TRANSAS

THE E-NAV ZONE
INCREASED EFFICIENCIES THROUGH USE OF
E-NAVIGATION SERVICES AND SMART CONNECTED SHIP
A PILOT PROJECT IN GULF OF FINLAND (EASTERN PART)

Anders Rydlinger
Director, Ships Solutions

Dmitry Rostopshin
Director, Traffic Control & Management Solutions

E-Navigation Underway 2017

THESIS

THESIS is a cloud-based platform that brings together

FLEET OPERATIONS, **SHIP SOLUTIONS**, **ACADEMY** functions,

and **SHIP TRAFFIC CONTROL** solutions on one interactive,

flexible platform with unparalleled functionality.

ADDRESSING THE USER NEED

MOVING FROM "P" TO "E"
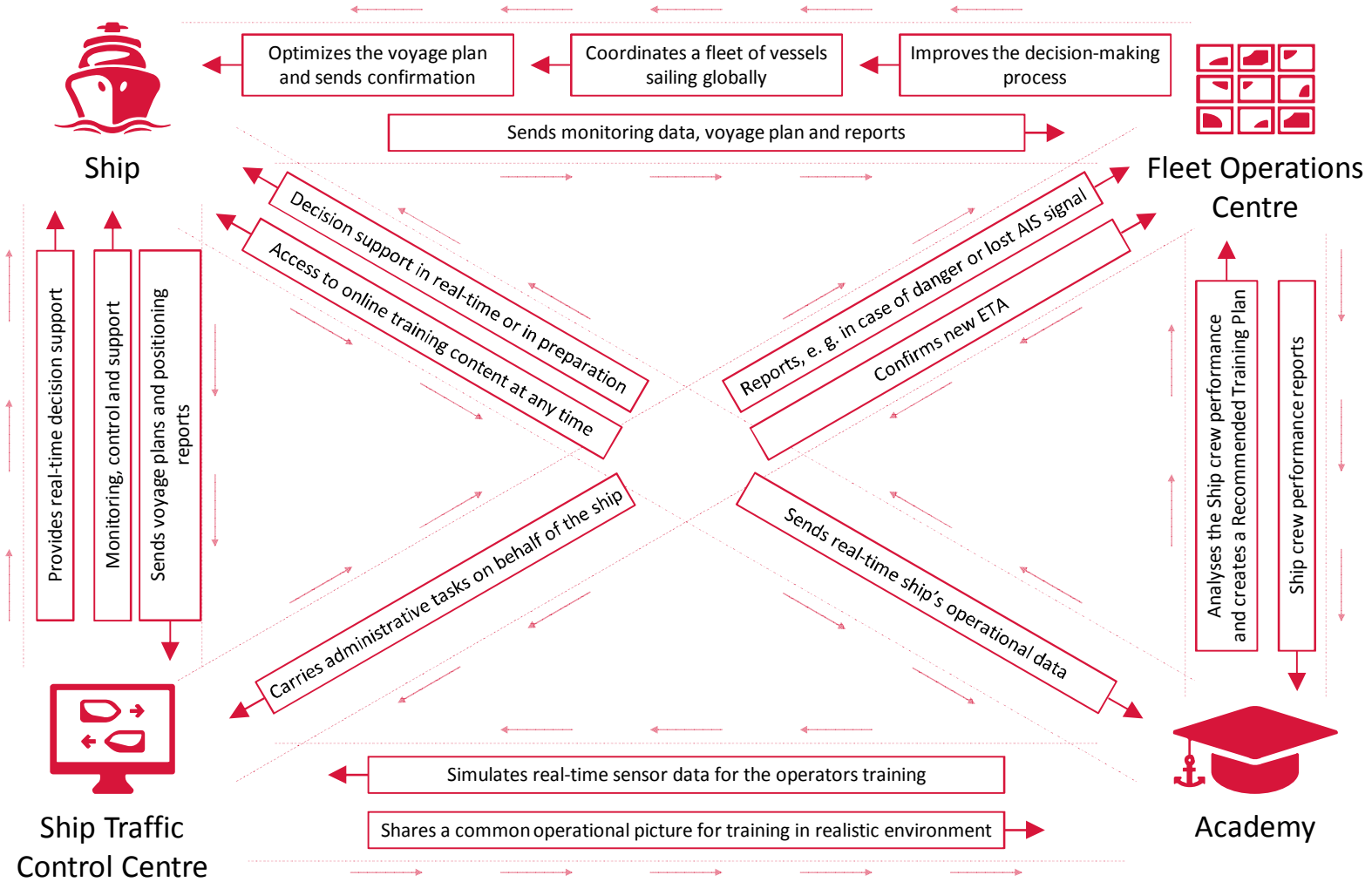
What are the user need?

