

# Antwerp Port of the Future

a 'smart' port strategy

Nico De Cauwer  
June 2019



# Importance of the port

Belgium's biggest economic driver



**235**

Million tonnes  
of freight



**12.068**

hectares



**15**

million TEU  
capacity



**143.058**

jobs



**900**

companies



**4,8%**

GDP



**20,3**

billion €  
added value

# Business plan 2018-2020

Mission:

A home port as a lever  
for a sustainable  
future



**Port of  
Antwerp**



## 5 strategic priorities for 2020



**Sustainable  
growth**



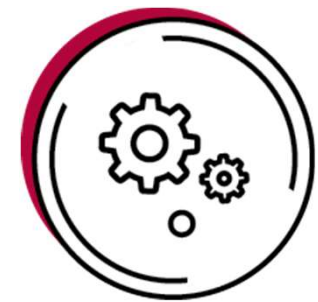
**Mobility**



**Transition**



**Safety and  
Security**








**Operational  
efficiency**



## PoA Strategic priorities & Technology drivers

2018 - 2020

Domain	Theme	Sustainable Growth 	Mobility 	Transition 	Safety & Security 	Operational Excellence 
ENERGY	CARBON CAPTURING & STORAGE					
	HYDROGEN					
ENVIRONMENT	SENSORS (eg. air quality)					
NEW ECONOMY	3D PRINTING					
AUTOCONTROL	SMART SHIPS					
	DRONES					
SMART PORT	INTERNET OF THINGS					
	AUGMENTED / VIRTUAL REALITY					
	BLOCKCHAIN					
	ARTIFICIAL INTELLIGENCE					
	BIG DATA (NxtPort, Cpoint)					

