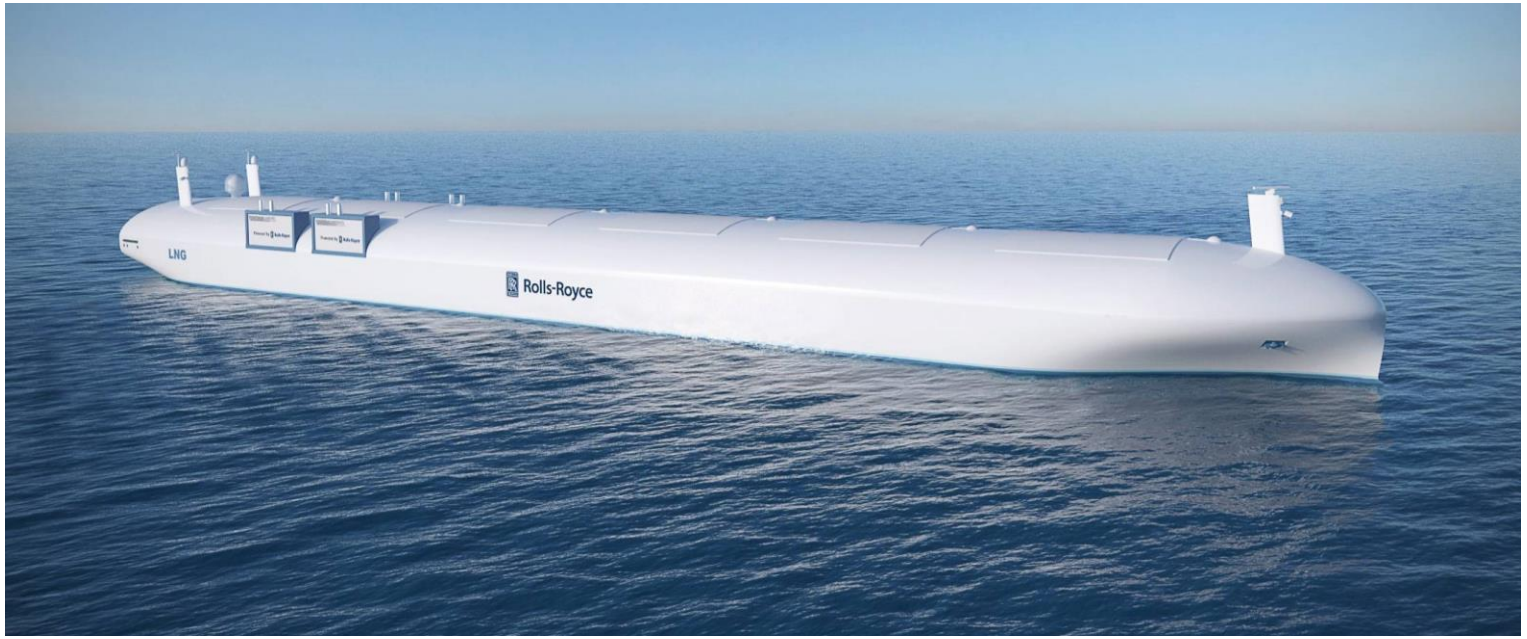


Fairway Informatics

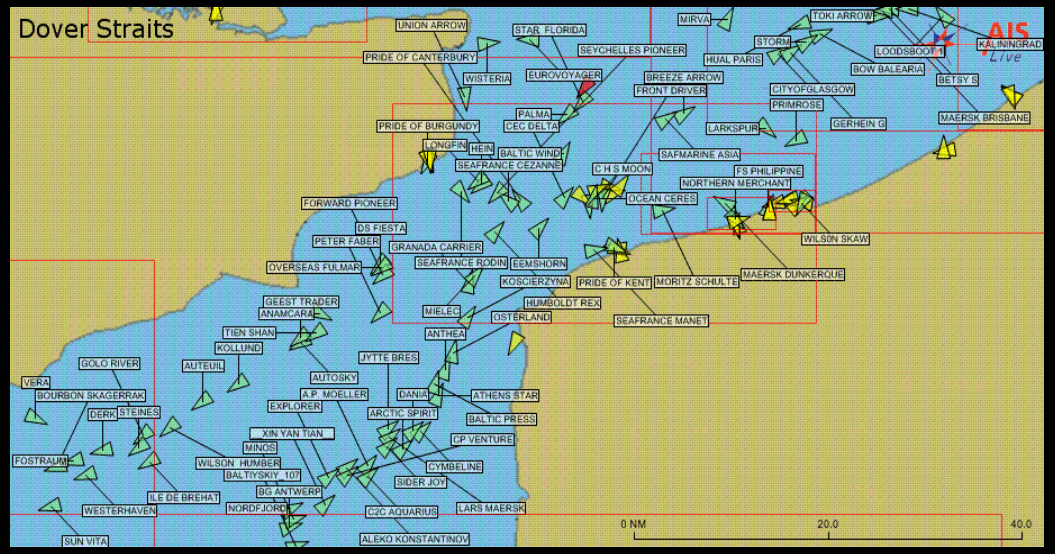
Swedish innovation

revisited

Racon

Sunvalve

Lighthouse



AIS

Gas Lights

STM
SEA TRAFFIC MANAGEMENT

Information Sharing
Connecting Maritime Community
Route Exchange
Port Collaborative Decision Making

