# Title Page:

Title: Examining the spatio-temporal dynamics of the presence, and purpose, of movement across the region of Montréal, Canada in 2016-2017. OR A space-time deconstruction of the travel patterns and the purpose of travel across the region of Montréal, Canada 2016-2017

# Abstract

* 300 words max

Movement of people across a given area still remains an area with a distinct lack of investigation and real metrics. This somewhat owes to difficulty in the handling of spatially and temporally reference data. Murray *et al.* (2012) suggests that the moment of people is spatial interaction between origin and destination. It is these two points that interrelate and, as such, the study of the purpose of the flow between these connections underpins our understanding of transport and behaviour of populations in a city. Theoretically, one can propose. The dataset forming the backbone of this report provides a look into the way that people move.

Which modes of transport people use for which activities around Montreal

This study serves as a spatio-temporal investigation into movement across Montréal and proposes a new methodology for understanding spatio-temporal information within network data.

Key Words: Networks, Machine Learning, Spatio-Temporal Insight

# Declaration

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# Introduction

* 1200 words
* demand for transport is a derived demand i.e. for people to do other things (Golledge & Gärling, 2001) -> thus important to study transport like this
* using the MTL trajet

First paragraphs:

* Movements can be similarly viewed as spatial interactions between an origin and destination.(Murray et al. 2012)
* ﻿Another reason is that goods are produced in one location, perhaps a factory or farm, then shipped to consumers at other locations. Of course, interaction could also be viewed as trade flows, as considered between towns, cites, regions, states, and countries. (Murray et al. 2012).
* ﻿Sometimes the movement patterns that result are understandable or explainable, like birds migrating south for the winter, but often times they are not obvious (Murray et al. 2012)
* Studying these geographical flows important

Other Ideas:

* Also an examination of where to people drive (and relation to parking spaces) -> this is flawed however as only subset
* Which modes are used for which activities
* big data allows for us to not only study the spatial and temporal interactions but also interactions of socio-economic factors [this is what this research aims to do] (Cheng *et al.*, 2017)
* Wireless portable devices are carried by humans, exhibit the same mobility behaviour of their human carriers and their movements (Jahromi *et al.*, 2016).
* ESSENTIAL: Smart City with interacting networks and GPS signals (Jahromi *et al.*, 2016)

Movement of people across a given area still remains an area with a distinct lack of investigation and real metrics. This somewhat owes to . Murray *et al.* (2012) suggests that the moment of people is spatial interaction between origin and destination. It is these two points that interrelate and, as such, the study of the purpose of the flow between these connections underpins our understanding of transport and behaviour of populations in a city. Theoretically, one can propose that different categories of movements have differing spatio-temporal profiles. Research carried out by Zhang & Cheng (2019) discover expected difference in the profiles of people travelling within London based on their employment status. In general, finding regularity in full-time transport patterns compared with those who are un-employed. While, this information is of use to transport authorities, there is still a lack of investigation into more of the local impacts of transport as well as the veracity. Indeed, the very same principles that ‘big data’ is defined by (i.e. Volume, Velocity, Veracity, Variety), so to is our understanding of transport.

WHICH MODES FOR WHICH ACTIVITIES

Big data measurement and influx has extended to the extent that it is real-time, which gives us a unique opportunity to study geographical phenomena (Goodchild, 2013)

Mathematical models being employed without regard of space, often including problems that are inhernetly tied to spatial considerations (O'Sullivan & Manson, 2015)

The MTL Trajet survey provides a unique insight into the

In Economic terms transport is a derived demand (Golledge & Gärling, 2001).

The dataset forming the backbone of this report provides a look into the way that people move.

This study also concerns itself with the modelling through classification on purpose of the movement. It is hoped, in combination with a spatio-temporal investigation, this analysis presented can infer something about movement at a higher scale within a city. Although, it must not be forgotten that this study primarily focusses in on Montréal and this may not be transferred to other cities (Ergodoic and Ecological Fallacy).

Montreal itself poses an interesting problem, and warrants further investigation

This project first examines the related literature and reviews the philosophy of the metrics introduced in 2. After this, in 3 detail is provided on the data

## Motivation: