Research Notes

DRISI
CALTRANS DIVISION OF RESEARCH, INNOVATION AND SYSTEM INFORMATION
TRANSFORMING IDEAS INTO SOLUTIONS

Planning, Policy & Programming

Validation of Freight Volume Modeling on Major Highway Links

Develop a method for generating freight (truck) volumes

NOVEMBER 2023

Project Title:
Validation of Freight Volume Modeling on Major Highway Links

Task Number: 3457

Start Date: July 1, 2023

Completion Date: June 30, 2024

Task Manager:
Frank Law
Project Manager
frank.law@dot.ca.gov

WHAT IS THE NEED?

One of the most challenging problems in urban transportation planning is the lack of fine grain data on freight movements.

WHAT ARE WE DOING?

The research seeks to develop a method for generating freight (truck) volume and origin-destination estimations at the traffic analysis zone level from streamed data so that estimations can be constantly updated.

The experiments focus on state highways in the vicinity of the ports of Los Angeles and Long Beach, so it's relevant to both ship to truck freight distribution (Livability and Economy) as well as maintenance of pavement that is heavily travelled by trucks (System Performance). The methods include developing Closed-Circuit Television (CCTV) camera video analytics, freight simulation tool and freight volume estimation algorithms.

The approach for this research is comprised of five tasks below:

Task 1: Freight sensing dataset

Task 2: CCTV modeling and validation

Task 3: Freight modeling

Task 4: Freight simulation tool and validation

Task 5: Final report, modeling tool packages and demonstrations

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WHAT IS OUR GOAL?

The research seeks to develop a new method for generating freight (truck) volume and origin-destination estimations at the traffic analysis zone level from streamed data so that estimations can be constantly updated. As a result, this method could provide fine grain data on freight movements for urban transportation planning and freight planning. In addition, this research would develop simulation tools and dashboards to allow to test freight volume estimation under varying scenarios.

WHAT IS THE BENEFIT?

The method developed by this research could enhance Caltrans freight modeling effort. In addition, it has the potential of providing fine grain data on freight movements for transportation planning and freight planning. Also, the simulation tool developed by this research should be accessible to Caltrans and provide support for envisioned planning use cases.

WHAT IS THE PROGRESS TO DATE?

The research task was executed on June 27, 2023. Project kickoff meeting was held on August 10. The following was accomplished during July 1-September 30, 2023:

- Contacted and worked with Caltrans District 7 to coordinate the acquisition of CCTV videos, Weight-in-motion stations (WIM) data
- Contacted and working with University of California at Irvine to obtain TAMS and possibly LiDAR data
- Contacting Port of Long Beach (POLA) and Port of Los Angeles (POLAB) for Radio Frequency Identification (RFID) data
- Submitted paper on August 15, 2023, on truck detection and counting using CCTV cameras
- Continuing research on CCTV truck detection and flow estimation

During this first period, we seek to collect a dataset of truck data over an extended region around the ports of Los Angeles and Long Beach. For this we have identified Caltrans District 7 groups that can provide us with the data. This includes:

- CCTV cameras: we have provided camera identifiers for 20 CCTV cameras located on major highways
- WIM data