SWEDISH MARITIME ADMINISTRATION

1160 Lighthouses

760 Lightbuoys


LightsAPP
Connecting Mariner and Fairways

About Fairways & Lights

Power consumption & Light pollution

Power Sources & Maintenance

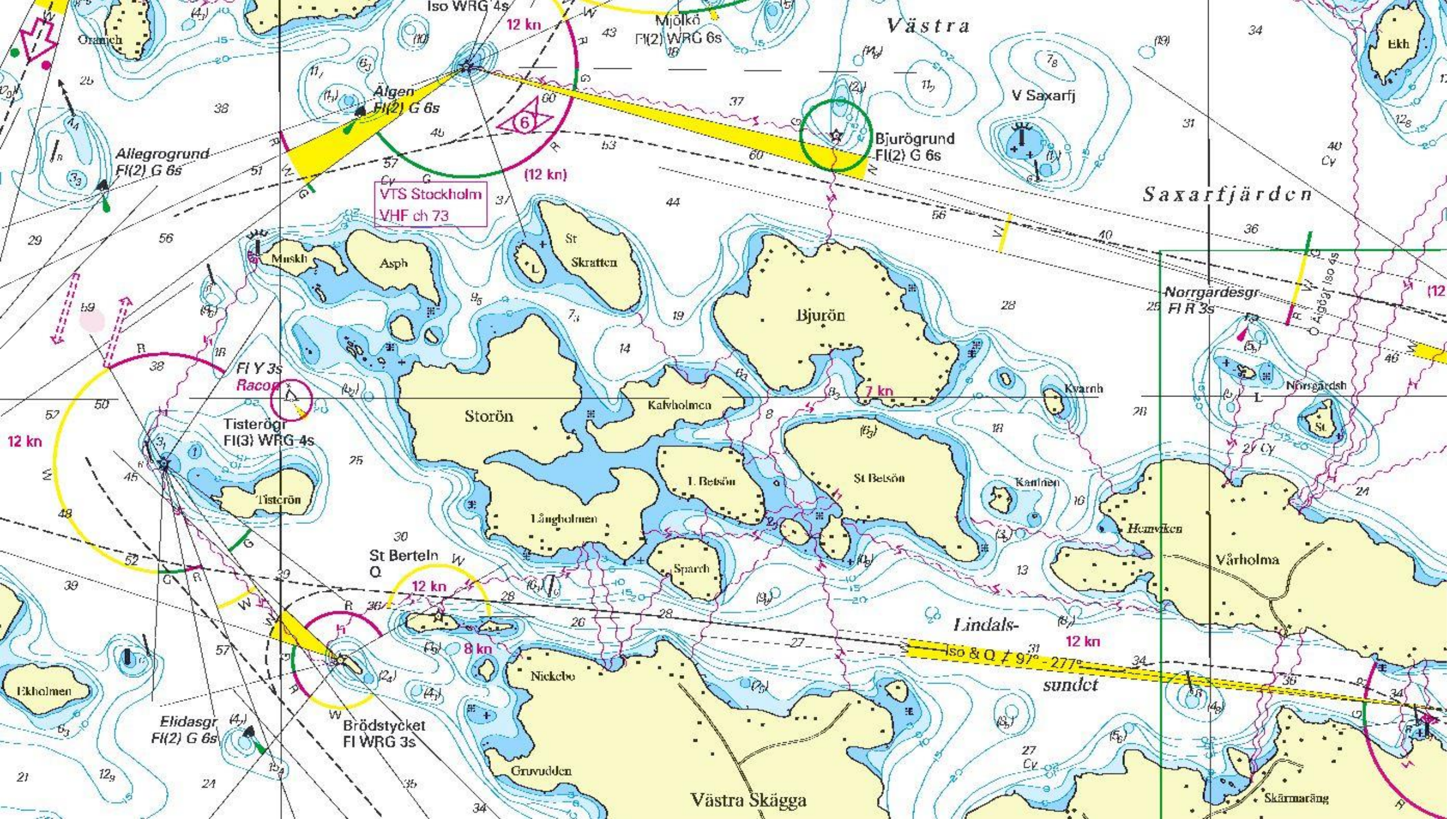
Frequencies & Statistics

Availability & Needs / Conflicts

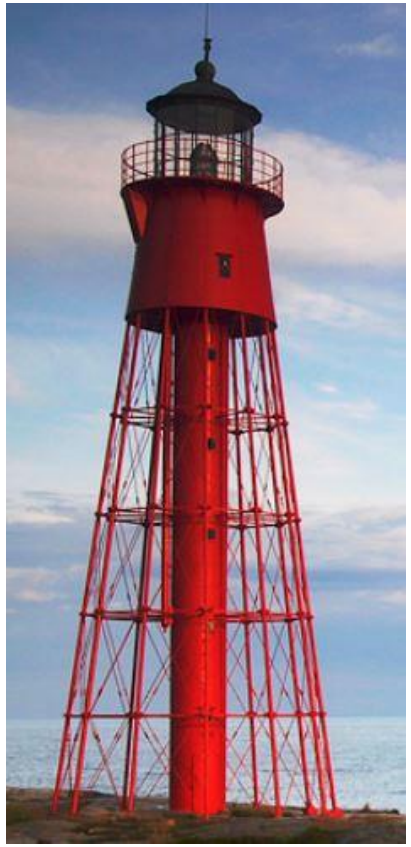
Costs & User-pay option

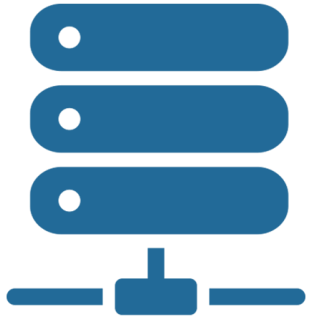
Fairways priorities !

