

SEE.SENSE[®]

SMART CITIES

IMPROVING CYCLING, IMPROVING CITIES



ABOUT US

SEE.SENSE MAKES CYCLING BETTER

Cycling is one of the most sustainable modes of transport, yet it needs to be safer, more convenient and more enjoyable for everyone.

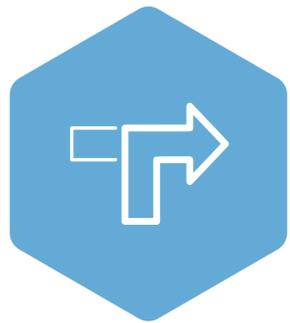
At See.Sense we're working to bring the whole community of cyclists together, with technology, to improve journeys for everyone. This is through our award-winning technology that gives cyclists more visibility on their ride, and cities more information on their roads.

“Transforming cities with big data & bicycle lights”

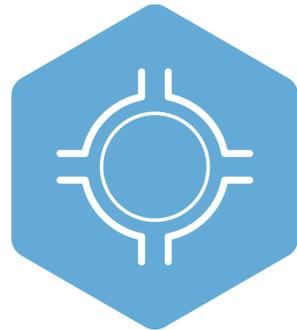
Forbes



ACE REACTS TO ITS ENVIRONMENT, IMPROVING VISIBILITY OF THE CYCLIST



ROAD JUNCTIONS



ROUNDBABOUTS



FILTERING IN TRAFFIC



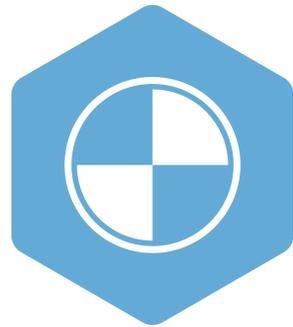
CAR HEADLIGHTS



ACE CONNECTS TO THE FREE SEE.SENSE APP

Use the app to control light settings.

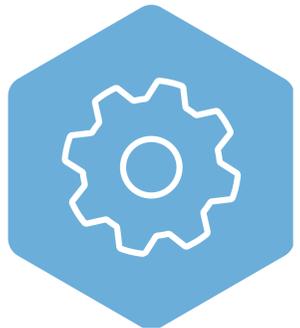
Cyclists can OPT-IN to the See.Sense community to unlock additional features such as crash alert, theft alert, change settings and share aggregated ride insights with their city.



CRASH ALERT



THEFT ALERT



SETTINGS

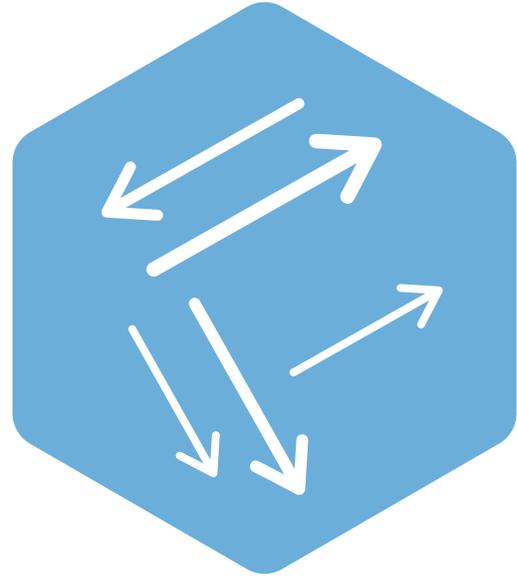


SHARE RIDE INSIGHTS

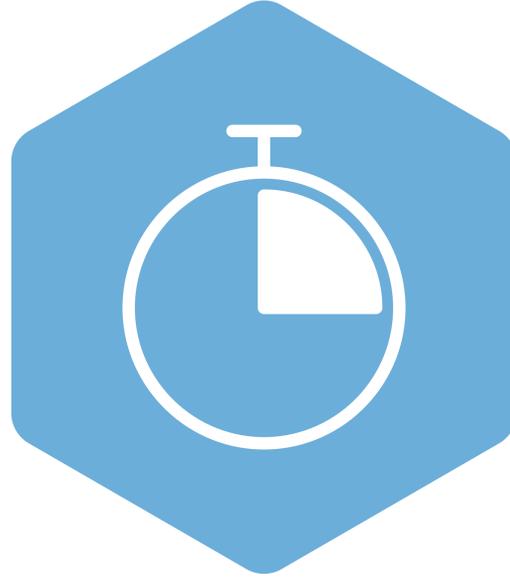


RIDE INSIGHTS COLLECTED FROM ACE SHOW

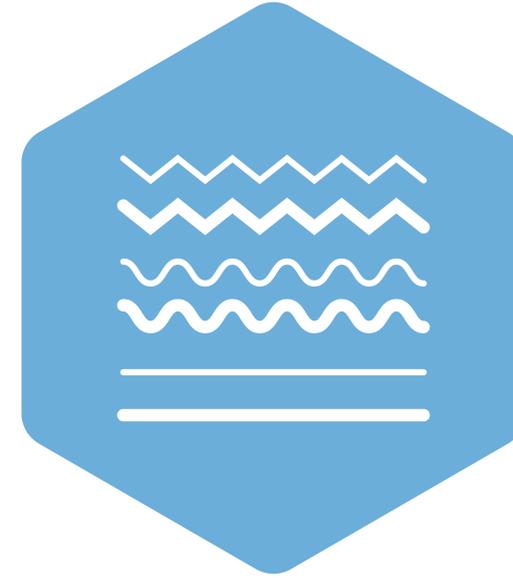
**MOVEMENT
PATTERNS**



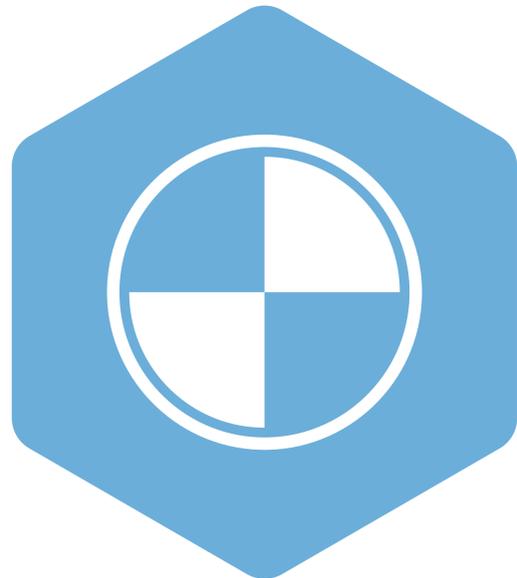
**SPEED AND
DWELL TIMES**



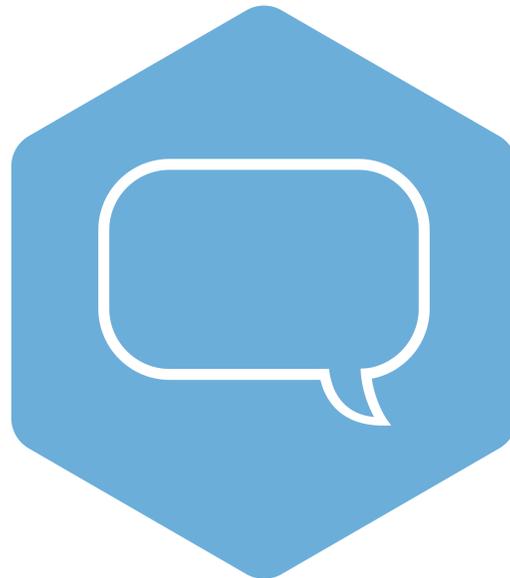
**ROAD
ROUGHNESS**



**COLLISION AND
NEAR-MISS EVENTS**



**CYCLIST
FEEDBACK**



**PROFILE
DATA**





DUBLIN AND SEE.SENSE CYCLING DATA TRIAL

SEE.SENSE®



ENGAGEMENT OF PARTICIPANTS



1,500
cyclists apply

500
cyclists accepted

3
Months of data
collection from
Sep - Dec

2,027
annoyances
recorded

6,862
Total number of journeys

33,942
Total distance covered (km)

SMART CITIES // MANCHESTER

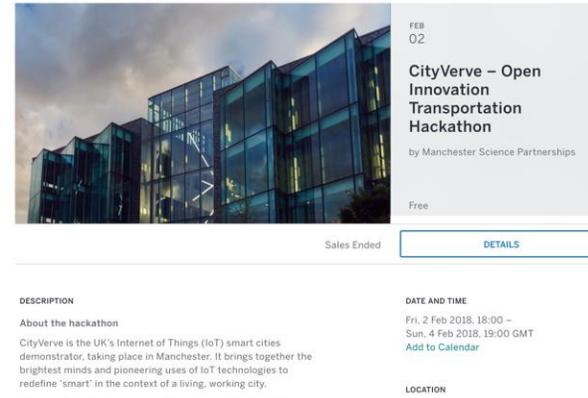
**MANCHESTER CITY TRIAL: THANK YOU! **
Thank you once again for your participation in the See.Sense Manchester City Trial, run in conjunction with BT and CityVerve.



