

That was close

**Using Near-Miss data to
prevent vulnerable road
users becoming casualties.**

Richard Young
SmartSense Ltd.
VivaCity's NZ Partner

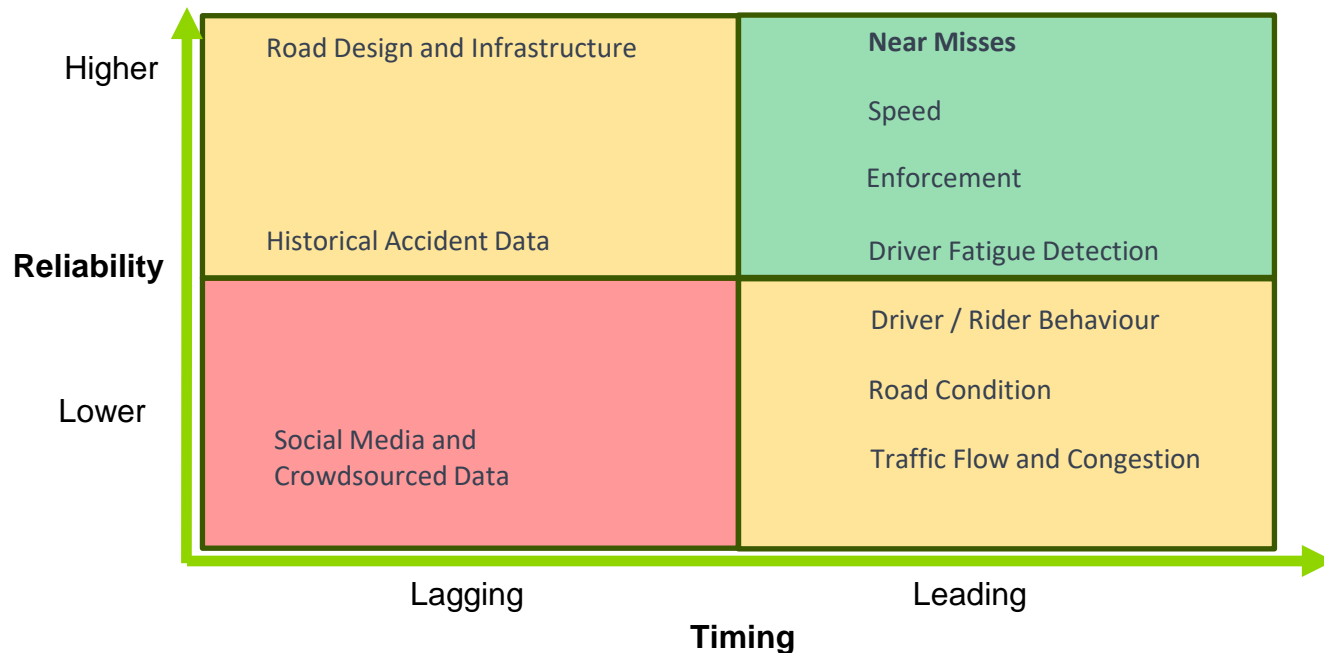
March 2024



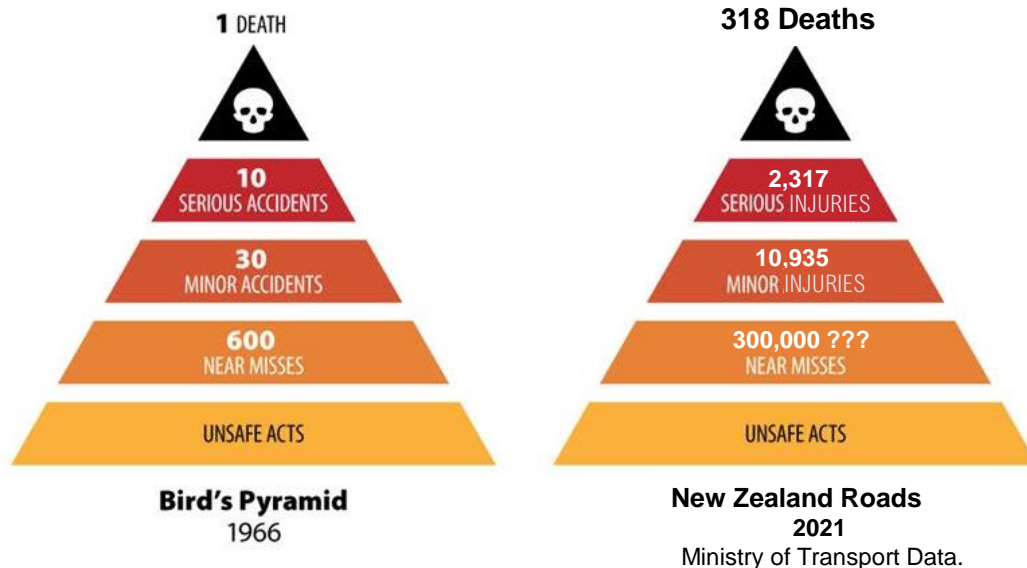


Road Safety Indicators

Lead and Lag Indicators



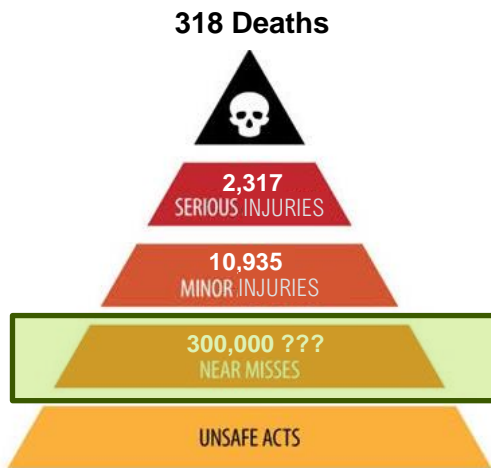
The Challenge: Our road environment



Auckland Transport & Ministry of Health data suggests cycling and pedestrians injuries under reported by up to 6x

The Challenge: Our road environment