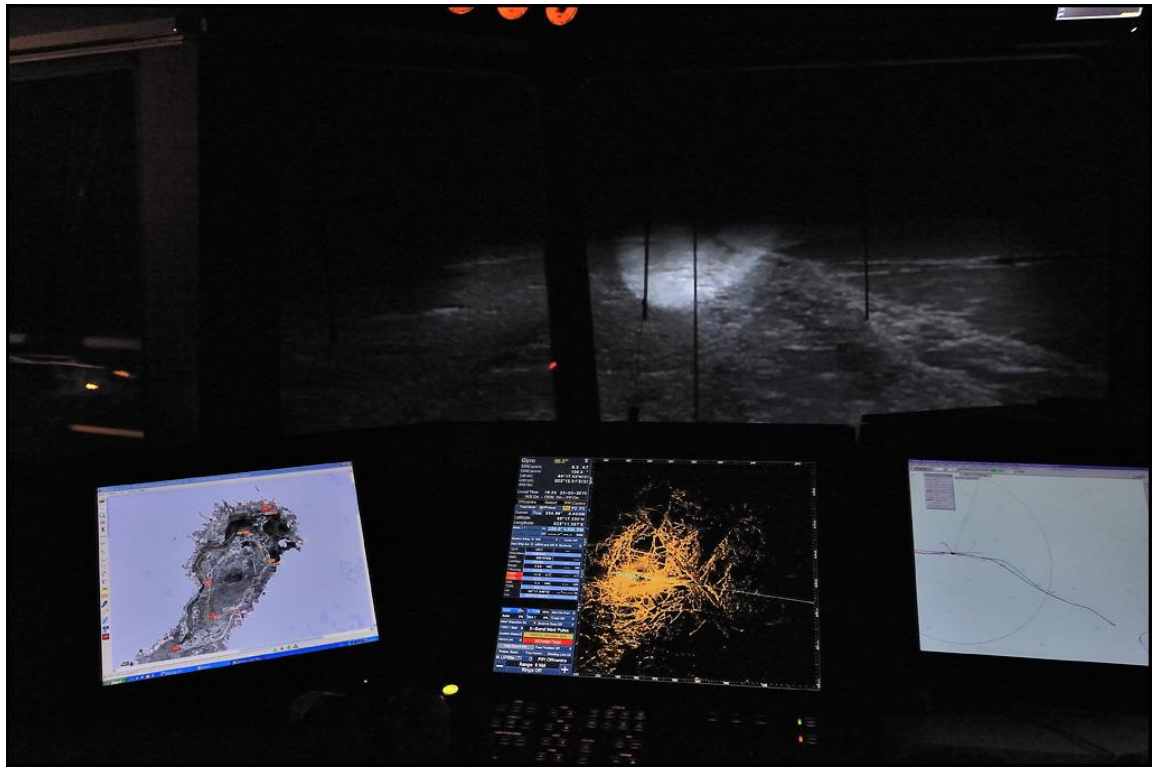
- Lights when mariners need it!
- Unlit or dimmed when not needed - save energy, reduce light pollution, minimize interferences
- Who, where and when - Statistics


Iso WRG 4s
12 kn
Mjölkö
Fl(2) WRG 6s
Västra
Ekh
Ormich
Älgen
Fl(2) G 6s
V Saxarfj
Allegrogrund
Fl(2) G 6s
Bjurögrund
Fl(2) G 6s
(12 kn)
VTS Stockholm
VHF ch 73
Saxarfjärden
St
Skratten
Muskh
Asph
Norrgärdesgr
Fl R 3s
Älgöar Iso 4s
Bjurön
Fl Y 3s
Racon
7 kn
Kvarnh
Storön
Kalvholmen
Norrgärdsh
Tisterögr
Fl(3) WRG 4s
12 kn
Tisterön
I. Betsön
St Betsön
Kanlnen
Långholmen
Henviken
St Berteln
Q
Sparrh
Vårholma
12 kn
8 kn
Lindals-
sundet
Iso & Q f 97° - 277°
Ekholmen
Nickebo
Elidasgr
Fl(2) G 6s
Brödstycket
Fl WRG 3s
Gruvudden
Västra Skägga
Skärmaräng

