



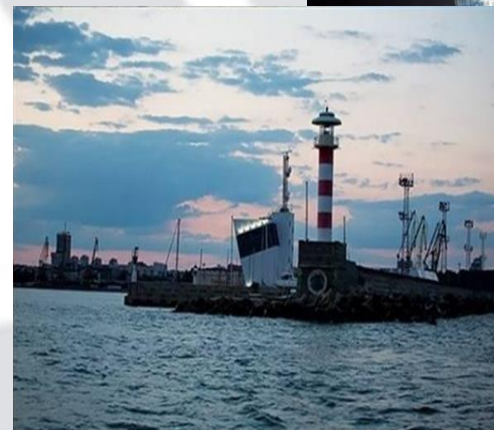
**Project proposal  
“Feasibility study on  
implementation of the concept for  
monitoring and management of  
maritime traffic (Sea Traffic  
Management) and development of a  
model for realization of a pilot project  
for the Black Sea region”**

Capt. Milen Todorov Ph.D.  
Director SDD VTS Authority – Black Sea  
Bulgarian Ports Infrastructure Co.

**Burgas, 22.06.2022**

# The Company

- Bulgarian Ports Infrastructure Company (BPI Co.) manages the port infrastructure of the public transport ports of national importance and **provides traffic management and shipping information services.**
- Object of activity and status of BPI Co. are regulated by the **Law on Maritime Spaces, Inland Waterways and Ports of the Republic of Bulgaria.**
- **SDD Vessel Traffic Services Authority – Black Sea** provides the vessel traffic management and information services to shipping in the maritime spaces of Republic of Bulgaria.



# Vessel Traffic Services Authority – Black Sea Directorate - SERVICES

- Monitoring and Management of ship traffic and navigational decision support;
- Collecting, storing and providing information (navigational, meteorological, etc.);
- Provision of Bulgarian part of the GMDSS and dissemination of maritime weather forecasts and maritime safety information;
- Digitalization of the G2G and B2G dialogue by provision of digital information systems;
- Provision of data exchange with European systems for maritime safety and security.



# Improved safety, environmental protection and security of merchant shipping

## Development of an integrated system for vessel traffic monitoring and management

- Vessel traffic monitoring and organization
- GMDSS and weather and safety information dissemination
- Enhanced monitoring of potentially dangerous for the environment vessels

## Establishment of coastal centers in burgas and varna, consisting of:

- Operational centers for traffic management
- Operational center of the Bulgarian part of the Global Maritime Distress and Safety System
- Situational centers for coordination of incidents and emergency situations related to maritime activity

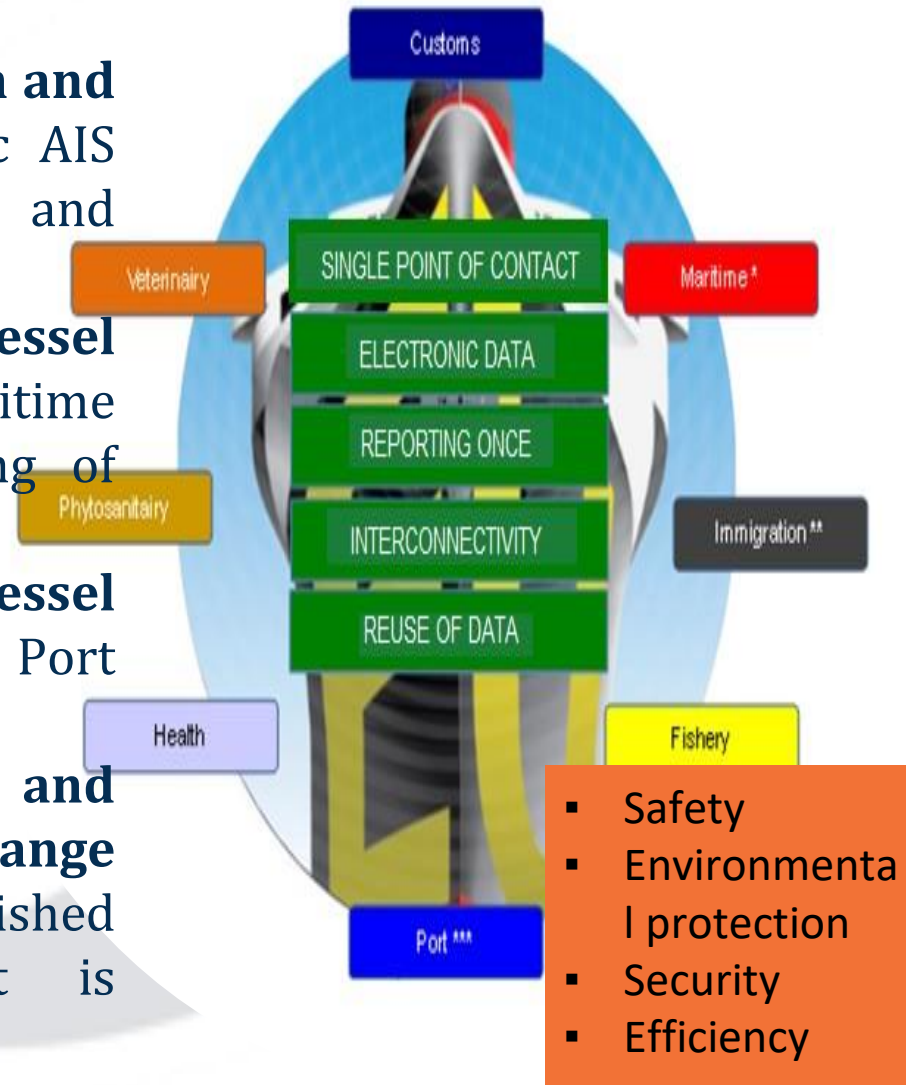
## Continuous expanding the scope and functionalities of the existing systems in means of:

- Vessel traffic management /VTS/ capabilities
- Technological modernization of the radio communication global maritime distress and safety system (GMDSS)
- Innovation

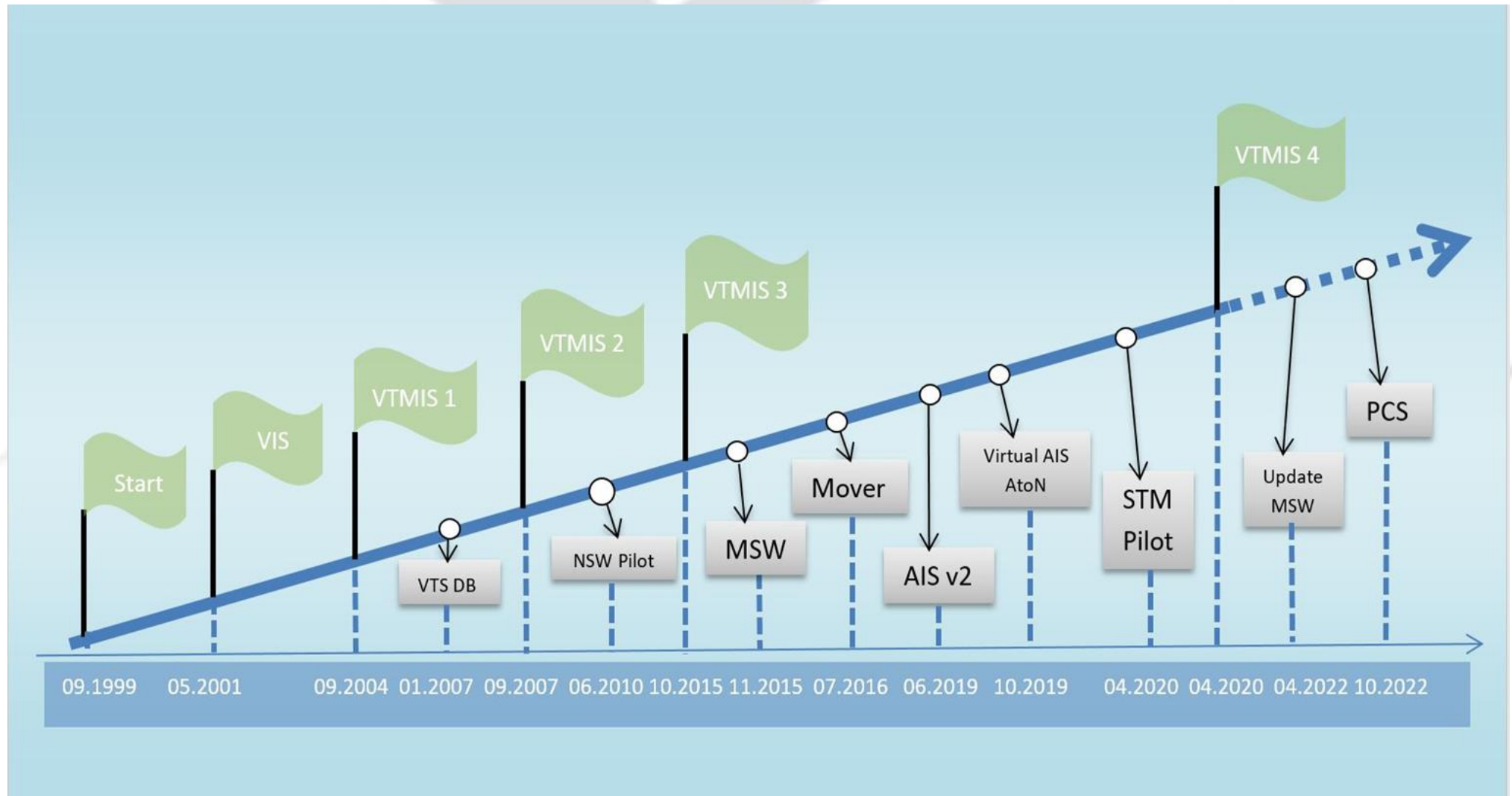


# Improved port efficiency via digitalization and electronic governance

- Digitalization of **vessel traffic information and system-to-system exchange** – automatic AIS and target data services to national and European systems;
- Digitalization of **mandatory vessel documentation** in Bulgarian ports – “Maritime Single Window” for electronic processing of vessel documents;
