Using AI to Improve Road Safety

Peter Mildon
COO and Co Founder

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Agenda

- Zeroes: Net Zero + Road to Zero
- Measurement of Risk Factors
- Direct Measurement of Hazard / Near Miss
- Case Studies
- Two new projects in New Zealand

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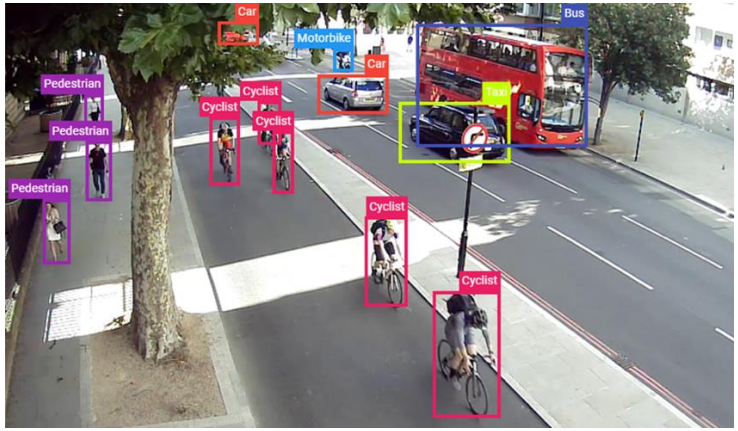
Who are VivaCity

- Computer vision tech company based in London, UK
- Founded 2015 by 3 friends who met at the University of Cambridge
- Over 100 members of staff, presence in UK, Australia and US
- 100+ local and regional authorities
- 3500+ sensors
- 29 Billion unique movements



This image was taken from a VivaCity sensor in central London.

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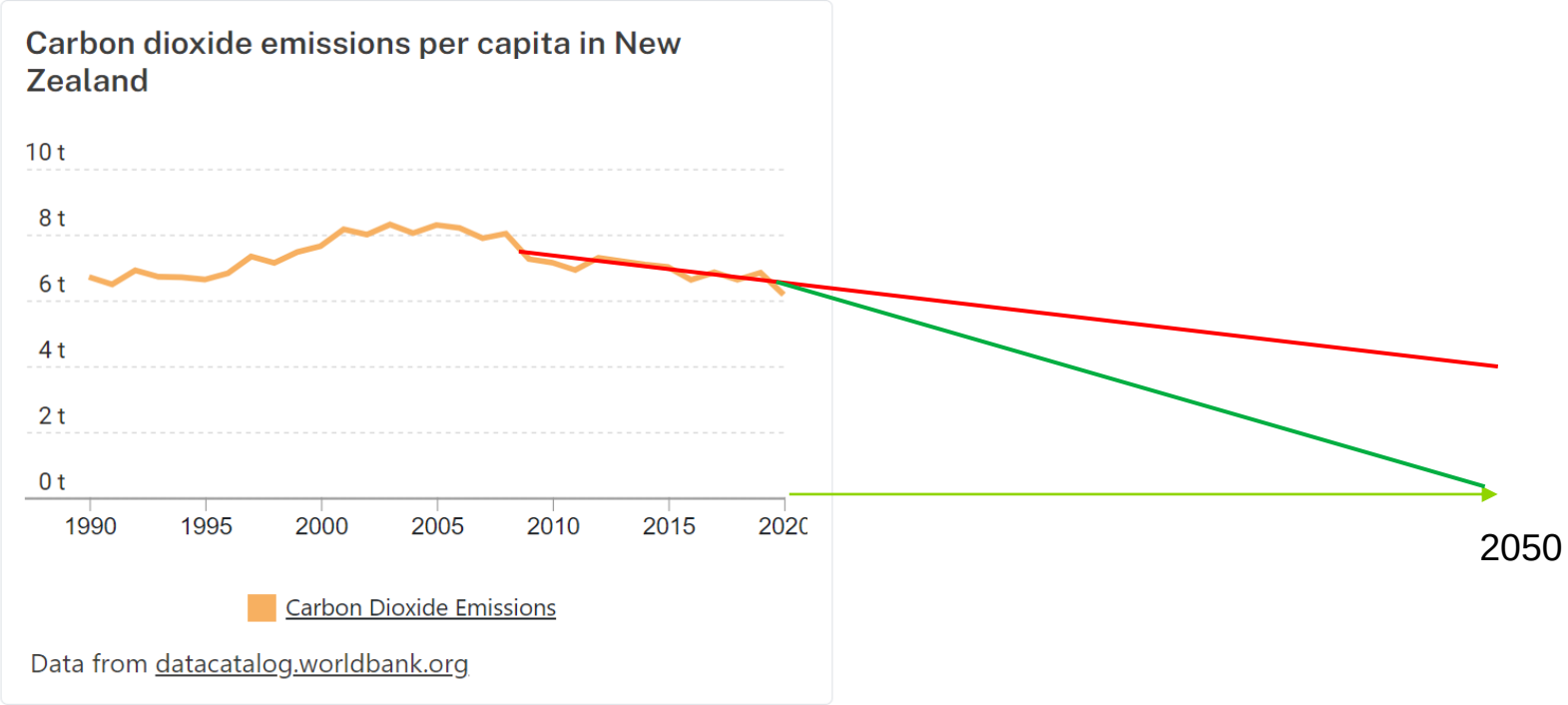
Net Zero by 2050

Enshrined in New Zealand Law



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Transport Decarbonisation

Government Strategy

- The Decarbonising Transport Action Plan 2022-25 sets out the areas that we will focus on to reduce transport emissions:
  - **Make it easy to get around without a car.**
  - Help New Zealand make the shift to zero emissions vehicles.
  - Encourage low emissions freight and heavy transport options.

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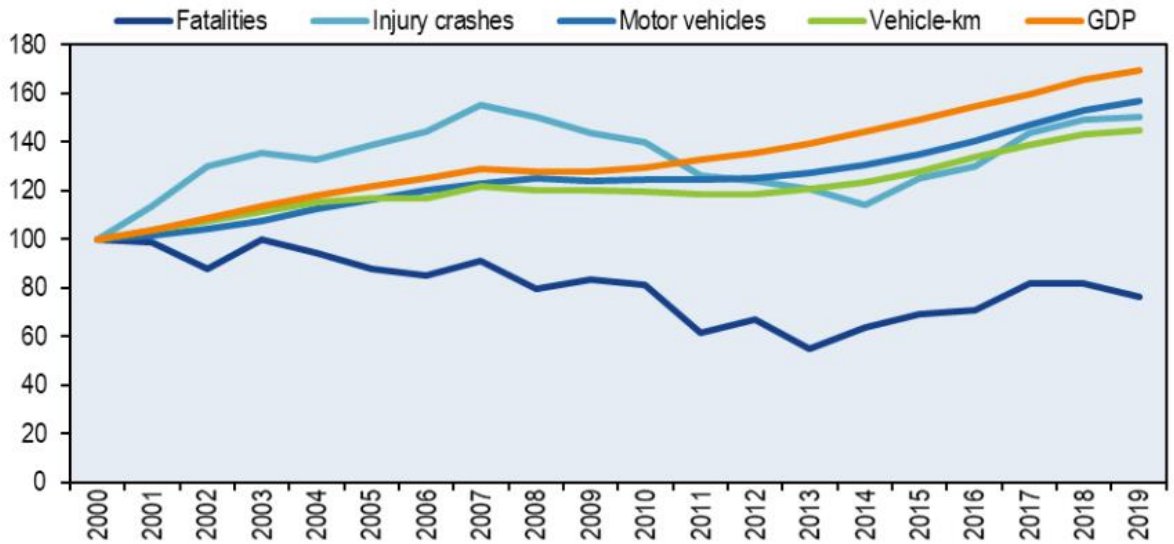
Road to Zero

