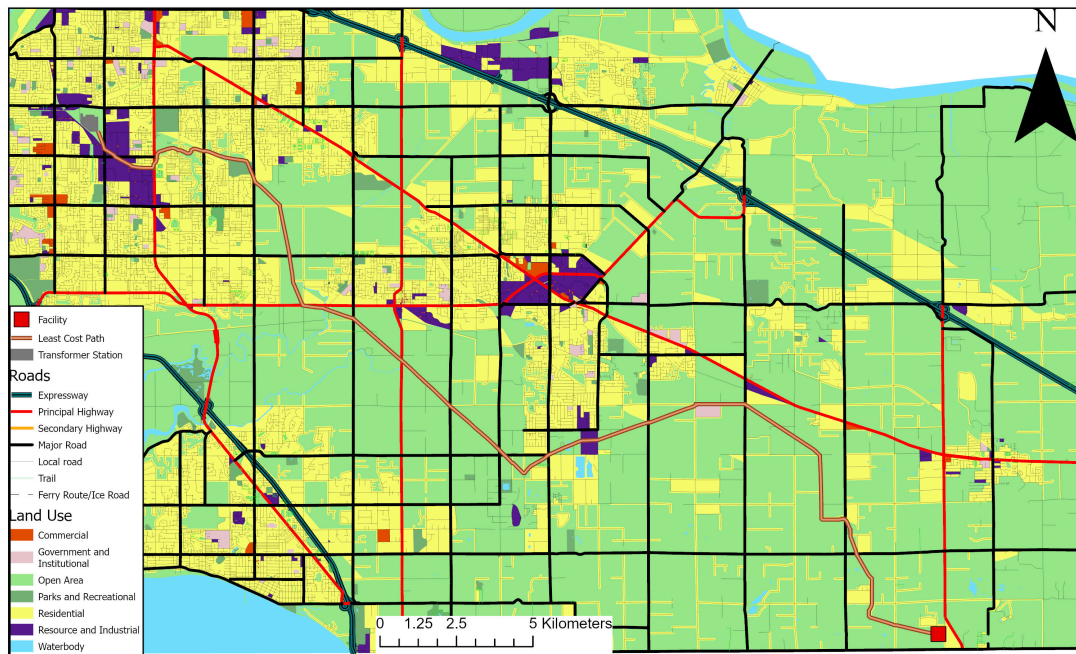


Lab 4: Questions and Answers

Question 1: You should now produce a nice map that illustrates our initial least-cost path overlaid on land use. You should use appropriate symbology for the path and for the facility. The legend should be carefully presented (e.g., the land use classes in alphabetical order), and proper attribution for the data used. (7 marks)

Least Cost Pathway



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Question 2: One set of objections could relate to the nearness of the least-cost path to schools. Suppose it has been conjectured that being near high voltage power lines is hazardous for children. How many schools are located within 500 m of the transmission line? (Hint: **Select by location**). Can you imagine other analyses you could do with respect to this concern about children and power lines? (Hint: Perhaps using **census data**?) (4 marks)

There are 6 schools that are within 500m of the transmission line. Some other analyses that I could do with respect to the concern about children and power lines are seeing where majority of youth population resides. I could use census data to determine the age range of populations and see where it is more feasible to put power lines.

Question 3: One question that the developers of the line have asked is: What is the actual shortest distance between the new facility and the transformer station? (Hint: **Measure tool**)

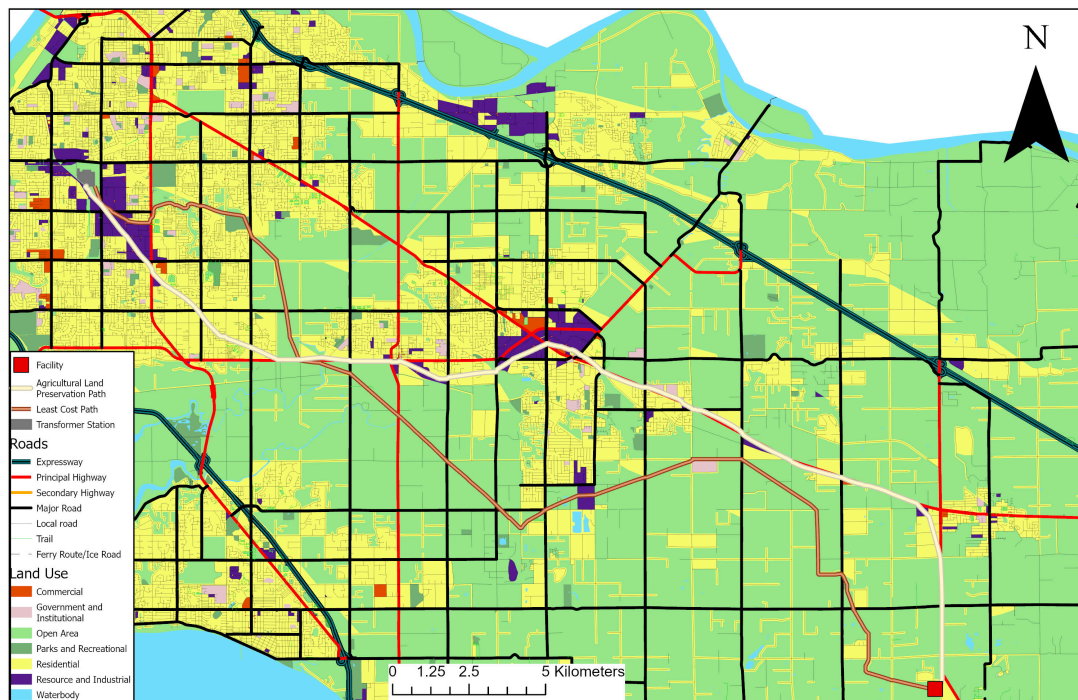
How does that distance compare to the distance (in metres) that the least-cost path takes? (2 marks)

The actual shortest distance between the facility and the transformer station is roughly 32 km. The least-cost path distance is 40000 m which compared to the shortest distance is 8000 m longer.

Question 4: The choice of frictions associated with the different land uses likely has a significant impact on where the path goes. How might a group that seeks to have somewhat more importance placed on preserving agricultural land uses suggest different relative cost frictions? Explain your numbers. *Recalculate and remap* the least cost path with these new numbers saved in `Cost.csv` (you can use Excel or Notepad++ to edit... just be sure to save the file in CSV format). You can plot the first and second paths both on this second map if you wish. Explain how and why does this second path take similar and/or different routes from the original least-cost path found above? (7 marks)

A group seeking to have somewhat more importance placed on preserving agricultural land use will have a cost friction of open land to be higher. This is because most of the agricultural land is located within the classification of open land.

Least Cost Pathway



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The second path (Agricultural Land Preservation Path) takes a different route from the original because since now open land has more cost friction, the path avoids open land. We see that the new path has a length of 38000 m which is roughly 2000 m shorter than the original. The new path also favors the roadways which has lower friction costs, due to areas near roads being

residential areas. However, as mentioned above there is concern for power lines near homes.