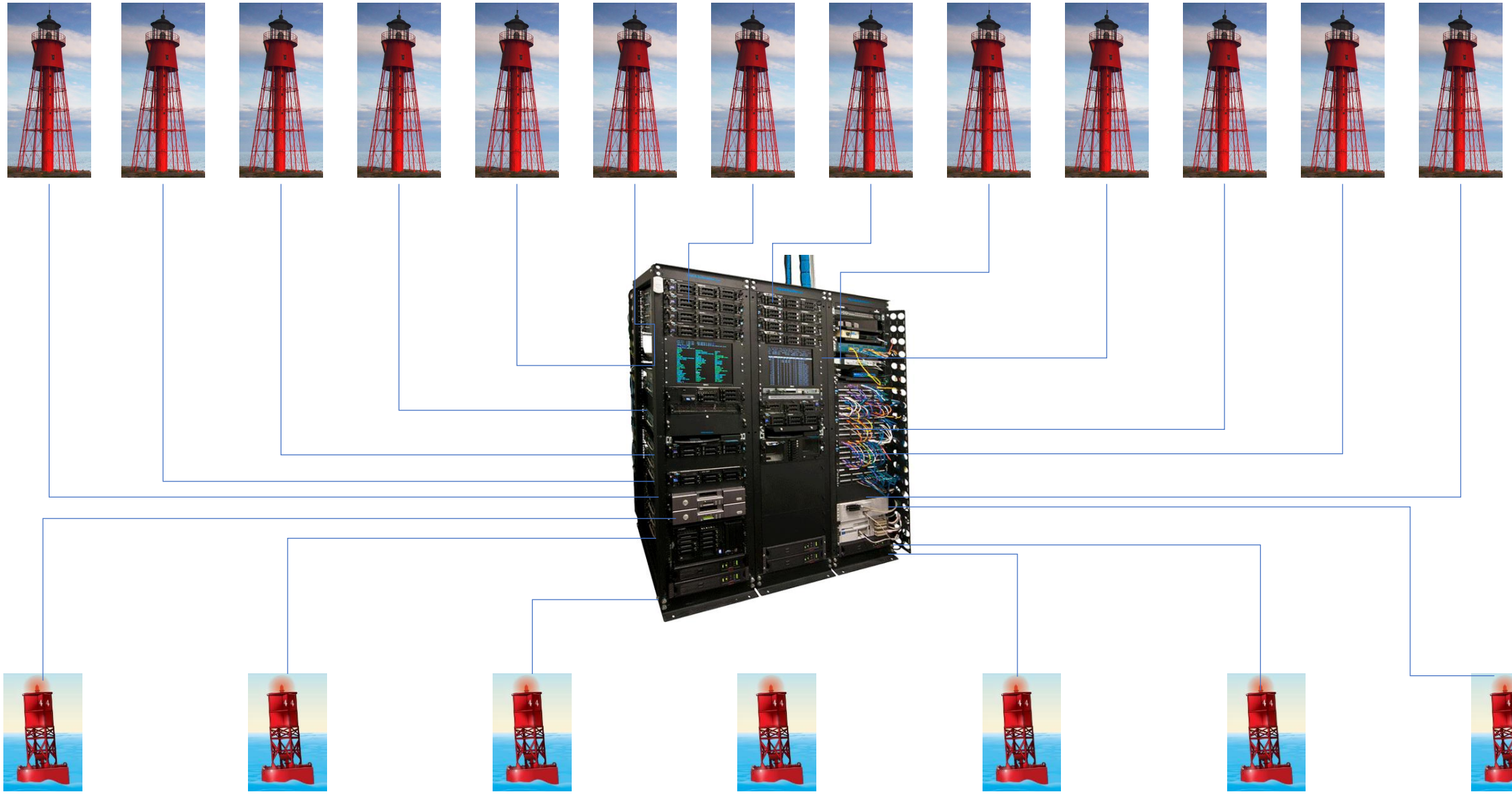

SIMRAD
58°23.7159'N
005°56.1930'E
1.421NM
253.3°T
(257034640) FISKEBOEN
Calculated TCPA
No collision
Distance to target
4.4NM
True bearing to target
226.8°
COG
234.2°
SOG
7.4kn
AIS target type
Vessel class A
Position
58°21.1213'N
005°52.6659'E
Relative bearing to target
313.2°
Navigation al status
engaged in fishing
Destination
FONN
Position accuracy is High flag
High
Call sign
LKXA
Type of Ship and Cargo Type
Fishing Vessel
EPFD type
GPS
Maximum draft in meters
4.0m
Dimension from CCRP to Bow
15.0m
Nordre Eigerøya
Eigerøy
Søre Eigerøya
Egersund
Lygre
Svetlingan
by Isakflu
Svånesfluene
Lædre
Svåholman
WP
NO3B0408
1:78 022
Better scale chart is available.
NO4D0611 1:22000
Lost target alarm is turned off
2015 February 11
10:14:17 LOC
58°24.1244'N
005°58.7658'E
SERIAL
270.7°
COG
6.3kn
SOG
5.5kn
STW
274.1°
HDG
248.8°
SET
0.9kn
DRIFT
77.0m
Depth
ROT
#3
Utsida
XTD
4.7m
1.147NM
DWOL
268.1°
BWOL
5.675NM
DTA
10m
TTG
29m
TTA
10:43LOC
2015-02-11
ETA
Menu
Custom Mode
Vessel
Head-up
TM
New route
Stop route
Layers
Measure
Palette
BRILL
MOB
The Connected Fairway within
Sea Traffic Management Concept







