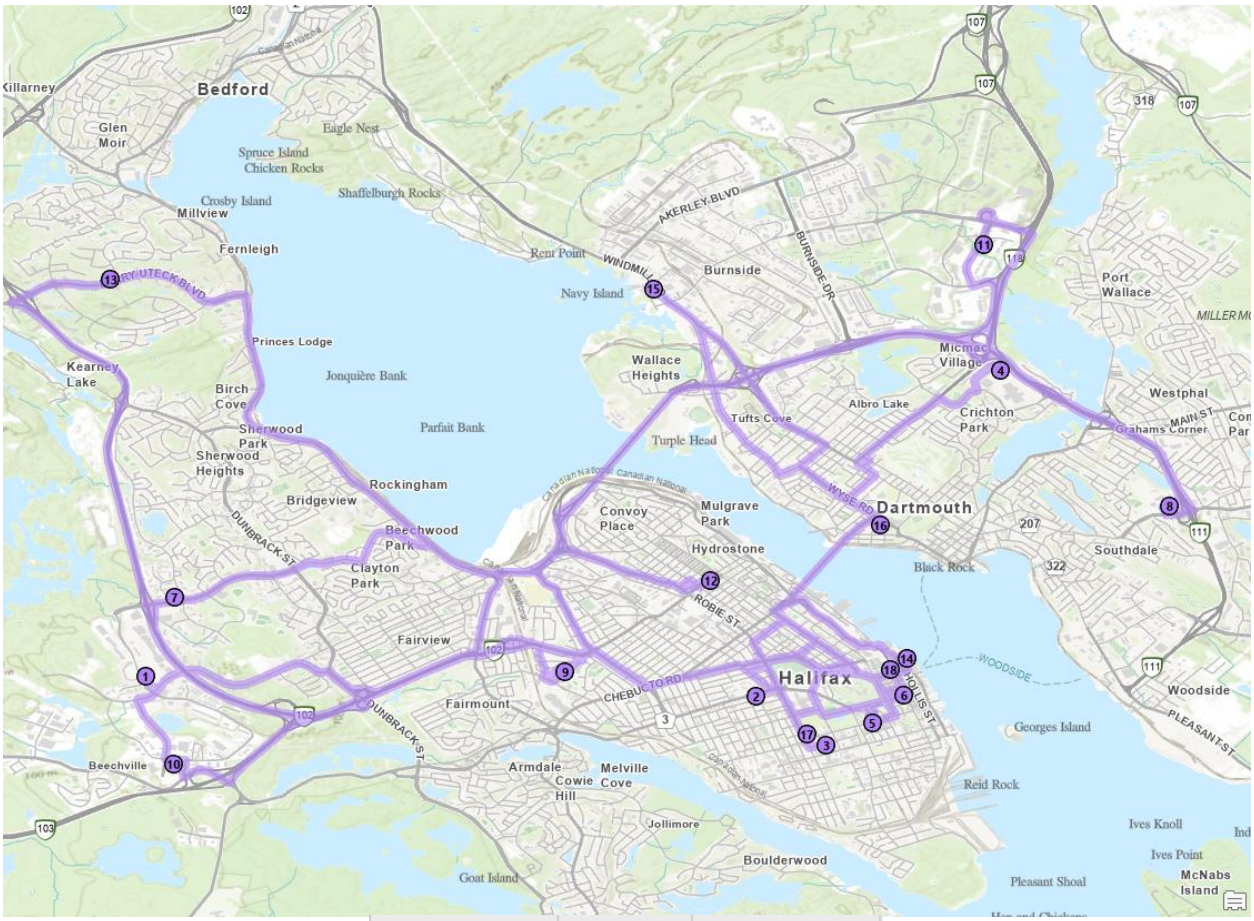
Project #3 – Location Analytics

Network Analysis: Finding Optimal Routes

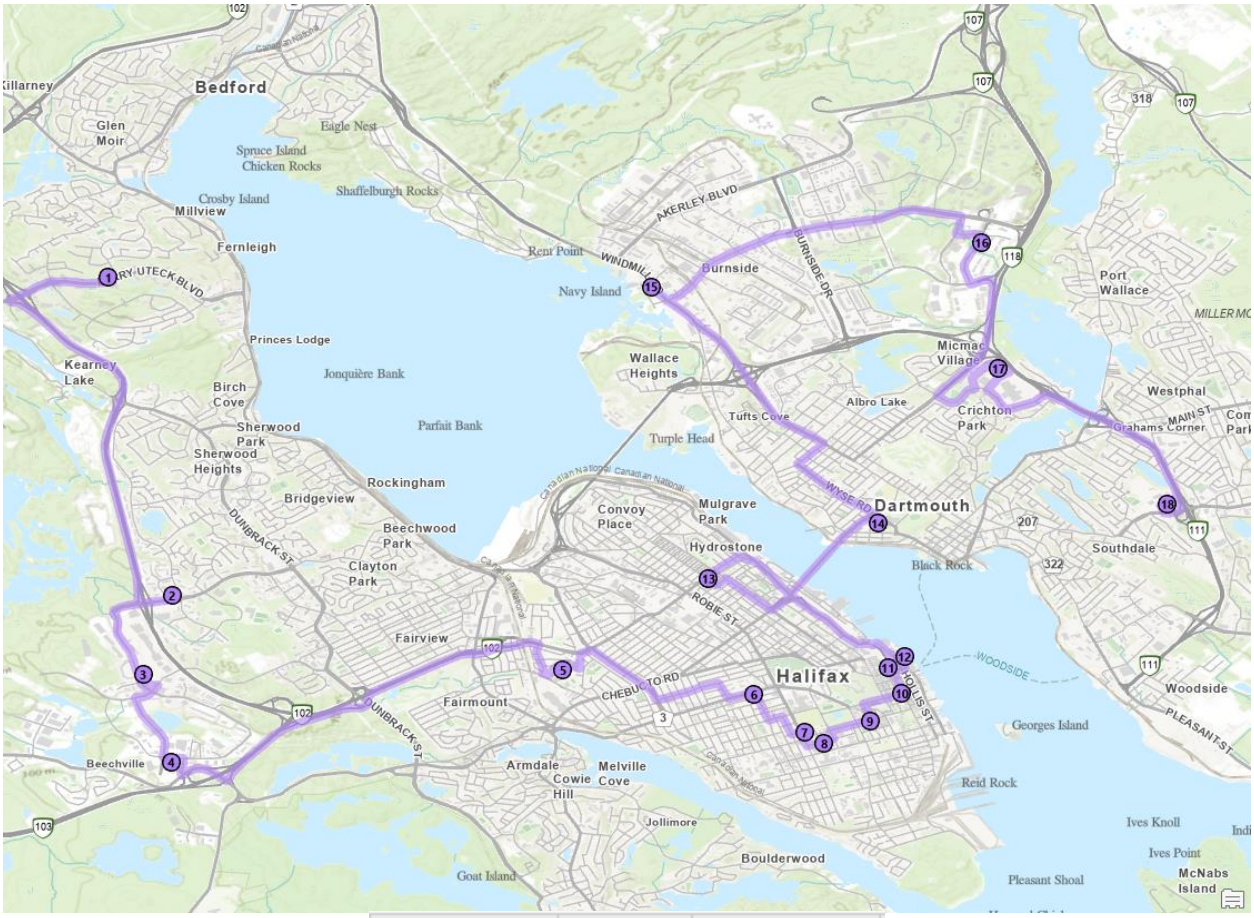
Run #1 –



Total_TravelTime	Total_Miles	Total_Kilometers
211.242135	<Null>	141.198561

The first run used no specific day of the week or time of day. The stop sequence used was the default sequence in which the stops were imported into the Network Analysis Route tool. This is an extremely suboptimal way to order the stops, as it does not take the stop location into account whatsoever. The time and distance results reflect this. The travel time for run #1 is over 3.5 hours long and has the driver travelling over 140 kilometres. The trip begins in Bayers Lake, then moves onto downtown Halifax for a few stops, then proceeds across the bridge to Dartmouth for a single stop, only to go right back over the bridge for more stops in downtown Halifax. The following stops are also in an inefficient order, leading to bad travel time and distance travelled.

Run #2 –



Total_TravelTime	Total_Miles	Total_Kilometers
84.879069	<Null>	46.38476

The second run used 7:30 AM on a Wednesday morning as the day of the week and time of day. This will hopefully simulate the early morning rush hour traffic experienced in the HRM during the work week. The stop sequence used for this run was the ‘Find Best’ option, which will find the most optimal stop sequence to minimize travel time/travel distance. This run should be the most optimized run of the three. The travel time for this run is almost 2.5 times faster than the