Morningside Avenue Traffic Safety Analysis Results

Webinar for the New York City Department of Transportation

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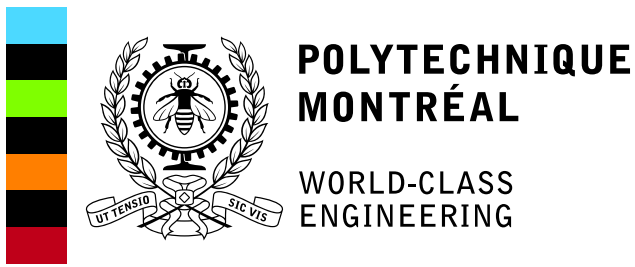

February 17th 2015

Outline

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Introduction

- There is a need for proactive methods of road safety analysis, that do not require to wait for accidents to happen
- In traditional road safety analysis, accidents are never observed: surrogate safety analysis relies on direct observations of traffic and thus provides an understanding of the factors contributing to safety and of collision processes
- Video analysis provides large amounts of traffic data and allows automated, quantitative and objective safety analysis

Morningside Avenue Traffic Safety Analysis Results

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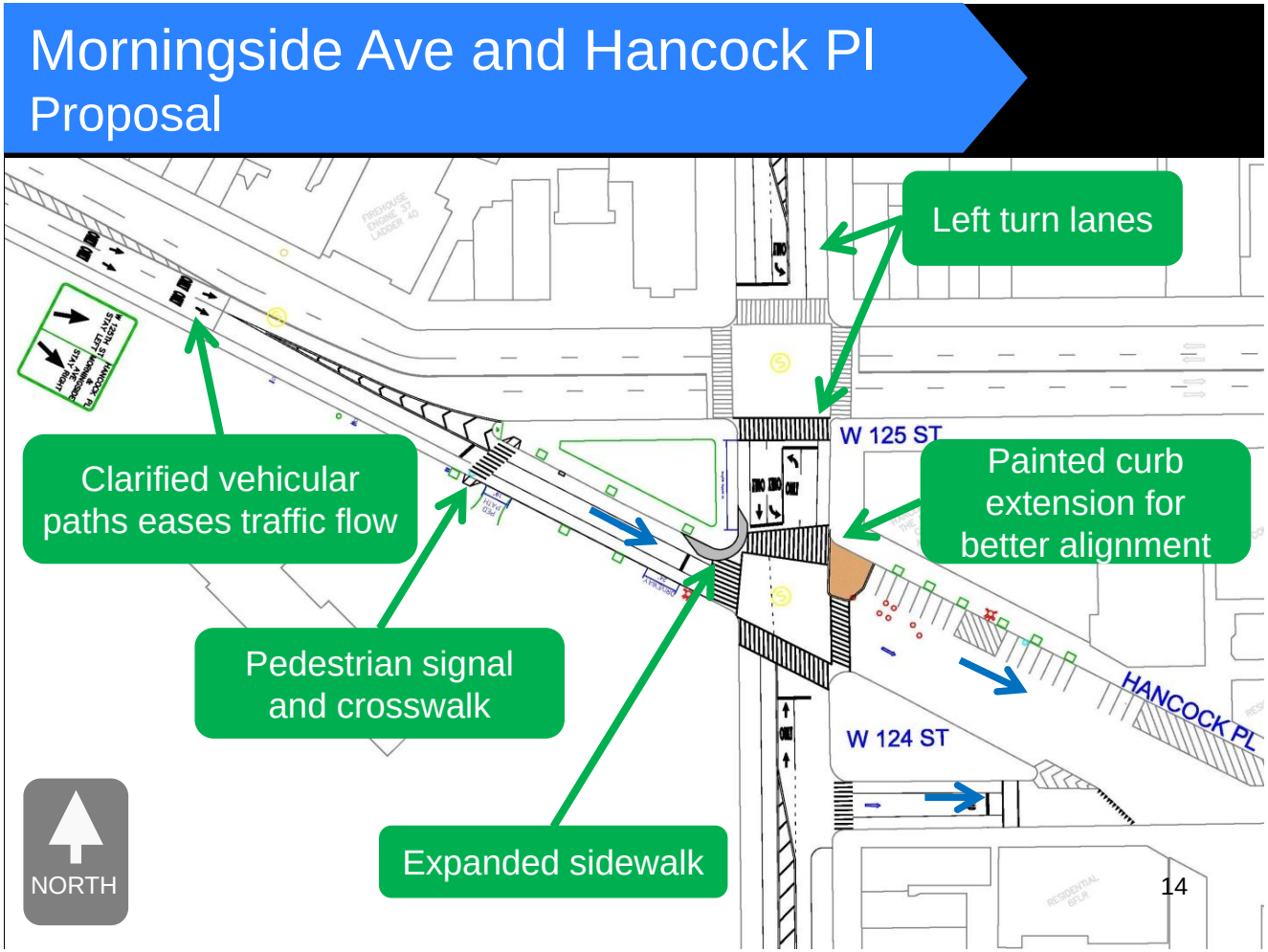

Morningside Avenue Traffic Safety Analysis Results

- Case study in New York City at Morningside Ave and Hancock Pl
  - collection of data before implementation of counter-measures
- Feasibility demonstration of our method