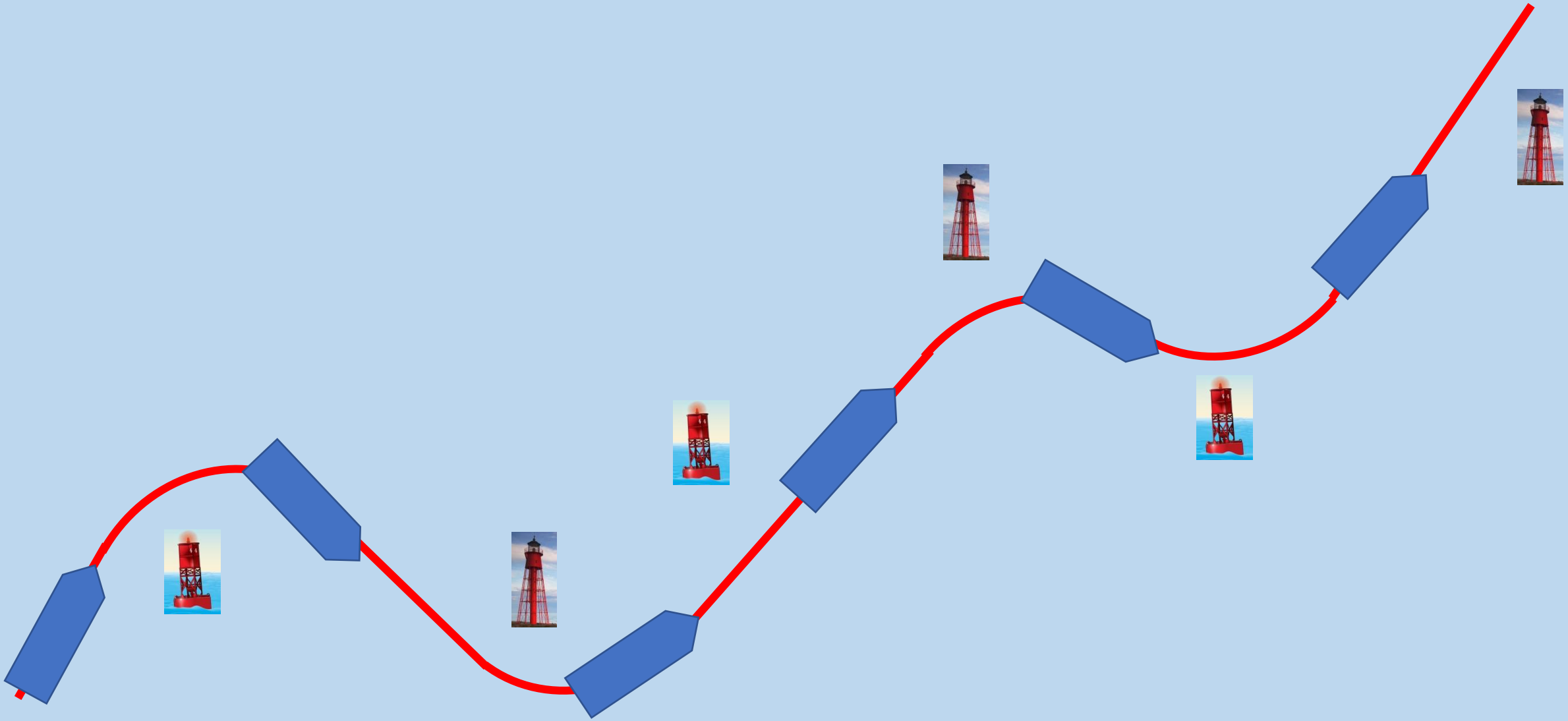
AIS = Signal trigger



Shipborne AIS Station

Maritime Internet Server
By
Authority

AIS Network
By
Authority



Leisure Crafts

Including system

Leisure craft will be able to inititate all Lights manually or automatically with *Lights App* web based server