NZTA: We have a vision of zero deaths and serious injuries on New Zealand roads



Source: International Transport Forum: Road Safety Data New Zealand

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The Challenge: Promote model shift towards Active Travel, whilst protecting vulnerable road users

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

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Promote modal shift towards Active Travel, whilst protecting vulnerable road users

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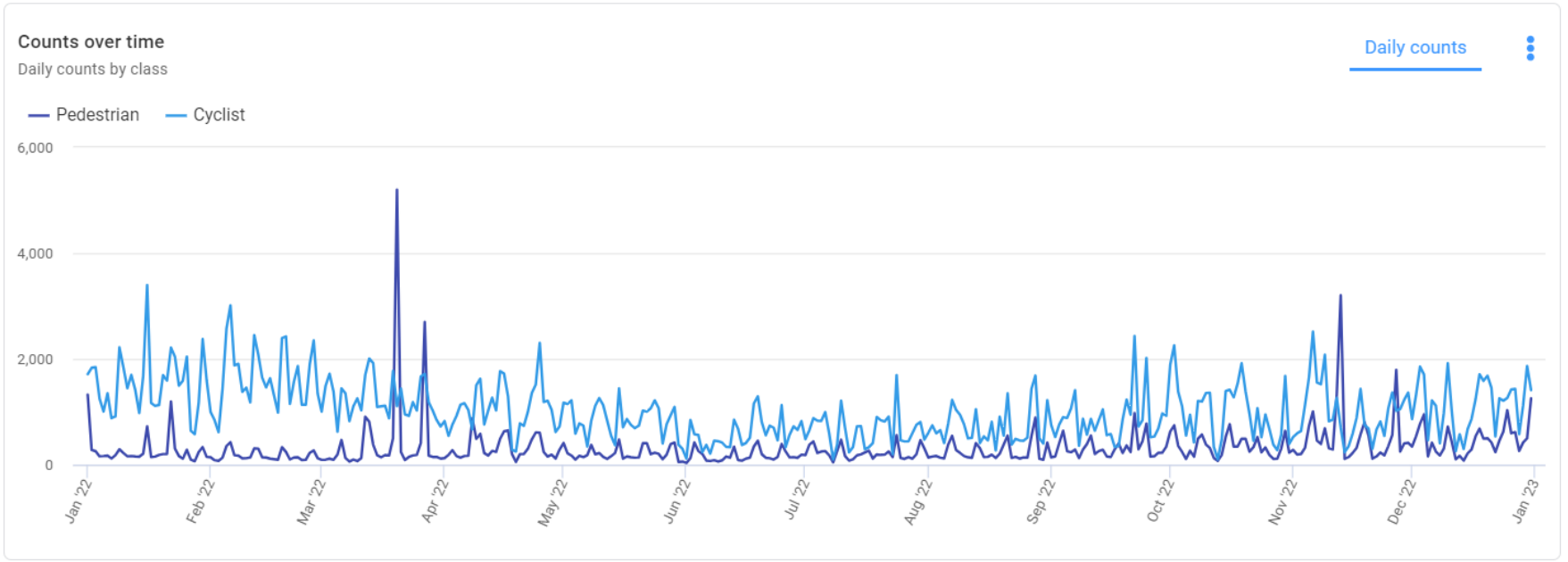

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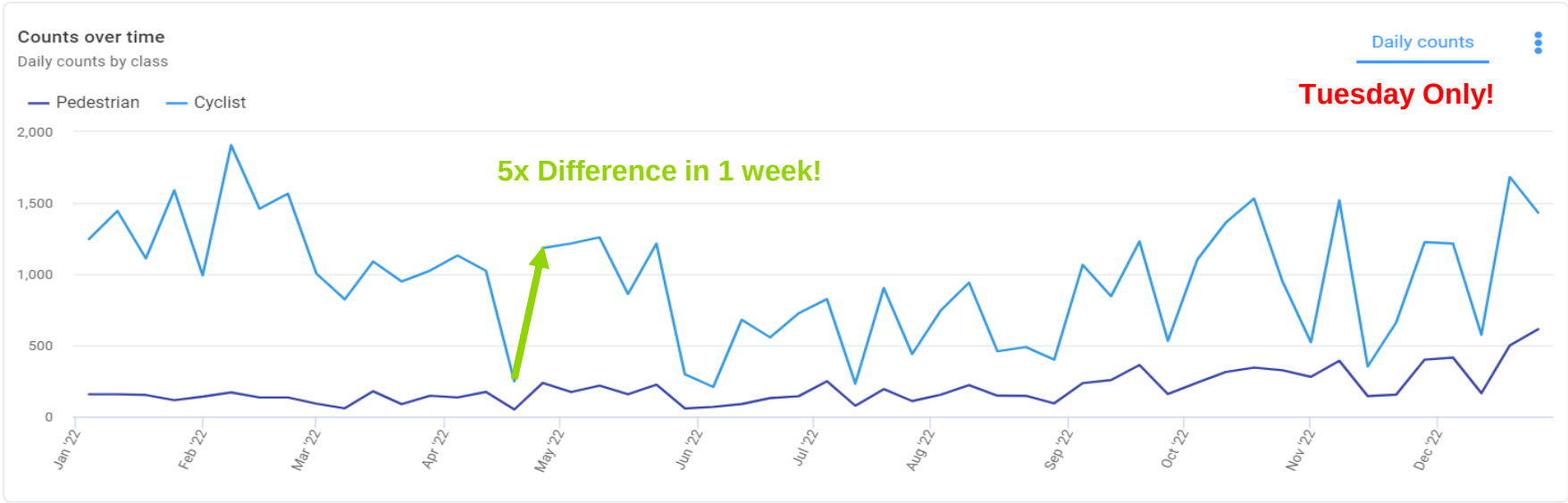

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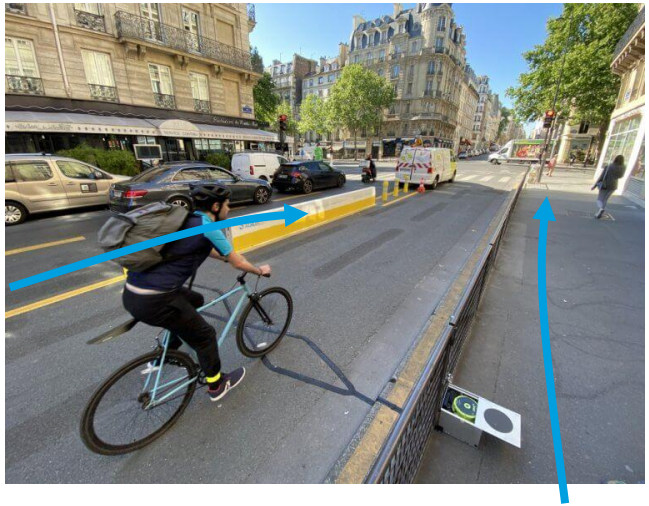
Promote modal shift towards Active Travel, whilst protecting vulnerable road users

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

- Traditional methods do not provide the whole picture (e.g., speed, path, dwell, turn, interact)



Not the whole picture:

- Speed
- Path
- Dwell
- Turn
- **Interact**

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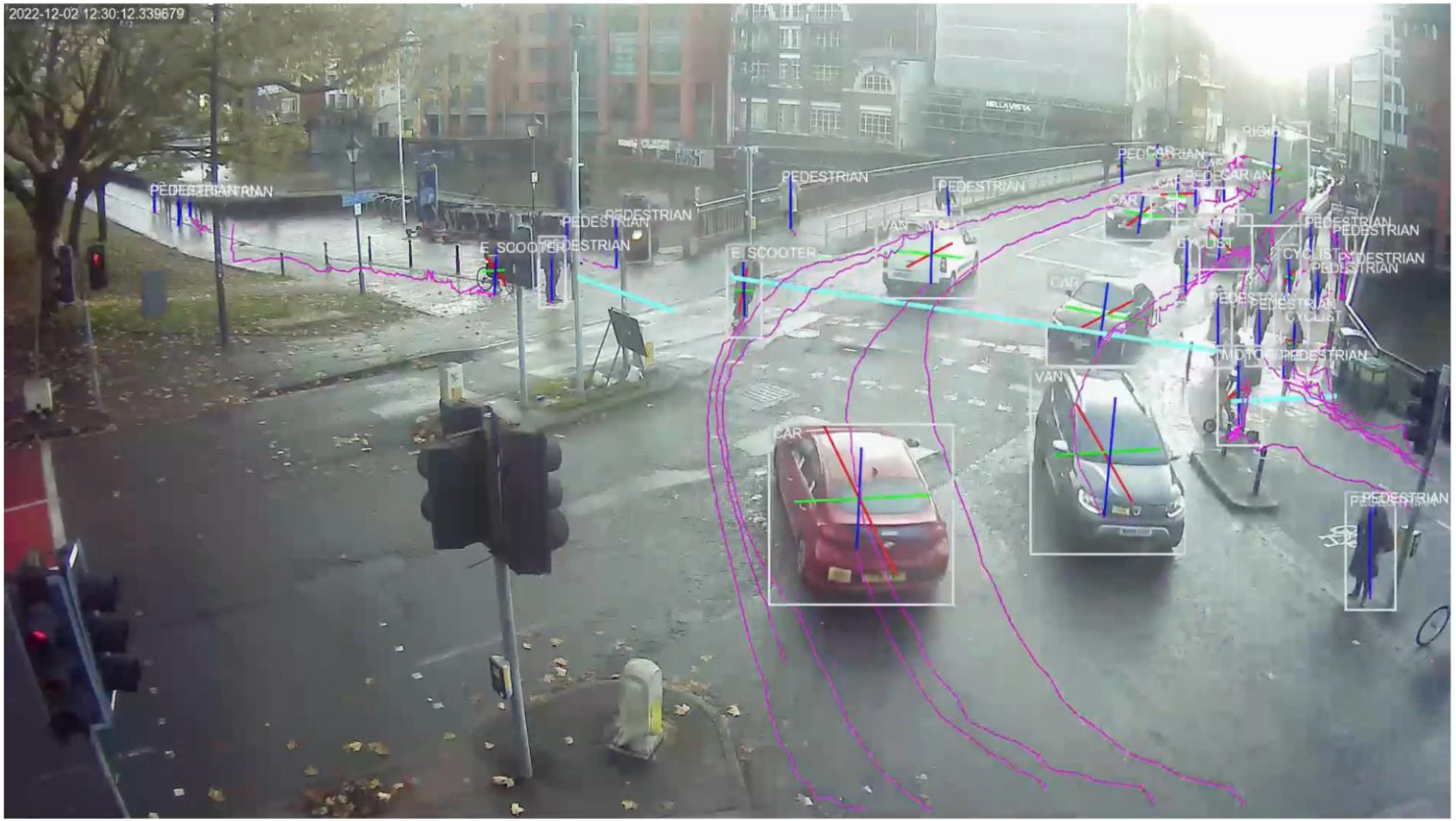
The solution: Edge Vision Sensors

Data is key, measure the right things



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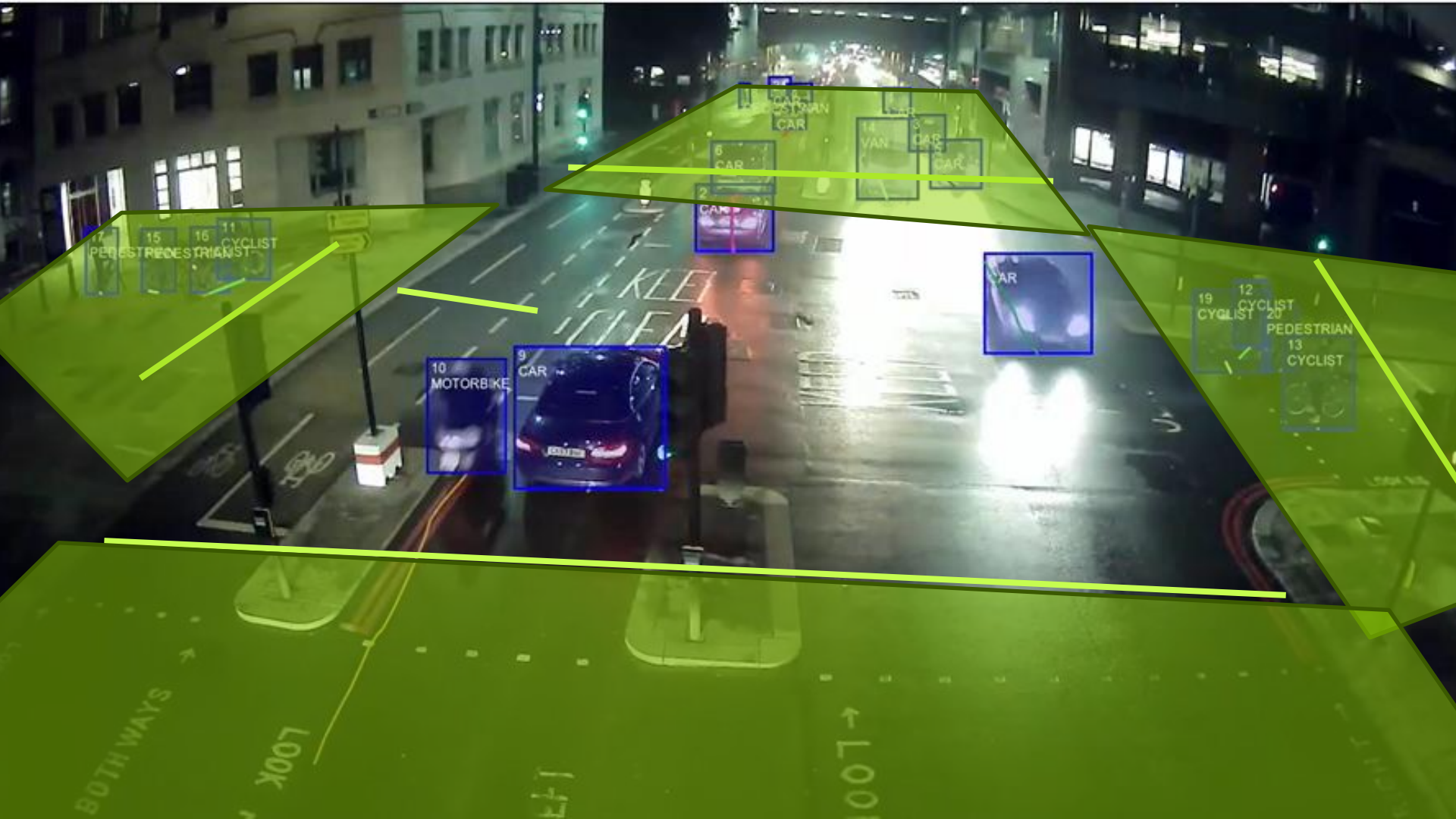
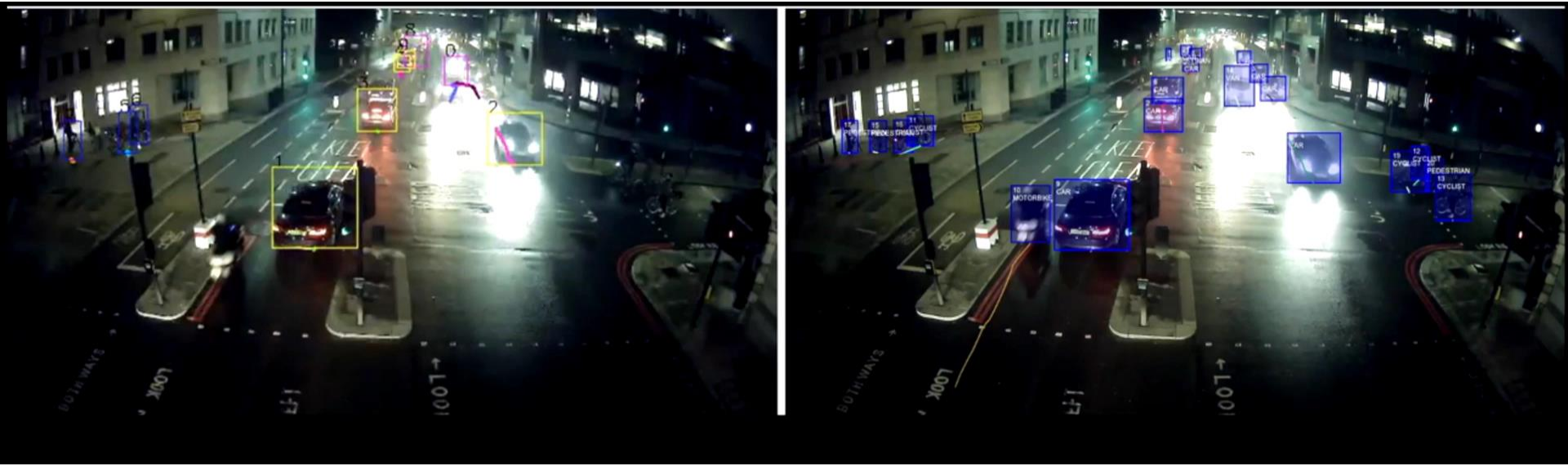