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Analysis Steps

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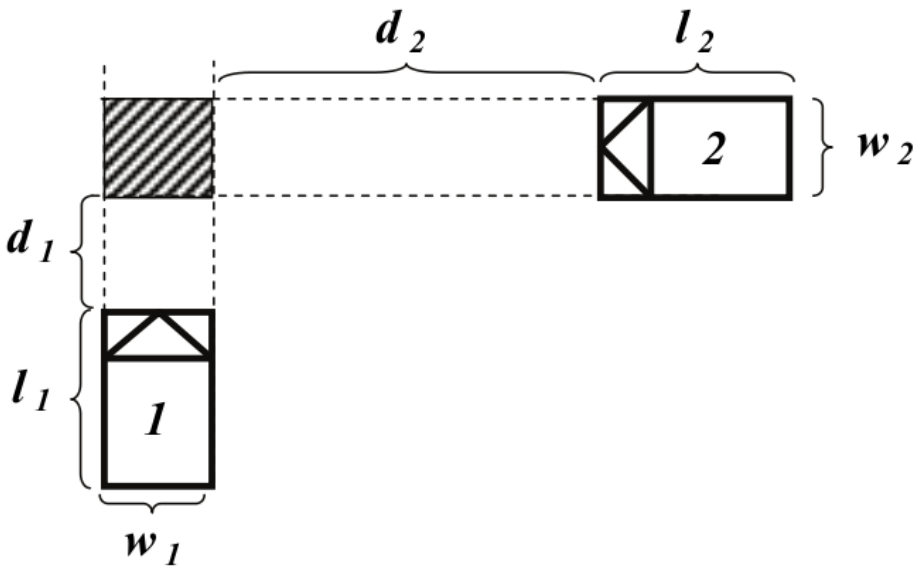
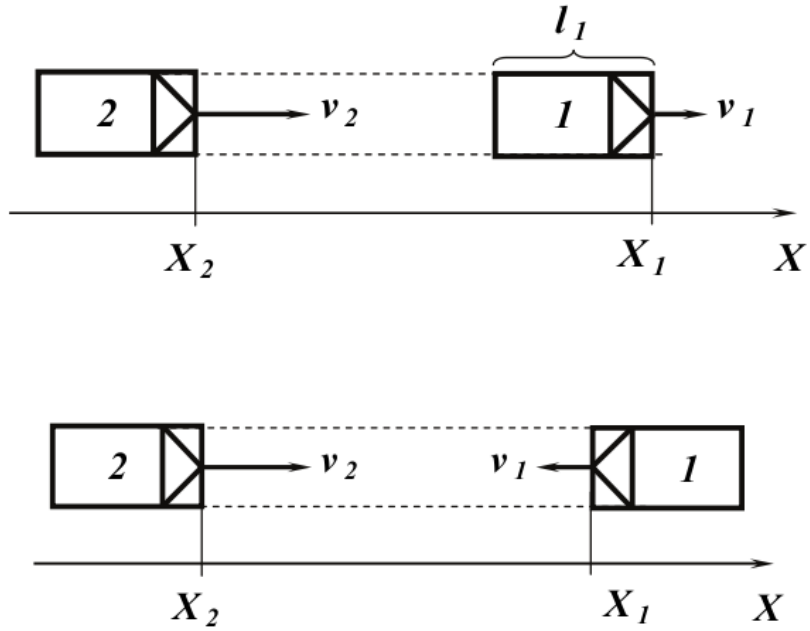
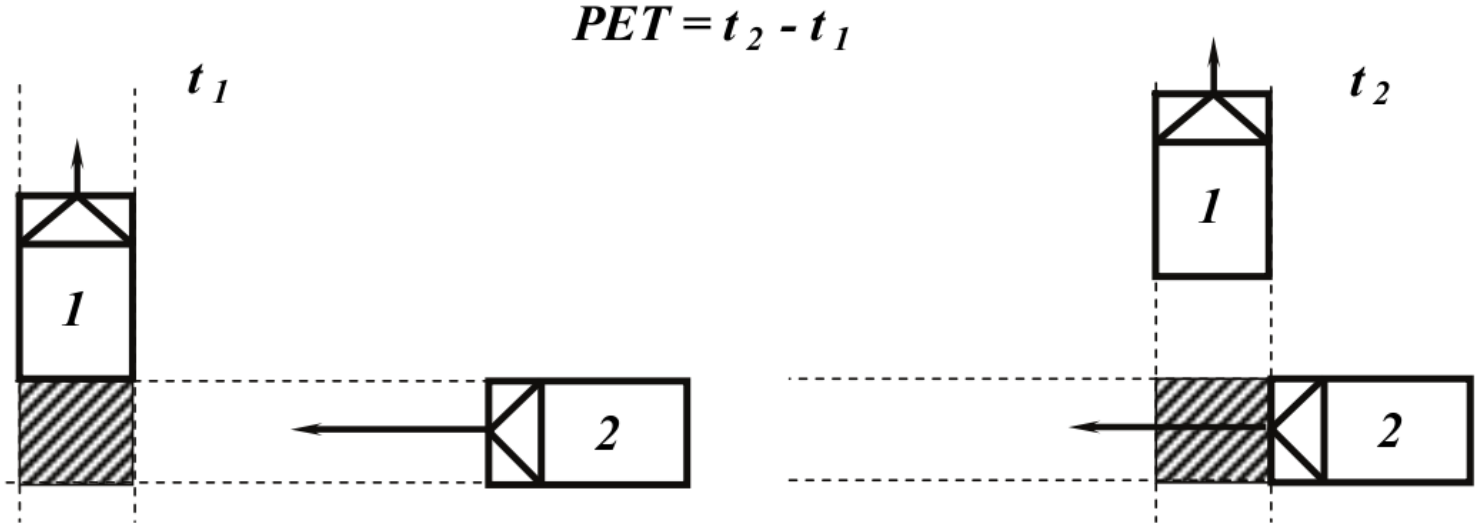
3. Video analysis: detect, track and classify road users
4. Identify interactions between pairs of road users (vehicle-pedestrian), compute (safety) indicators (speed, time to collision (TTC), post-encroachment time (PET), etc.)