Monthly Newsletter



Public Showcase



Hackathon

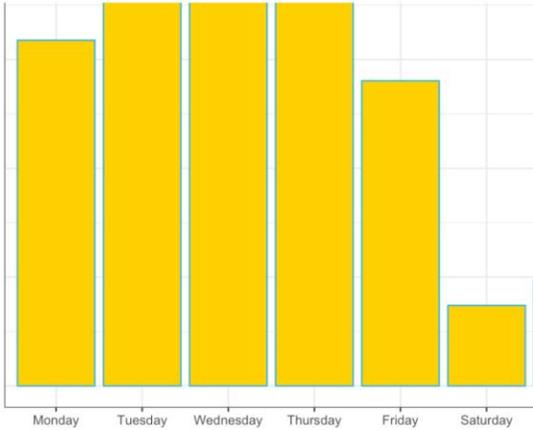


Participant Workshop

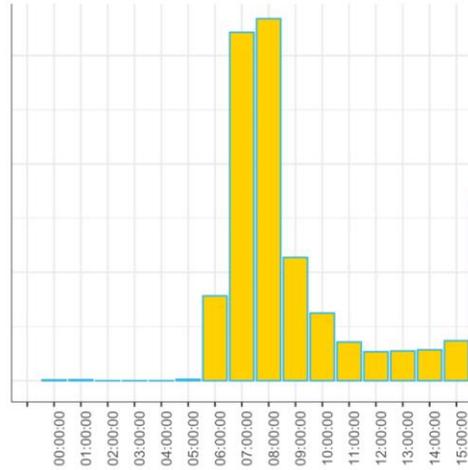
WE ACHIEVED A REPRESENTATIVE COMMUTER SAMPLE

Majority of cycle journeys take place Mon-Fri during peak commuter periods.

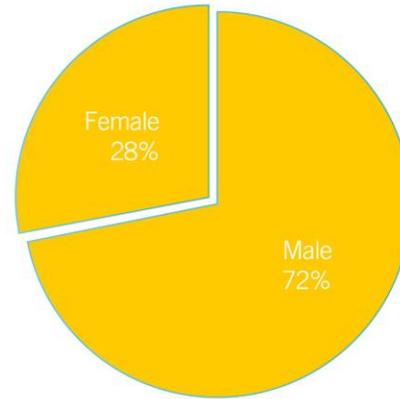
Popular days of the week



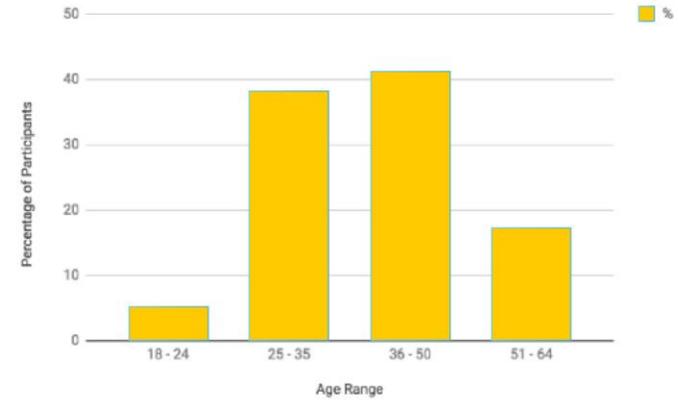
Popular hours of the day



Male vs Female Participants



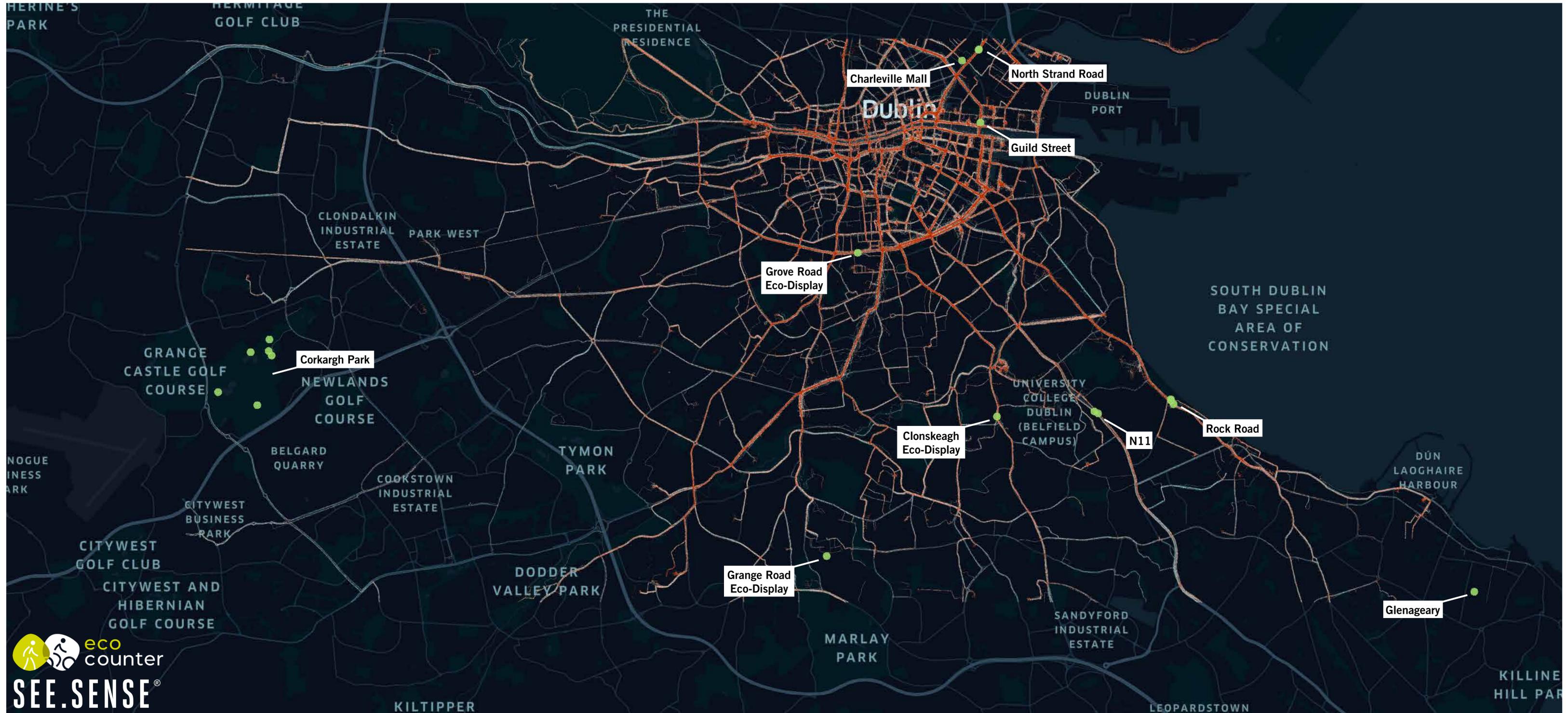
Age Range of Participants



SEE.SENSE DATA COVERAGE

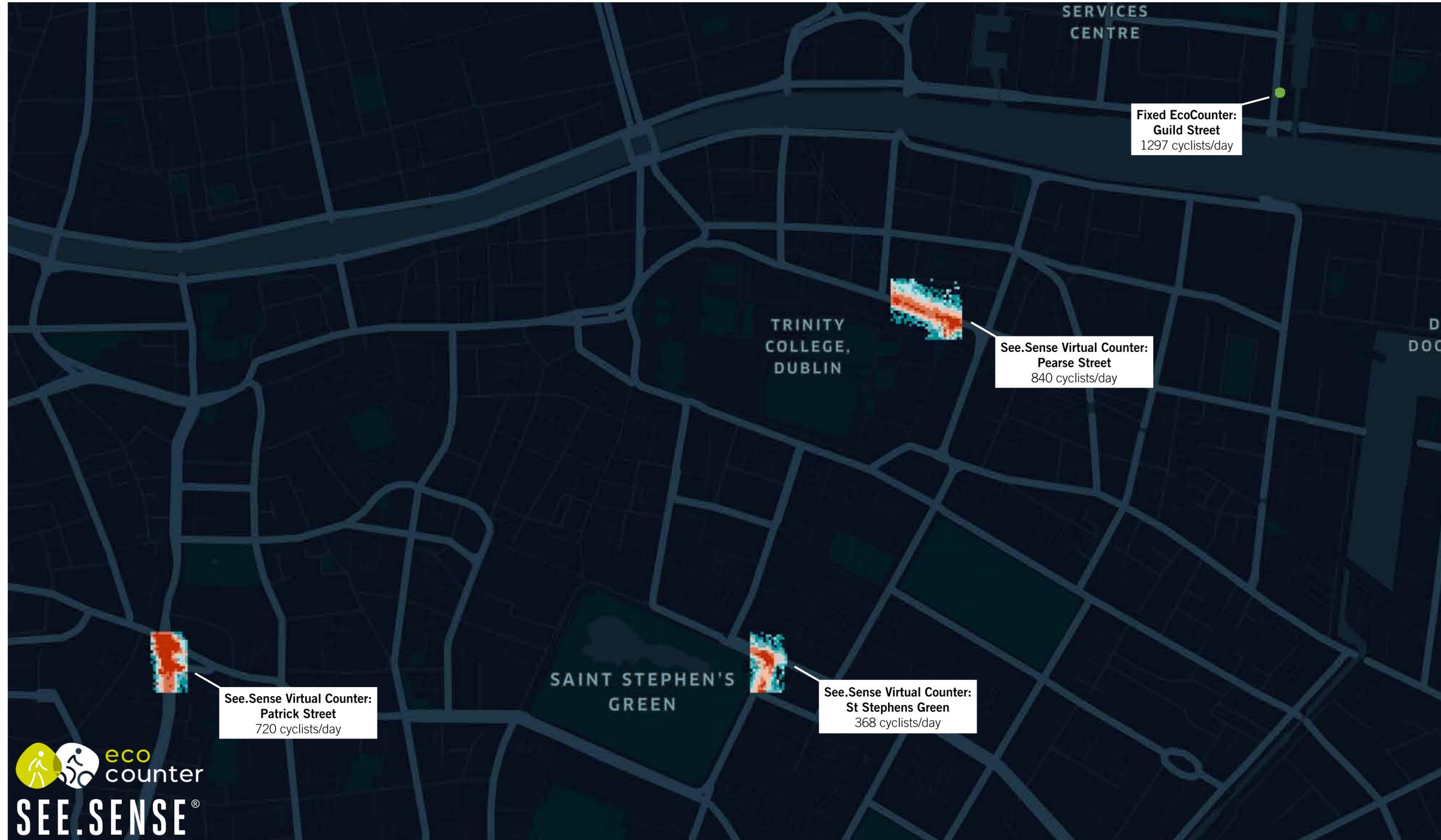


ECO-COUNTER X SEE.SENSE IN DUBLIN



USE CASE 1: EXTRAPOLATION TO CREATE VIRTUAL COUNTERS

A series of three virtual counters, generated by extrapolating riders from the fixed point:



ECO-COUNTER

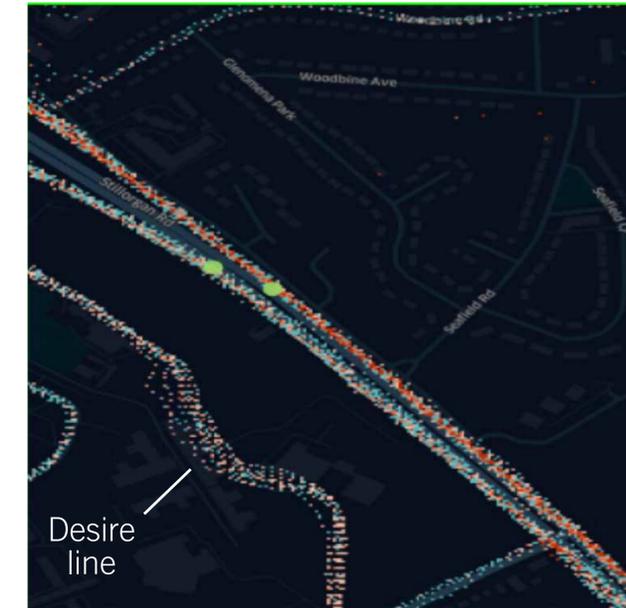
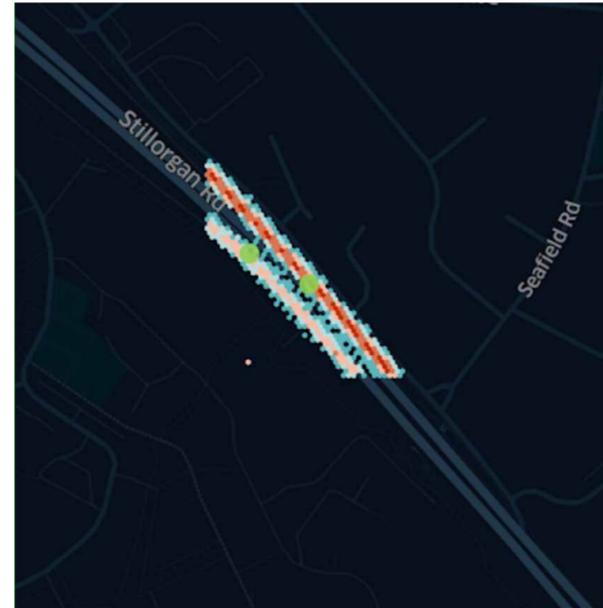
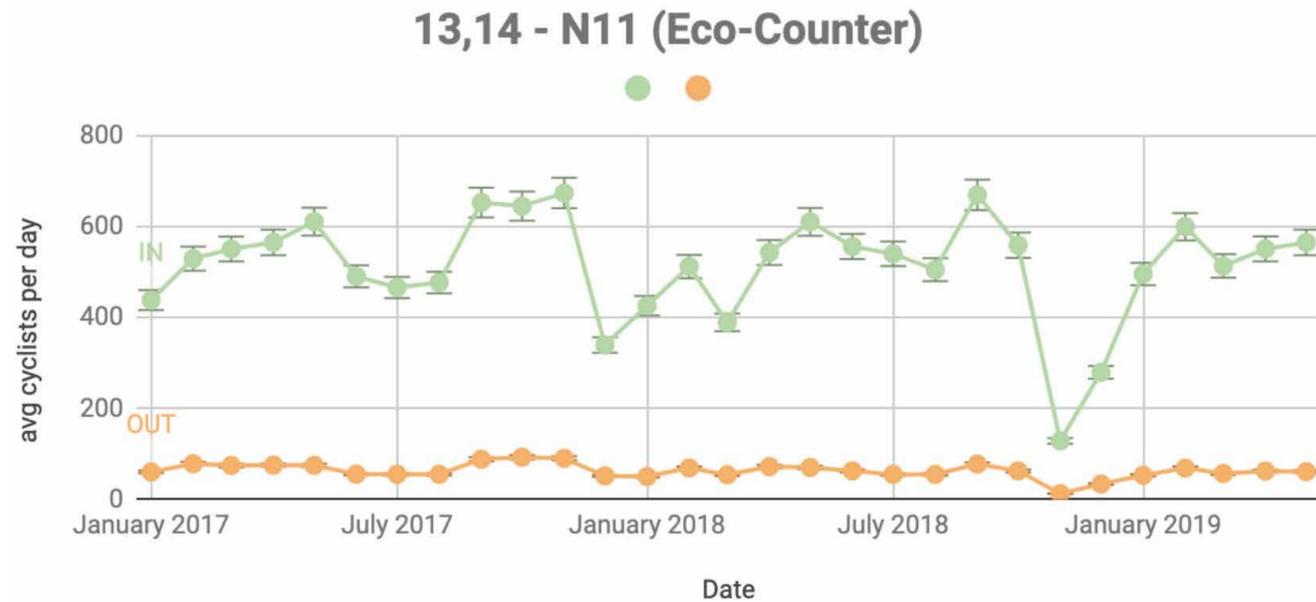
Average cyclists per day at Guild St in October 2018.

SEE.SENSE

GPS reading at same counter location in October 2017 (extrapolated from 2018 data).

USE CASE 2: USE DESIRE LINES TO IDENTIFY LOCATIONS FOR SUPPLEMENTARY COUNTERS

Stillorgnan Rd



Both Eco-Counter and See.Sense data indicates that cyclists have a preference of using Stillorgnan Rd on the way down rather than going up the hill.

See.Sense data shows desire line, where cyclists are taking an alternative route for the journey uphill. Indicates location for supplementary counter.

LEVEL OF SERVICE CASE STUDY



AECOM worked with See.Sense on a methodology for a Quality of Service assessment to measure how well the needs of cyclists are met - Grades A+ (highest) to D (lowest).



A level of service makes it possible to identify where investment in infrastructure will yield the highest return, thereby improving urban mobility, air quality, health and active travel.

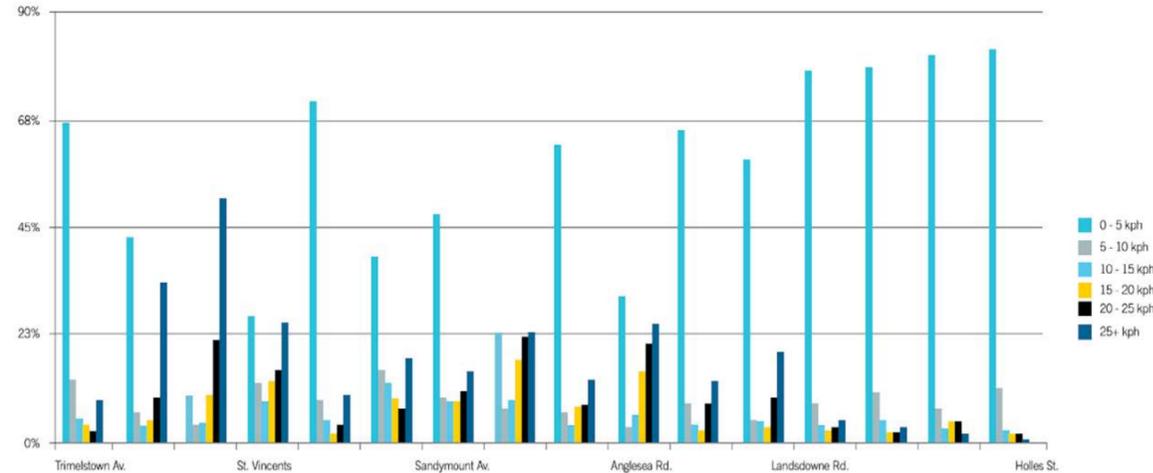
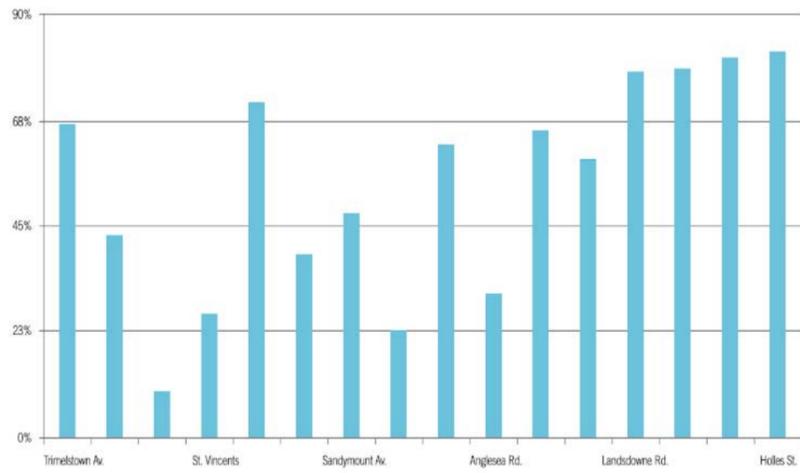


The current methodologies for quality of service assessments are labour intensive. They involve site visits to collect data usually by teams of people. Depending on the size of the network the process can often take several months or even years.

A NEW METHODOLOGY WAS TESTED USING SEE.SENSE DATA

JUNCTION ANALYSIS (INBOUND)
Avg. Speed at Junctions

JUNCTION ANALYSIS (INBOUND)
Delay at Junctions (% results with speed <5kph)



Data recorded by the See.Sense lights was used to get a better understanding of a Cities cycle network in terms of: Desire Lines, Junction Delay, Pavement Condition & Conflicts.