# Smart port defined



**Port of  
Antwerp**

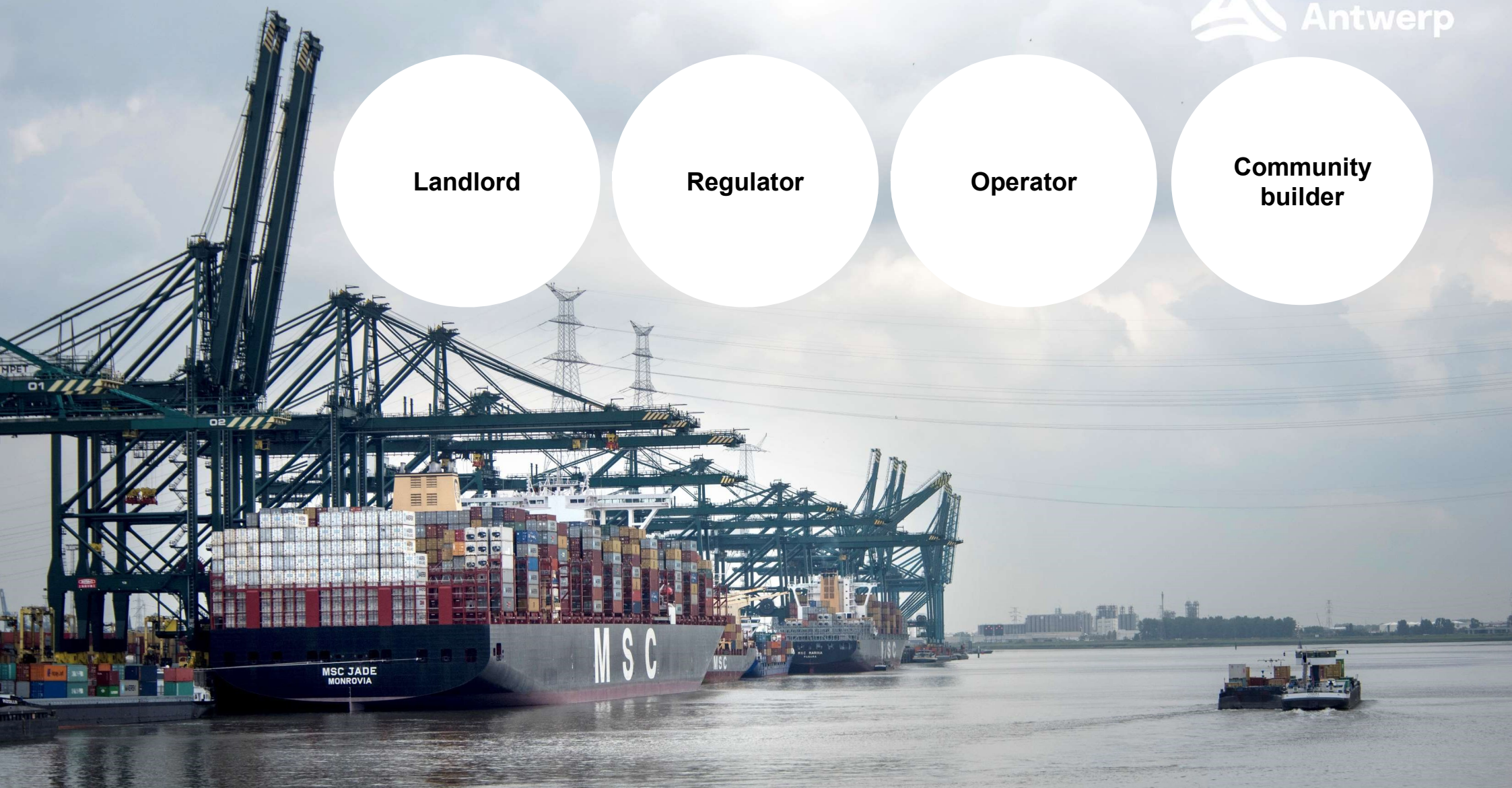


**Landlord**

**Regulator**

**Operator**

**Community  
builder**





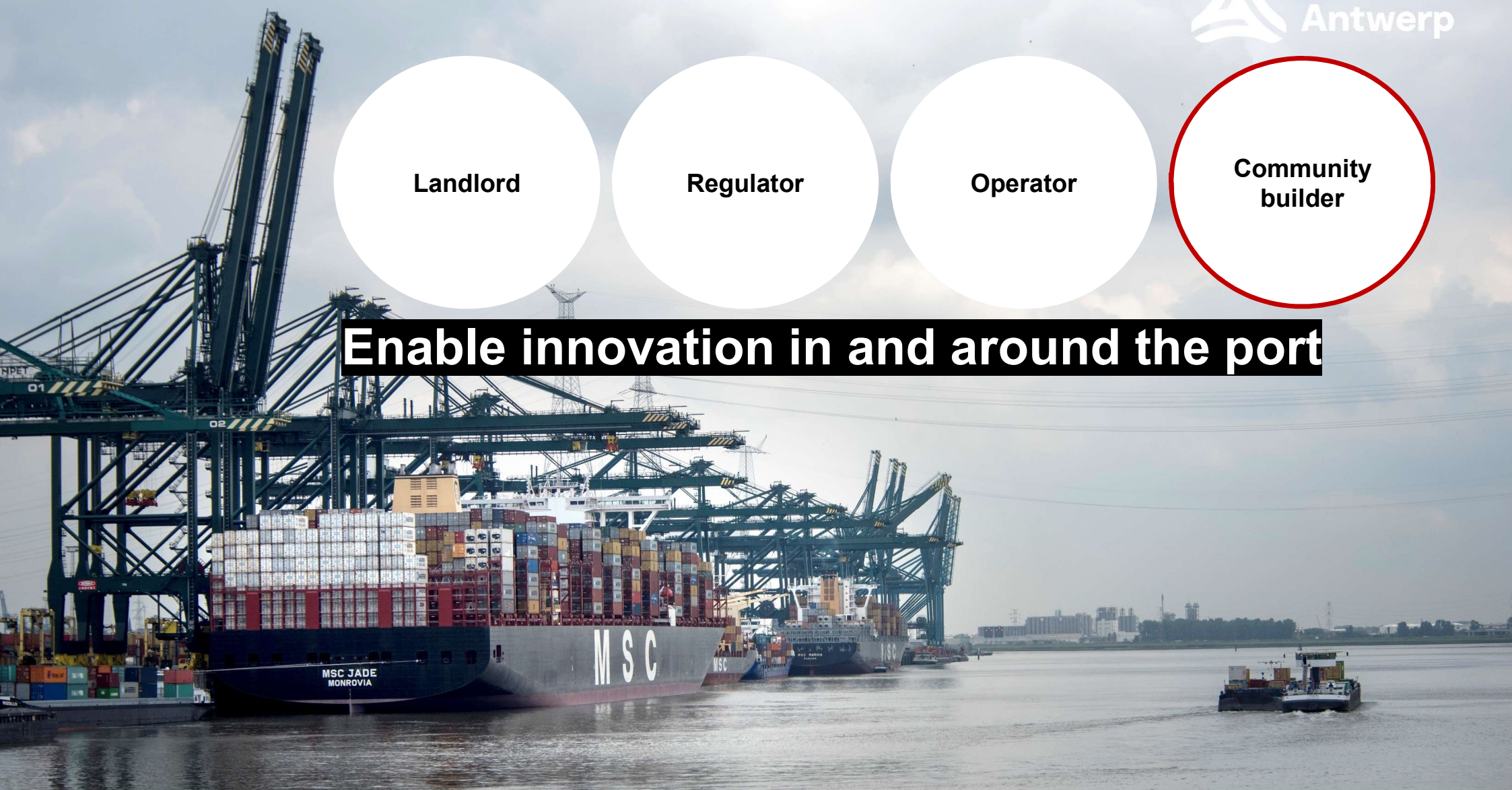
**Landlord**

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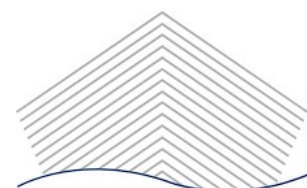
**Enable innovation in and around the port**







PORTXL



NxtPort

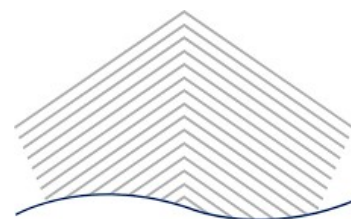


CHAINPORT



Innovation for industry,  
logistics and smart cities





**Nxt**Port



**co-envision**



**co-market**



**co-build**

# NxtPort

Building the Port of the Future, Together



**AN OPEN PROJECT**  
BY & FOR THE COMMUNITY  
w/ LOW ENTRY BARRIER



**DATA PLATFORM  
MARKETPLACE**  
w/ STRONG DATA GOVERNANCE

enabling



**CO-CREATED  
DIGITAL SUPPLY CHAIN SOLUTIONS**



**NxtPort**



**MARKETPLACE**  
OF AVAILABLE API's and APP's



**CO-CREATED SOLUTIONS** (API's and APP's)  
targeting # actors & cargo types



**API ENABLING DATA BACKBONE WITH SOLID  
SHARING LOGIC**

1 connection

Private  
Company X  
(1-N)

