

The background of the slide is a collage of three images related to energy and marine industries. On the left, there are several wind turbines against a blue sky. In the center, there is a large ship, possibly a cargo or container ship, viewed from an elevated angle. On the right, there is an offshore oil rig or platform. The images are separated by diagonal lines, and the overall color scheme is blue and green.

The **Energy & Marine** Consultants.

## **Challenges and opportunities emerging from new European expansion targets**

Shipping and the use of maritime space in times of offshore wind energy expansion in the Baltic Sea

# The **Energy** and **Marine** Consultants.

**ABL** is a leading global independent **energy and marine consultant** working in **energy and oceans** to de-risk and drive the transition across the **renewables, maritime** and **oil and gas** sectors, offering our customers the deepest pool of **world-class expertise across marine, engineering and adjusting disciplines** from more than **300 locations** worldwide.

- Headquartered in London, UK
- Founded over 40 years ago (LOC Group)
- Branch offices in Poland, Germany, France, Norway, Italy, Russia etc
- Focus on technical consultancy in the maritime shipping, Oil&Gas as well as Offshore Renewable Industry



1000+

People



38

Countries



60

Offices



303\*\*

Locations



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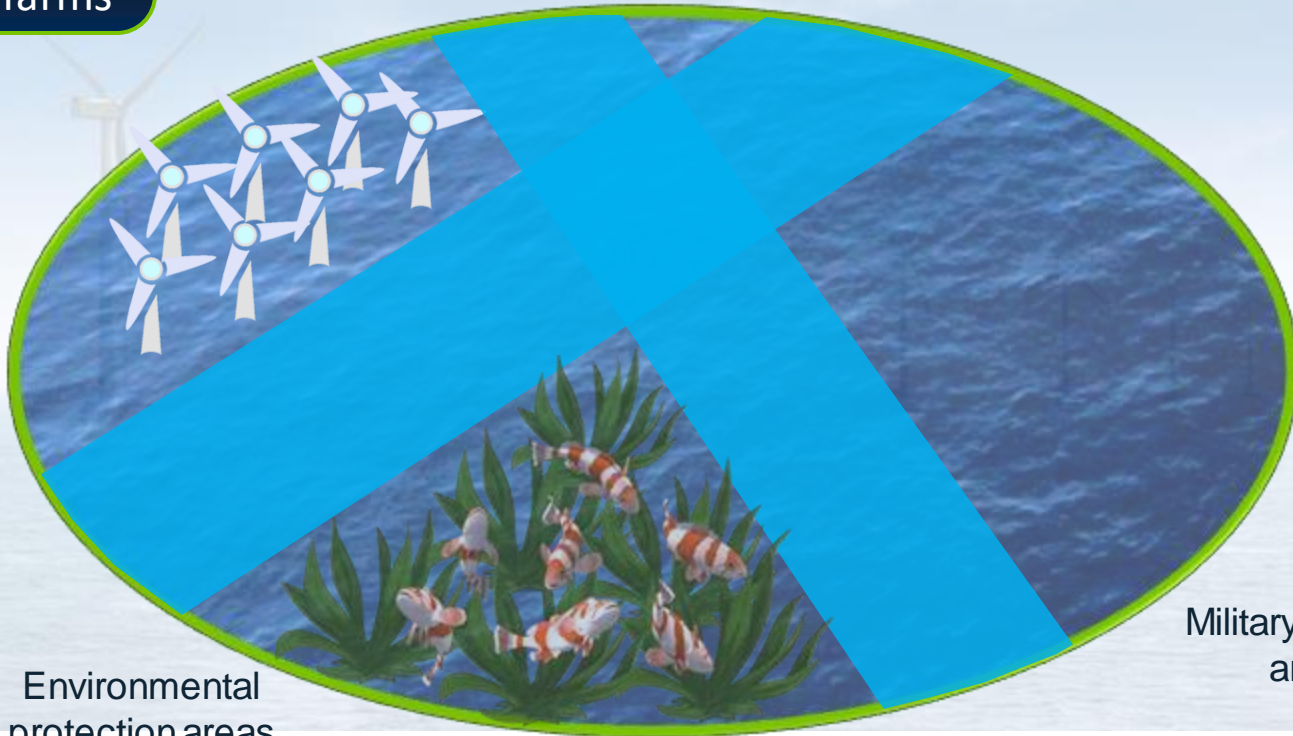
# Introduction

