KYSTVERKET
NORWEGIAN COASTAL ADMINISTRATION

Ship Traffic Management System in the Straits of Malacca and Singapore

Langkawi, Malaysia, September 2014

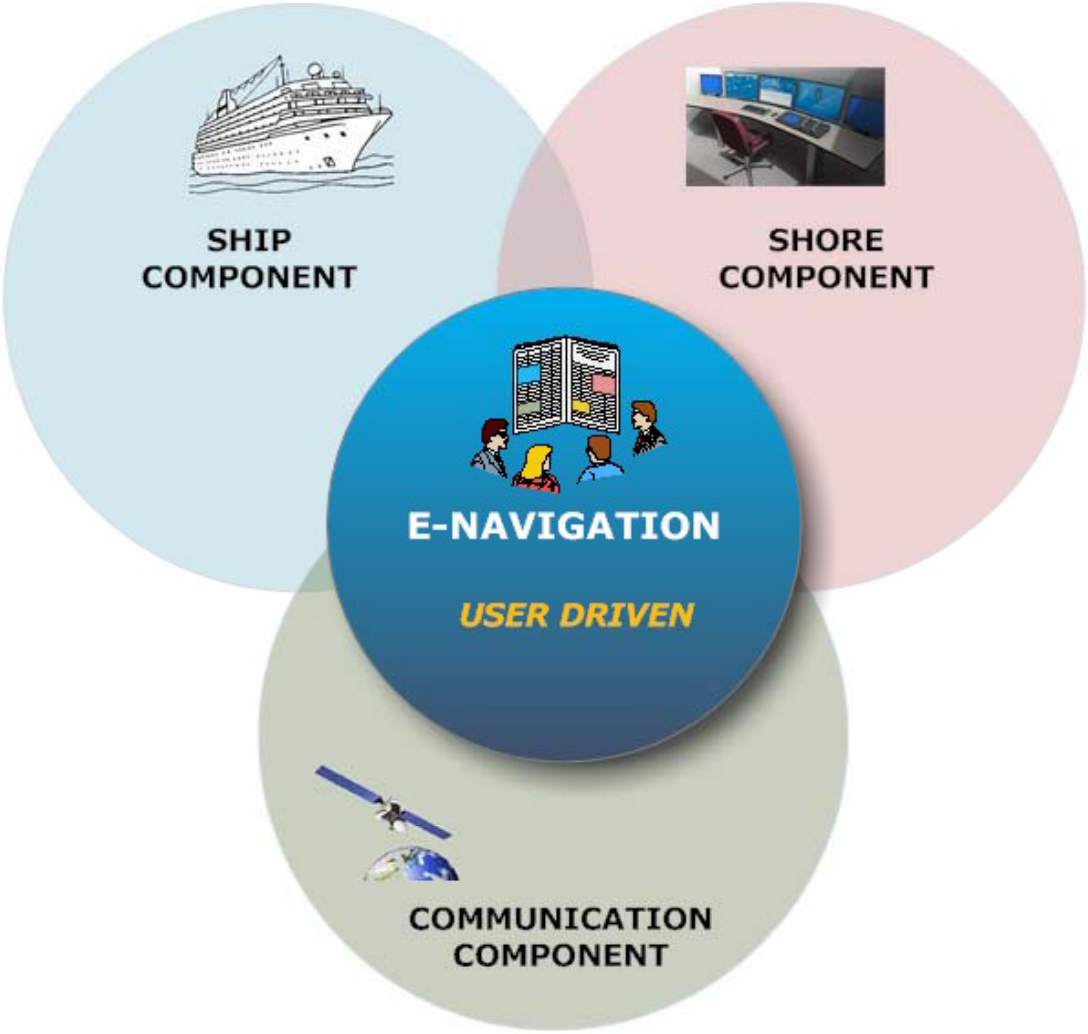
John Erik Hagen, Regional Director NCA
Coordinator of the completed IMO Correspondence Group on e-navigation

IMO’s vision of e-navigation

- ***Navigation systems on board***
  - Integration
  - Standard user interface
  - Preventing distraction and overburdening
- ***Management of vessel traffic information ashore***
  - Coordination
  - Exchange of comprehensive harmonized data
- ***Communications infrastructure***
  - Seamless harmonized information transfer

The vision of e-navigation was defined in MSC 85/26 annex 20 paragraph 4

Key Components of e-Navigation



User Needs

- One of the first steps in the e-navigation process was to investigate the results of several international surveys on user needs. The main results were:
  - More reliable and more user centric, and familiar equipment on board
  - Better integration of the different systems on a ships bridge
  - Improved electronic reporting between ships and ship to shore and vice-versa
  - Better identification of shore based services, harmonised world wide, on a port by port basis – this service is known as the Maritime Service Portfolio (MSP).

