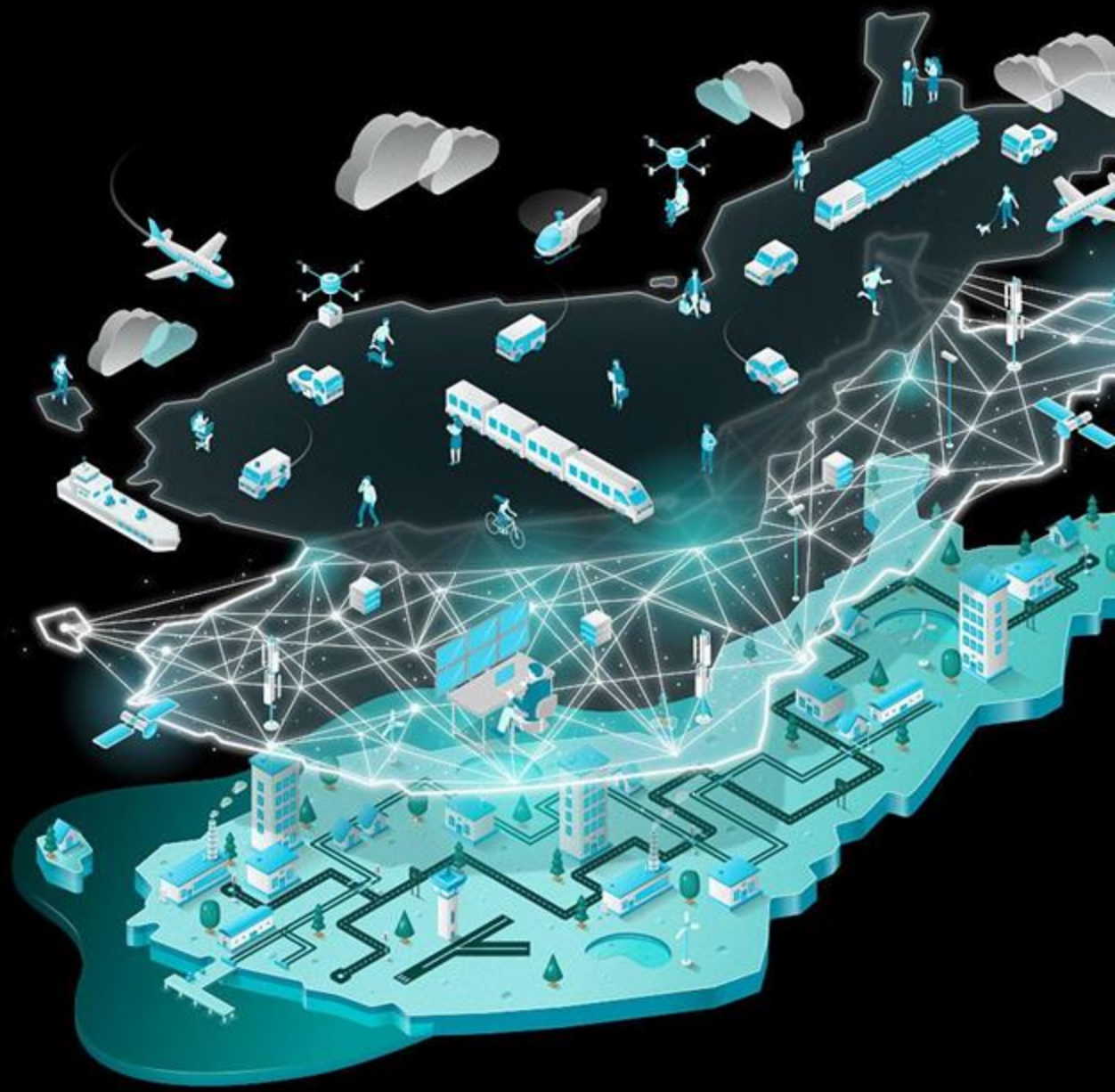
Fintraffic

Insights into international cooperation in maritime



Olli Soininen
Head of Programs
Fintraffic VTS

Global Drivers of Maritime Cooperation

Why International Cooperation Is Essential

Maritime transport carries 80–90% of global trade → requires globally harmonized rules.

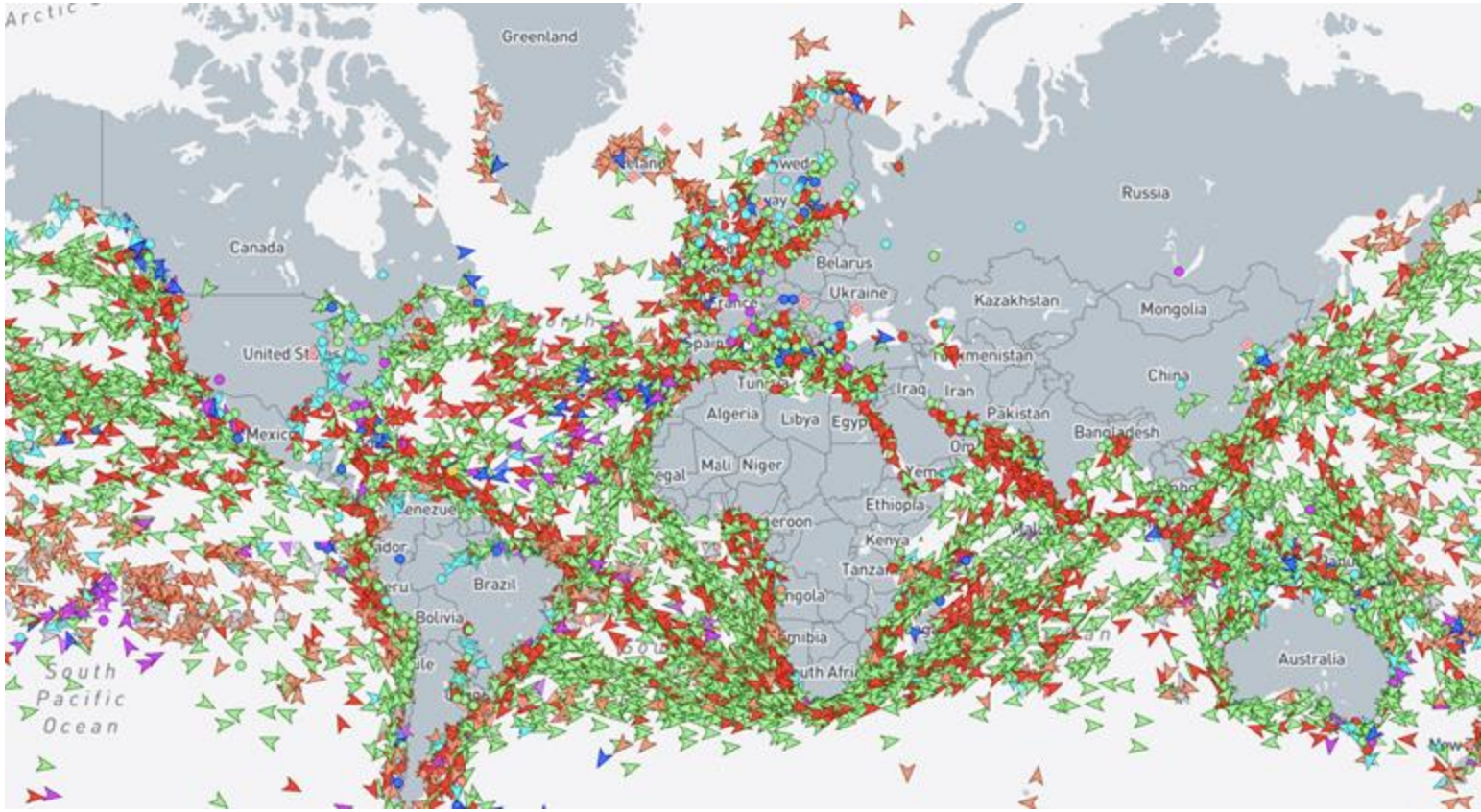
Ships cross multiple jurisdictions → need consistent safety, reporting, and navigation standards.

Decarbonization pressures → global alignment needed for alternative fuels, GHG reporting, JIT arrivals, and efficiency measures.