How can we address them?

Can we provide a solution to the user need using "e-nav technologies" ....

Is the customer ready to pay for it

- Planning and Optimization
- Data Supply
- Monitoring
  - Tracking & Navigation safety
  - Voyage Performance
  - System performance & Alarms
  - Crew performance

- Decision Support and Control
- Remote service and Support
- Reporting and documentation
- Data collection and Analytics
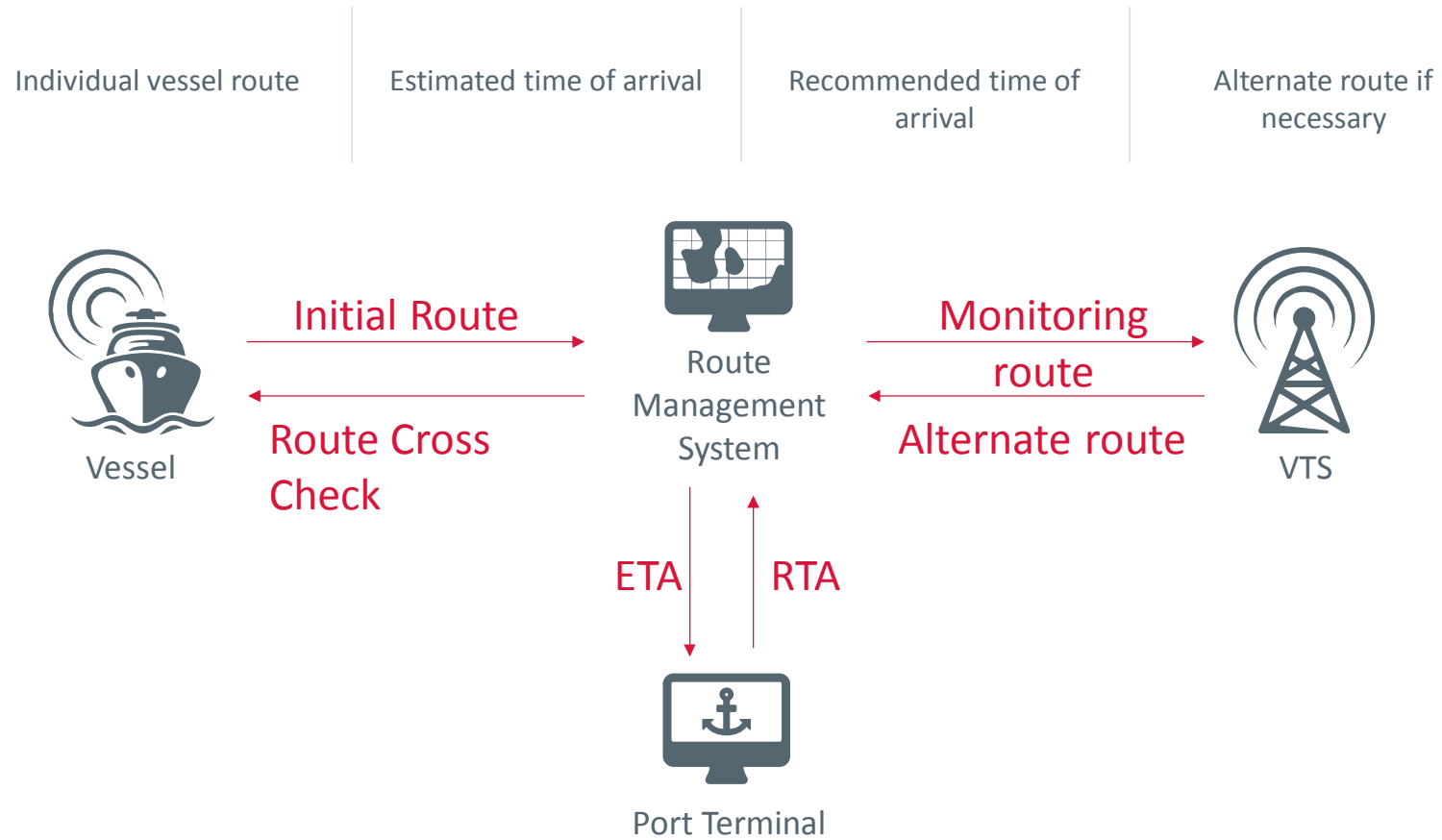
THESIS DATA ECOSYSTEM