CAR
VAN
CAR
CAR
CAR
CAR
CAR
CYCLIST
PEDESTRIAN
CYCLIST
CYCLIST
PEDESTRIAN
CYCLIST
MOTORBIKE
CAR
BOTH WAYS
LOOK

The solution: Edge Vision Sensors

Not all Computer Vision is Equal



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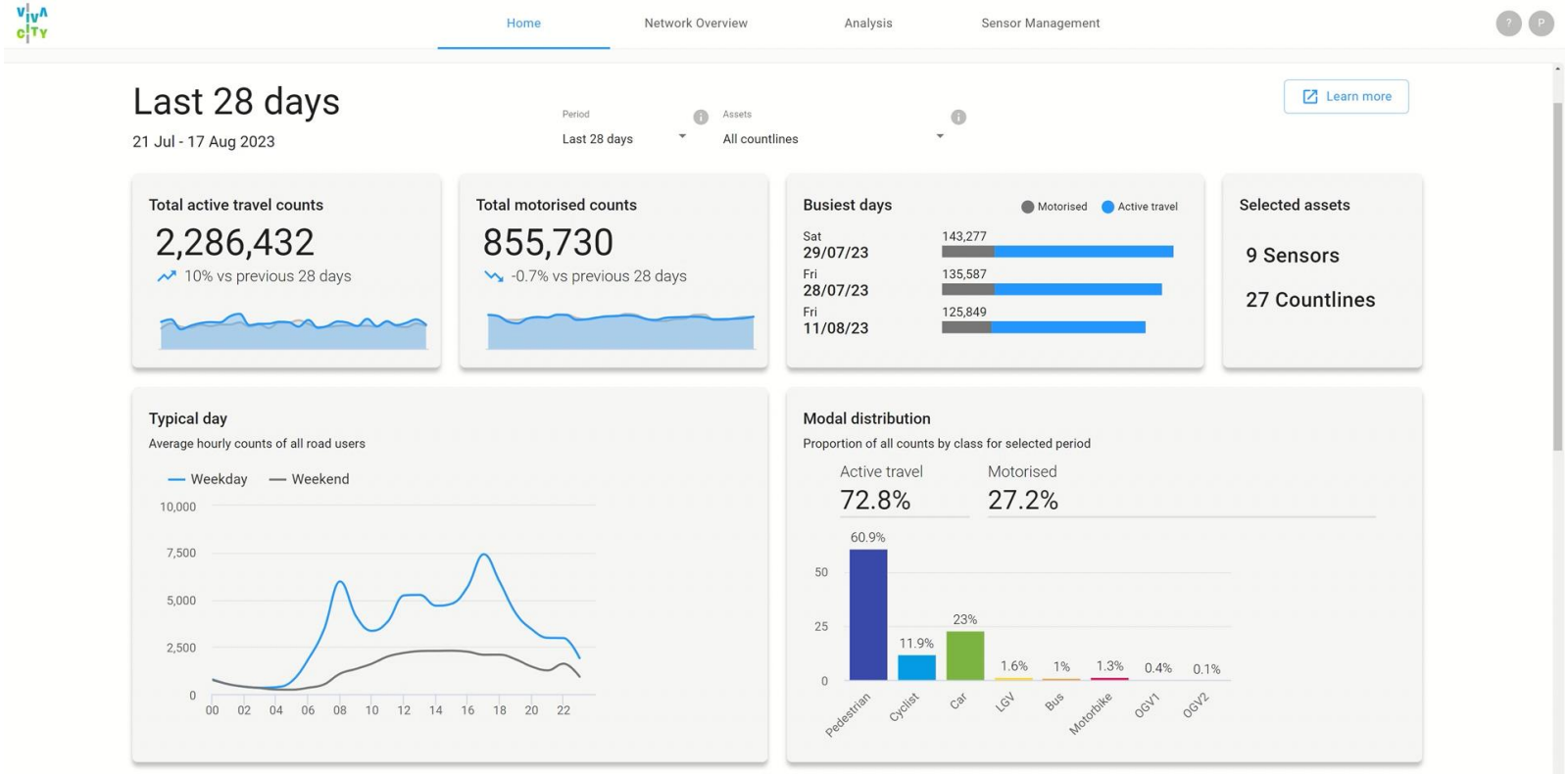
The solution: Data Dashboard