The use of maritime space

# The use of maritime space

Offshore Windfarms

Merchant shipping routes



Environmental  
protection areas

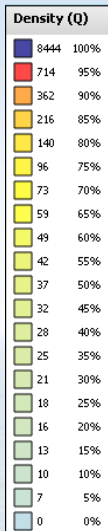
Military practice  
areas



# Maritime space in the SW part of the Baltic Sea

## Density analysis

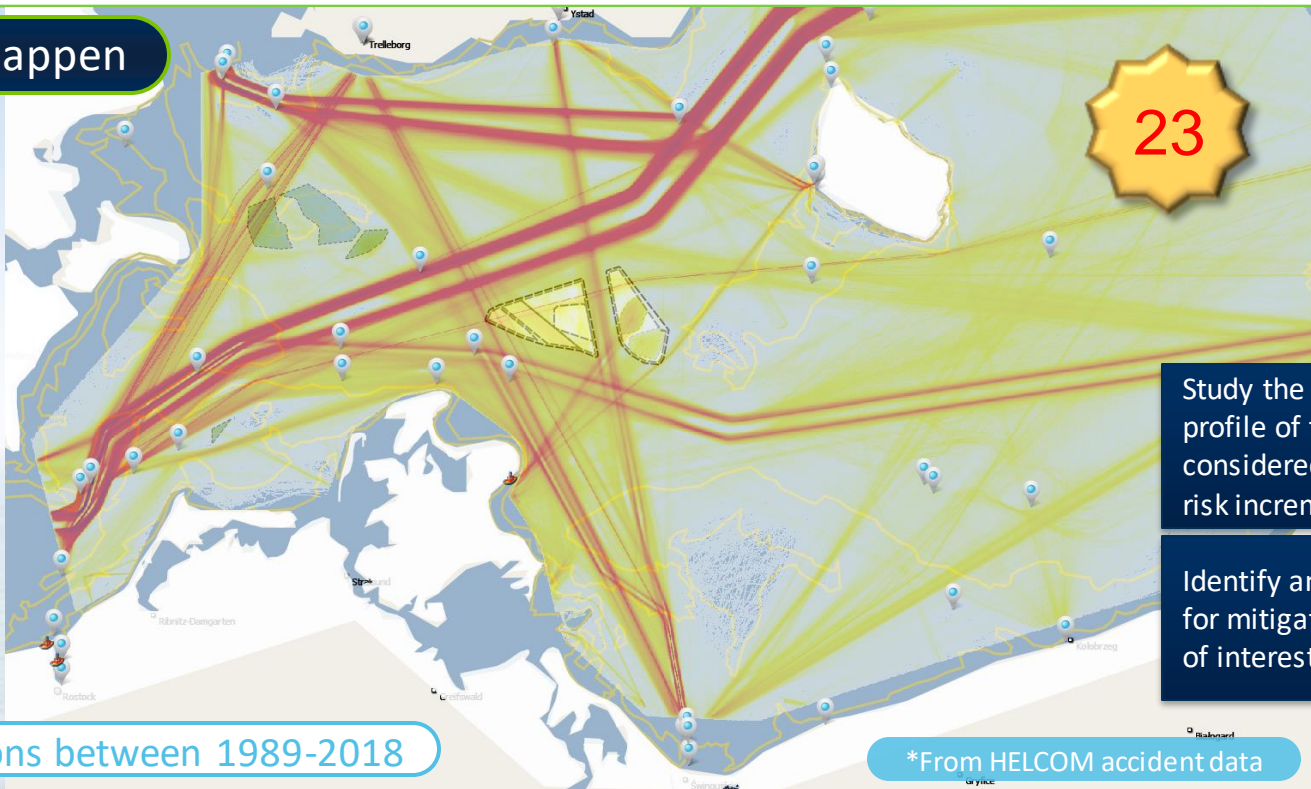
Vessel crossings  
per  
200m  
square



- Bulk Carrier
- Container
- General Cargo
- Tanker
- Gas Carrier
- Ro-Ro Cargo
- Ro-Ro/Pax
- Passenger/Cruise
- OWF Service Vessels
- Other Offshore
- Tug
- Other Work Vessels
- Fishing
- Pleasure Craft
- Military/Law Enf.
- Other

# Need to be mindful of the potential for accidents

Accidents do happen



Study the changes in the risk profile of the area considered, to quantify the risk increment