Ship

Fleet Operations Centre

Ship Traffic Control Centre

Academy

Optimizes the voyage plan and sends confirmation

Coordinates a fleet of vessels sailing globally

Improves the decision-making process

Sends monitoring data, voyage plan and reports

Decision support in real-time or in preparation

Access to online training content at any time

Reports, e. g. in case of danger or lost AIS signal

Confirms new ETA

Provides real-time decision support

Monitoring, control and support

Sends voyage plans and positioning reports

Carries administrative tasks on behalf of the ship

Sends real-time ship's operational data

Analyses the Ship crew performance and creates a Recommended Training Plan

Ship crew performance reports

Simulates real-time sensor data for the operators training

Shares a common operational picture for training in realistic environment

TRANSAS

4

VOYAGE INFORMATION SERVICE

TRANSAS

INFORMATION DELIVERED

Individual vessel route	Estimated time of arrival	Recommended time of arrival	Alternate route if necessary

Vessel

Initial Route

Route Cross Check

Route Management System

Monitoring route

Alternate route

VTS

ETA | RTA

Port Terminal

SAFETY INFORMATION DELIVERY

Addressed delivery to vessel entering the VTS area

Regular broadcasts to all vessels

VTS

No Go areas, Navareas, SAR Areas

Notices to Mariners

Weather information

INFORMATION DELIVERED

Amendments and changes in information concerning the VTS area such as boundaries, procedures, radio frequencies, reporting points

Meteorological and hydrological conditions

Any information concerning the safety of navigation

E-NAV SERVICES

ACTIVE DECISION SUPPORT SERVICES (DSS)

TRANSAS

Navigational Warning

DSS Solution

VTS Operator approval

Delivery of DSS recommendation to Vessel
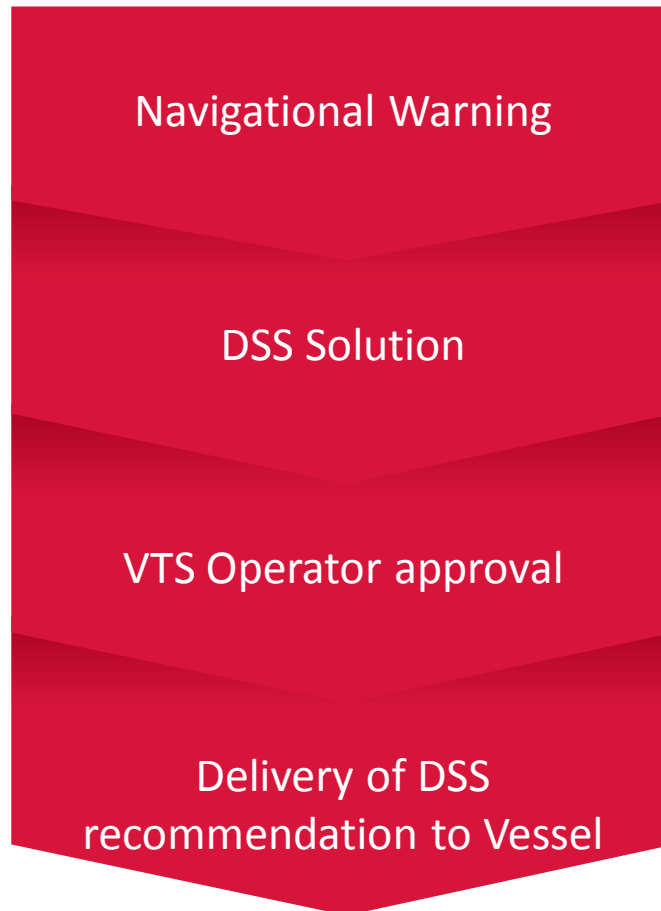
- The system informs operator (shore & Ship) about dangerous situations.

