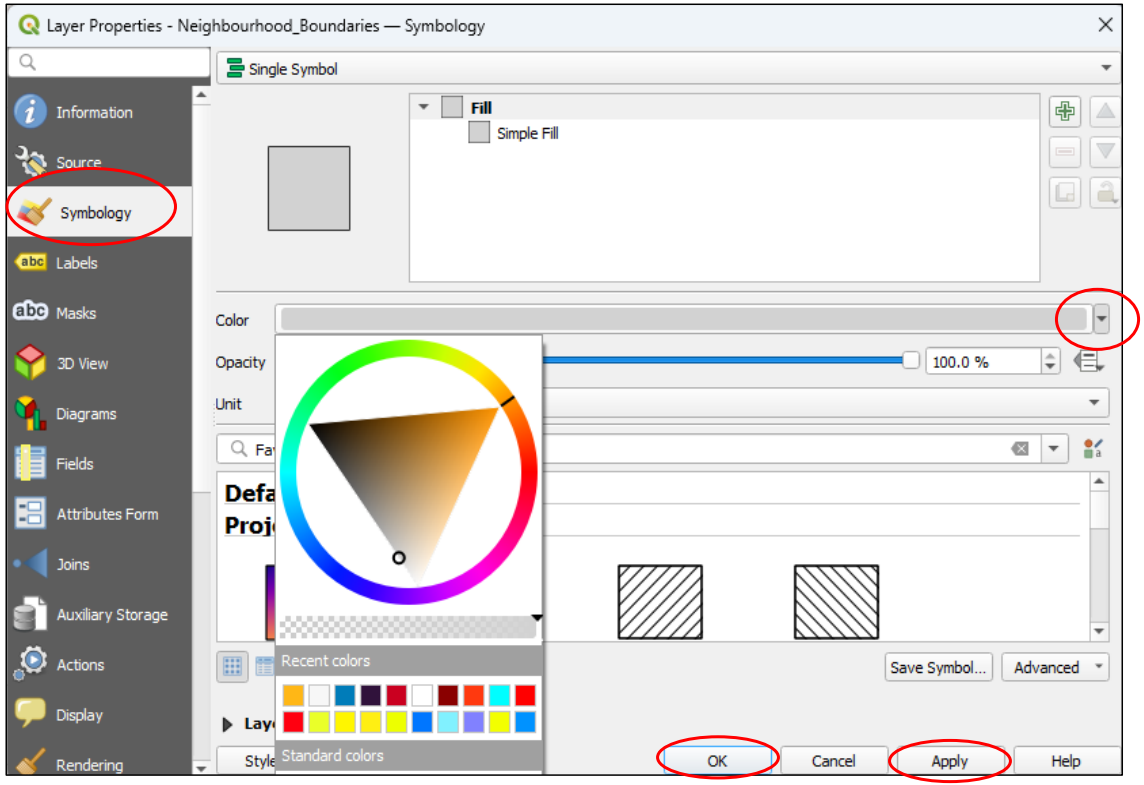
(next: change vector data symbology…)

Activity #5

Change CRD_Neighbourhoods.gpkg polygons symbology

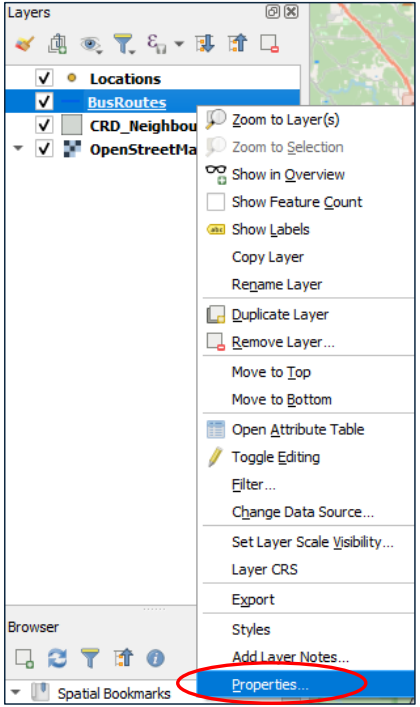
- In the *Layers* panel right click **CRD_Neighbourhoods**
- Select *Properties* and then *Symbology*
- With *Colour* field, click the arrow and use colour palette to select light grey (or light colour of your choice)
- **Apply** and **OK**

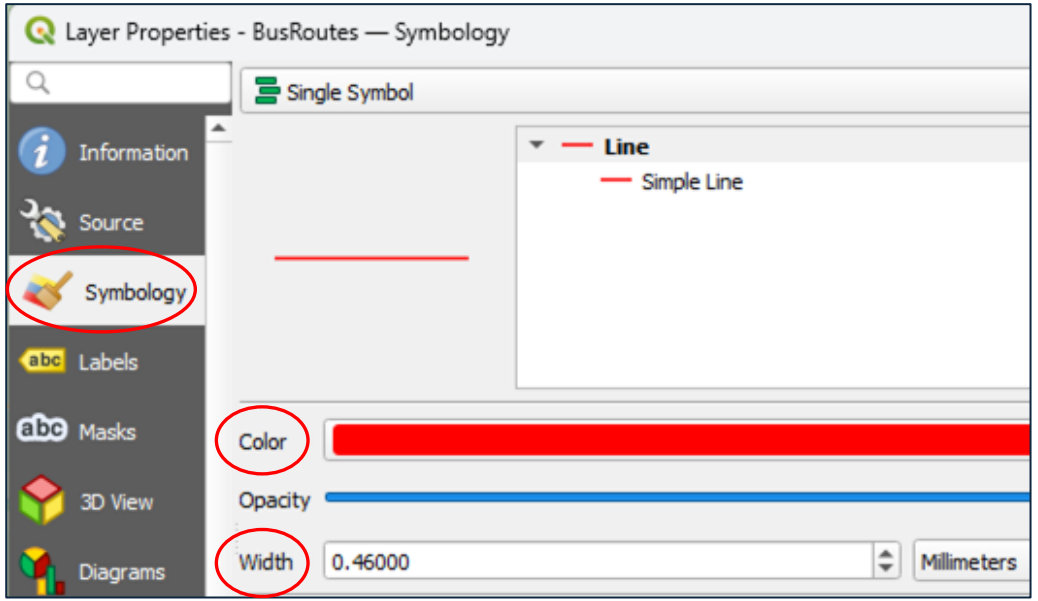




Change BusRoutes symbology

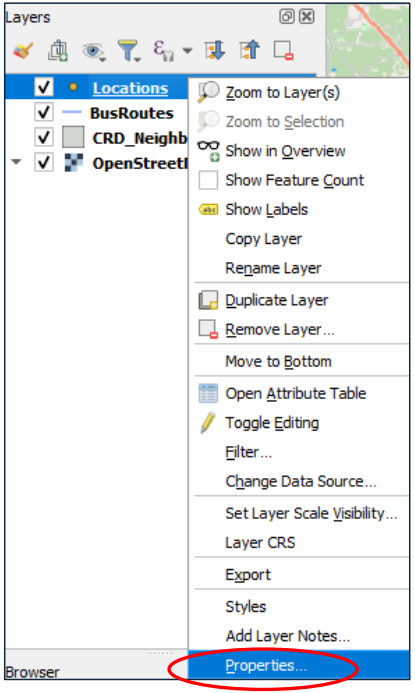
- In the *Layers* panel right-click **BusRoutes**
- Select *Properties* and then *Symbology*
- Change Colour and Width to your preference
- **Apply** and **OK**

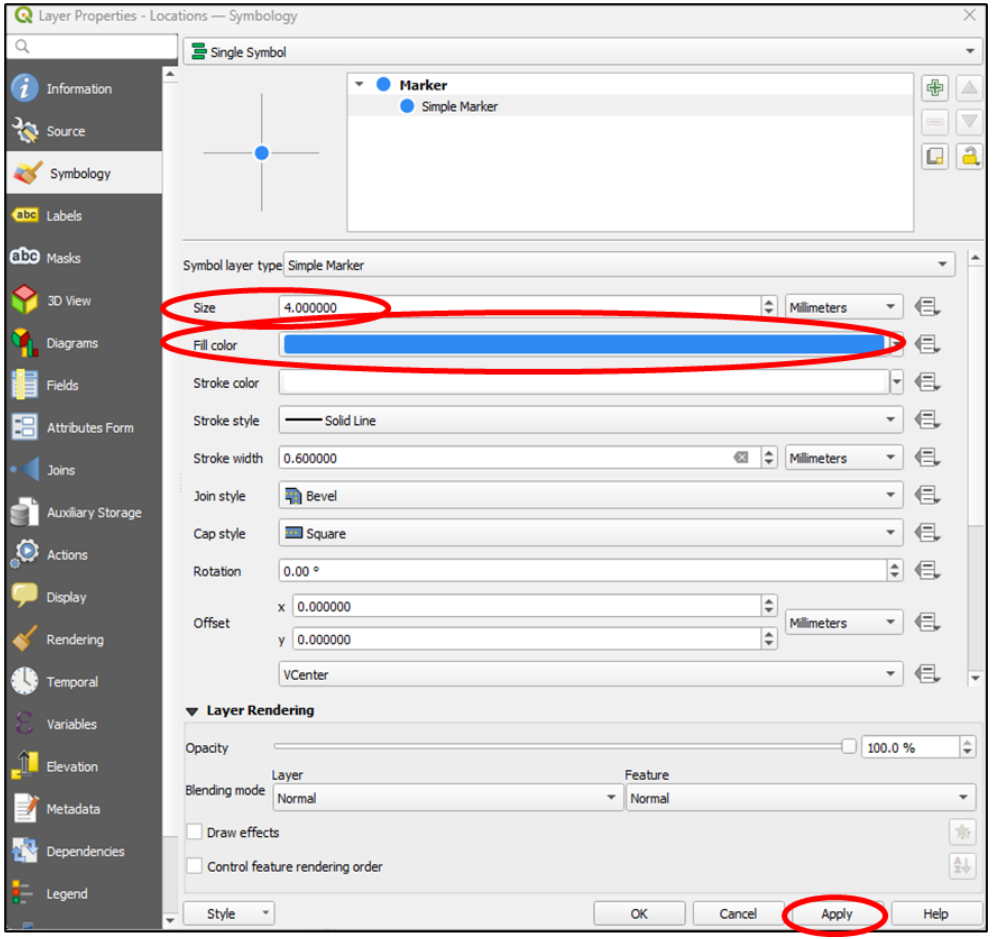




Change Locations.geojson symbology

- In the *Layers* panel right click **Locations**
- Select *Properties* and then *Symbology*
- Change *Size* to 4.0
- Change *Colour* to a visible colour
- click **Apply** but not OK yet

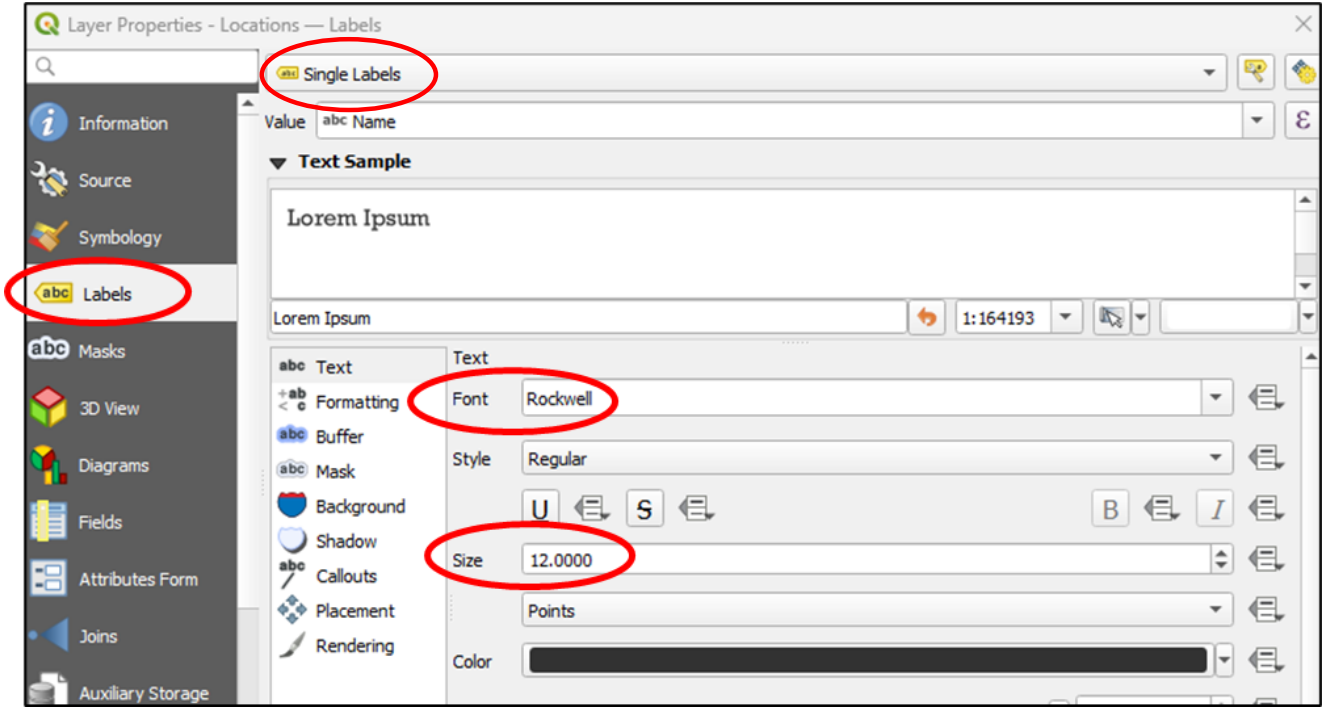




Change Locations symbology

- while still in *Properties,* select the *Labels* tab
- Select *Single Labels* from the drop-down
- *Value* "Name"
- change *Font* (if desired)