Identify and propose means for mitigating risk in the area of interest



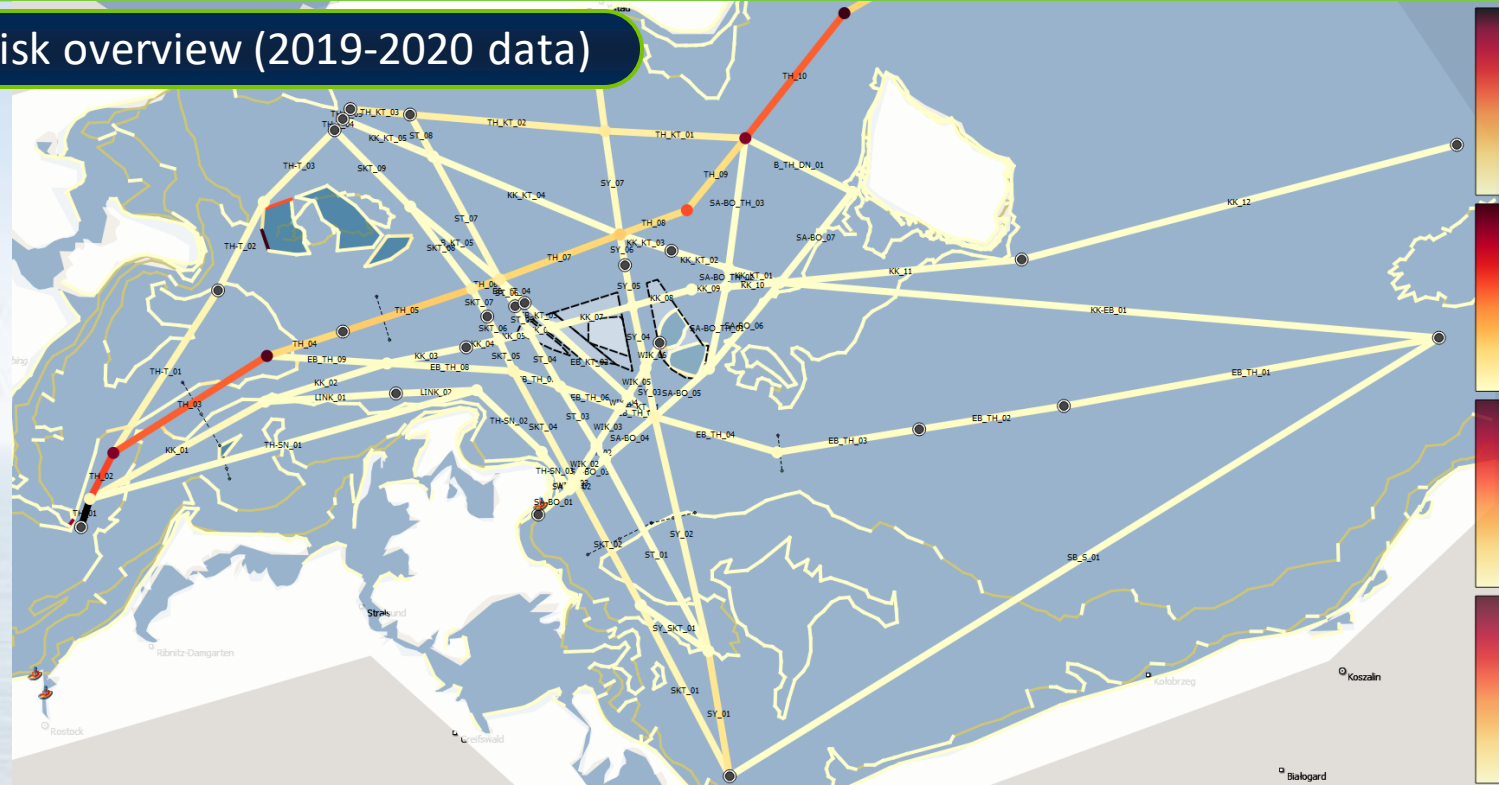
# Risk Analysis

Based on a case study within the German jurisdiction



# Risk Profile of the area of interest

## Current risk overview (2019-2020 data)



Model the existing traffic, understand the changes each plan entails, and quantitatively determine its impact on risk.

