Rebalancing Streets for everyone

Matthew MacDonald

Boyd Brothers

(Fauldhouse) Ltd.

Why
How
What


BUCHANAN STREET
Subway

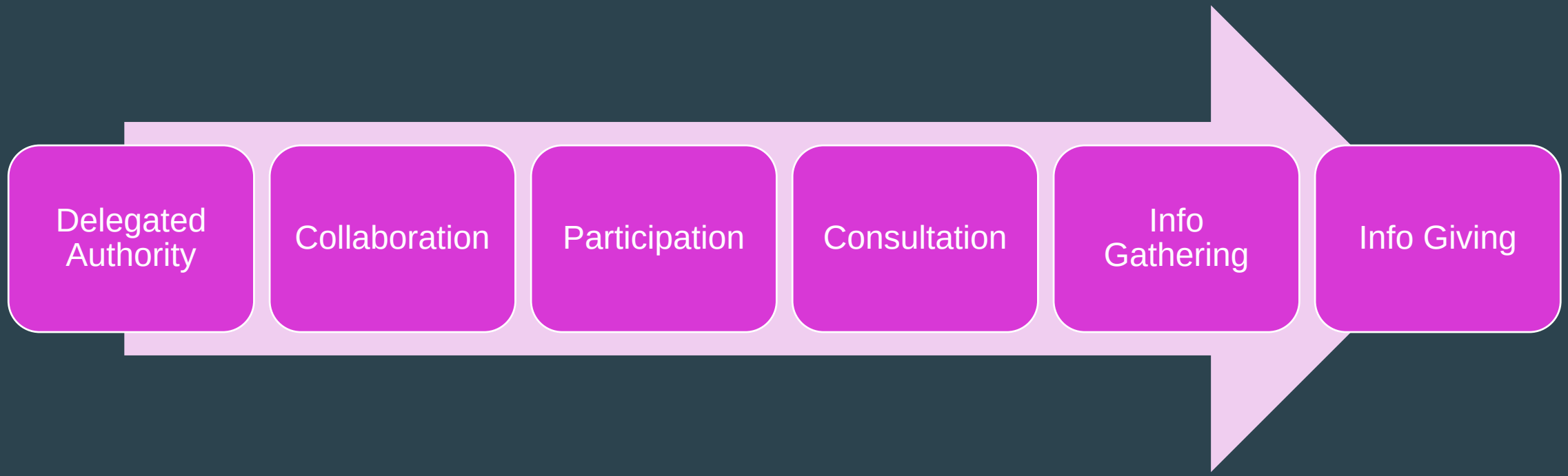

Age
Disability
Gender Reassignment
Marriage and Civil Partnership
Pregnancy and Maternity
Race
Religion or Belief
Sex
Sexual Orientation
Protected Characteristics

An Equality Impact Assessment is NOT…

- A tick box exercise
- Only about physical accessibility
- Only about infrastructure design and construction
- Only about minority groups
- Finished in a couple of hours
- A single-person task
- Optional
- Complicated


WHAT I LOVE ABOUT MY
NEIGHBOURHOOD IS...
The people, the buildings &
Community

Depth of engagement




ROAD
CLOSED
EXCEPT
CYCLES
ROAD
CLOSED

Thank you!

mmacdonald@boydbrothers.co.uk

nowwireless®

Artificial Intelligence for modern cities

We are

nowwireless®

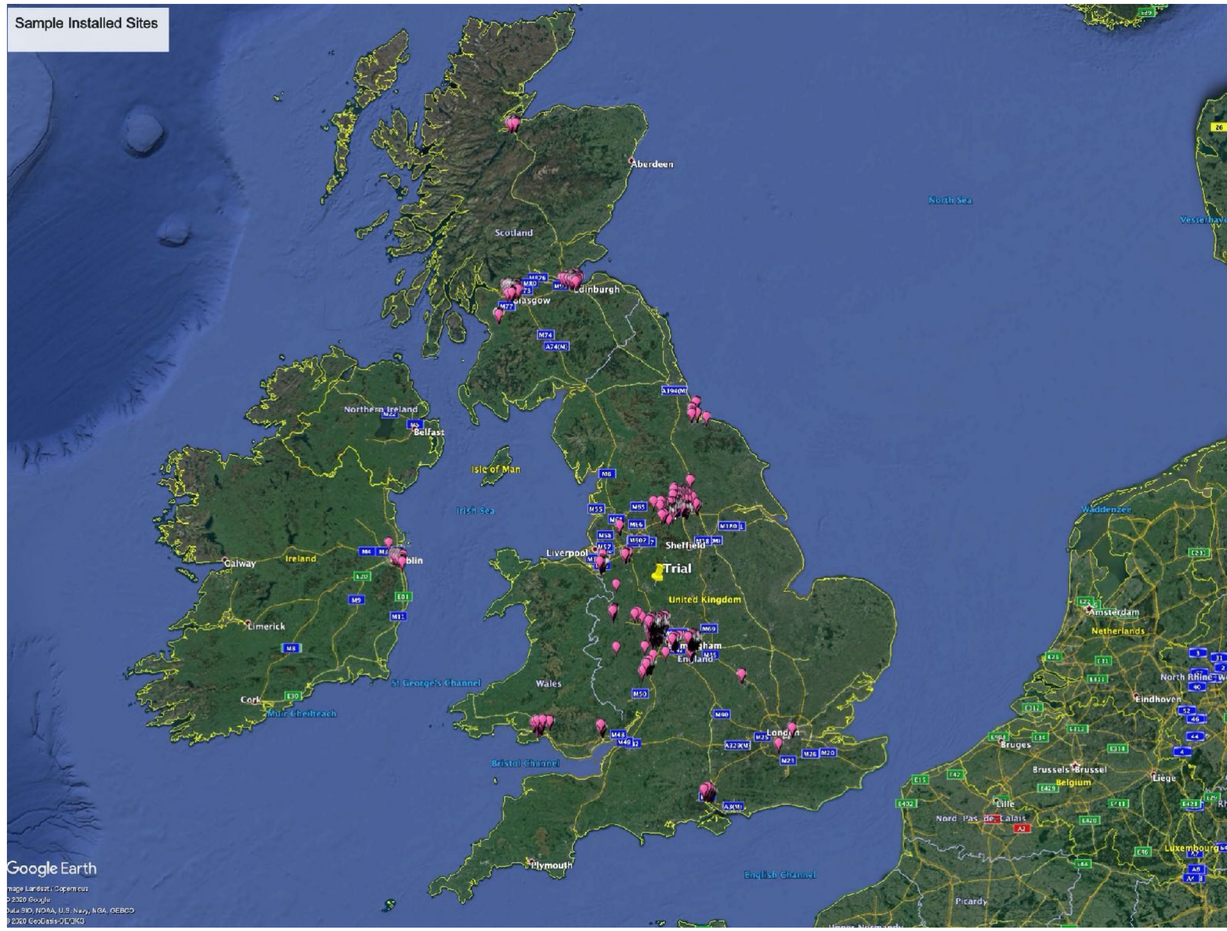
A leading Artificial Intelligence solution provider, shaping the future of AI in transport for modern cities.