ANDROID APP ON Google play

Download on the App Store

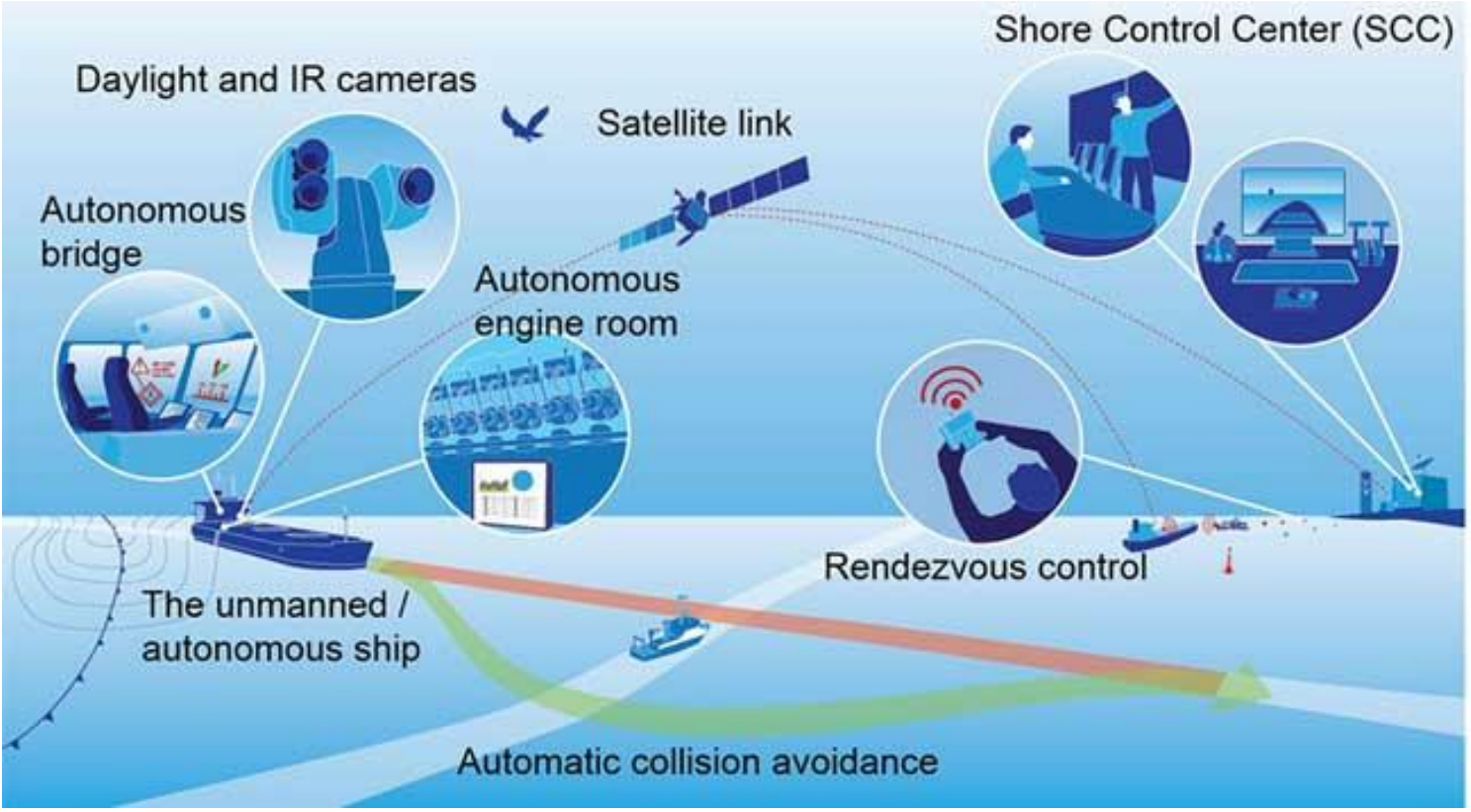
Target areas and Usage facts

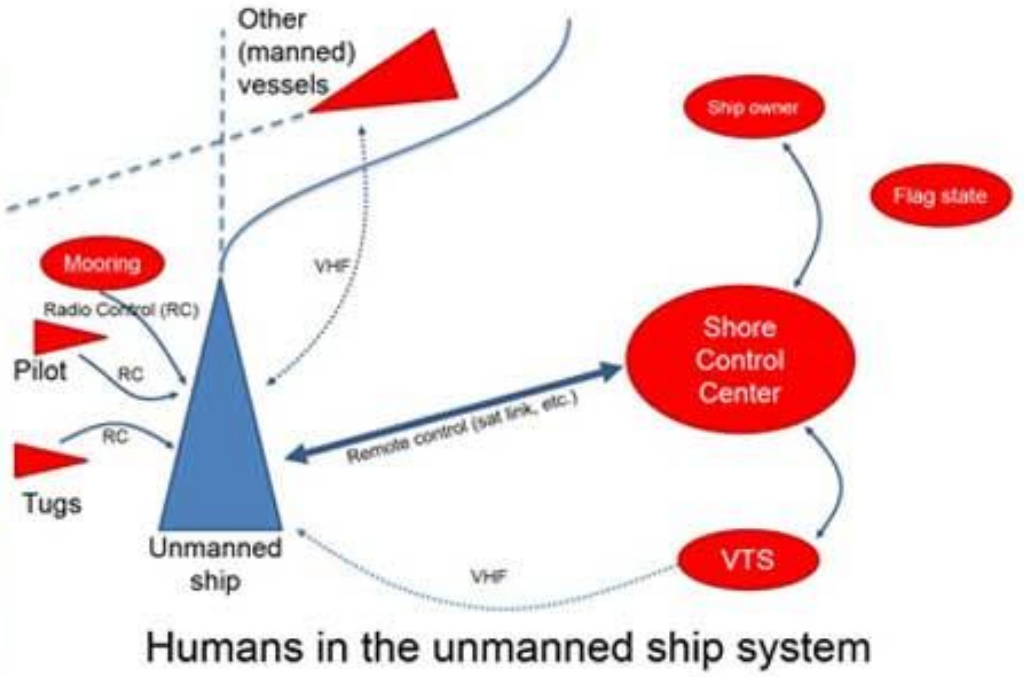
- Who
- When
- Where
- Power
- Influence

- Identity
- Duration and Time
- Usage of fairway
- Radical Reduction
- Maintenance

- Cost allocation
- Statistics / Big data
- Need? Reconstruction?
- Minimized emission
- Minimized Light Pollution

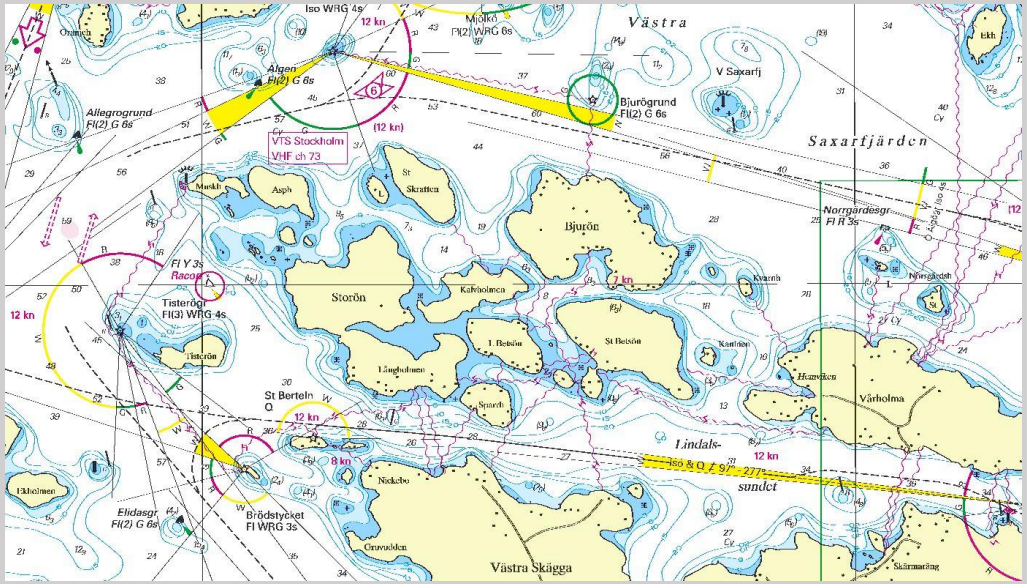
Autonomous ships http://www.unmanned-ship.org/munin/