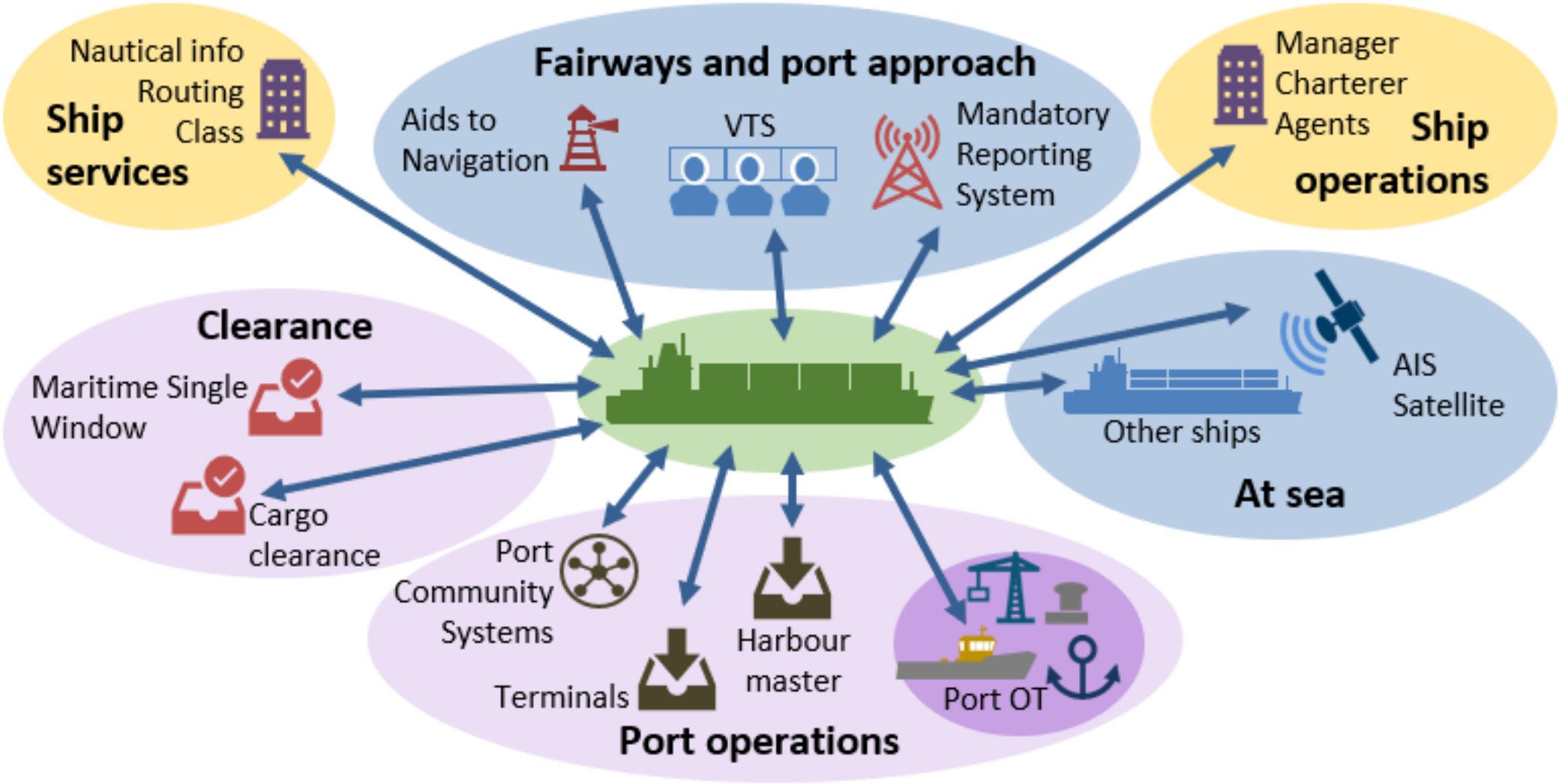
Digital transformation requires common data models, APIs, cybersecurity rules, and interoperable systems.

Global threats (cyber, piracy, hybrid disruption) demand shared situational awareness and unified protocols.

Efficient supply chains require harmonized customs and, ship clearance port call processes, trade data, and logistics interfaces.



Digital Maritime Environment



Roles of Key Global Maritime Organizations

IMO – Safety, environment, security

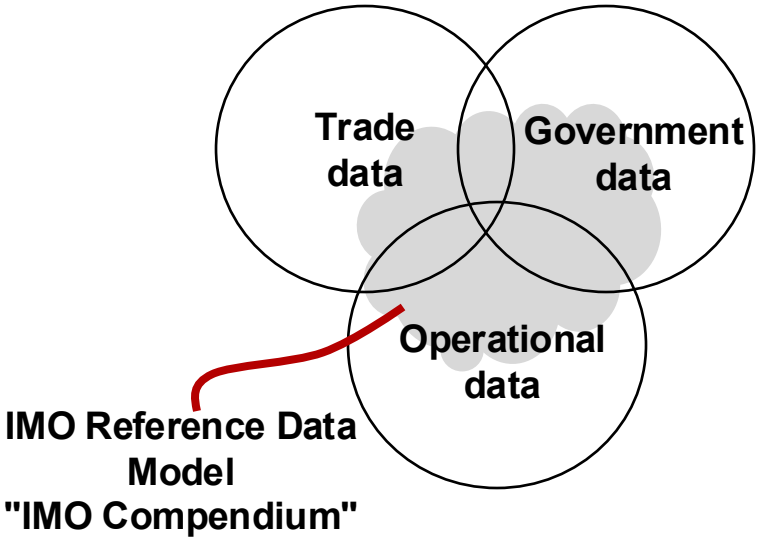
IALA – VTS, AtoN, e-Navigation

IHO – S-100, ENC, hydrography

IEC – Navigation/communication equipment

ISO – Cross-industry standards

GS1, DCSA, SMDG etc.. – Supply chain digitalization



Nautical/IMO MSC

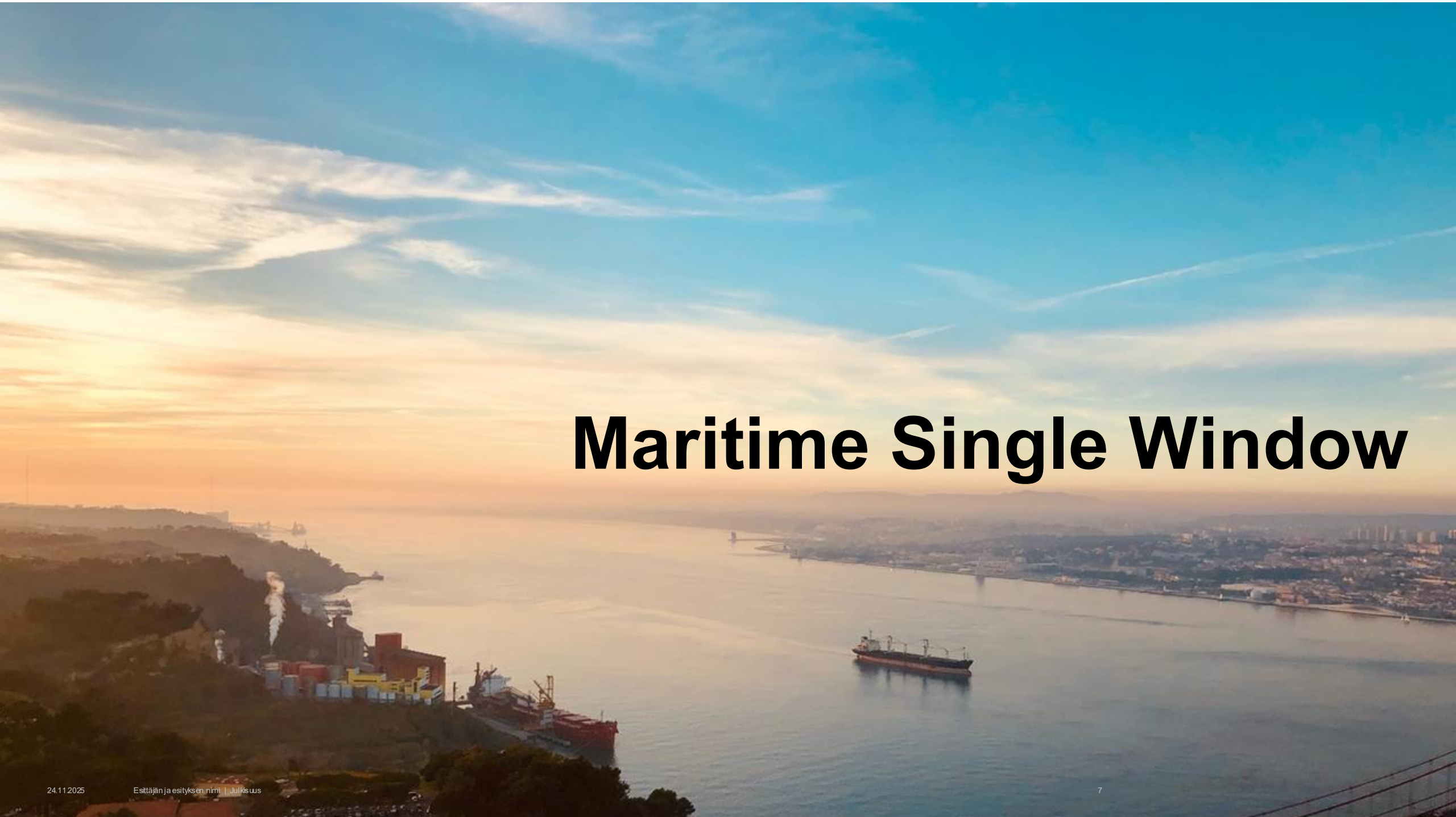
Administrative/IMO FAL

Operative/Commercial

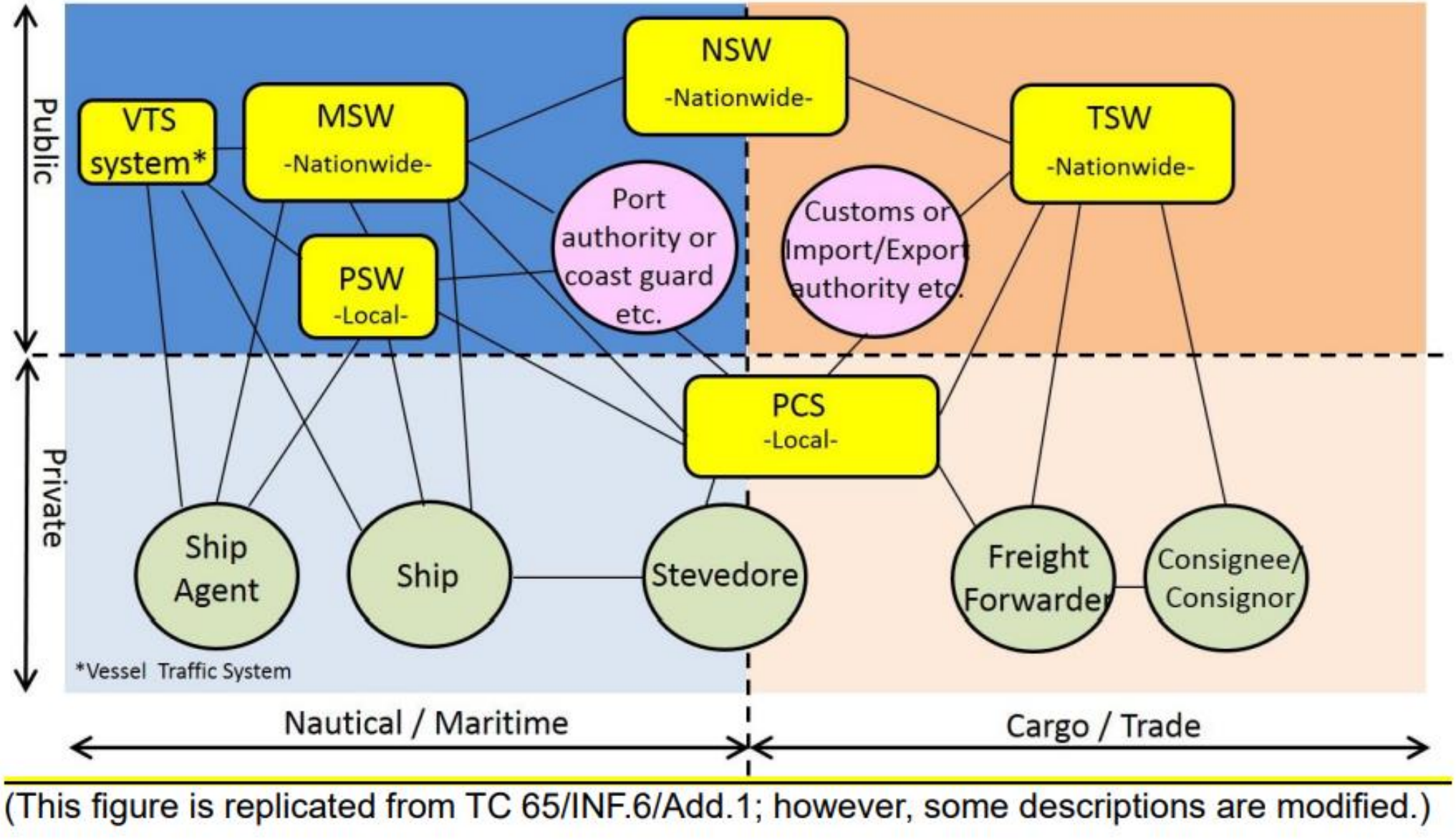
INSIGHTS INTO INTERNATIONAL COOPERATION ACTIVITIES AND PROJECTS

“Slower at sea and faster in port”

- About 96 % of Finland's trade (EU 80%) relies on maritime transport,
- Global shipping is undergoing rapid transformation at an unprecedented pace.
- Regulatory and market demands for low-emission shipping are increasing.
- The transition to alternative fuels is essential but hindered by high costs and limited availability.
- Bunker fuel accounts for 50–80% of a ship’s operating costs in global shipping.
- Enhanced situational awareness, connectivity, and operational optimization are critical for success.
- Lower logistics costs directly reduce domestic product prices and strengthen global export competitiveness.

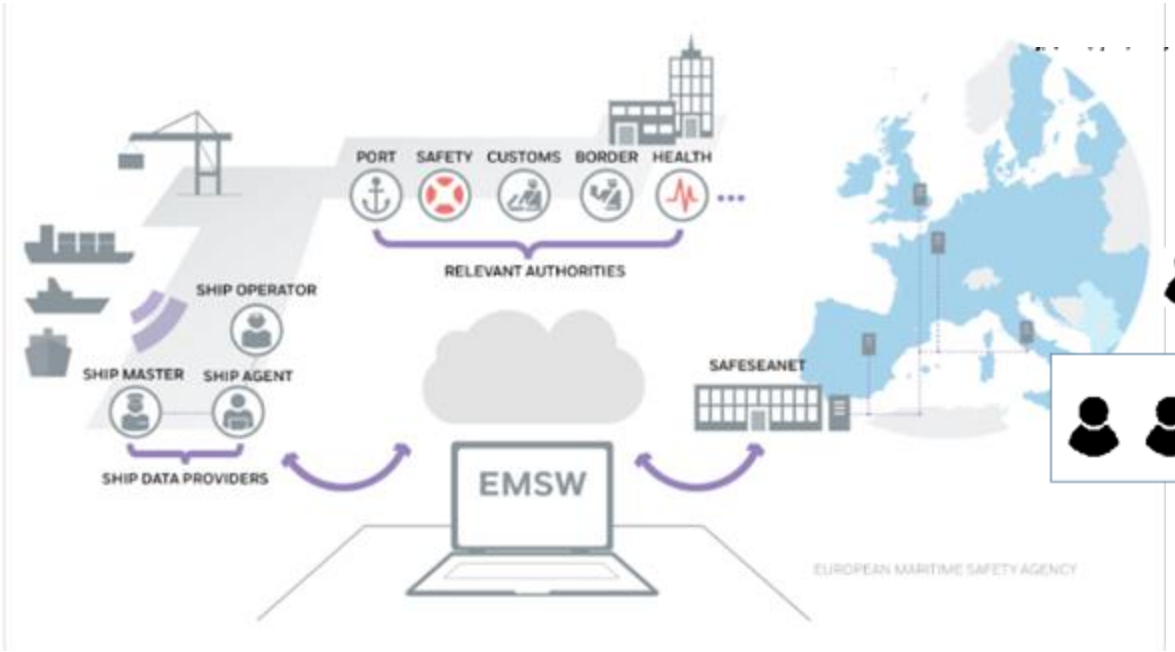

Maritime Single Window

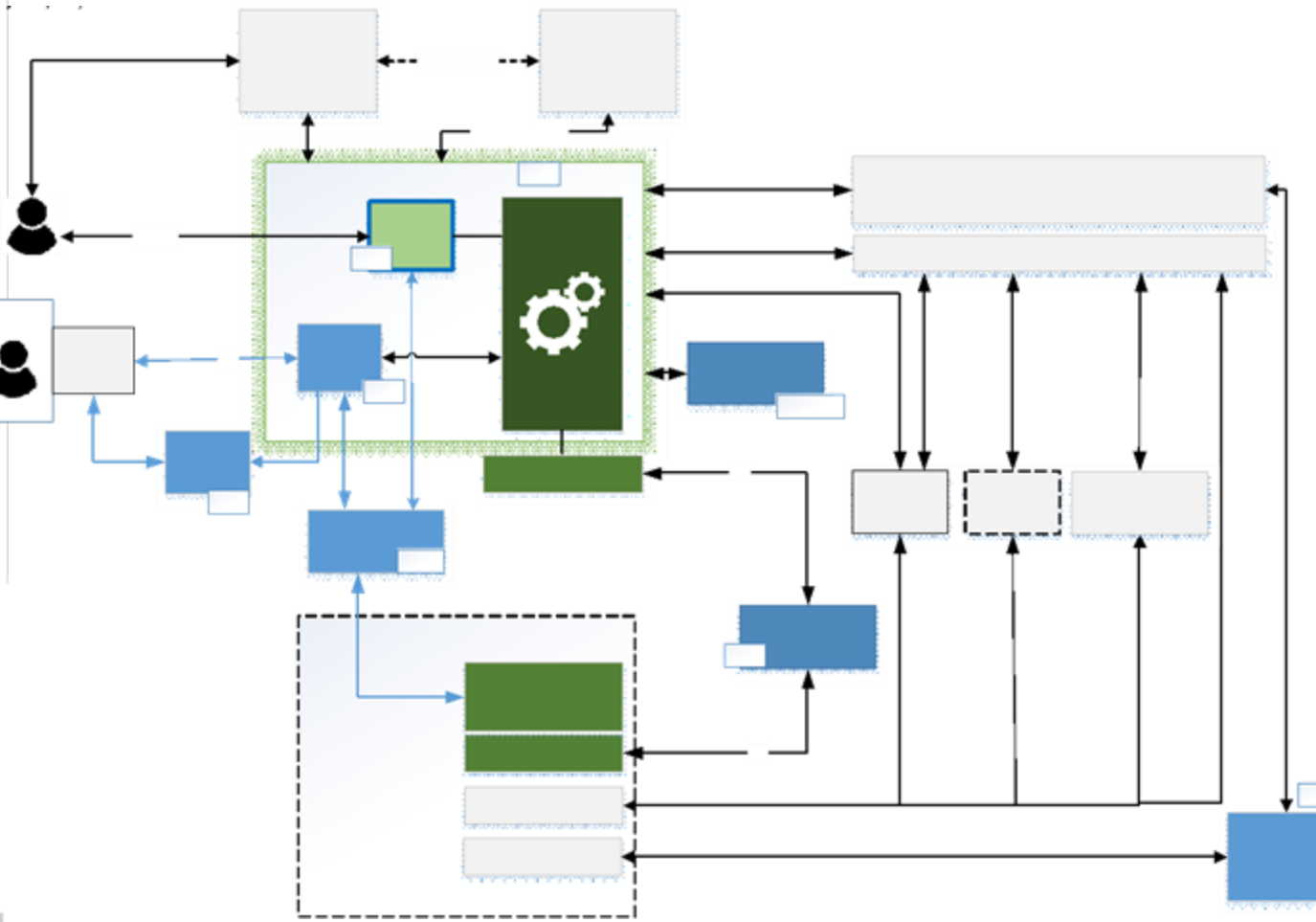
Maritime Single Window (MSW)