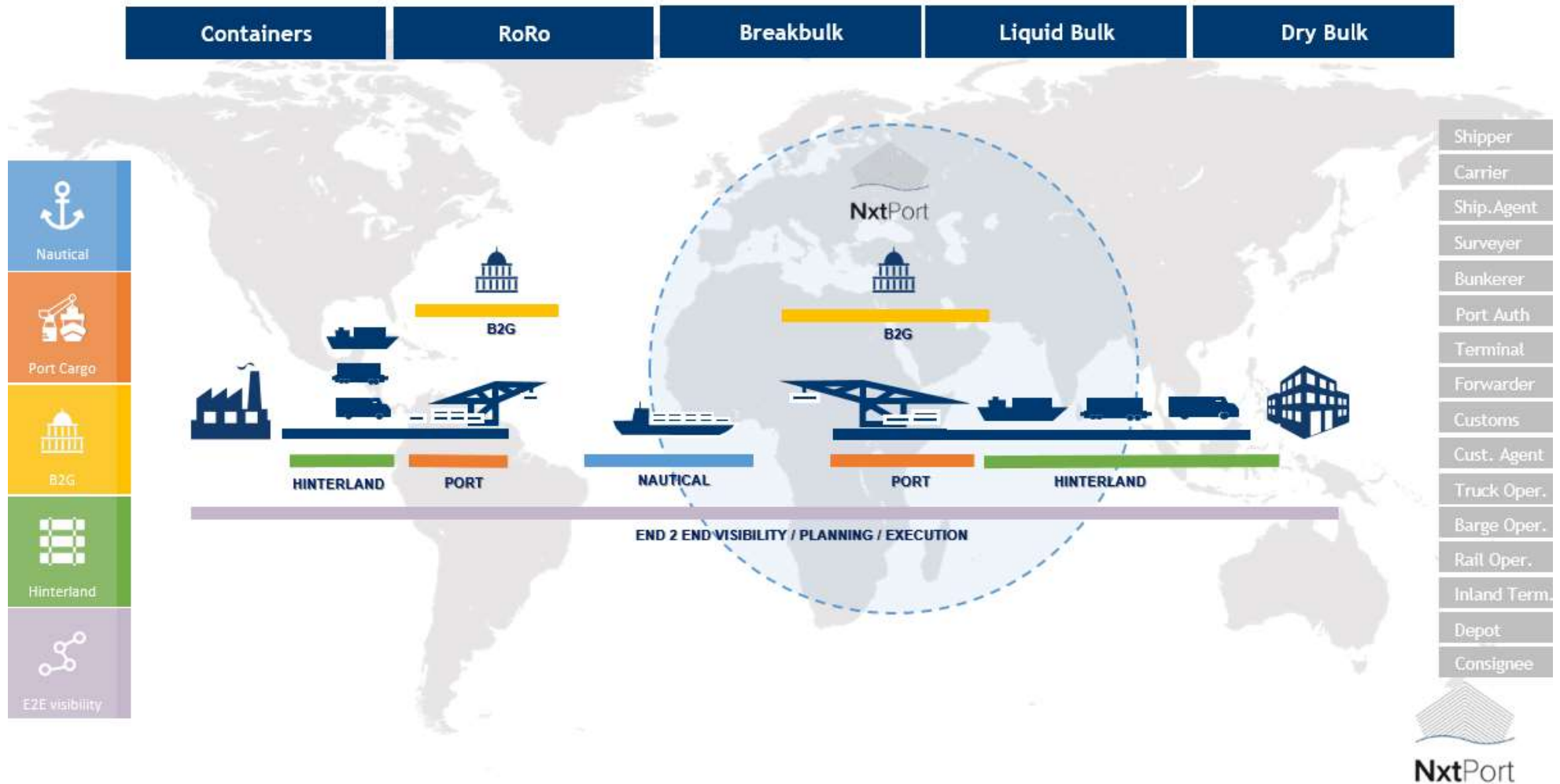
1 connection

Customs

1 connection

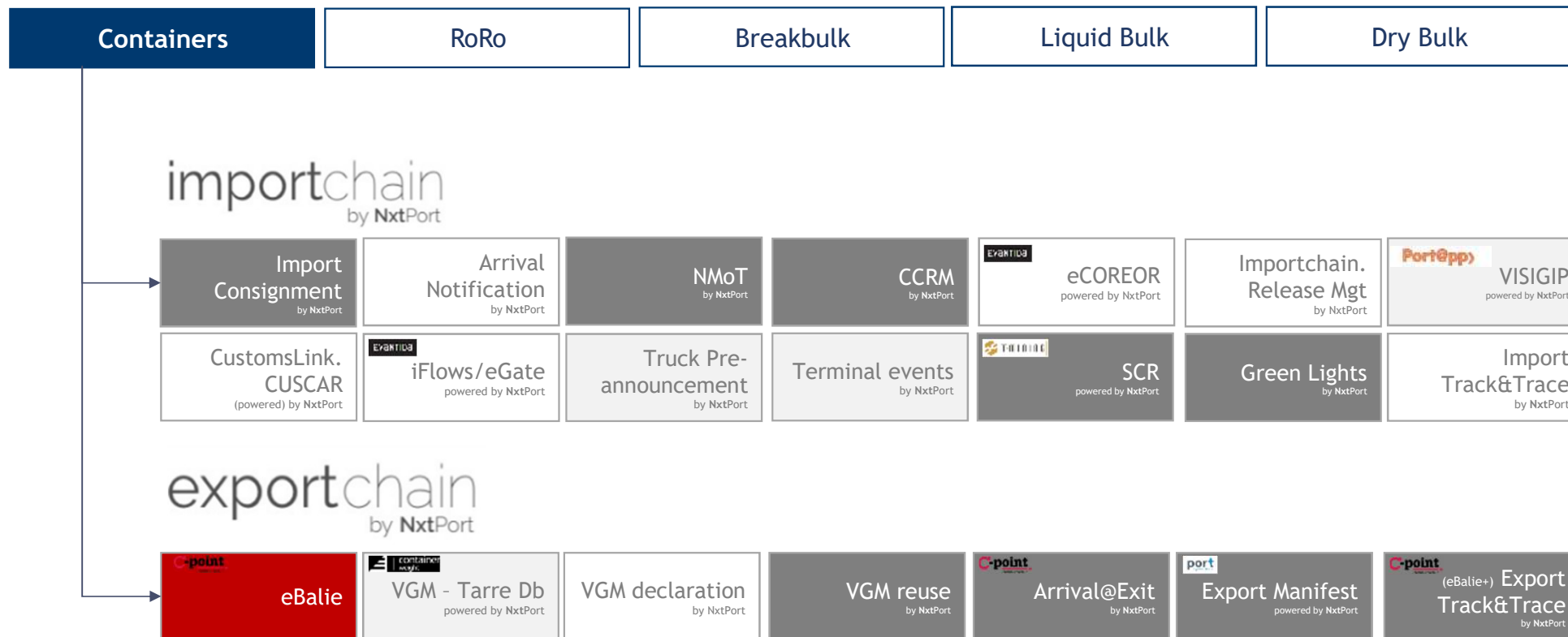
Other  
Authorities

# Nxtport: The activity canvas



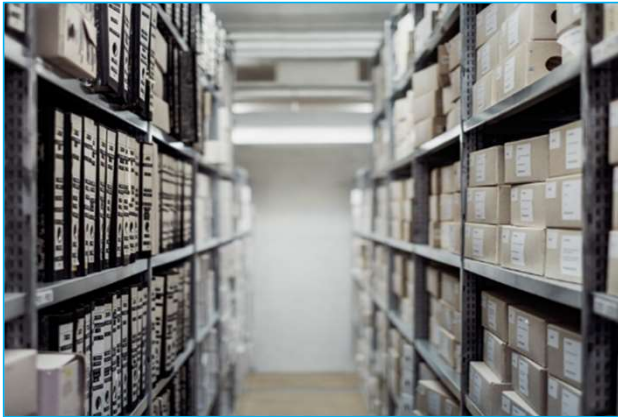


# Nxtport: The activity canvas



# NxtPort data assets leveraged beyond EDI

## Harmonized datasets



**Library**  
extensive range of data sources



## Combined datahubs



**Pitstop**  
a coordinated file



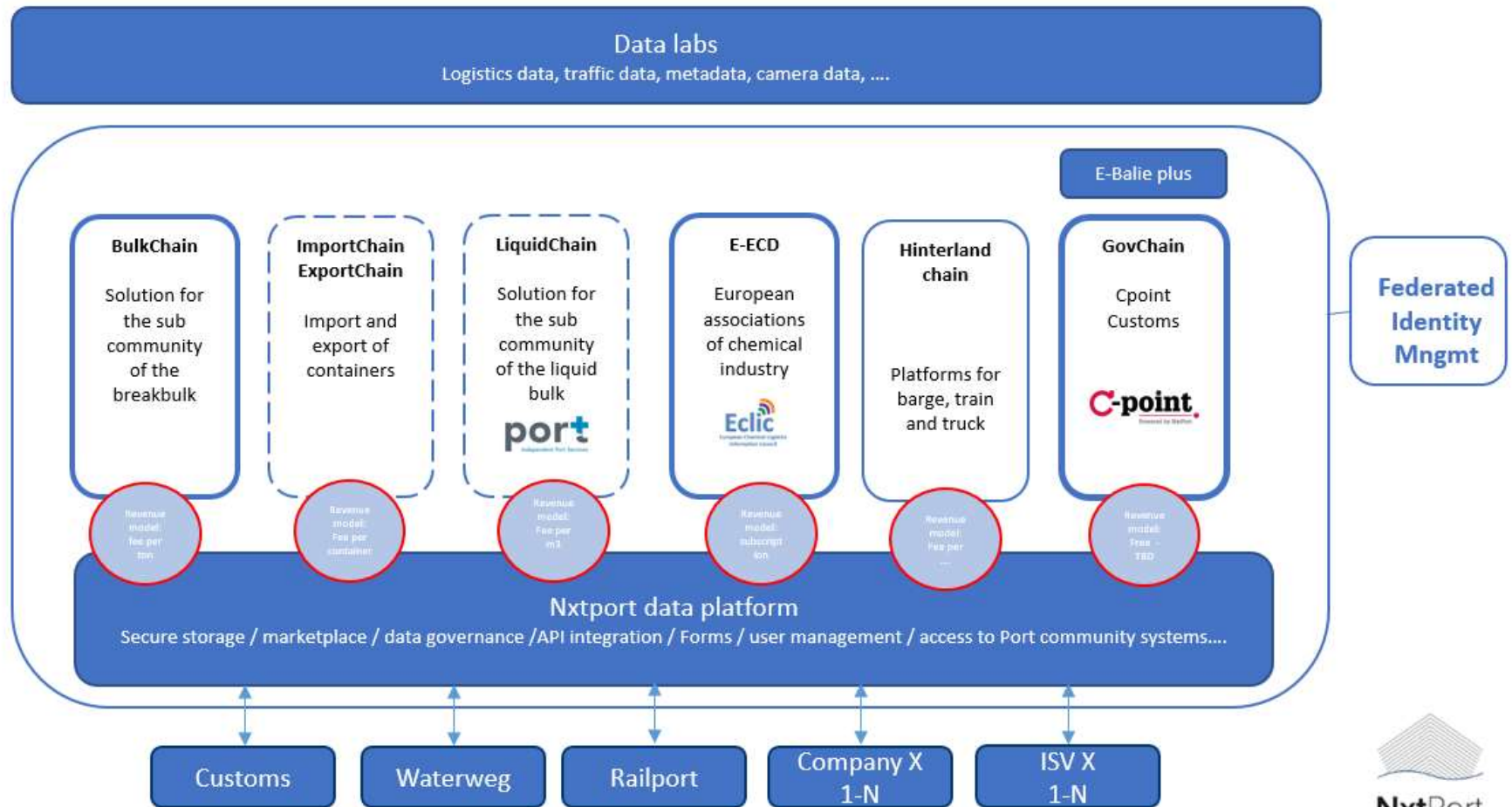
## Interactive datalabs



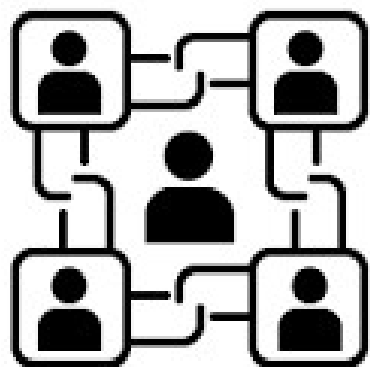
**'Waze'**  
Anonymized overview 4 dynamic behavior



# Our Port community system enabled by the data platform







# Blockchain

## The new kid on the block



A light gray world map serves as the background for the slide. Five red circles are overlaid on the map, each containing a white text label. The circles are positioned across the Americas, Europe, and Asia.

