MONA LISA

MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

MONALISA & MONALISA 2.0
Helsinki, June 11

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

MONA LISA
MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

MONALISA – Some Basic Facts

- Budget: 22.4 M€
- EU grant from TEN-T: 11.2 M€
- Implementation period: Sept. 2010 - Dec. 2013
- Lead Partner: Swedish Maritime Administration

DANISH MARITIME AUTHORITY

SWEDISH MARITIME ADMINISTRATION

Liikennevirasto
Finnish Transport Agency

CHALMERS

SSPA

SAAB

GateHouse

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

MONA LISA
MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

Background of the Project

- Cooperation in the Baltic Sea for the development of Motorways of the Sea
- Environmental aspects of maritime transport – Green Corridors are considered
- EU Strategy for the Baltic Sea Region
- HELCOM Moscow Minsterial Declaration (May 2010)
- Consortium established with partners from public authorities, private sector and academic organisations

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

MONA LISA
MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

MONALISA´s contribution to EU´s BSR Strategy

EU´s Strategy for the Baltic Sea		MONALISA
Prio-area 4	To become a model region for clean shipping	- Less emissions through optimisation of shipping routes and speed schedules.
Prio-area 11	To improve internal and external transport links	- Development of the Motorways of the Sea concept - Contributing to Green Corridors
Prio-area 13	To become a leading region in Maritime safety and security	- Development of concrete e-navigation services - Re-surveying of HELCOM fairways

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

MONA LISA
MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

Scope of the MONALISA-project

Quality Assurance of Hydrographic data

Verification of Certificates

Global Sharing of Maritime Data

Dynamic & Proactive Routes

Wider Benefit Motorways of the Sea Project MONALISA

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Ensuring the Quality of Hydrographic Data - speed up re-surveys

Freedom of the ocean is also visible in the Baltic Sea. The coastal countries have realized this and both the Baltic Sea Hydrographic Commission (BSHC) and the HELCOM ministerial meetings have addressed this with a need to re-survey the shipping routes with todays up-to-date hydrographic survey methods to obtain full coverage bathymetric data.

- action over the past 10 years;
- based on the shipping routes and AIS records;
- Roadmap to compete the work;
- Chemical transport in the Gulf of Finland about 200 M tons annual;

HELCOM AIS track: 15 days in August 2013

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Ensuring the Quality of Hydrographic Data - speed up re-surveys

Re-surveys of HELCOM I and II shipping routes and areas have covered about 34 000 km² within Motorways of the Baltic Sea and MonaLisa TEN-T programs.

~65% - open for public tendering;

~20% - SGEI service order;

~15% - public administration work;

Over M€18 is used during TEN-T;

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Ensuring the Quality of Hydrographic Data - re-survey impact

<u>Contribution to safety of navigation</u>:

Full coverage depth information -> adequate water depth
Up to date charts and ENCs
VTS, Notices to Mariners

- Excellent record on avoiding groundings
- Environmentally friendly shipping
- Base data for all activities
- Ice breaker routing

The survey vessel 'Aarab Hägg', of the Swedish Maritime Administration, equipped with modern technology to optimise shipping routes.

SMA: Multibeam surveying

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Ensuring the Quality of Hydrographic Data - Development of Baltic Sea Depth Model

a Baltic Sea Depth Model has been created, to serve the needs of science and researchers.

This model is built on each national Hydrographic Office provided best bathymetric data and it follows the INSPIRE directive on available public data.

The model is available at the BSHC web-site

data.bshc.pro

and also displayed at the stand in the exhibition.

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Ensuring the Quality of Hydrographic Data - pilot implementation of harmonized vertical reference

All Baltic Sea coastal countries, except Russia are now committed to a transition into a harmonized chart datum – transition period is years. Each country has it's own and possibly a different path to common Chart Datum.