Humans in the unmanned ship system

Traditional fairway navigation



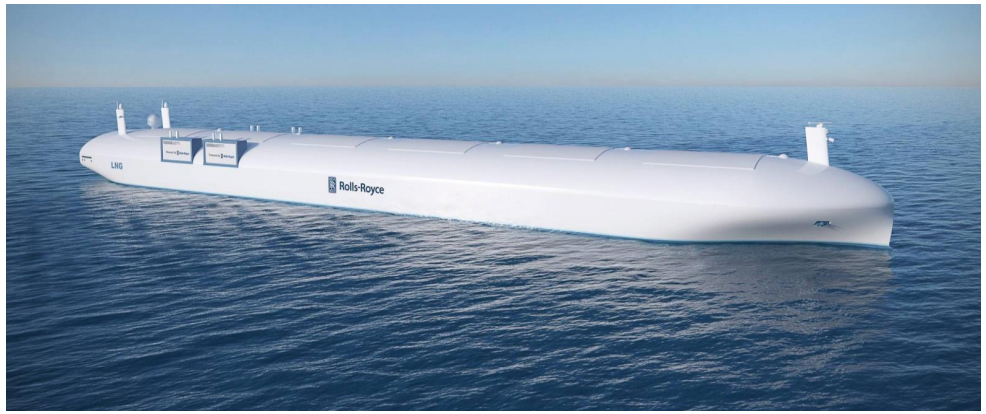
Connected Fairways Informatics

Mapping obstacles, visualize options

Passive methodology

Provide controlled trajectory

Active methodology



Tunnel Trajectory (Extended Route plan)

Connected Fairways

Network- RTK (Real Time Kinematics)

Route Exchange

- The ships passing in it´s trajectory or safe maritime tunnel
- Exactly positioned by Network-RTK
- Checked continously via the Connected Fairways stations

The fairways will go from non-respond actor to active provider

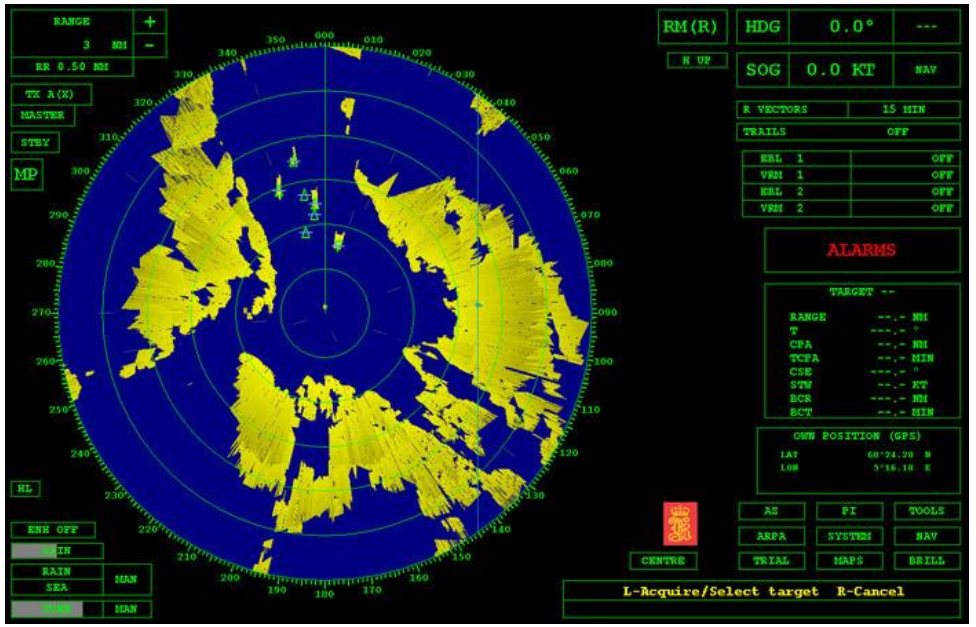
We´re not talking:
Shore based pilotaged or safe haven or shore center assistance

It´s:
Fairway provided, safe and controlled maritime trajectory transport

Transmission of Radarpicture

Transmit collected radarpicture over internet to PPU onboard vessels in fairways and port areas gives:

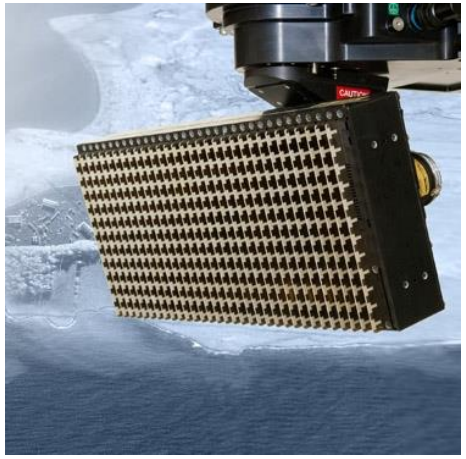
- Three antenna signals extracted to one robust and reliant radarpicture
- Landbased radarpicture overlay on PPU
- Redundance to the onboard radar appliances
- The vessel can plot itself and others by means of external independent incoming signal



