Workshop | Traffic Simulations using SUMO

Conducted by

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Plan

- Introduction to traffic simulations
- Check Installation
- Quick simulation: Ready, Set, Go!
- Know the basics
- Real world scenario

Introduction

During the Paris 2024 Olympic Games:

39

competition sites

10+ million

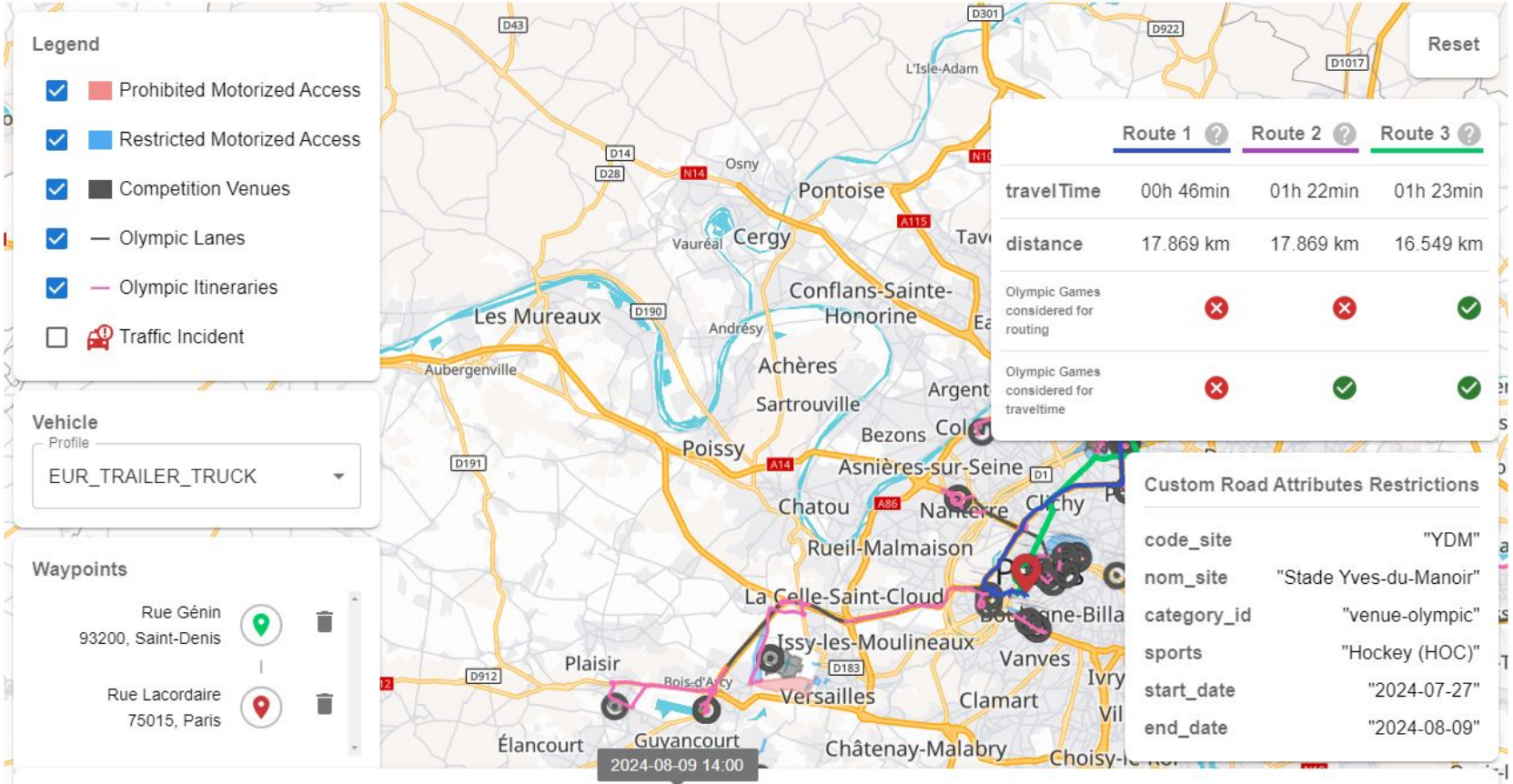
visitors

>185 kilometers

of reserved roads or lanes

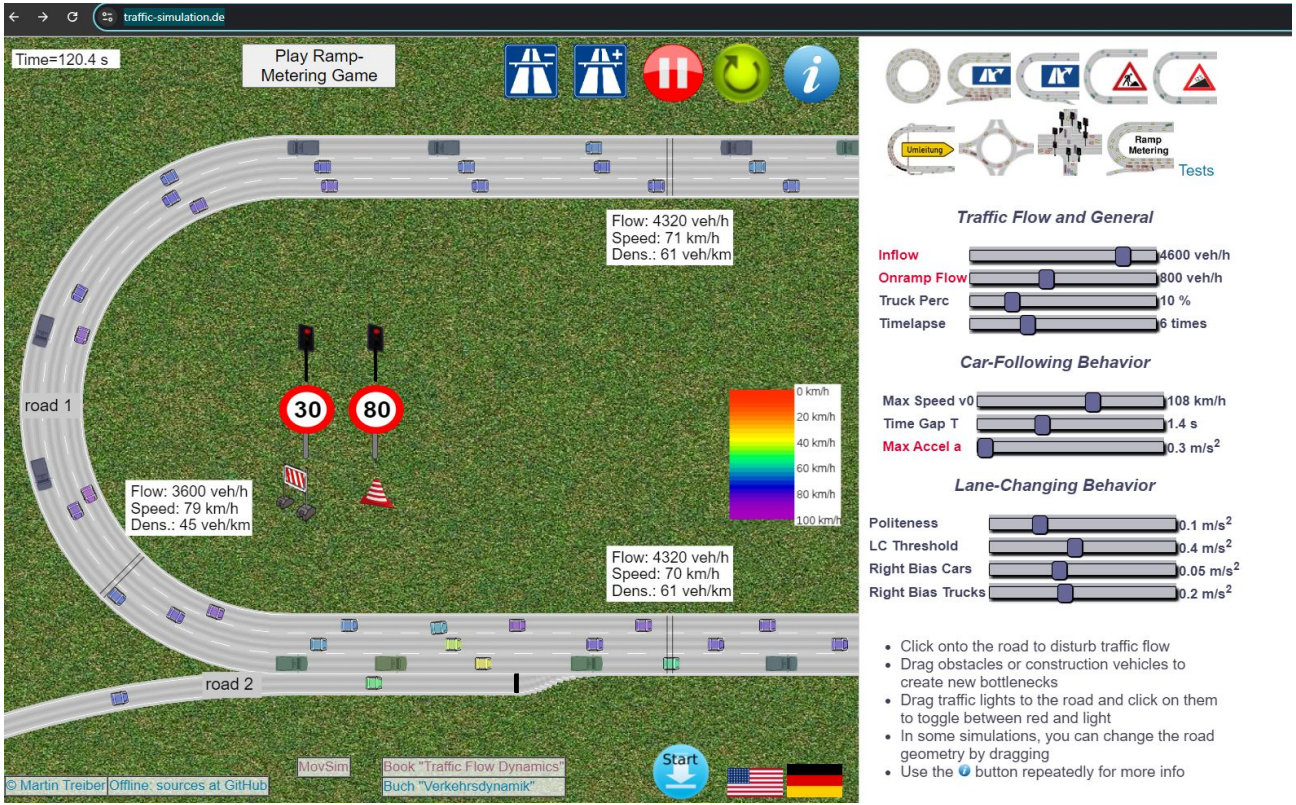
PTV Logistics free 2024 Olympic Games route simulator

Based on the developer components in PTV Developer, you can now calculate, simulate, and visualize these temporary restrictions on the map and check whether they may affect your routes. In addition, the simulator dynamically calculates the best scenarios and alternative routes that avoid roads with reserved lanes. Just enter your start point and the stops!



Link

Give It a Go!