Leading Indicators



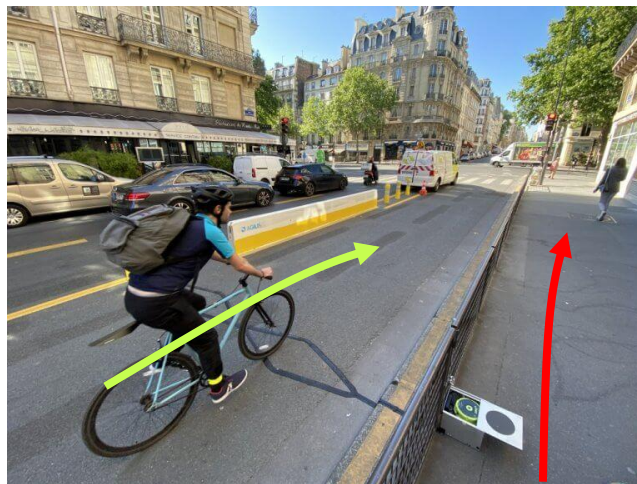
**New Zealand Roads
2021**
Ministry of Transport Data.

- Can we use technology to accurately measure Near Misses?
- Can we use that data to plan interventions to improve safety?
- We know we can implement interventions to improve safety.
- But can we re-measure Near Misses to assess any safety improvement?

To protect vulnerable road users, we need to capture Near Misses

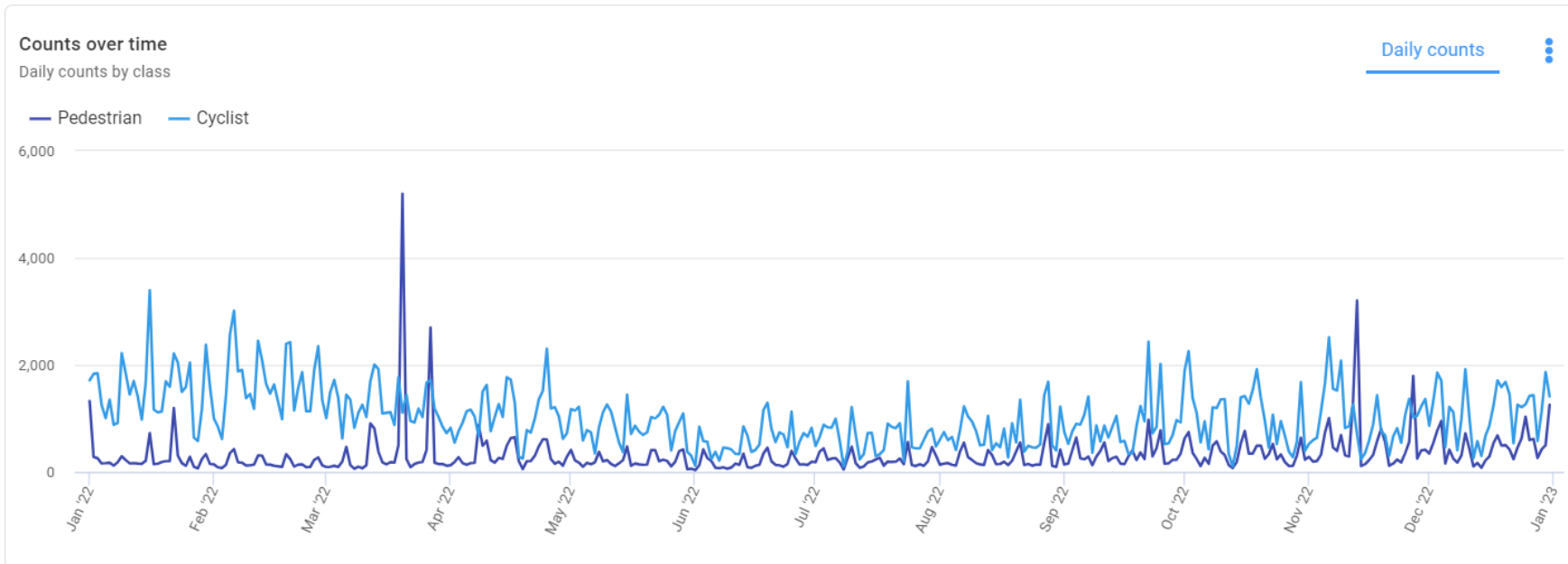
Data is key, but do we have the right data?

➤ Traditional methods don't provide the whole picture (e.g., speed, track, dwell, turns, interacts, trend)



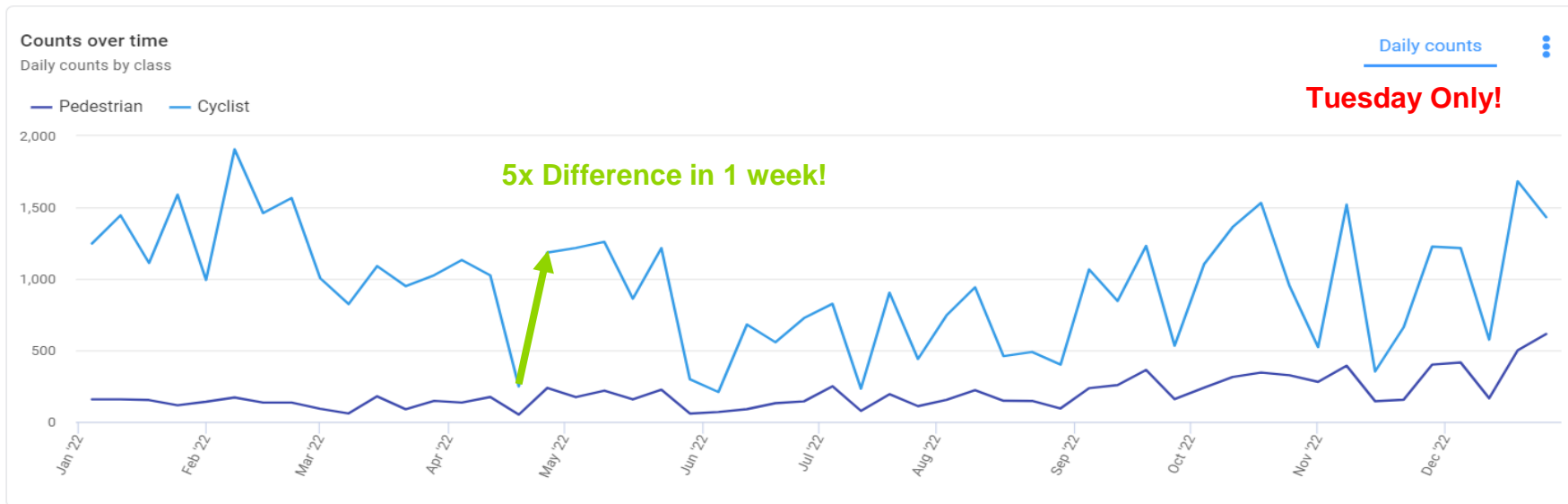
To protect vulnerable road users, we need to collect representative data

Data is key, but do we have the right data?



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The solution: Edge Computer Vision Sensors

Not all Computer Vision is Equal

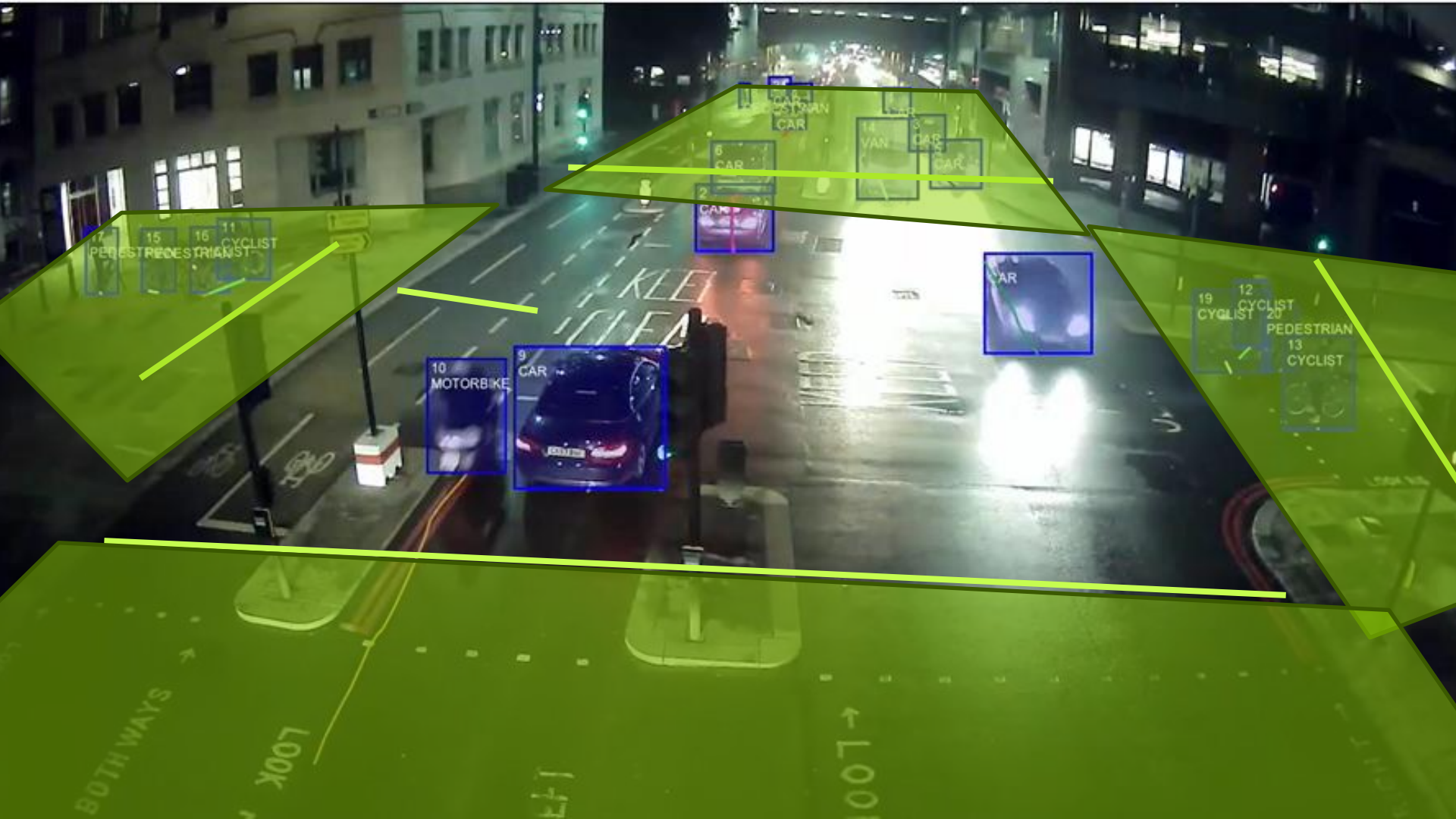


Open source algorithm



VivaCity Labs algorithm





CAR
CYCLIST
CAR

VAN
CAR
CAR

PEDESTRIAN
PEDESTRIAN
CYCLIST

CAR

CAR

CYCLIST
CYCLIST
PEDESTRIAN
CYCLIST

MOTORBIKE

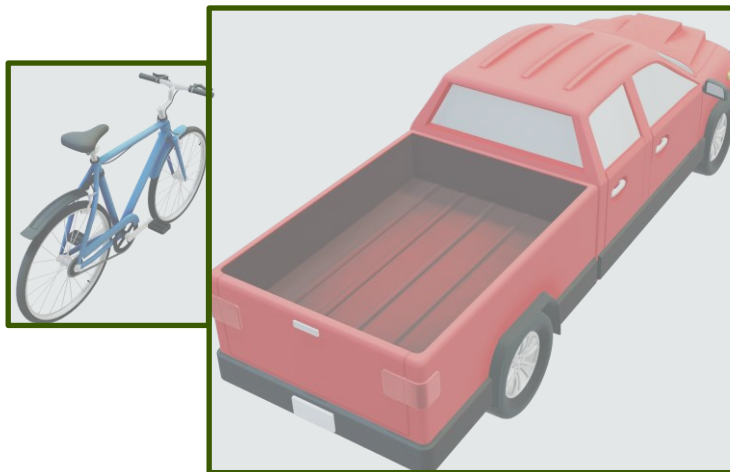
CAR

To protect vulnerable road users, we need to capture Near Misses

Data is key, but do we have the right data?

2D Camera Based Systems

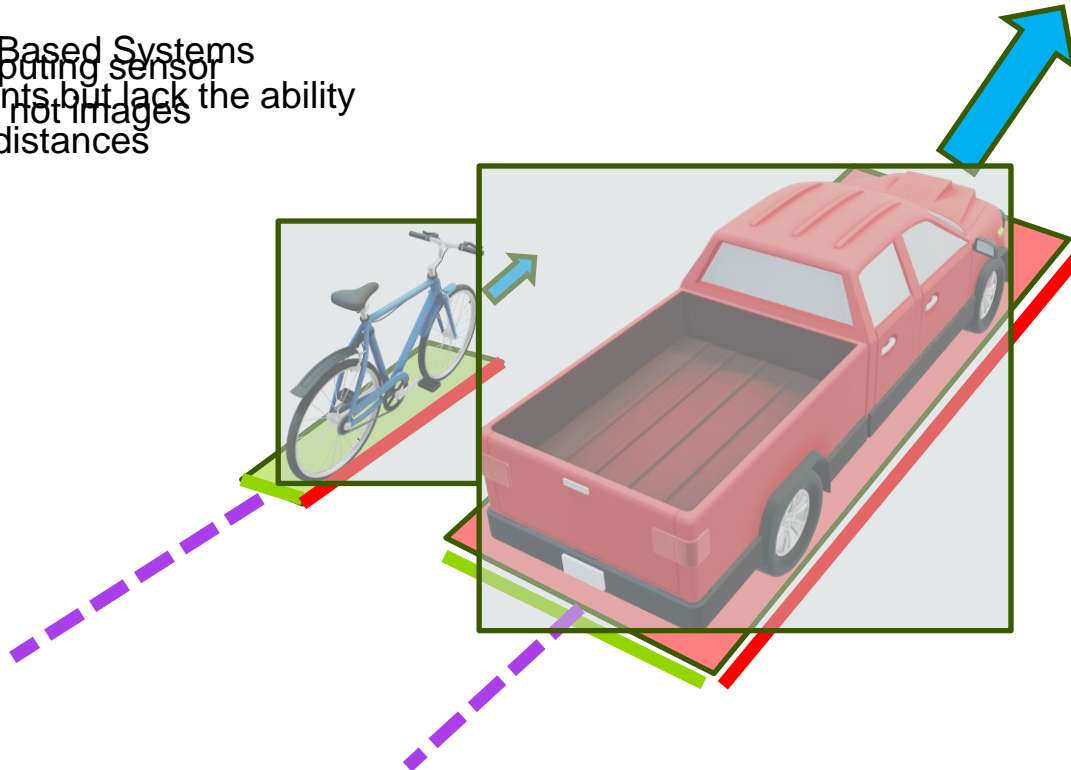
Ideal for counts but lack the ability to measure distances



To protect vulnerable road users, we need to capture Near Misses

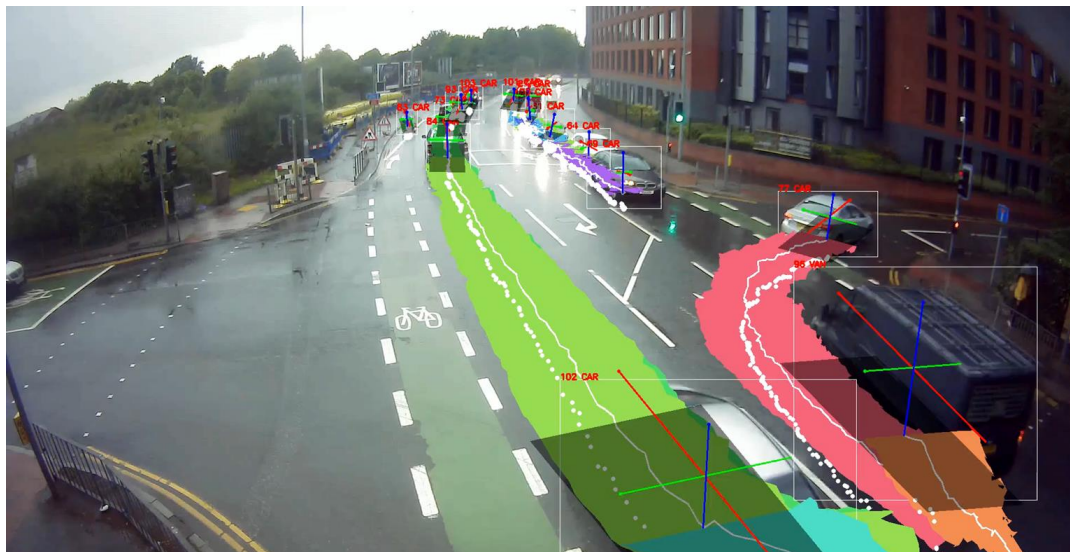
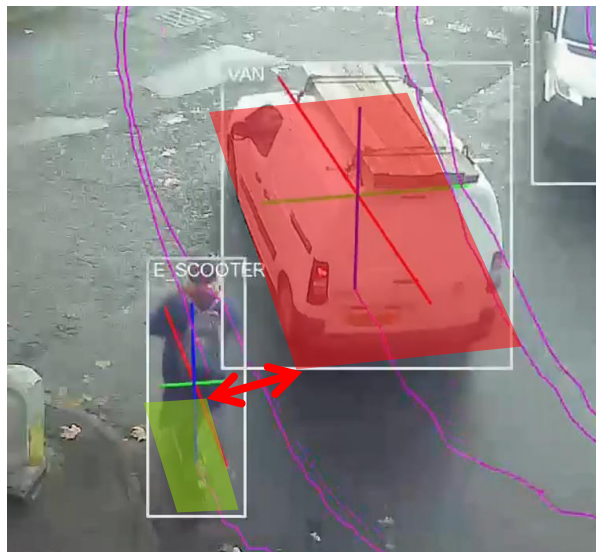
Data is key, but do we have the right data?

