Chapter 12: Google Earth Exercise

Exercise 1
Urban Form and Governance: A case study in urban mobility

Moving around the city is closely related to planning and governance. Investment in road and transit infrastructure and the promotion of active transit are some of the responsibilities of local governments.

The task: Using Google Maps, visit New York City, Toronto, Amsterdam, and Portland to determine the relationship between active transport, and transit and traffic flows.

Click on each of the city names below to explore transit, cycling, and traffic information for each location on a typical Thursday afternoon at 5:30pm. You may wish to enable to disable the individual data layers to better see the layer of focus.

Amsterdam, New York City, Portland, Toronto

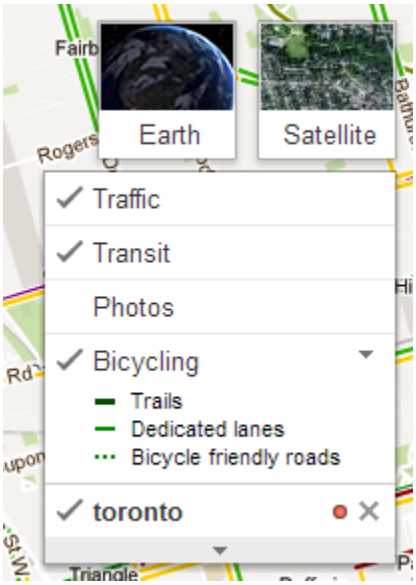

Figure 1: Layers selection in Google Maps

- Question 1: Differentiate between the cycling infrastructures in each city, what patterns do you notice? (Think specifically in terms of how many cycling routes exist, and how well connected they are as a network). Out of the four case studies, which do you think has prioritized active transport? How might each city's network of bicycle routes affect commuting preferences?

- Question 2: Compare traffic patterns in each of the cities. Does an improved cycling or transit infrastructure mitigate traffic congestion?

Exercise 2
Urban Growth and Sprawl

Urban sprawl results primarily in the unplanned expansion of urban land uses into rural areas. Urban sprawl tended to proceed unchecked throughout much of second half of the twentieth century in Canada. The negative consequences associated with such growth—such as traffic congestion, loss of agricultural lands and forests—have led to better growth management and planning. The Greater Golden Horseshoe Region (GGHR) in southern Ontario is one of North America's fastest-growing urban regions. It extends from Oshawa through Toronto to St Catharine's, and contains approximately 22 per cent of the country's population! The provincial government adopted a growth plan for the region that aims to limit urban growth to defined areas within the region in an effort to increase density, decrease sprawl, improve transit connectivity, and protect valuable agricultural lands and forested areas.

The task: Using Google Earth, explore how the GGHR has expanded in area from its nucleus in Toronto, and observe the different types of urban form that characterize pre- and post-war growth using historical cartographic data from the US Geological Survey.

Step 1: Disable all layers of Google Earth except "Borders and Labels." Load the Chapter 12.kmz file. Enable the *map* layer. A topographic map of the GGHR region at a scale of 1:250,000 illustrates the extent of the urban areas in the region in 1952. These are displayed as orange-coloured areas on the map. Use the polygon tool (figure 1) in the Google Earth toolbar to trace the boundaries of the contiguous urban area of Toronto.

Figure 2: Polygon tool

- Question 1: What is the extent of the total contiguous urban land area of Toronto in 1952? (Hint: in the polygon window, click on the *measurement* tab to display area. NOTE: you must be using Google Earth Pro to obtain area measurements).

Step 2: Disable the *map* layers. Observe the extent of the contiguous urban area of the GGHR visible on Google Earth. Use the polygon tool in the Google Earth toolbar to trace the boundaries of the contiguous urban area of Toronto.

- Question 2: What is the extent of the total contiguous urban land area of Toronto today? (Hint 1: measure the boundaries that roughly correspond to the contiguous urban area of the GGHR, which extends east from Oshawa, north to Richmond Hill, and west to Hamilton, following the shoreline of Lake Ontario to the south. Hint 2: you will need to zoom in closely to note the visual differences between agricultural and urban land uses).

Step 3: Draw a 1 km^2 polygon of a residential area within the most northern part of the 1952 urban area boundary. Draw another 1 km^2 polygon of a residential area within the most northern part of the current urban area boundary.

- Question 3: Describe differences in urban residential form between the two areas—including street shape and width, housing style, size and type, signs of public transit availability, small scale retail, and any other differences you can observe within each polygon (Hint: you can use Google Street view to get a ground level-perspective of the area).

Exercise 3
Planning the Garden City at the Neighbourhood Scale

As your textbook notes, the chaotic, unregulated, and often dangerous nature of everyday life in nineteenth-century urban centres inspired the Garden City planning movement. Based on the premise of combining the amenities of urban life with the serenity of the natural environment, Garden City planners created several master plans for a new way to experience urban life. At a smaller scale, Clarence Perry, a New York City Planner, was a strong advocate of what he called the "Neighbourhood Unit" and developed a set of principles (figure 1) that planners could use to promote a sense of community amidst the chaos of modern urban life.

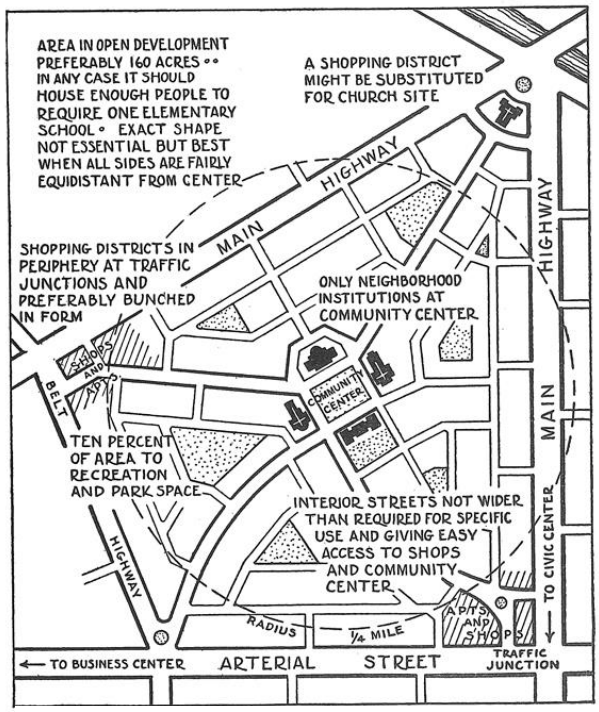

Figure 1: Clarence Perry's Neighborhood Unit Principles (Source: New York Regional Survey, Vol 7, 1929)

The task: Using Google Earth, examine how Perry's concept of the Neighbourhood Unit has been applied in an early post-war Canadian suburb, the Westmount Subdivision in Halifax, NS.

Step 1: Disable all layers of Google Earth except "Borders and Labels" and "roads." Load the Chapter12.2.kmz file.

- **Question 1:** Examine the neighbourhood within the polygon in relation to the surrounding urban environment north and north east of it. What key difference in street layout do you notice? How does this layout compare to Perry's design? What main highways and arterial streets serve as boundaries for the neighbourhood?

- **Question 2:** What is the total area of the neighbourhood? How does it compare to Perry's ideal of 160 acres? (Hint: to find the area of the polygon, click on the polygon in the sidebar and right-click [ctrl-click on Mac]. Select Properties [PC] or Get Info [Mac] at the bottom of the menu).

- **Question 3:** Using a combination of Google Earth and Google Street view, find some of the key elements found in Perry's Neighbourhood Unit Formula and note their location, such as a shopping centre; school(s), church(es); and park space.

Answers

Exercise 1

- Question 1: Toronto's network is highly fragmented, with efforts to introduce cycling routes throughout the city. There is no continuity of routes, most routes are not dedicated to bicycles, and the cycling routes are not aligned to the traffic flows as evident on the traffic layer. The situation is similar in New York City, though in New York there is a concerted effort to introduce continuous lanes on some of the major avenues in Manhattan. Amsterdam's network is one of the most developed in the world with numerous dedicated bike lanes and a cycling infrastructure that takes precedence over other forms traffic. Though transit data is not available for Amsterdam it is evident that cycling routes follow the same patterns as vehicular traffic. Portland is renowned in North America for its cycling infrastructure, but much of the network is composed of shared bike lanes, not dedicated routes as in Amsterdam. All cities have committed to developing increased cycling infrastructure, but Amsterdam remains far more advanced than the others.
- Question 2: Traffic congestion in Amsterdam is lower in comparison to the other cities. Portland's congestion is concentrated in the core, possibly as a result of lower density. New York's is distributed throughout the metropolitan area, but is most severe in Manhattan and on the bridges leading into it. Amsterdam, despite being a much larger city than Portland, has relatively light traffic, and most congestion is confined to the core. Toronto is unique in that it is congested throughout the city, including the inner suburbs and has severe congestion in areas outside the core.

Exercise 2

- Question 1: The total contiguous urban land area of Toronto in 1952 measures approximately 190km^2.
- Question 2: The total contiguous urban land area visible in Google Earth measures approximately 2250km^2.
- Question 3: While answers will vary depending on the area chosen some observable differences in the newer urban areas versus the older one might include larger and fewer homes, wider lots and streets, absence of nearby public transit and small scale retail.

Exercise 3

- Question 1: The main visual difference in the layout of the streets is a warped grid pattern rather than a straight grid. The pattern invokes the design elements of Perry's Neighbourhood Unit formula. The main highways and arterial roads bounding the neighbourhood are Highway 102 (Bayers Road); Connaught Avenue; Chebucto Road, and Mumford Road.
- Question 2: The area of the Westmount Subdivision is 0.46km^2, which is just under Perry's ideal of 0.64km^2 (or 160 acres).
- Question 3: Westmount subdivision contains most of the key elements of Perry's plan. These include:
  - two churches (a Roman Catholic church on the southern tip of the neighbourhood; and a Protestant Church on the northern tip)
  - two schools: one elementary and one junior high

- a large shopping centre on the southwest edge of the neighbourhood
- park space in the centre, northwest, southwest and southeast areas of the neighbourhood. A series of public paths also run in between the backs of each row of houses.