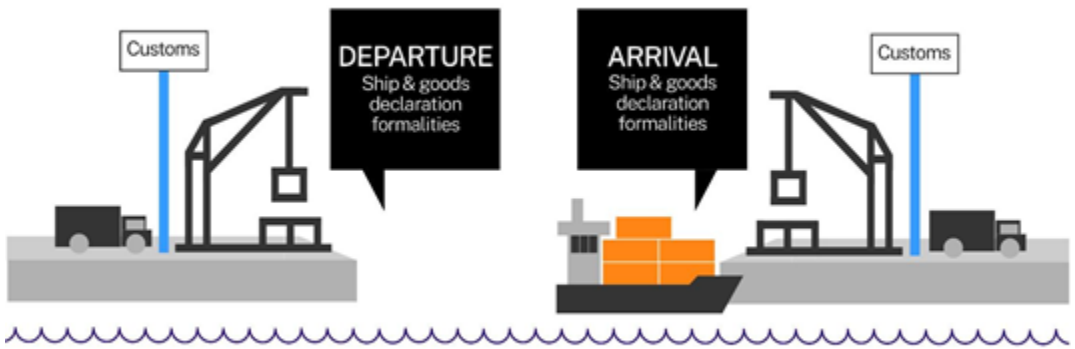


(This figure is replicated from TC 65/INF.6/Add.1; however, some descriptions are modified.)

European Maritime Single Window







NEMO Vision concept

A visionary maritime data platform of the future that combines public and commercial information in a way that benefits all parties in the operator ecosystem.

NEMO MSW concept was produced together with more than 150 stakeholder representatives who represented almost 70 different organizations (public and private).

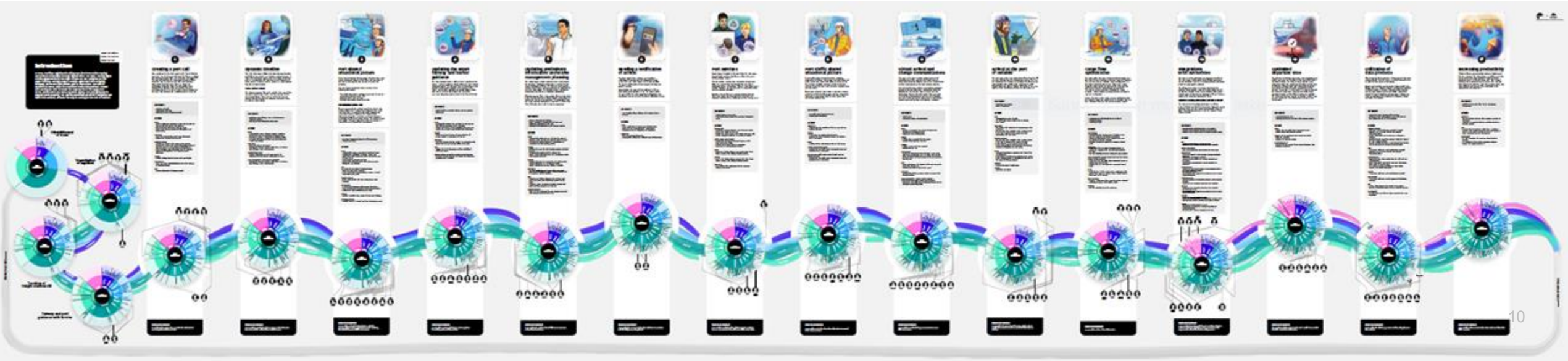
During the initial phase of development, various stakeholders participated in the design and planning process for the new system and methodologies

Concept story
A story set in the future about the different stages of a ship's port call, the benefit achieved by different actors and the value produced.

Data journey
Tasks, rights and responsibilities of actors in the concept story, utilization of data in the ecosystem

UI proto
A conceptual prototype of a possible future user experience

Blueprint
Summary of the concept story and data journey



Ship and goods declarations in MSW – 1400 data

Type of	Description
ABS	Absentee declaration
ACT	Expected activities notification
ATA	Notification of actual arrival
ATD	Notification of actual departure
BKA	Bunkers at arrival
BKD	Bunkers at departure
BLU	Safe loading and unloading of bulk carriers
BWA	Ballast water
CGA	Cargo declaration at arrival
CGD	Cargo declaration at departure
CGM	Customs goods manifest
COA	Cancellation of port call
CRT	Ship certificates
CWA	Crew list at arrival
CWD	Crew list at departure
DUE	Fairway dues declaration
EFF	Crew's effects declaration
EXP	Notification of expanded inspection
EXS	Exit Summary Declaration
EXT	Exit notification
HOS	Hospitalised crew member declaration
HZA	Notification of hazardous materials (dangerous and polluting goods) on board at arrival
HZD	Notification of hazardous materials (dangerous and polluting goods) on board at departure
HZS	Notification of hazardous materials (dangerous and polluting goods) on board during a shift
MDH	Maritime Declaration of Health

MSA	Maritime Transport Statistics on Arrival
MSD	Maritime Transport Statistics on Departure
NAC	Notification of arrival to the customs office of first entry
NAV	Navigation
NOA	Notice of pre arrival
NOD	Notice of pre departure
NOS	Notification of shift in port
PPA	Presentation of the proof (at arrival)
PRN	Presentation Notification
PXA	Passenger list at arrival
PXD	Passenger list at departure
REX	Re-export notification
SEC	Notification of security information
SHP	Ship information
SID	Ship identifiers notification
SRV	Request for service
SSA	Ship to ship activity declaration
STA	Declaration of stores on board at arrival
STD	Declaration of stores on board at departure
STW	Stowaways notification
TRA	Electronic transport documents used for transit at arrival
TRD	Electronic transport documents used for transit at departure
TSD	Temporary storage declaration
VID	Request for Visit ID
VIS	Ship visitors declaration
WAR	Waste delivery receipt
WAS	Advance notification for waste delivery to port reception facilities

Co-financed by the Connecting Europe Facility of the European Union

GRAVITY
(Green Reductions in Operational Vessels and Zero Emission Navigation)

The Change through GRAVITY

Current Situation at the Baltic Sea
(Pre-Gravity Project)

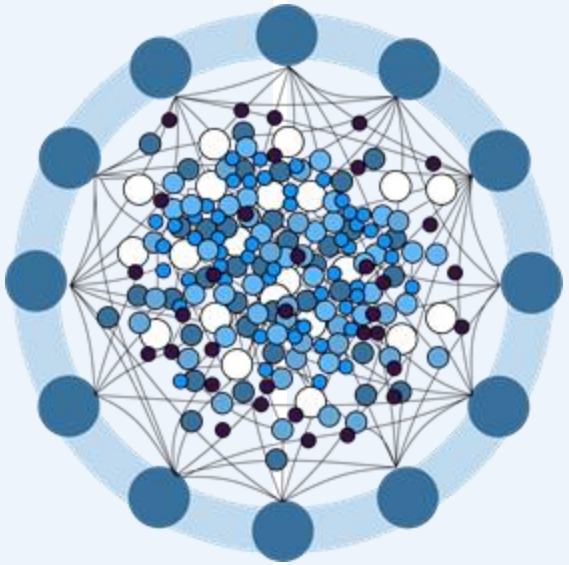
Inefficient Communication

Isolated Data

Lack of Coordination

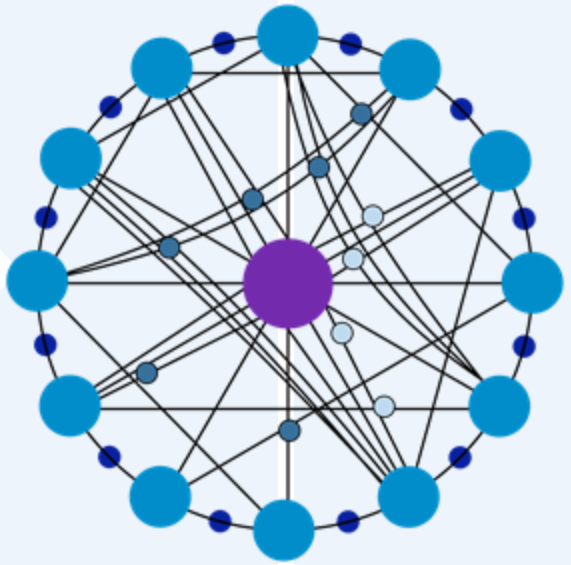
Impact on Operations

Local Projects



Unified Process and Service

Common Standards



Future Situation After the Gravity Project
(Post-Implementation)