Five agreed solutions

1. **Improved, harmonized and user-friendly bridge design;**
2. **Means for standardized and automated reporting;**
3. **Improved** reliability, resilience and **integrity of bridge equipment** and navigation information;
4. **Integration and presentation of** available **information** in graphical **displays received** via communication equipment; and
5. **Improved** Communication of VTS **Service Portfolio.**

The solutions and the e-navigation strategy

- *The five agreed solutions provide a holistic approach to the e-navigation strategy, connecting the ship with the shore and vice-versa*
- *The solutions focus on improved, and more user friendly bridge systems and equipment and efficient information exchange ship-shore and vice versa*
- *Important to this is improved and harmonized Communications*

Suggested concept for a Ship Traffic Management System – STMS (proposed by the NCA during 5th CF)

- Contribute to the IMO e-navigation implementation:
  - Development of the e-navigation shore based services (Maritime Service Portfolios), including more use of shared situational awareness and decision support, onboard and on shore.
  - Development of the VHF Data Exchange System (VDES).
  - Contribute to the IHO S-100 standard.
  - Analysis of legislation, drafting of operational procedures and performance standards.
- Build on the Maritime Electronic Highway (MEH) concept.
- Enable STMS solutions to be deployed in other regions.

The core concept for STMS

- Exploit synergies between the MEH and e-navigation [Agenda item 3.1, Annex 1, of the minutes of the 5th Cooperative Forum].
- Acquire more and earlier information about ship position, destination and times for port services.
- Provide early and update guidance to ships on speed and course to maximize safety and security while optimizing fuel and other resource usage.
- Monitoring and prognosis of traffic to detect future "hot spots" and update guidance to avoid these.

The approved project

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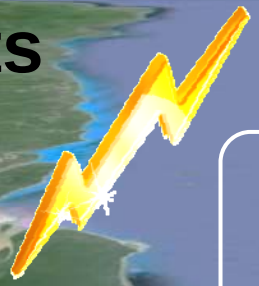
SESAME Straits



Satellite and terrestrial VHF Data Exchange system (VDES)

"Secure, Efficient and Safe maritime traffic Management in the Straits of Malacca and Singapore"