01883 621 100 sales@nowwireless.com

Our Story

Creating the tools traffic managers and transport planners need to meet the challenges of city life

- 21 year old R&D and Manufacturing Company in AI, IoT and Communications
- 30,000 devices currently live across 44 Councils
- 2,500 mobile operators & MVNO
- Supply most UTC, UTMC Companies



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Who we work with…

City of Wolverhampton Council

dlr Comhairle Contae County Council

Cheshire West and Chester

Newport City Council Cyngor Dinas Casnewydd

Transport for Greater Manchester

Transport for London

Kirklees Council

City and County of Swansea Dinas a Sir Abertawe

East Ayrshire Council

Warwickshire County Council

Southampton City Council

Coventry City Council

Surrey County Council

milton keynes council

Dudley Metropolitan Borough Council

The Highland Council Comhairle na Gàidhealtachd

Leeds City Council

Glasgow City Council

Edinburgh The City of Edinburgh Council

worcestershire county council

Solihull Metropolitan Borough Council

Shropshire County Council

Sandwell Metropolitan Borough Council

Staffordshire County Council

wakefield council working for you

Lincolnshire County Council Working for a better future

Middlesbrough moving forward

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Who we have strategic partnerships with…

Balfour Beatty

swarco

dynniq

SIEMENS

telent

Case Study: Southampto

Philosophy - *integration* not replacement

Working alongside Councils to deliver The Councils masterplan to realise their long-term transportation objectives

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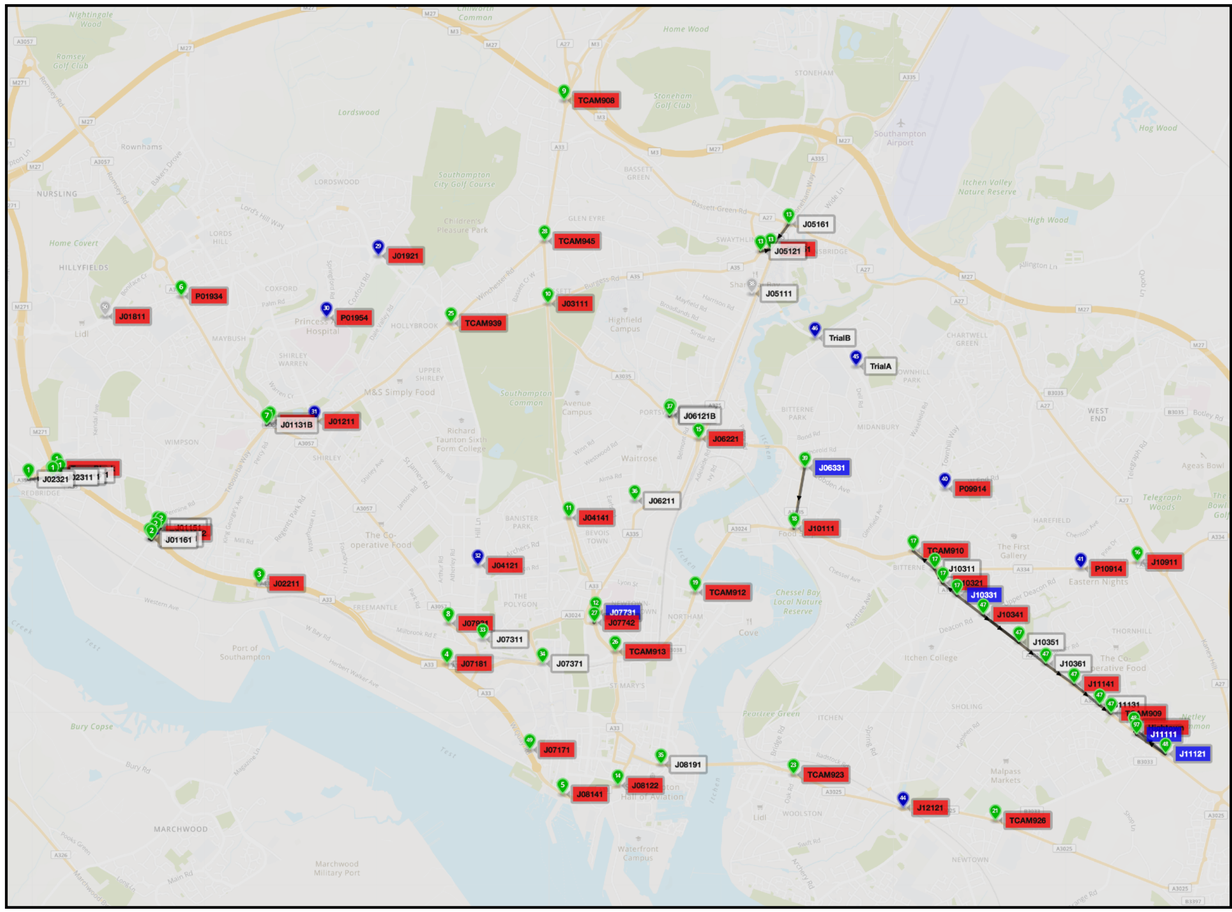
Southampton Network

Senseview Data Platform

- Wireless network connects Traffic Lights and CCTV provides to an IoT and AI infrastructure
- 68 Mesh Nodes in place for communication sharing
- 56 Bluetooth/Digital Signature Nodes analysing 850,000 journeys every day
- 5 active pollution monitors in place
- Senseview Data Platform with millions of records available from five years



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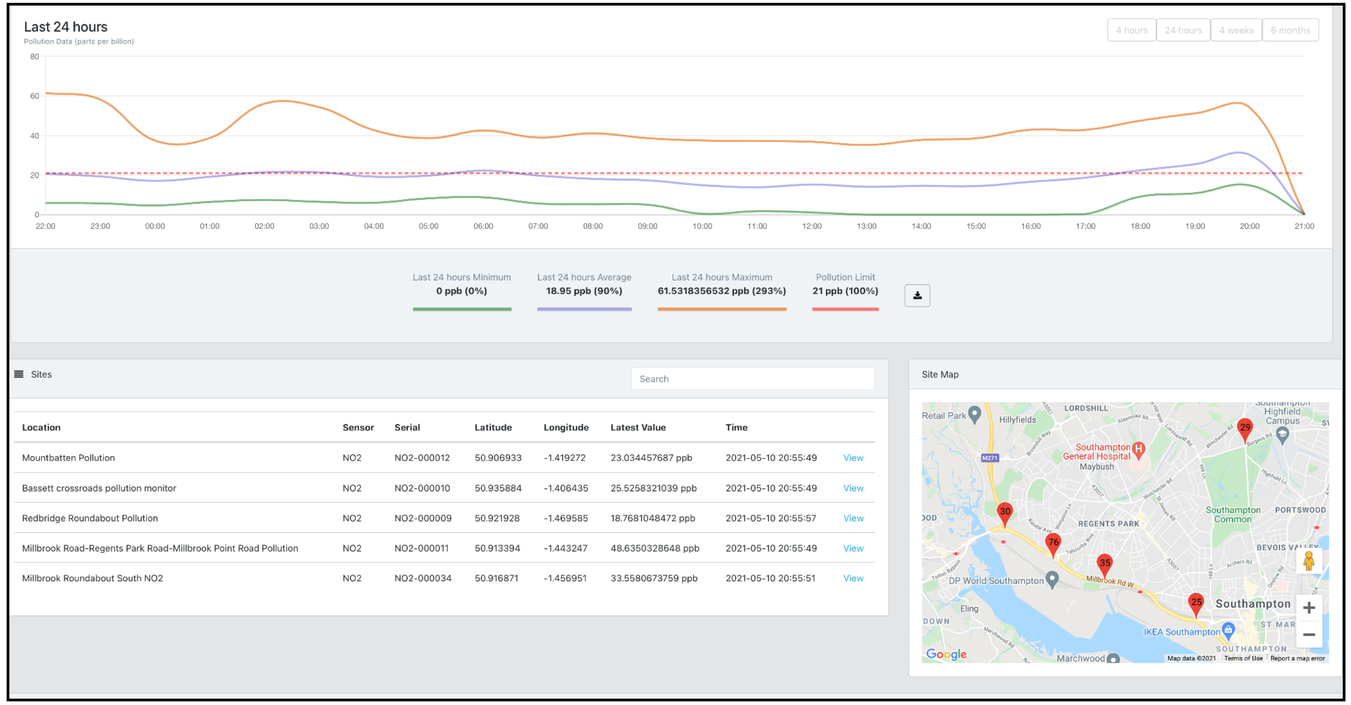
Pollution Analysis