2D Camera Based Systems
At edge computing sensor
delivers data not images
Ideal for counts, but lack the ability
to measure distances



The solution: Directly measure Near Misses

3D Detection becomes key



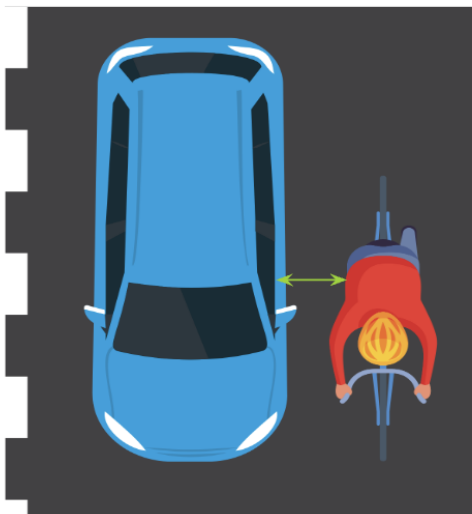
➤ 3D AI enables calculation of vehicle ground plate

➤ Provides a much more accurate proximity measurement for Near Miss

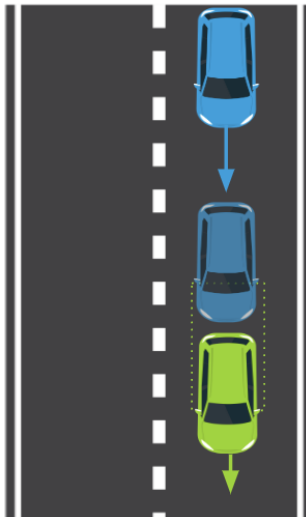
The solution: Directly measure Near Misses

We have identified three principle detection methodologies

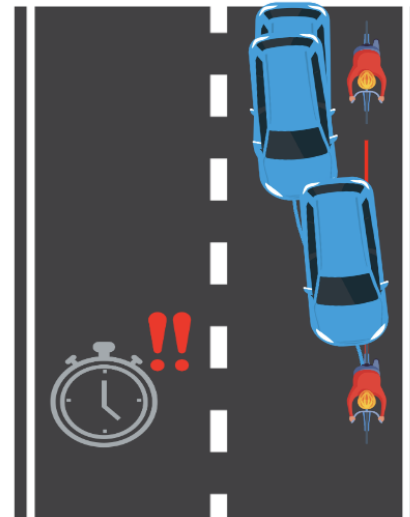
1.
Proximal



2.
Post-encroachment time (PET)



3.
Time to collision



Case Study: Signalised Turning Near Misses



Cyclist Right of Way not working well, many similar incidents every day.

(Image reversed)