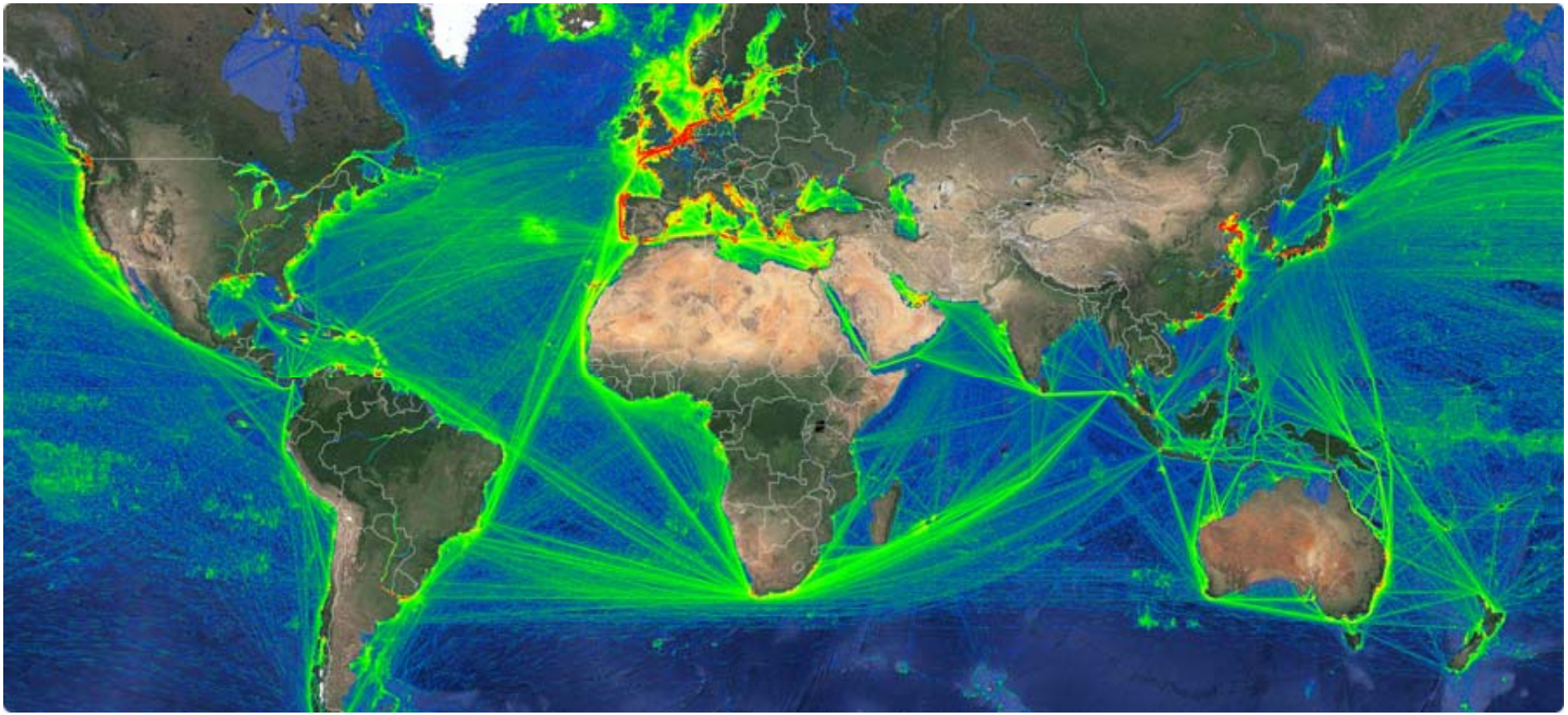
Primary objective

*To **develop** and **validate** a ground-breaking concept for a next generation Ship Traffic Management System.*

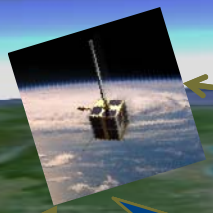
*Based on **shared situation awareness** and **cooperative decision making** between the ship's bridge team and shore personnel.*

Project background

- Improve **safety** and **efficiency** of ship navigation
- With focus on vessel traffic **hot spots**
- Taking into account the **voyage** of the vessel



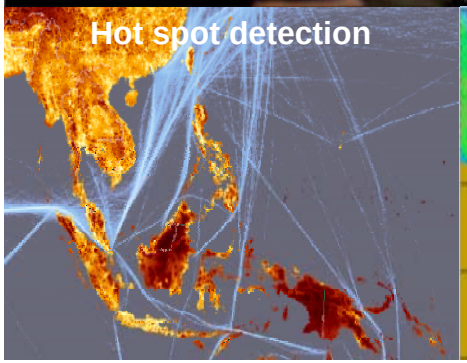
SESAME Straits

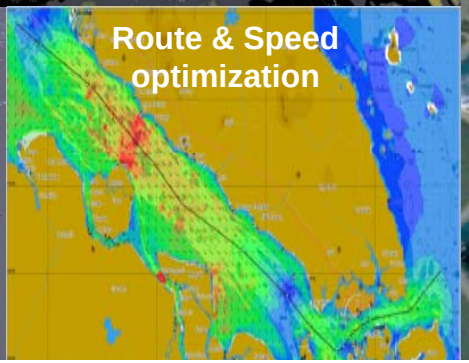


VTS suggestions evaluated

Suggestion for a new route and speed

Ship reduces speed and changes route

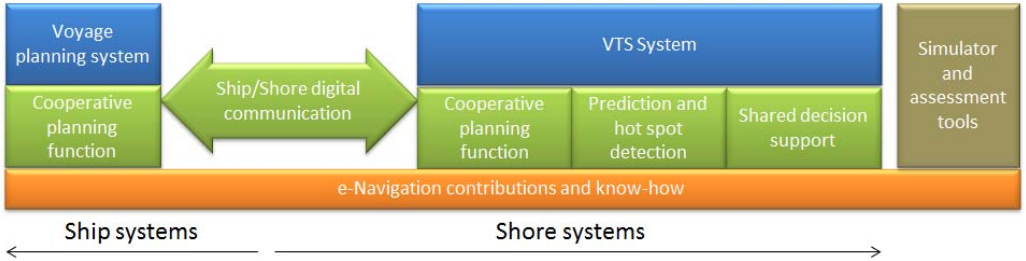




- **Shared situational awareness**
- **Collaborative decision support**
- **Just-in-time arrival**
- **Optimal transit speed**
  - Reduced ship bunkers
  - Efficient traffic flow
  - Reduced navigation risk
  - Reduced fuel comsumption
  - Reduced CO2 emissions
  - Better utilization of port resources