Link

Introduction

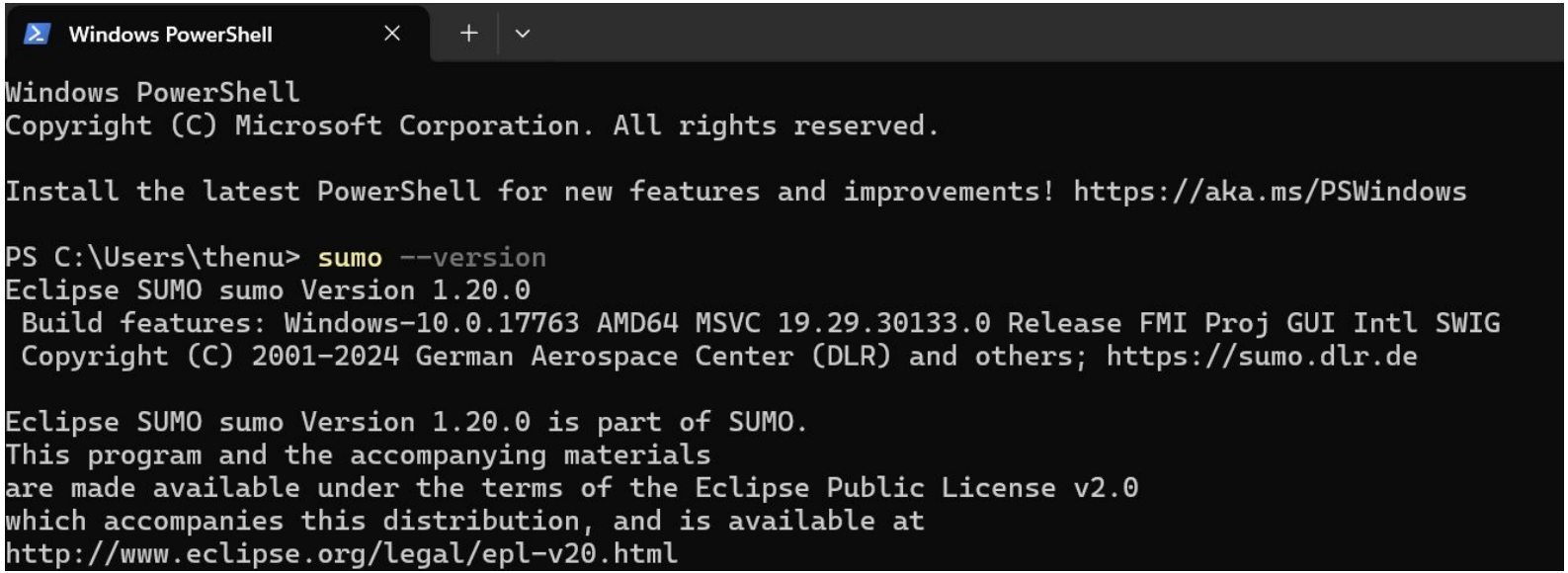
- **Why?**
  - Test behavior of a new system prior to its actual implementation
- **When to use?**
  - The problem statement is more complex to solve by using an analytical approach
- **Use cases**
  - Model existing systems
  - Estimate the impact of a future scenario
  - Simulate processes that are difficult / costly to implement
  - Try out large number of possible options before choosing the best

Introduction

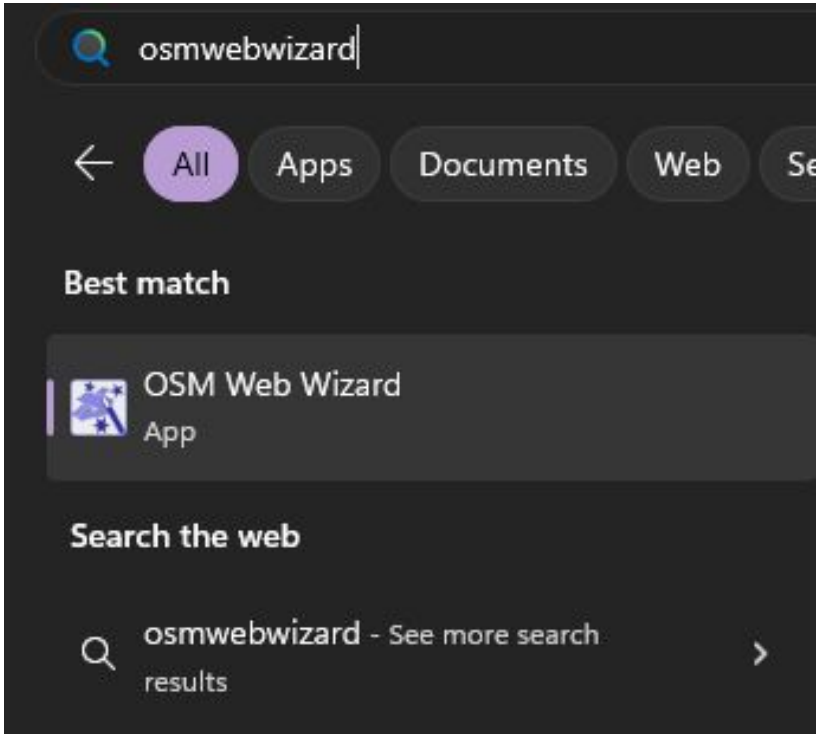
- **Advantages**
  - No risk - Trial and error approach
  - Test hypothetical scenarios
  - Cost effective
- **Disadvantages**
  - Time consuming
    - Data collection, preparation
    - Model development
    - Calibration