Senseview Data Platform

- AI powered pollution analysis and monitoring
- Long-life sensors due to built in AI
- Detailed Information view with trend detailing
- Easy data export for decision and policy making in efforts to tack air quality issues



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Digital Signatures

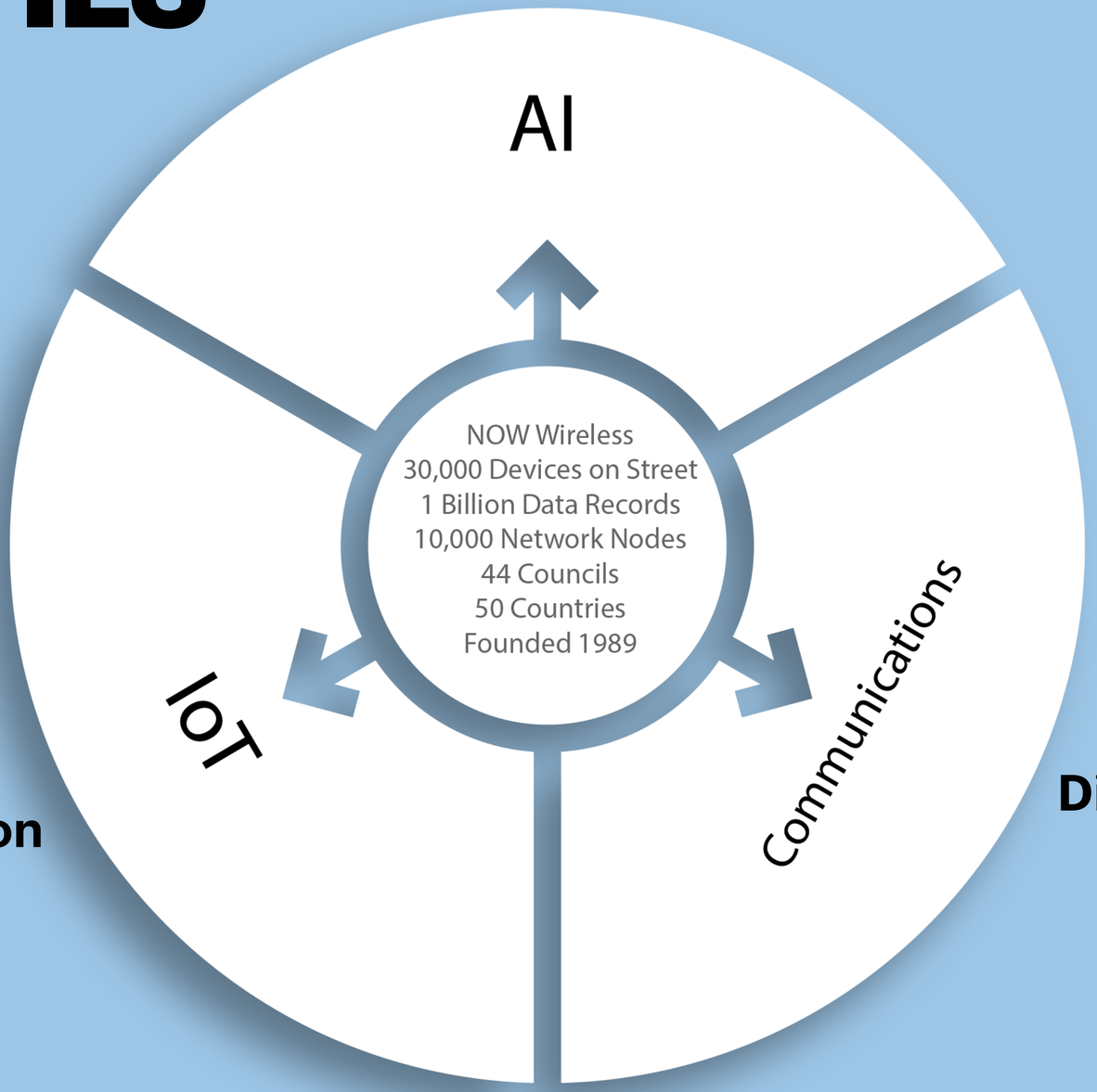
Journey Time - No AI Analysis

Southampton Daily Journeys

Date	Journeys
2021-05-01 00:00	850,134
2021-05-02 00:00	671,181
2021-05-03 00:00	661,043
2021-05-04 00:00	872,786
2021-05-05 00:00	876,314
2021-05-06 00:00	878,402
2021-05-07 00:00	927,018

SMART CITIES

Act on the Information



Collect Information

Distribute the Information

AI’s are trained to take a lot of data, learn from that data.

Then Process it in real time to give results, learning as they go, whats right and wrong.

AI’s perform Trillions of operations per Second.

The future progress of AI in transport is expected to be spectacular. We agree.

The success of AI very much depends on its deployment

Philosophy - *integration* not replacement

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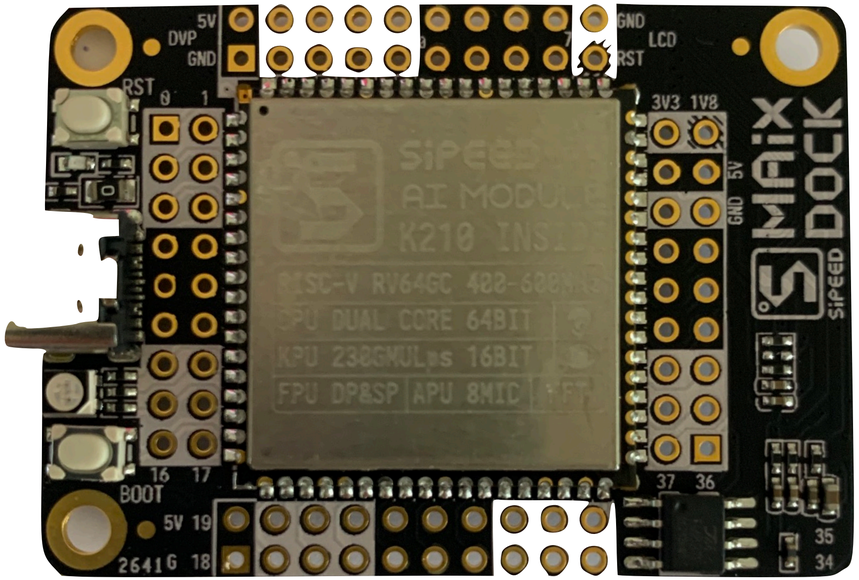
Drivers for AI Technology

- CAV - Connected Autonomous Vehicles
- Cycles, eScooters and Pedestrian Space & Priority
- CAV need AI Rain and Mist Detection - Weather Stations
- AI Pollution Monitors - Reduce Pollution
- 5G For Vehicles and IoT - infrastructure for CAV & IoT
- API - Senseview data platform for UTC/UTMC
- Loop Interface - 24v. RS485, IP - UTC
- NOW API AI's integrated into UTMC
- Siemens, Swarco, Dynniq, Telent and most others.