  and Size (if desired)
- Colour "Black"
- click **Apply** but not OK yet



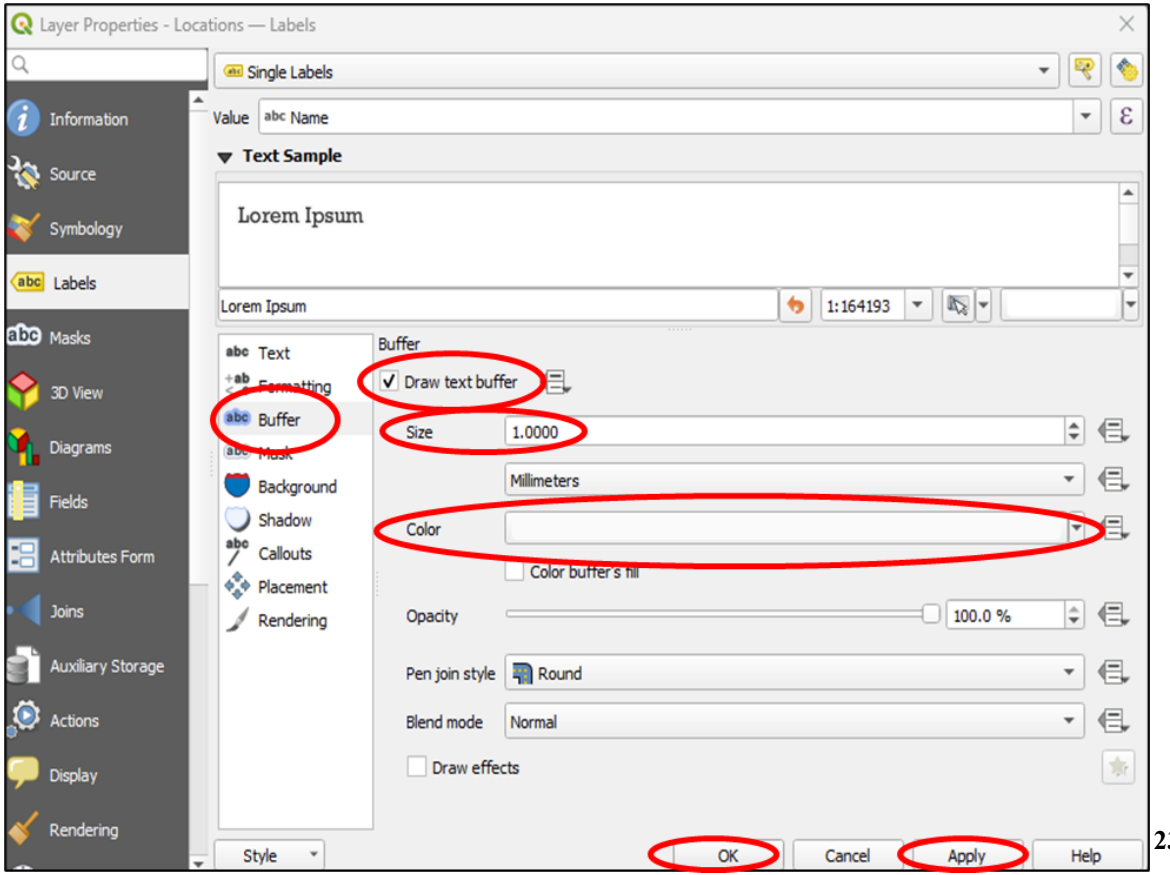
Change Locations symbology

•while still in *Labels*, choose “Buffer” and check

“Draw text buffer”

•*Size* 1.0 and *Colour* white

•**Apply** and **OK**

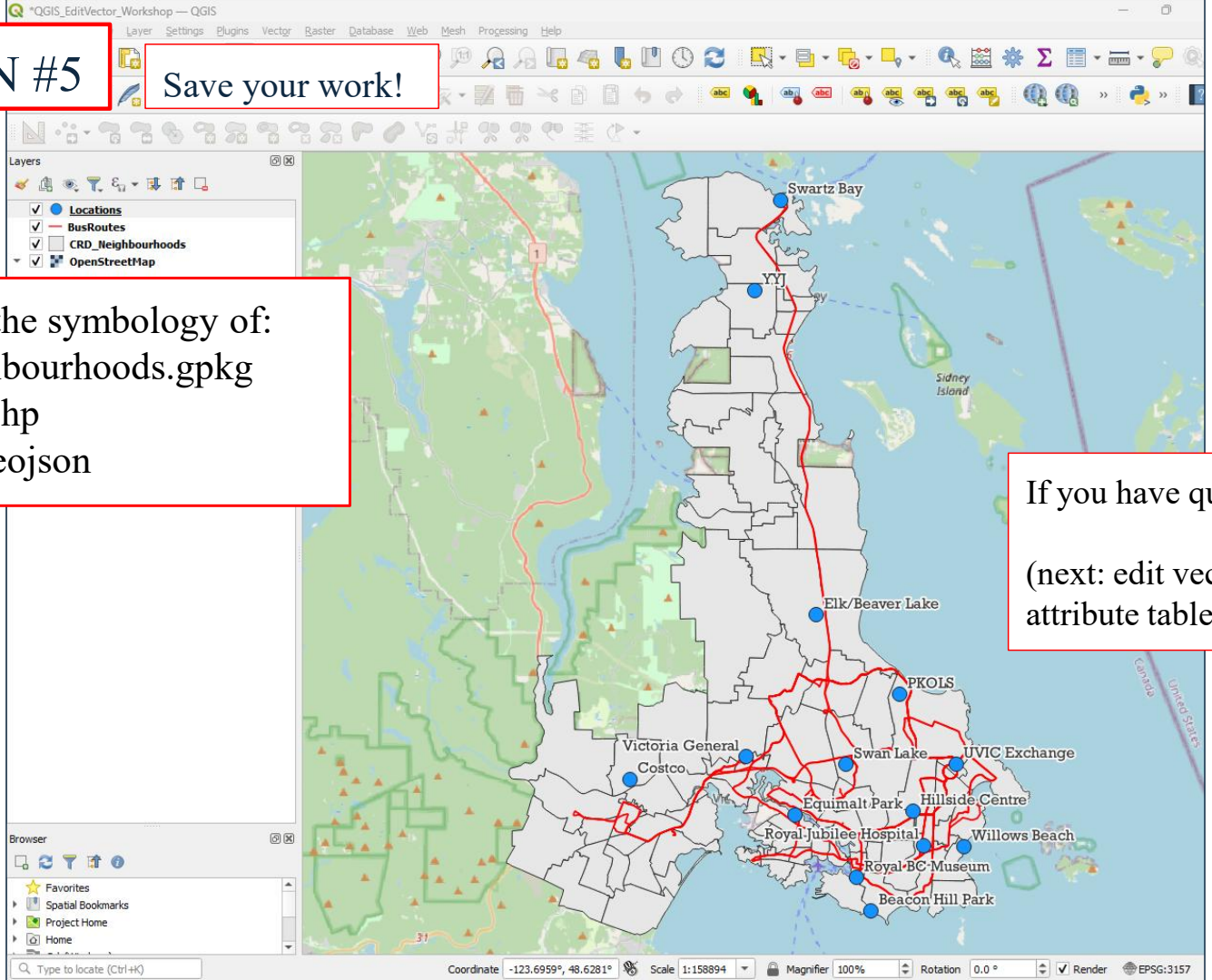


CHECK IN #5

Save your work!

You changed the symbology of:

- CRD_Neighbourhoods.gpkg
- BusRoutes.shp
- Locations.geojson



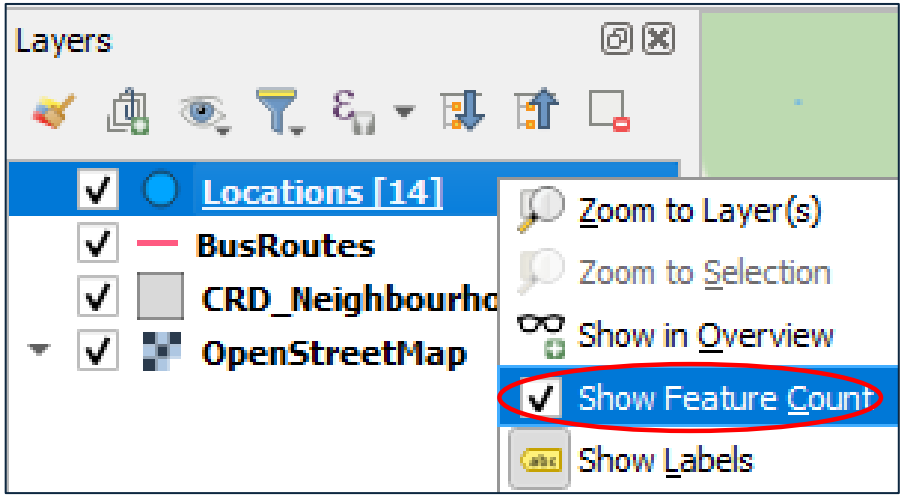
If you have questions, **ask**!

(next: edit vector layers and attribute tables…)

Activity #6

Show layers feature count

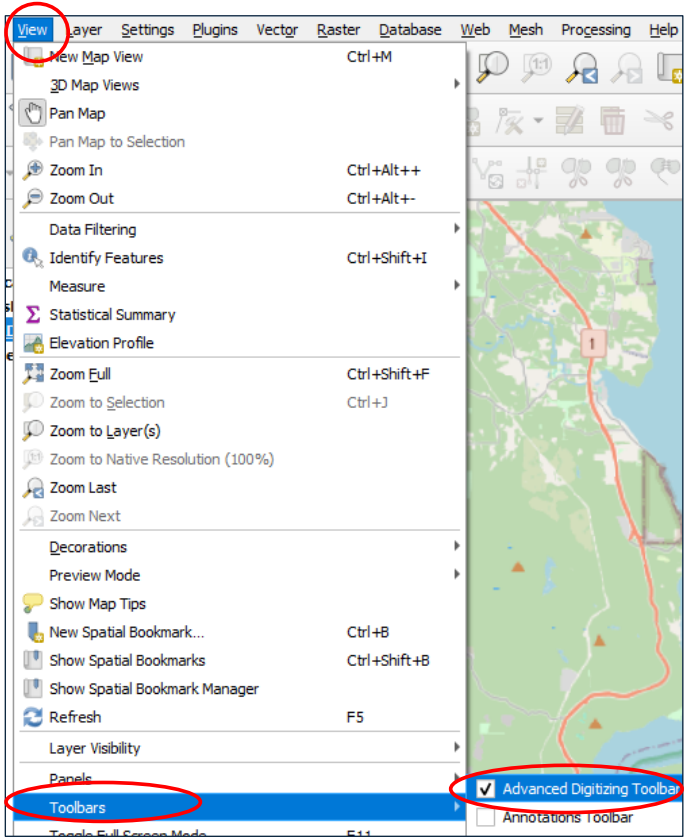
- In *Layers*, right-click **Locations** and check *Show Feature Count*
- Repeat for **BusRoutes** and **CRD_Neighbourhoods**

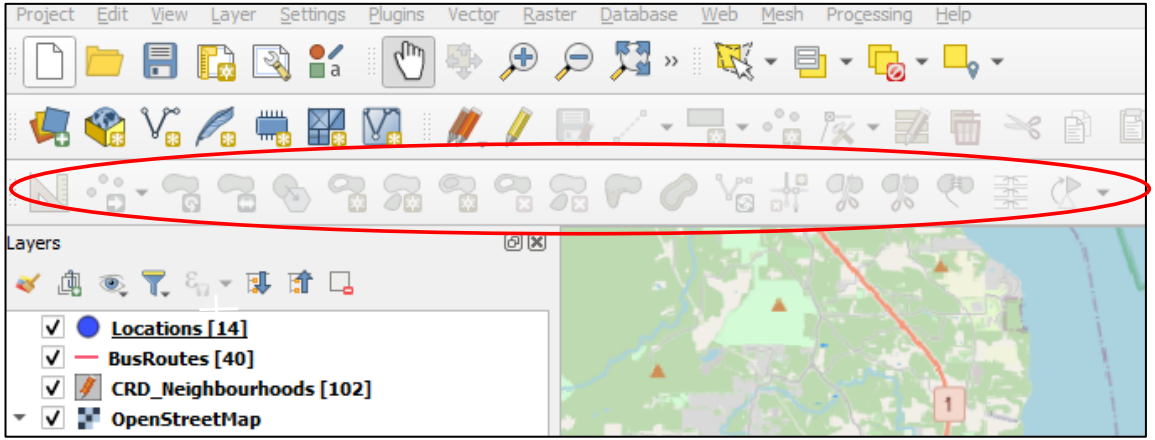


Note **BusRoutes** has 40 features and **CRD_Neighbourhoods** has 102 features

Open Advanced Digitizing Toolbar

- In the *Menu* bar, select *View* then *Toolbars*, then check *Advanced Digitizing Toolbar*
- The toolbar will appear (will be 'greyed out' until we start editing a layer)

