Connected, sustainable and resilient transport futures Digital Ports and Maritime Intelligent Transport Systems



#### **Tim Morris**

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# The digital maritime opportunity

#### Digitally enabled, intelligent and autonomous

- Global smart ports market valued at \$2bn in 2022 but expected to grow to \$15.5bn in 2032, a CAGR of 23.1% (Allied Market Research, 2023)
- Ports, their customers, and the wider maritime logistics community is seeking to understand the digital transition pathway
- Maritime ITS can enhance the synergy between land based and seaborne transport
- Data centric solutions help predict and mitigate supply chain failure
- Enabling intelligence led interventions to improve connectivity and build resilience



Shipping giant Maersk plans to ensure 80% of its logistics tasks are managed by AI within the next 5-7 years



### BEING A RESPONSIBLE INDUSTRY

Maritime

Maritime Autonomous Ship Systems (MASS) UK Industry Conduct Principles and Code of Practice

A Voluntary Code Version 7 November 2023

#### News story

## Self-driving vehicles set to be on roads by 2026 as Automated Vehicles Act becomes law

Road safety is at the heart of the legislation, with automated vehicles expected to improve road safety by reducing human error.

# UK Freight Context

#### **Current State Overview**

- According to the DfT in 2020, 89% of UK freight was transported around the UK via the road network, underutilising other, greener, alternatives.
- Development of electric and hydrogen propelled HGVs will help reduce the detrimental environmental impact of road freight however issues, such as congestion, driver shortage, particulates given off by tyres, range and resilience, persist.
- Modal shift is required as part of a multifaceted approach so 2050 net zero targets can be achieved.
- Opportunity for UK container transport to be shifted from HGVs to a coastwise alternative.

2020 Domestic freight goods lifted by mode (million tonnes) in UK



• Road • Rail • Water

## Maritime ITS as an enabler of modal shift

- Forecasted increase in freight volumes will exacerbate resource and congestion issues year-on-year
- Modal shift should be viewed as a solution to lessen this impact







#### Source: UK DfT, Dec 2016



# Integrating maritime ITS as part of a holistic transport landscape

#### System of systems approach







# Maritime ITS standards can support National Single Windows

Handling port operations, customs procedures, technical controls and certification procedures



# Applying an AI Data Decision System led approach to integrated transport management

Our proposed AI-DSS solution and approach will enable VDOT to lead the way to innovation





#### **Dover Green Corridor Energy Strategy, DHB, 2022**

Delivering a zero-carbon freight and passenger transport corridor from the port

Using a holistic framework, we explored future energy demand scenarios to shape energy supply options that could realise the ports ambition to create a green corridor in the 2030s. We developed an infrastructure concept for a HV electric system, helping to realise a viable business case.

Port of Dover aerial photo (https://www.doverport.co.uk/)



A Clean Maritime Demonstration Competition Project https://cp.catapult.org.uk/project/clean-tyne-shipping-corridor/

## ARUP

Clean Tyne Shipping Corridor, Department for Transport & Innovate UK Funded Consortium

Investigating the feasibility of a green shipping corridor from the Port of Tyne

Arup is working with a consortium including the Port of Tyne, EDF Energy, Newcastle University, Connected Places Catapult, and others to develop a roadmap for implementation of a green shipping corridor connecting the Northeast of England with Europe. The project will produce a costed plan to demonstrate the corridor by 2025.

## Maritime decarbonisation and sustainability

#### Our thought leadership



#### Port Energy Supply for Green Corridors

<u>This report</u> explores the opportunities and challenges associated with developing infrastructure for alternative fuels. Focusing on a case study of a green shipping triangle in the Atlantic Ocean, it outlines the critical role of ports as a bridge between low carbon energy infrastructure and decarbonised vessel fleets.

# Ports: net-zero, systems thinking and big opportunities

This <u>Arup.com thoughtpiece</u> sets out how a broader view of the energy transition highlights the opportunities for ports, as well as the process ports can take to plan a holistic decarbonisation roadmap.



## Resilience4Ports: Gateways to a resilient future

<u>This report</u> explores a framework for taking a whole-system view of port resilience and examines the opportunities – as well as potential threats – that decarbonisation poses.

# Partnerships are key to effective cooperation!

Technology, and the policy and standards to drive its deployment, are only part of the process....

- Collaboration between ITS networks can help expedite the maritime ITS vision
- ITS has a role to play across the spectrum of port and maritime services
- A collaborative focus needed to uncover optimal pathways to scale up solutions and maximise global impact





# Is maritime the missing link in the ITS portfolio?

Considering maritime ITS as part of the total value framework for transportation ecosystems

The impact of shipping and maritime logistics extends beyond the quayside and port boundary









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#### **Project Womble**

Arup researched the role of automation to provide innovative solutions for port gates in congested port precincts and cities.

Arup presented a concept proposal to move shipping containers between a busy port located within a congested urban area and a new inland logistics facility located on the city boundary closer to the strategic transport network.