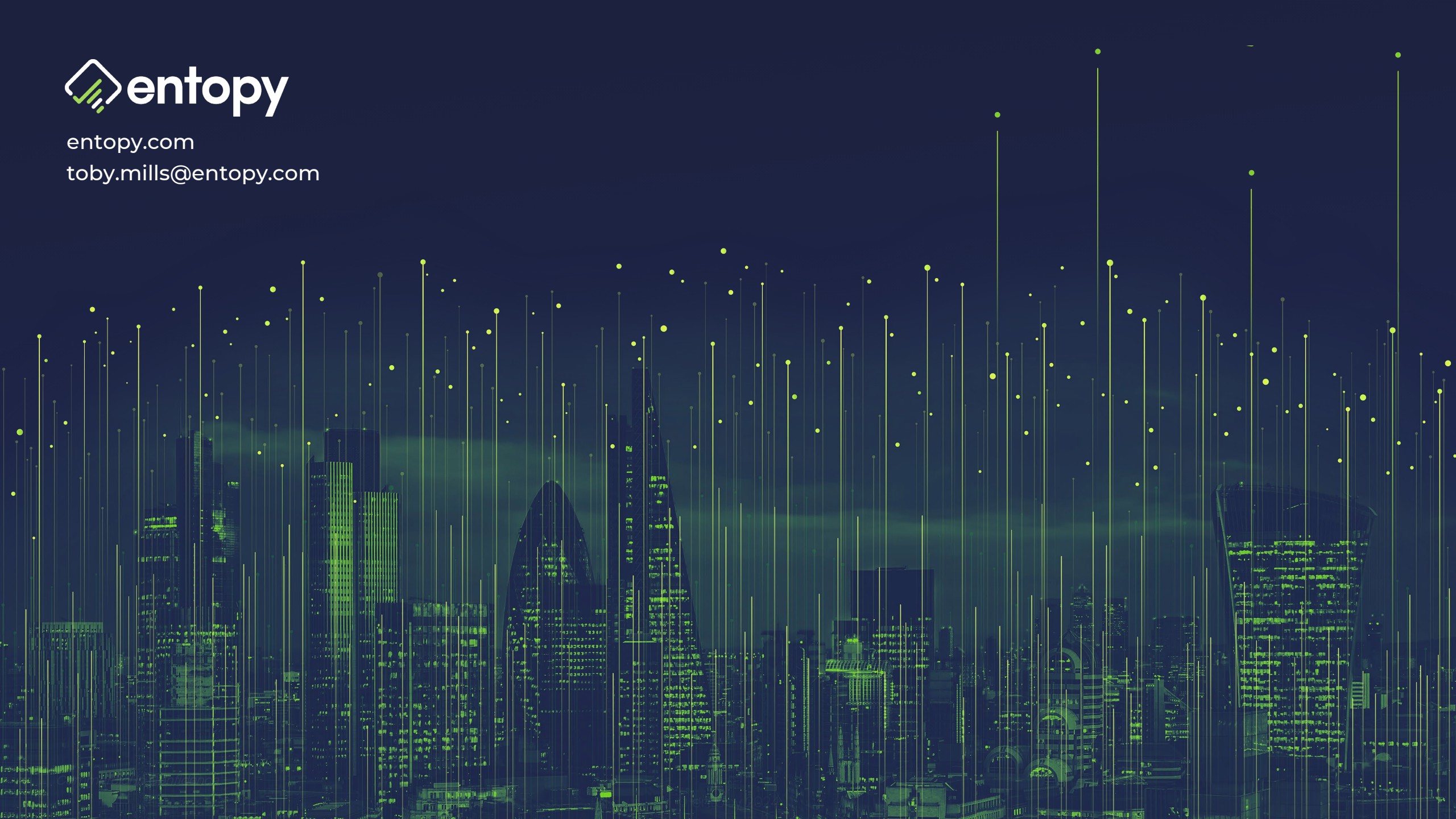
Essex County Council

DIGITAL ESSEX

Toby Mills and Dan Smith

Entopy



entopy.com
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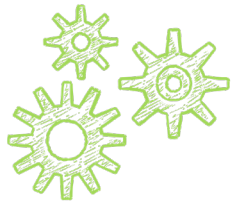
SMART bid

Adaptive orchestration framework of scalable and sustainable Digital Twin and AI across real-world, operational environments.

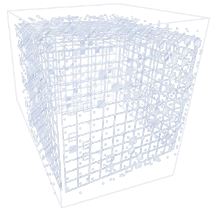
- Quick intro to Entopy
- What is Digital Twin?
- Example / case study
- The SMART bid:
  - The proposal & timelines
  - The innovation
  - What this will deliver for ECC

Quick intro to Entopy…

Newmarket, Suffolk



Engineers & data scientists



AI-enabled Digital Twin platform

Focus on roads & critical infrastructure

Large-scale & high-profile deployments

R&D & Growth (Universities, UKRI)

What is a Digital Twin?

A digital twin is a digital representation of a physical asset, process or system. It is distinguished from any other digital model by its dynamic connection to the physical twin.

- Historical data
- Internet of Things
- Models (AI/ML)
- Other sources

Data

Information

- Our focus is roads & critical infrastructure
- Improving operational decision making
- Through real-time & predictive intelligence
- Congestion, pollution, social impact, future developments, maintenance

- Holistic intelligence
- Automation
- Simulation / testing
- Digital tools

PORT OF DOVER
Powered by entopy

Logout

Toby Mills

- Dashboard
- Monitoring
- Trends
- Models
- Admin Tools
- API
- Settings
- Logout

Dashboard Port of Dover

Predicted freight
142