- Digitalization of **port movements and vessel maneuvers** planning – developed a Port Management System in 2015;
- Digitalization of **port activities, logistic and multimodal transport information exchange** – conducted a feasibility study for PCS, finished in 2018, building and deployment is forthcoming;



# Integrated system for safety of navigation



# Integrated system for safety of navigation

## MONITOR

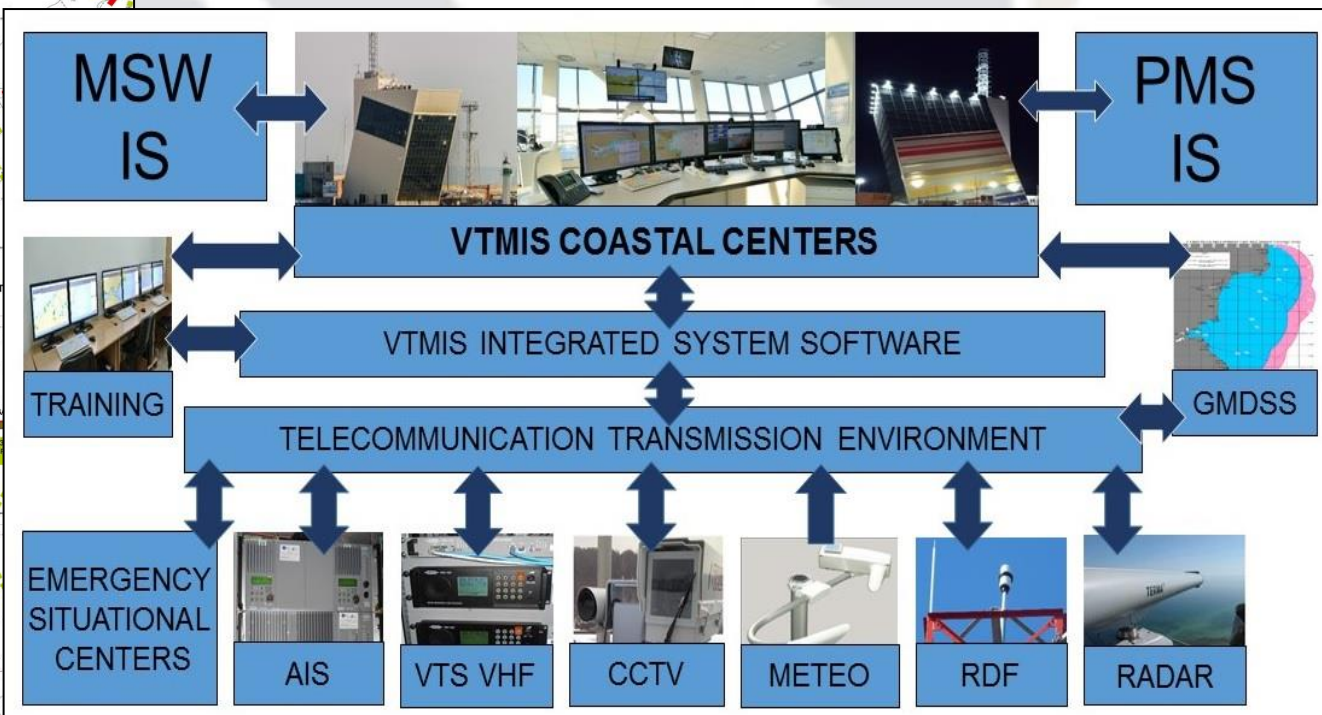
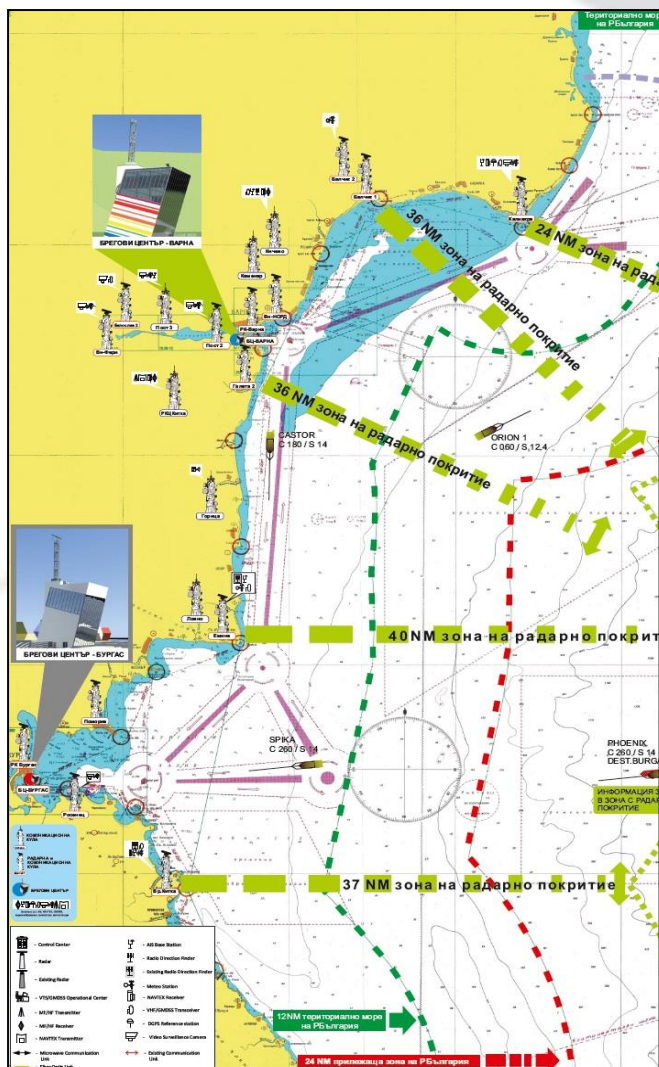
- ❖ Collect and process the data
- ❖ Create common operational picture
- ❖ Distribute data to clients