Time to Collision (TTC)





Post-Encroachment Time (PET) and Predicted PET (pPET)



Outline

Pedestrian Tracking Issues: Features

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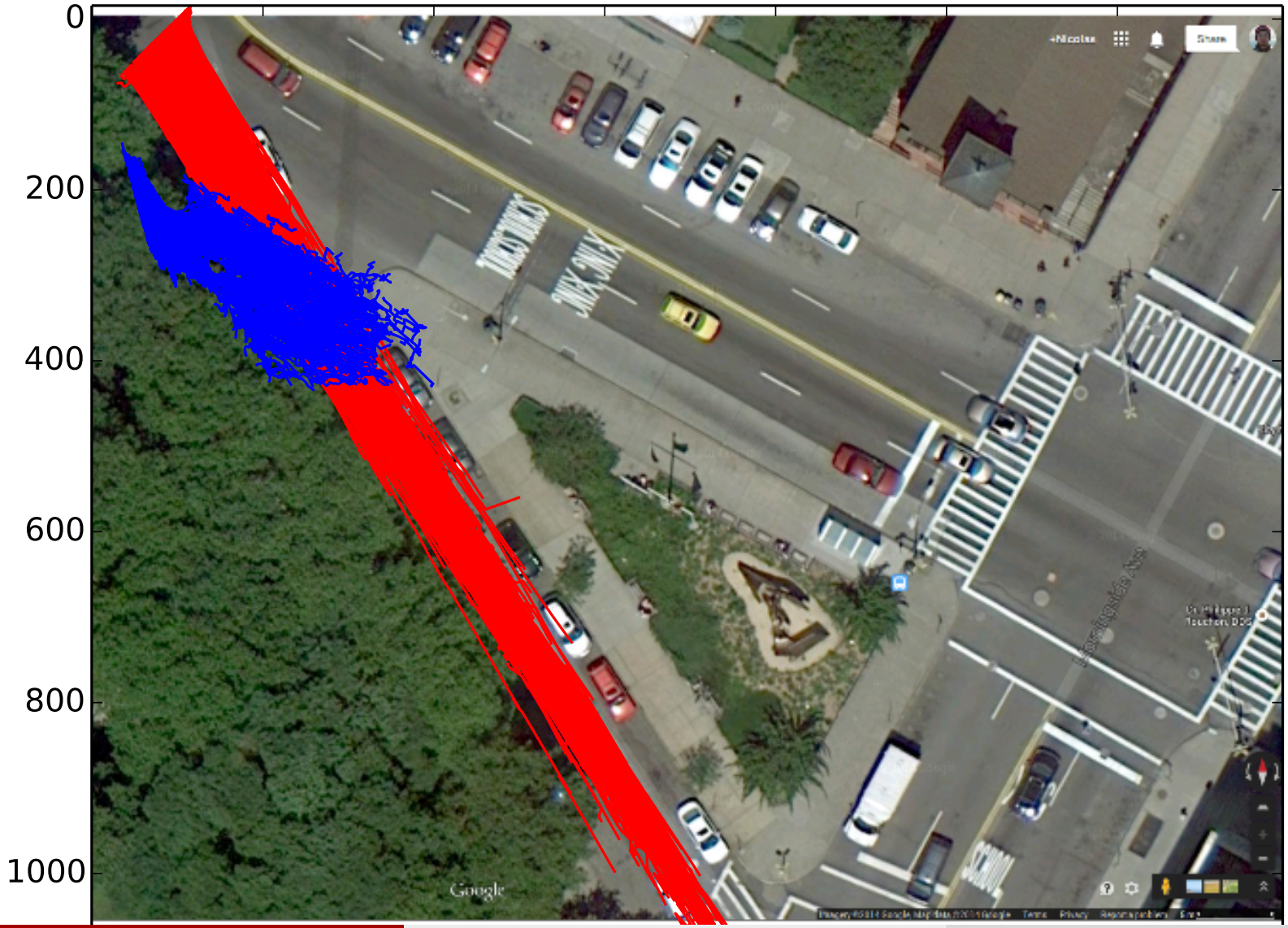
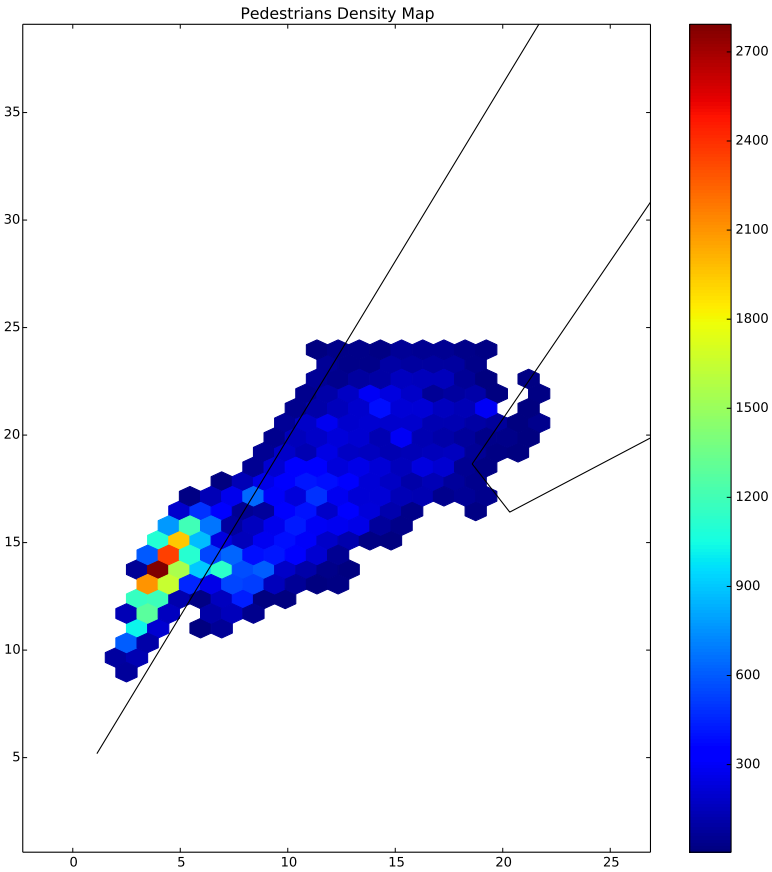
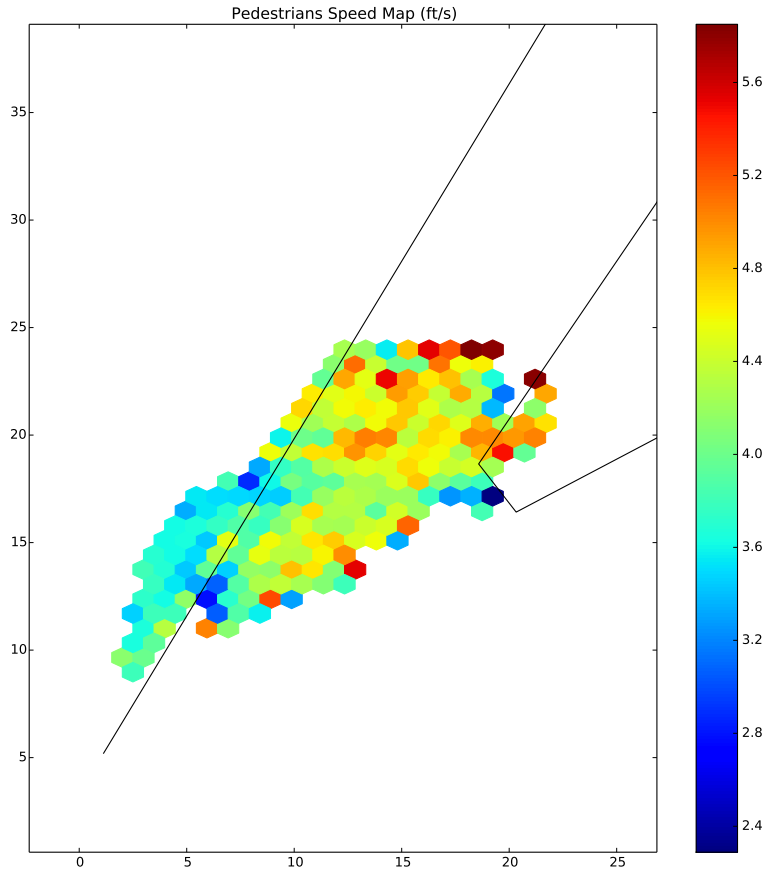
Pedestrian and Vehicle Trajectories