ROAD & PAVEMENT CONDITION

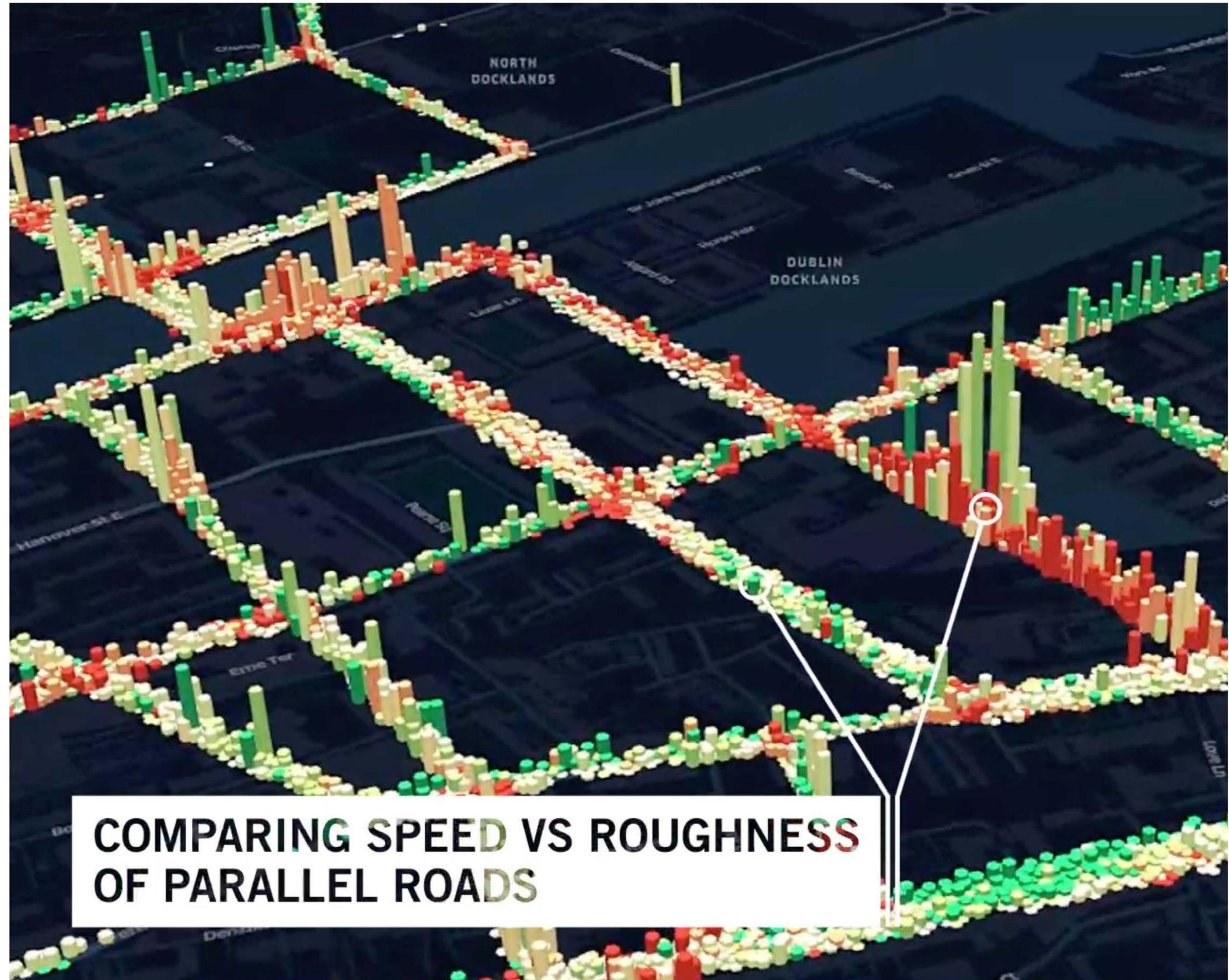
An AECOM engineer conducted a visual inspection and compared the SSRI (See. Sense Roughness Index) with the rating AECOM would apply. A strong correlation was found.

DATA VISUALISATION VIDEO EXAMPLE FROM DUBLIN