# Traffic Analysis

## Maritime Development Plans - Baltic

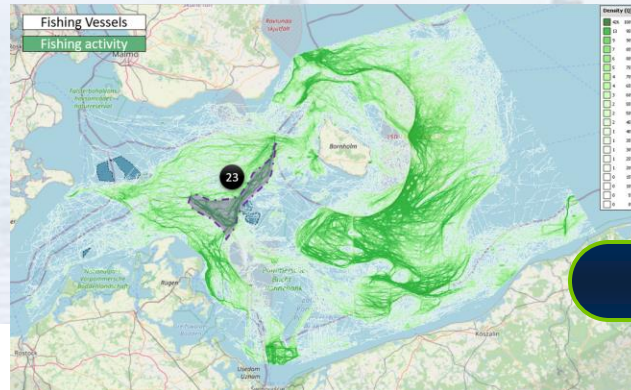
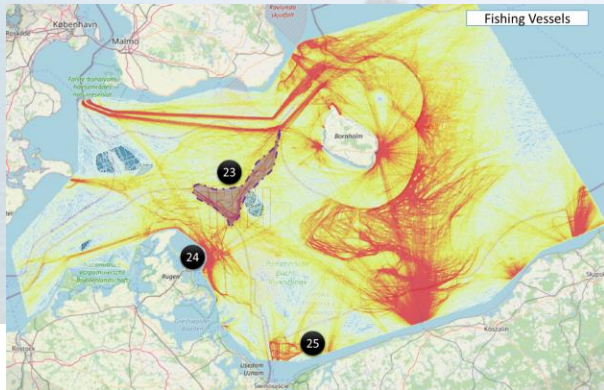
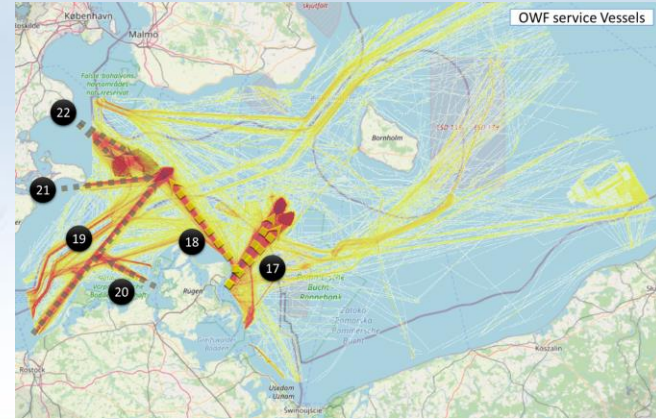
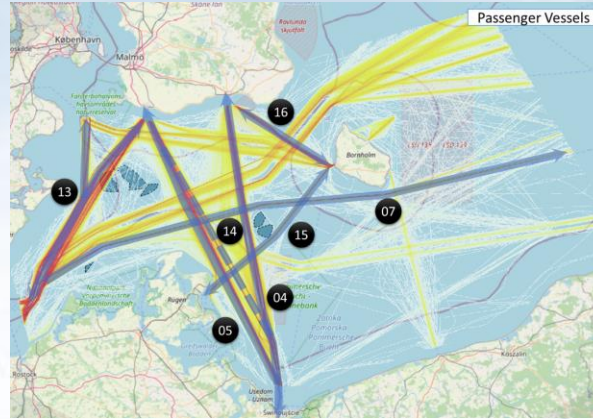
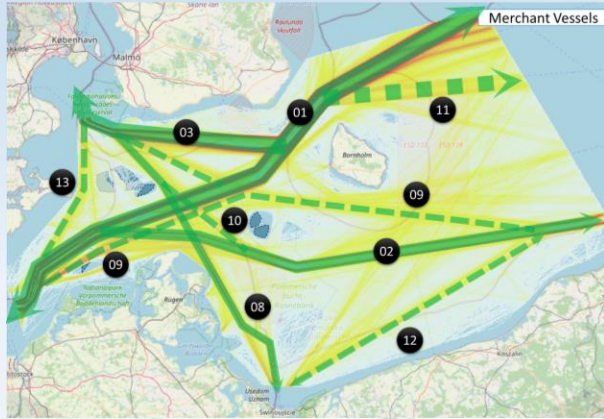
⚡ Review of the current maritime traffic flows

⚡ Consideration of development plans and changes to maritime traffic and ports





# Traffic Analysis, different patterns in the SW Baltic Sea



SW Baltic traffic patterns

# Impact of proposed changes around EO2 to navigation

## Risk modelling stages

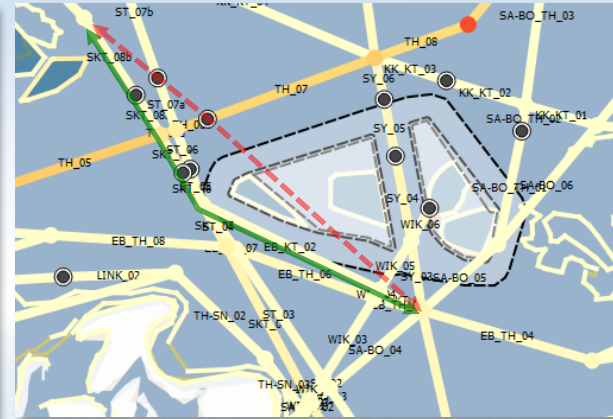


Current arrangement (2019-2020)



Post Arcadis Ost 1 and Baltic Eagle

- Diversion of Swinoujscie – Ystad ferry route that uses Arcadis Ost 1 footprint
- Diversion of Kiel – Klaipeda ferry route crossing the area of interest



Post Arcadis Ost 1 and Baltic Eagle

- Diversion of SE freight spur between Arcadis Ost 1 and EO2.