The Challenge: Our road environment

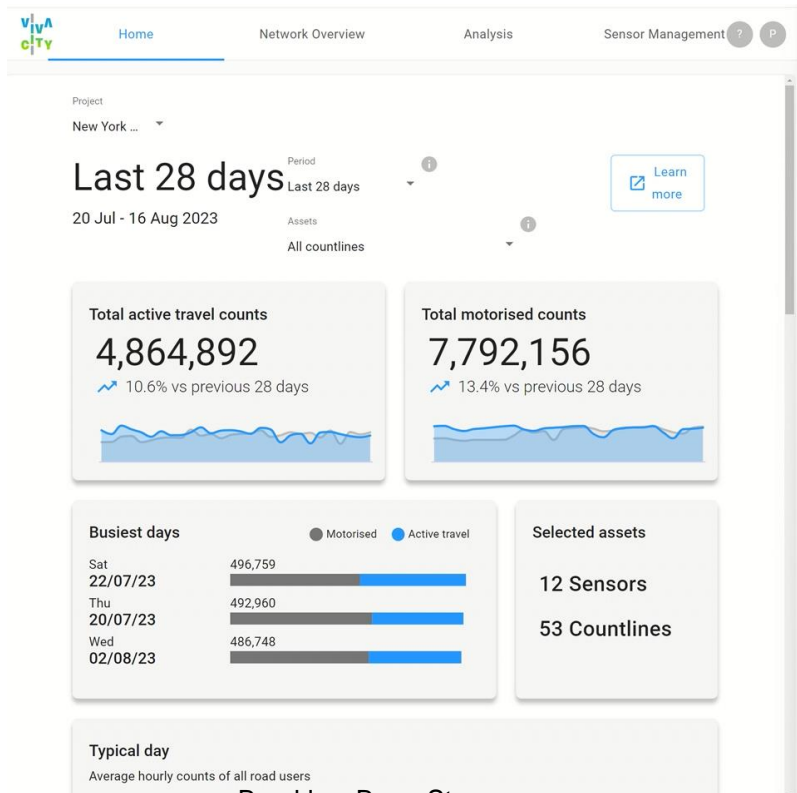
Leading Indicator



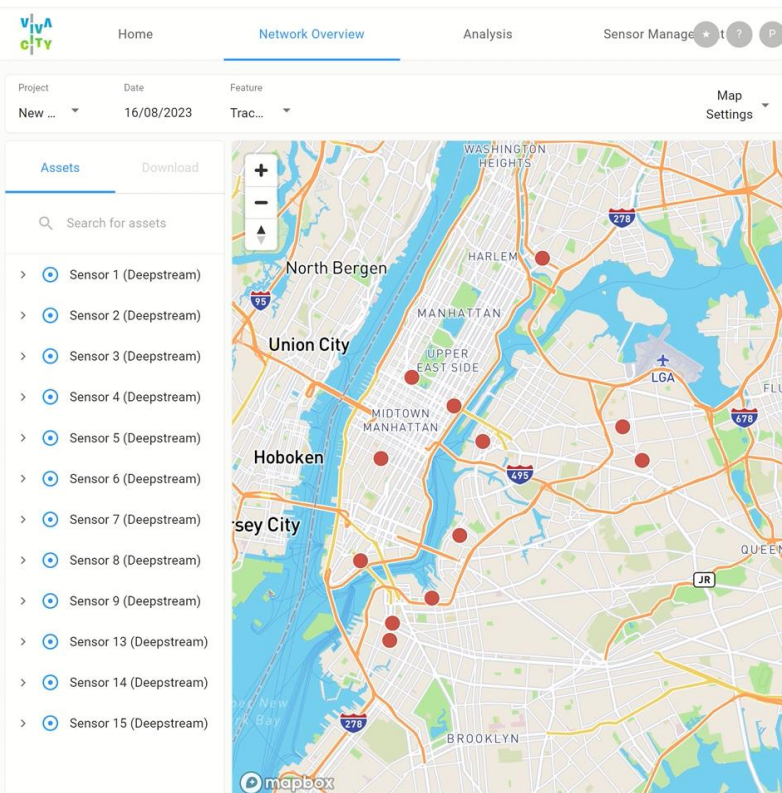
- Use technology to accurately measure Near Misses.
- Plan interventions to improve safety.
- Implement intervention to improve safety.
- Re-measure Near Misses to assess effectiveness of safety improvement.

Case Study: New York City

NYC **Open Streets**: Re-allocate road space to Active Travel to promote safer greener travel



Brooklyn: Berry St
 "Open Street Neighbourhood"



Brooklyn: Smith St
 "Main Route"

Case Study: New York City

NYC Open Streets: Re-allocate road space to Active Travel to promote safer greener travel



Trend analysis

View classified counts over a long time period for a single countline.

[Learn more](#)

[Go](#)



Intervention analysis

Compare classified counts between two time ranges to explore the impact of an intervention for a single countline.

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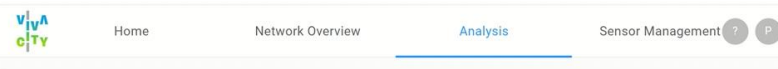


Near miss analysis

Analyse trends in near miss events, and view video footage of individual events.

Brooklyn: Berry St

“Open Street Neighbourhood”



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Case Study: New York City

NYC Open Streets: Re-allocate road space to Active Travel to promote safer greener travel

The dashboard for Brooklyn: Berry St "Open Street Neighbourhood" features a navigation bar with "Home", "Network Overview", "Analysis", and "Sensor Management". The main content area contains three analysis cards:

- Trend analysis:** View classified counts over a long time period for a single countline. Includes a "Learn more" button and a "Go" button.
- Intervention analysis:** Compare classified counts between two time ranges to explore the impact of an intervention for a single countline. Includes a "Learn more" button and a "Go" button.
- Near miss analysis:** Analyse trends in near miss events, and view video footage of individual events.