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Standard applications of AI

In modern cities

- Data analysis via cloud-based intuitive dashboards
- Multi-modal travel trends and interaction(s) analysis
- Classified vehicle counts, journey time, queue build ups
- Live and historical data
- Monitoring and reporting after intervention implementation
- Traffic signal control to change in line with predicted traffic conditions and real-time flow
- Alert newly automated vehicles of issues ahead

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Automatic Pedestrian AI Technology

World-first solution

- First pedestrian crossing lights that change without being touched
- Uses AI and machine learning to predict behaviour by identifying travel patterns of road crossers and working out their intentions.
- Keeps traffic flows moving rather than stop starting vehicles unnecessarily
- Helps tackle climate change, meet air quality targets and keeps pedestrians safe
- Highly cost effective as no expensive road works are required for installation

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AI - Tracking across a City

- Digital Signature tracking using Bluetooth technology with Video Analytics offers superior anonymous tracking without the use of ANPR or facial recognition
- Give unprecedented data analysis and traffic predictions from single junctions to entire streetscapes and from city -to-city
- This is the result of five years of research and development work in our own labs

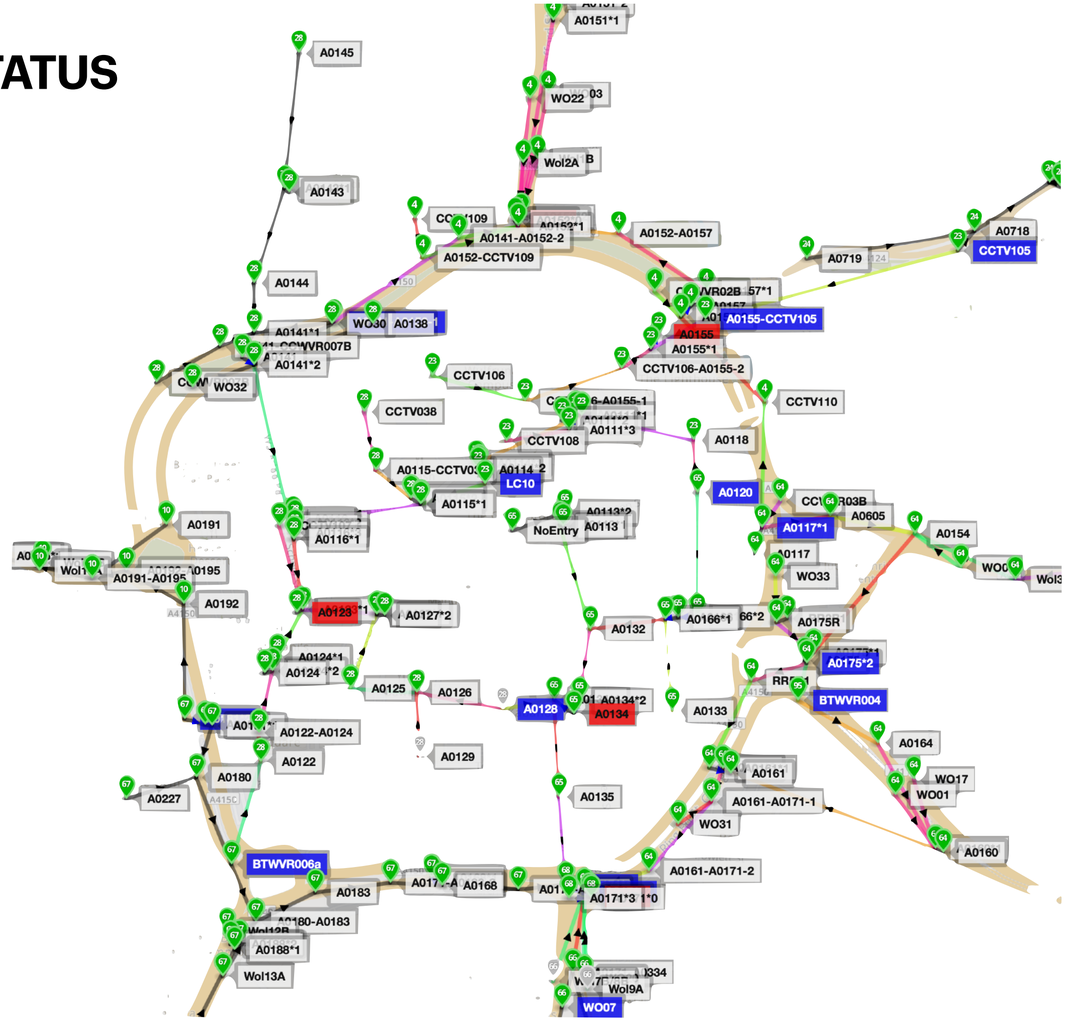
Insights from our AI covers the whole city infrastructure. The granular level of data analysis we provide gives local authorities the confidence to make informed decisions when designing and managing transport policies that carry maximum, long-term impact.

REPORTS CAN BE GENERATED FROM SQL DATABASE

JOURNEYS PER DAY PREPARED WEEKLY AND NETWORK STATUS

Traffic Journey Report - Wolverhampton

Day	Total Journeys
2021-01-12 00:00:00+00	742,881
2021-01-13 00:00:00+00	731,318
2021-01-14 00:00:00+00	705,969
2021-01-15 00:00:00+00	754,724
2021-01-16 00:00:00+00	572,005
2021-01-17 00:00:00+00	423,904
2021-01-18 00:00:00+00	666,094
2021-01-19 00:00:00+00	732,760