## ALERT

- ☐ Analyze traffic
- ☐ Detect dangerous traffic situations
- ☐ Increase situation awareness

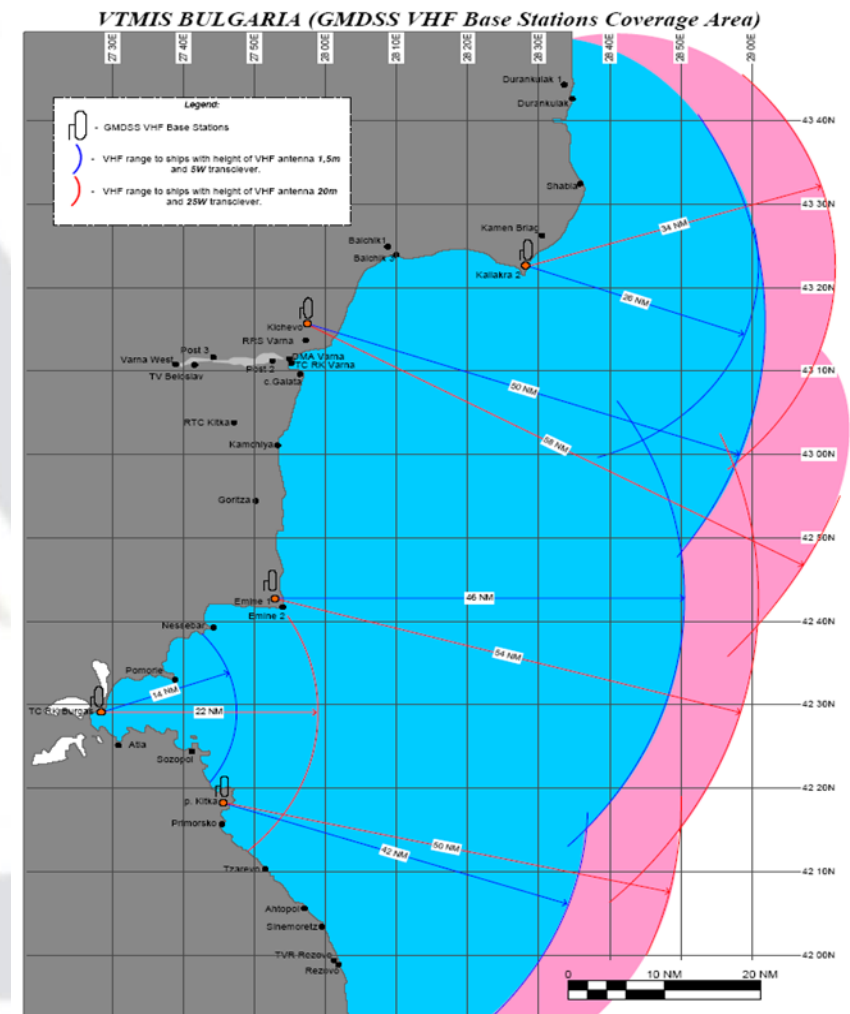
## RESPOND

- ✓ Provide decision support services
- ✓ Ensure ship to shore communications



# Bulgarian part of the GMDSS, provided by VTS Authority – Black Sea Directorate

- Technical system (hardware and software) provides coverage of GMDSS areas A1, A2, and broadcast information about the safety of shipping by the means of the NAVTEX system
- GMDSS operating center uses all remote radio resources (base stations, transmission and receiving center)
- All communications of the maritime rescue coordination center (MRCC) are being provided by the GMDSS