**Ownership  
transfer**

**Verifiable  
trust**

**Real time  
transparency**

**Tamper proof  
data storage**

**Resilience of  
the platform**

# Early adopters in the maritime supply chain



## Maritime Logistics + Blockchain Timeline

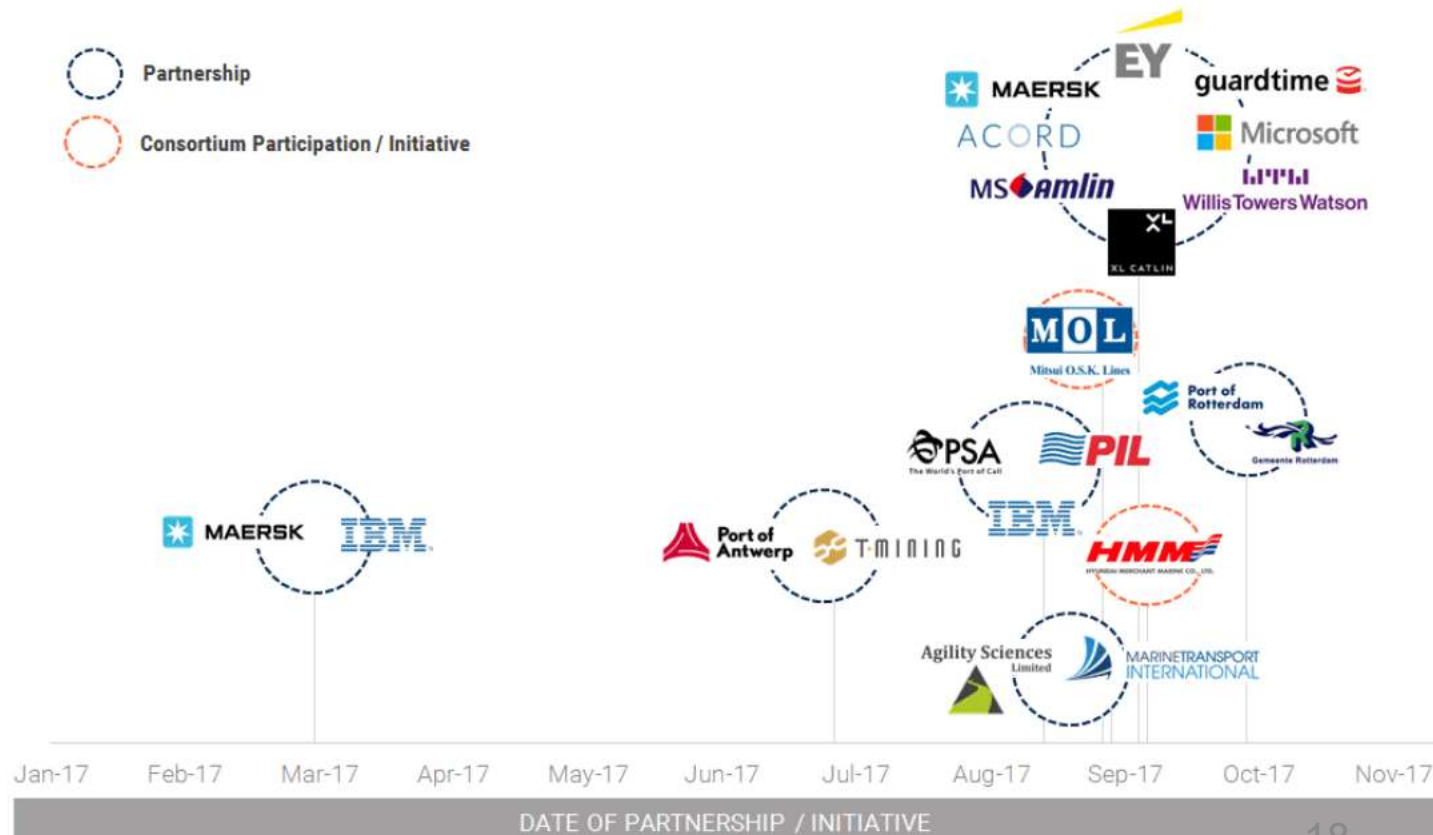
Select 2017 Blockchain Partnerships and Initiatives in the Maritime Logistics Space