Check Installation

- Install Python 3.x
- Install SUMO



Quick simulation: Ready, Set, Go!



SUMO
SIMULATION OF URBAN MOBILITY

Let’s focus on SUMO now

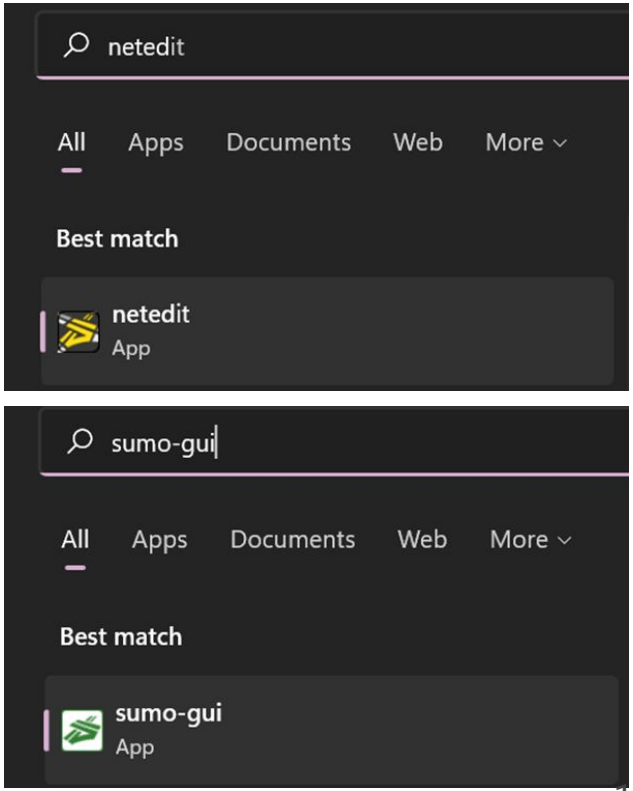
What is SUMO?

- **S**imulation of **U**rban **Mo**bility
- Open source (since 2001)
- Developed by Institute of Transportation Systems at German Aerospace Center (DLR)

Understand Available Tools with SUMO

- **Netedit** - Network Editor
- **SUMO GUI** - Visualize your Simulations

- **File Types**
  - **.net.xml** - describes the traffic-related part of a map, the roads and intersections the simulated vehicles run along or across
  - **.rou.xml** - define vehicle types, vehicle demand, routes etc.
  - **.add.xml** - Additional files
  - .**sumocfg** - Configuration file (combines everything together)



SUMO
SIMULATION OF URBAN MOBILITY

<Hello World/>

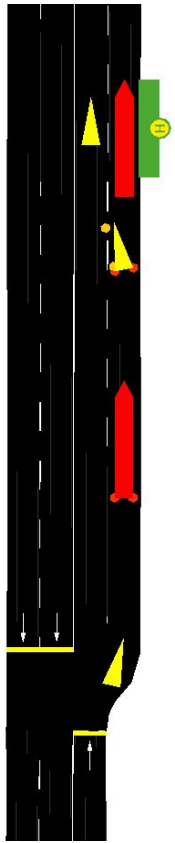
...

