

INTELLIGENT LANE UTILIZATION (ILU) TO IMPROVE FREIGHT TRANSPORTATION MOBILITY

Soha Saiyed
Supervisor: Dr. Peter Park

9th July 2020

Department of Civil Engineering
Lassonde School of Engineering
York University

creative

passionate

rational

confident

ingenious

WHY FOCUS ON FREIGHT TRANSPORTATION?



OBJECTIVE

- Examine and justify the need of ILU Technique
- Improve the mobility of the selected corridors in the Greater Toronto and Hamilton area
- Quantitatively estimate the anticipated benefits of truck friendly measures using simulation

METHODOLOGY

- Review literatures related to ILU
- Develop a Micro-level simulation model (VISSIM Model)
- Develop a Macro-level simulation model (EMME Model)
- Evaluate network performance (e.g., potential travel time saving) and make recommendation for the most appropriate ILU

ILU TECHNIQUE

1. Truck Lane Restriction (TLR) ★
2. Truck Only Lanes (TOL) ★
3. Truck Only Toll (TOT)
4. High Occupancy Vehicle (HOV)

STUDY AREA

Derry Road



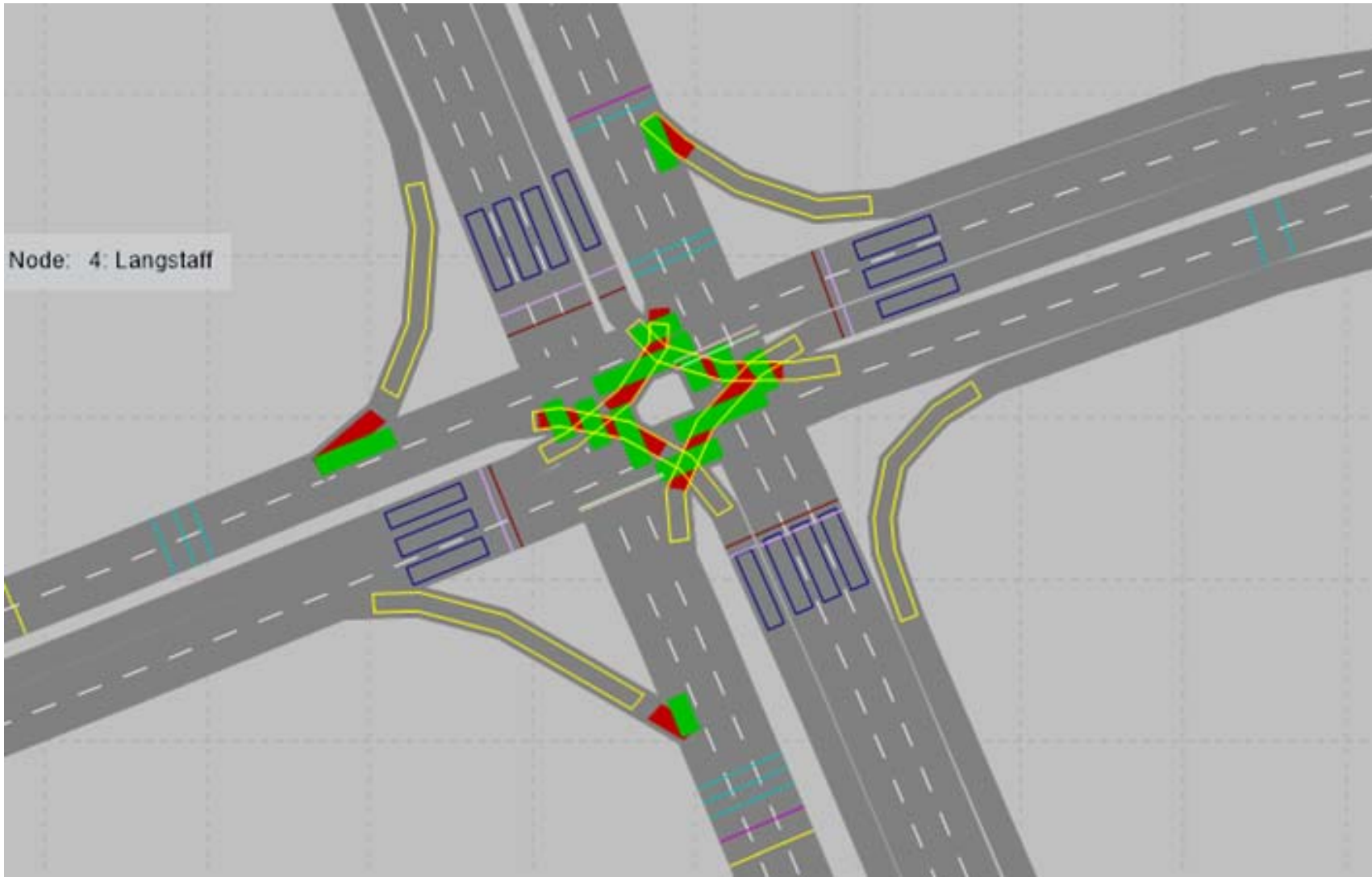
STUDY AREA

Highway 50

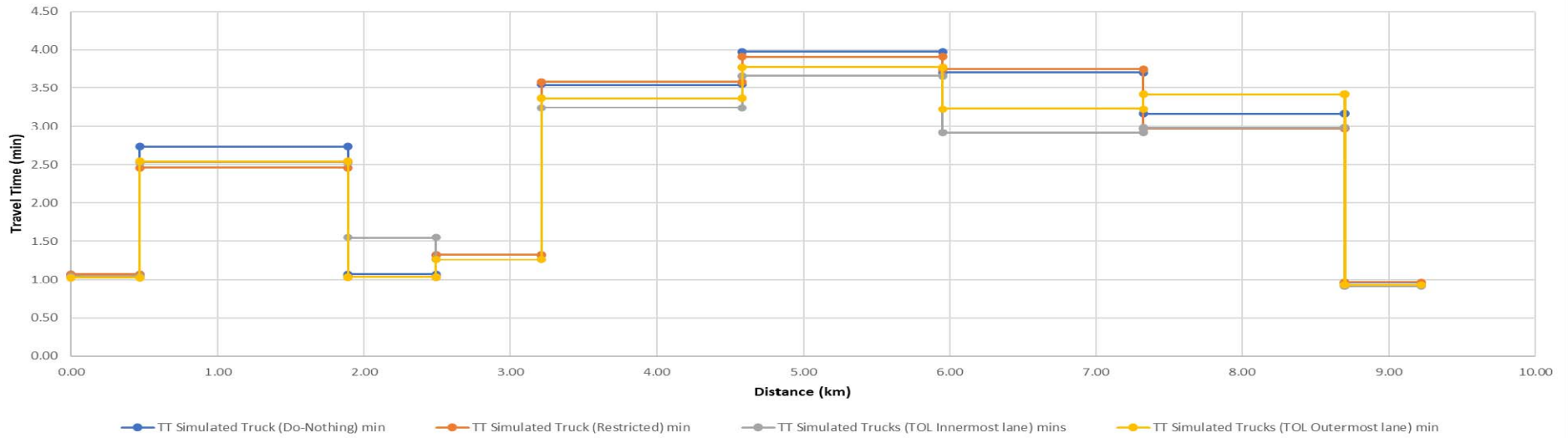


MICRO-SIMULATION ANALYSIS

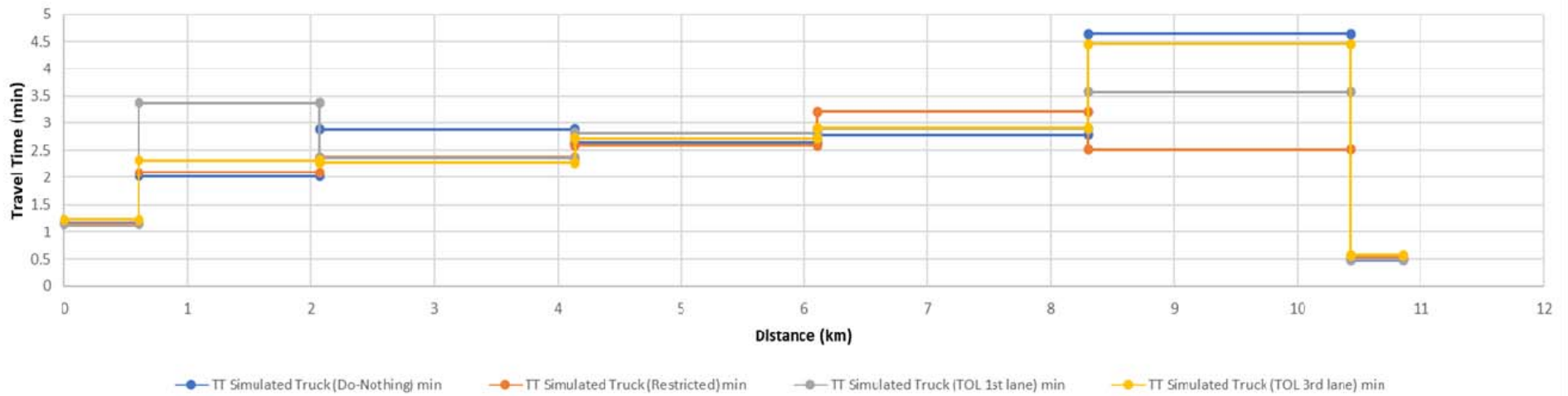
- Turning movement and Traffic Signal Data was provided by region of Peel.
- The model was calibrated to reflect the real-world situation using GEH Statistics.