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

MONA LISA
MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

Scope of the MONALISA-project

- Quality Assurance of Hydrographic data
- **Verification of Certificates**
- Global Sharing of Maritime Data
- Dynamic & Proactive Routes

Wider Benefit Motorways of the Sea Project MONALISA

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

MONA LISA
MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

Background

- **Poor or no control of Pilot exemption certificate**
- **Fatigue at sea, how to minimize risk of fatigue?**
- **How reduce the increasing administrative burden on board and at the same time create means for inspection of other certificates and reduce risk of forgeries?**

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

MONA LISA
MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

Work done

- **Evaluate the attitude towards a new system**
- **Workshops and interviews with stakeholders.**
- **Legal study conducted.**
- **Hardware for testing proposes developed**
- **Software for testing proposes developed**

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

MONA LISA
MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

Results & Conclusions

- **Seafarers participating in the different tasks mainly positive towards a MONALISA like system.**
  - Could be a "Quality stamp" for "good" flag states.
  - May ease administrative burden for on board personnel
  - Will provide tools to identify problems related to working hours.

- **"Big brother" effect smaller than anticipated.**

- **Low cost on board and on shore hardware based on existing technology if certificate databases ashore exists and are available.**

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

MONA LISA
MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

Scope of the MONALISA-project

- Quality Assurance of Hydrographic data
- Verification of Certificates
- **Global Sharing of Maritime Data**
- Dynamic & Proactive Routes

Wider Benefit Motorways of the Sea Project MONALISA

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Global Sharing Of Maritime Data

Goal:
The activity aims to develop a functional demonstrator system both technically and procedurally.

Defined, with the final objective to extend the sharing of maritime information to a global scale as well as expanding the scope of maritime information shared between maritime authorities in accordance with their needs.

=> Demonstrator for Global Sharing Of Maritime Data

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Global Sharing Of Maritime Data

Maritime Cloud

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Maritime Cloud, Service Broker

Service Broker (Danish Maritime Authority)

Provides the relevant information for the entities, e.g. weather, routes etc.

Born in MONALISA

Demonstrator for parts of the service broker in the Maritime Cloud running at DMA

Field tests performed by DMA on ships

Continue in the MONALISA 2.0 project.

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Maritime Cloud, Security Broker

Security Broker

Complete product

- Design completed
- Implementation completed
- Test and integration

Deployed or in test at:

- Coast Guards
- Maritime Authorities
- SAT AIS operator

Provides the relevant informa
weather, routes etc.

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

MONA LISA
MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

Scope of the MONALISA-project

- Quality Assurance of Hydrographic data
- Verification of Certificates
- Global Sharing of Maritime Data
- **Dynamic & Proactive Routes**

Wider Benefit Motorways of the Sea Project MONALISA

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

MONA LISA
MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

Dynamic & Proactive routeplanning

Subactivities

1. Preparation and Process planning
2. Routes
3. Technical solutions
4. Surveillance and security
5. Ports
6. Legal Matters
7. FSA
8. Human factors
9. Test & evaluations
10. Dissemination

SAAB

SWEDISH MARITIME ADMINISTRATION

SSPA

CHALMERS

FARVANDSVÆSENET
Danish Maritime Safety Administration

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

MONA LISA
MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

Dynamic & Proactive Route planning

- Optimize routes
- Exchange routes/Voyageplans
- Monitor and provide assistance
- Decision support for anticollision
- Effective surveillance
- Reduced costs
- Reduced emissions
- Big Data Analysis

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

MONA LISA

MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

MONA LISA

MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

MONA LISA
MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

Construction of routes or Voyageplans

Information	Needs	Constraints
Weather	Earliest possible ETA	UKC and Airdraft
Berth available	Economic route	Landmasses
Pilot available	Good weather	TSS Areas
MSI	Cargo & Charterers	No-Go Areas

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Route construction

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Static separation

- Extra miles ,fuel and emissions
- Conflict points

Dynamic separation ?

Saving 10 miles !!