Partnership



Consortium Participation / Initiative



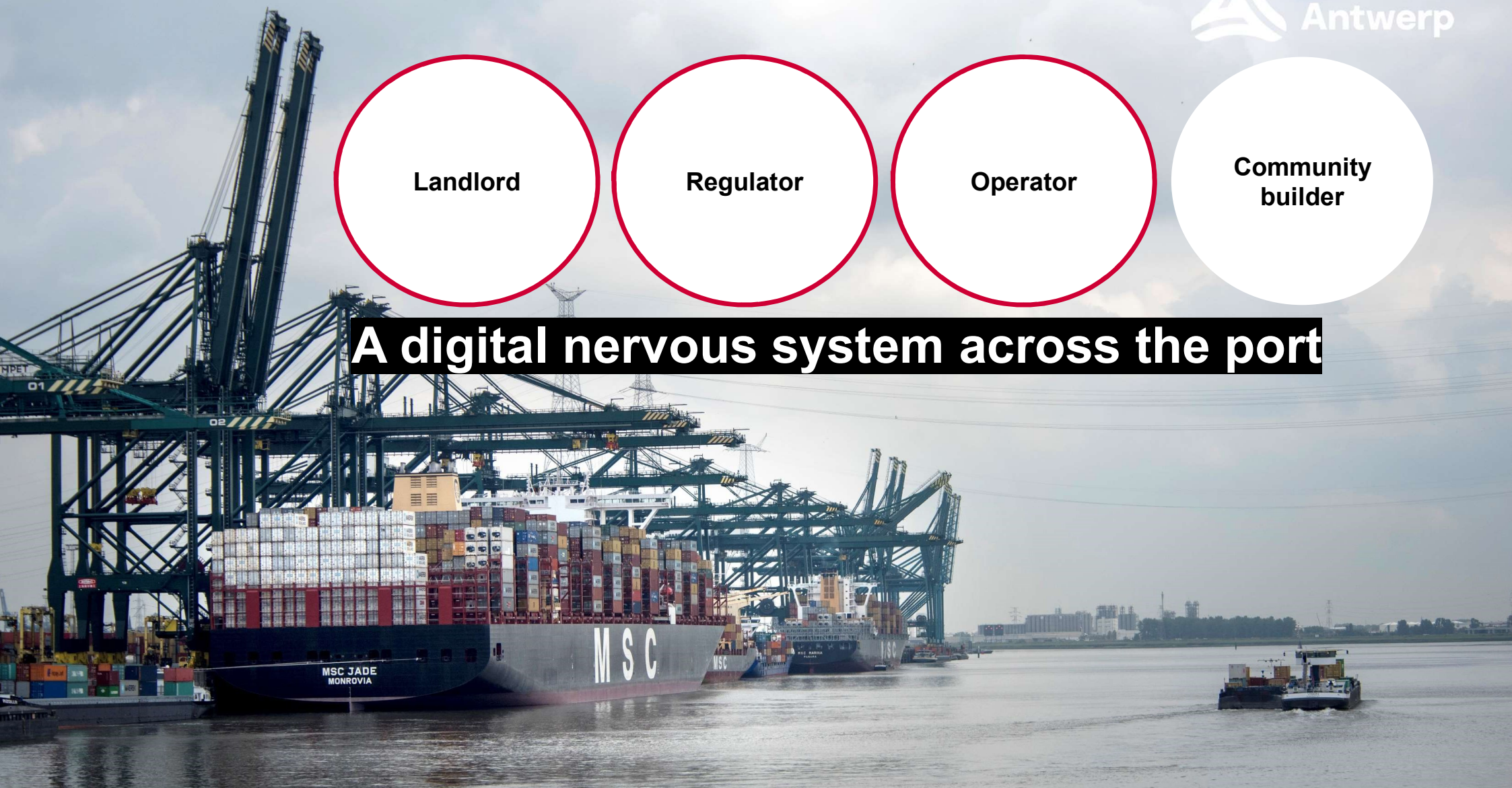
**Landlord**

**Regulator**

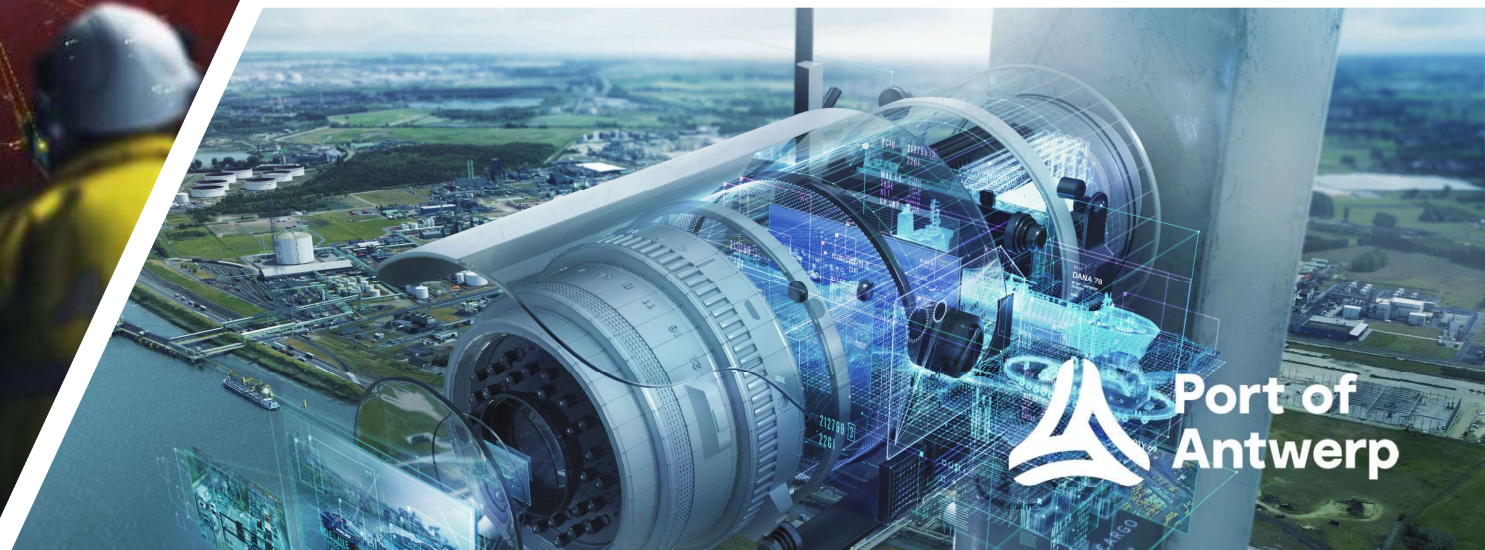
**Operator**

**Community  
builder**

**A digital nervous system across the port**









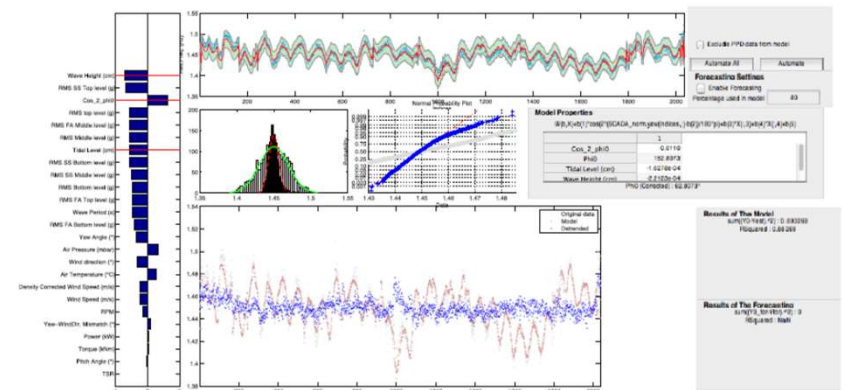
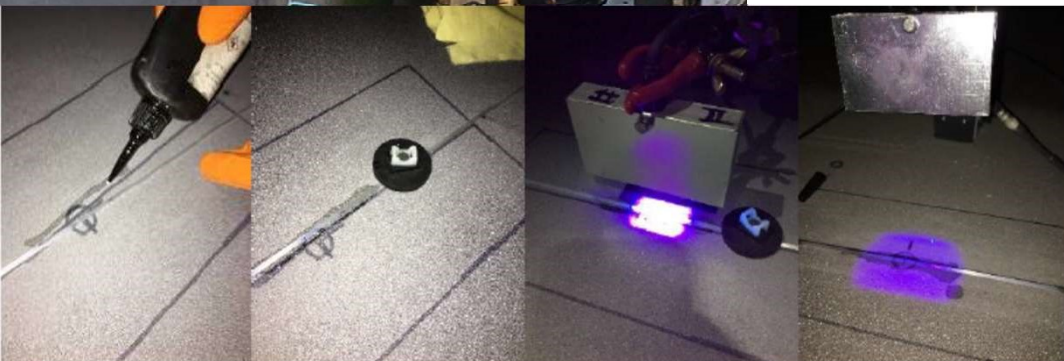
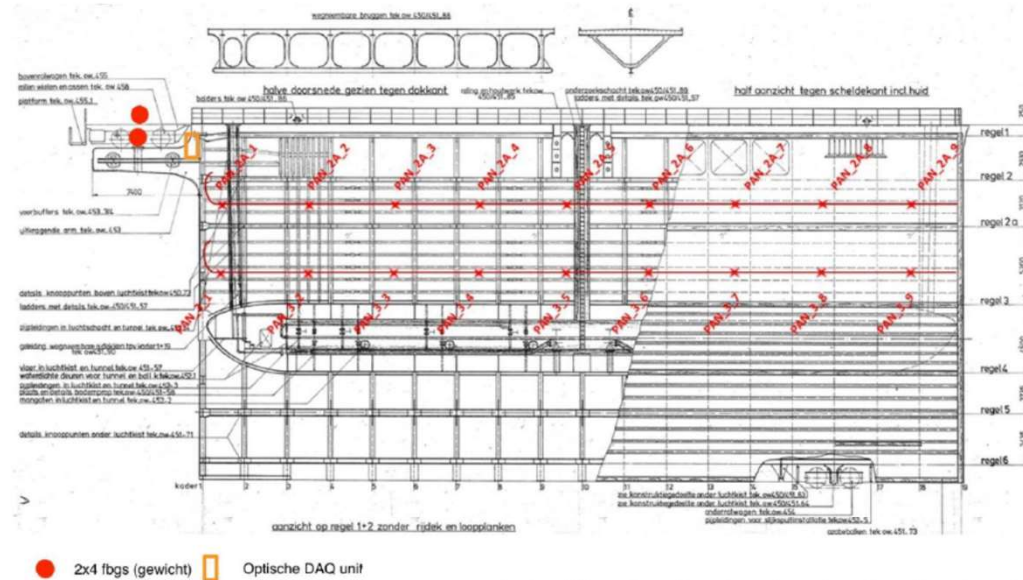
# INTERNET OF THINGS