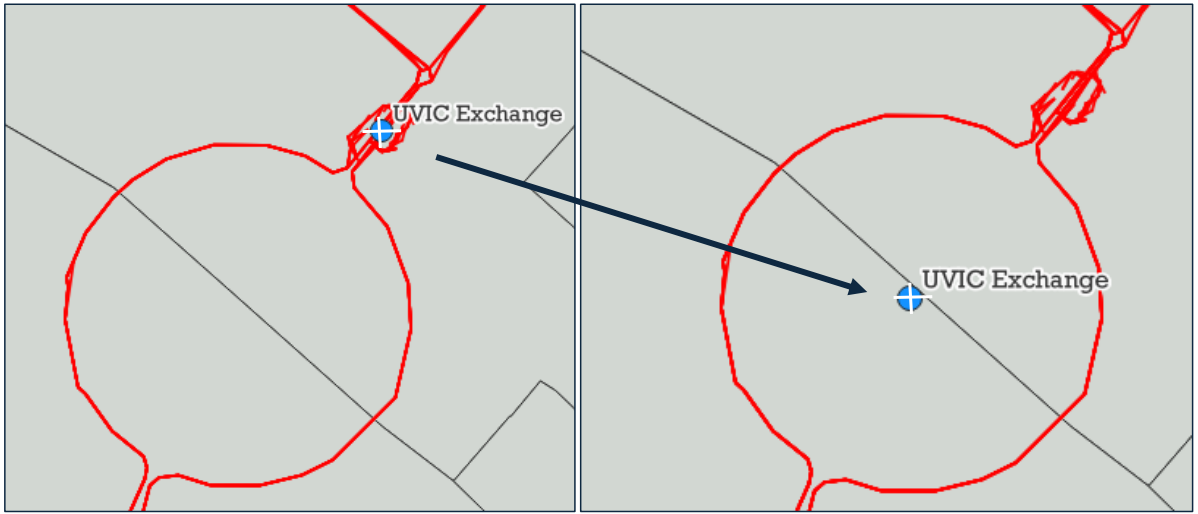




Move Locations vector point

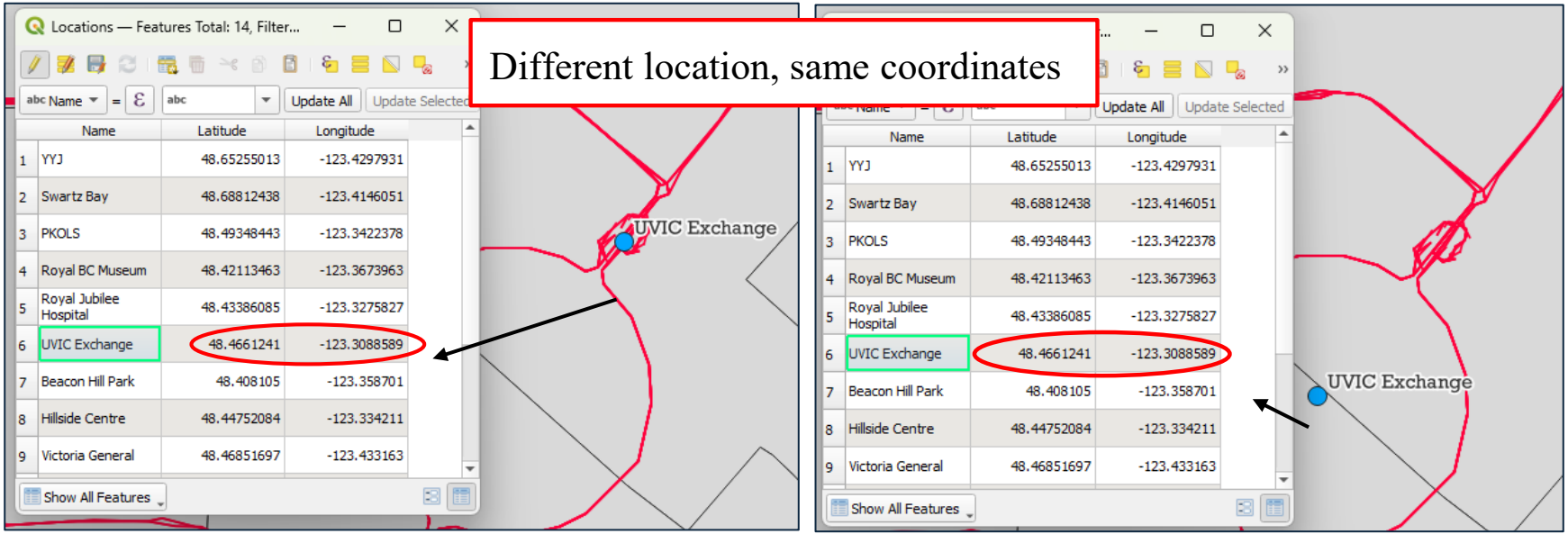
We want our “UVIC Exchange” **Locations** point to represent UVIC instead;
we will move it to the centre of Ring Road

- In the *Layers* panel, select the **Locations** layer, then click the pencil icon to turn on editing
- Select *Move Feature* 
- Zoom into the “UVIC Exchange” point, and click on it with the crosshair
- Move to the centre of Ring Road, and click again to place the point



Change Locations Lat/Long

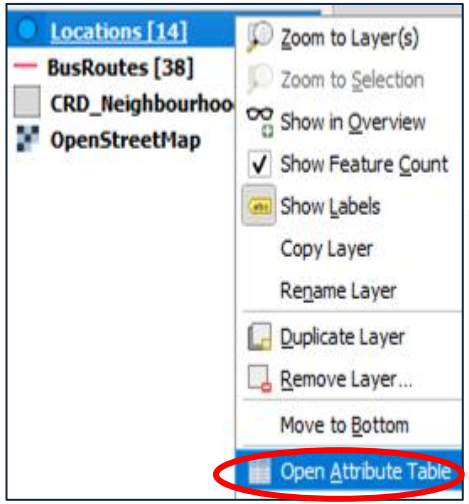
If **Locations.shp** (with its edited UVIC new location) was removed and re-added to *QGIS*,
the point would be in its new correct location (because of the .shp file)…
but the *Attribute Table* would still have the former coordinates (incorrect after moving the point)

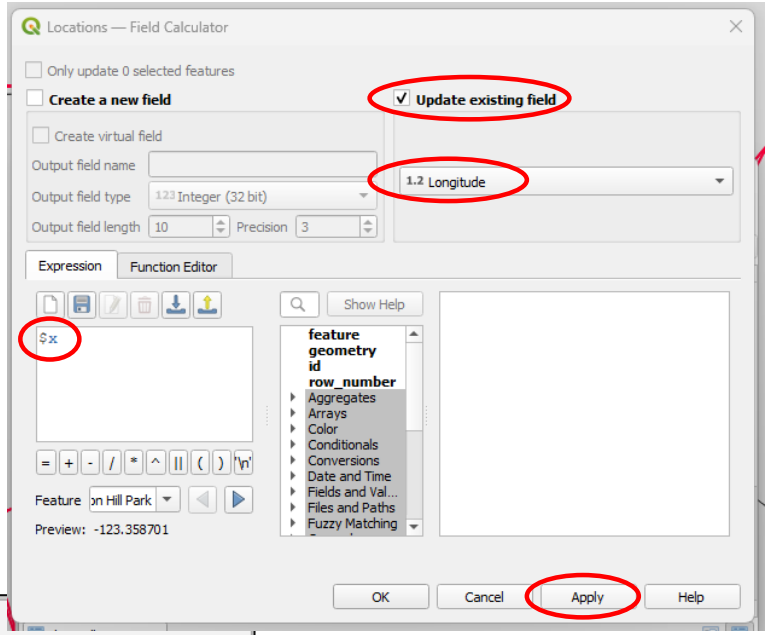


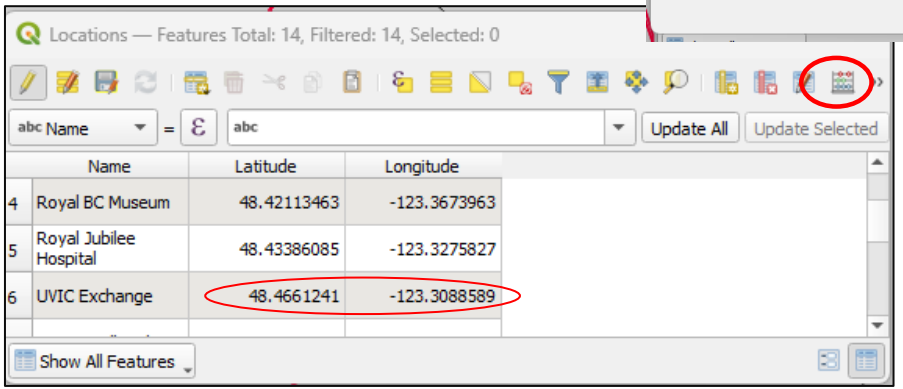
Can calculate new X and Y coordinates with *Field Calculator* (next slide)

Change Locations Lat/Long with Field Calculator

- In *Layers*, right-click on **Locations**, *Open Attribute Table*
- Select *Field Calculator* 
- Check *Update Existing Field*, choose *Longitude* from the drop-down
- In the Expression box, type **$x** (because x-longitude)
- Click **Apply** but not **OK** yet (next slide…)

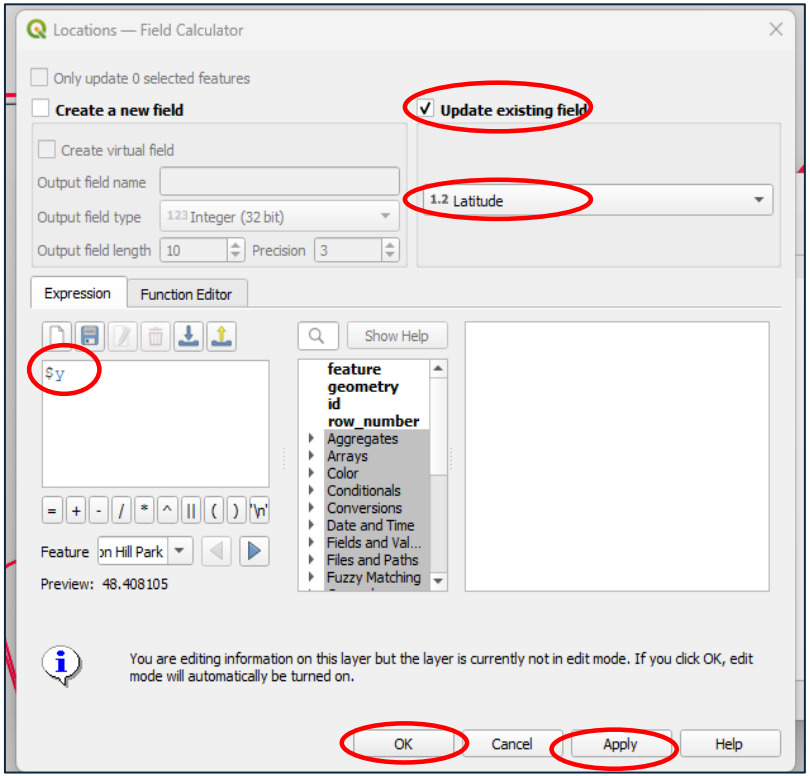


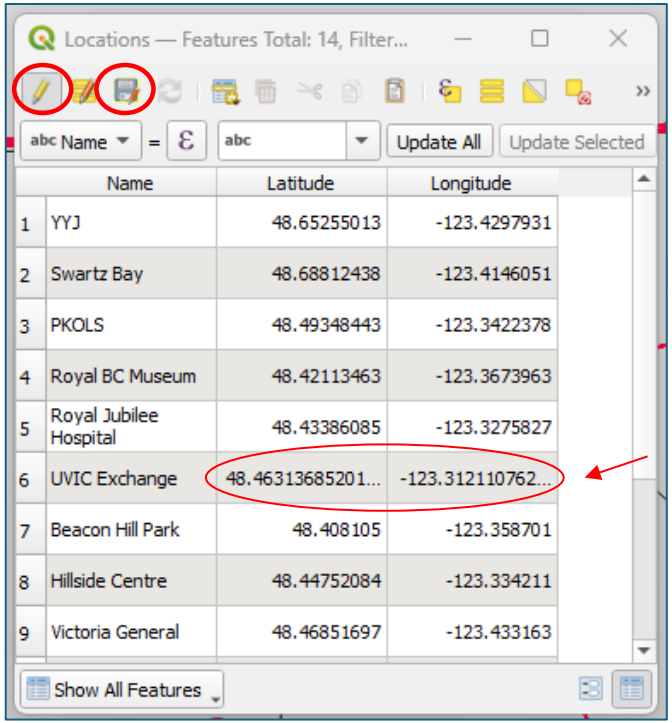




Change Locations Lat/Long with Field Calculator

- Now choose *Latitude* from the drop-down
- In the Expression box, type **$y** (because y-latitude)
- **Apply** and **OK**