- Operator receives route suggestions (alternative) from the DSS that avoid close situations and increase CPA.

- Operator approves the decision

- The decision is automatically delivered to the on-board ECS / ECDIS or pilot device as a VTS recommendation

E-NAV ZONE

PROJECT GOALS

- Development of E-NAV technologies that allow optimization of processes and information sharing between vessels, operators, service providers and authorities in the test bed area.

- Deploy the technologies into Transas products

- Prepare test platforms for live testing of the solutions.
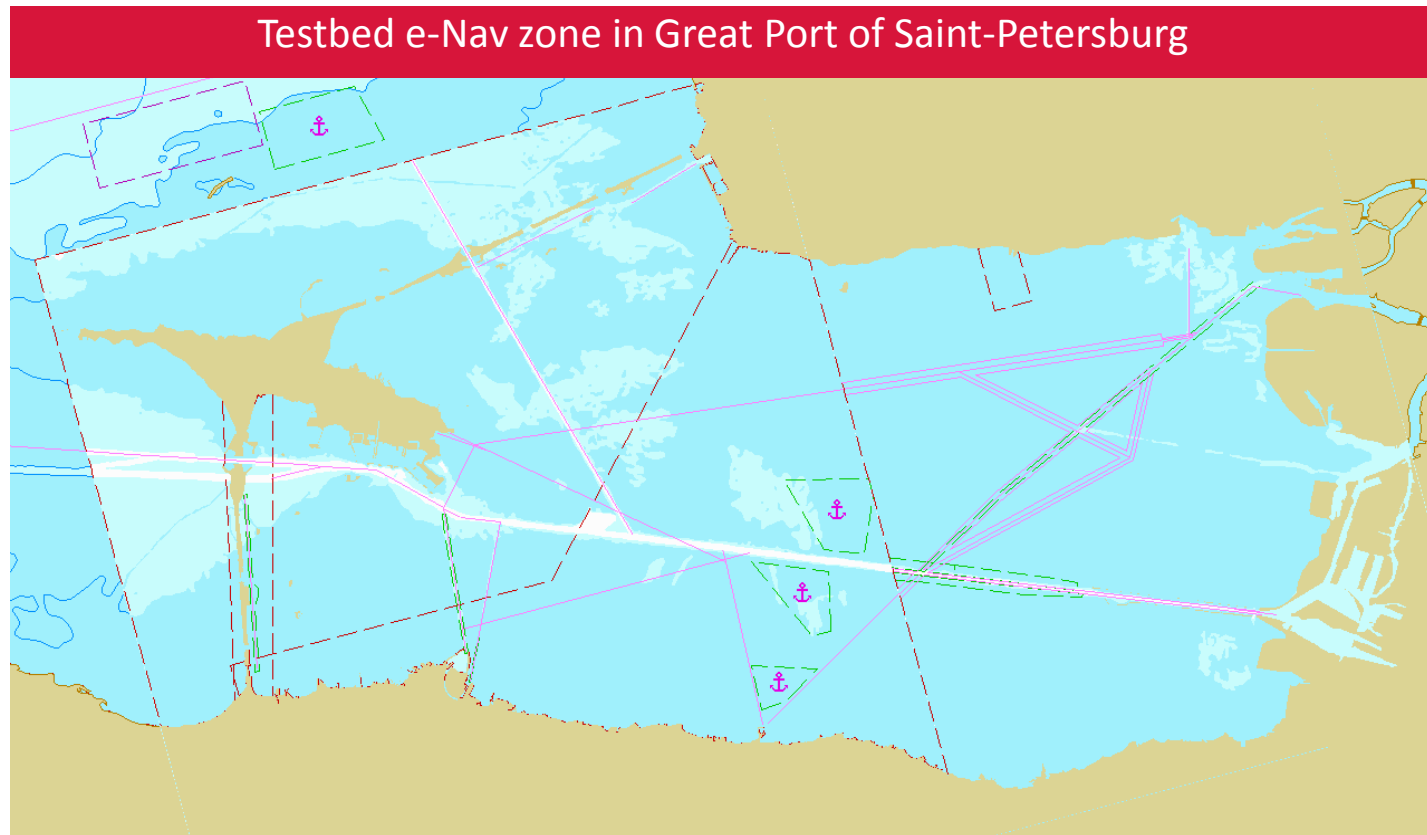
E-NAV TESTBED PROJECT