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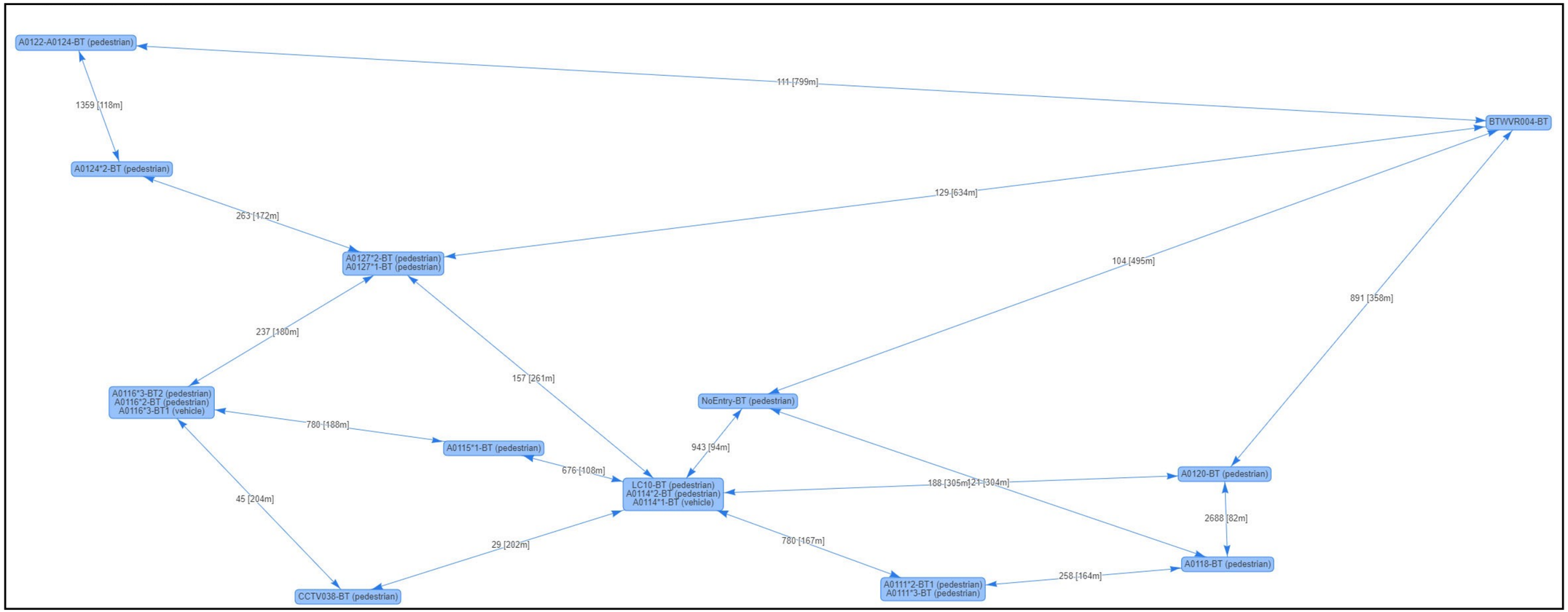
Traffic and pedestrian analysis

AI analysis of Digital Signatures and Video Analytics



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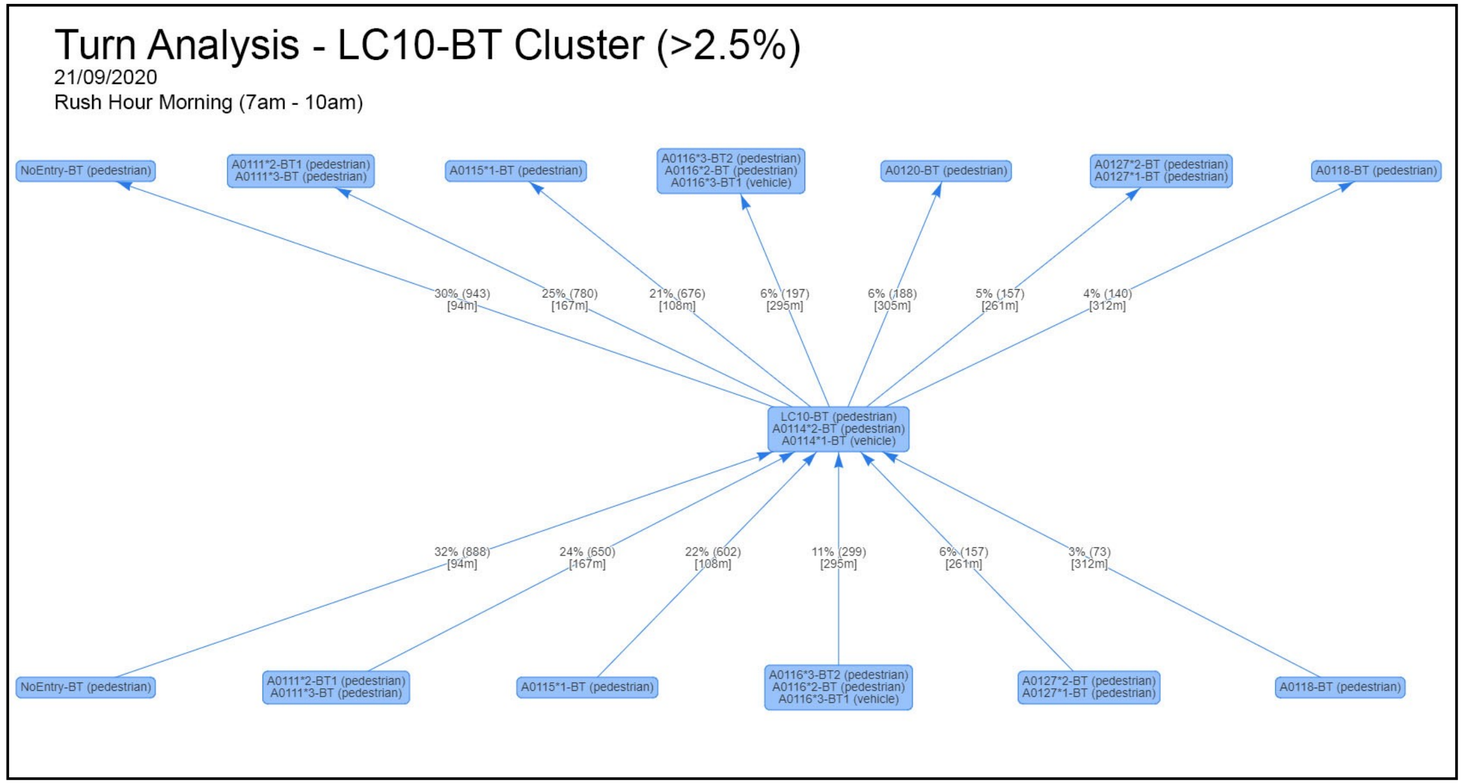
Route and Turn Analysis

Where do vehicles go

- Video Analytics gives detailed turn analysis
- Digital Signatures tell us where they came from and where they are going
- AI analysis of collected data to provide in-detail insights to road user usage
- Capable of showing devices journeys throughout the whole day.
- Can easily identify non-standard vehicle routing
- Easy data export



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Route and turn analysis opens up new ways of achieving co-operative travel between all road users on complicated road systems. Analysis helps UTC make short-term and long-term improvements to manage flow

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Pollution Prediction - Making Cleaner Cities

- AI powered Pollution Monitors provide monitoring and analysis
- With these AI based pollution monitors we can predict pollution build-up with 99% accuracy up to one hour ahead giving time for action to be taken
- This can be fed into Transport Management Systems to adjust traffic timings and reduce pollution
- AI calibration keeps pollution sensors accurate for up to 5 years
-

Our AI and pollution sensors can make day-to-day living more comfortable. We continuously support local authorities in their quest to create safe environments where communities are happy to live, work and play