WB Truck Travel Time

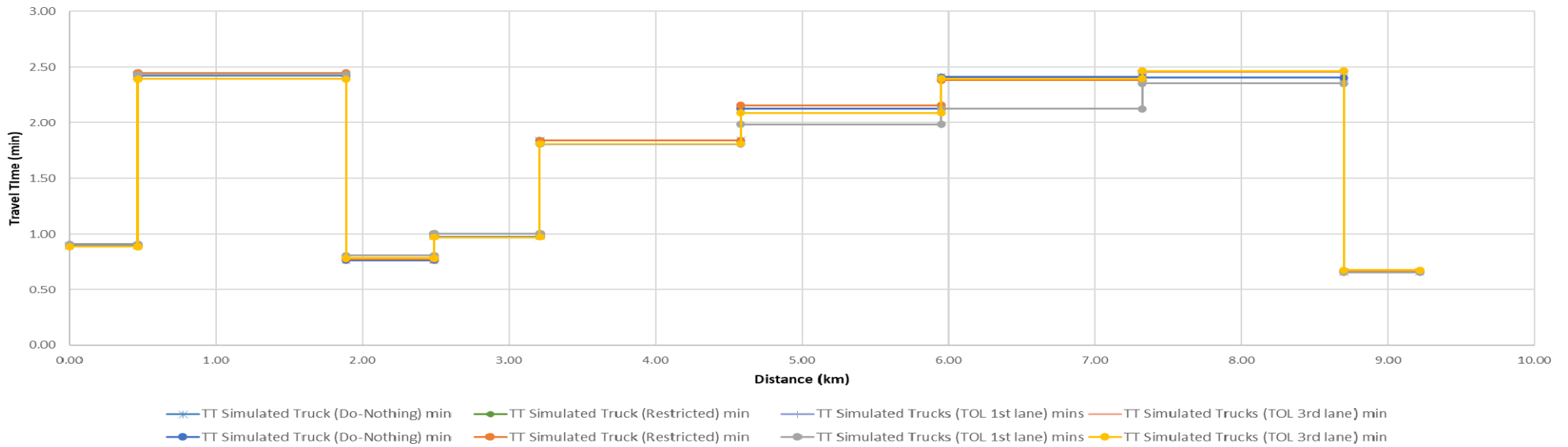


SB Truck Travel Time

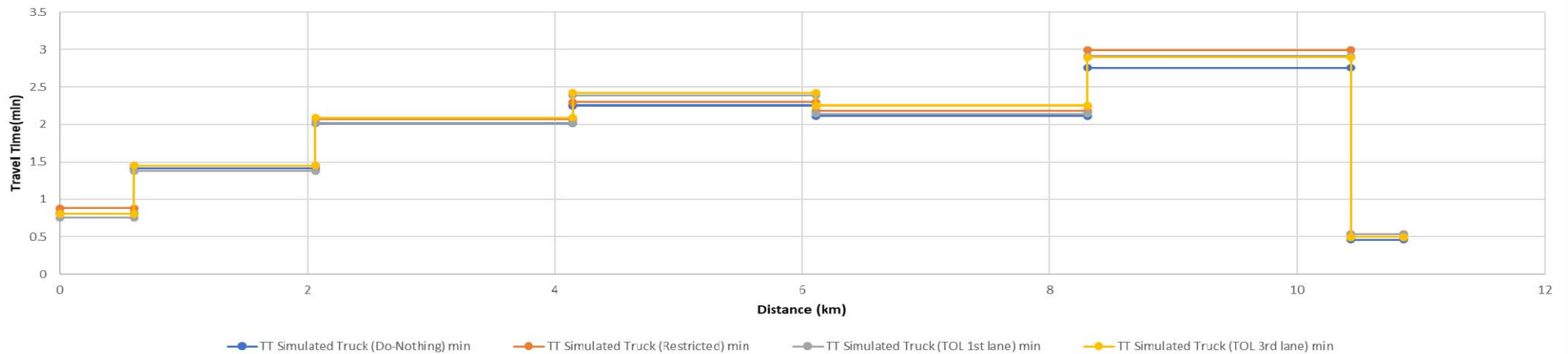


PM Micro-Simulation Result

Truck Travel Time



Truck Travel Time



Mid-day Microsimulation Result

MACRO-SIMULATION ANALYSIS

- Macrosimulation analysis was performed using EMME
- A four-step Passenger Vehicle (PV) model and a commercial vehicle (CV) model are provided by Region of Peel
- The CV model available is only for the PM peak hour data and there is no such Mid-day data available