PROJECT STAGES

- Stage 1 - Dec 2016
  - Developing of the e-Nav architecture
  - Implementation of e-Nav functions: route exchange, AIS binary data exchange text chat
  - Validation in the simulation environment
- Stage 2 - July 2017
  - Implementation of e-Nav functions: remote support, S-124 areas, route validation
  - Validation in the simulation environment
- Stage 3 - Dec 2017
  - Implementation of e-Nav functions: hydrographic data delivery, active decision support system, route optimization
  - Validation in the simulation and real environment
- Stage 4 - July 2018
  - Implementation of e-Nav functions: reporting, port information messages, telemetry
  - Validation in the simulation and real environment
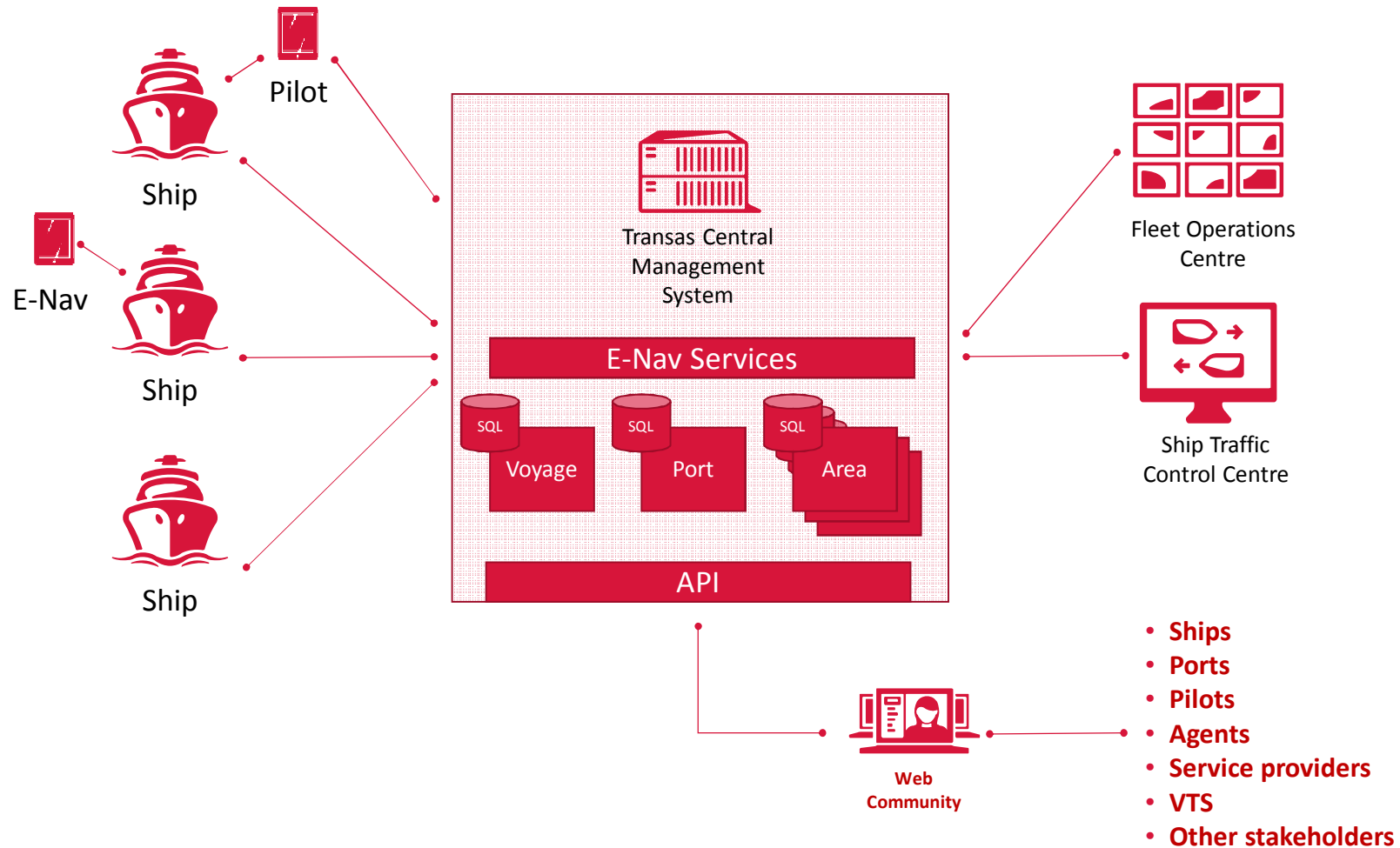
E-NAV ZONE PROJECT

