BIG DATA FOR TRAFFIC SAFETY PERFORMANCE EVALUATION
Development of an On-Line Scalable Approach for Identifying Secondary Crashes

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Motivation

- Traffic accidents cause delays & secondary crashes
- Secondary crashes reduce more operational & safety issues
- Modeling the risk of secondary crashes is a high challenge
- Identification of secondary crashes is very limited

Objectives

- Discuss the issues of existing approaches for secondary crash identification
- Improve the virtual sensor-based traffic data collection methodology
- Improve the identification algorithms based on traditional sensor data
- Develop an on-line scalable approach for automatically identifying procedures
- Provide easily deployable identification tool for large-scale networks

Framework

- Potential Data Sources:
  - Google Map
  - Google Map
  - Traffic Sensors
  - Traffic Sensors

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Virtual Sensor

- A virtual sensor is a user-defined sensor that can coordinate traffic information & be accepted by 80%

Data Validation

- Virtual sensor output need to capture actual traffic & measuring congestion
- Virtual sensor output need to capture actual incident & traffic
- Virtual sensor output needs to match traditional traffic sensors

Challenges

- Does the facility have a virtual sensor?
- What if there is no special event?
- What if there is no specific event?

Conclusions & Discussion

- Traditional approaches for secondary crash identification are largely based on traffic sensors
- A virtual sensor approach is proposed to identify the third party opens sensor traffic data

Development of an On-Line Scalable Approach for Identifying Secondary Crashes

Demos: virtual sensor vs detector

What if a simple approach is used?

- Crash C is NOT identified as a secondary crash of crash A
- Crash B is identified as a secondary crash of crash A

Prescription of Queue

- Early progression of a queue
- Sensor one reading segment is checked
- Maximum sensor one is checked & failure detection
- The travel time is interpreted.

Queue can exist even incident is cleared

Gradual clearances

- Actual impact exceeded Threshold 1
- Actual impact with Threshold 2

Presence of Impact

Objectives: early long term & space

Smaller virtual sensor vs defacto

The time delay between two virtual sensors is measured

No standard criteria to establish the fixed thresholds

No hierarchical algorithms are low reliable

Sensitivity: What are the internal algorithms?

Static vs dynamic

- Static sensor data is acceptable in connecting the traffic information aggregates
- Virtual sensor output needs to capture the actual impact of each incident

Improvement of Identification Algorithm

- Detect the location of two segments
- Detect the location of speed sensors
- Check the speed of each sensor

Presence of Impact

- The identification of a secondary crash
- The traffic sensors are not available.

Queue can exist even incident is cleared

Challenges

- How far the difference?
- How far the difference?
- What are the reasonable scenarios to define the impact area?

Virtual sensors are needed in a given look

How does the facility have a virtual sensor?

Step 1: Develop a representation speed sensor map (800x500)

Step 2: Construct a virtual sensor map (800x500)

SAFETY PERFORMANCE

Demos: virtual sensor vs detector

If you have question, please contact: Hong.Yang@nyu.edu

Progression of Queue

- Early progression of a queue
- Sensor one reading segment is checked
- Maximum sensor one is checked & failure detection

Presence of Impact

Objectives: early long term & space

Intelligent information and can be created a marker on map.

A virtual sensor is a user-defined sensor that can coordinate traffic information & be accepted by 80%