Risk increments considered for each development stage along a timeline, to identify the rate of introduction of risk at each stage

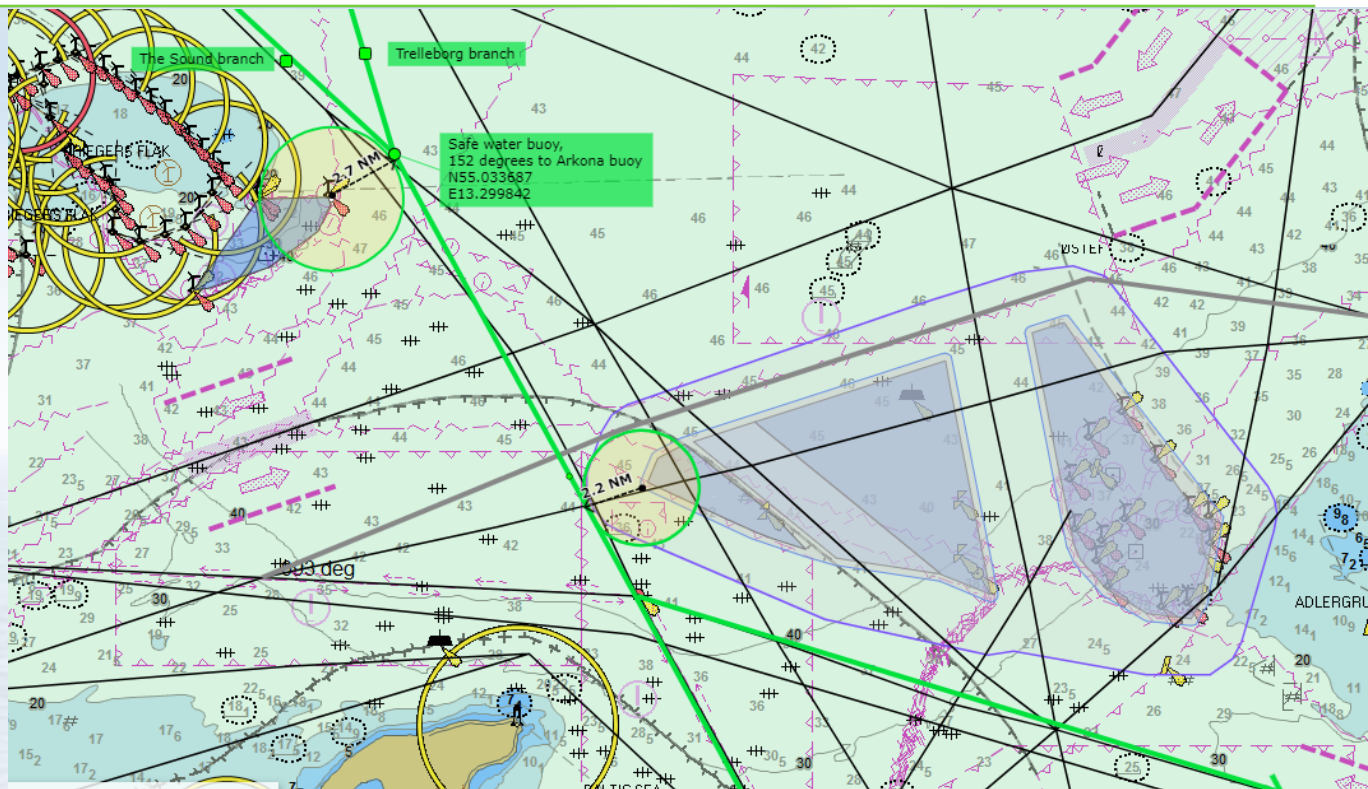


# Use insight from analysis to propose risk mitigation measures

## Mitigation Proposals

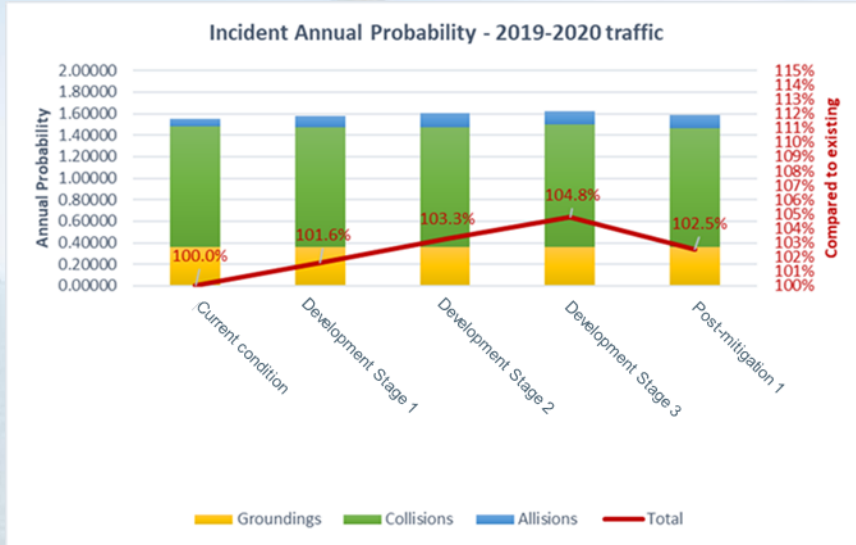
Minimal impact from the current conditions in the area

Consideration of the impact of a future extension of the recommended route to the North