# Virtual Aids to Navigation



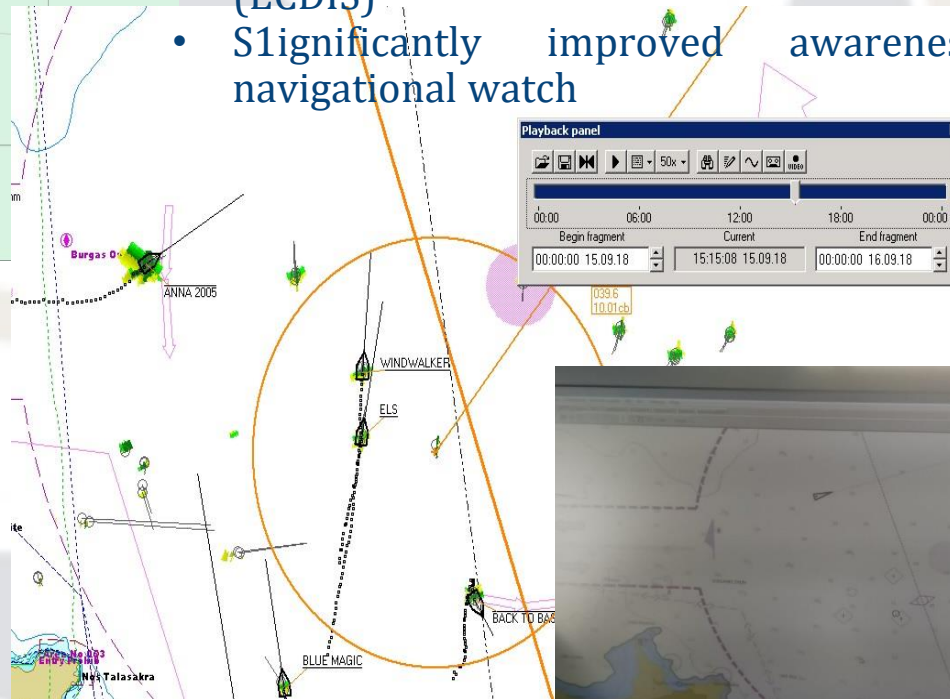
## Use of AIS capabilities to broadcast virtual and synthetic AtoN

- Visualization of AtoN information for new or temporary objects and dangers to navigation directly on the displays of the ship's navigation systems (ECDIS)
- Significantly improved awareness of the navigational watch

An example of a practical result of using such a system is the “Mopang” fuel drain operation in the TSS in the approaches of port Burgas:

A vessel sank on 30.06.1921. and started leaking fuel oil in the summer of 2018 in an area of heavy ship traffic.

After broadcasting the virtual and synthetic AtoN the navigation situation has improved significantly