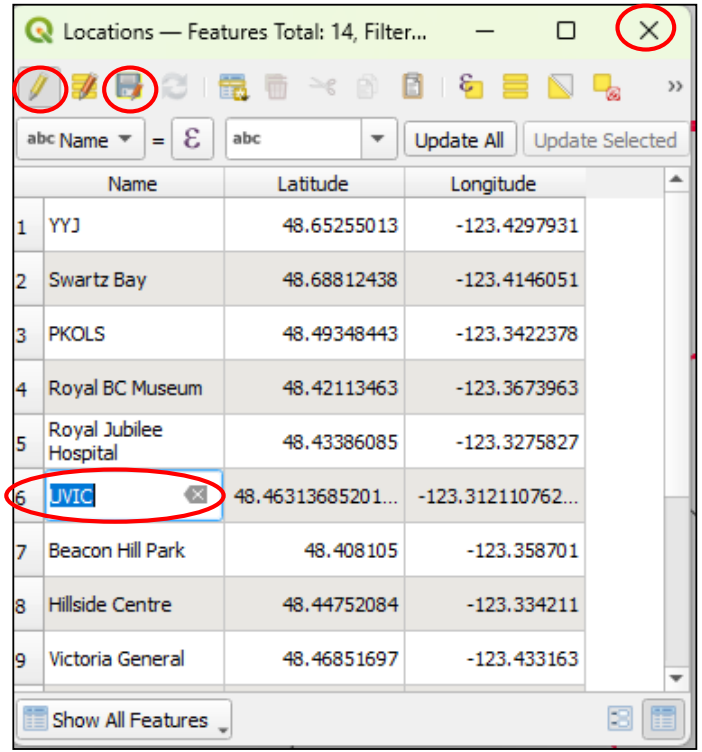




Note new calculated coordinates for UVIC Exchange point

Edit Locations feature names in attribute table

- Double click on “UVIC Exchange” feature name and change to “UVIC”
- Click *Save Edits* and then the pencil icon to stop editing
- **Close** attribute table

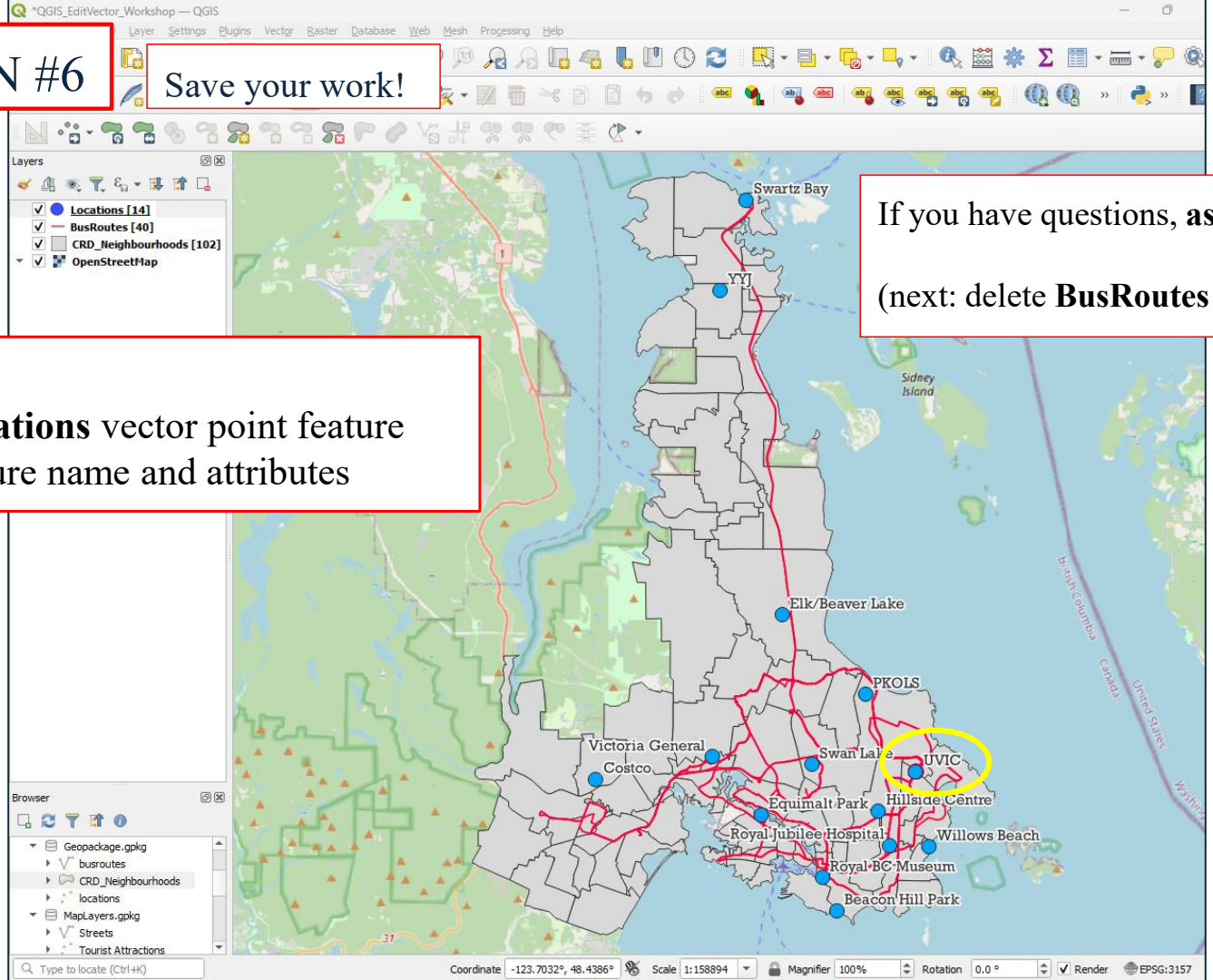


Can also add/delete point(s)...

Later, we will delete a bus route line…

CHECK IN #6

Save your work!



You have:

- Moved **Locations** vector point feature
- Edited Feature name and attributes

If you have questions, **ask**!

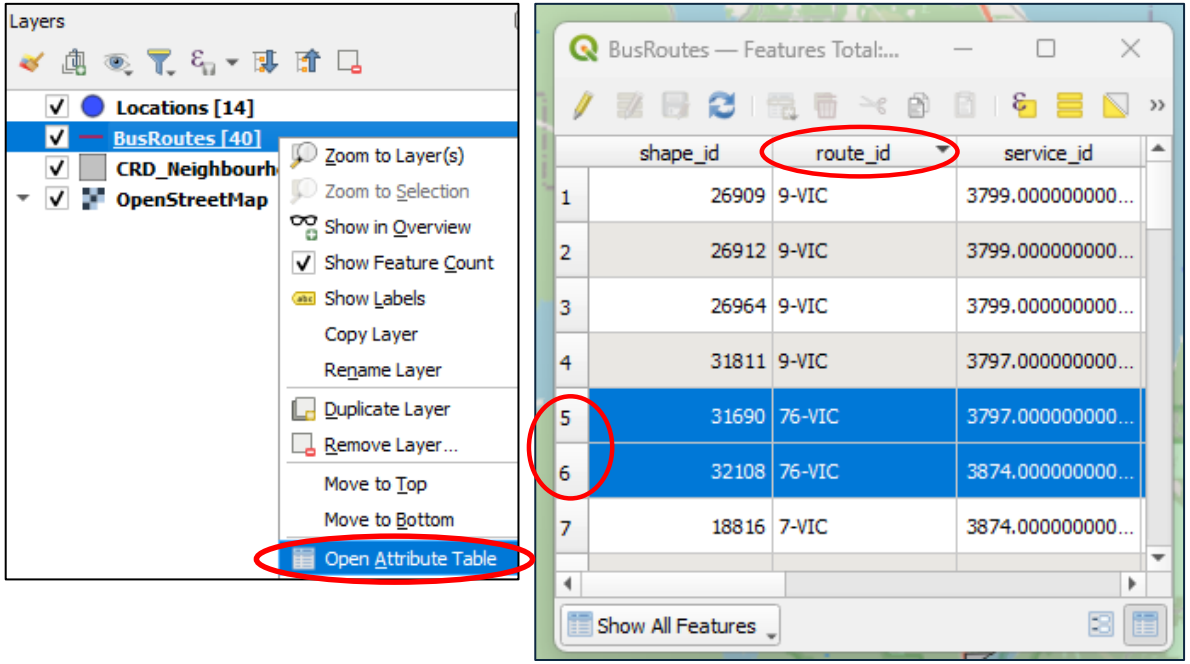
(next: delete **BusRoutes** feature…)

Activity #7

Delete BusRoutes feature

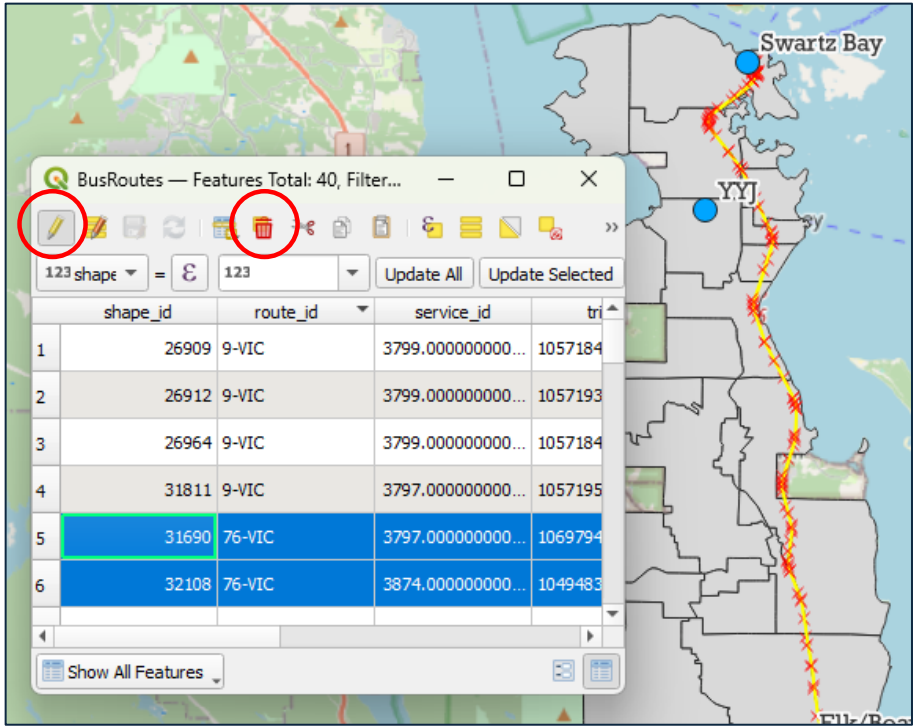
We want to delete Route 76 from the map and **BusRoutes** attribute table

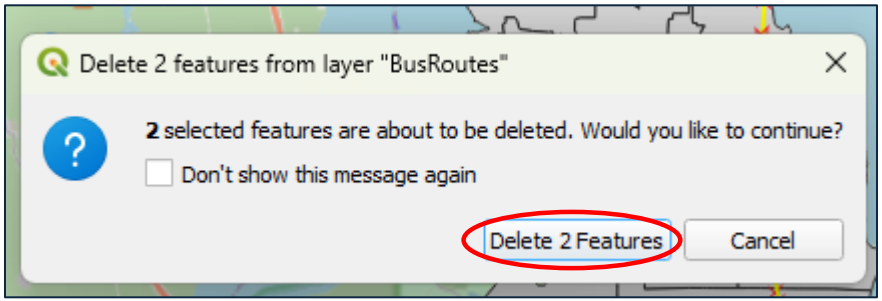
- In *Layers*, right-click on **BusRoutes**, open *Attribute Table*
- Click on header for “route_id” once to sort acscending, and then again to sort descending
- Find the two rows with “route_id” **76-Vic** and select both features by clicking on one row header number, holding CTRL or Shift key, and clicking the other