**Intelligent lock doors for long term data analysis and predictive maintenance**



# IoT lockdoor Kallo



Figuur 11 Automatische correlatieanalyse en data normalisatie tools die alle operationele data in rekening brengt (deel van een eigen ontwikkelde toolbox)





**Smart buoys – harbour wide own Lora network**



**iNoses**  
**Sensor network for volatile organic compound detection**



 **Port of  
Antwerp**

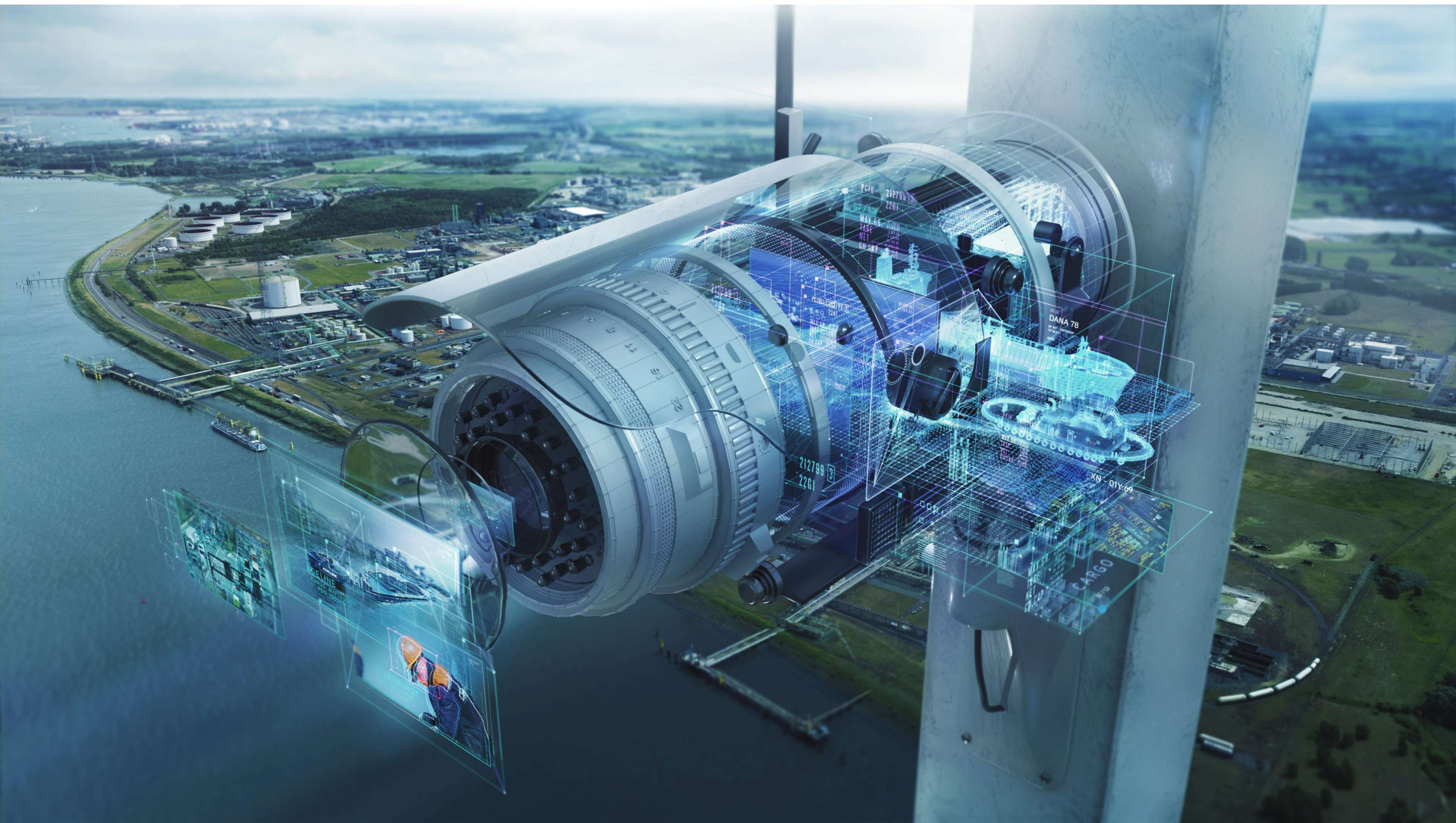




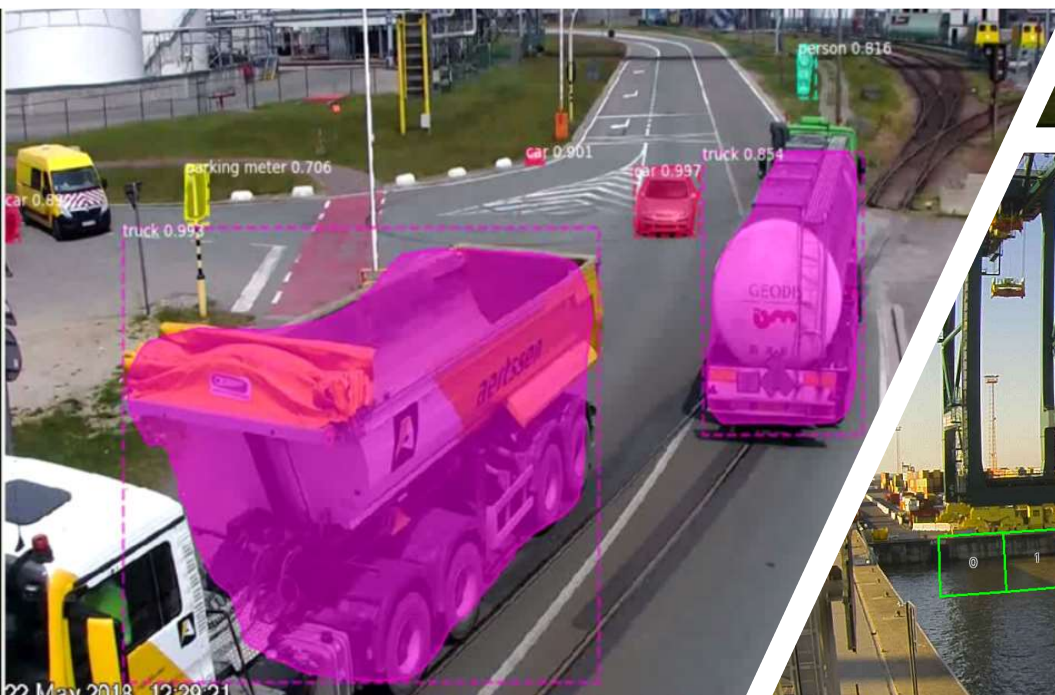
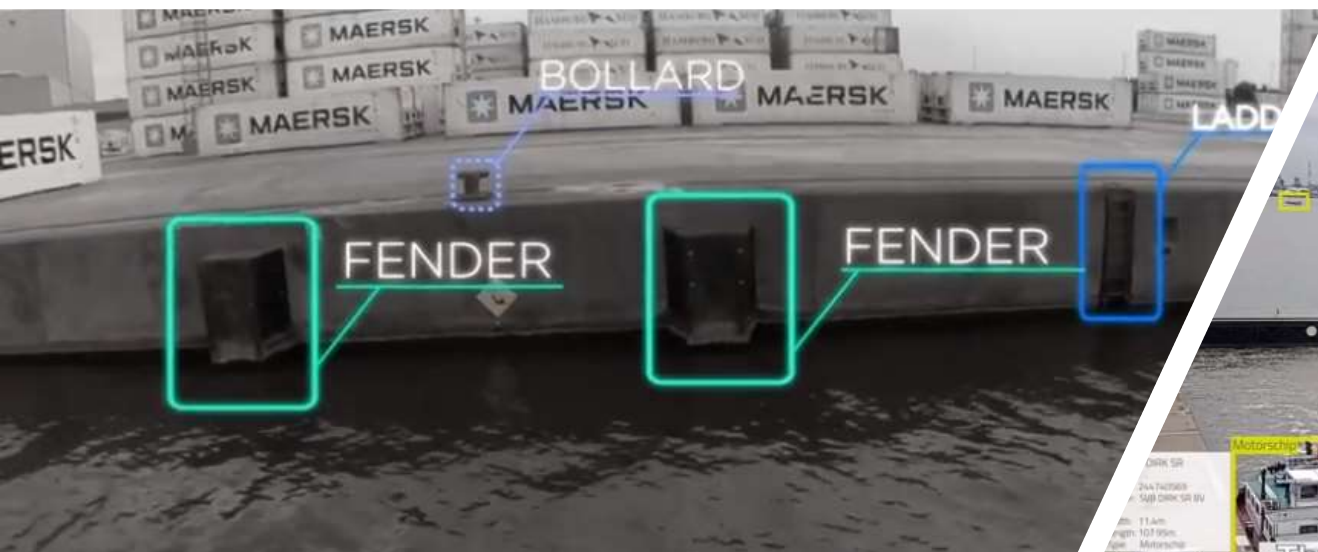
# iNose: Events