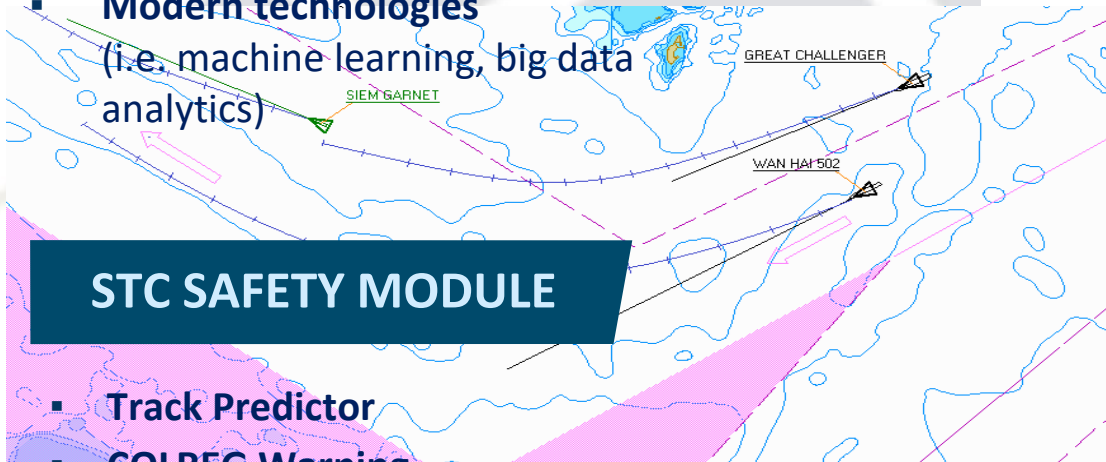
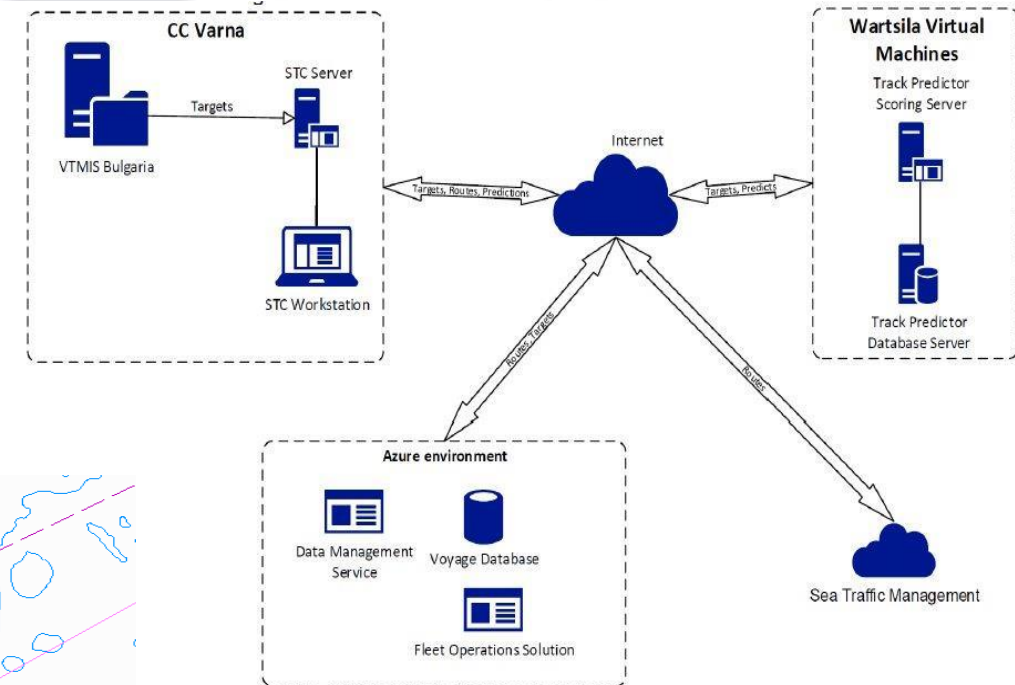
# Artificial intelligence in navigation

## NEXT VTS GENERATION

- Berth-to-Berth Traffic Control
- Long Range Monitoring
- E-Navigation approach
- Active decision support
- Modern technologies (i.e. machine learning, big data analytics)