Project overview

- **Project duration:** 2014-2016
- **Funding:** MAROFF, total budget NOK 23 mill
- **Project owner:** Kongsberg Norcontrol IT
- **Country Agreement:** Singapore/Norway R&D MoU
- **Endorsed by:** IMO, IALA, MPA, ICS, BIMCO, CIRM



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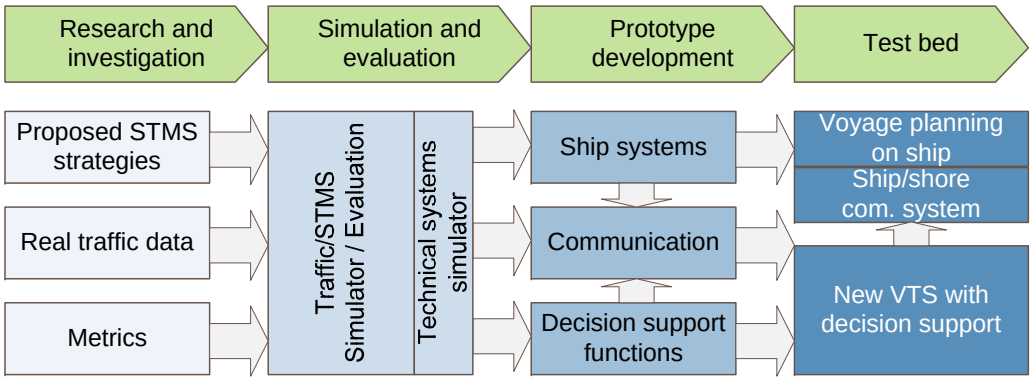
KONGSBERG