Delete BusRoutes feature

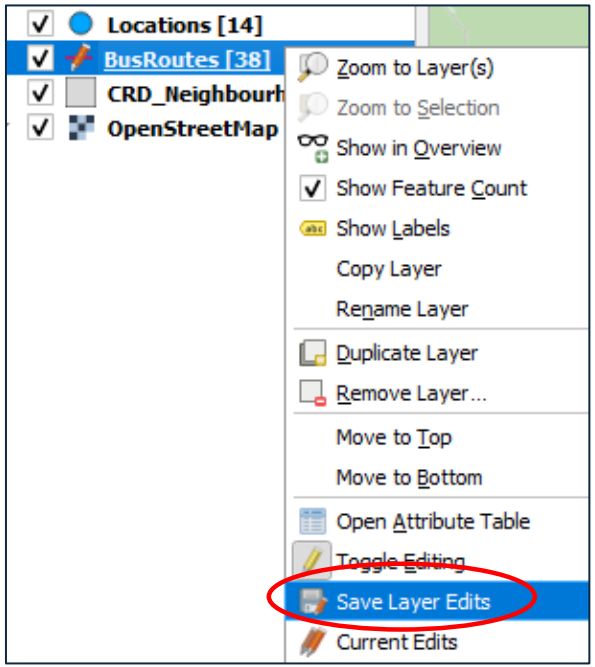
- Click pencil icon to start editing
- **Route 76** will be selected on screen (yellow with red x's)
- Click garbage can icon to delete features from the map and attribute table
- Select *Delete 2 Features* in pop-up

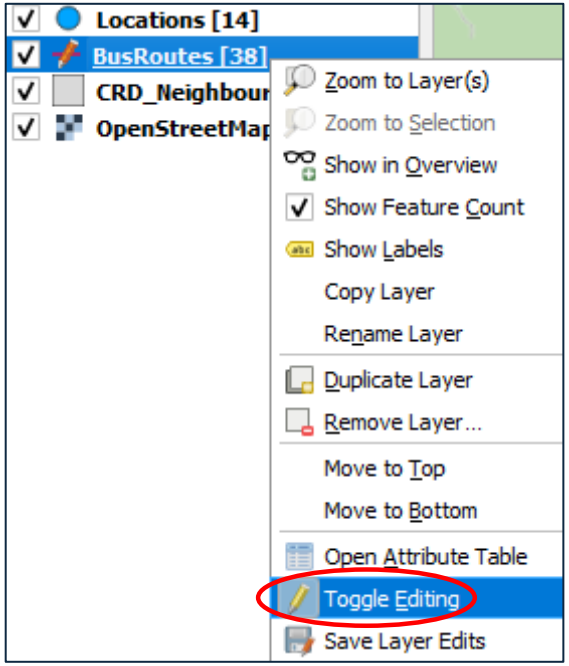




Delete BusRoutes feature

- Right-click on **BusRoutes** to *Save Layer Edits*
- Right-click on **BusRoutes** again to *Toggle Editing* (turn off editing)

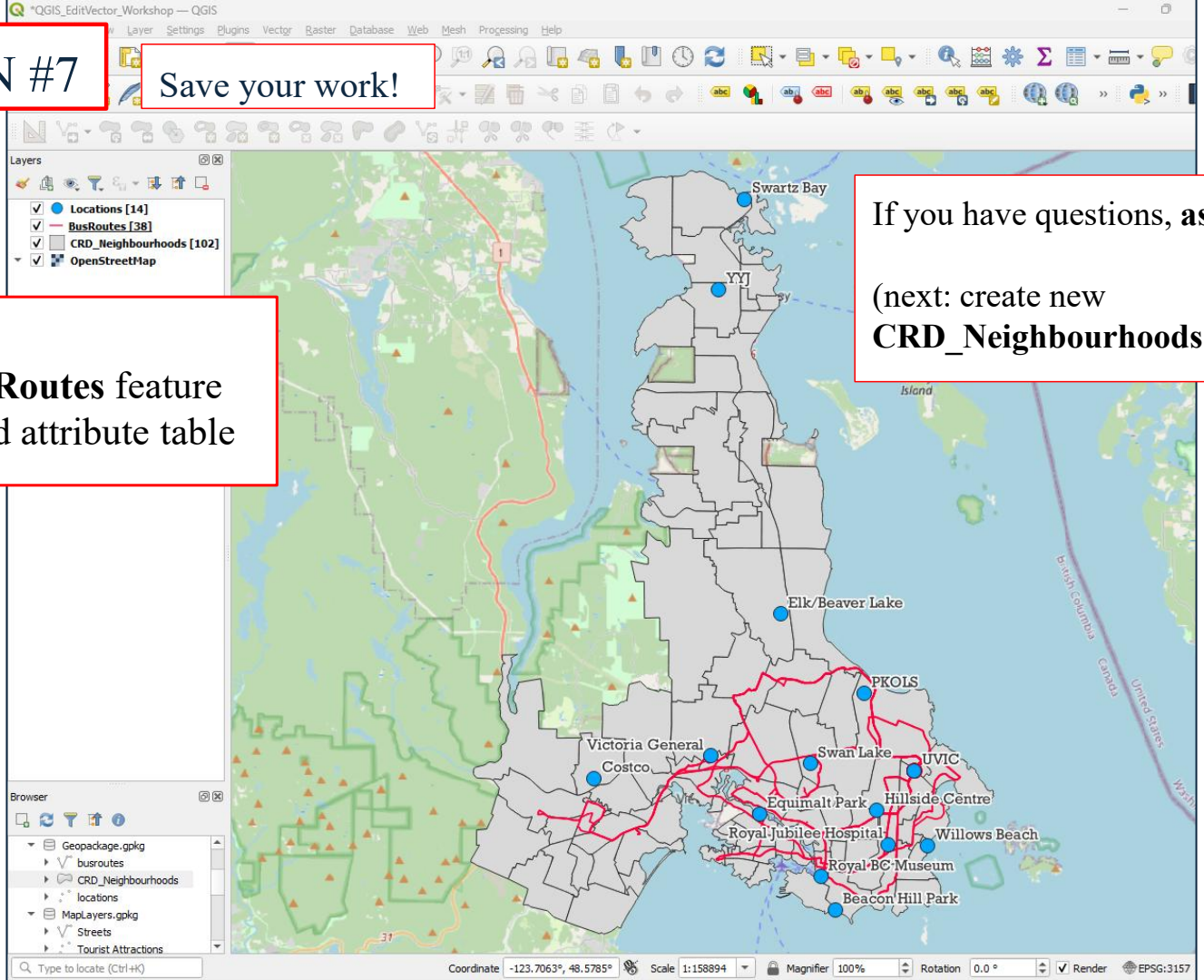




Note **BusRoutes** now has **38** features

CHECK IN #7

Save your work!



You have:

- Deleted **BusRoutes** feature from map and attribute table

If you have questions, **ask**!

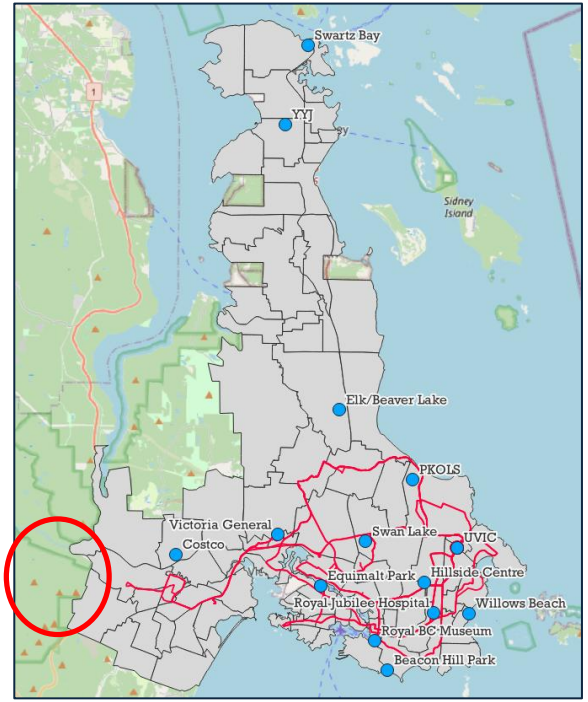
(next: create new **CRD_Neighbourhoods** polygon…)

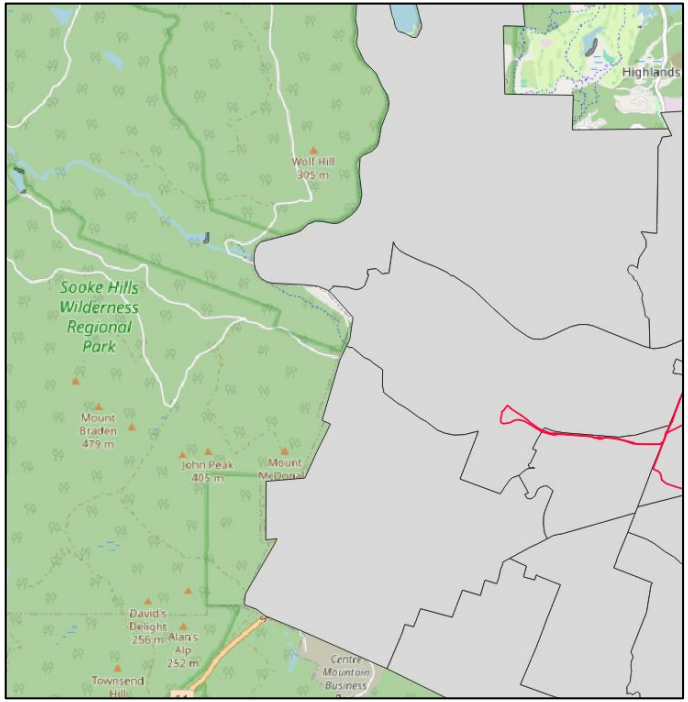
Activity #8

Create new CRD_Neighbourhoods polygon feature

Add new Neighbourhood polygon feature to CRD

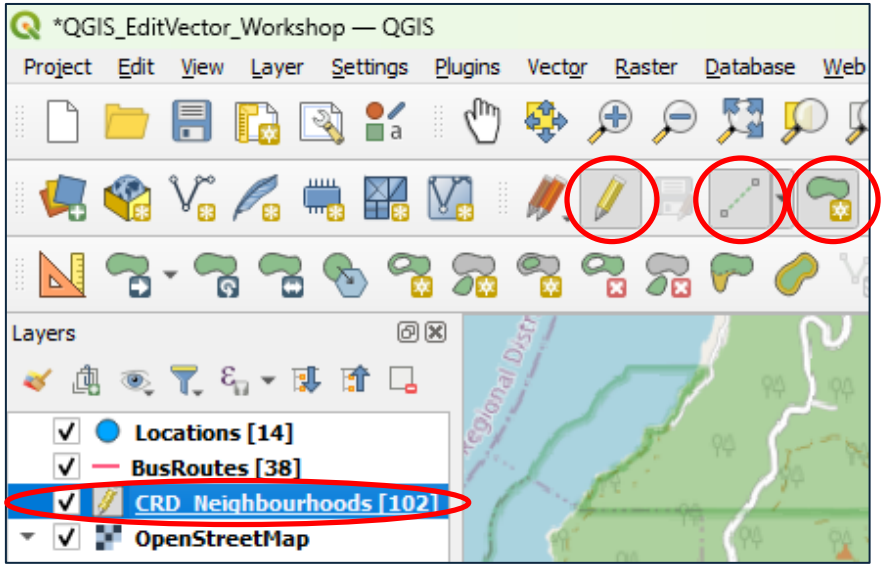
- Zoom to SW of CRD

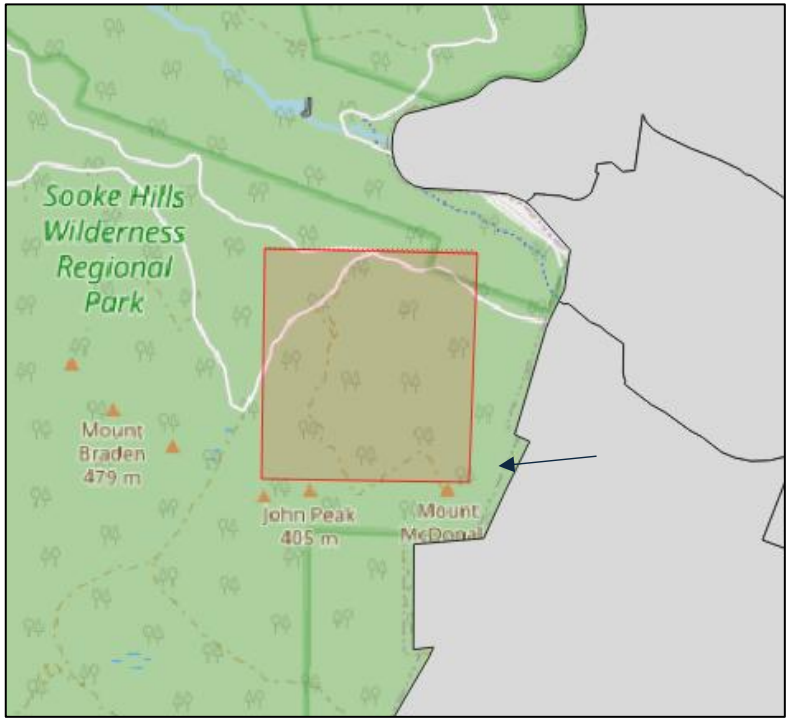




Create new CRD_Neighbourhoods polygon feature

- In *Layers*, select **CRD_Neighbourhoods** and click the pencil icon to turn on editing 
- Select *Add Polygon Feature*  and ensure *Digitize by Segment* is selected 
- Click to place a vertex, continue to make a simple rectangular neighbourhood
- Right-click to finish the shape