<https://youtu.be/co2iebOUDtU>

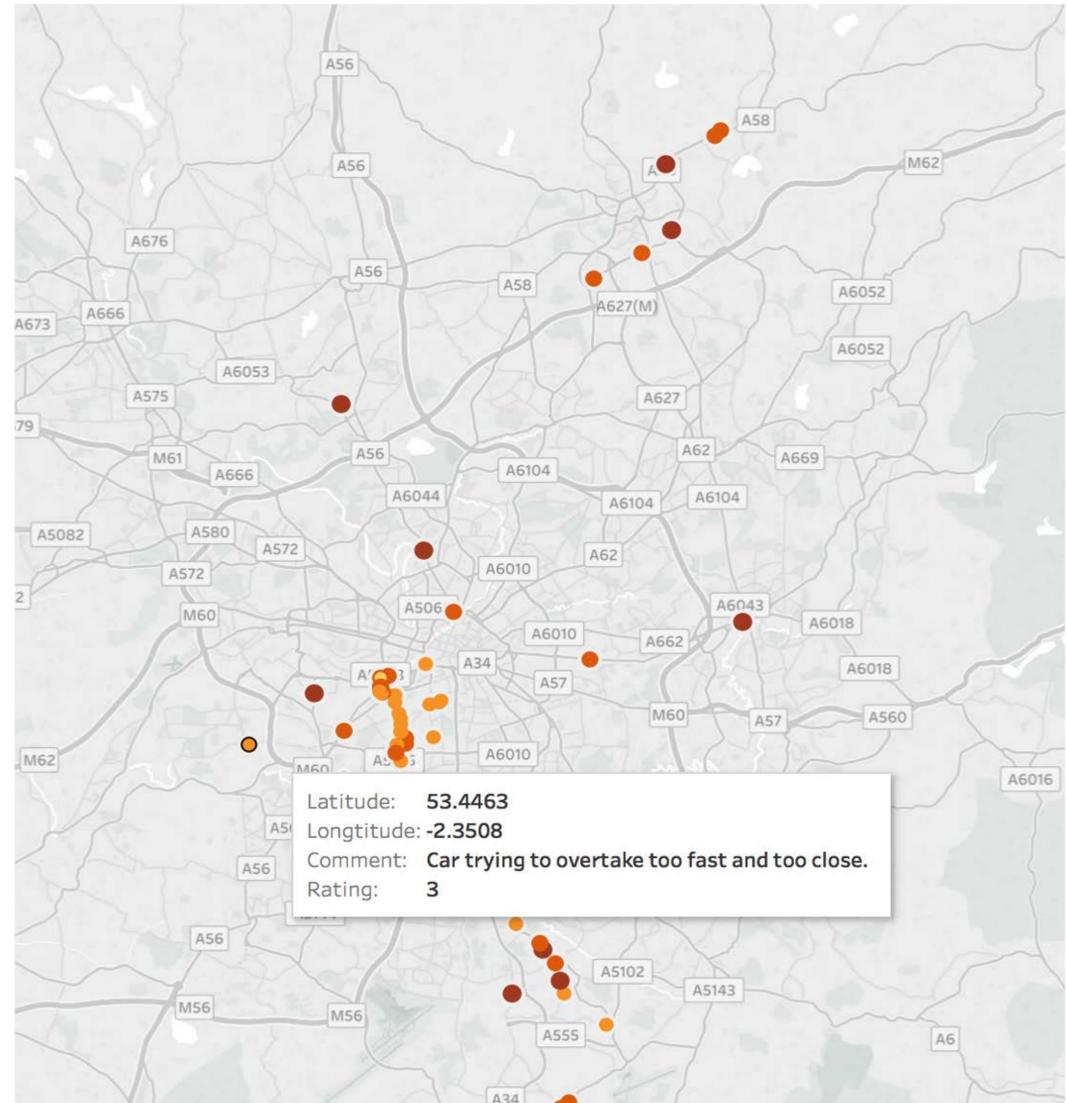
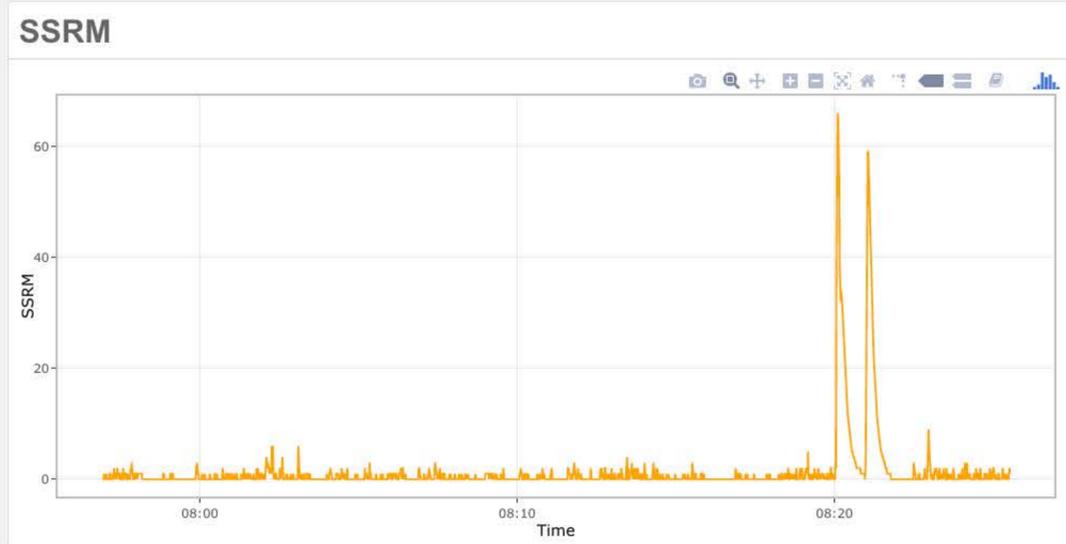
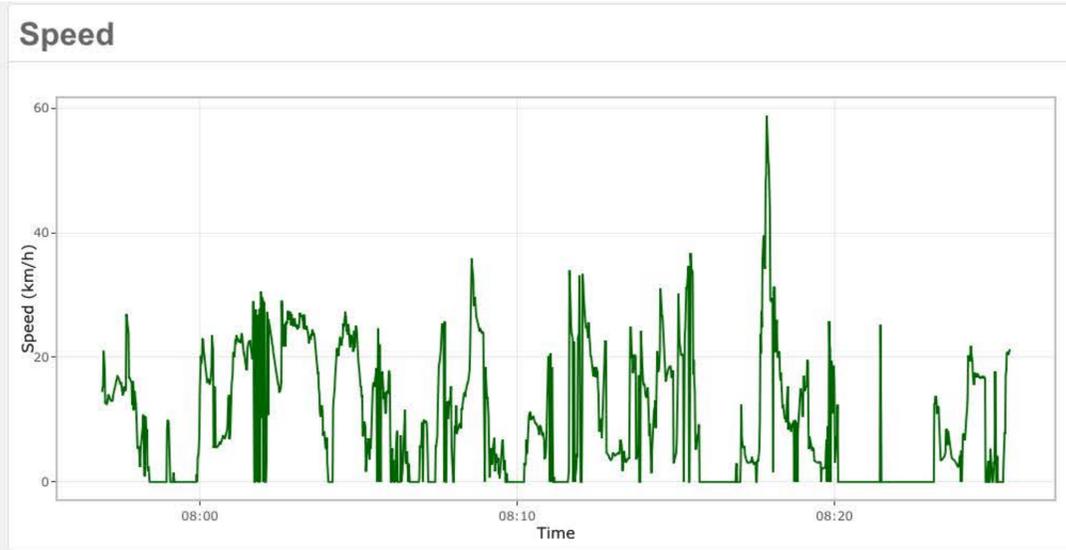
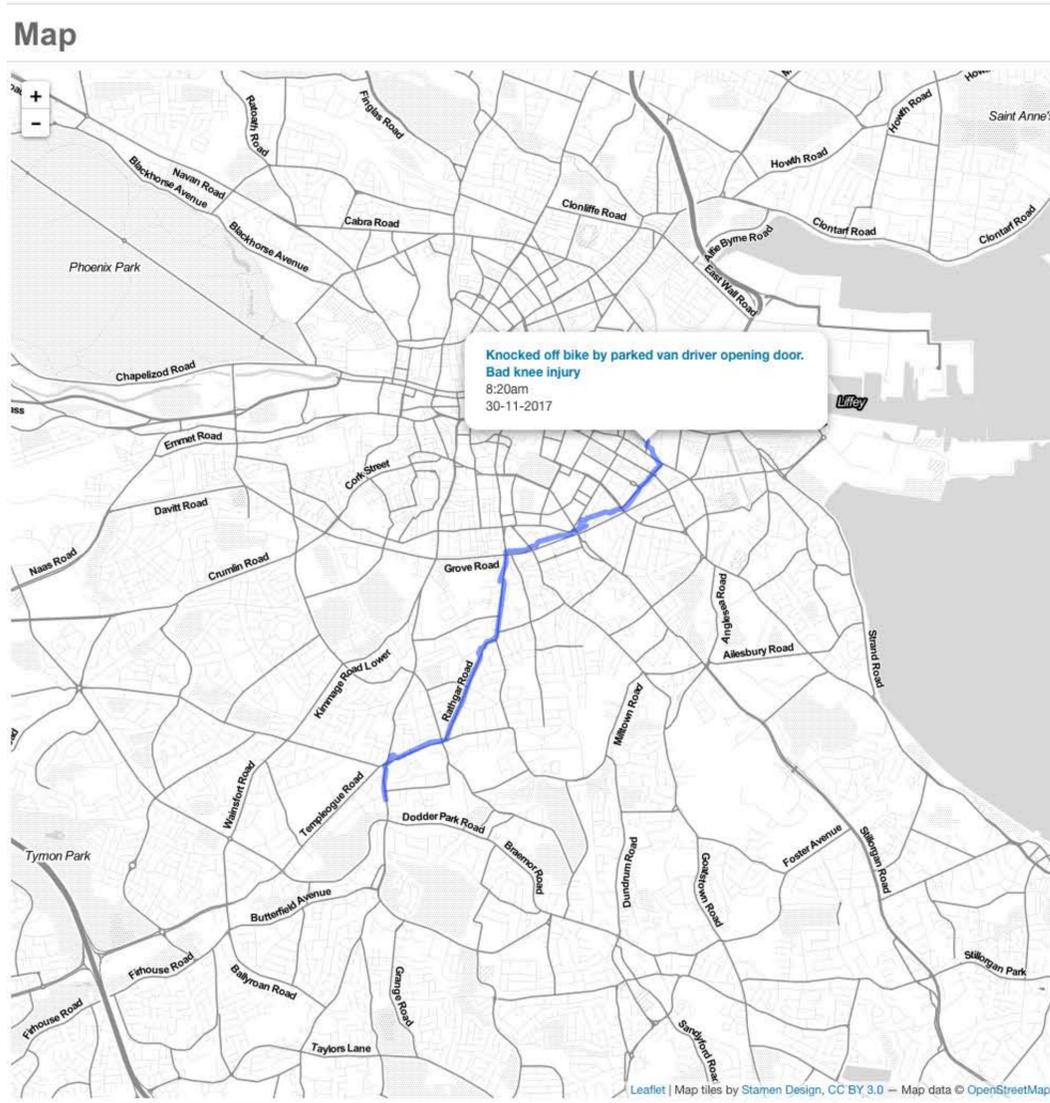
This video gives a demonstration of analysis in Dublin showing:

- _ comparison of popular ingress routes
- _ speed vs roughness on parallel roads
- _ analysis of how junctions can disrupt flow
- _ identification of bike parking requirements



MAP COLLISION AND CLOSE PASS HOTSPOTS

Enabling proactive data based responses to improve problem areas.



Cyclist reporting of collision using See.Sense App.

See.Sense sensor data identifies collision event, location, and the speed cyclist was travelling at time of collision.

Close Pass events reported in Manchester.

SELECTED FOR THE LARGE SCALE IOT PROJECT SYNCHRONICITY

THEME

Encouraging active (non-motorised) travel

PROJECT TITLE

Smart Cycling Project

PARTNERS

See.Sense & BT

800 participants over 3 European countries



MANCHESTER
CITY COUNCIL



CYCLISTS CAN OPTIONALLY CREATE PROFILE INFORMATION

Our project participants have a facility in the app to provide information on their profile, allowing data to be disaggregated by:

- _ Age
- _ Gender
- _ Cycling Experience level
- _ Type of bike



MOBILE APP UPDATES

PROFILE INFORMATION

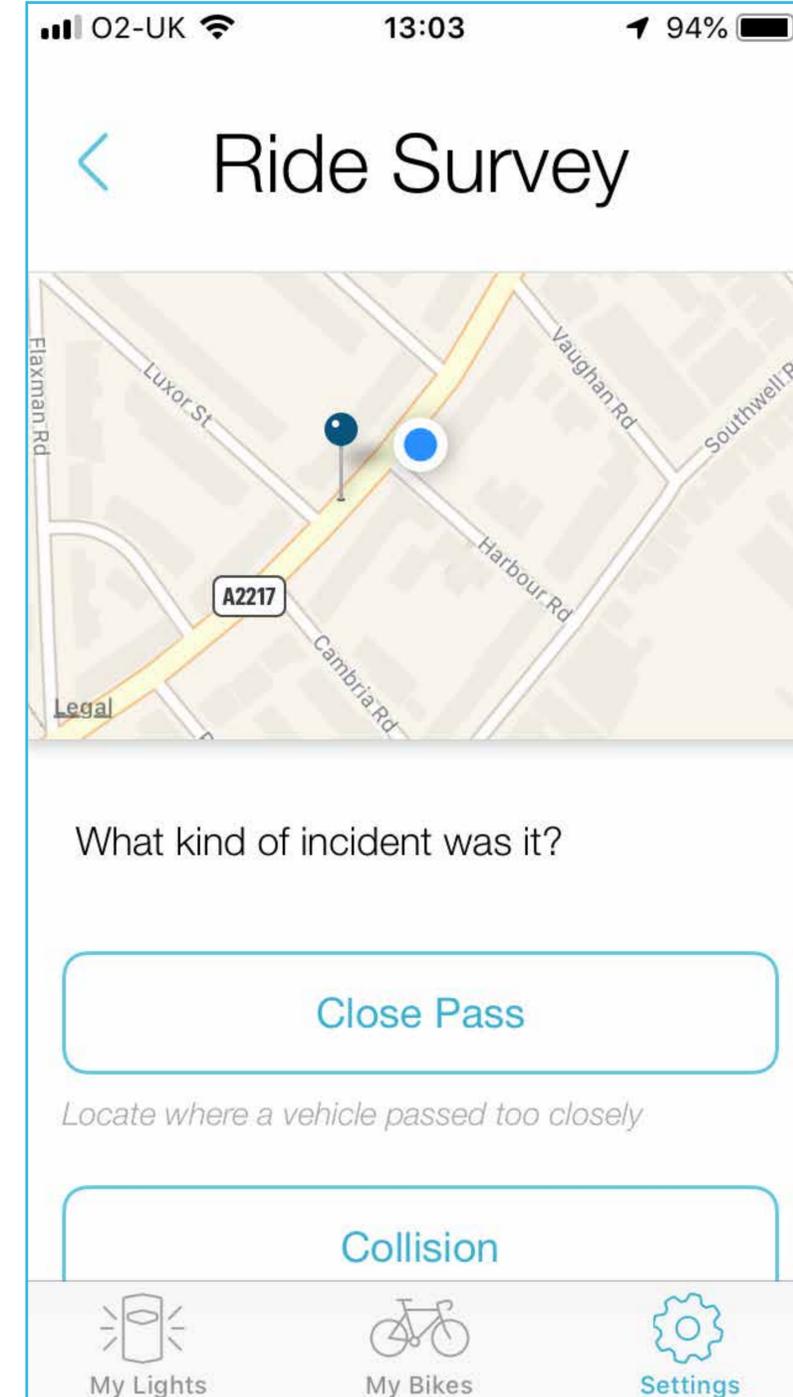
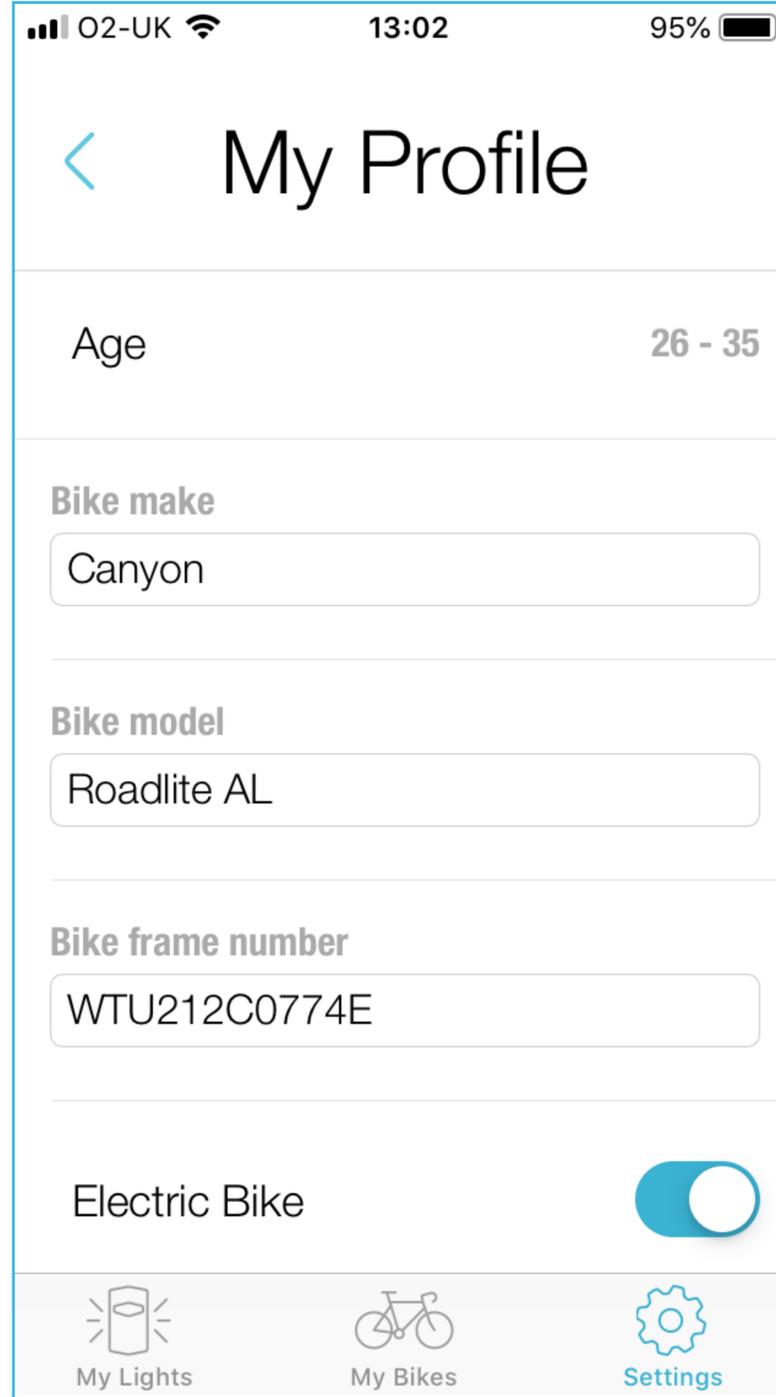
We have updated our iOS and Android BETA apps with:

Account profiles

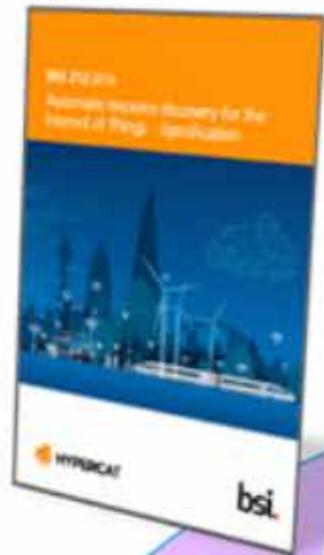
Enabling us to see gender, age, e-bike use and monitor how these influence route choice.

Ride surveys

Enabling us to gather qualitative insights into the conditions faced by project participants.



BT IoT DATA HUB



(On-boarding of Information)

(Connecting applications to information)



Applications

City Motion Map	Supply Chain	Smart Energy Usage	Smart Water Usage
Connected Buildings	Air Quality	Assisted Living	Smart Street Lighting
Connected Home	Smart Waste Management	Smart Parking	Connected Vehicles

A safe and secure way to way to expose data in a collaborative ecosystem

- _ Lowers barriers for sharing data from sensor systems, events and geo data
- _ Sensor and network agnostic
- _ Ecosystem for data sharing, supporting:
 - _ Data providers
 - _ Data consumers (app developers, analysts or proprietary systems)
 - _ Further exposure to other data hubs and marketplaces

Includes

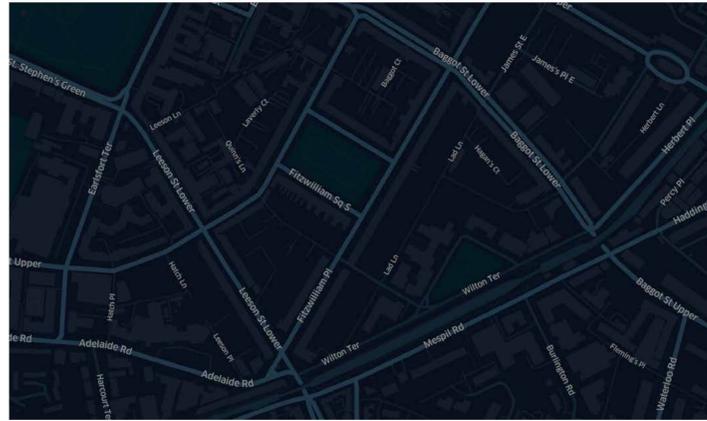
- _ Automatic API wrap
- _ Automatic analytics and monitoring capability
- _ Data translation into multiple formats
- _ Automatic hypercat exposure