Data Supporting Zeros Strategy



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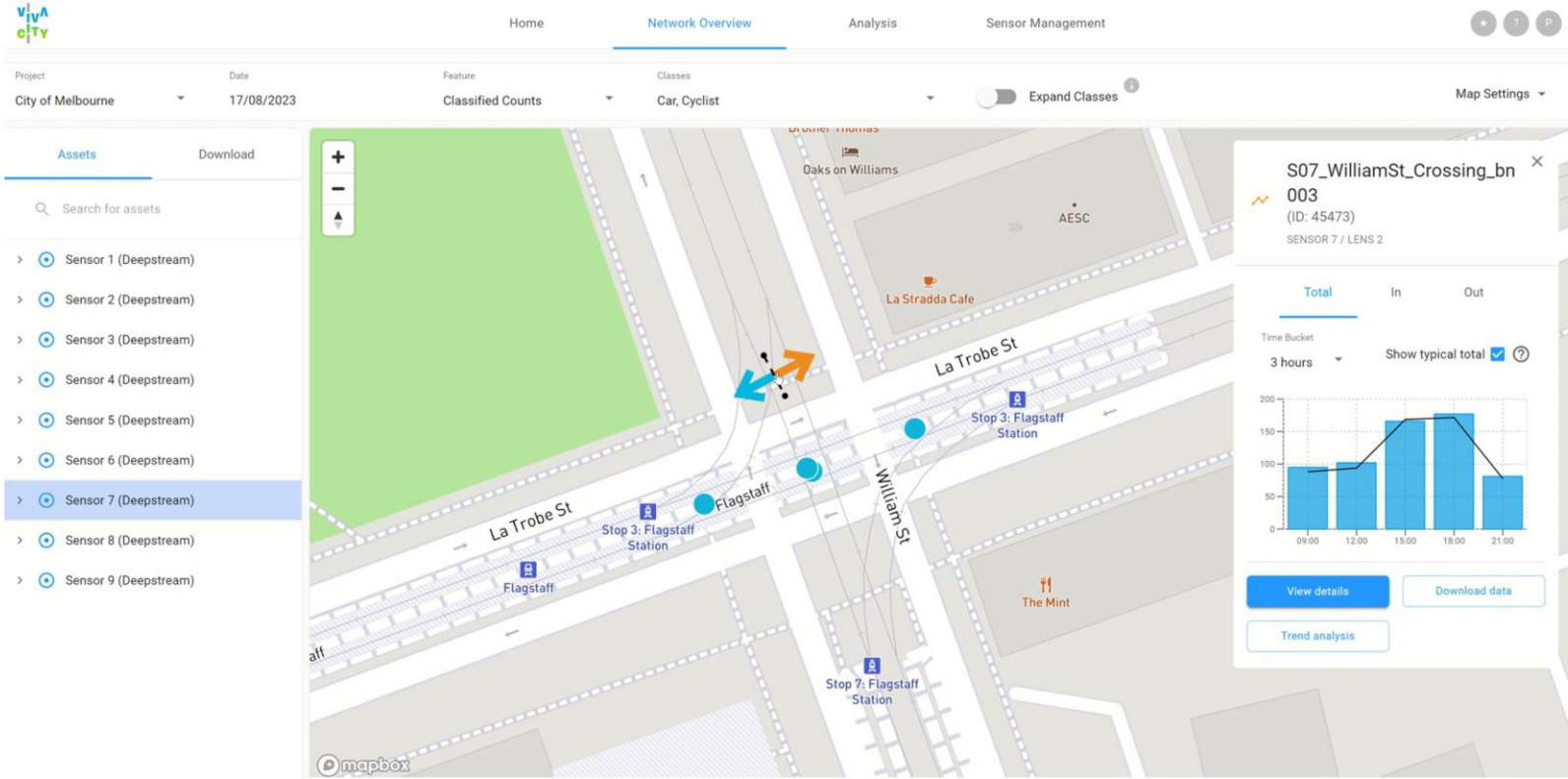

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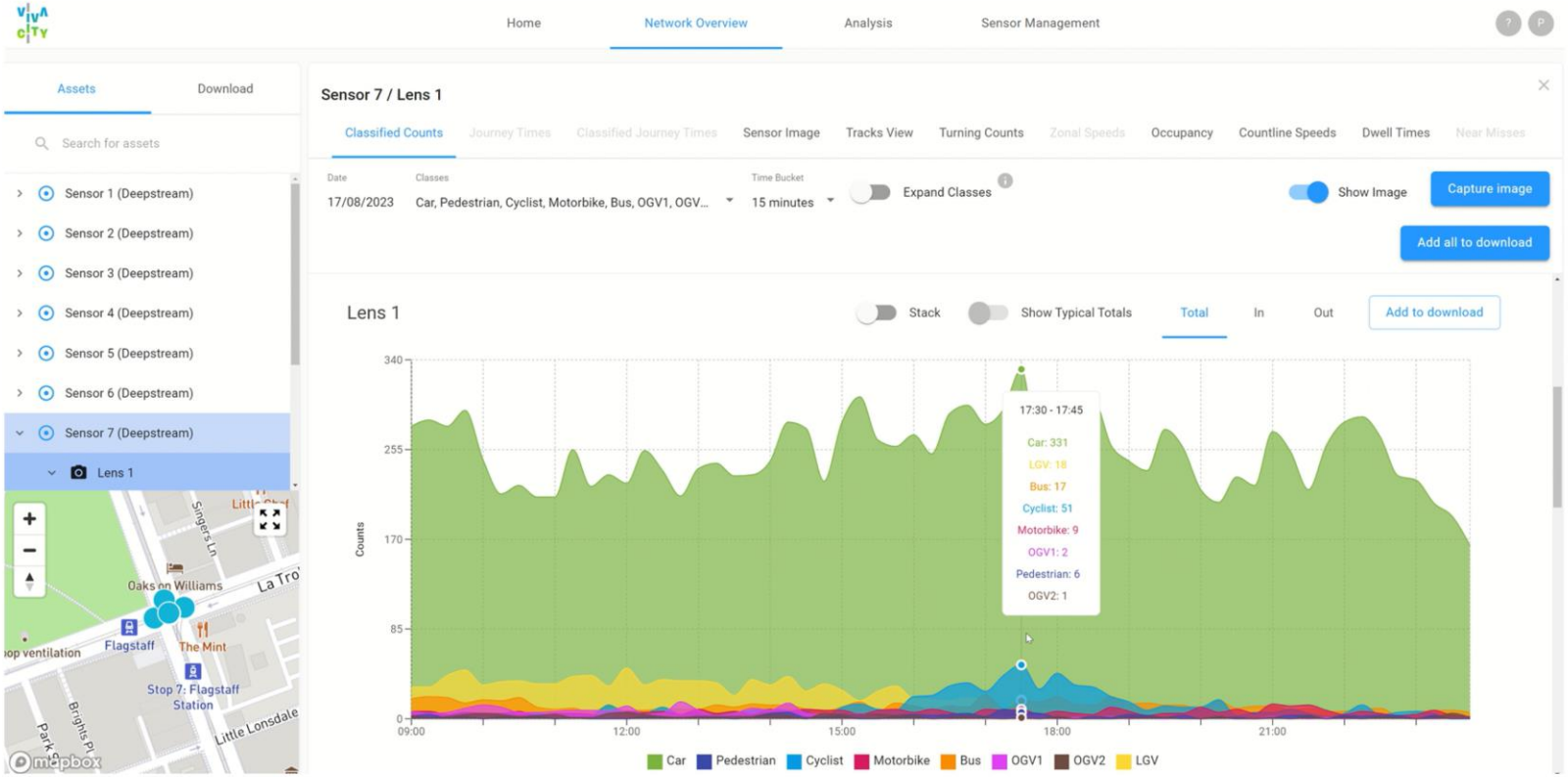