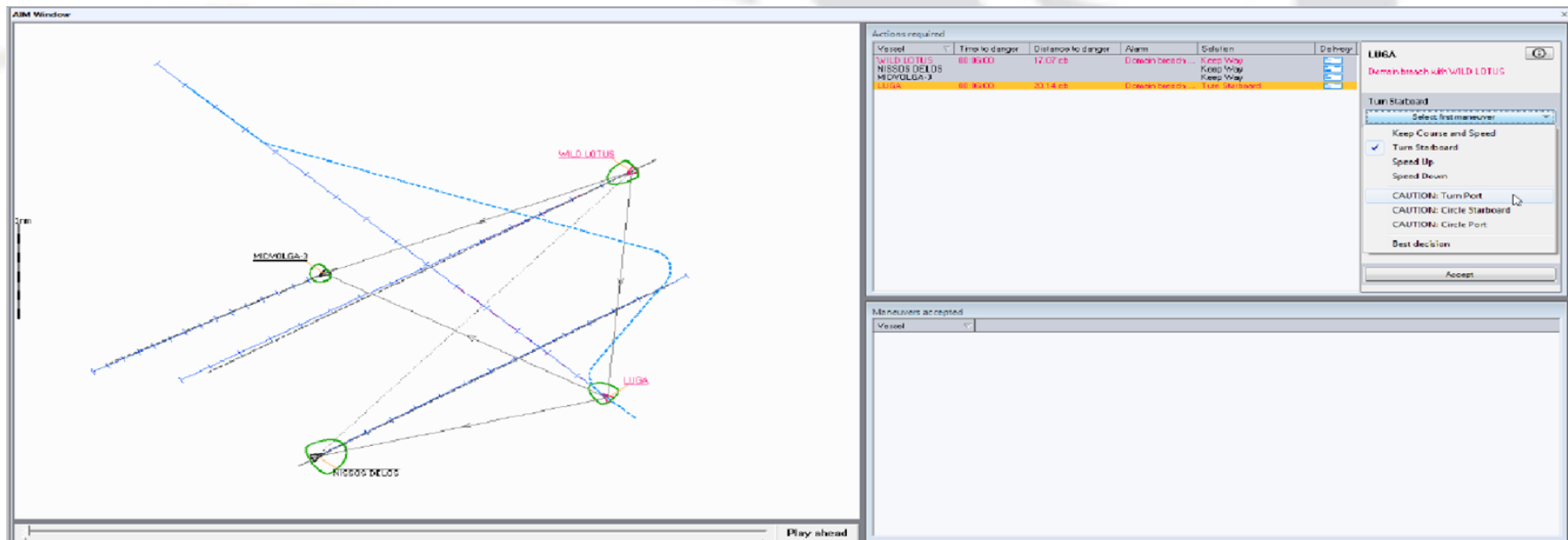
## STC SAFETY MODULE

- Track Predictor
- COLREG Warning
- Active Decision Support
- STC Operator approval
- Delivery of recommendation to Vessel



# Purpose of an enhanced monitoring and management of the sea traffic

- On November 13, 2018 **BIMCO** adopted a specific **STM-clause** developed to facilitate just-in-time port calls in commercial contracts.
- **EMSA's pilot project** on Facilitation of ship to shore reporting connects to STM
- Numerous pilot projects around the world



# Purpose of an enhanced monitoring and management of the sea traffic

## **Expected benefits:**

- Safety: 50% reduction in accidents;
- Efficiency: 30% reduction in waiting time for berthing and 10% reduction in voyage costs;
- Environment: 7% lower fuel consumption and 10% lower greenhouse gas emissions.

## **Achieved by:**

Support just-in time operations within ports and other actors;

Tactical and operational decision about voyage, such as planned and executed routes;

Coordination of multiple ships in congested geographical areas;

Provides a framework for the harmonization of data formats and standards for information management and operational services;

Energy saving.

## Potential participants

- VTS centers of Black Sea countries
- Shipping companies / vessels

### Collateral participants

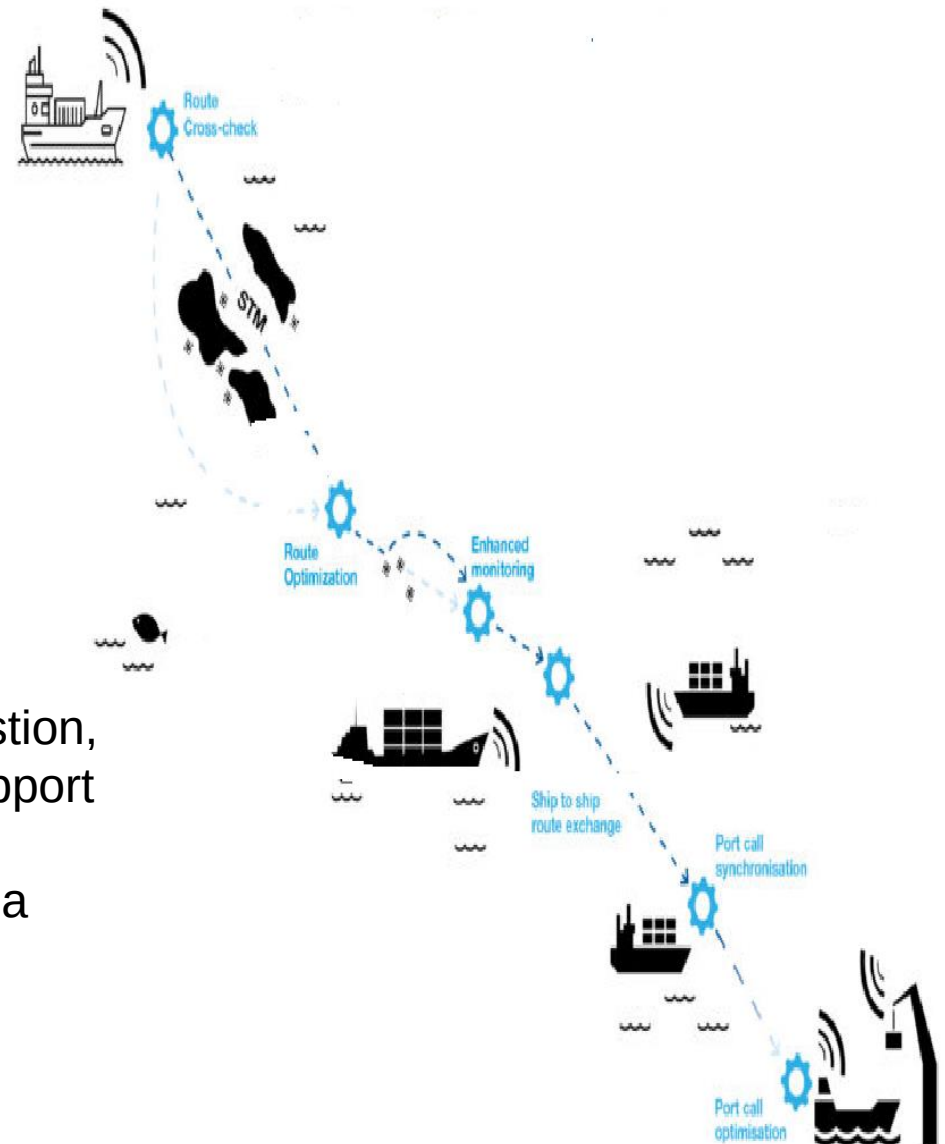
- Shipping agents, Authorities, other participants in the business process