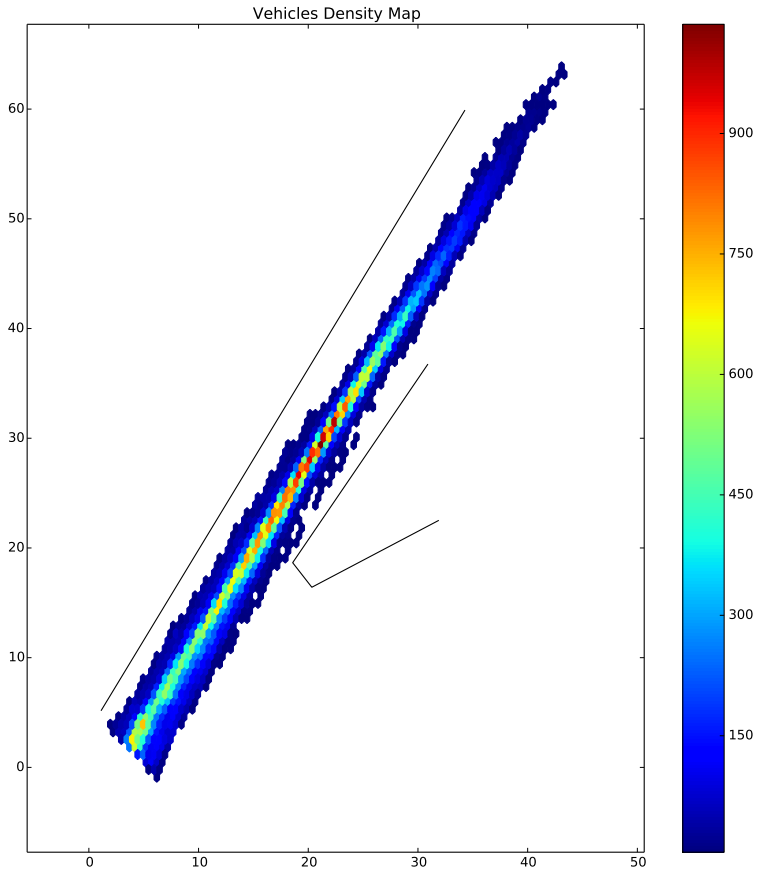


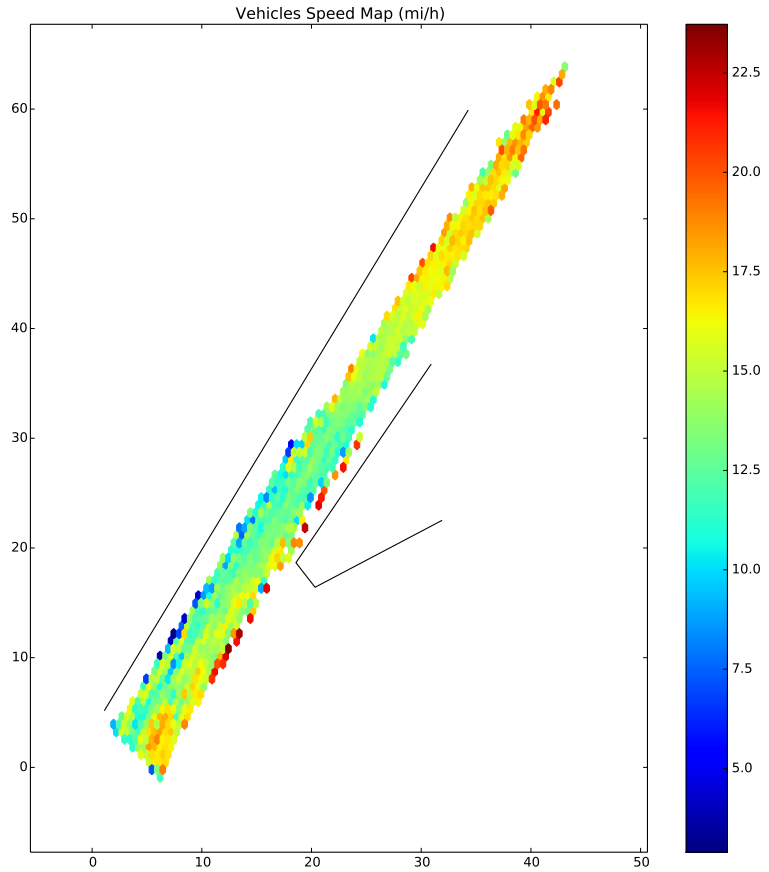
Pedestrian Density and Speed Maps



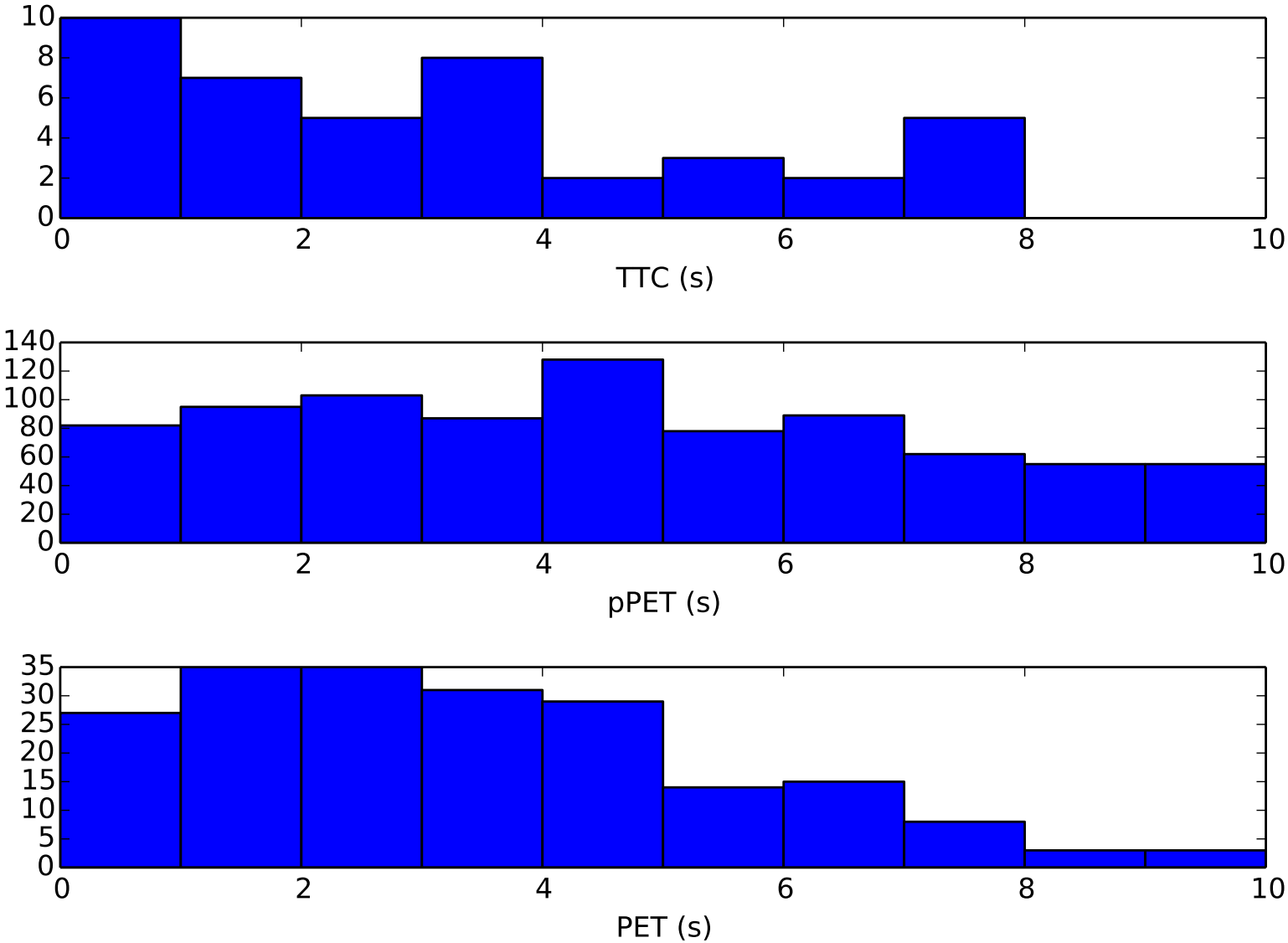


Vehicle Density and Speed Maps

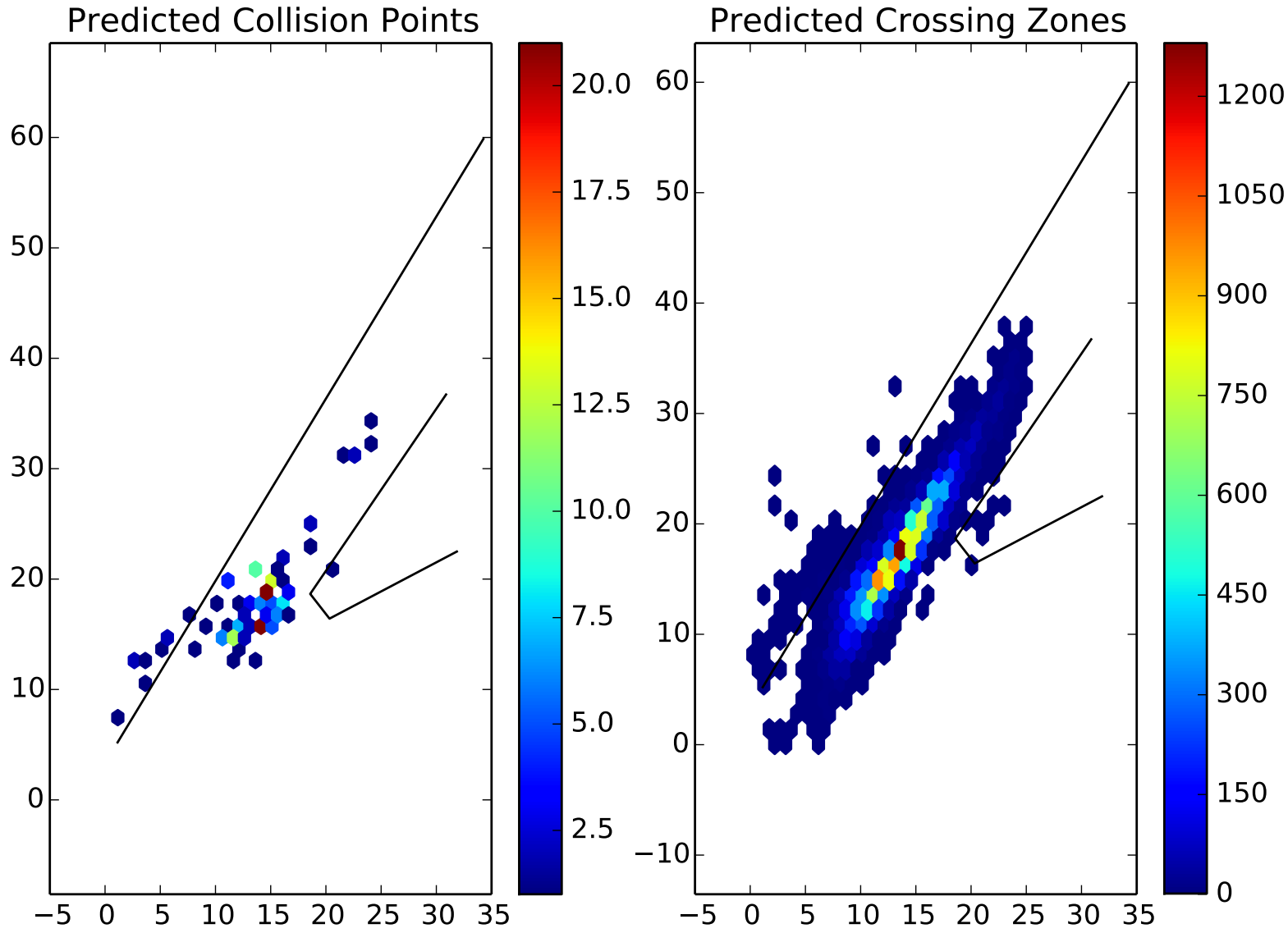




Distributions of Safety Indicators