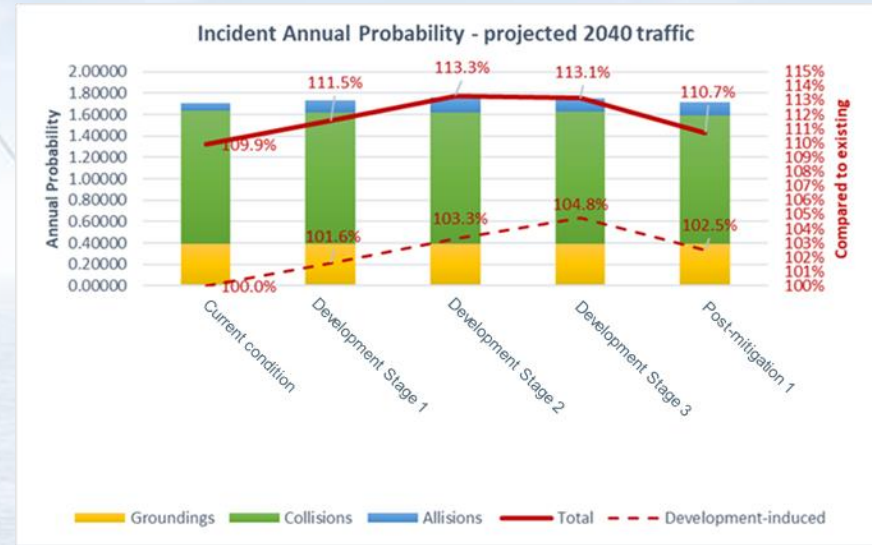


# Compare risk increments in the model

## MSP Implementation for current traffic volumes



## MSP Implementation for future traffic volumes



Also, consider risk changes in smaller areas of interest, where traffic will change substantially, routes will converge or cross.



# Navigation Simulation

Confirmation via the modelling and assessment of the new environment formed, in a navigation simulator