Know the basics

Guide/0_know_the_basics

Instructions

- **.net.xml**
  - Create an intersection
  - Increase the lane count
  - Add traffic signals to the intersection
- **.rou.xml**
  - Define a vehicle type named ‘car’
  - Create a route
  - Create a car flow
- **.add.xml**
  - Add a bus stop
  - Add a bus trip
  - Add a bus flow
- Combine everything to a **.sumocfg** file
- Run the simulation



Introduction to Work with Command Line

- Often, a great tool when you are working heavily with SUMO
- Helps to
  - Open files
  - Run SUMO related scripts
  - Run simulation without GUI

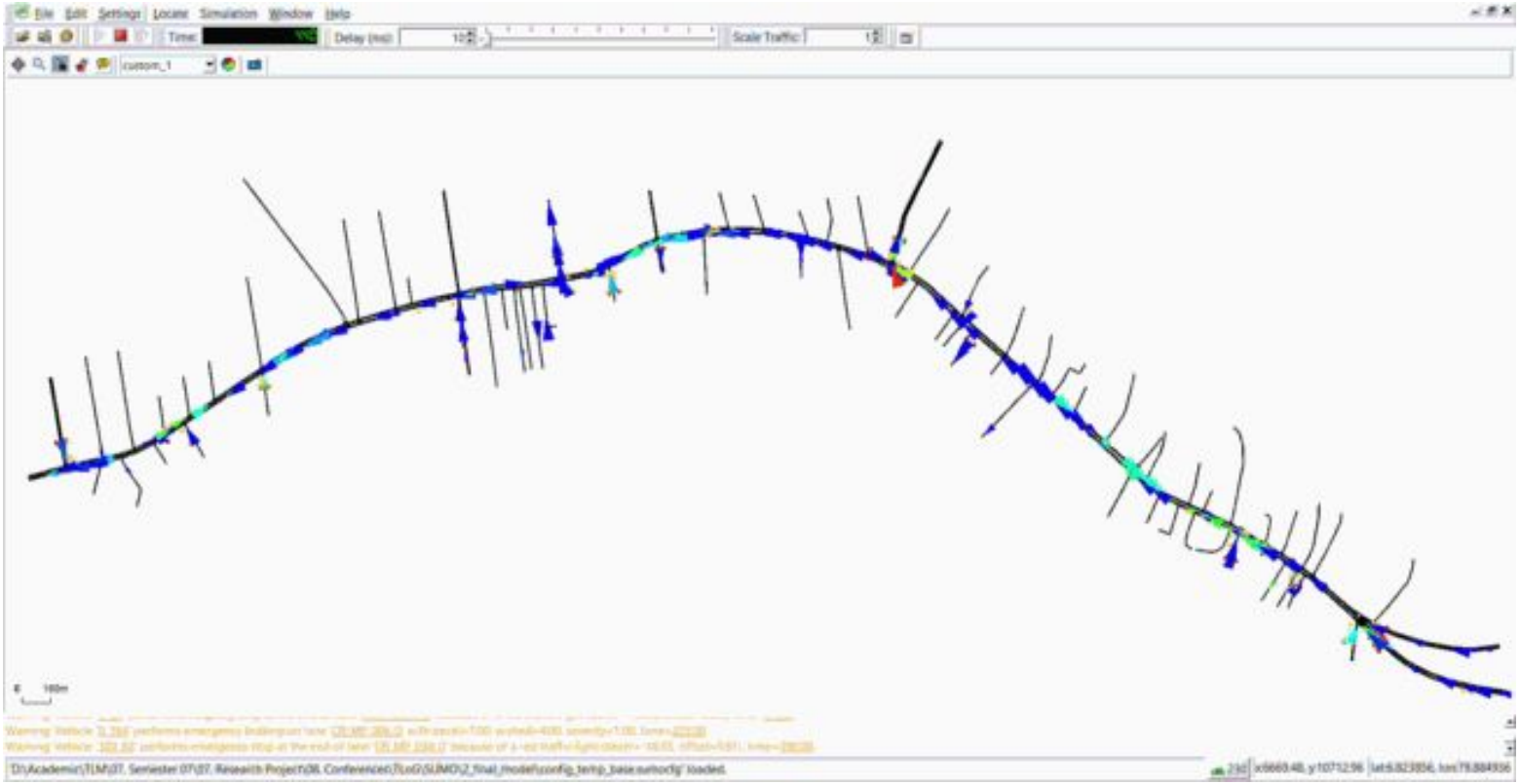
SUMO
SIMULATION OF URBAN MOBILITY

<Hello Colombo/>

Real world scenario

Guide/1_real_world_simulation

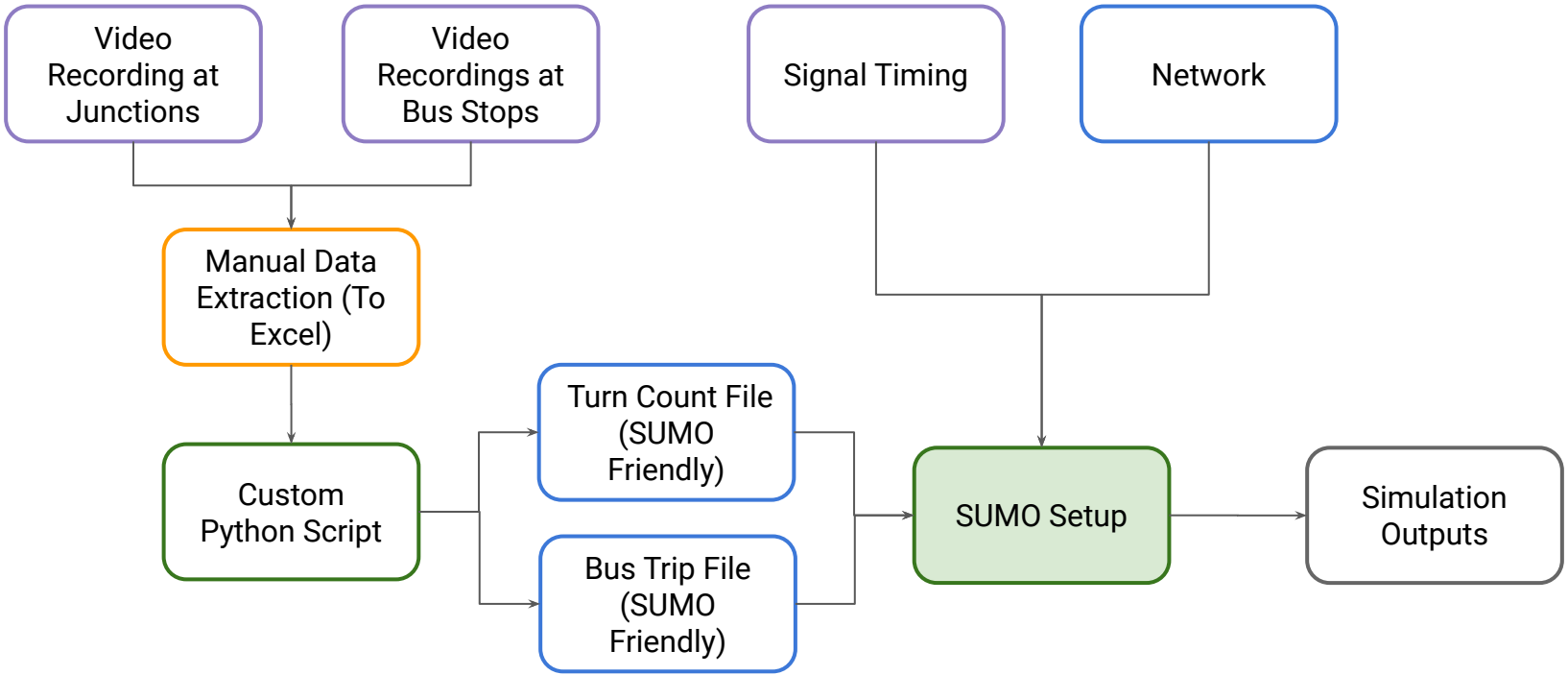
Real World Scenario



Case Study - Cross Junction to Maliban Junction

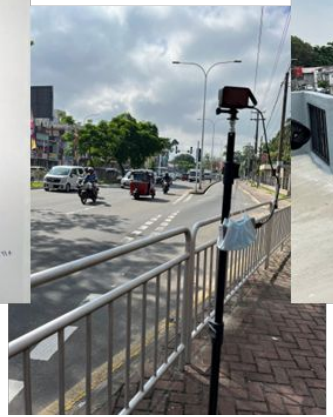
- **Aspects to look at**
  - Network
  - Accuracy of the vehicle counts
    - General vehicles (Count by `time interval`, `location`, `movement type`, `vehicle type`)
    - Busses (`bus route`, `bus type`, `bus stop`, `stop duration`)
  - Signal timing