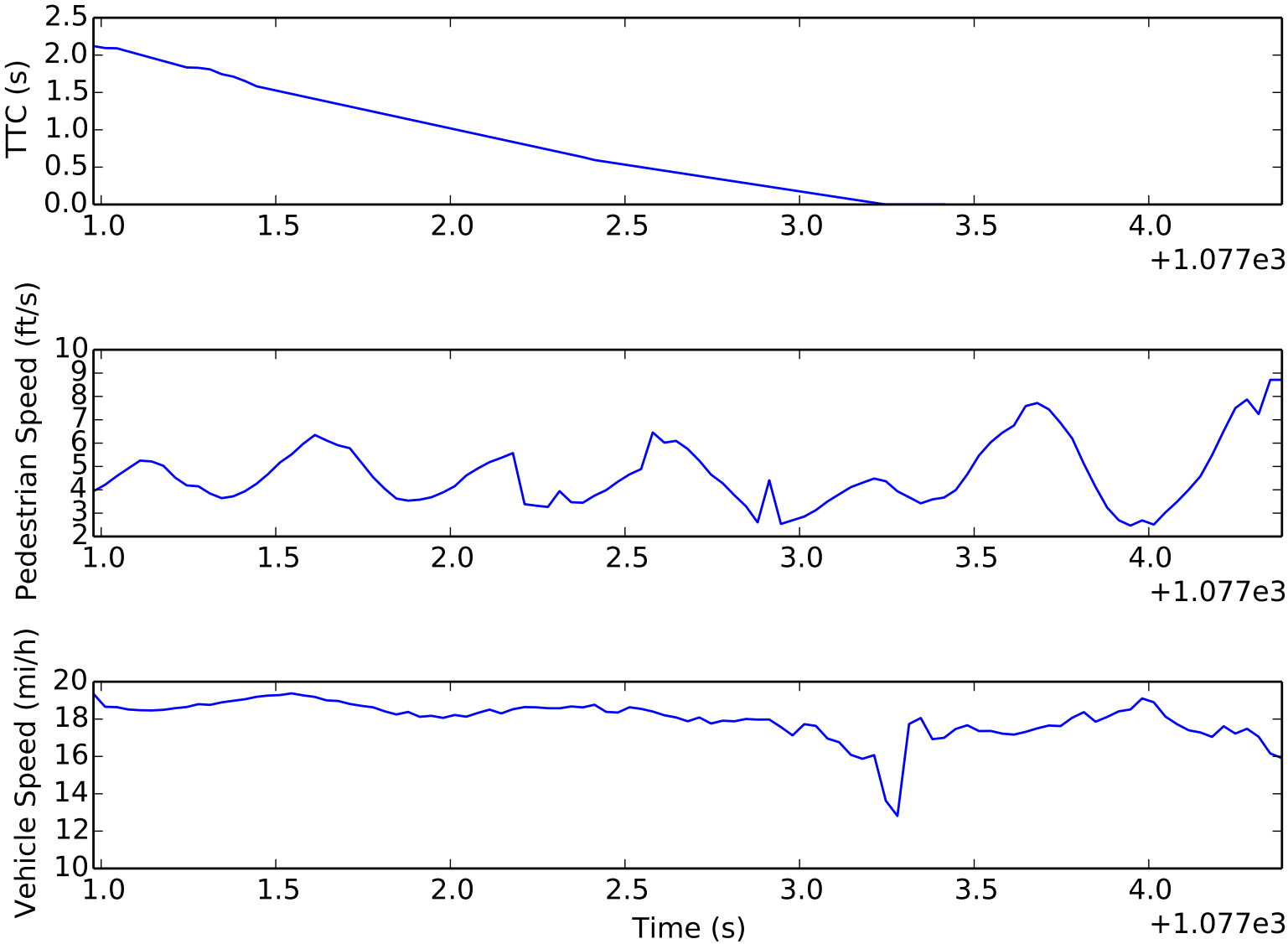


Predicted Collision Points and Crossing Zones



Interesting Interactions

Interesting Interactions: $PET = 0$ s and $TTC_{min} = 0$ s



Interesting Interactions

Videos: interactions with cars and bikes

Outline

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  - difficult to compare to period after the implementation
- Even when quality is lacking, the tools may be used for assisted investigation of interactions
- Road user classification is crucial in mixed traffic

