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# Smart Marine Fairway - information paper of studies implementing services for eNavigation in Finland

## 1. Introduction

Digitalisation and automation are defined to be one of the main focuses in national strategy in Finland. The strategy directs public agencies e.g. FTA to digitise their datasets and services and support private sector to develop their services towards "remote" or "self" service and automation.

The electronic nautical charts with unique standards and global coverage have been a success story of digitalisation in the field of hydrography. Transition to a fully digital chart services and paperless navigation will not happen overnight and the fact is that most if not all vessels still carry conventional printed charts as a main chart material for navigation or as a backup system for ECDIS. Although digitalisation usually provides opportunities for additional information and new functionalities to end users the data content of ENC's has almost without exception been equivalent with printed charts.

Finnish HO has for some time been requests from e.g. pilots for more dense bathymetric data. Detailed seabed topography is especially needed from those fairways where vessels can't use their full cargo capacity. So far dredging has been the only way to allow greater draft and more efficient transport to and out of Finnish ports. With post glacial land lift and lengthy and all the way shallow approach channels the dredging is becoming too expensive. Therefore other means are needed to discover in order to keep transport costs under reasonable level.

The new or further developed datasets, products and services are believed to ensure safe passage and enable to have more cargo on board while navigating through shallow and narrow routes in the Finnish coastal waters.

Studies are divided into two phases:

Phase I defines the concept for Smart Marine Fairway datasets and services.

During Phase II the defined datasets and pilot products will be tested using bridge simulator and on board with ECDIS.

Studies support implementation of the IMO eNavigation strategy.



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## 2. Description of the studies

### Phase I

#### 1. Sea (Water) Level

Responsible party is the Finnish Meteorological Institute.  
Research are planned to cover e.g. availability of real time measurements, long-short term variation of water level in main ports and on fairways, reliability of measurements, ensemble predictions for different time periods and uncertainty or probability of predictions, respectively.

#### 2. BSCD 2000 vertical reference

Responsible party is the Finnish Transport Agency.  
The "N2000 project" task list consist several actions e.g. list all datasets, products and services at FTA where features includes depth or height attribute, analyse effects to information systems that are used to store, process or used with vertical related data, define a transformation method (or set of methods), estimate amount of work for the transformation, create a draft plan and time schedule for the transformation and make a communication plan for the stakeholders.

#### 3. Bathymetric surface (IHO S-102)

Responsible party is the Finnish Transport Agency.  
Research are focused e.g. to analyse and develop suitable gridding methods, define product portfolio for Finnish S-102 datasets taking into count various scale bands of ENC and feasibility for ECDIS use, redesign chart production process to incorporate necessary steps for bathymetric surface output.

#### 4. Nav aids remote control

Responsible party is the Finnish Transport Agency.  
First nav aids with remote control were installed 2008 and since then over 700 nav aids both fixed and floating are connected in the system. The nav aids in the system send reports including automated failure alarms, battery charge, horizontal position and timestamp when light switch on and off for example. Further studies are planned to carry out on "light on demand" function and on "synthetic AIS AtoN".

#### 5. Marine Weather, Waves and Currents

Responsible party is the Finnish Meteorological Institute.  
Research are planned to cover at least measurement and predictions of wind/gusts, waves and currents. Ice situation may be added into studies later on.



## Phase II

Target is to test some of the phase I datasets in a bridge simulator and on board with modified ECDIS. Four ports (fairways) have been selected for test bed purposes; Sköldvik, Utö-Naantali, Uusikaupunki and Pietarsaari. One of the objectives is to develop a mathematical solution for ECDIS in order to calculate real time safety contour using vessel draft, bathymetric surface, water level and other relevant data sources.

### 3. Roadmap

Schedule for phase I:

2014	2015	2016
	Sea (Water) Level	
	BSCD 2000 vert.ref.	
		Bathymetric surface
	Navais remote control	
	Weather, Waves, Currents	

Schedule for phase II: 3Q/2016 and 3Q/2017.

### 3. Actions for the BSHC 20<sup>th</sup> Conference:

The BSHC 20<sup>th</sup> Conference is requested to

- take note on this information