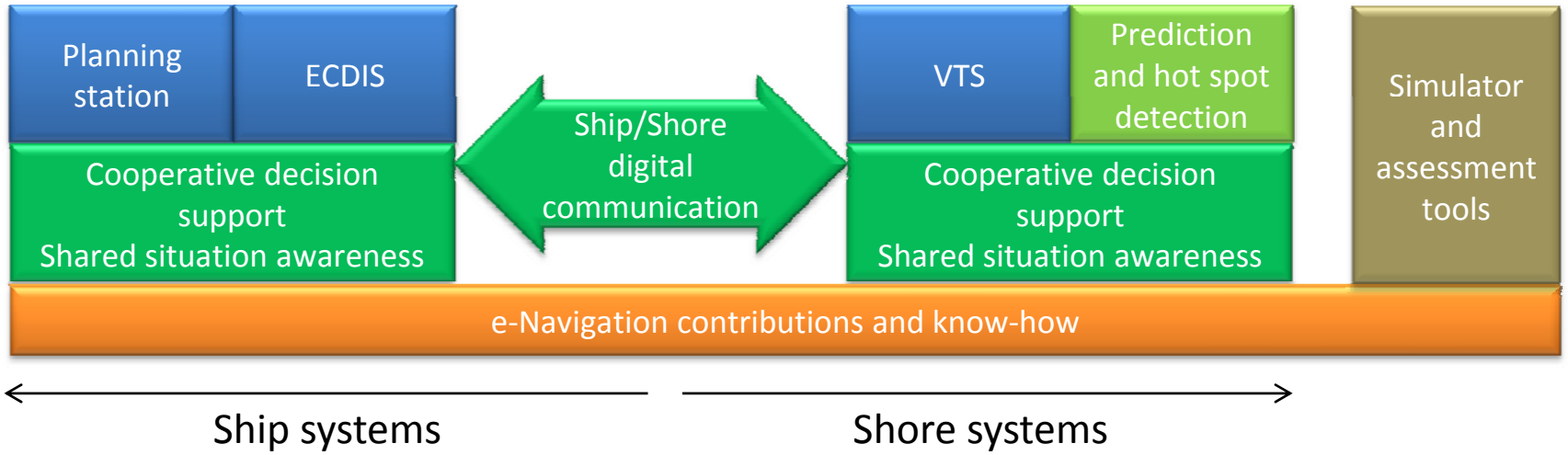
MARINTEK

NAVTOR

HØGSKOLEN I VESTFOLD

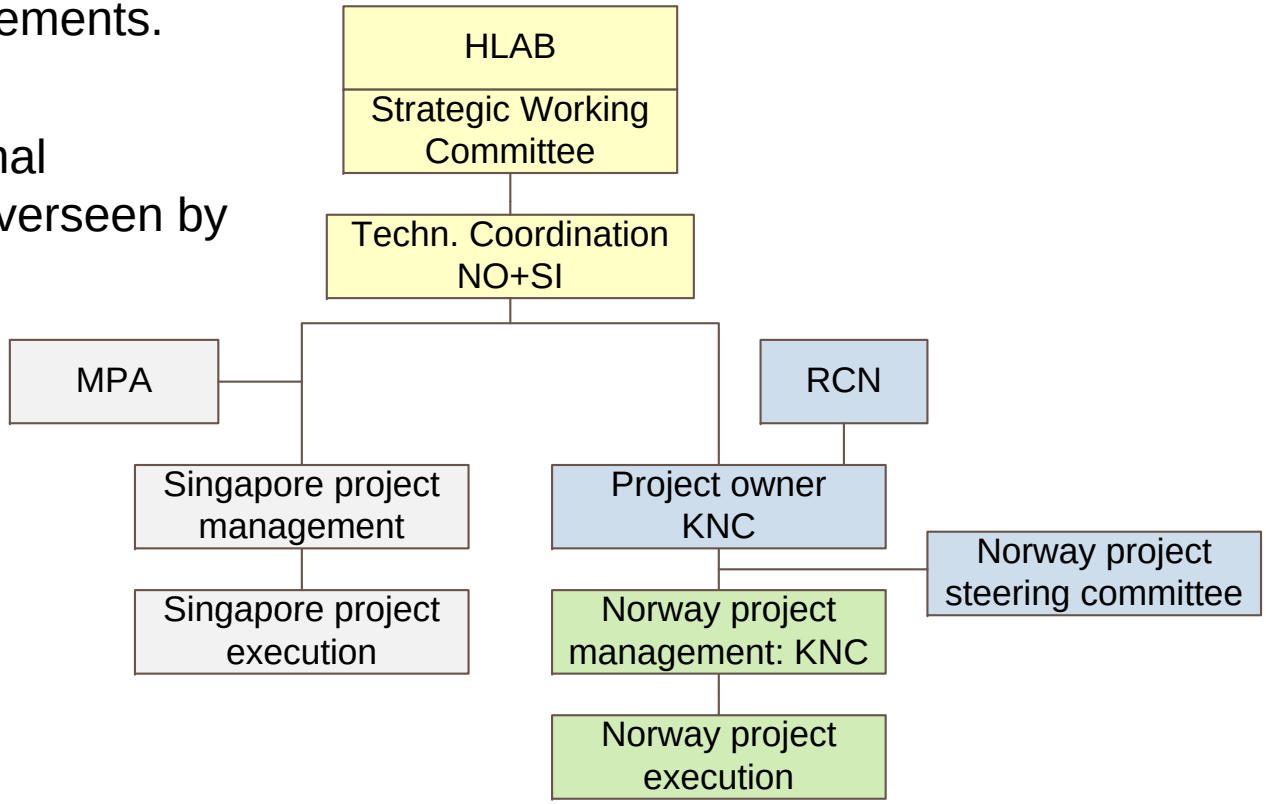


System components and contributions building on existing ship and shore systems/equipment



Joint effort between international projects

- Projects organised in accordance with local contractual requirements.
- Establish an international coordination function overseen by HLAB.



Ship Traffic Simulator (STS)

For Assessment of Traffic Management Strategies

As part of the SESAME Straits Project

HLAB2 Meeting on 19 Sep 2014

By: Stuti Nautiyal

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Background & Objectives

- Collaboration Project: STMS for the Straits of Malacca and Singapore (SOMS)
- Need for a simulation and assessment tool, to study the effects of new traffic management strategies

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Scope

- Design & Development of Ship Traffic Simulator (STS)
- Development of STS Model for SOMS, and validation using historical traffic data
- Development and evaluation of innovative ship traffic management strategies

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Application

- Long term Strategic planning
- Mid term traffic prediction and decision support for just-in-time arrival planning
- Short term traffic prediction and decision support for hot spot detection and traffic control