Collaborative Ecosystem

Data Integration

Efficiency Gains

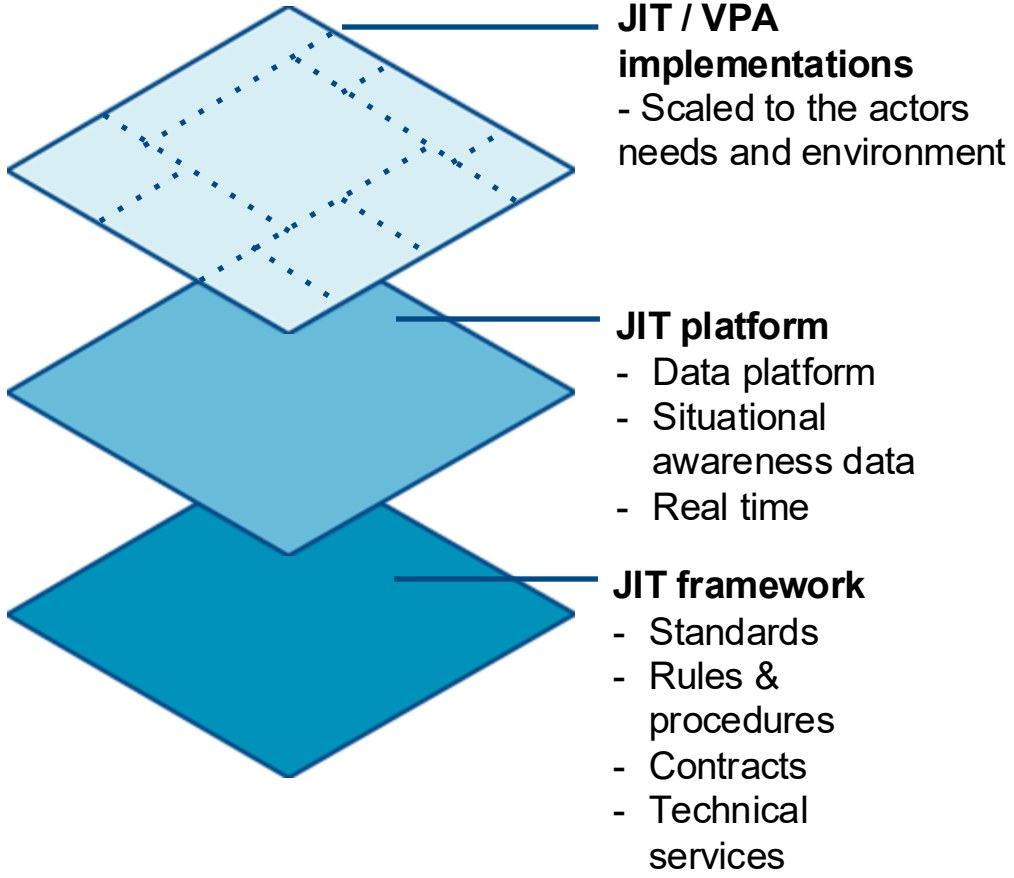
Enhanced Situational Awareness

GRAVITY partners are curretly 11 organisation providing PCS solutions
GRAVITY ECOSYSTEM has currently more that 70 members
Ports, Ports Community Systems Providers, Gargo Owners, Shipping Companies, Banks, Port Operators

GRAVITY - Main Goals of the Project

Developing and implementing Just In Time (JIT) and Virtual Port Arrival (VPA) as a commonly defined and implemented service:

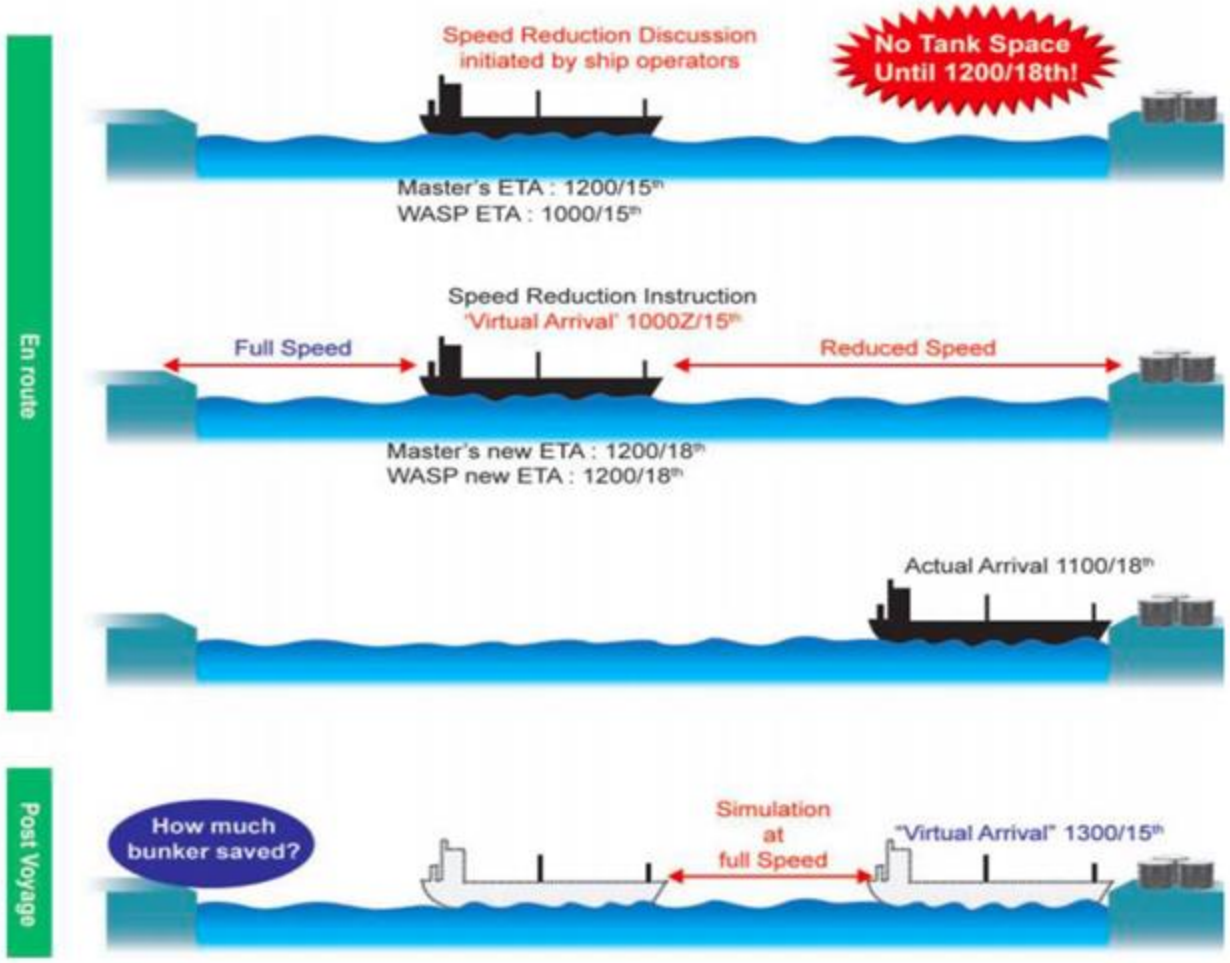
1. Reduces the environmental impact of shipping and promotes sustainable shipping
2. Supports digital development aimed at emission reductions for various operators
3. Harmonizes operational processes, relevant documentation and agreement
4. Supports data sharing and trust between maritime stakeholders.
5. Produces financial and competitive advantages
6. Aligns with regulatory needs and changes



Just In Time (JIT) & Virtual Port Arrival (VPA) in Maritime Logistics 1/2

Just In Time (JIT):
A logistics concept where ships adjust speed and voyage planning so they arrive at port exactly when their berth, services, and cargo operations are ready. This reduces waiting times at anchor, cuts fuel consumption, lowers emissions, and improves overall efficiency.

Just In Time (JIT) & Virtual Port Arrival (VPA) in Maritime Logistics 2/2



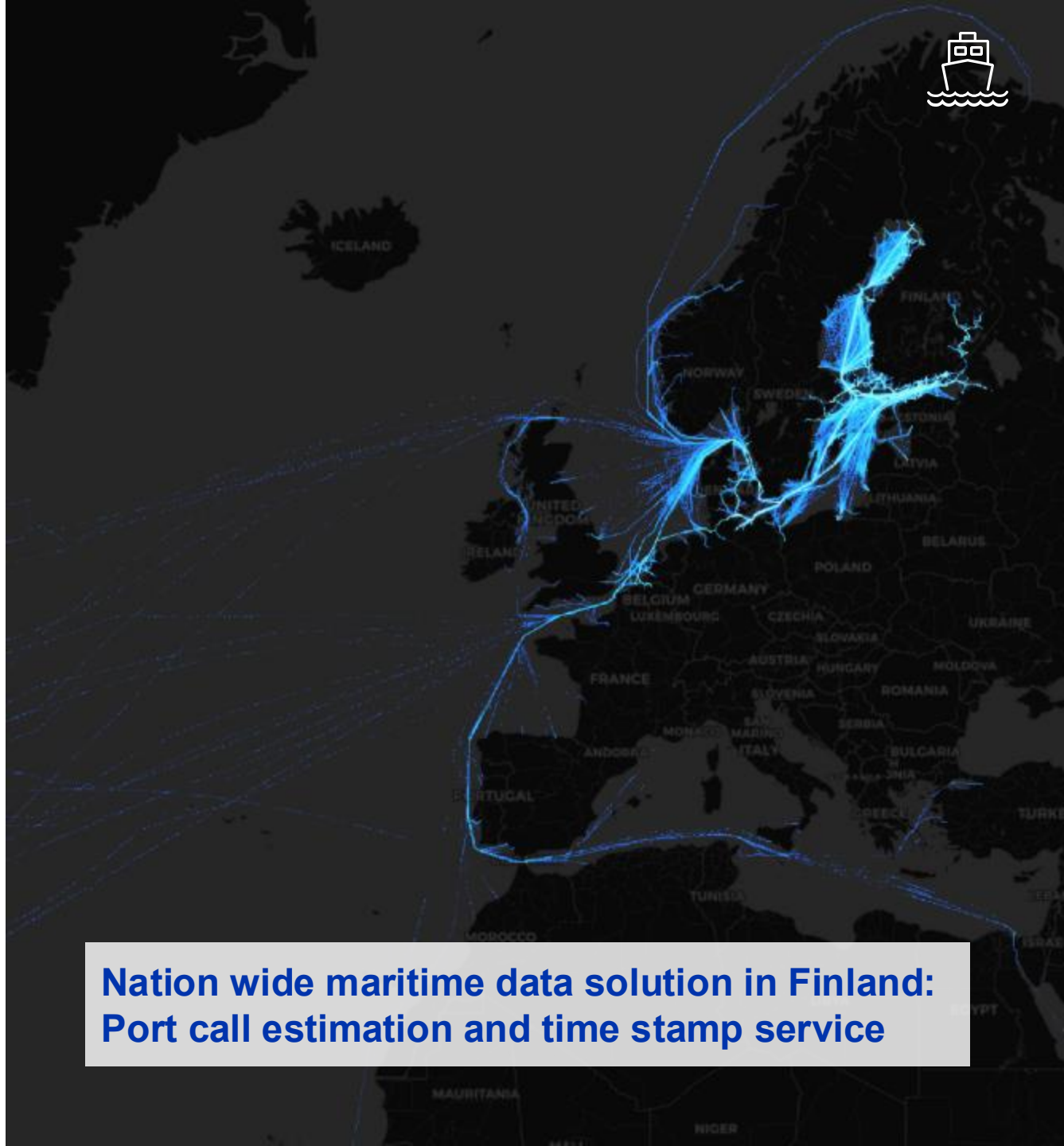
Virtual Port Arrival (VPA):
A digital process that enables ports and shipping lines to share real-time information about berth availability and arrival slots. Instead of queuing outside the port, vessels receive a “virtual queue number” and slow down at sea, aligning their arrival with the port’s readiness.