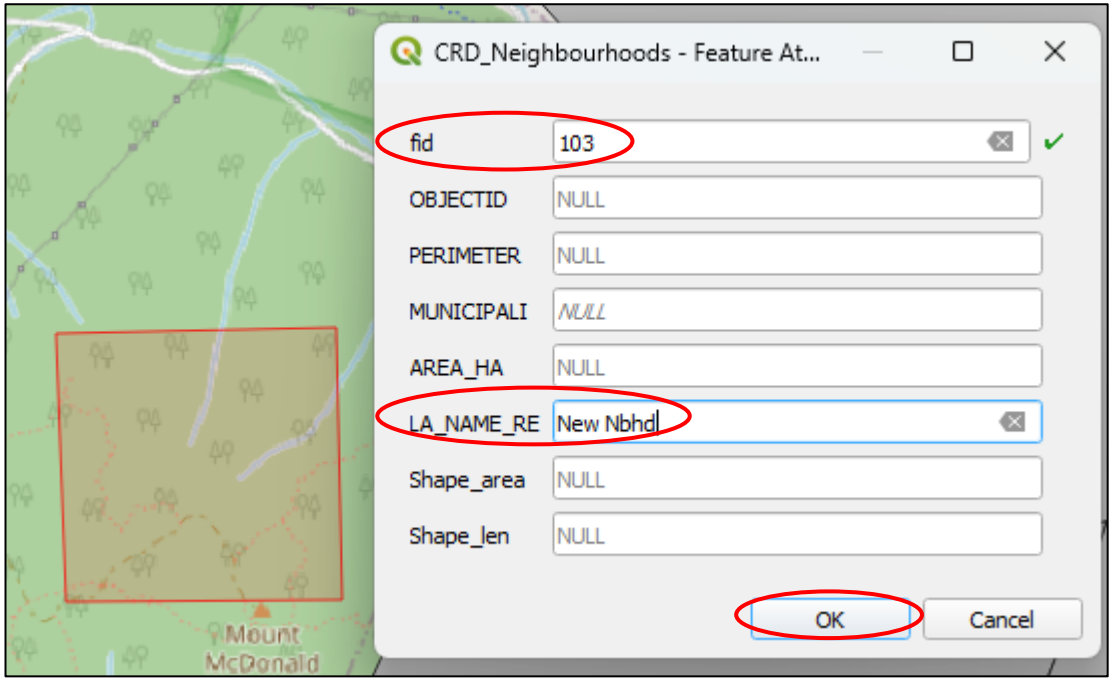


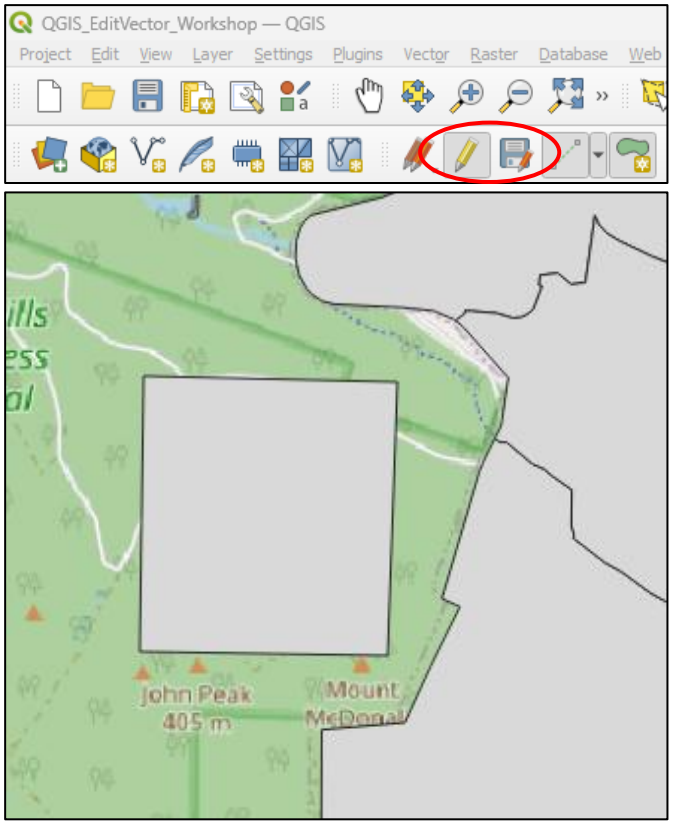


Add new CRD_Neighbourhoods polygon attributes

When you right-click to finish the shape, the **CRD_Neighbourhoods** Feature Attributes pane will pop up

- Change *fid* to "103" (**CRD_Neighbourhoods** already has 102 features) and *LA_NAME_RE* to "New Nbhd"
- Click **OK**
- The new polygon will appear on the map
- Click *Save Edits* and then the pencil icon to stop editing





CHECK IN #8

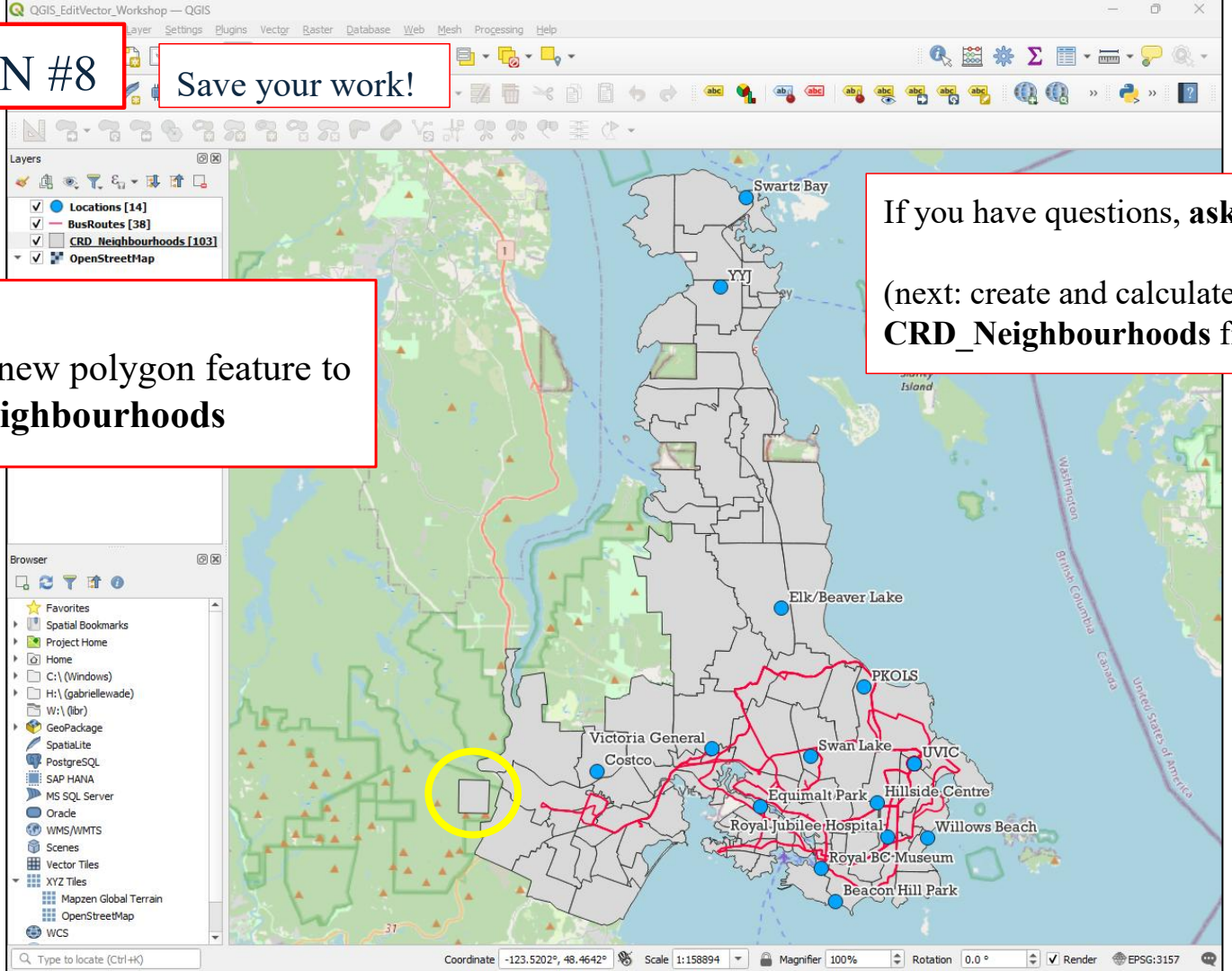
Save your work!

You:

- Added a new polygon feature to **CRD_Neighbourhoods**

If you have questions, **ask**!

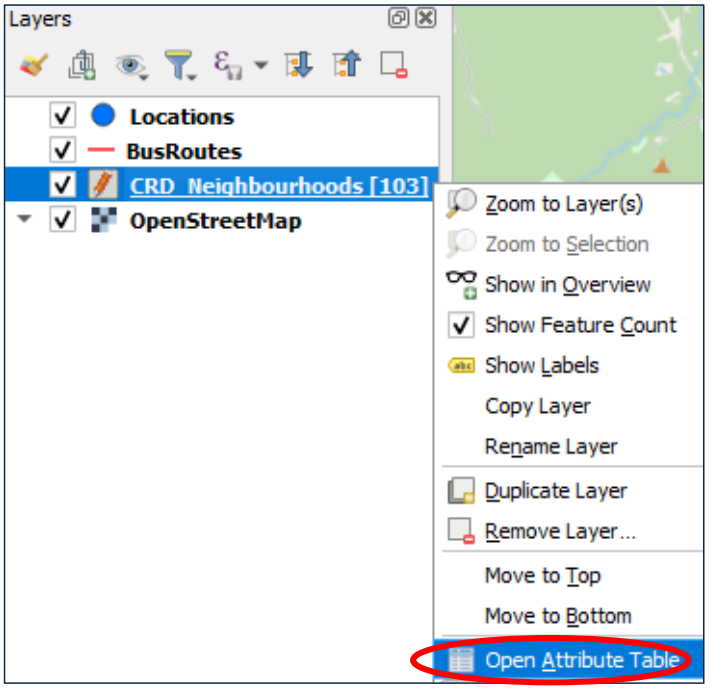
(next: create and calculate new **CRD_Neighbourhoods** field…)

