

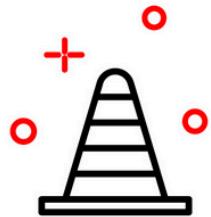
Topic:
Space-Time Classification of Routing
Data

Dataset

- Source: Montreal Open Data Portal ([data source](#))
- ‘The [MTL Trajet](#) application is one of the many measures put forward to better understand and facilitate travel in Montreal’

Column	Type	Description
id	Integer	Unique number of trip
mode	String	Travel mode
purpose	String	Reason for travelling
Start-Time	DateTime	–
End-Time	DateTime	–
Geometry	LineString	–

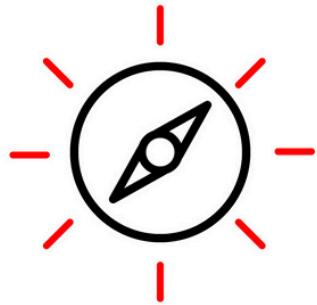
Data Background



Measure the impact of the work



Calculate travel times

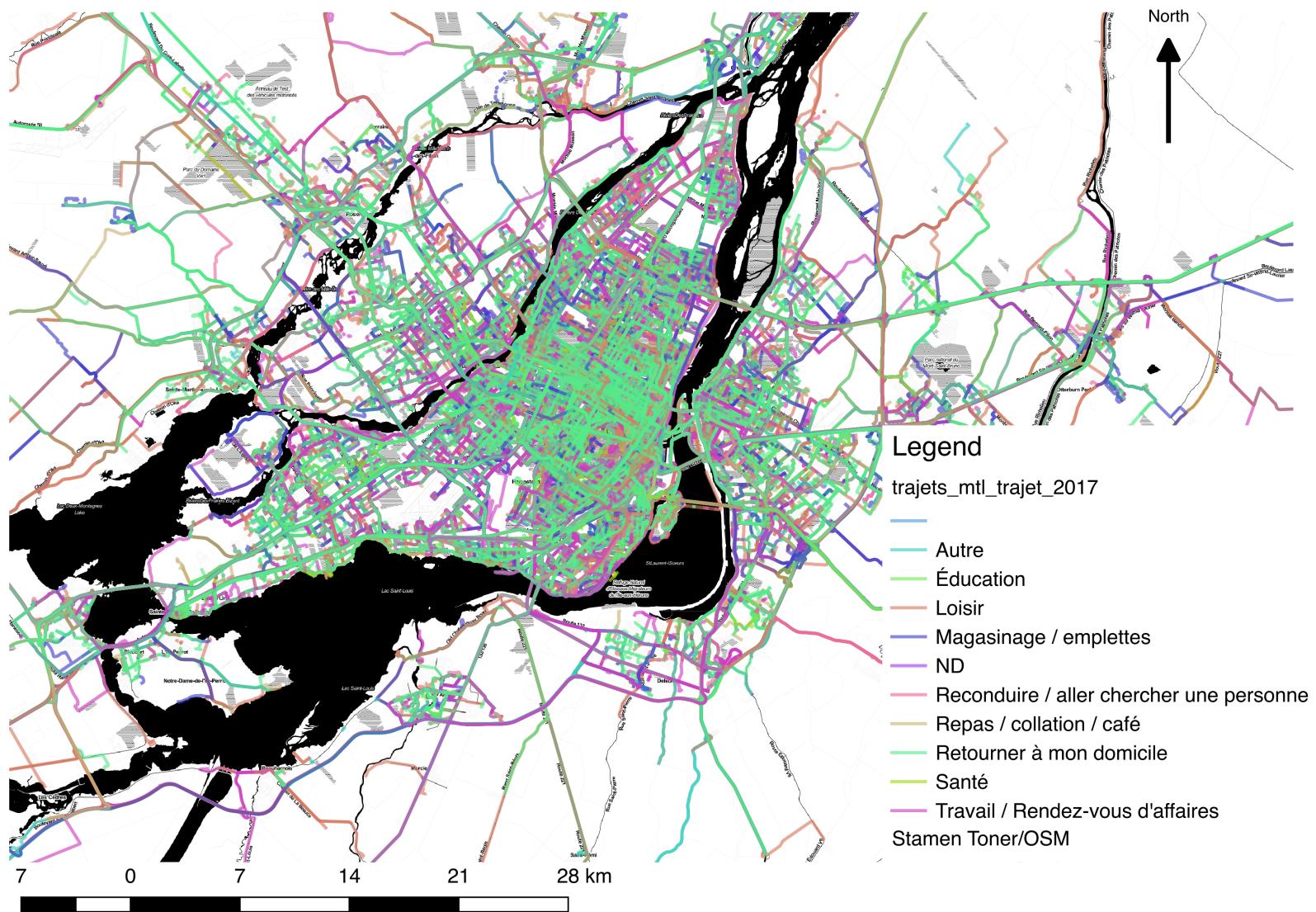


Plan detour paths



Coordinate traffic lights

[Image Source](#)



Purpose

- Investigate the space-time dynamics and patterns within travel (i.e. not only *who* travels *when* and *where*, but also *why*).
- Directionality of travel based on mode (i.e. where do people do certain activities within a city)

Analysis

Route Categorisation

- Space-Time Clustering (ST-DBSCAN)
- Route Similarity -> Haussdorf distance
- Work completed for Autotrip

Model(s)

Overview

- Long Short Term Memory model?

Problems:

- Incorporating space

Potential Solution:

- CNN LSTM (Yu *et al.*, 2017)

Background & Motivation

Zhang & Cheng (*in press*) – employment status from smart card data

- “[build a model that] incorporates learning temporal features in different travel modes”

Lassoued *et al.* (2018) – clustering of route similarity

Sources:

Lassoued, Y., Monteil, J., Gu, Y., & Russo, G. (2018). A Hidden Markov Model for Route and Destination Prediction, 1–19.

Yu, H., Wu, Z., Wang, S., Wang, Y., & Ma, X. (2017). Spatiotemporal Recurrent Convolutional Networks for Traffic Prediction in Transportation Networks, 1–16.

Zhang, Y., & Cheng, T. (n.d.). A Deep Learning Approach to Infer Employment Status of Passengers by Using Smart Card Data. *IEEE Transactions on Intelligent Transportation Systems*, PP, 1–13.