first run, travelling just under 100 fewer kilometres. Looking closely at the route, it starts around the Kearney Lake area, then completes the three stops in around the Bayers Lake area. All of the stops in the Halifax Peninsula are then completed before crossing the MacDonald bridge and hitting the rest of the stops on the Dartmouth side.

Run #3 –

Total_TravelTime	Total_Miles	Total_Kilometers
118.020968	<Null>	94.176708

The third run used the same date and time settings as run #2, but the sequence preserved both the first and last stop from the initial stop import. Also, two barriers were erected for this run, one blocking the Macdonald bridge, the other blocking the MacKay bridge. For this run, the first stop had to be one of the Bayers Lake stops, and the final stop had to be one of the downtown Halifax stops, all of the stops in between were optimized. These constraints added an extra ~35 minutes of travel time, as well as an extra ~50 kilometres of travel distance. This makes sense as not being able to travel across the bridges is a huge hinderance on travelling between Halifax and Dartmouth. If the first stop was in Dartmouth, the added time and distance to complete the route would not be as exaggerated. However, because the first stop is in Bayers Lake, the necessary route completes all of the Bayers Lake and Kearney Lake stops before completing all of the Dartmouth stops. Then, instead of being able to cross the bridge to complete the Halifax stops, steps need to be retraced to then get to Halifax and complete the remaining stops on the route.