next 3 hours

Predicted freight
387
next 6 hours

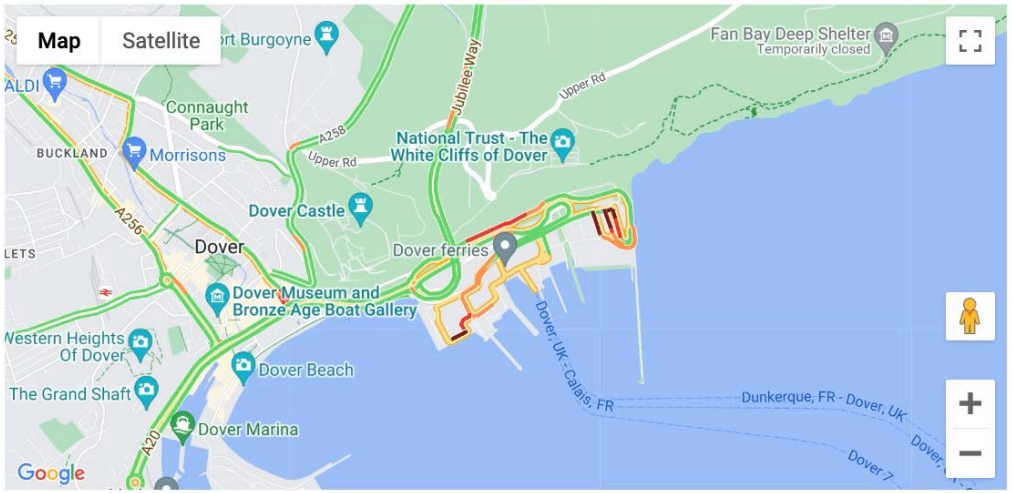
1 hour 11 mins
ETA from Dartford Tunnel

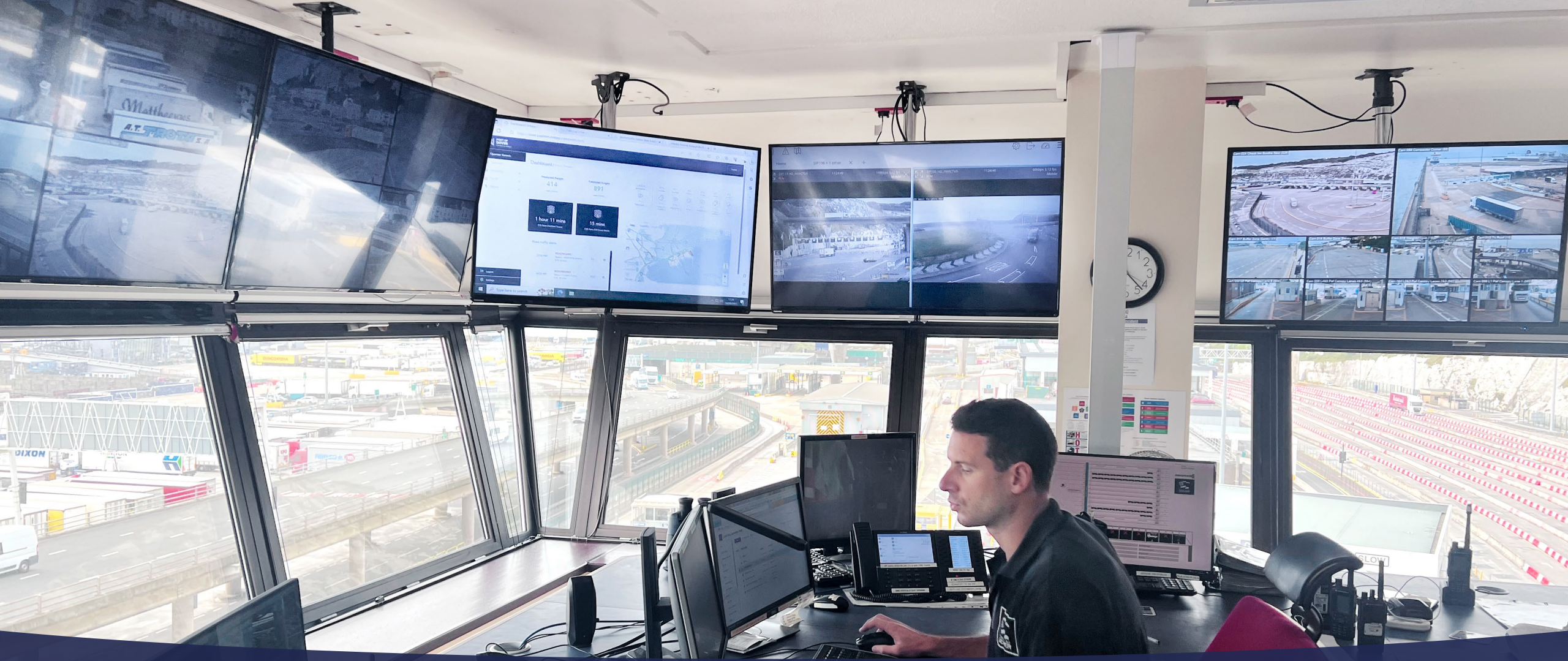
15 mins
ETA from A20 Court Wood

CURRENT 16th January	17TH January	18TH January	19TH January	20TH January	21ST January	22ND January
3°C	3°C	2°C	1°C	3°C	7°C	8°C
Partly cloudy	Patchy rain possible	Sunny	Sunny	Overcast	Patchy rain possible	Patchy rain possible

Road traffic alerts

20:00 PM	ROADWORKS Status : Currently Active ETA: 44 mins	M20	
20:00 PM	ROADWORKS Status : Currently Active ETA: 25 mins	M20	





Operational since September 2023

>93% predictive accuracy

>25% reduction in congestion

Commercial in Confidence

SMART grant bid

- **£1.3 million bid** to UKRI
- Announcement on **29th March 2024**
- **36-month** project
- Digital Twin of Strategic Road Network (SRN) of Essex, supporting 3 use cases
- To research and develop game-changing innovations to address scalability, sustainability & accessibility issues surrounding AI-enabled Digital Twin deployment (particularly for Local Authorities)
- Consortium of Essex County Council, Entopy and the University of Essex, with support from public and private sector