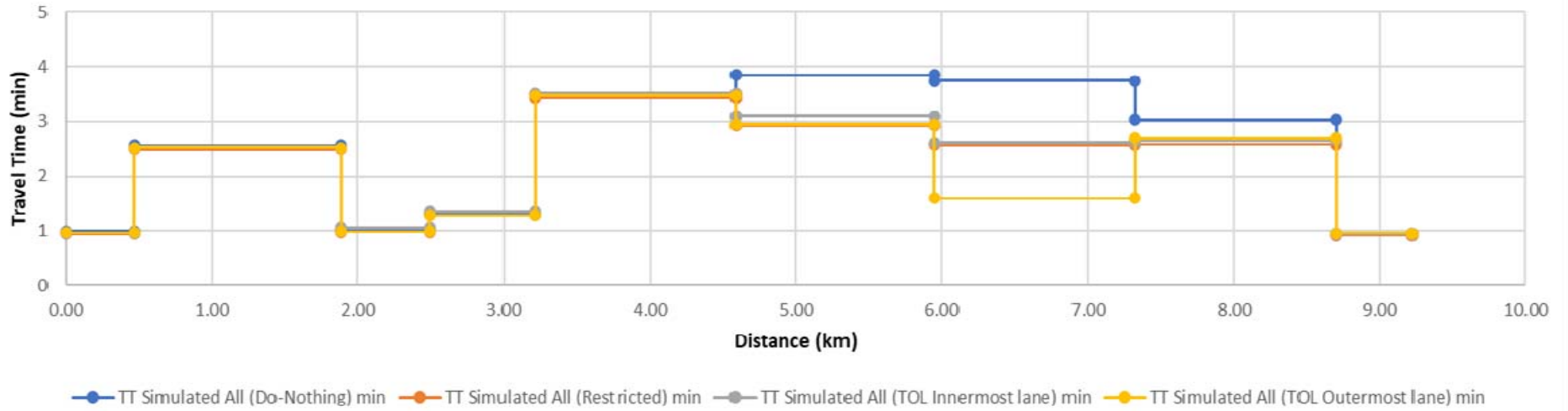
MACRO-SIMULATION ANALYSIS

- VISSIM model is for the year of 2016, whereas the EMME data provided is having model for Base Year 2011 and forecasted year 2031.
- Developed 2016 matrices using Linear Interpolation method.
- TOL scenario was developed to extract result (Traffic Volume).

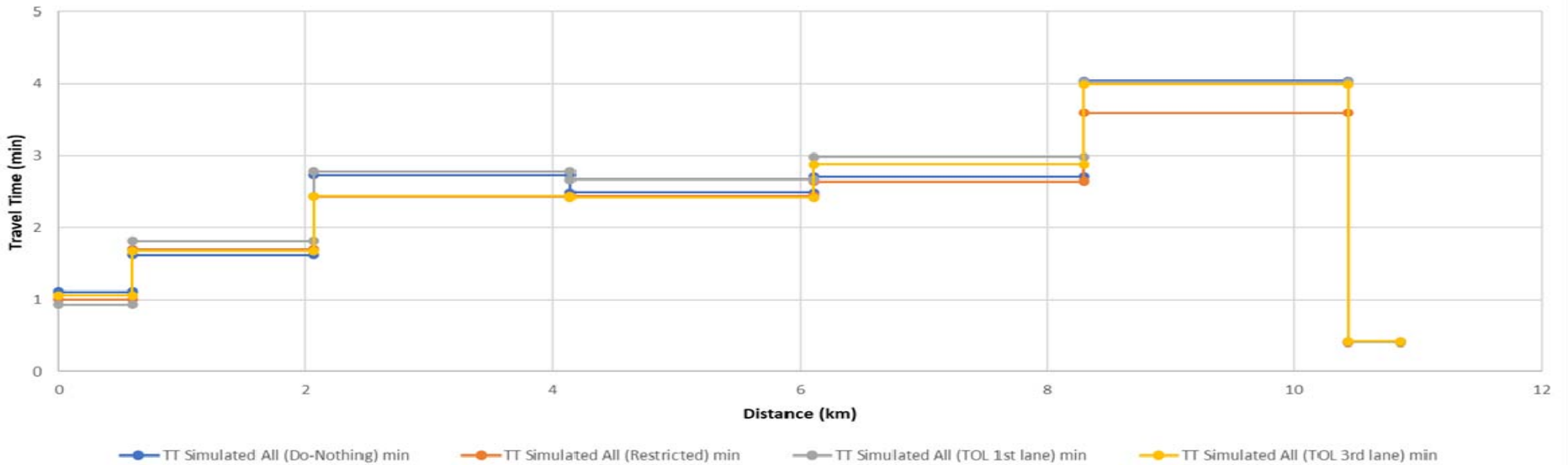
MICRO-SIMULATION ANALYSIS (STAGE 2)

- Result obtained from EMME was used as the input
- Changes were made in the VISSIM files for all the scenarios developed and simulation runs were performed.