Tracking Pedestrians at Penn Station Crosswalk

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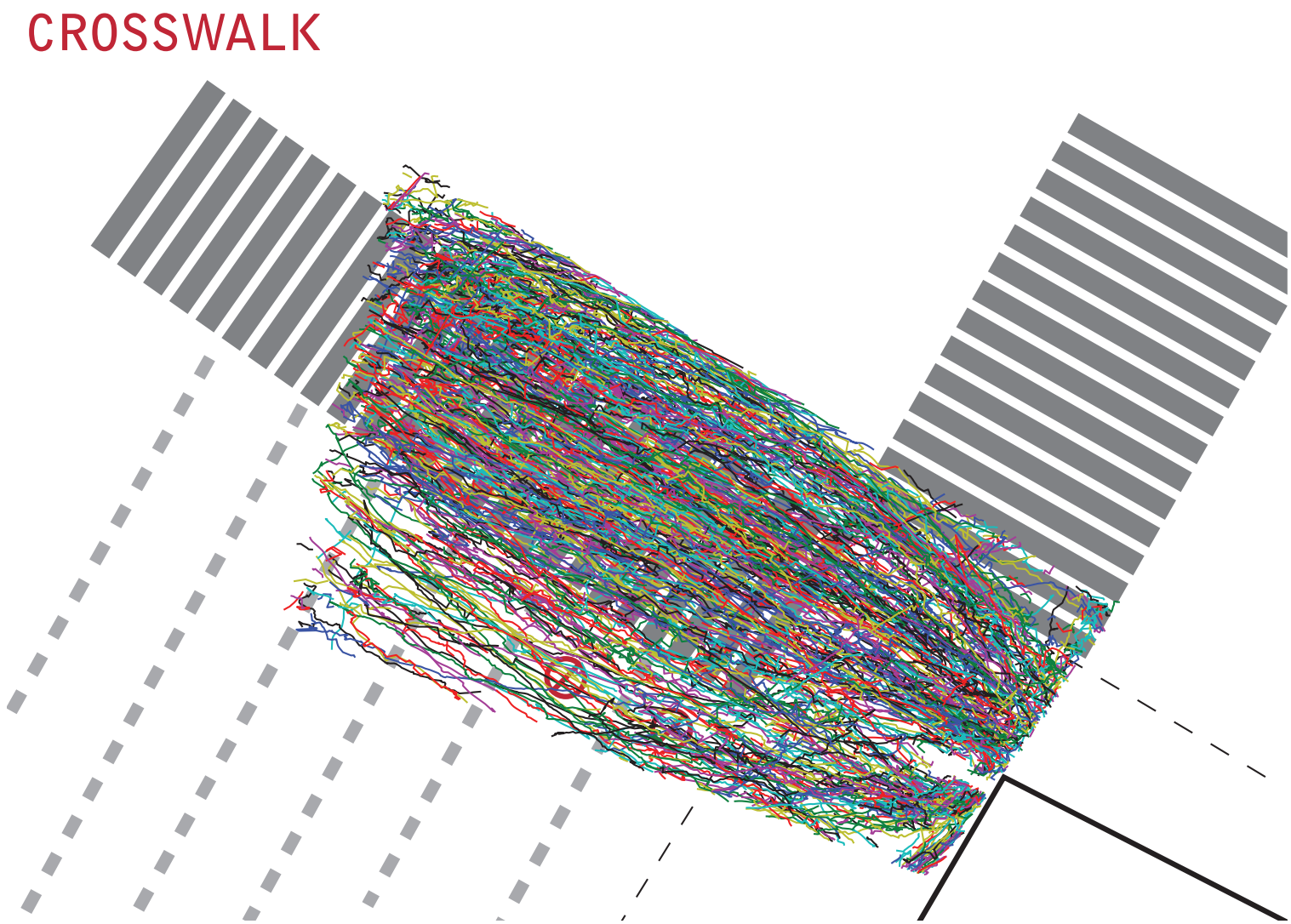
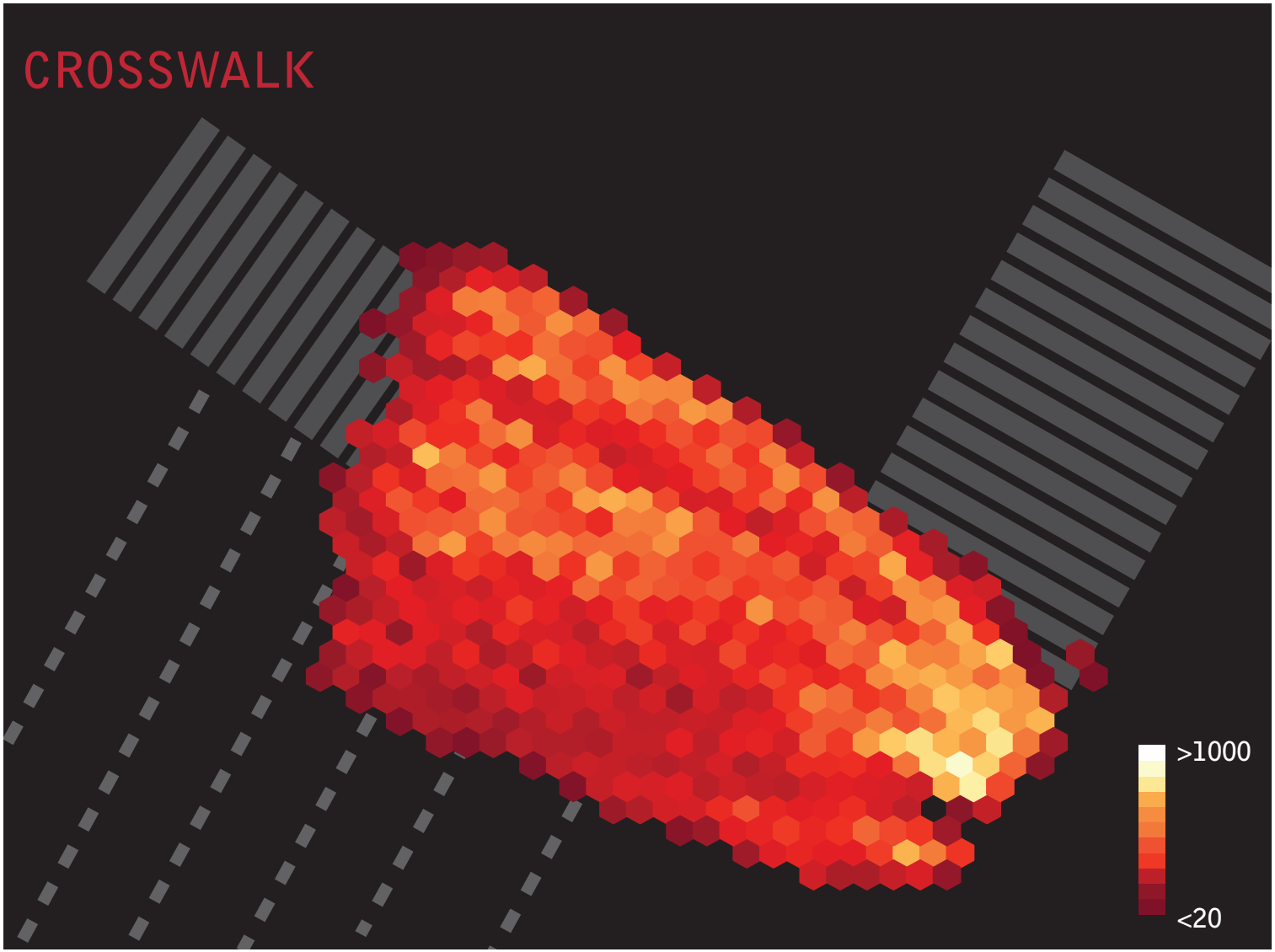