REMOTE VTS CENTER

Non-VTS equipped Ports and Fairways, low traffic frequencies

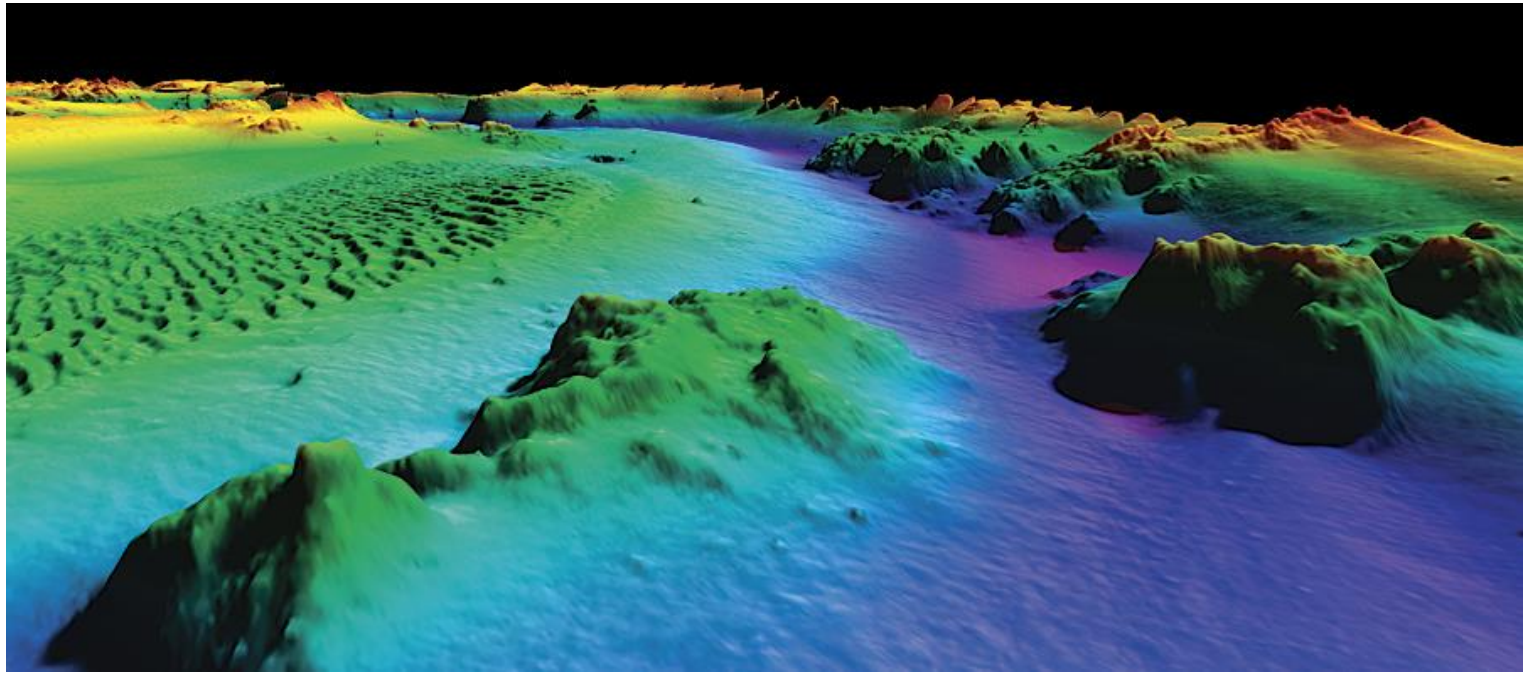
- Drone delivers radar and camera to prepared radar masts
- When needed only, VTS-on-demand
- Shift between different sites during ships passage in outstretched fairway
- One equipment used in multiple fairways
- Increased safety in low frequented locations
- Extra support for pilot/Captains in less trained/experienced areas



S-102

Distribution and use of bathymetric data in an operational environment

- **Integration of bathymetric data displayed on ECDIS onboard**
- **ECDIS gives exact data for UKC,** *Under keel clearance*
- **Route planning with latest weather and tidal data**
- **Positioning derived from bathymetric datamodels**



https://s102.no/2017/10/23/s-102-demonstrator-scenario-sore-sunnmore-sore-sunnmore/

Objectives of project

- Legal matters: Pianc, IALA, IMO regulations and recommendations
- Technical Issues: Transmission, Storage, Power supply, Availability
- Administration: National and international for system access
- Economic: Gains and loss, cost/profits, User Pay principles, politics
- Maintenance: Consequences for infrastructure, redesign of fairways
- Horizontal cooperation between similar initiative in- and outside project
- Big Data analysis: Statistics, determination of usage
- Pilots: Start-up areas, long term implementation
- Dissimination: International promulgation
- Correspondance groups: CIRM, NI, IFSMA, IEC, BIMCO, ICS etc, Vendors

Project composition

Swedish Maritime Administration

Swedish Transport Agency

Saab, Rise, Ericsson

Combitech

Stena, Wallenius

Finland/Poland/Estonia?

InCo Projected ?(Outside EU, Korea, USA?)

3 year project 2019-2021

Co-funded by EU

Tack
Ulf Svedberg
Sjöfartsverket
22 mars 2018