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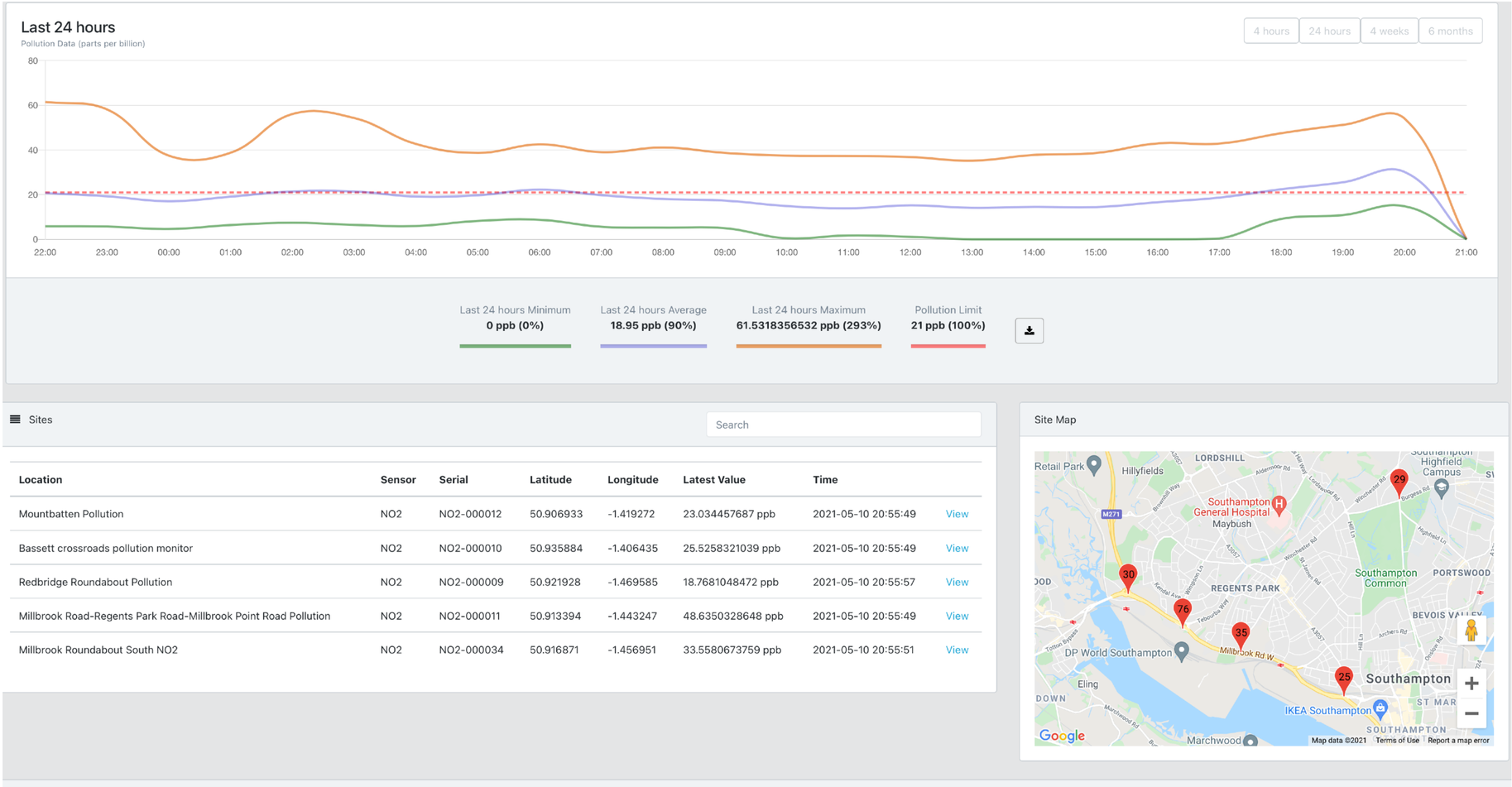
Pollution Measurement



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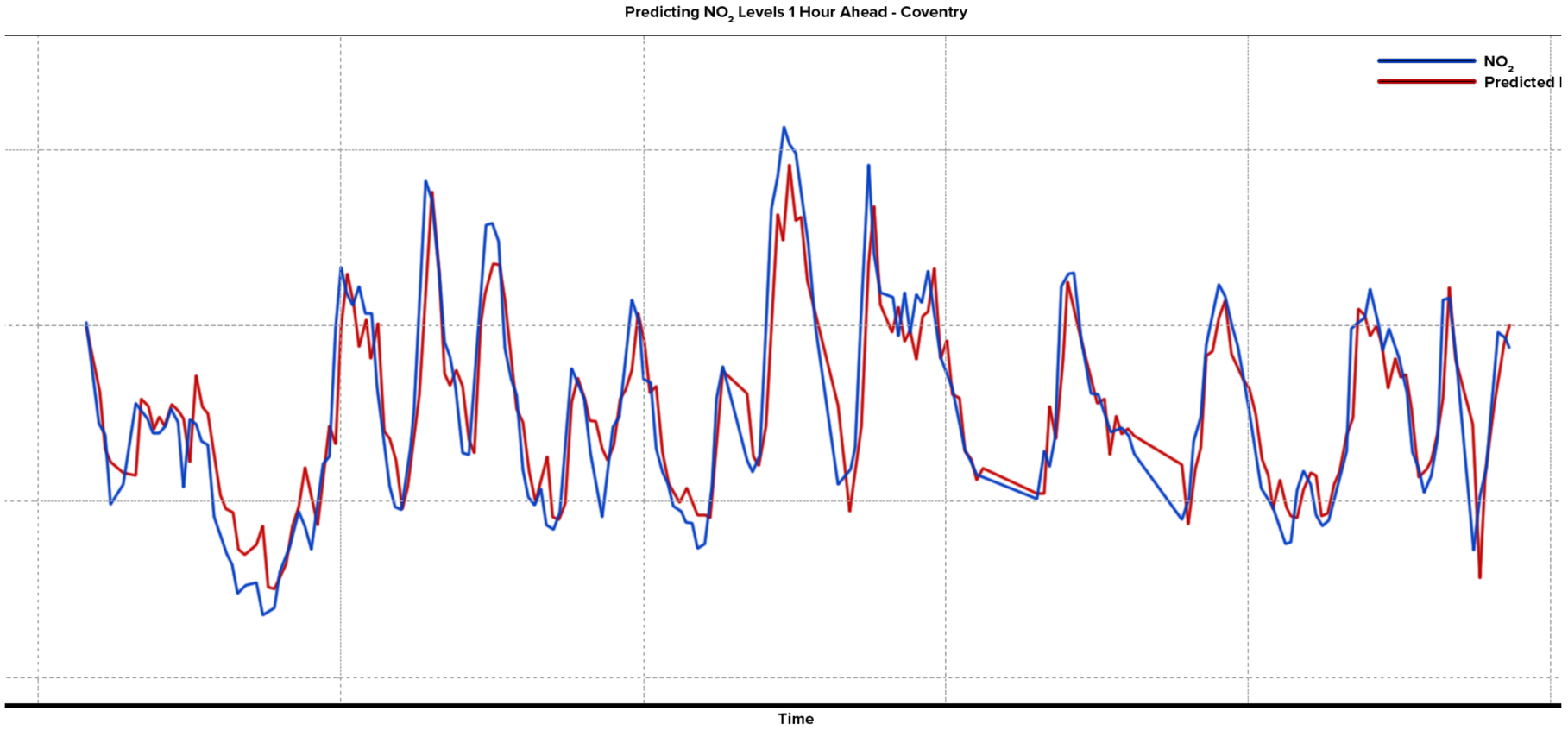
AI Pollution Prediction

Predicted pollution vs Actual Pollution in Coventry (1 hour ahead)



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Virtual Cycle Lanes

Giving the right priority at the right time

- Cycle lanes most difficult in side streets
- Existing technology doesn’t help - it either closes the street or risks cyclists safety
- Our video analytics allow cycles to be detected and given a green wave across junctions
- Prevents accidents to improve city safety records
- Allows roads to remain open

Local authorities can use our AI and classification and movement data generated to create new cycle schemes based on real insights. We remove the guesswork on what scheme will work best for a individual and whole city streetscapes