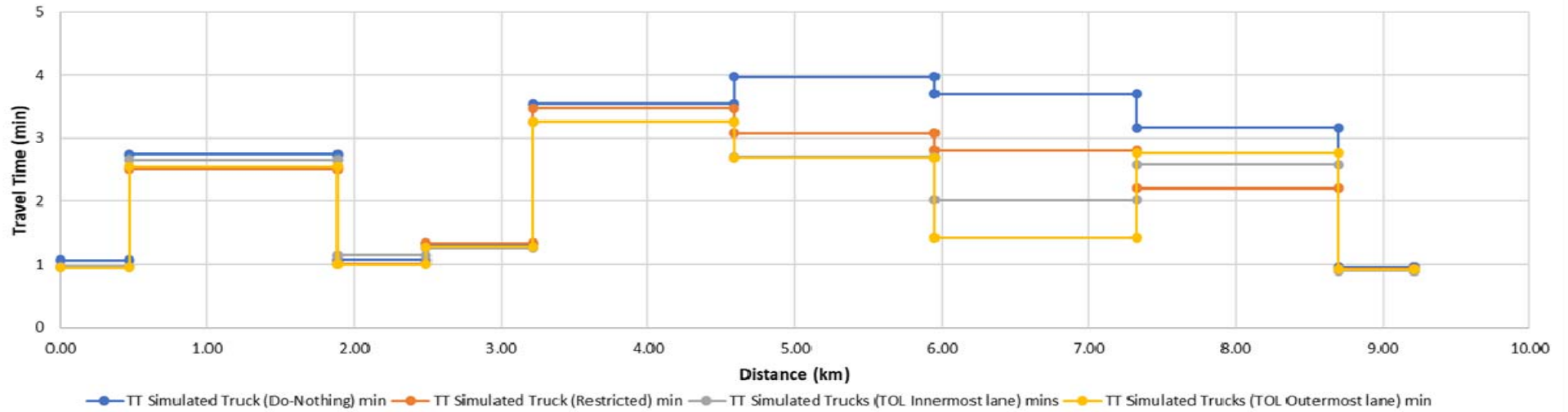
WB Travel Time All Vehicle



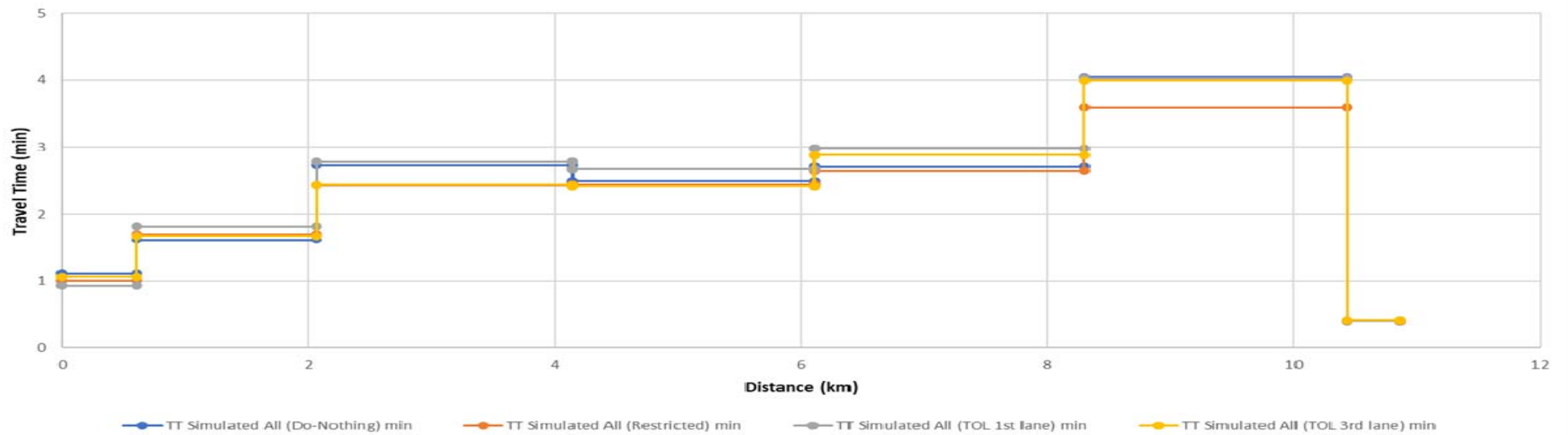
SB Travel Time All Vehicle



WB Travel Time Trucks



SB Travel Time All Vehicle



ACKNOWLEDGEMENT

A special Thanks to Region of Peel for providing the data and Smart Freight Center for Funding our Research.

Also a Special Thanks my Supervising Committee:

Dr. Park and Dr. Gingerich



Thank you