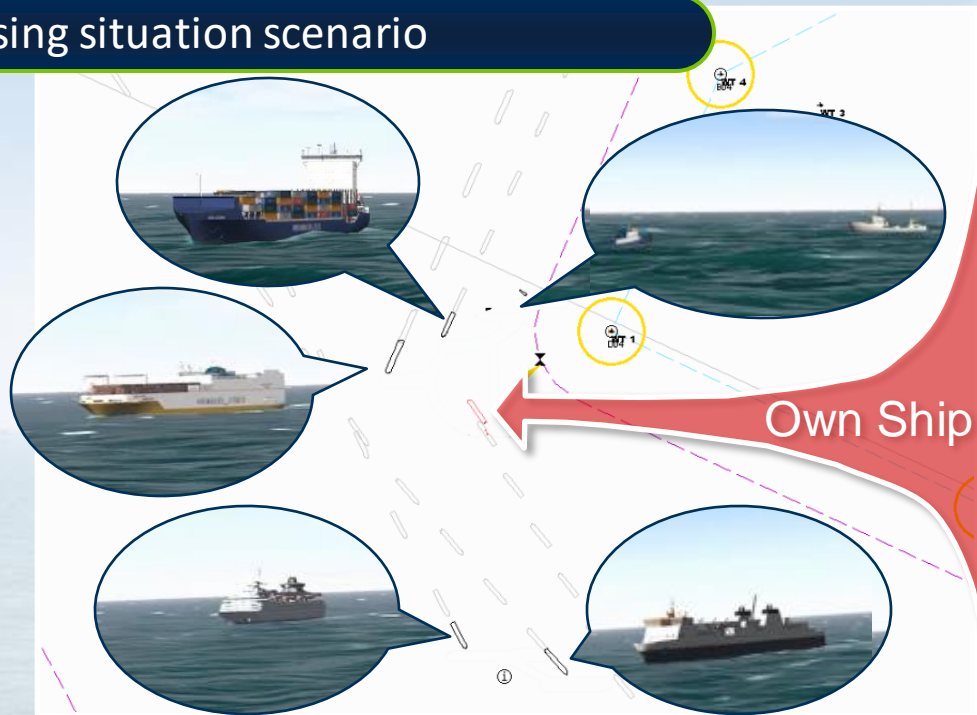
# Aim of developing simulation model






# Example: Crossing situation scenario to Rules of the Road

## Crossing situation scenario



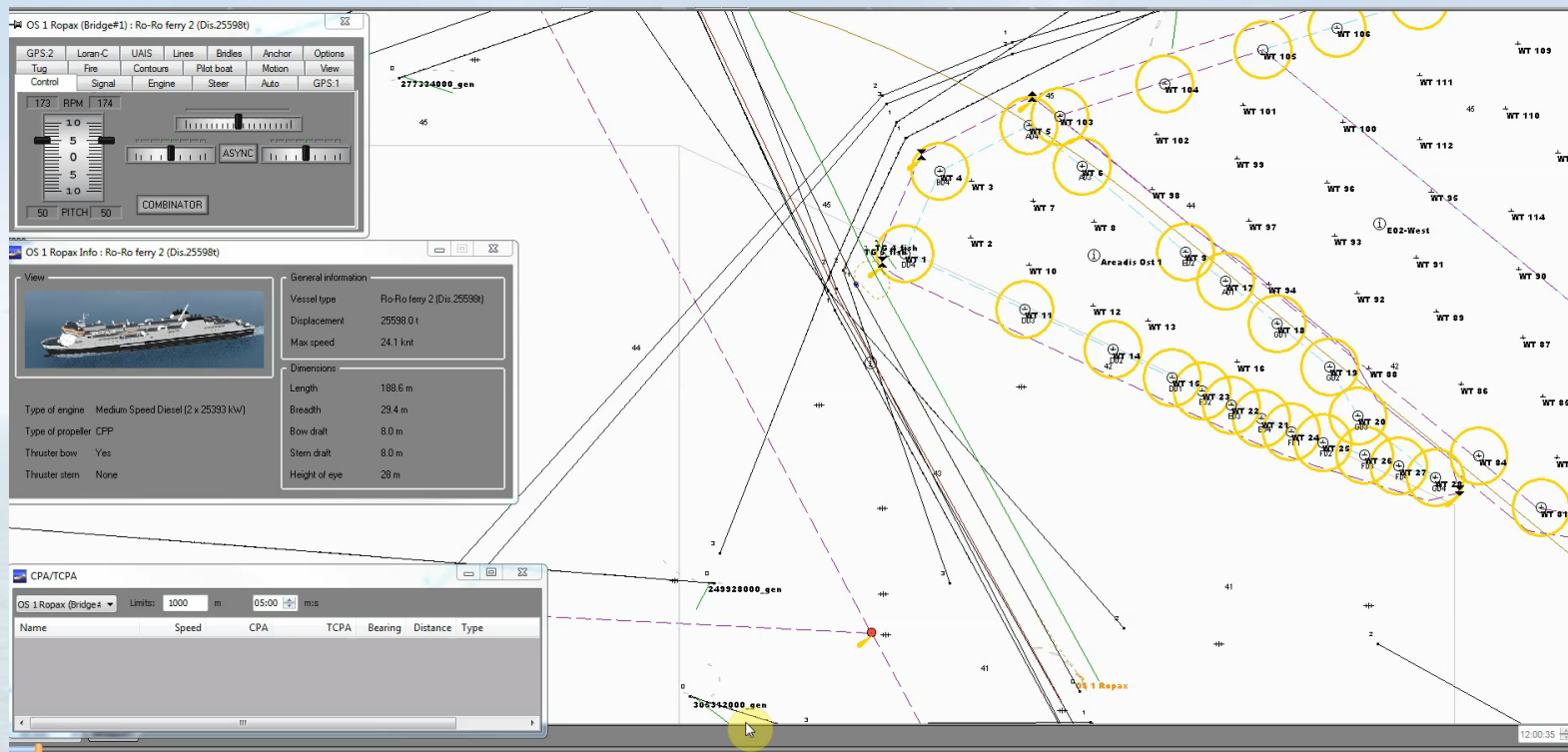
View		General information	
		Vessel type	Ro-Ro ferry 2 (Dis. 25598t)
		Displacement	25598.0 t
		Max speed	24.1 knt
		Dimensions	
		Length	188.6 m
		Breadth	29.4 m
		Bow draft	8.0 m
		Stern draft	8.0 m
		Height of eye	28 m
		Type of engine	Medium Speed Diesel (2 x 25393 kW)
		Type of propeller	CPP
		Thruster bow	Yes
		Thruster stern	None