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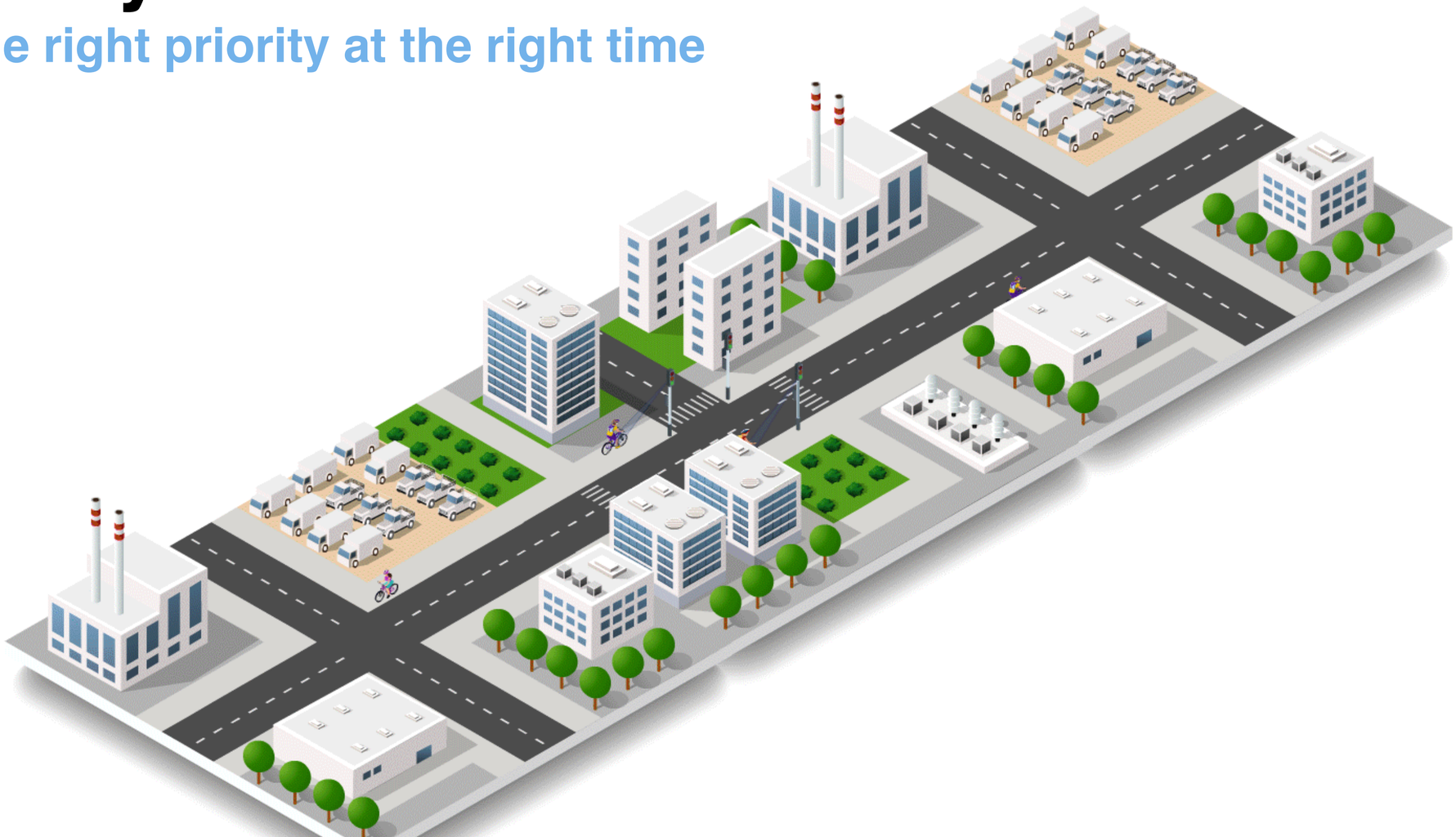

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Virtual Loops

For smarter, cheaper, data-driven traffic light management

- Traditional loops requiring road works are replaced by AI, sensors and a camera
- Resulting video analytics allows vehicles to be counted and classified
- Identifies traffic hotspots and automatically triggers mitigation measures
- The AI is flexible and can be trained to identify pedestrians and 17 vehicle types

Local authorities can use our virtual loops to save thousands of pounds. This solution costs a fraction of traditional solutions to give local authorise and national agencies scalable, cost-effective and adaptable transport management solutions

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Virtual Loops

Scalable. Flexible. Cost Effective.

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World-first solution

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Pedestrians

Applications for pedestrian management

- Counting pedestrians
- Tracking pedestrians using digital signatures
- Contactless crossings using video analytics

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Vehicles

AI Functions for Vehicles

- Counting vehicles
- Classify Vehicles
- Virtual loops for seamless traffic light system integration
- Speed detection
- Bus priority (detect local buses to give them priority)

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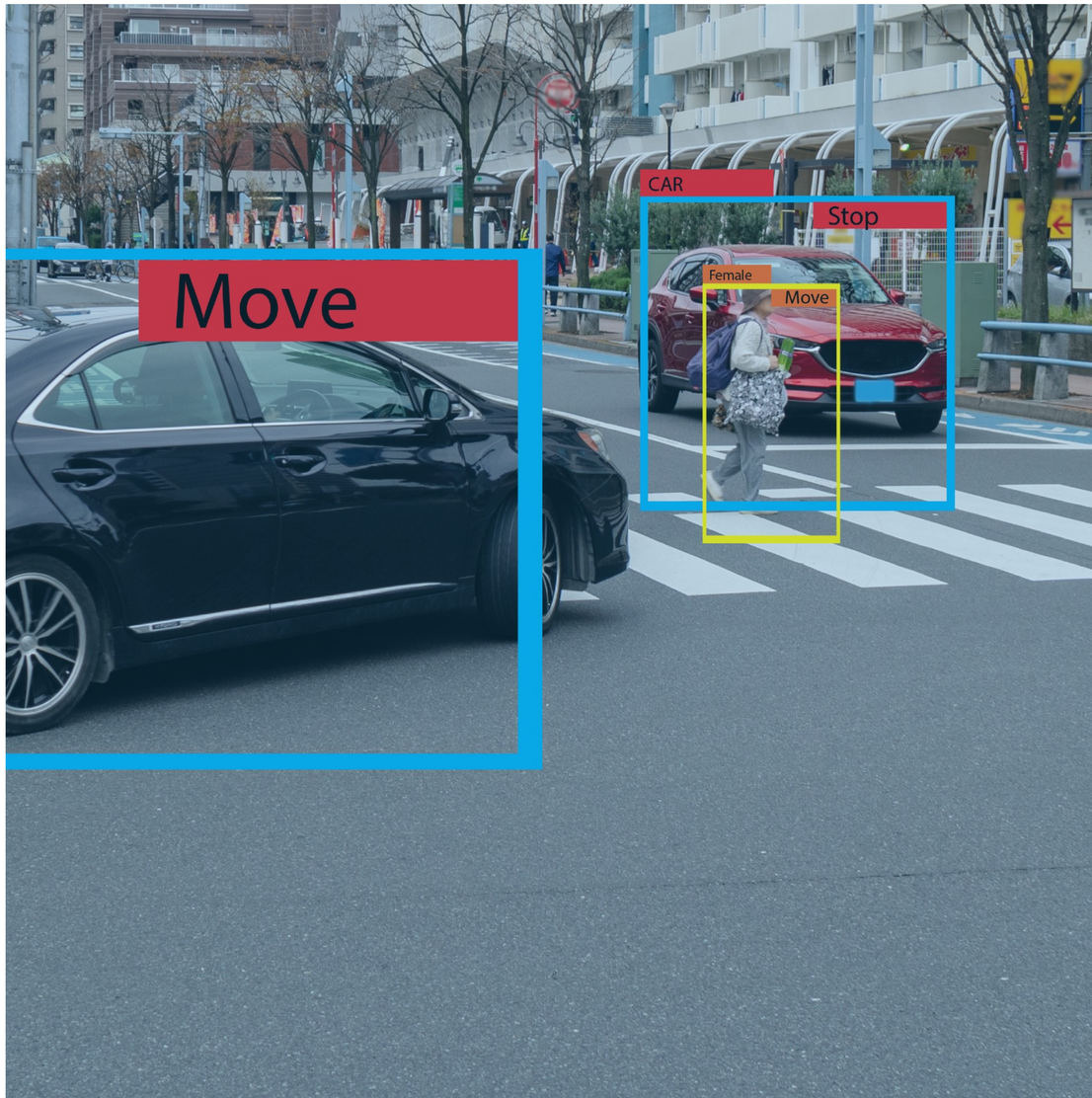
Tracking