Fintraffic

ETA(D) / ATA(D) Service

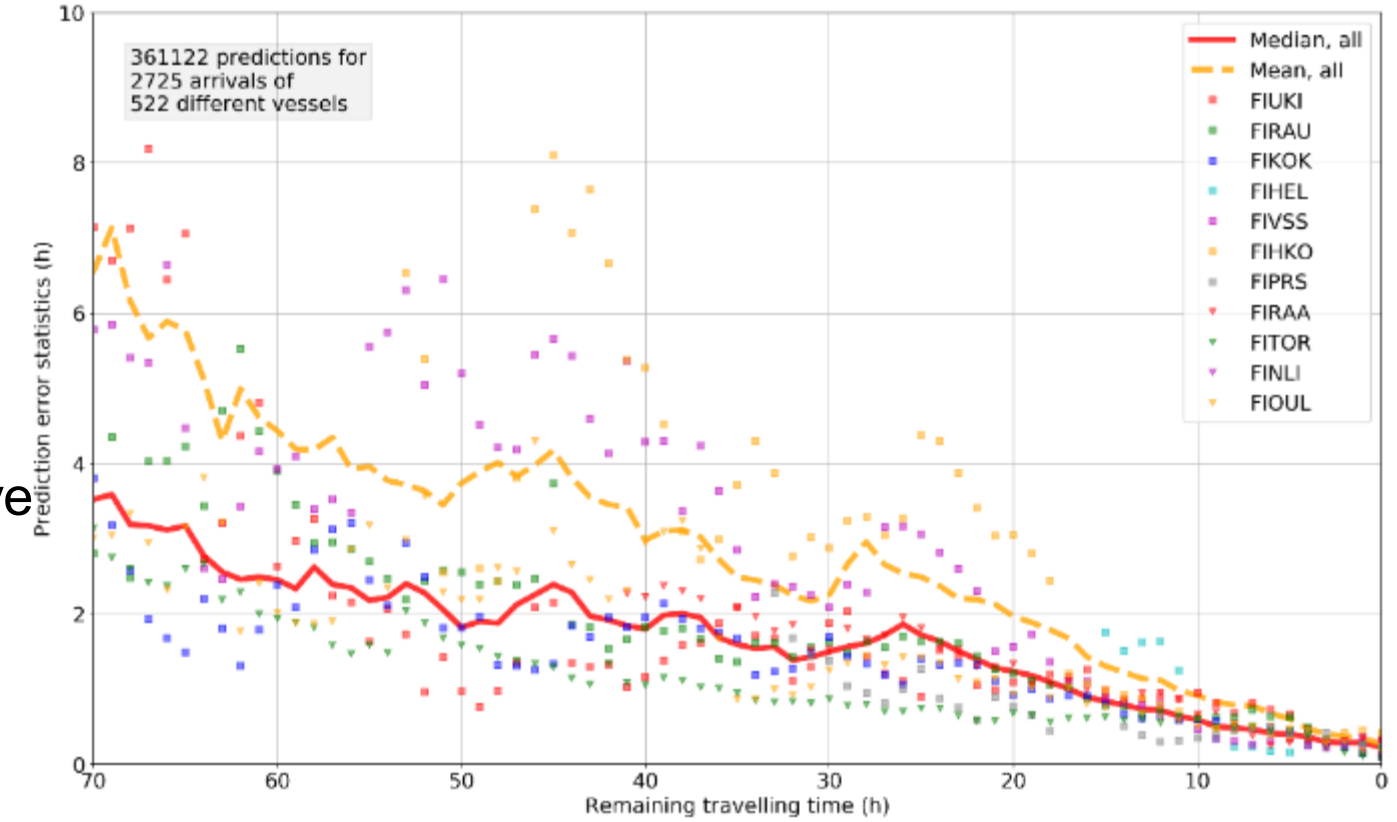
Case: ETD/ETA Estimation Service

- **Problem**: Actors in the maritime supply chain do not have up to date shared knowledge of current and future vessel schedules. *This leads to unnecessary manual work and makes operational planning less efficient.*
- **Solution**: A machine learning based system which monitors incoming traffic for all ports in the Baltic region, providing schedule predictions and up to date traffic events. *Integrates global vessel data with regional port call plans, weather information, etc.*
- **Beneficiaries**: Port operations planners and coordinators (e.g. terminal operators, agents, port authorities), port service providers (e.g. towage, pilotage), cargo owners, land transport operators



Time Data Forecasting Service – at Deployment

- Time data forecasting service calculates ETA forecasts for commercial transport vessels entering Finnish ports (ETB berth)
  In the future, ETA forecasts of the arrival of vessels at pilot sites will also be included in the service
  Time forecasts are calculated for vessels that are constantly on the move in focus (continuous distance)
  New forecast data is calculated on every 5-30 minutes, depending on the availability of AIS data

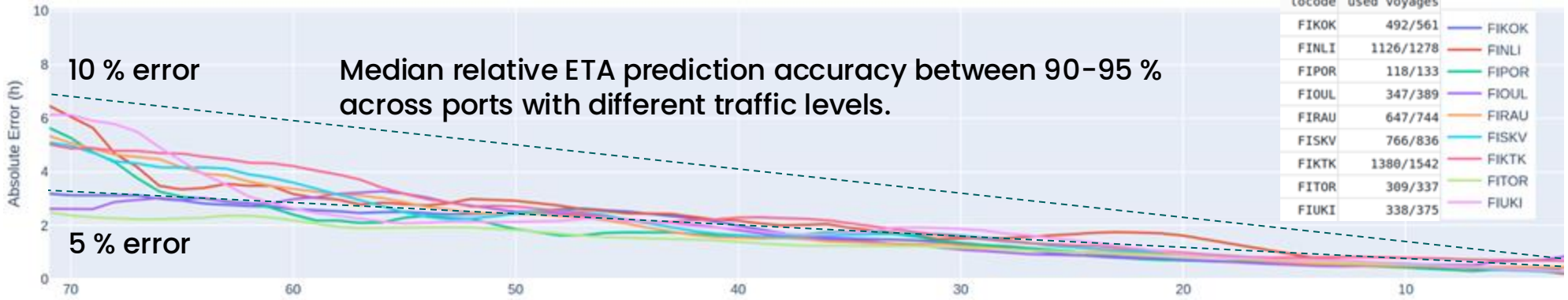


ETA Predictions, March 2024 – February 2025

2024-03-01 → 2025-02-09

Filter trajectory outliers

Apply filters | Download data



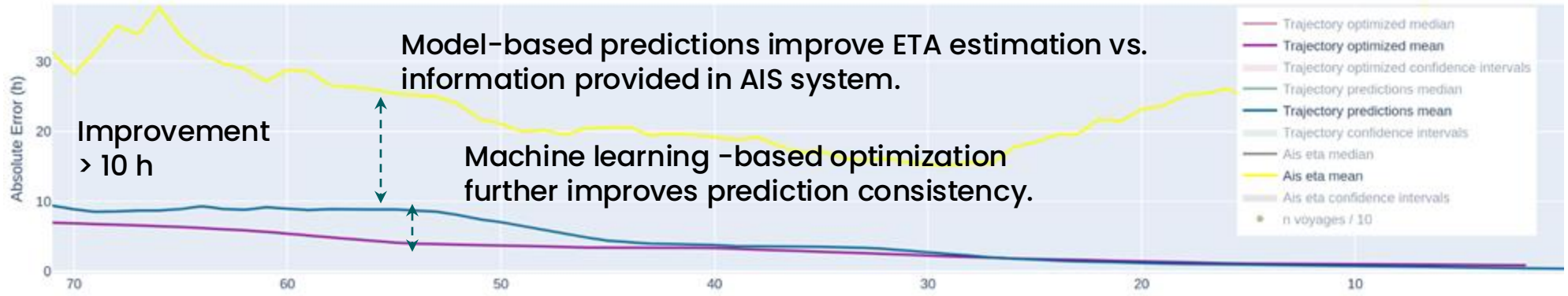
Locode and time selection:

2024-03-01 → 2025-02-09

Filter trajectory outliers

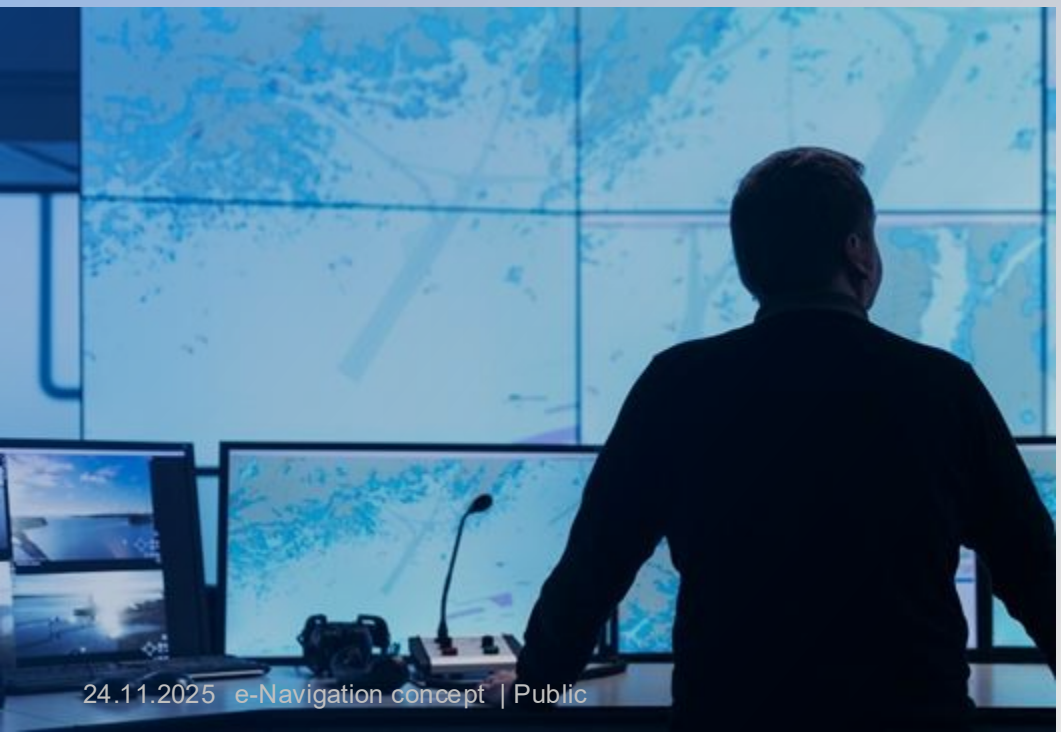
Filter ais outliers

Apply filters | Download data



Vessels under way to a selected port can be detected automatically, early, and with high reliability.


(e-)Navigation



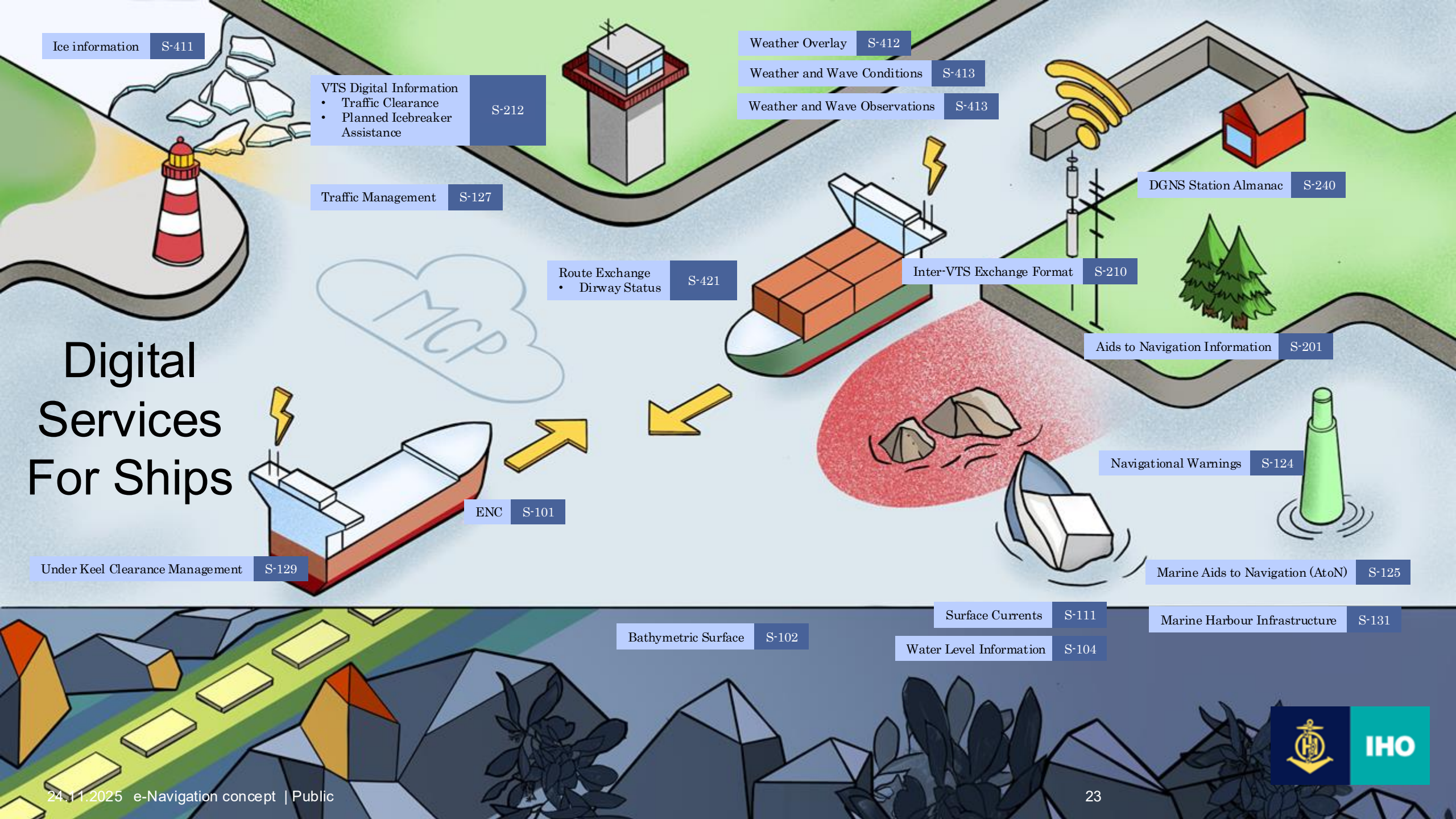
Current Navigational Information Delivery

The national coastal radio stations broadcasts navigational warnings, maritime weather forecasts and ice reports using VHF

VTS uses VHF radio for voice-based communication with vessels

Navigation is based on an offline ECDIS chart.

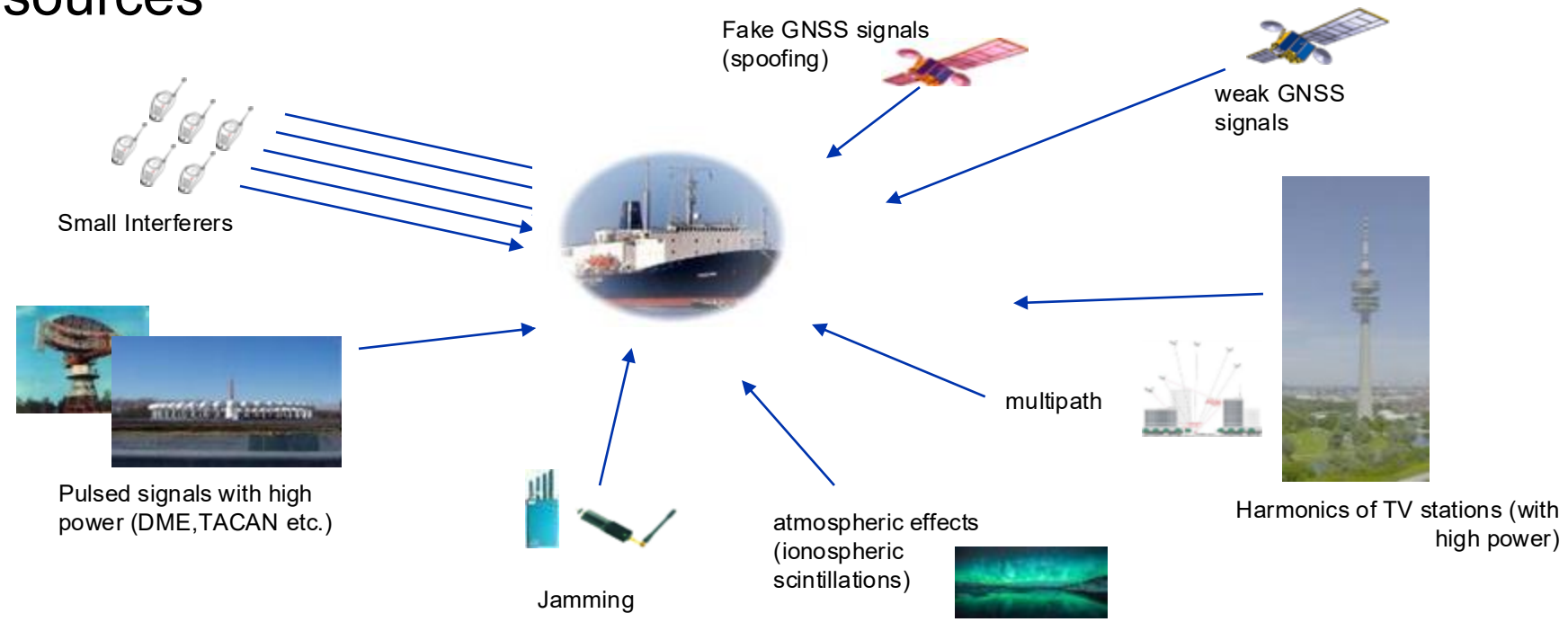
NAVTEX (Navigational Telex) provides navigational and meteorological warnings, forecasts and other urgent maritime safety information to the vessels.