Project Stakeholders

- Ships
- VTS / STC operators
- Ship owners
- Ship operators
- Pilots
- Coastal services

Testbed e-Nav zone in Great Port of Saint-Petersburg

INFRASTRUCTURE FOR COMMUNICATION AND INFORMATION EXCHANGE

TRANSAS

Pilot

Ship

E-Nav

Ship

Ship

Transas Central Management System

E-Nav Services

SQL — Voyage

SQL — Port

SQL — Area

API

Fleet Operations Centre

Ship Traffic Control Centre

Web Community

- **Ships**
- **Ports**
- **Pilots**
- **Agents**
- **Service providers**
- **VTS**
- **Other stakeholders**

11

SAINT-PETERSBURG TESTBED FOR E-NAVIGATION

SIMULATION CENTER

- 2 vessels bridge
- 1 STC operations station
- 1 FOC operators station
- 2 Pilots mobile set
- Simulator instructor place
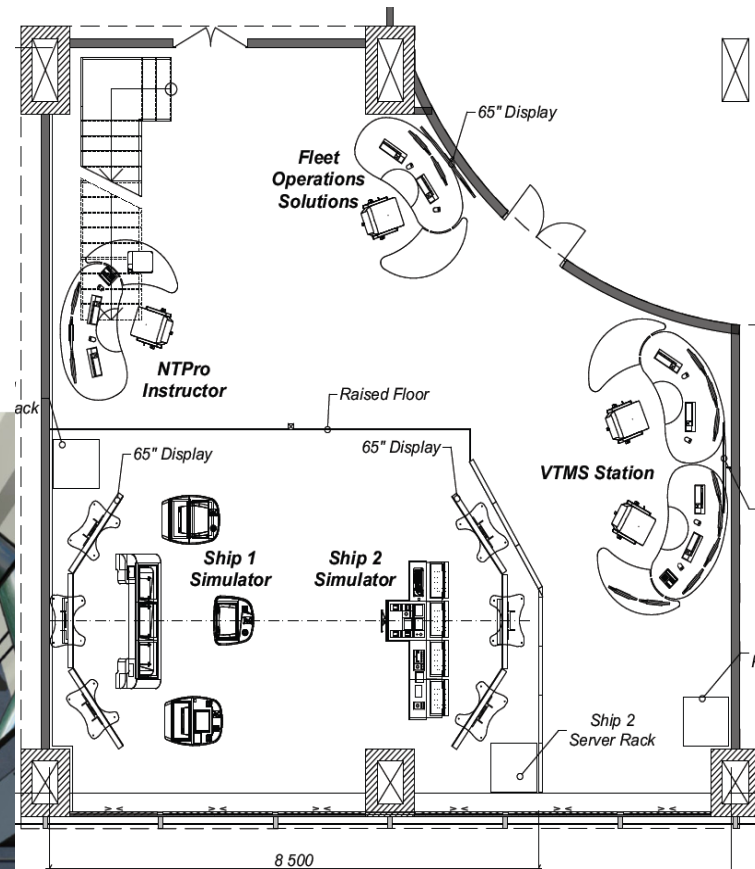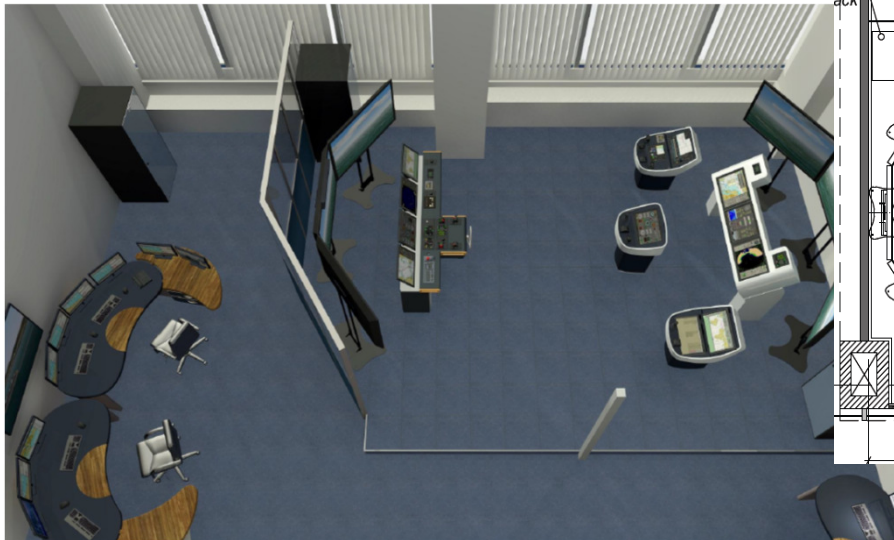
MILESTONE 1- DECEMBER 2016