AI Based Tracking

- Tracking across multiple cameras (ribbons)
- Turn analysis on junctions
- Pedestrian, cycling and vehicle tracking with Digital signature
- Rat run detection



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Parking

AI Applications for Parking

- Counting free spaces among rows of parked cars
- Alerts when cars enters and leaves spaces
- Off street parking and car parks
- Alerts when cars stay past allocated time
- Photo and ANPR detection
- API for billing engine

Glasgow Now Wireless Sites

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Road User Charging

AI Applications for Driver Charing

- Digital signature monitoring
- Beacon monitoring
- ANPR capture
- Interface to billing engine
- ANPR Pre and Post Processing

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Cycles

AI Applications for Cyclist Management

- Counting cyclists
- Tracking cyclists using digital signatures
- Virtual loops for cycle detection giving seamless traffic management integration
- Virtual cycle lanes including cycle green waves for management integration

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Traffic Monitoring

Intelligent Information for Traffic Managers

- Slow traffic alert
- Stopped traffic alert
- CAV interfacing
- Incident detection
- Dynamic Area of Interest alert

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Enforcement

AI Driven Enforcement

- Yellow box
- Illegal turns
- Bus lan infringements
- Parking
- One way street infringements
- Road user charging
- Pollution detection
- API for billing engine
- ANPR options

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Weather and Pollution

Environmental Analysis

- Pollution tracking and prediction
- Rain measurement with low cost sensor
- Local weather station alerts
- Mist detections
- Standing water detection
- Flood warnings

Now Wireless ‘plug and play’ AI technology means

Now Wireless AI will

- **Map traffic activity:** broken down into 17 different vehicle types from motorbikes to flatbed trucks across multiple lanes
- **Prioritise road use:** as required during busy and non busy times, day and night
- **Respond:** to actual and predicted pollution types
- **Gather and present:** detailed information for insightful policy decisions and road design

To inform

- **Congestion management:** by identifying traffic hotspots before they happen to trigger immediate mitigation measures
- **Categorisation:** by gathering data on pedestrians and 17 types of vehicle to archive and analyse
- **Compatibility:** through connection and integration with unrelated systems by other service providers including hospitals and police
- **Clean air management:** by monitoring and anticipating pollution build up with 99% accuracy to trigger real-time remediation

“Artificial Intelligence will reach human levels by around 2029.”

Ray Kurzweil, American Inventor and Futurist

AI’s have become 10 times more powerful in past three years at a lower cost

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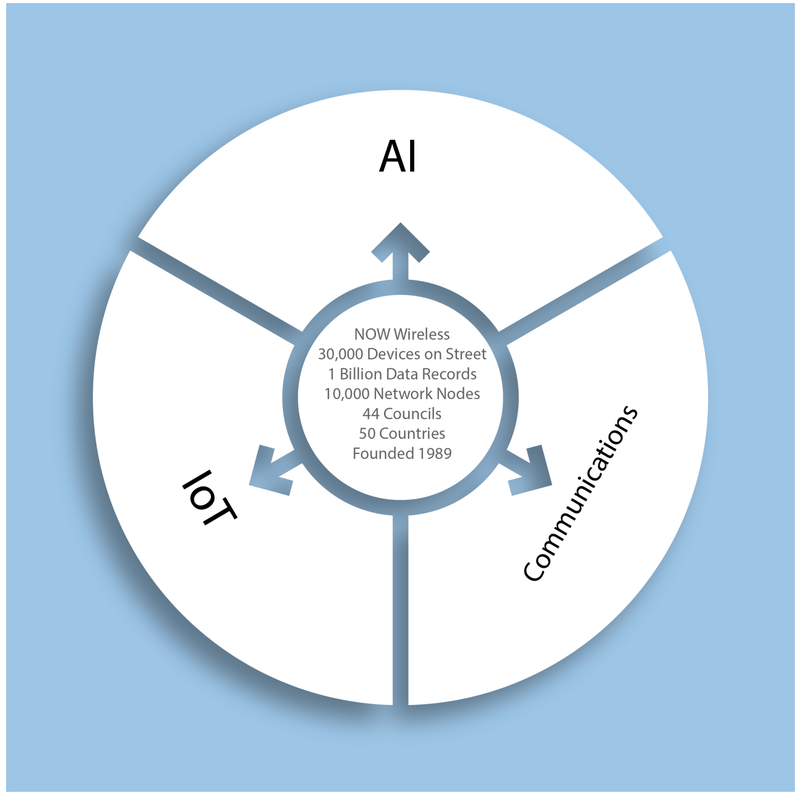
Committed supplier of secure and robust systems

- We believe in data protection and privacy.
- Data has military level encryption at source and through all machine learning processes
- No random or rogue device can ever infiltrate our system
- We are fully secure and comply to all data privacy and GDPR policies



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As featured in…

THE TIMES

Mail Online

TN TRANSPORT NETWORK

THE AUSTRALIAN

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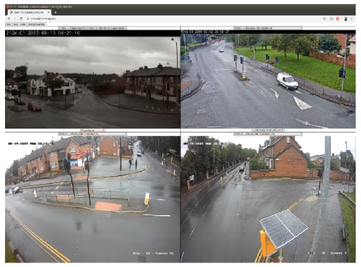
Products

Radios

Weather

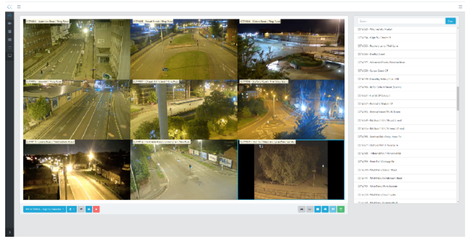
CCTV



Video Control Room

Cloud AI

AI Pollution Monitor

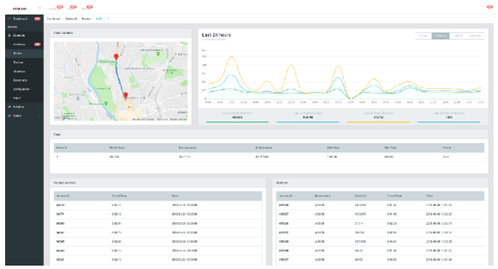


Camera Control Station

AI
Vehicle Analysis

Mesh Routers/
Outdoor AI

5G IOT/CAV



IOT Control

Edge AI

IOT
Traffic Light