

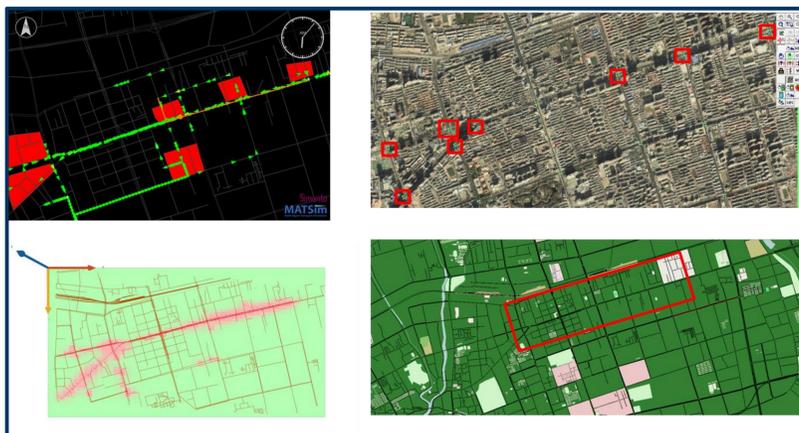
## Introduction

- This project aims to address the issue of increasing congestion in the main urban area caused by large-scale transportation infrastructure construction as the urbanization process accelerates.
- In the case of high-density traffic flow, traditional traffic data statistical analysis methods, can no longer meet the demand for traffic analysis.
- Drones for traffic data statistics, based on an aerial bird's-eye view, no offset, and error-free complete statistics of urban road shooting section of all data, while greatly reducing cost consumption.
- A multi-dimensional simulation model is established for the recreate the UAV captured scenarios in the central urban area of Hohhot.

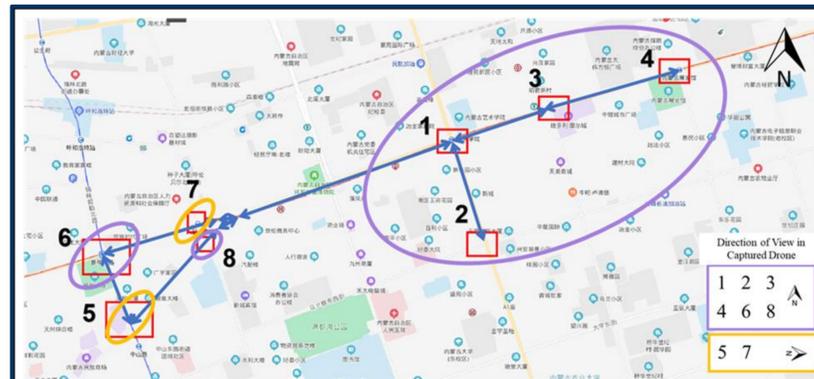
## Research Framework

- The multidimensional data will be tested and explored in the simulation platform in order to investigate the congestion problem in Hohhot's central city, as well as motor vehicle driving characteristics, non-motor vehicle driving behavior, and other aspects of research and exploration, and to provide optimization solutions for data-driven intelligent traffic control and management.
- Deep Learning is used for the vehicle detection and tracking.
- Smart phones, Gyroscope and GPS Sensor are used for non-motor vehicle data collection.

## Multi-resolution Simulation Model



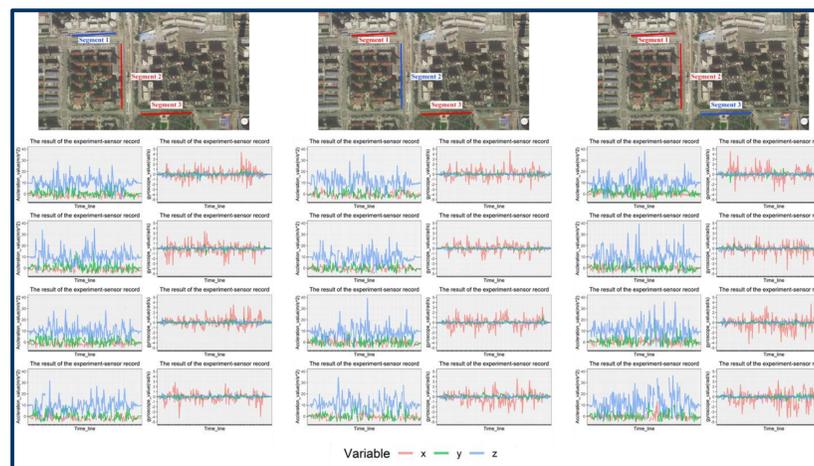
## Data Collection and Visualization



Specifications for Videos Captured in 8 Intersections and LC Situation in Sample Video