- Test using Simulator that involves
  - STC   Transas VTS/STC
  - Ships   Transas ECDIS
  - Pilot   Transas Pilot Pro (iPAd)

- Arrival /departure to/from the port of Saint-Petersburg

- Same exercises was run twice:
  - #1 e-Nav services was not used
  - #2 e-Nav services in use

- What did we study and measure
  - Comparison of the volume in VHF communication
  - Accuracy in information exchange
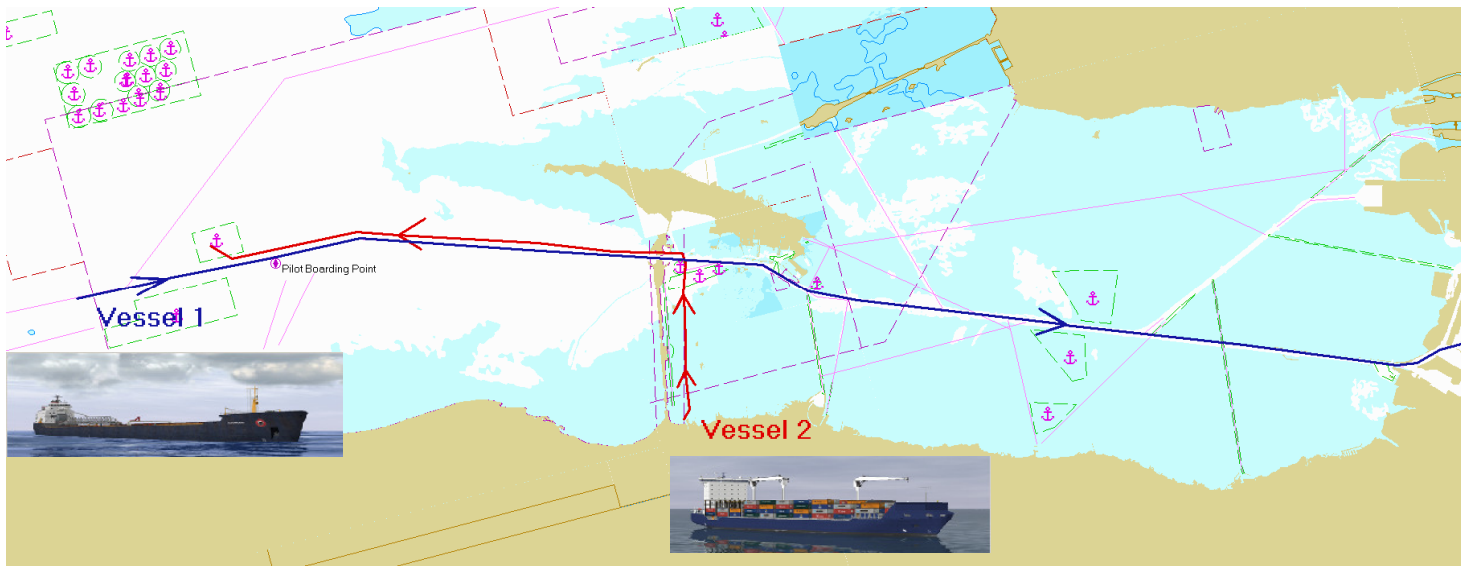 - User Feedback - perception
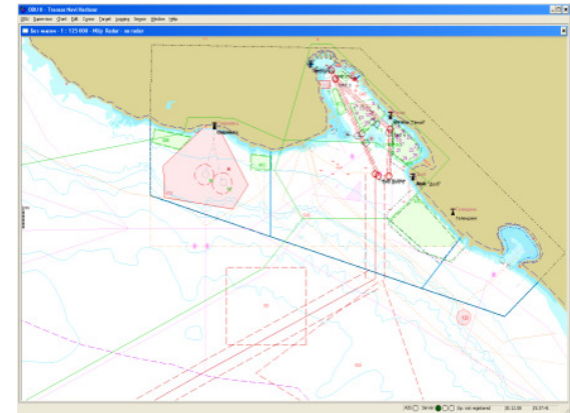
SCENARIO DESCRIPTION