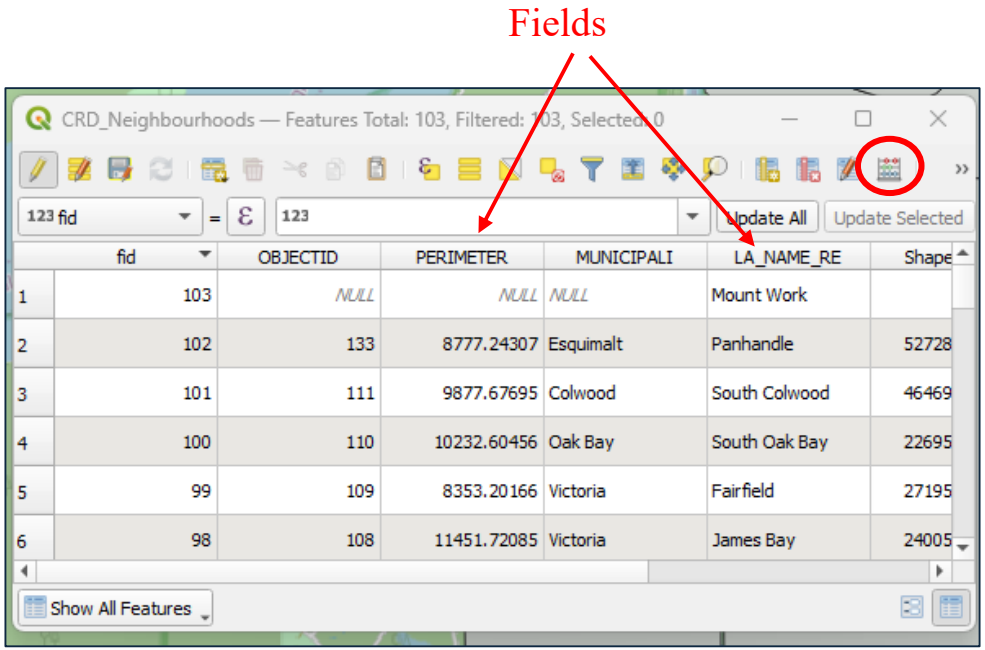


Activity #9

Calculate CRD_Neighbourhoods area

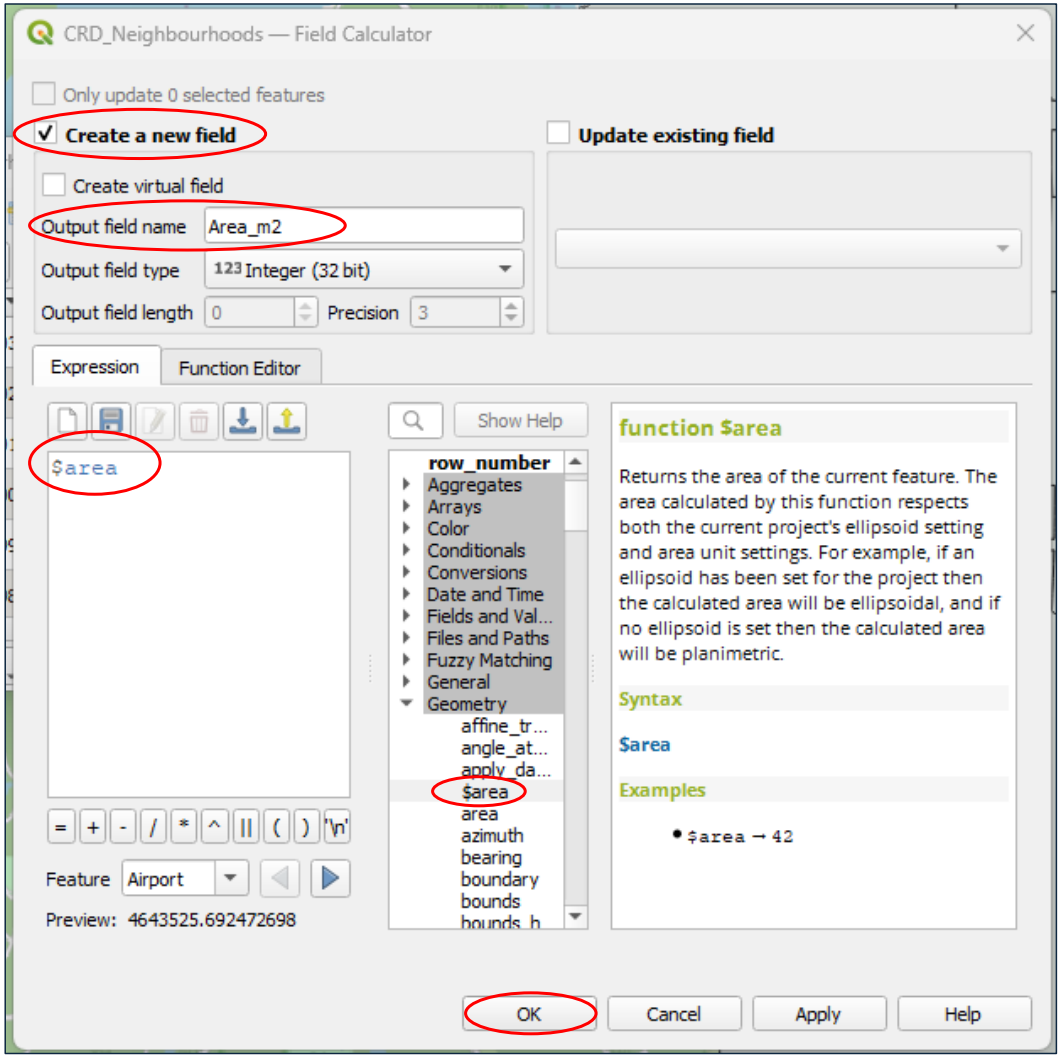
- Right-click on **CRD_Neighbourhoods,** *Open Attribute Table*
- Click the icon to open *Field Calculator*
    - This tool lets us create and calculate new fields or update existing ones



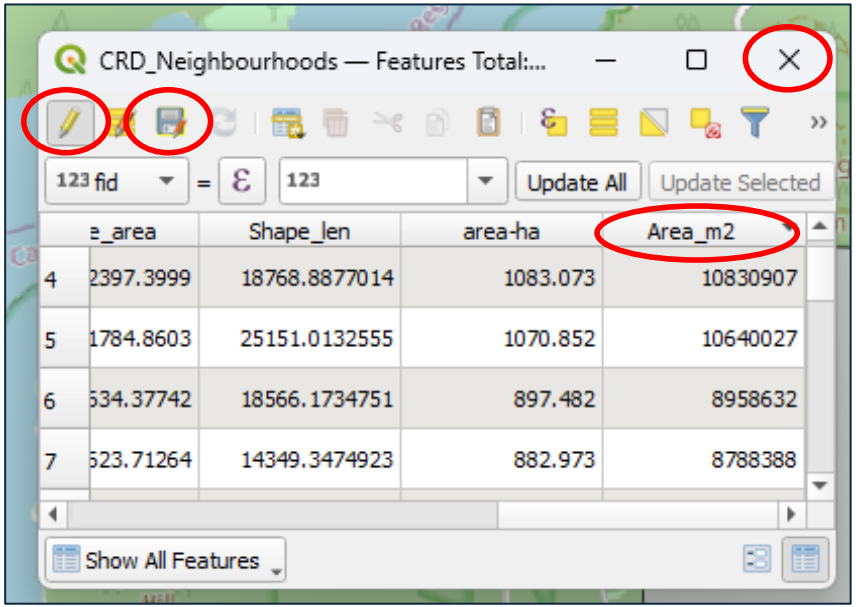


Create and calculate a new Field

- Check “Create a new field”
- Type “Area_m2” in *Output field name*
- Leave *Output field type* as “Integer (32 bit)”
- Type **$area** in the expression box or find it in the *Geometry* drop-down and double-click to add it to expression box
- Click **OK**

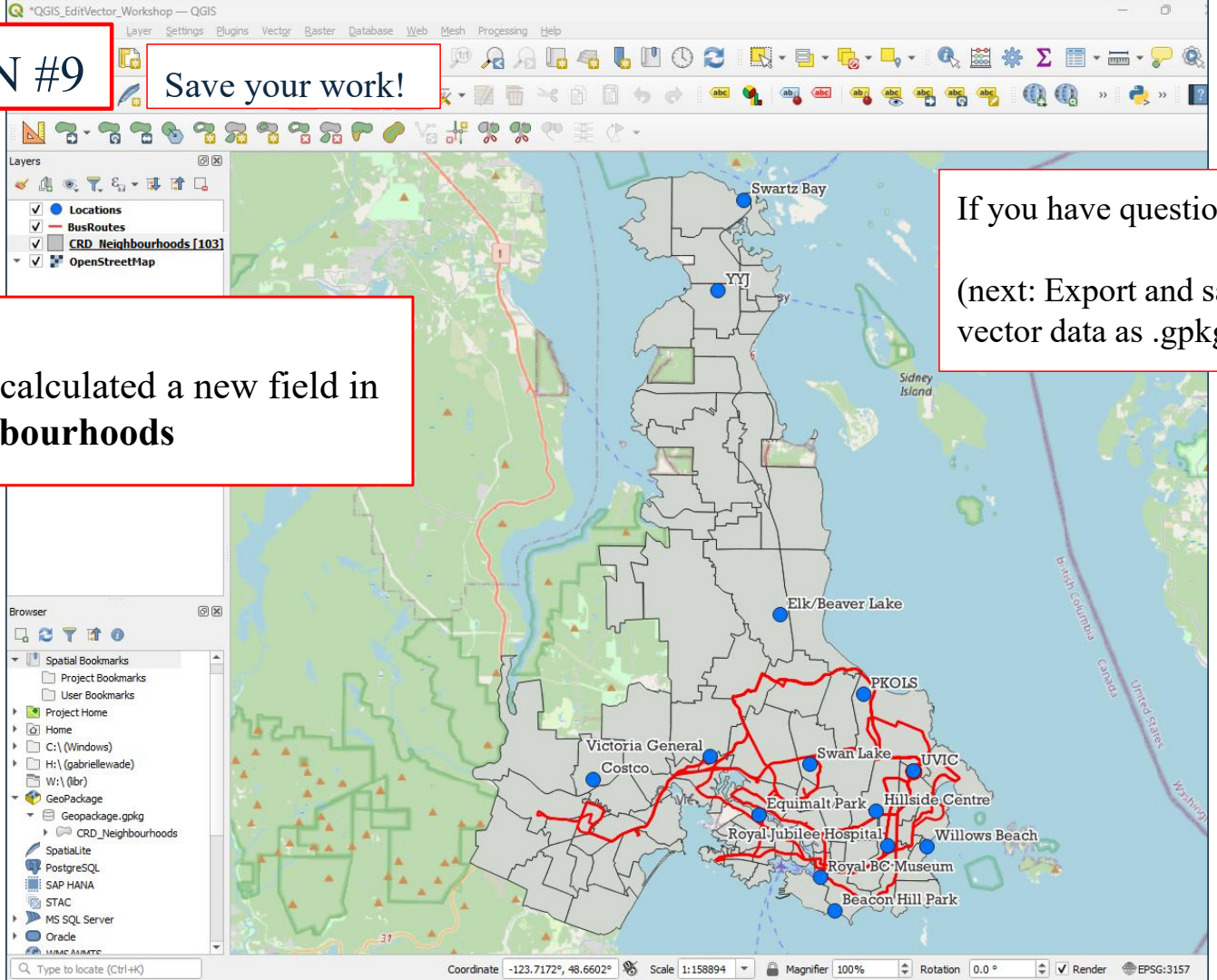


- New Field (Area_m2) will be visible as an attribute table column and area of all CRD neighbourhoods will be calculated
- Save layer edits and stop editing
- **Close** attribute table



CHECK IN #9

Save your work!



You have:

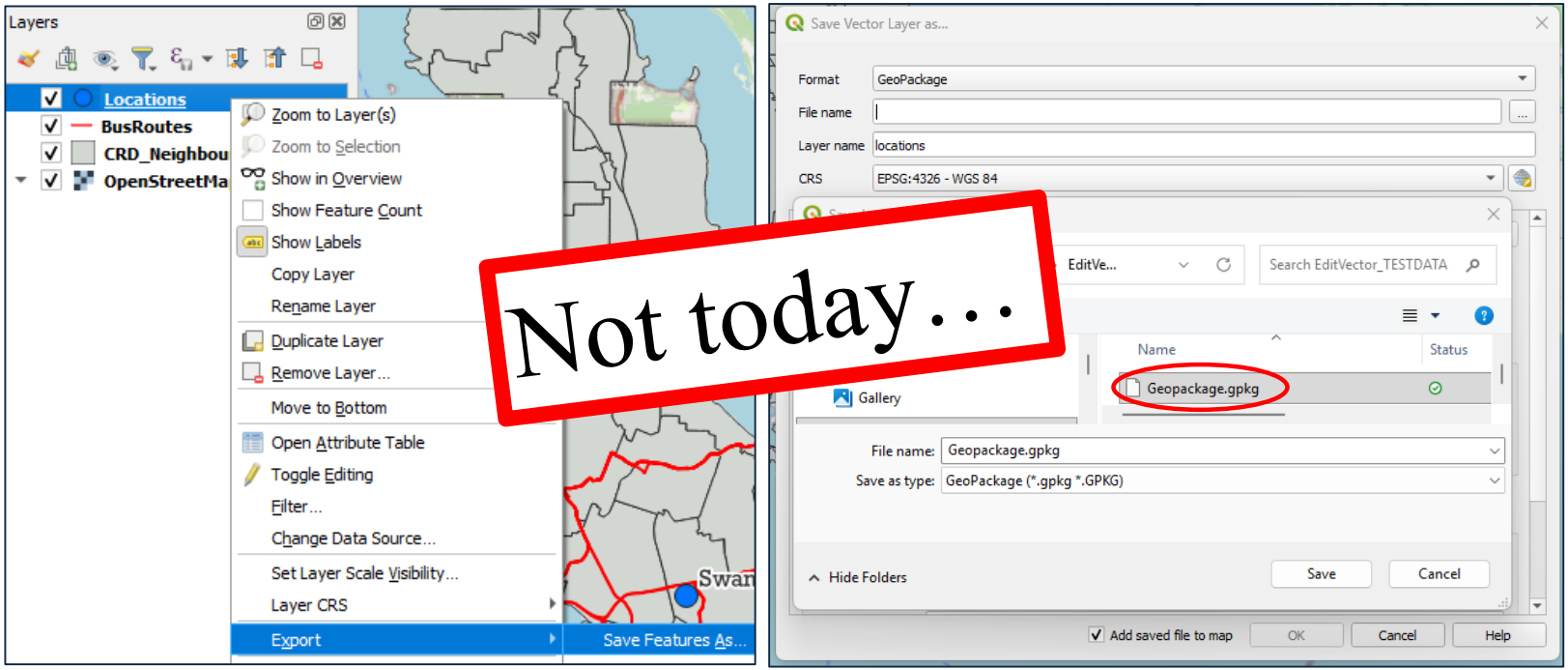
- Created and calculated a new field in **CRD_Neighbourhoods**

If you have questions, **ask**!