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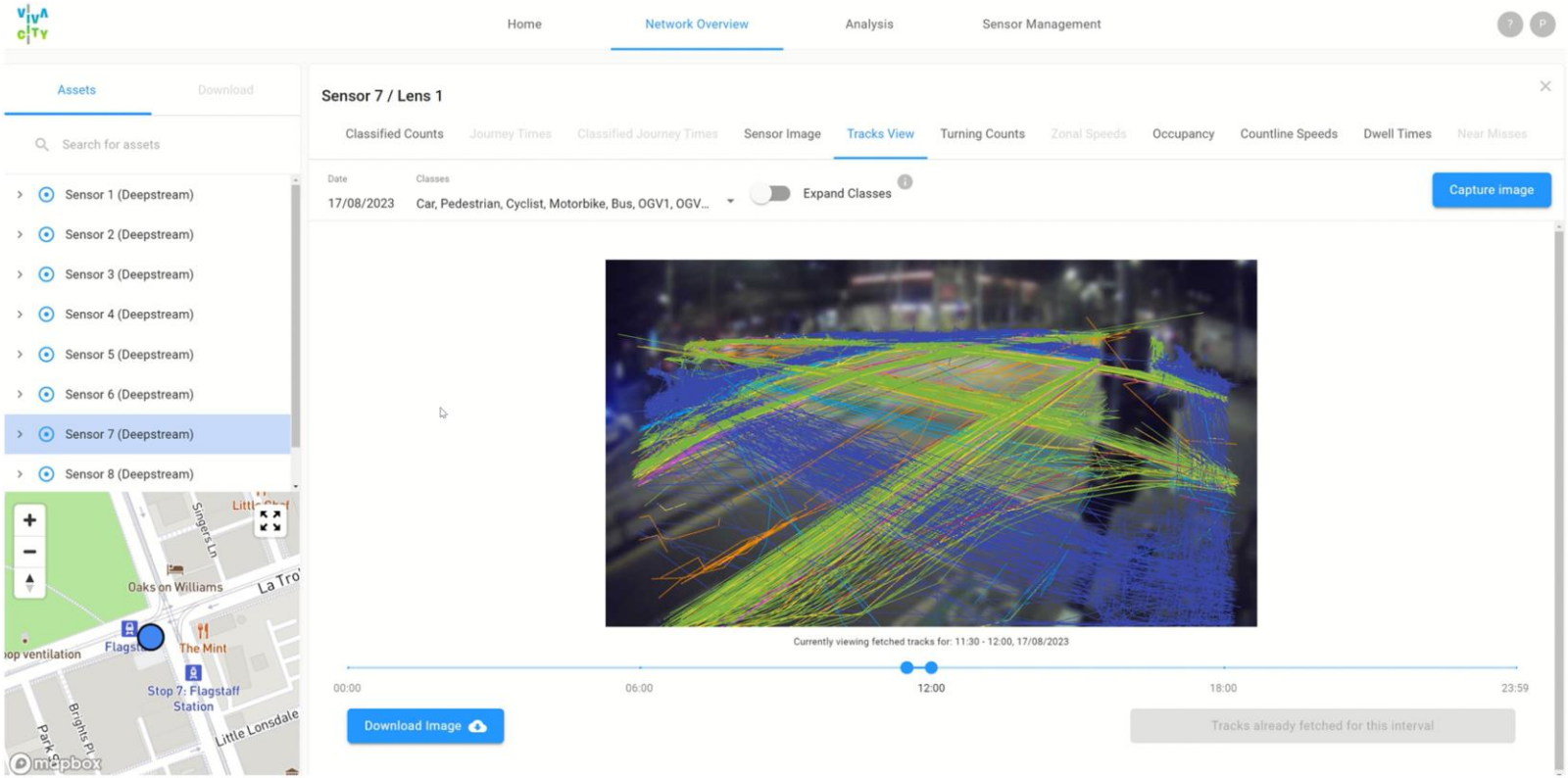

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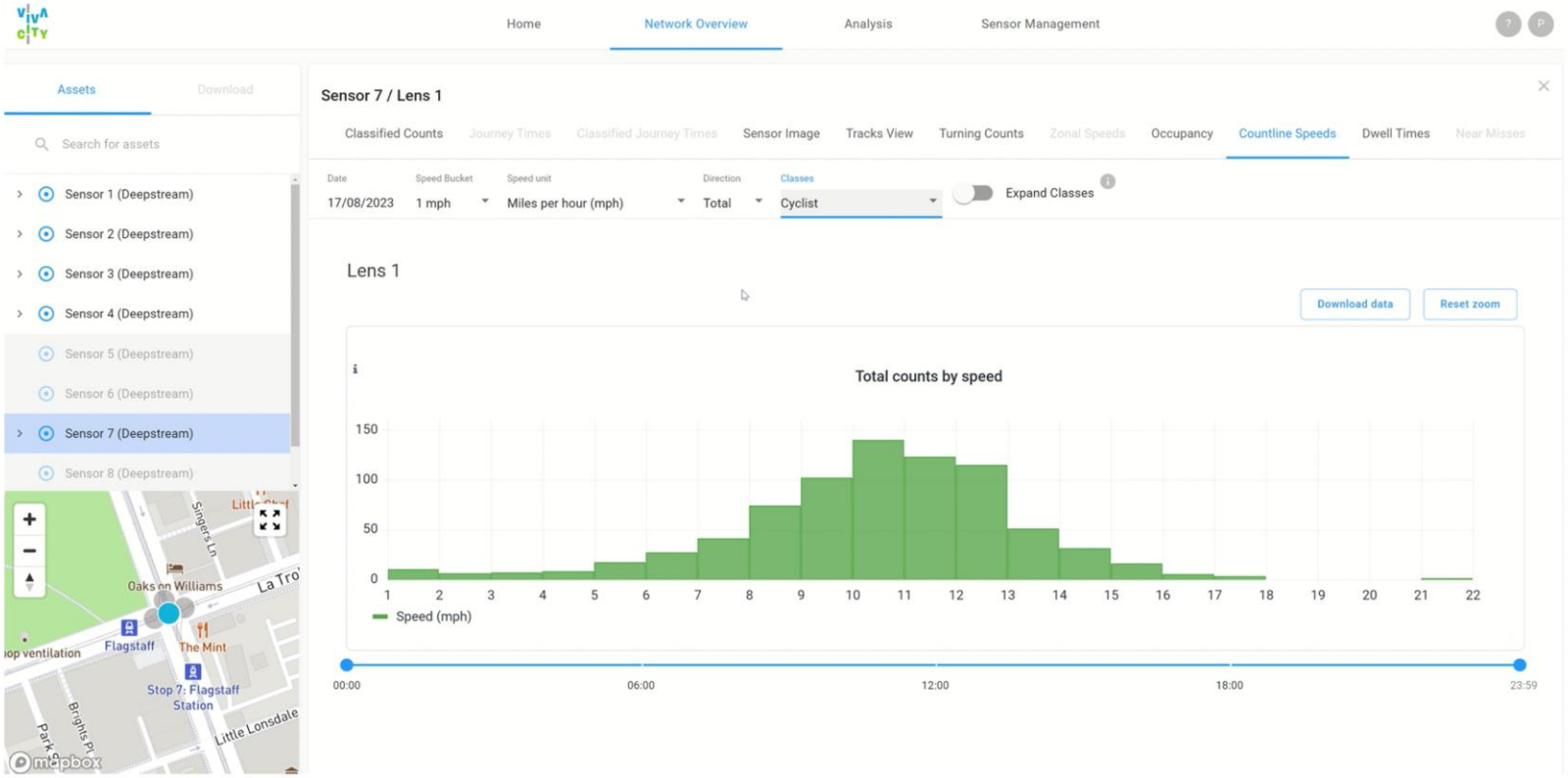