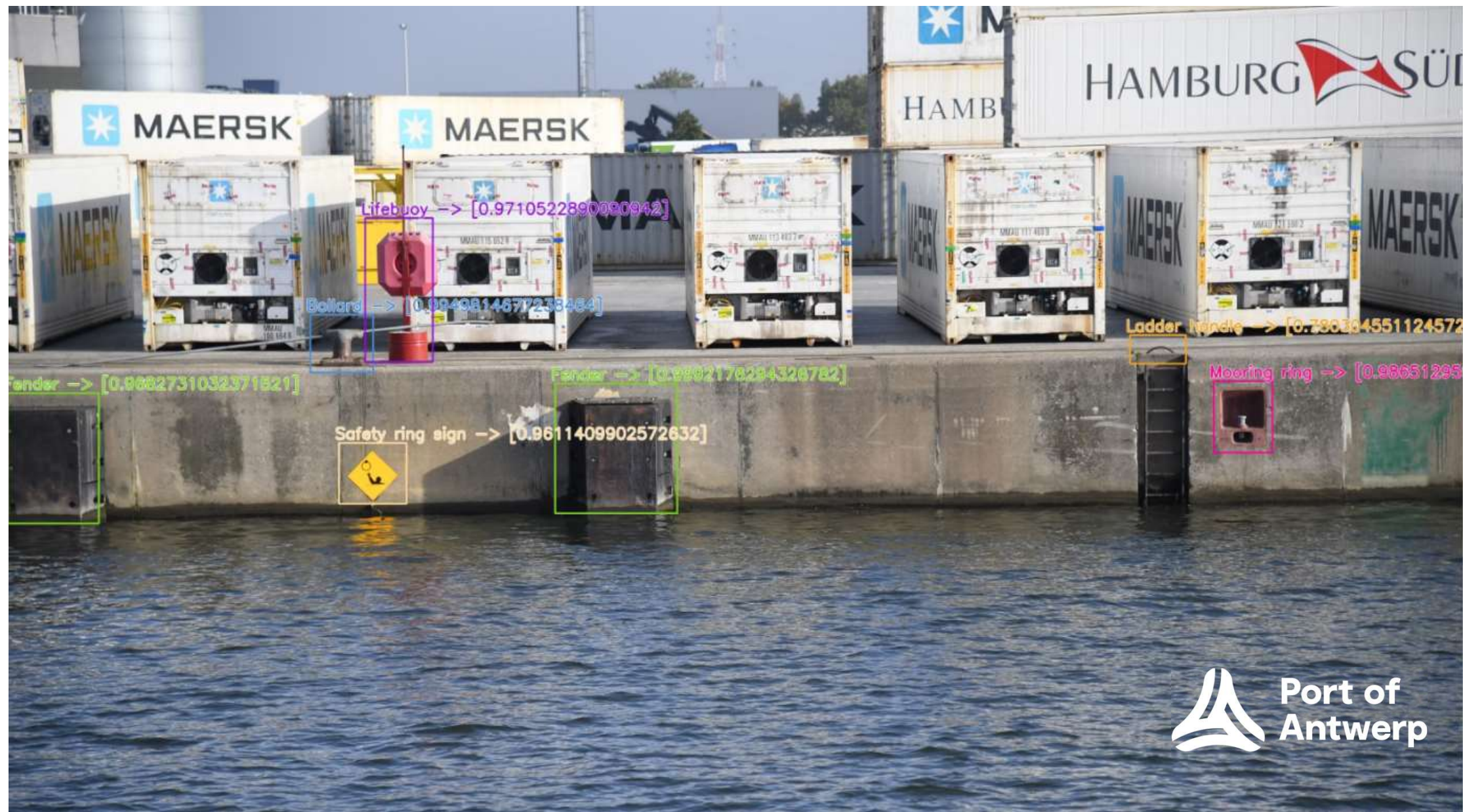
















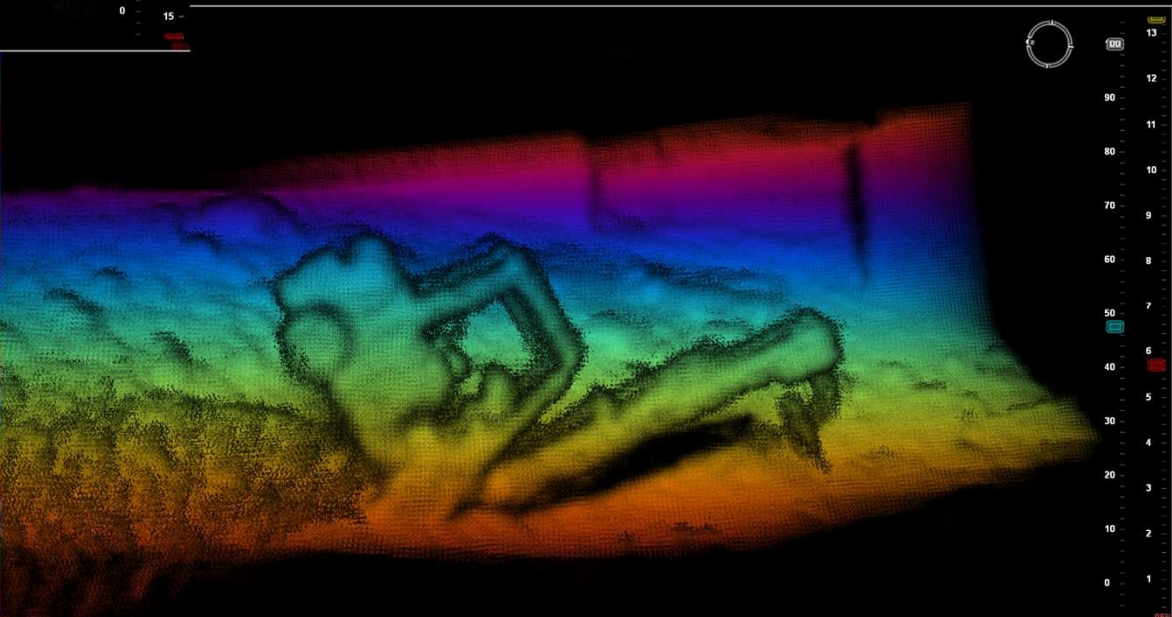
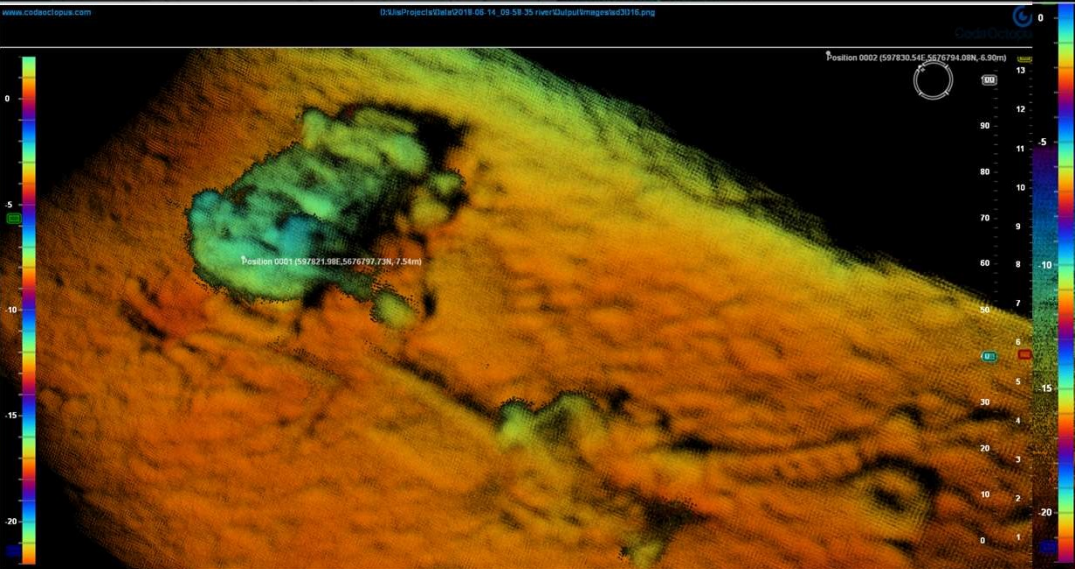