Essex County Council

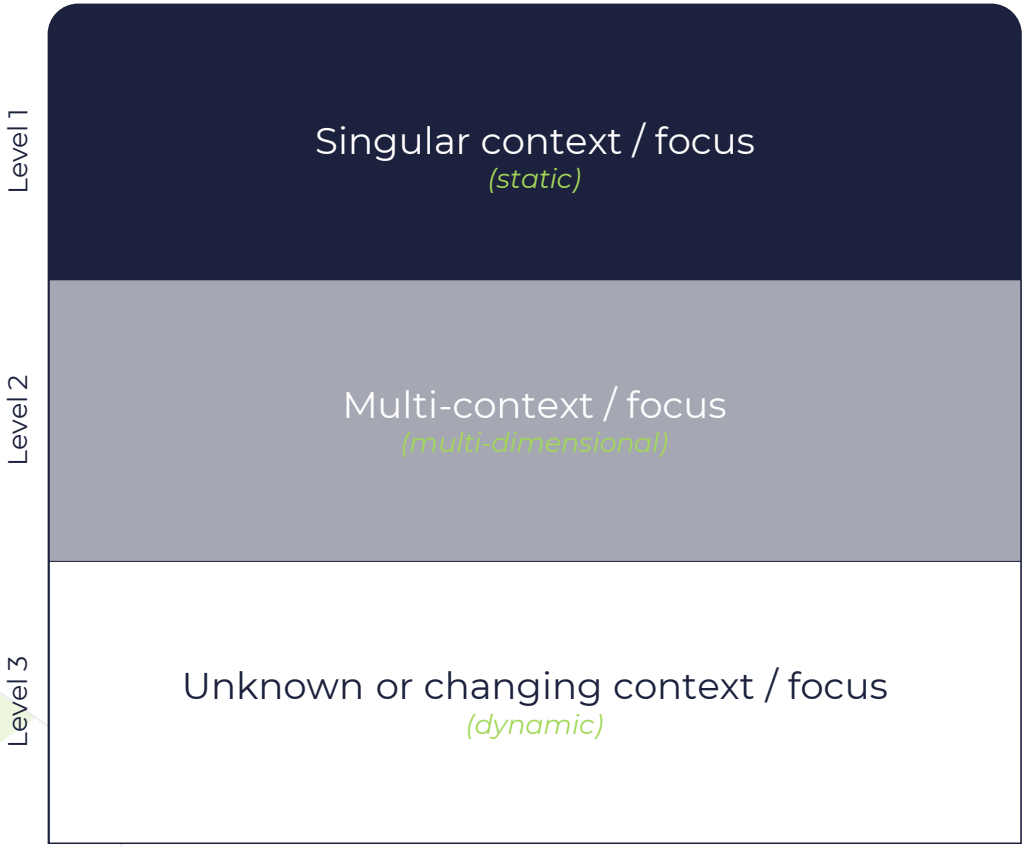
University of Essex

IADS | The Institute for Analytics and Data Science

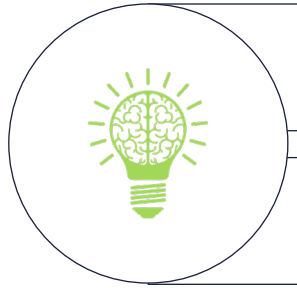
entopy

Game-changing, two-fold innovation

The project seeks to address a major challenge of Digital Twin & AI in real-world contexts that is preventing adoption by local authorities but is also a fundamental challenge in Digital Twinning more generally.



- Mobilisation and maintenance of Digital Twins requires a lot of manual developer resource
- Data & models must be orchestrated to serve target workflows (RDF/ontology)
- Leading to:
  - higher costs
  - restrictions on the types of use cases that can be served (singular defined/static)
  - capacity/scale issues for vendors



Context-oriented orchestration
(automated selection, composition & orchestration)

Context-oriented optimisation
(development of model/data federation techniques)