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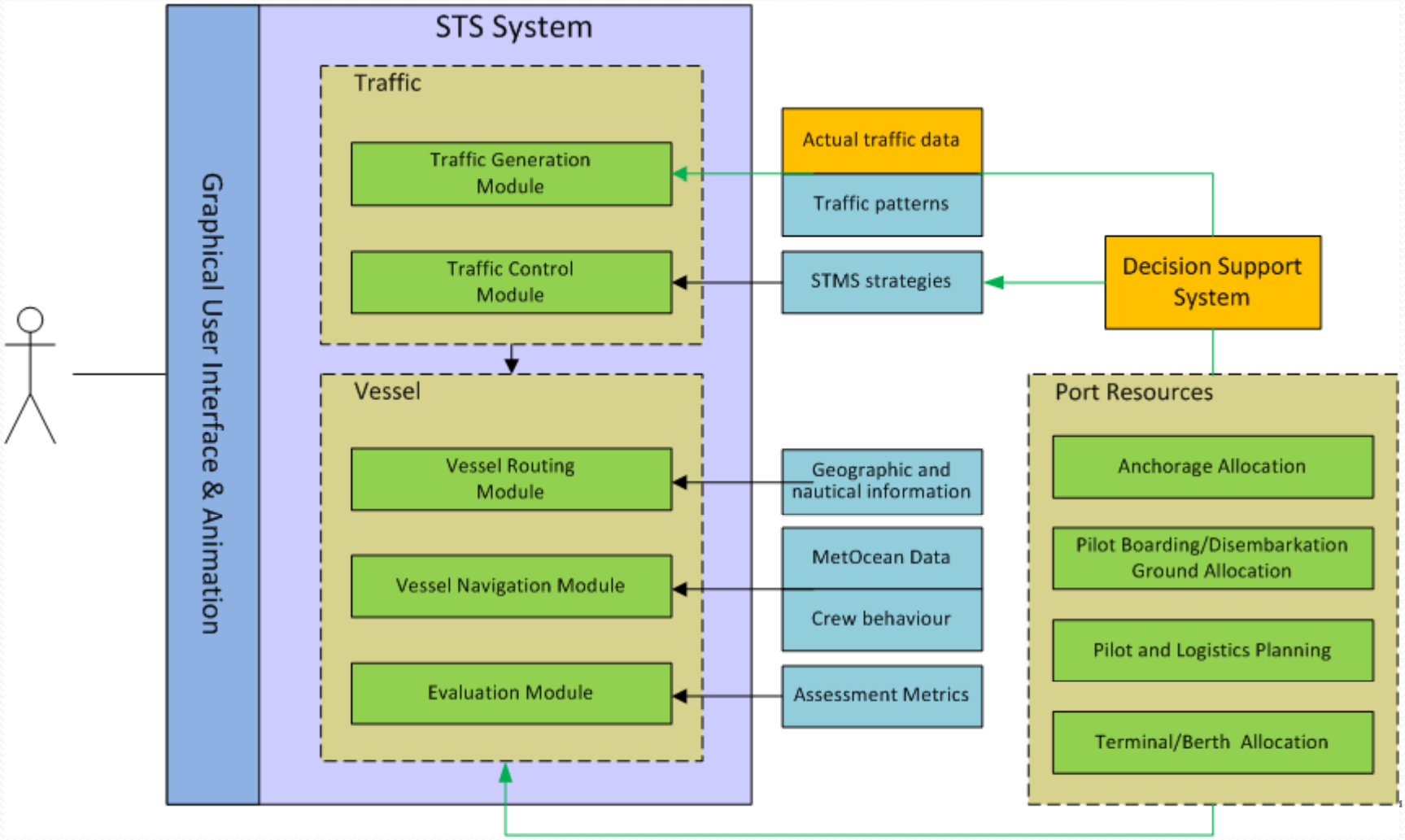
System Overview



Timeline

Milestones\Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
User requirement gathering	■	■													
System design		■	■	■											
System development & testing				■	■	■	■	■	■	■	■	■			
Model building and validation											■	■	■		
STMS strategy evaluation											■	■	■	■	
Project report & presentation														■	■

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Progress

- User Requirements
  - Discussions with MPA POCC team on short term and mid term traffic prediction and decision support for hot spot detection and traffic control
- System Design
  - Discussions with Kongsberg and Marintek on system parameters and metrics

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Steps Ahead

- User Requirements
  - Discussions with Kongsberg and Marintek on requirements from SESAME Straits Project
- System Design
  - Assessment Metrics
  - Vessel behaviors, e.g. modeling of impact of wind, tidal, visibility and human factors
  - Interface with external systems, e.g. VTIS for traffic data, PTMS for vessel particulars and arrivals, ENC, Decision Support System for strategies

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Thank You

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