CITY

SCALE

USE CASES

PROFILE INFORMATION



Street/Cycle Corridor



Cycle Network Planning



Virtual Cycle Counters

Gender



District

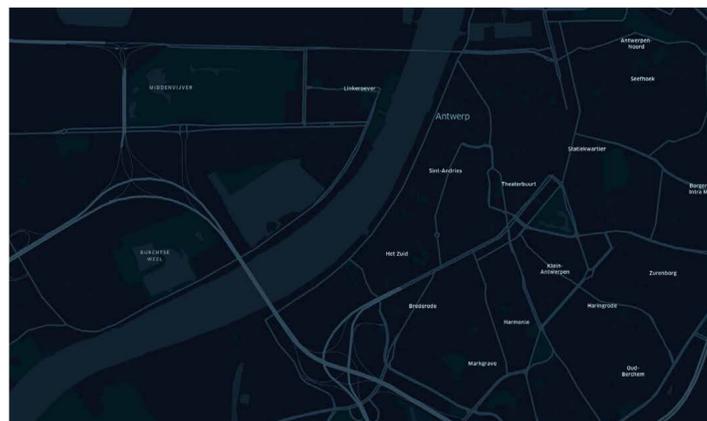


Cycle Network Planning



Road Surface Roughness

Confidence



City Centre



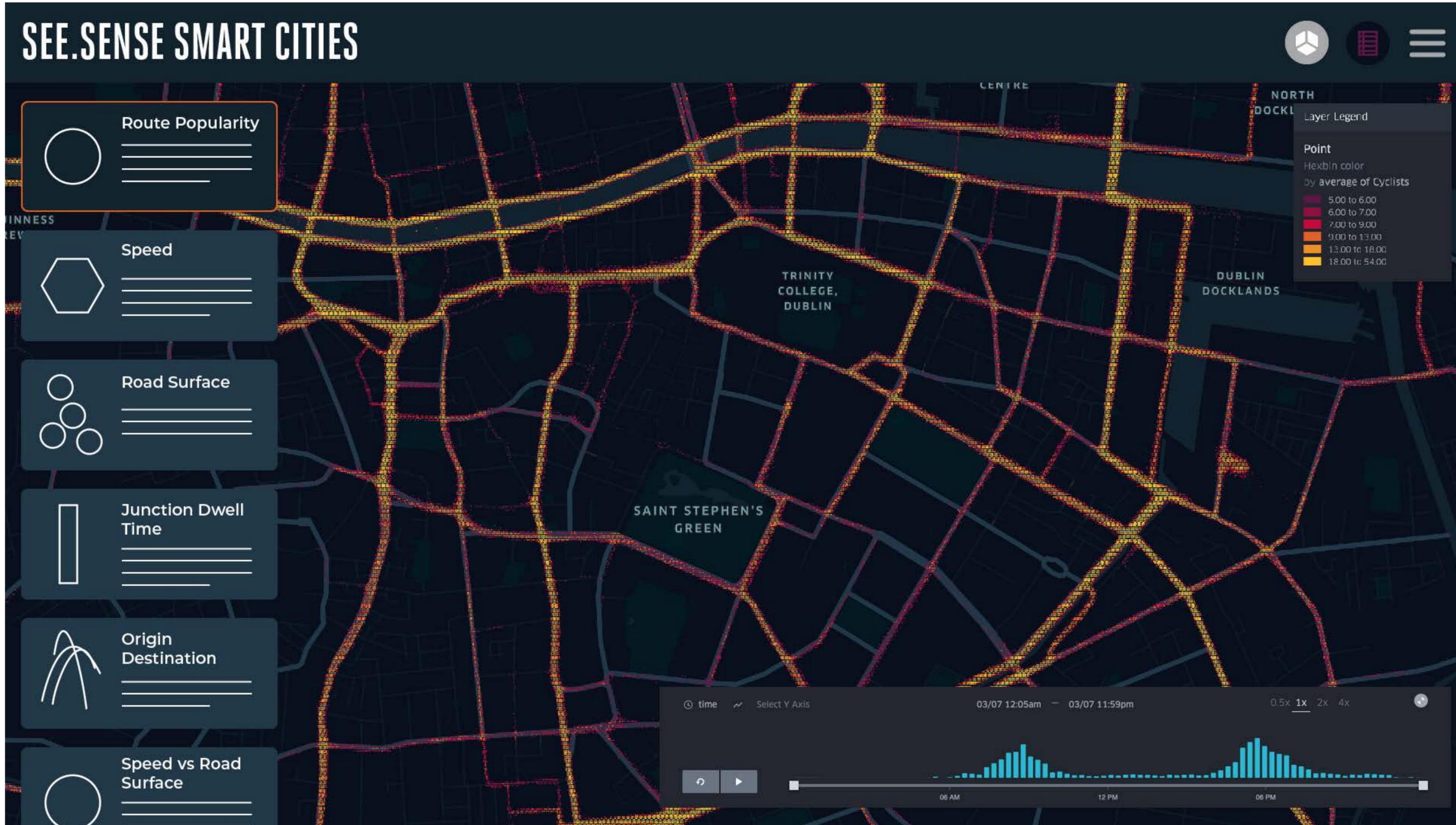
Cycle Network Planning



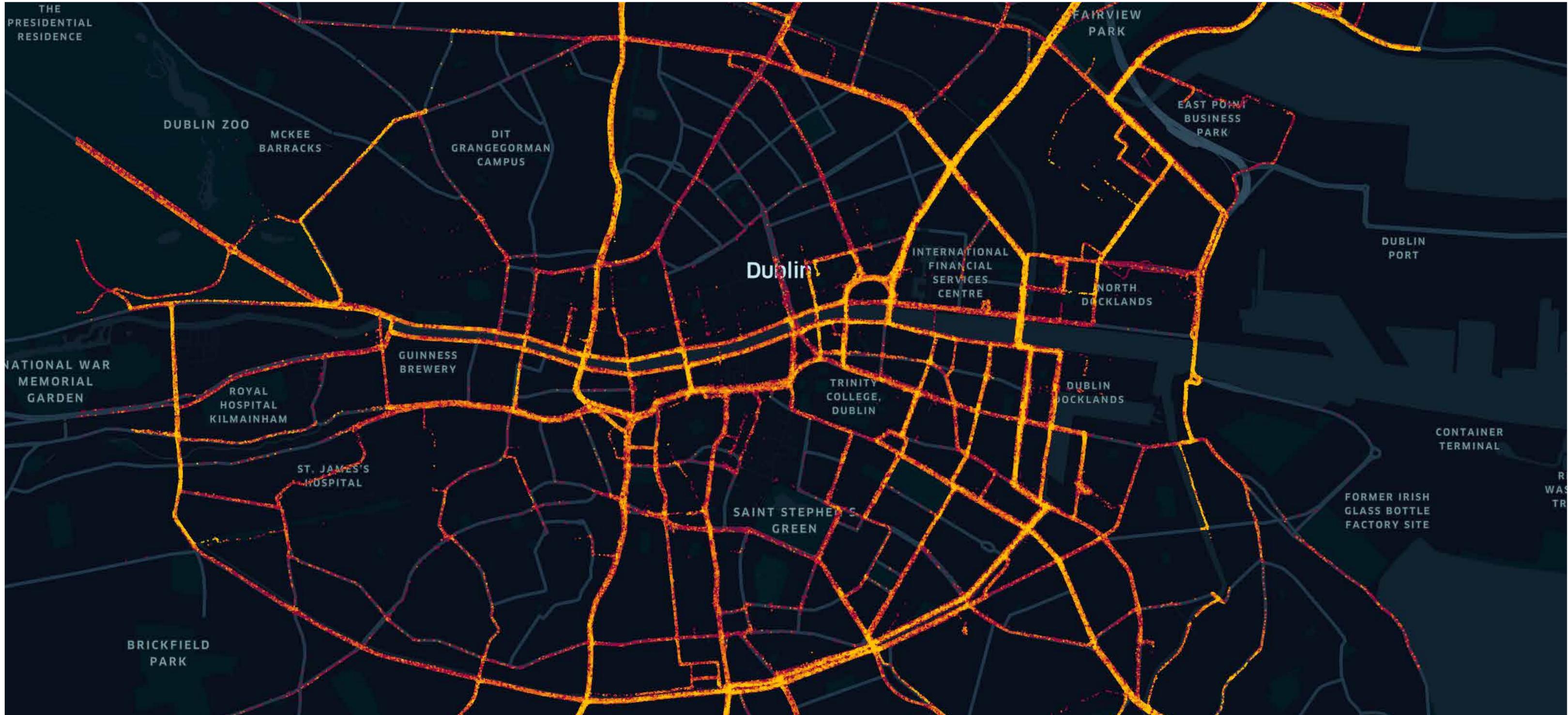
Virtual Cycle Counters

E-bike users

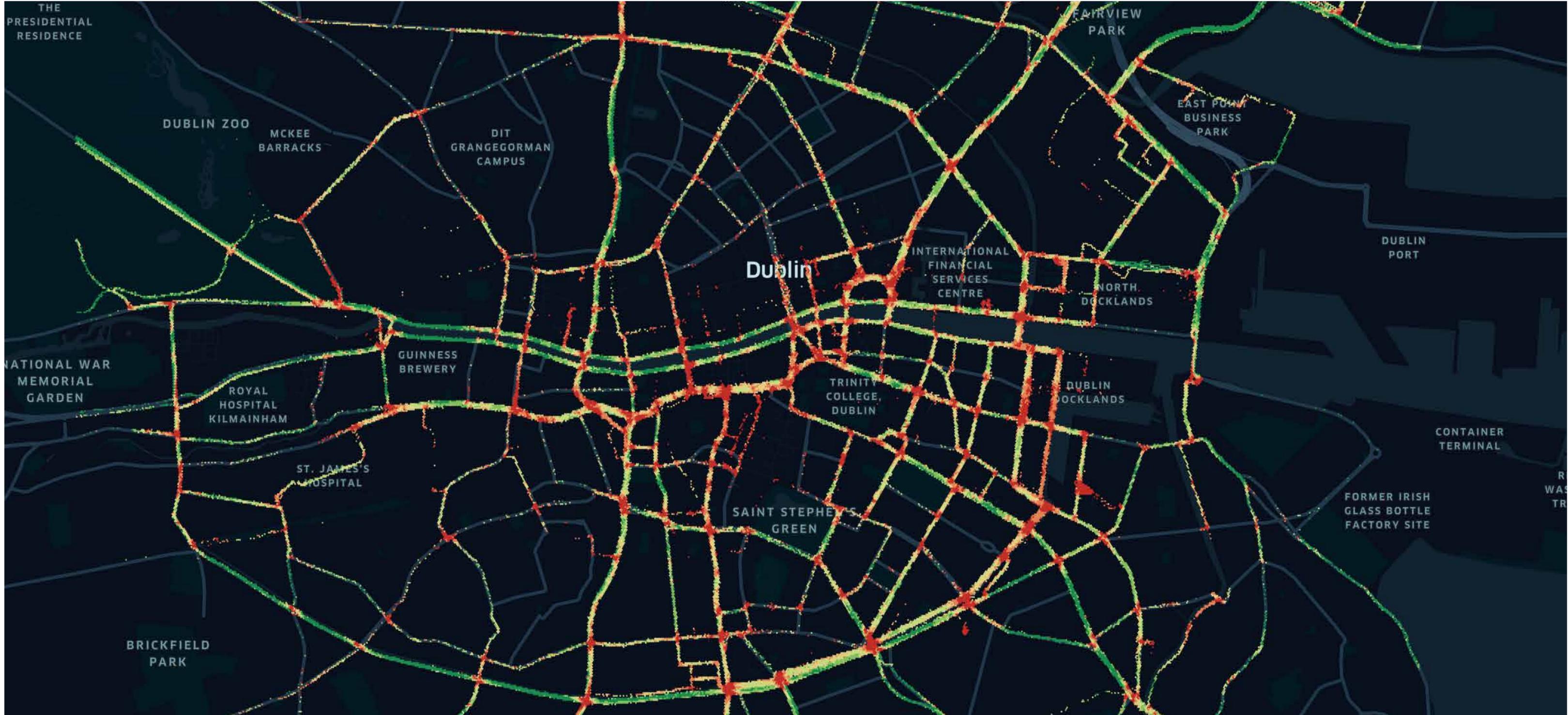
RIDE INSIGHTS CAN BE DISPLAYED ON AN EASY TO USE DASHBOARD



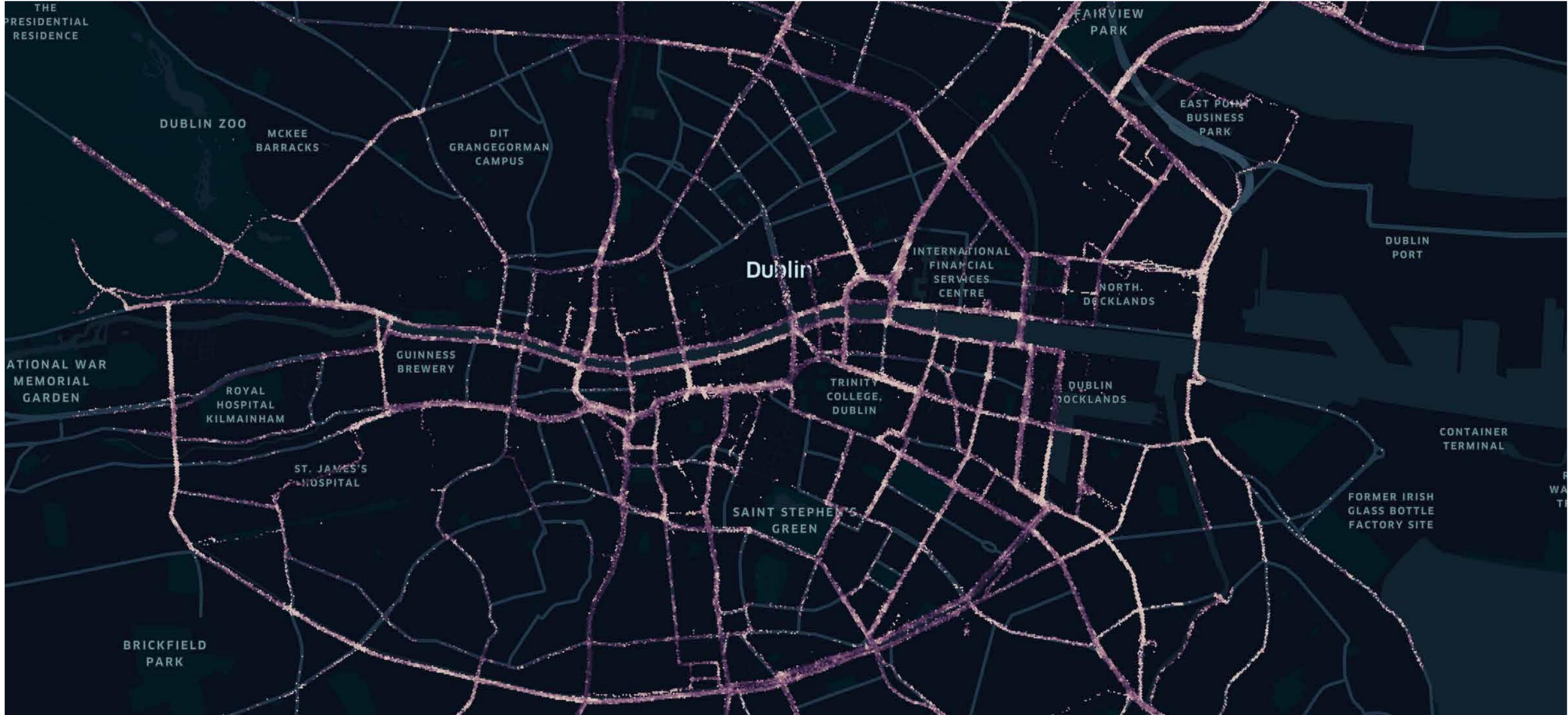
POPULARITY HEATMAP



AVG SPEEDS



ROAD SURFACE



ORIGIN-DESTINATION



DWELL TIMES



ANNOUNCING 'SEE.SENSE INSIDE' FOR BIKE SHARE SCHEMES