SAMPLE OF SCENARIO

- Vessel 1
  - Inbound to Port of Saint-Petersburg
  - Pilot onboard at PBP

- Vessel 2
  - Outbound from Port of Bronka Pilot onboard
  - Leaving pilot at BPP

Vessels meeting during the during passage of the Saint-Petersburg Maritime Channel.

E-NAVIGATION SERVICES USED

- Voyage Information Service – Route Exchange ship-shore-ship

- Route Exchange Ship to Ship AIS ASM

- Text communication (AIS Binary)

- Vessel route and safety monitoring (STC)

- Routes and intentions of other vessels in the area

- Weather station information via AIS ASM

Other achievements,

- Test of Lightweight PPU equipment with WIFI Connection
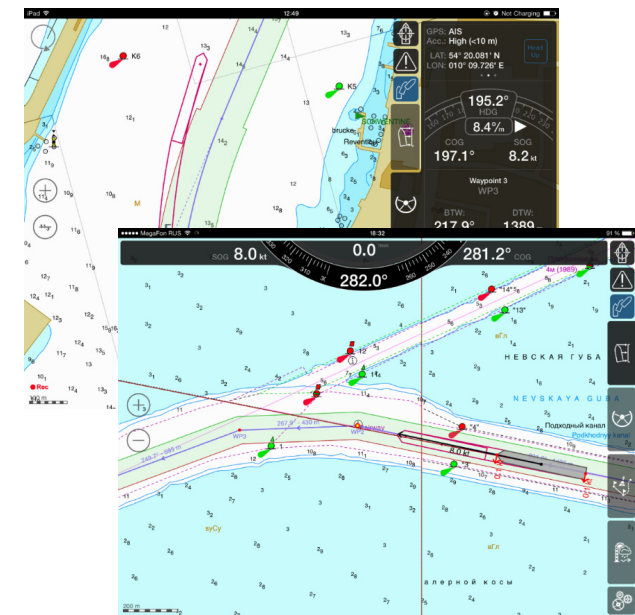
MILESTONE 1 RESULT

- **VHF Communication reduced by 30%**

- **Clarity and accuracy in information exchange improved**

- **Situation awareness - Pros and Cons**

  - + Ship to Ship route exchange – good prediction of meeting points

  - + All actors can have the same picture of the situation

  - − Reduced VHF traffic - some users missing part of the "Big Picture"

- **Benefits for the users**

  - Less stress and reduction of workload

  - Improves safety of navigation (Ship to Ship)

  - Simplifies planning of port operations and allied services

  - Minimizes amount of routine VTS operations

  - Reduces the VTS operators load

  - Speed-up delivery of correct information

FUTURE SERVICE TO BE TESTED PHASE 2-4

TRANSAS

- Auto routing and Route Validation
- Route optimization Service
- Shore based performance monitoring
- Decision Support and post-analysis of near-miss situations
- Maritime Safety Information (MSI) –MSP5
- Data delivery
  - Navigational warnings –S124
  - Bathymetric Services – S102
- Vessel Shore reporting – MSP8
- VTS Navigation Assistance Service (NAS)-MSP2
- Remote Service and Diagnostics
- Port Arrival (Service ordering – Time of Arrival Support)
- Exchange of Sea Traffic Information between several STC/VTS

Thank you!

Anders Rydlinger (Anders.Rydlinger@transas.com)

Dmitry Rostopshin (rost@transas.com)

TRANSAS GLOBAL CONFERENCE **TRANSAS**
Hilton Hotel, Malta
6–8 March 2017 REGISTER AT WWW.THESIS2017.COM

TRANSAS