- Saves miles, fuel, emissions and $

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

MONA LISA
MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

Technical Solutions

Hardware:
Satellites communications, AIS, 3G/4G

Software: Saabs Sea Watch and Coast Watch

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

MONA LISA
MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

Test and evaluations

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

MONA LISA
MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

Ports & cargo

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

MONA LISA
MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

Legal & Economic Matters

The way forward
on micro level

Voluntary basis and regional implementation by Port State recommendations/law and reductions of port and/or fairway fees and insurance etc.

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

1300 ships

Every day

One Year

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

15 M Euro

5 M Euro

Investment

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Distance

Speed

100 M Euro **16 M Euro**

1 % **SAVINGS** **4 Hrs** **30 %**

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Dissemination

- 4 films produced
- 2 brochures
- 44 conference presentations

- A non measurable value is the immense impact on the maritime cluster for the acceptance of the Sea Traffic Management concept that our dissimination efforts have resulted in. In July 2013 Monalisa 2.0 was granted co-financing with goals to fulfill the Monalisa projects findings. 39 partners involved.

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

MONA LISA 2.0

SECURING THE CHAIN BY INTELLIGENCE AT SEA

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Project rationale

- Promising results and experiences from the current MONALISA project
- Need for more effective flow of information
- Inspiration from the Aviation
- Internationally increased demands for actions and needs for route exchange and route surveillance – Sea Traffic Management
- After Costa Concordia:
  > How to improve maritime safety, SAR and mass-evacuations?

  > Need to secure the chain, incl. Safety in Ports

Facts and Figures

Partnership:	39 partners/ 30 beneficiaries
Total budget:	24.3 million euro
EC contribution:	50%
Time frame:	2012-2015

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Project Partnership

Starting points:	07° 51,082’ (W)	33°
	68° 15,295’ (N)	72° 25,2
Ending point:	10° 31,044’ (W)	28°
	34° 34,198’ (N)	32° 13,8

MONALISA 2.0 involves the following EU Member States:

- Sweden
- Finland
- Denmark
- Germany
- United Kingdom
- Spain
- Italy
- Malta
- Greece

The consortium consists of Public, Private and Academic partners. See further Section 6 – Quality of the Action.

The Norwegian Coastal Administration is full partner in the consortium. Being a public body in a non-EU country, the Norwegian budget is not eligible. The financing of the Norwegian participation is fully covered by own sources.

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Scope of MONALISA 2.0

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

The MONALISA legacy

MONA LISA 2.0 SECURING THE CHAIN BY INTELLIGENCE AT SEA

MONA LISA MOTORWAYS & ELECTRONIC NAVIGATION BY INTELLIGENCE AT SEA

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Sea Traffic Management

STM is a concept **encompassing all actors, actions, and systems** (infrastructure) assisting maritime transport from port to port. STM is a part of **the multimodal logistics chain**, encompassing sea as well as shore based operations. STM is a **network-based approach** for optimal Intermodal Sea Transport. STM is performed on multiple actor levels, where **each engaged actor co-produces traffic management**. These actors contribute to the integrated performance of the realization of the performance targets of intermodal Sea Transport as the shared common object of interest of the ecosystem constituting Sea Transport. STM puts an emphasis on **interoperable and harmonized systems** allowing a ship to operate in a **safe** and **efficient** manner from port to port with a minimal impact on the **environment**. **STM secures sea traffic flow and capacity optimization**.

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Sub-concepts of Sea Traffic Management

- Flow Management
- Strategic Voyage Management
- Dynamic Voyage Management
- Port CDM (Collaborative Decision Making)
- SWIM (System Wide Information Management)

For reaching full effects of:

- Increased efficiency
- Increased safety
- Reduced environmental footprint

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

1 Billion € / Year

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

www.monalisaproject.eu

Mid-term Conference:
November 4-5, 2014
Barcelona

Ulf Siwe, Communication Officer
Ulf.siwe@sjofartsverket.se

Co-financed by the European Union
Trans-European Transport Network (TEN-T)