Case Study - Our Approach

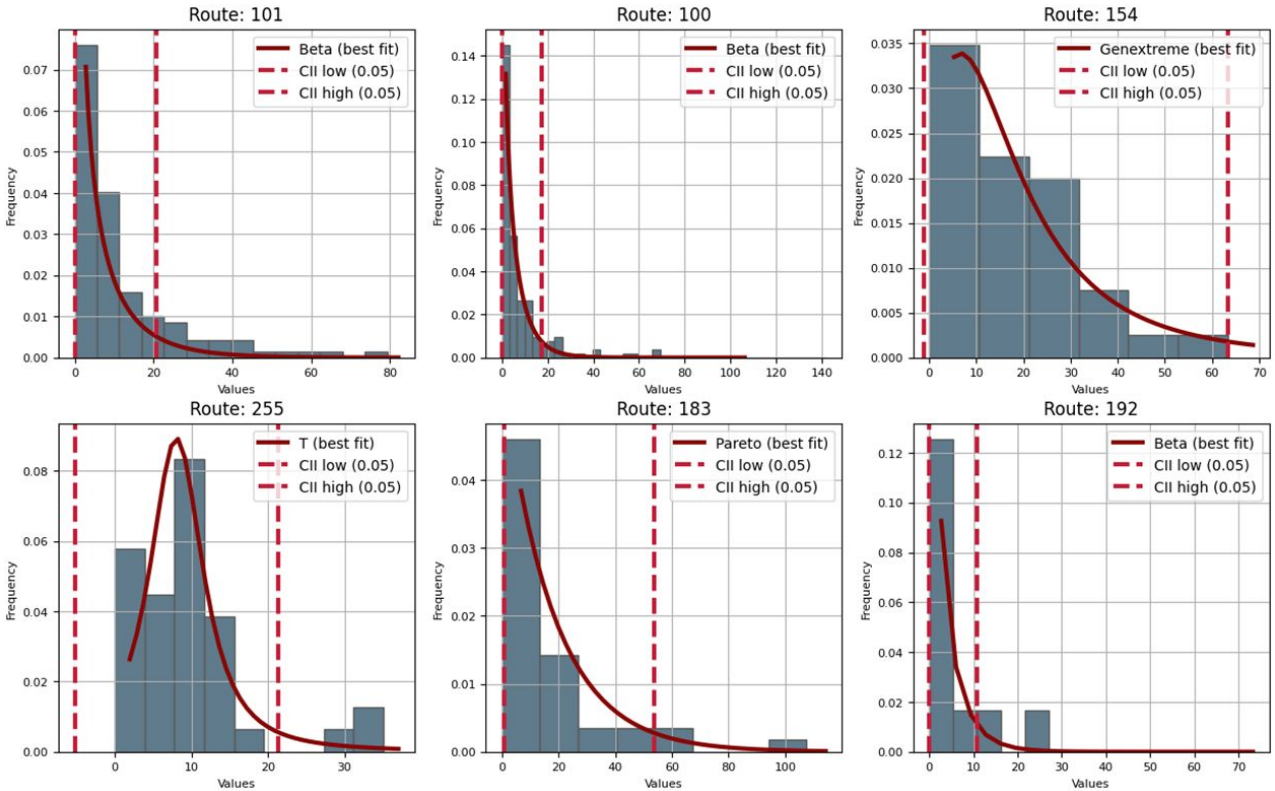


Case Study - Data Collection


University of Moratuwa
Department of Transport Management & Logistics Engineering
(TML)), Moratuwa, Sri Lanka



Case Study - Realistic Bus Trips



This figure shows the distribution of bus dwell times for each bus route

Q&A

Contact us

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Could be an issue