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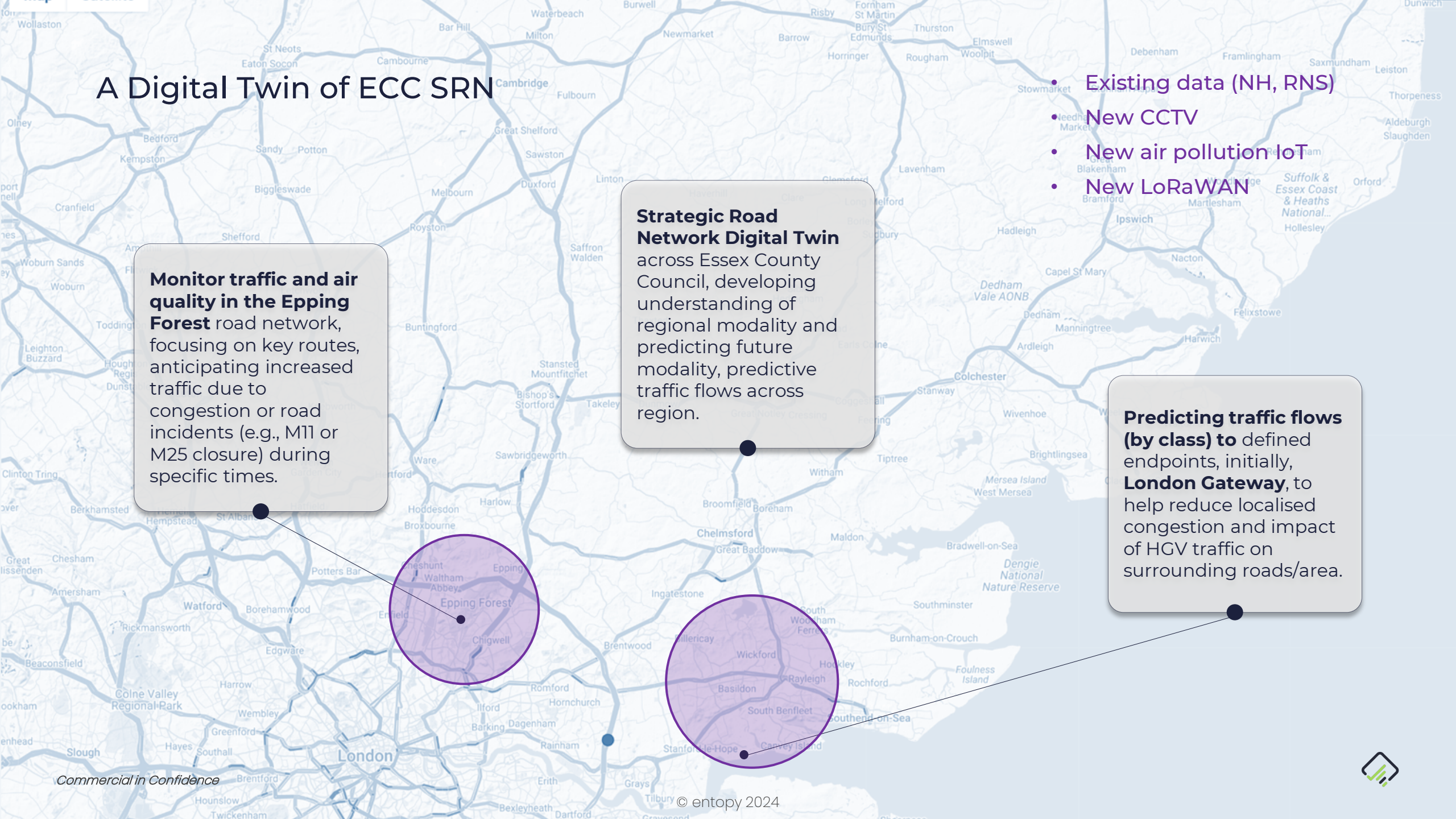
A Digital Twin of ECC SRN

- Existing data (NH, RNS)
- New CCTV
- New air pollution IoT
- New LoRaWAN

Monitor traffic and air quality in the Epping Forest road network, focusing on key routes, anticipating increased traffic due to congestion or road incidents (e.g., M11 or M25 closure) during specific times.

Strategic Road Network Digital Twin across Essex County Council, developing understanding of regional modality and predicting future modality, predictive traffic flows across region.

Predicting traffic flows (by class) to defined endpoints, initially, **London Gateway**, to help reduce localised congestion and impact of HGV traffic on surrounding roads/area.



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