Sea Traffic Management Validation Project
The visions of Sea Traffic Management

Transparency leads to better overall decisions resulting in increased efficiency and, in the maritime industry, improved safety as well. Imagine a world where all the information you need is at your fingertips, updated in real-time. And where most information does not have to be entered manually but is collected from various data sources.

A world where the control of information still lies with the information owner and the maritime distributed way of working still remains. A maritime world where the crew focuses on safe navigation instead of reporting, where port calls become even more efficient and just-in-time, making maritime shipping the main transport option for even more goods. We have seen the development of new services in many different industries, and the maritime sector can be revolutionised in ways that we cannot even imagine.

Sea Traffic Management will overcome many of the challenges of communication and information sharing between stakeholders in the maritime transport industry. It will create significant added value for the maritime transport chain, in particular for ship owners and cargo owners.

By providing vessels with the ability to see each other’s planned routes, navigators get a more complete picture of how surrounding vessels will influence their onward voyage. Using this data, other services are able to produce valuable information and offer advice to vessels on their routes, such as recommendations to avoid congestion in areas with high traffic, avoidance of environmentally sensitive areas, and maritime safety information. The information exchange between vessel and port actors will improve planning and performance regarding arrivals, departures and turnaround times.

The MONALISA 2.0 project with a consortium of 39 partners and a budget of 24 million euro, has during 2013-2015 defined STM, assessed the strengths and weaknesses of the current maritime ship- and transport systems, operations and interactions, and defined a target concept and key performance indicators for four STM strategic enablers:

1. **Voyage Management** services will provide support to individual ships in both the planning process and during a voyage, including route planning, route exchange, and route optimisation services.

2. **Flow Management** services will support both onshore organisations and ships in optimising overall traffic flow through areas of dense traffic and areas with particular navigational challenges.

3. **Port Collaborative Decision Making (Port CDM)** services will increase the efficiency of port calls for all stakeholders through improved information sharing, situational awareness, optimised processes, and collaborative decision making during port calls.

4. **SeaSWIM (System Wide Information Management)** will facilitate data sharing using a common information environment and structure (e.g. the Maritime Cloud). This ensures interoperability of STM and other services.

A common technical protocol for route exchange has been developed and was approved as an international standard in August 2015. This is a huge achievement and a prerequisite for further development and deployment of Sea Traffic Management.

In addition, MONALISA 2.0 has developed and created a network of interconnected simulator centres in a number of EU countries. This network enables testing of Sea Traffic Management in complex traffic situations, as well as other functions, like Search and Rescue, as a safer alternative to live testing.

MONALISA 2.0 has shown that performance targets within one area affect performance targets in other areas. For example, setting the right speed for reaching a destination according to an agreed ETA (estimated time of arrival) enables optimal consumption of bunker and also minimises environmental impact. Thus, the orchestration and integration of the efforts of all actors involved in maritime transportation will be needed to achieve the goals of STM.
300 vessels, 10 ports and 5 shore based service centres
STM has been defined on the basis of discussions with various actors of future needs. When the same actors are faced with demonstrations of the future concepts they might identify key modifications that will prevent that subsequent development and implementation phases go in the wrong direction.

Starting 2015 and running till the end of 2018 the STM Validation Project will demonstrate the STM concept in large-scale test beds in both the Nordic and Mediterranean Seas, encompassing around 300 vessels, 10 ports and 5 shore based service centres as well as using the European Maritime Simulator Network. The key strategic enablers of STM will be tested and validated.

The STM Validation Project has a total budget of approximately 43 million euros. 50% is co-financed by the EU (Connecting Europe Facility/Motorways of the Sea)

Description of the Activities

The STM Validation Project encompasses:
- **Validation of common Maritime Service Infrastructure** using System Wide Information Management (SeaSWIM) and the Maritime Cloud as the infrastructure for information exchange in the validation test beds. Standardised information exchange is the heart of STM.

The Activities of the STM Validation Project
- **Validation of Port Collaborative Decision Making (Port CDM)** by expanding the network of ports and Port CDM services developed in MONALISA 2.0 in the Nordic and Mediterranean regions. The contextual differences between port approaches will be gathered and analysed, and will serve as a basis for the concept’s refinement. The test beds will also be the first step towards involving both commercial and public service developers/distributors in building Port CDM Services.

- **Validation of Voyage Management** will be executed in two test beds, one in the Mediterranean and one in the Nordic region. In the latter STM services for more efficient winter navigation and crisis management (i.e. Search and Rescue) will be tested and validated.

- **Validation of Flow Management** utilising the European Maritime Simulator Network and the test beds for Voyage Management. This simulator network was developed within the MONALISA 2.0 project and will be used both to simulate varying traffic conditions and further test and validate other parts of STM that are not possible to test and validate in real life at this stage, such as area management.

- **Analysis and Evaluation** will cover many aspects of the future changes: business, socio-economic, risk, technological, legal and institutional. Competencies and training requirements for STM implementation will also be considered. Reporting will be in line with the IMO and IALA test bed guidelines.
Project Partners
– delivering **results** in the project

- Swedish Maritime Administration (SE)
- Swedish Meteorological and Hydrological Institute (SE)
- Danish Maritime Authority (DK)
- Ministry of Infrastructure and Transport with several implementing bodies (IT)
- Ministry of Transport and Communications/Finnish Transport Agency (FI)
- SASEMAR (ES)
- Norwegian Coastal Administration (NO)
- Port Authority of Valencia (ES)
- Port Authority of Barcelona (ES)
- Valencia Port Foundation (ES)
- Carnival Corporation (UK)
- Costa Crociere (IT)
- CIMNE (ES)
- GS1 (SE)
- HiQ (SE)
- TRANSAAS (IE)
- Furuno (FI)
- SAAB (SE)
- Jeppesen (DE)
- Navicon (DK)
- Signalis (DE)
- Frequentis (AT)
- Wärtsilä SAM-Electronics (DE)
- Svitzer (SE)
- Magellan (PT)
- Chalmers University of Technology (SE)
- Novia University of Applied Sciences (FI)
- Southampton Solent University (UK)
- University of Southampton (UK)
- University of Flensburg (DE)
- Maritiem Instituut Willem Barentsz (NL)
- Cyprus University of Technology CY)
- OFFIS (DE)
- University of Oldenburg (DE)
- SSPA (SE)
- Polytechnical University of Catalonia (ES)
- Fraunhofer CML (DE)
- Rörvik Maritime Safety Center (NO)
- Viktoria Swedish ICT (SE)

**Associate Partners**
– contributing actively in workgroups
- Port of Gothenburg,
- Kvarken Ports (Umeå-Vaasa)
- IBM
- Ericsson
- Cygate
- Raytheon
- Kongsberg Maritime
- UK Hydrographic Office
- BIMCO
- SSAB
- Rheinmetall
- STENA

**Advisory Partners**
– giving regular input on policy, operational and technical level
- International NGOs
- Flag states
- Shipping lines
- Agents
- Ports
- Subject matter experts
"We have seen the development of new services in many different industries, and the maritime sector can be revolutionised in ways that we cannot even imagine."