View		General information	
		Vessel type	VLCC 6 (Dis. 59356t) bl
		Displacement	59356.0 t
		Max speed	16.3 knt
		Dimensions	
		Length	249.3 m
		Breadth	44.0 m
		Bow draft	5.8 m (5.8 m ext.)
		Stern draft	8.7 m (8.7 m ext.)
		Height of eye	30 m
		Type of engine	Slow Speed Diesel (1 x 21100 kW)
		Type of propeller	FPP
		Thruster bow	None
		Thruster stern	None

A vessel navigating northbound on the western end of OW development is required to avoid the collision with vessels crossing her bow from the starboard, with limited room to manoeuvre due to the presence of southbound traffic and fishing vessels stationary near the safety zone of the development

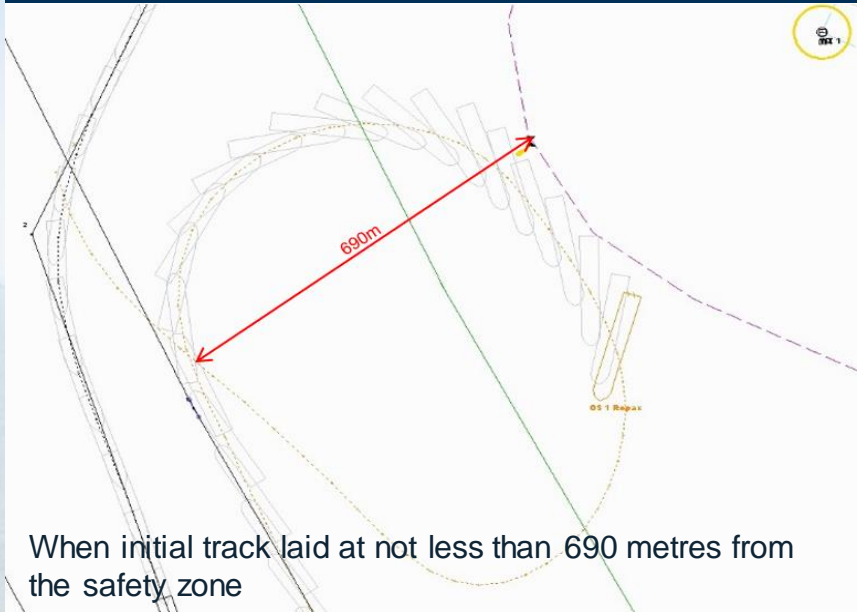
# Navigation simulation for Ro-Ro ferry



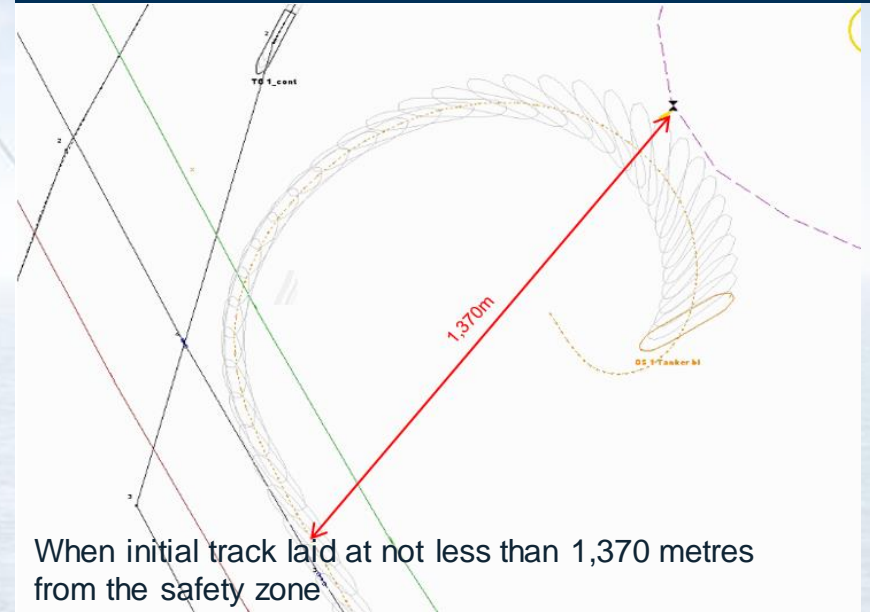
## Video demonstration

Both vessels successfully taken an evasive manoeuvre without allision with the Cardinal Buoy

Ro-Ro Ferry



Tanker



Thank you

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