## Communication

- AIS
- VDES
- Internet and satellite internet

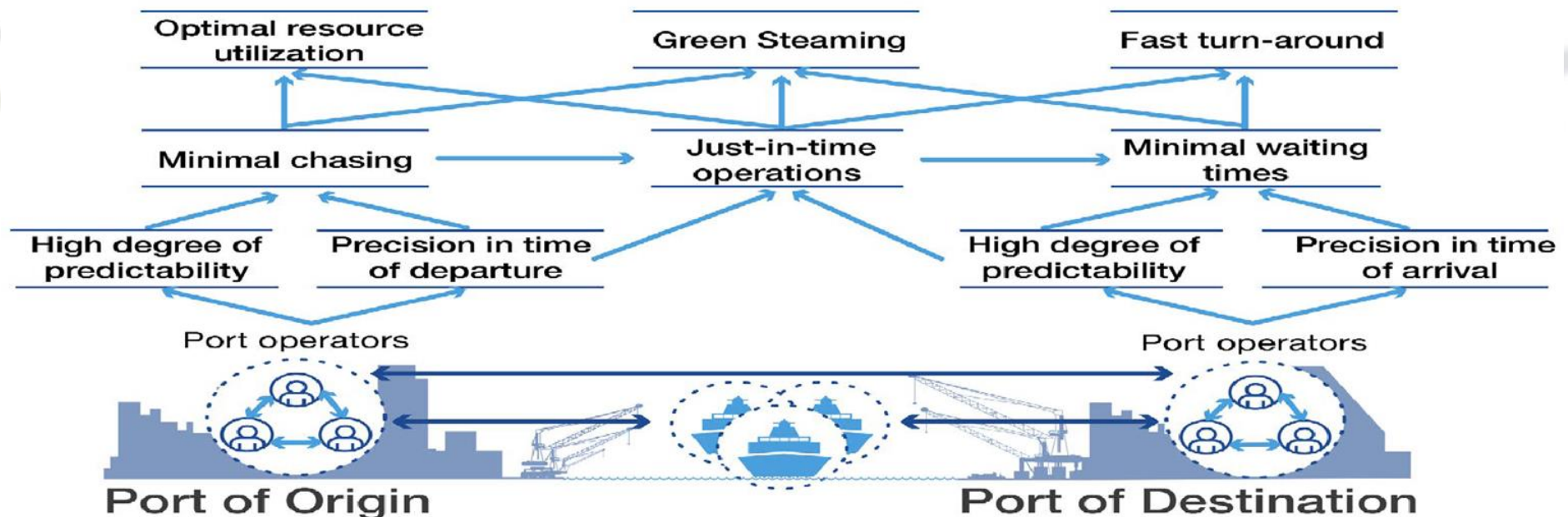
## Services

- Route Cross-check, Route Suggestion, Route Optimization and Navigational Support
- Navigational warnings
- Routes served by pilot stations in the area
- Ship to ship route exchange
- Enhanced traffic monitoring
- Port call synchronization
- Port call optimisation
- Winter Navigation



## Aimed results

- **Existence** of a developed concept for the implementation of a pilot project that will allow staff on board ships and on land to make decisions based on information received in real time **and** provide opportunities for determining the exact time of arrival of ships in ports, reduction of gas emissions from ships, reduced administrative burden and reduced human risk factors.
- **Developed strategy** for creating conditions for safer, more efficient and environmentally friendly maritime transport.



The image is a composite illustration. On the left, a large, dark grey cargo ship's hull is shown, with a red-painted bottom section. A thick black rope is attached to the hull and extends towards the right. On the right, a smaller tugboat with a white superstructure and a red hull is positioned. The background is a light blue sky with soft, orange-tinted clouds, suggesting a sunset or sunrise. The water is depicted with white, textured strokes.

**THANK YOU  
FOR  
YOUR  
ATTENTION**