(next: Export and save all vector data as .gpkg…)

Activity #10

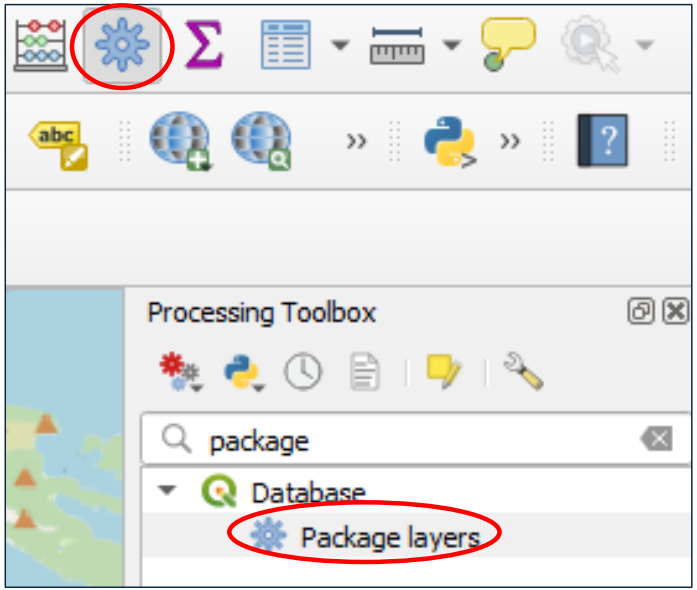
- Able to export individual layers to existing geopackage (e.g. **Geopackage.gpkg**) **but want to save layers style** (symbology)…
- Will use *Package layers* tool instead (which can **save layers style**)

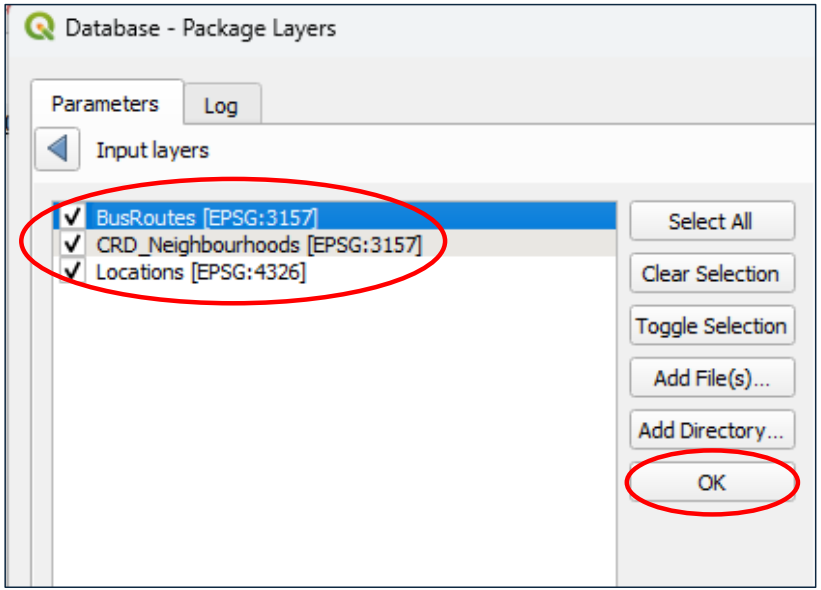


Package vector layers into a geopackage

Package all vector layers (.shp, .geojson, .gpkg) into a single new geopackage

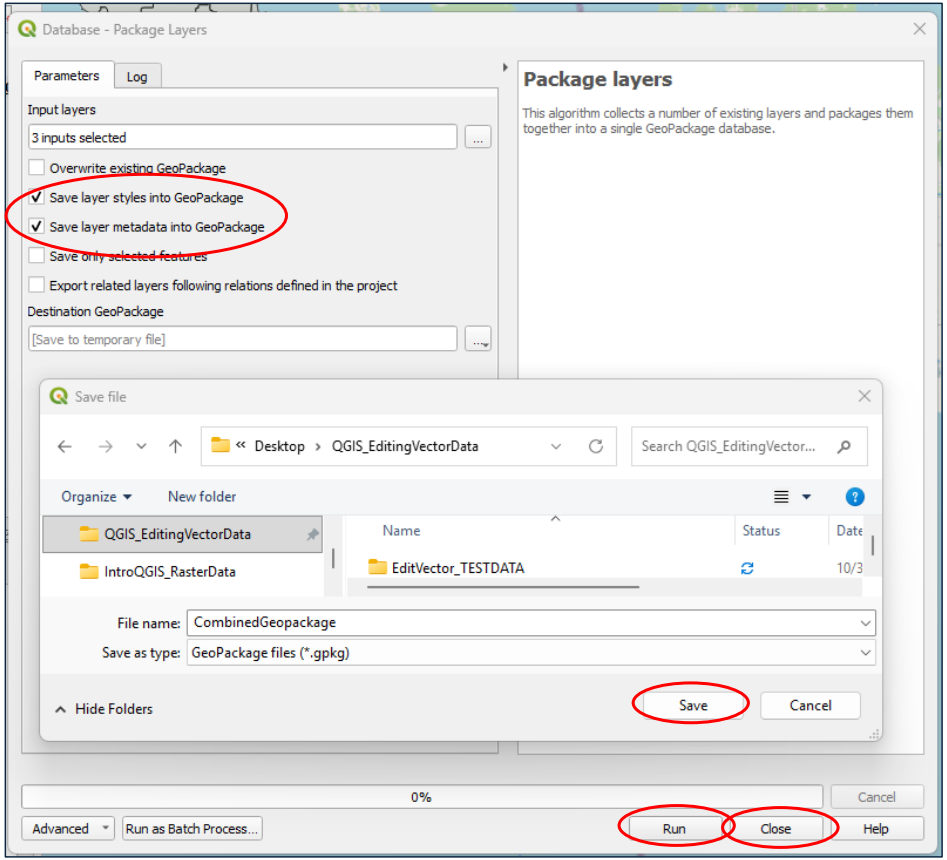
- Open *Processing Toolbox* and search for "package layers"; double-click on *Package layers* to open
- Click the three dots under "Input Layers" and check
  - **BusRoutes, CRD_Neighbourhoods,** and **Locations** layers
- Click **OK**



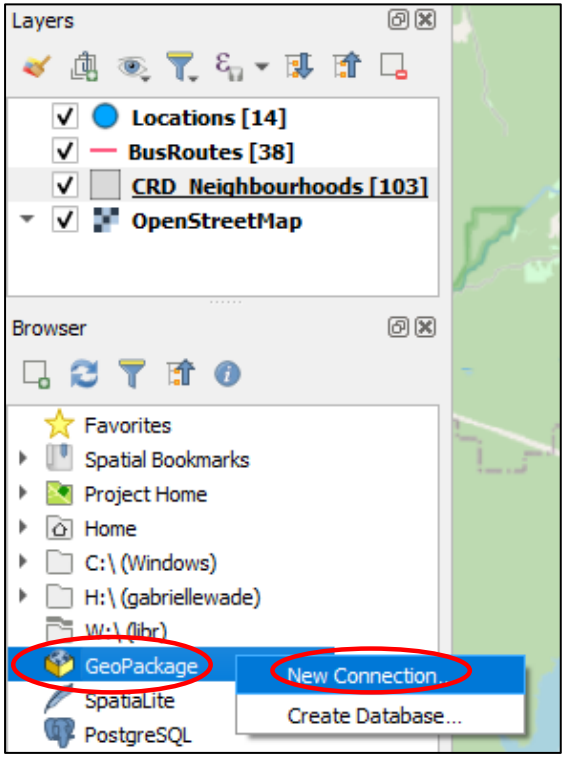


Package vector layers into a geopackage

- Make sure “Save layer styles into Geopackage” and “Save layer metadata into Geopackage” are checked
  - This will keep layer styling when adding geopackage layers back into *QGIS*
- Click three dots under “Destination GeoPackage”, *Save to file,* navigate to workshop folder, save as “CombinedGeopackage”, Save
- **Run** and **close** when Complete

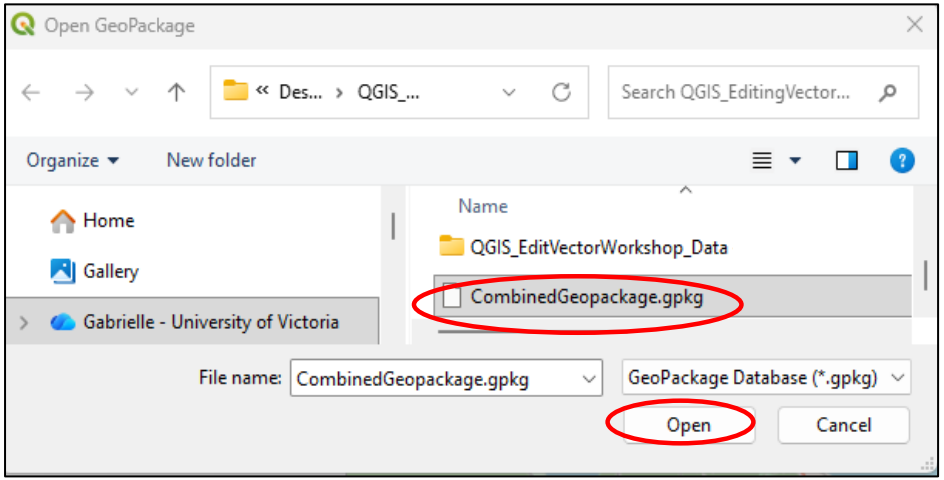


Add CombinedGeopackage

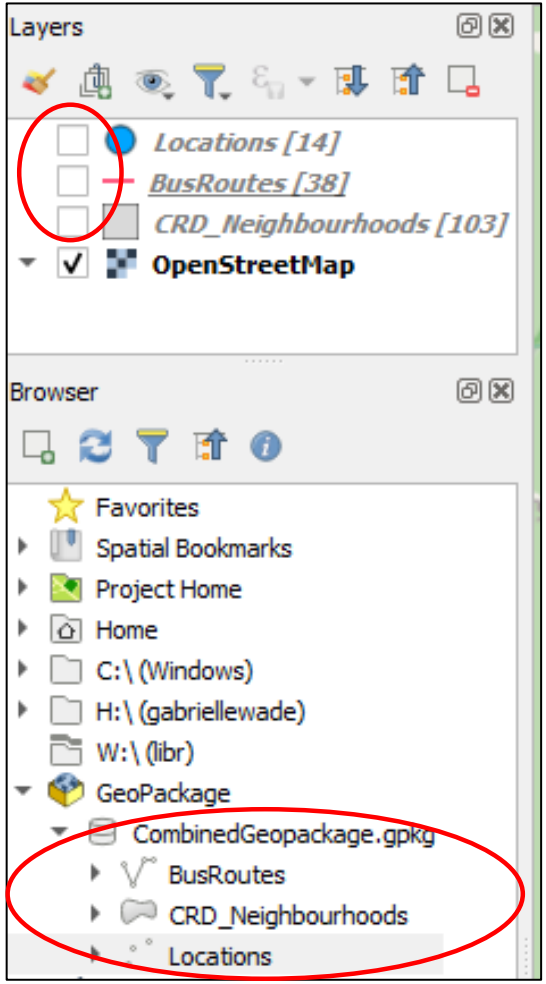


- In *Browser* find *Geopackage* heading
- Right-click *Geopackage* and select *New Connection*
- Navigate to workshop folder and select

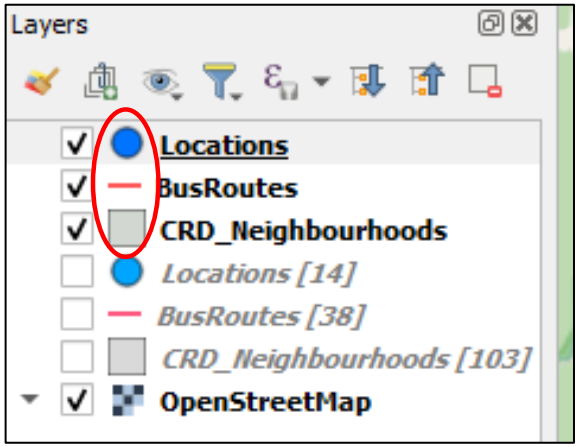
CombinedGeopackage.gpkg, Open



Add geopackaged layers



- In *Layers*, uncheck **Locations, Busroutes,** and **CRD_Neighbourhoods**
- In *Browser*, expand **CombinedGeopackage.gpkg**
- Add **BusRoutes, CRD_Neighbourhoods,** and **Locations** to map by double-clicking each one
- Note added geopackage layers have saved styles/symbology



Congratulations!

You can:

- Load and edit vector files
    - Shapefile, GeoJSON, geopackage
- Change **Symbology** of vector layers
- Edit vector layers using **digitizing**
- Edit vector layer **attribute tables**
- Package vector layers into a Geopackage (.gpkg)

Resources going forward:

QGIS – used in workshop today:
•QGIS Tutorials & Tips: https://www.qgistutorials.com/
•QGIS Training Manual: https://docs.qgis.org/3.40/en/docs/training_manual/index.html
•QGIS User Guide: https://docs.qgis.org/3.40/en/docs/user_manual/index.html

Find data:
•GeoSpatial Data Guide: http://libguides.uvic.ca/geospatialdata

Questions or problems:
•UVic Geospatial Librarian (danielbm@uvic.ca), YCW Geospatial Intern (gabriellewade@uvic.ca), or KULA Geospatial Assistant (jeronimo.elenes@gmail.com)

UVic full semester GIS courses in the Department of Geography:
•GEOG222 – Intro to Maps and GIS
•GEOG328 – GIS Analysis

GIS Skills and Mapping Micro-certificate (36 hours)
•https://continuingstudies.uvic.ca/science-and-the-environment/programs/gis-skills-and-mapping