

SEE.SENSE[®]

RIDE INSIGHTS

**Bike to Infrastructure
Communications**



ABOUT SEE.SENSE

At See.Sense we're on a mission to **make micromobility better** - by making it **safer**, and collectively **smarter**.

- UK-based, multi-award winning SME
- Founded in 2013 by Husband and Wife team Philip and Irene McAleese, passionate about micromobility safety
- Our products are now used by over 120,000 cyclists worldwide and we work with leading smart cities globally
- Applying **patented sensor and AI-fusion technology**, See.Sense is specialised in products and data for the cycling and micromobility market



OUR TECHNOLOGY: CONNECTED, AI-DRIVEN SENSORS FOR MICROMOBILITY

- See.Sense technology effectively **turns a bike or an e-scooter into a sensor**, generating never before insights into the rider's experience
- Our patented technology **monitors the rider's environment 800 times per second**, using edge processing and AI to providing highly granular data

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See.Sense data insights ...will enhance the effectiveness of our risk model and therefore contribute to our understanding of the risk of collision, helping London to achieve its Vision Zero ambition.

Alex Drake, Data Scientist



-SWERVING
-BRAKING
-COLLISIONS
-ROAD SURFACE
-SPEED
-DWELL TIME
-MOVEMENT PATTERNS

OUR TECHNOLOGY CONNECTS ANY TYPE OF MICROMOBILITY



SEE.SENSE KNOWHERE GPS SENSOR BIKE & E-SCOOTER DEVICE

- Near-real time currently but could be configured higher rates
- Cellular tracking
- Centrally controlled



SEE.SENSE BIKE LIGHTS

- Near-real time currently but could be configured higher rates
- Locally controlled

SEE.SENSE DATA COLLECTED

REAL-TIME

- Bike location
- Speed
- Start-stop (dwell time)

HISTORICAL

- Start/stop information
- Swerving
- Braking
- Road surface condition
- Speed
- Demographic information
(depending on project)





ITS Applications: Bike to Infrastructure

Potential project examples using
See.Sense x TRL UTC SCOOT collaboration

LOCAL AUTHORITY USE CASE

- LA's want to encourage cycling as part of their Active Travel initiatives, and ensure the safe passage of cyclists across the network.
- **Almost 40% of cyclists killed and 70% of cyclists seriously injured are involved in collisions at, or near, a road junction (DfT, 2021)**



UTC AND SCOOT

- Optimises the timings of signals and generates signal activity data every second.
- The signals optimisation **can be influenced and controlled by other data sources** being drawn into the UTC.
- The data produced by SCOOT **can be consumed by external applications and hardware** using a unique open data feed built on top of TRL's UTC.

The logo for TRL Software, featuring the letters 'TRL' in a bold, sans-serif font with an orange 'T' and 'R', and 'Software' in a smaller, black, sans-serif font below it.

TRL
Software

The text 'UTC' in a large, bold, dark blue sans-serif font, with an orange L-shaped bracket to the left and an orange inverted L-shaped bracket to the right. Below it, the text 'POWERED BY SCOOT 7' in a smaller, blue, sans-serif font.

UTC
POWERED BY SCOOT 7

USE CASE 1: PRIORITISATION AT JUNCTIONS

HOW?

- **See.Sense device** sends real-time presence data to **SCOOT** to extend the green phase.
- Could also use prediction - extrapolate from one cyclist, to predict when a peloton of cyclists is arriving (based on bunching due to traffic signal phasing at preceding junctions)
- Central management

BENEFITS

- Prioritise cyclists eg. in case of emergency or for cargo bikes last mile delivery
- Reduces conflicts with cyclists
- Improves experience for cyclist
- Can also detect cyclists outside of junctions



USE CASE 2: GLOSA FOR CYCLISTS

HOW?

- **SCOOT GLOSA** data is communicated to the **See.Sense bike light**
- See.Sense BEAM bike front light has a row of cyclist-facing indicator lights that can be programmed to flash faster to indicate to optimal speed for green signal timings.

BENEFITS

- Reduces conflicts with cyclists
- Improves the rider experience, with less stop and starting



USE CASE 3 - MODELLING

HOW?

Using See.Sense historical data to

- enrich modelling capabilities with additional information beyond the signal detection range
- Inform planning of signal strategies and operations

BENEFITS

- Understand seasonal changes
- See where bunching occurs
- How well/ helpfully does the traffic flow



USE CASE 4 - SAFETY & NEAR MISS

HOW?

Using See.Sense historical data to

- Identify hazardous locations based on harsh swerving and braking patterns
- Inform signal strategies to minimise conflicts

BENEFITS

- Making cyclists visible - even outside junctions that might have cameras
- Data to baseline vision zero
- Gain data on single bike crashes and pedestrian conflicts, not just conflicts with cars.



USE CASE 5 - NETWORK DESIGN AND ASSET MAINTENANCE

HOW?

- Sensor data is collected from See.Sense devices - swerving, braking, road surface condition, speed, dwell time, collisions, journey mapping.

BENEFITS

- Data insights for the safety, identifying hotspot areas
- Road surface data can be used for cycle path asset maintenance



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