

Port of Dover

CASE STUDY

Transforming operations at the Port of Dover with Entropy's AI-enabled Digital Twin.

The Port of Dover is the UK's busiest roll-on roll-off port, managing over 2 million freight vehicles and millions of passenger journeys annually. Its strategic importance demands precise, real-time operational oversight and forward-looking decision-making to ensure resilience, safety, and service continuity, particularly as pressure grows on infrastructure and resources.

To address this, Entropy collaborated with the Port of Dover to implement an AI-enabled Digital Twin platform, specifically designed to support complex port operations through intelligent data integration, predictive modelling, and scenario simulation.



The Challenge

With rising volumes of both freight and passenger traffic, the Port of Dover faces daily pressures on traffic management, space optimisation, and operational continuity. Siloed data, reactive decision-making, and limited visibility into dynamic conditions were key obstacles to long-term efficiency.

Dover needed a solution that could:

- Improve situational awareness
- Provide forward-looking insight into traffic and port operations
- Enable real-time and strategic decision-making
- Support collaboration across teams and partners

The Solution

Entropy deployed its AI-enabled Digital Twin platform, purpose-built for the Port of Dover's operational environment. This included:

AI Micromodels

Dozens of lightweight, targeted micromodels were trained on specific data streams (e.g., traffic flows, weather, vessel movements, social signals) and orchestrated across the port ecosystem. These micromodels feed into the wider Digital Twin, creating a real-time, predictive picture of port activity, down to 15-minute intervals and up to 4 weeks in advance.

Intuitive Dashboards

Entropy delivered user-friendly dashboards to visualise insights clearly and effectively. Operational teams can now monitor trends, identify risks, and test what-if scenarios with ease. Dashboards are tailored to show predictive port traffic, coach and freight volumes, and key operational KPIs.

Simulation Capability

The platform allows the Port of Dover to test different operational scenarios, such as staffing levels, road closures, ferry disruptions, and seasonal surges, without impacting live operations. This proactive planning tool helps mitigate risk and improve response.

AI Agent

Entropy's AI Agent enables natural-language interaction with the Digital Twin. Port teams can ask operational questions, explore trends, generate charts, and interrogate model performance; all without needing to write code or interpret raw data.

The Impact

By integrating Entropy's platform into its operations, the Port of Dover has achieved:

- Improved situational awareness and visibility across the port environment
- Enhanced decision-making through predictive insight and real-time data fusion
- Better planning and resource allocation during peak periods
- Reduced operational disruption and stronger incident response
- Strengthened collaboration across port stakeholders and teams

This partnership exemplifies how AI-powered Digital Twins can deliver measurable operational value in real-world, high-pressure environments.

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The goal has been to monitor and ascertain traffic figures with accurate predictions of what's coming to the port – we can then dictate how many resources we need at the port to make sure that the customers, once they arrive have a pleasant experience for their onward journey.”

Tracy Pavitt, Duty Operations Officer