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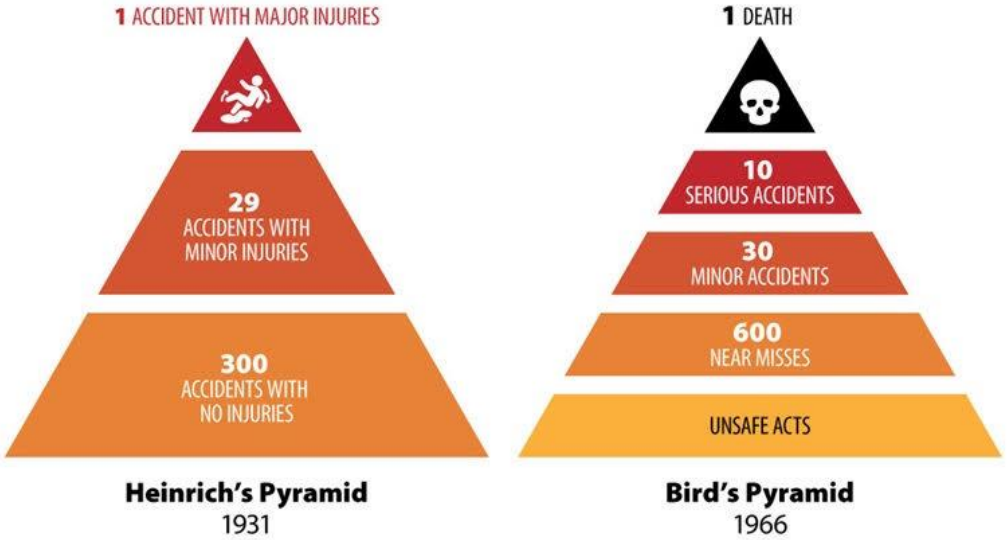
The solution: Directly measure Near Misses

Leading Indicator



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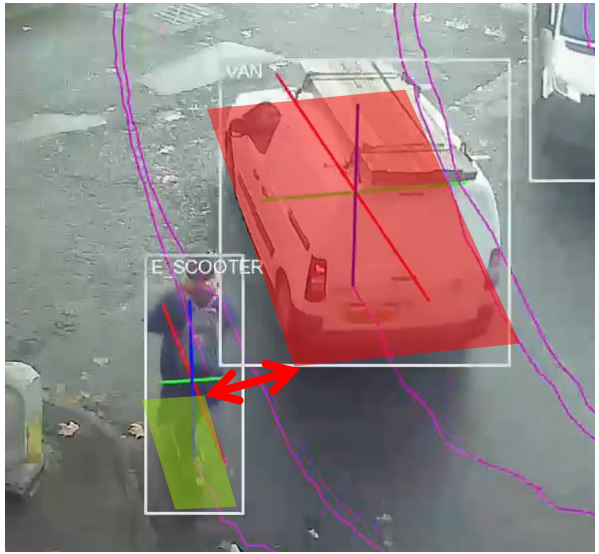
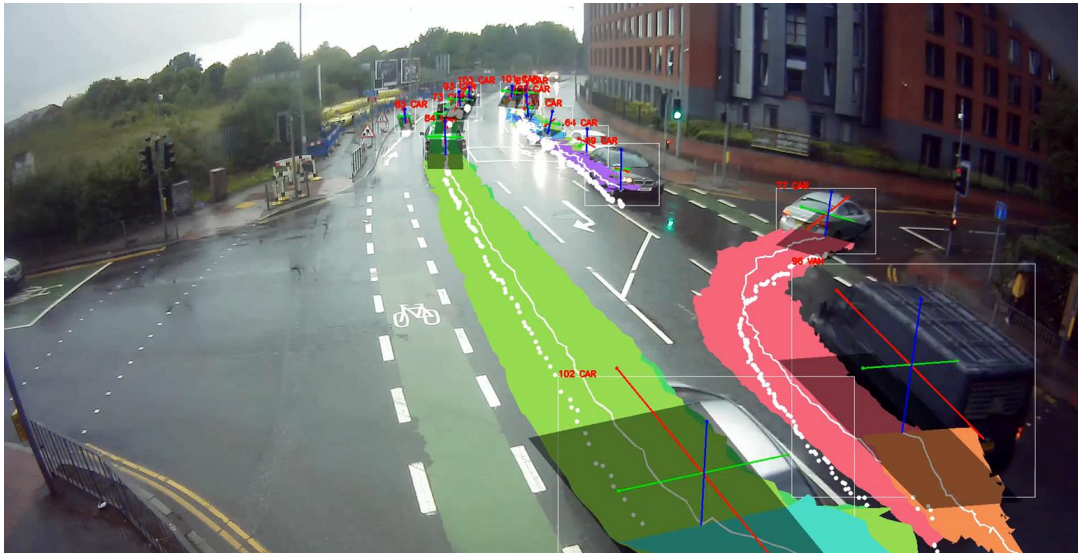
The solution: Directly measure Near Misses

3D Detection becomes key





- 2D AI thinks these two road users have crashed!
- 3D AI enables calculation of vehicle ground plate
- Provides a much more accurate proximity measurement for Near Miss

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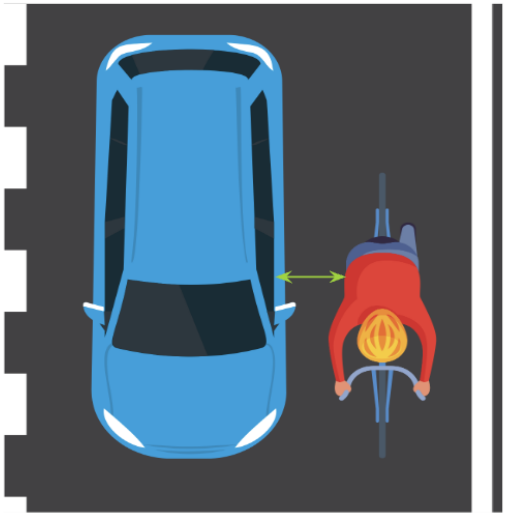
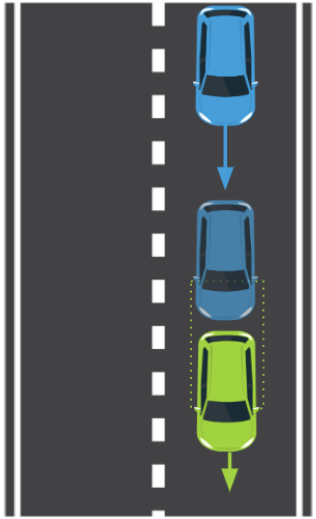
The solution: Directly measure Near Misses

We have identified three principle detection methodologies

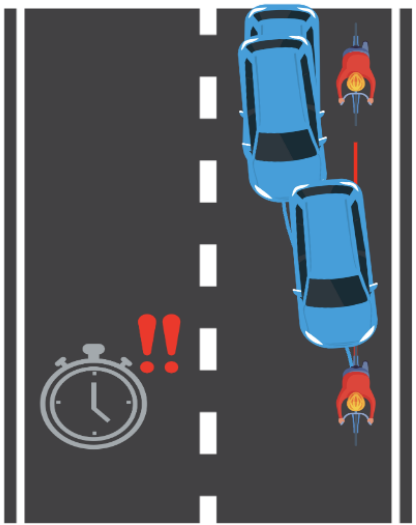
1. Proximal



2. Post-encroachment time (PET)



3. Time to collision



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Case Study: New York City

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

Objectives

- Have Open Streets interventions encouraged more Active Travel?
- Are the new road spaces being used in the way expected by the design team?
- Are there any safety issues that require further interventions to resolve?