Tracking Pedestrians at Penn Station Crosswalk



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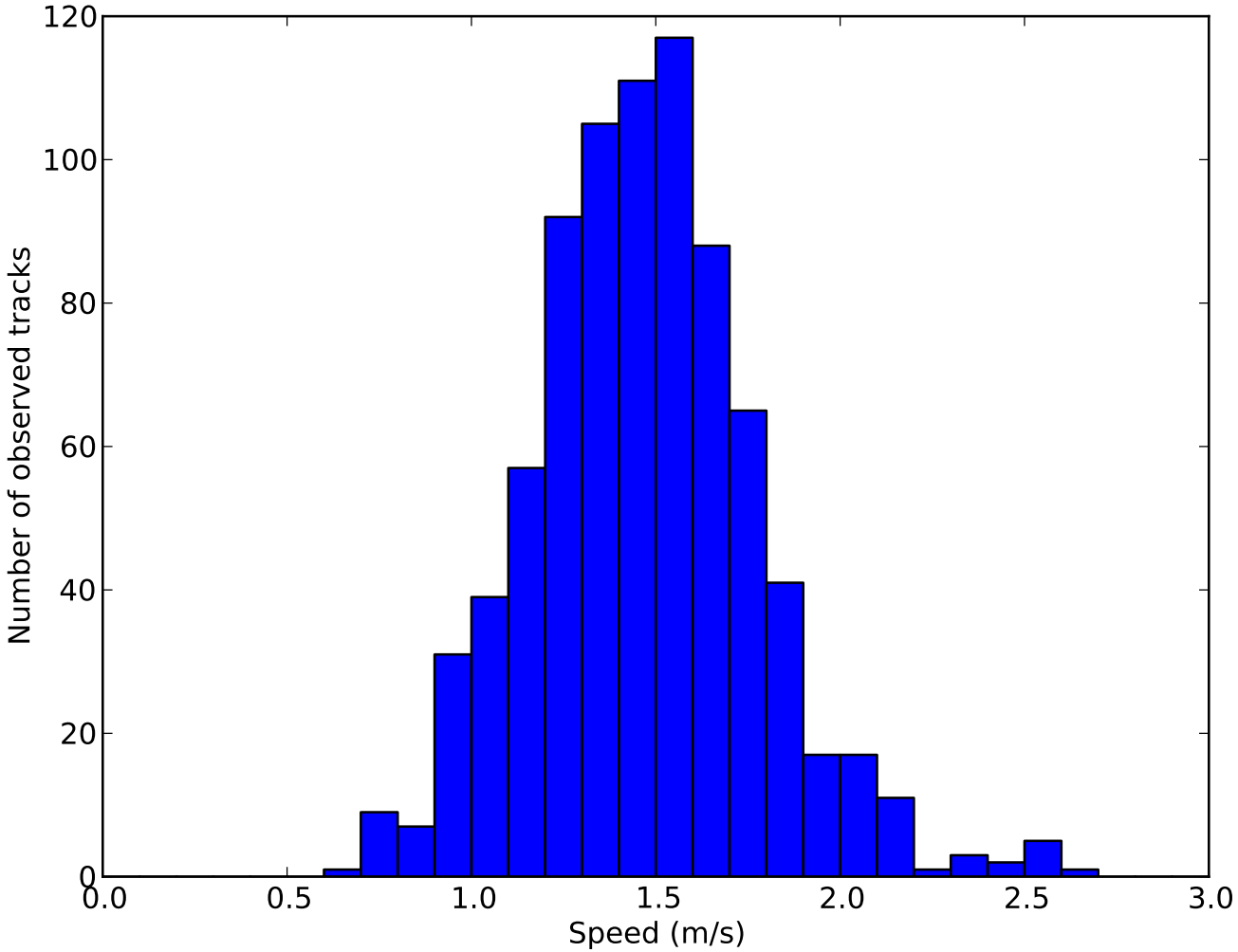

- This work can be easily reproduced: the program for this analysis is available
- Traffic Intelligence open source project `https://bitbucket.org/Nicolas/trafficintelligence`

Acknowledgement: Work on Tracking Optimization on Penn Station Video with D. Ettehadhieh & B. Farooq

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Questions?