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"Open Street Neighbourhood"

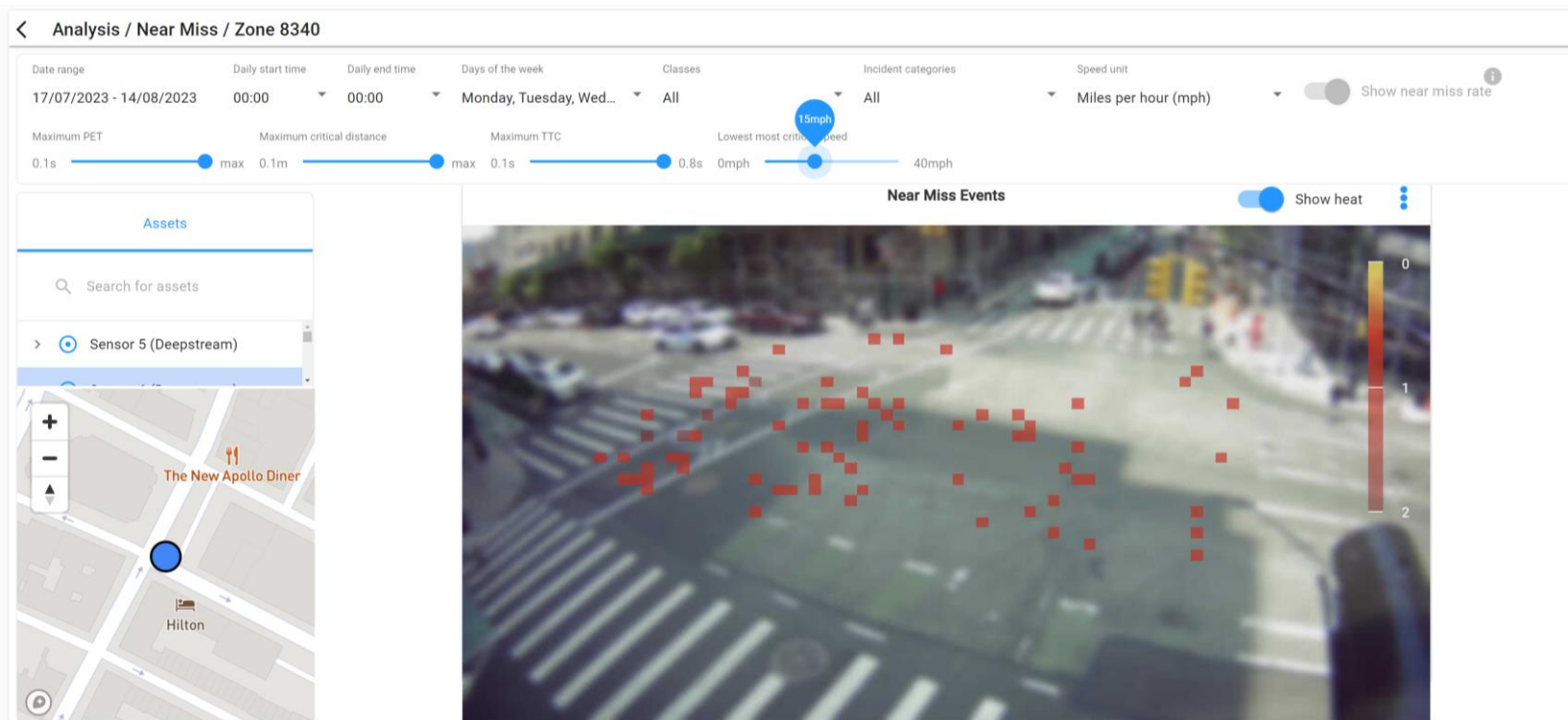
The dashboard for Brooklyn: Smith St "Main Route" features a navigation bar with "Home", "Network Overview", "Analysis", and "Sensor Management". The main content area contains three analysis cards:

- Trend analysis:** View classified counts over a long time period for a single countline. Includes a "Learn more" button and a "Go" button.
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"Main Route"

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Research and Enhancements Underway

Waka Kotahi – Innovation Fund



- **Objective 1:** Quantify the correlation between Near Misses and fatality and serious injury data
- **Objective 2:** Extend analysis from pedestrians, e-scooters and cyclists to motorbikes and mopeds
- **Objective 3:** Test the benefit of quick and low-cost interventions

30 locations around the motu for this project. These include Hamilton, Taupō, Wellington, Nelson, Christchurch and Dunedin.

1. Current high crash risk areas for vulnerable road users.
2. Location thought to be functioning well and safely to act as a control site.

Richard@smartsense.nz

ANY QUESTIONS?



local partner



SmartSense
people driven intelligence

Richard@smartsense.nz
027 839 1961