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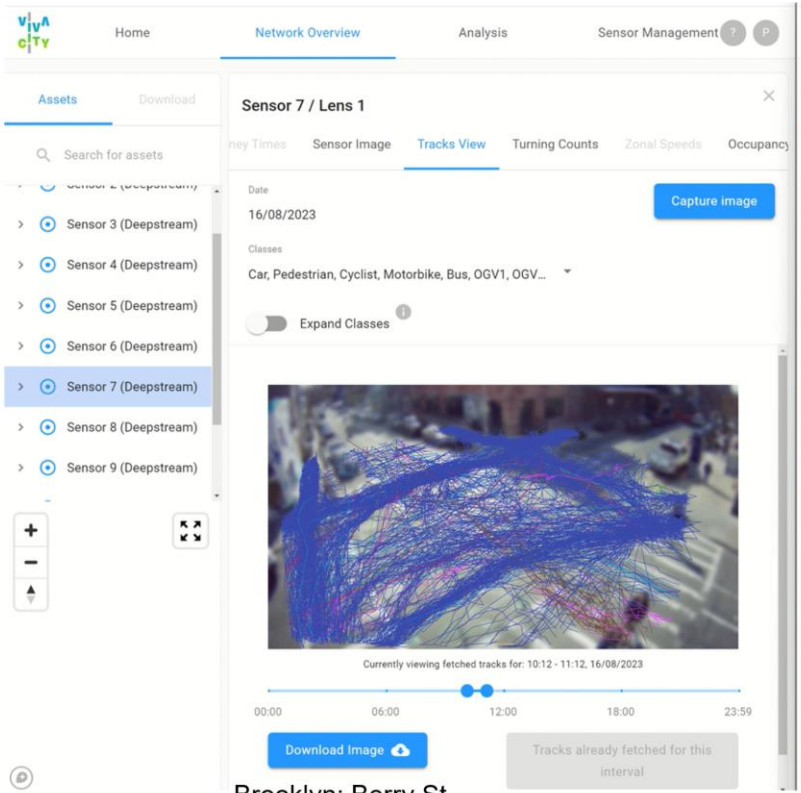
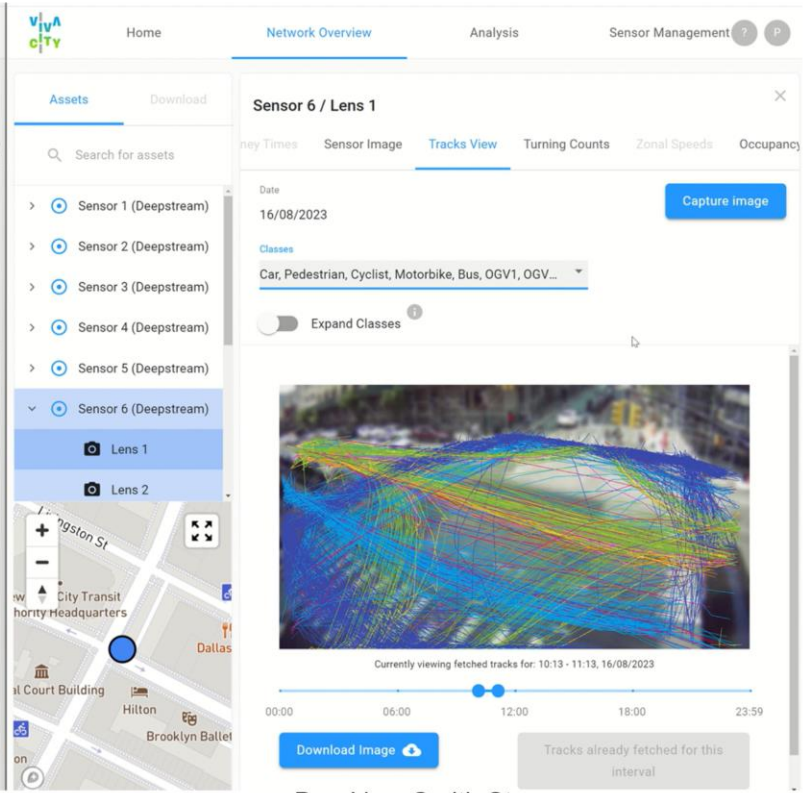


Brooklyn: Berry St
"Open Street Neighbourhood"



Brooklyn: Smith St
"Main Route"

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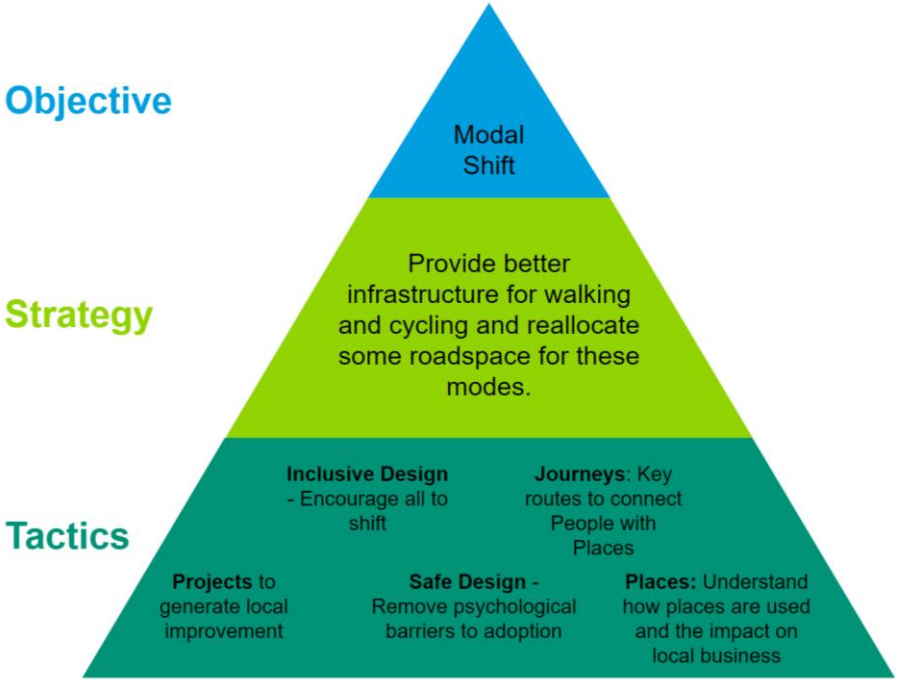
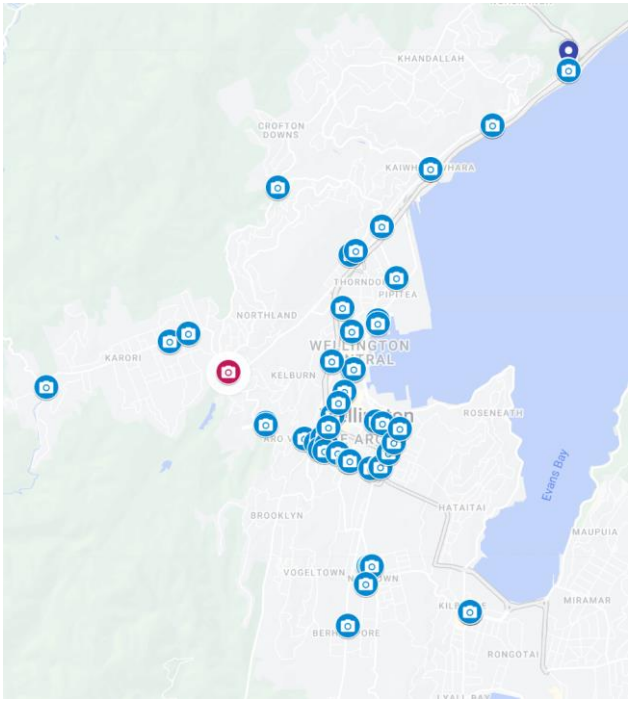
Future Case Study: Wellington City Council, New Zealand

Model Shift Data: City wide strategy & project by project monitoring





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Future Case Study

New Zealand Focused Research

- **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

We are actively looking for authorities in New Zealand to act find us 30 test sites for this innovation project. Please contact me if you have a current accident hot spot that you would like more data on, or a road that you think is currently functioning well and safety to act as our control group.

Interested: peter@vivacitylabs.com

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ANY
QUESTIONS?