Ice information S-411
VTS Digital Information
• Traffic Clearance
• Planned Icebreaker Assistance
S-212
Traffic Management S-127
Weather Overlay S-412
Weather and Wave Conditions S-413
Weather and Wave Observations S-413
DGNS Station Almanac S-240
Route Exchange
• Dirway Status
S-421
Inter-VTS Exchange Format S-210
Aids to Navigation Information S-201
Digital Services For Ships
ENC S-101
Navigational Warnings S-124
Under Keel Clearance Management S-129
Marine Aids to Navigation (AtoN) S-125
Surface Currents S-111
Marine Harbour Infrastructure S-131
Bathymetric Surface S-102
Water Level Information S-104

GNSS Interference

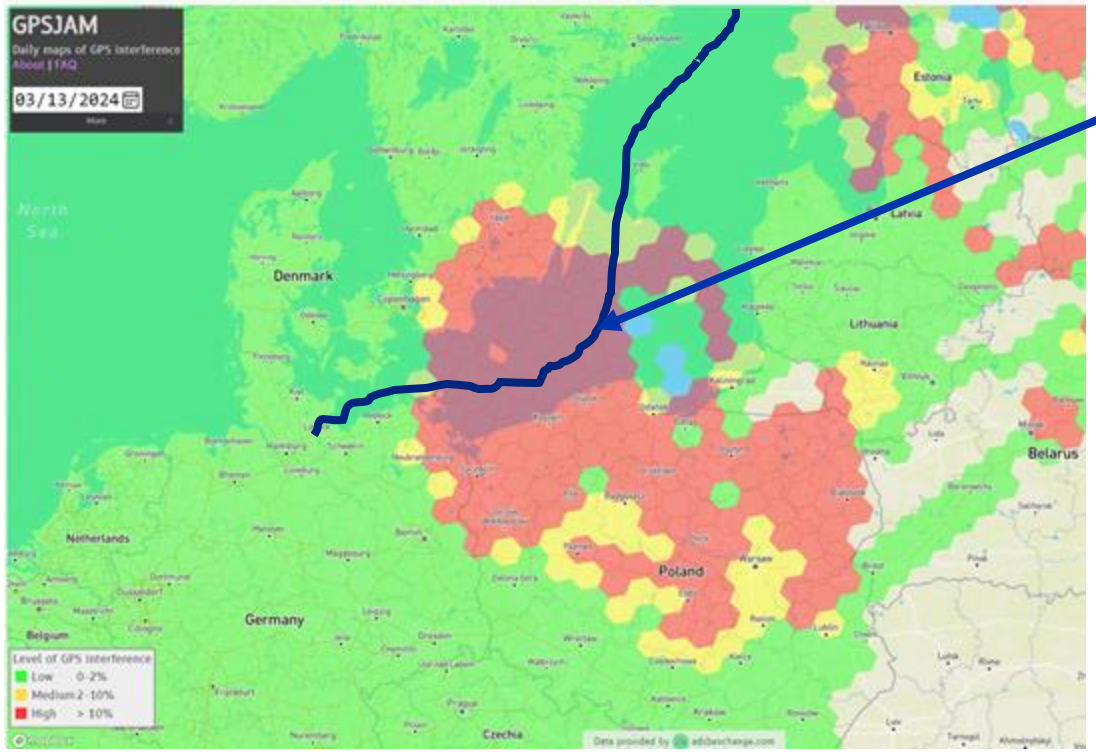
The Need for a GNSS Backup System

- Global Navigation Satellite Systems (GNSS) are the main source of position, navigation and timing (PNT) data for shipping today.
- All GNSS are vulnerable to interference, whether from natural or man-made sources



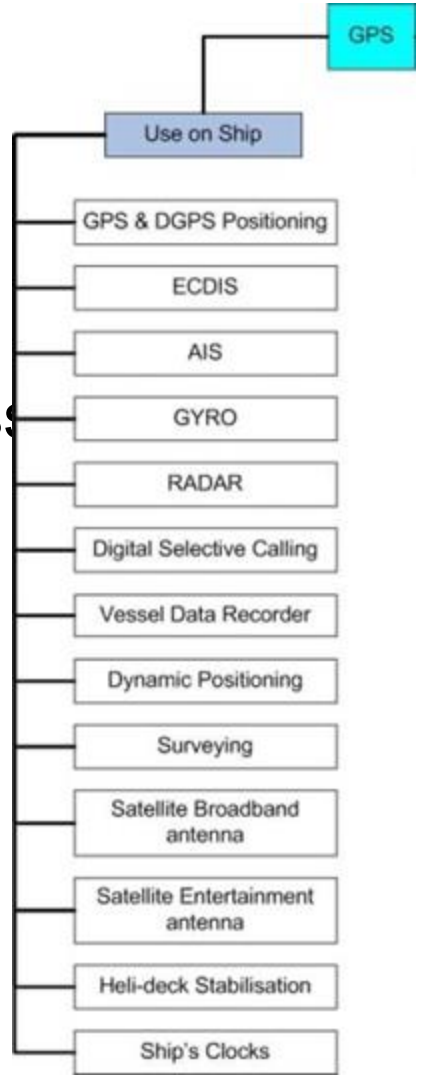
The Weak Point of Shipping

- GNSS / GPS provides position and timing for vessel systems
- Ships are prone for GNSS interferences
- Risk for collisions, groundings and disruption of operational process



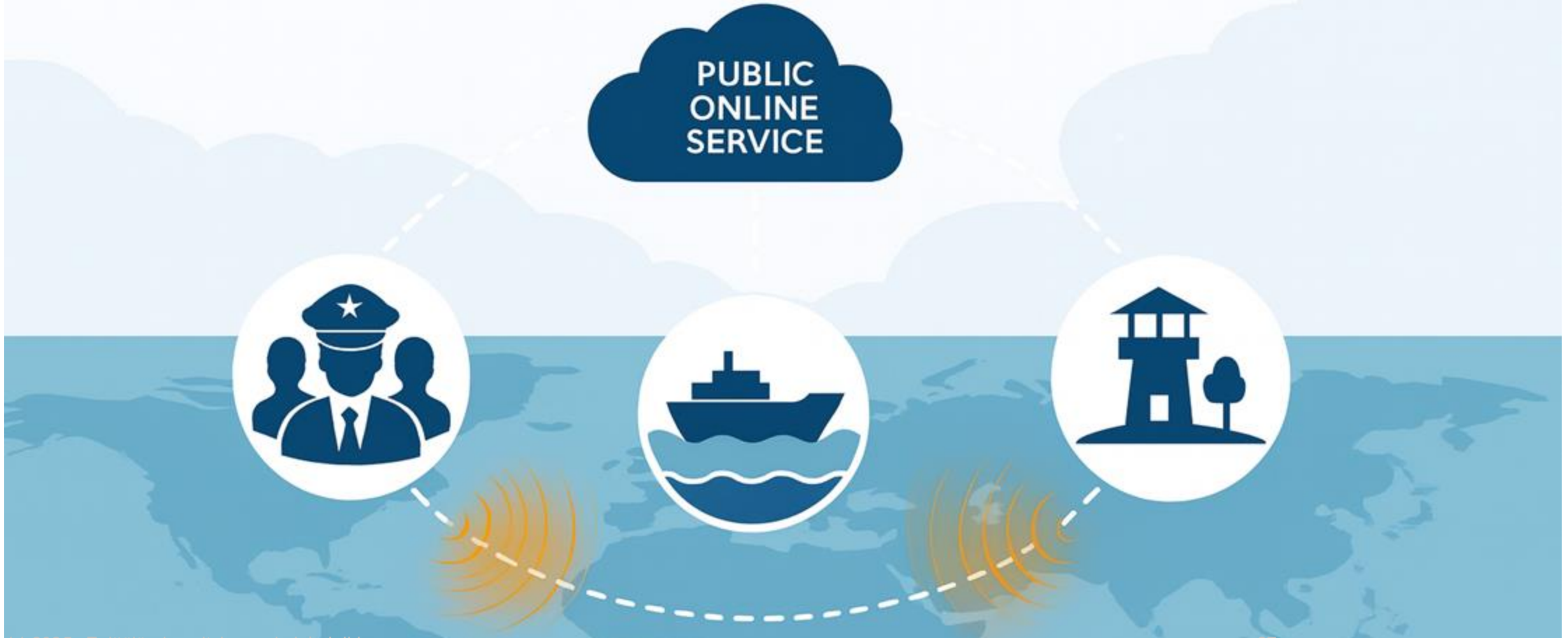
Ferry Travemünde-Hellsinki crosses this area

*Jamming attacks detected over the Baltic Sea Region on 13 March 2024 by using ADS-B reports. (**Source: gpsjam.org**).*



The Target State – A Shared Interference Picture

- Mariners can monitor GNSS interference directly from a public online service
- Observations from ships and shore stations are combined into one operational picture
- This creates a shared, visualised understanding of interference across the maritime domain.




Thank you