See.Sense has developed patented sensor and communication technology that seamlessly integrates into bike share schemes, sending data over LPWA networks to offer state of the art data collection.



SEE.SENSE®



vodafone

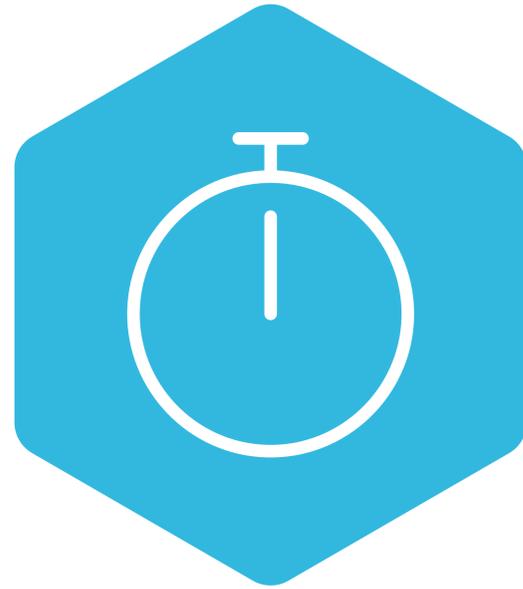


Comhairle Cathrach
Bhaile Átha Cliath
Dublin City Council

WITH 'SEE.SENSE INSIDE' BIKE SHARE OPERATORS CAN:



Prevent theft & vandalism & track stolen bikes



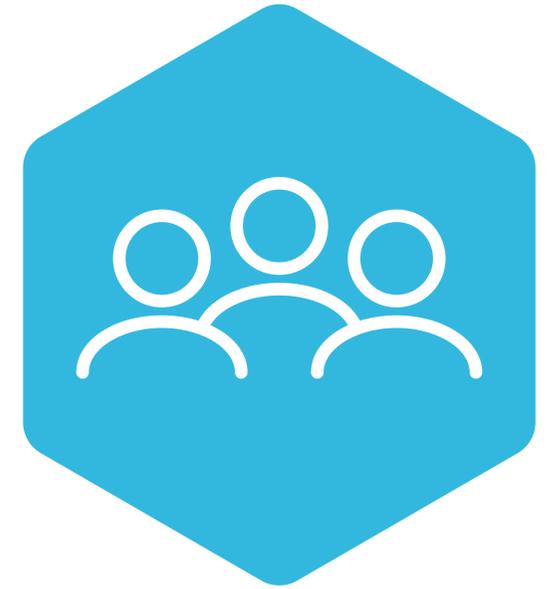
Track fleet movement in near real-time



Perform predictive maintenance

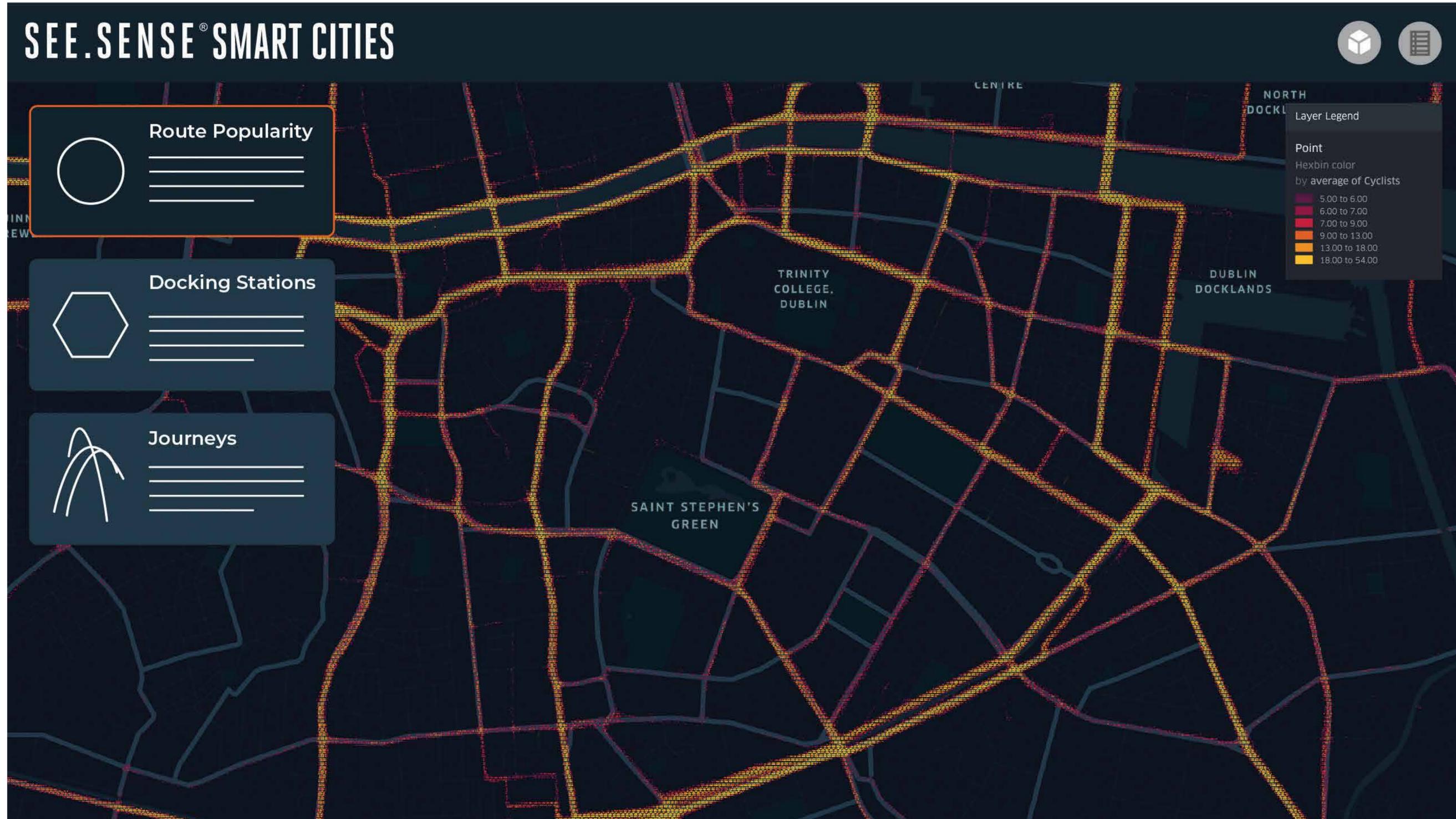


Redistribute bikes more efficiently



Help differentiate your tender

BETTER INSIGHTS FOR OPERATORS AND FOR THE CITY



INTERESTED IN WORKING WITH US?

CONTACT

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