Record Order	Target Intersections	Time Period And Date	Number of Captured Video and Total Length	Length of the Represent Video (min)	STRLC Number	ALC Number	
A	1	17:30-18:45 PM	19min 4	7:30 (4:47+2:43)	122	40	Left-Right View Right-Left View
		2021-03-03(Wed)			128	32	
B	2	19:00-19:30 PM	15min 2	7:07	108	38	
		2021-03-03(Wed)			113	18	
C	3	17:30-18:45 PM	28min 2	13:51	57	25	
		2021-03-08(Mon)			61	17	
D	4	18:55-19:10 PM	21min 2	13:51	51	13	
		2021-03-08(Mon)			64	14	
E	5	17:50-18:25 PM	28min 2	13:51	137	13	
		2021-03-12(Fri)			137	8	
F	6	18:50-19:35 PM	28min 2	13:52	96	7	
		2021-03-12(Fri)			103	11	
G	7	17:50-18:30 PM	19min 2	13:52	131	11	
		2021-03-17(Wed)			166	13	
H	8	18:35-19:30 PM	28min 2	13:52	295	5	
		2021-03-17(Wed)			304	7	

Traffic Flow and Lane Change DATA Collection



E-bike Sensor Data Collection Results

## Acknowledgement

The contents of this paper reflect views of the authors who are responsible for the facts and accuracy of the data presented herein. The contents of the paper do not necessarily reflect the official views or policies of the agencies.

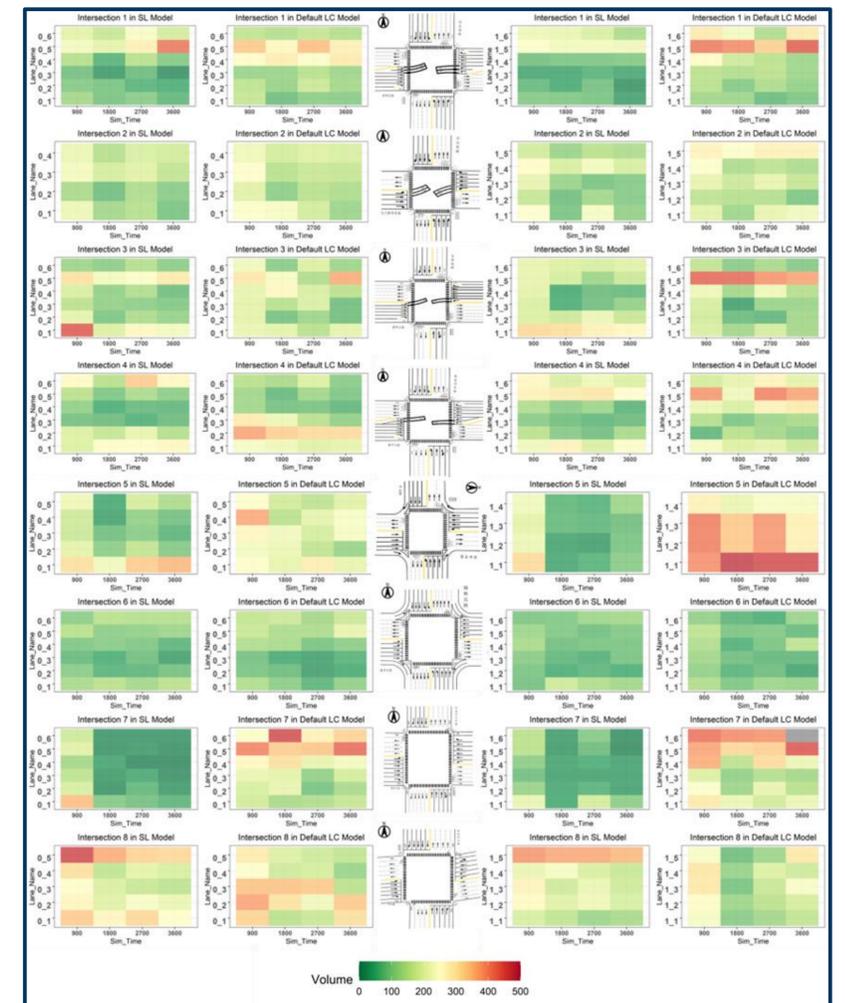
## Case Study



UAV Detection Results



Calibrated Result for the Traffic Flow in SUMO



Volume Comparison Between Aggressive Lane Change and Default Lane Change

- The UAV data is used to model and evaluate roads and intersections, as well as predict flow under ideal conditions in order to establish a multi-scale simulation evaluation and prediction mechanism and achieve complementary calibration of realistic and ideal situation data.