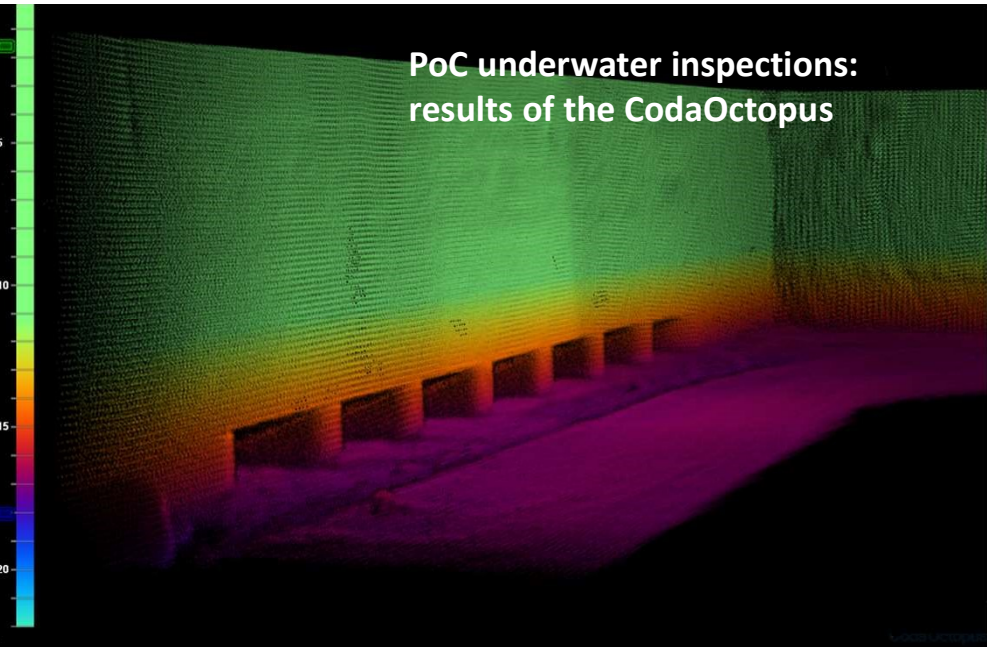
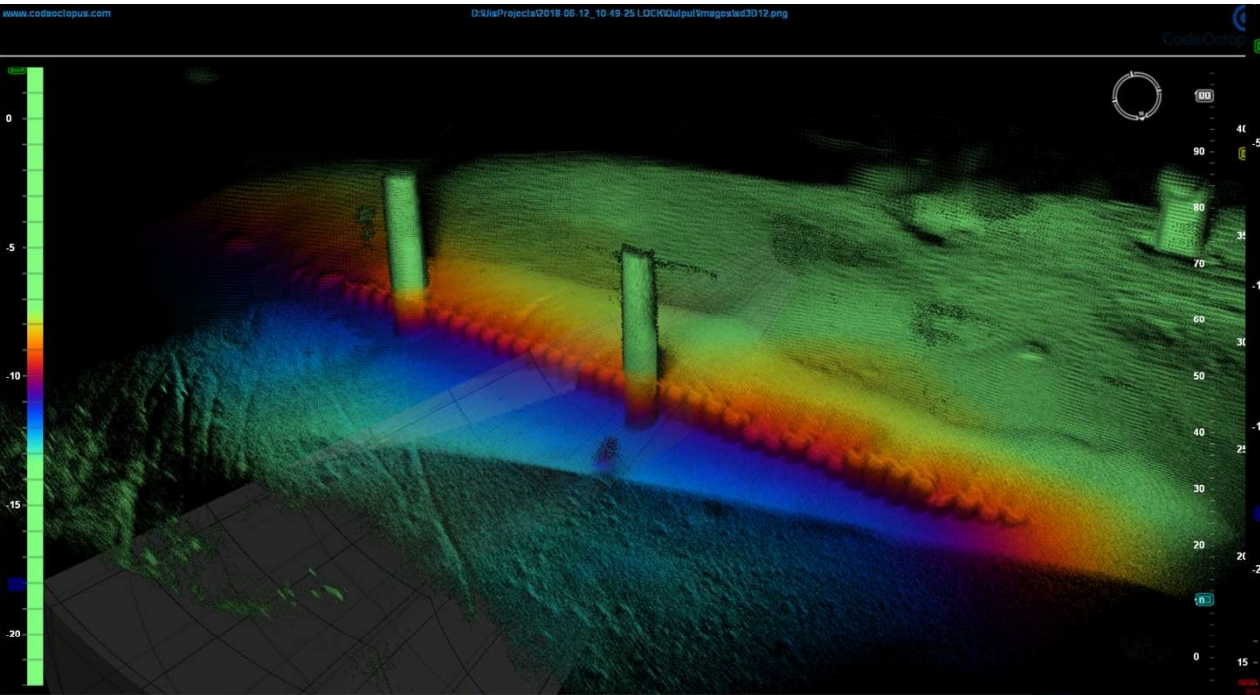
boat 0.6011053

boat 0.8346

boat 0.43410856

boat 0.32710898



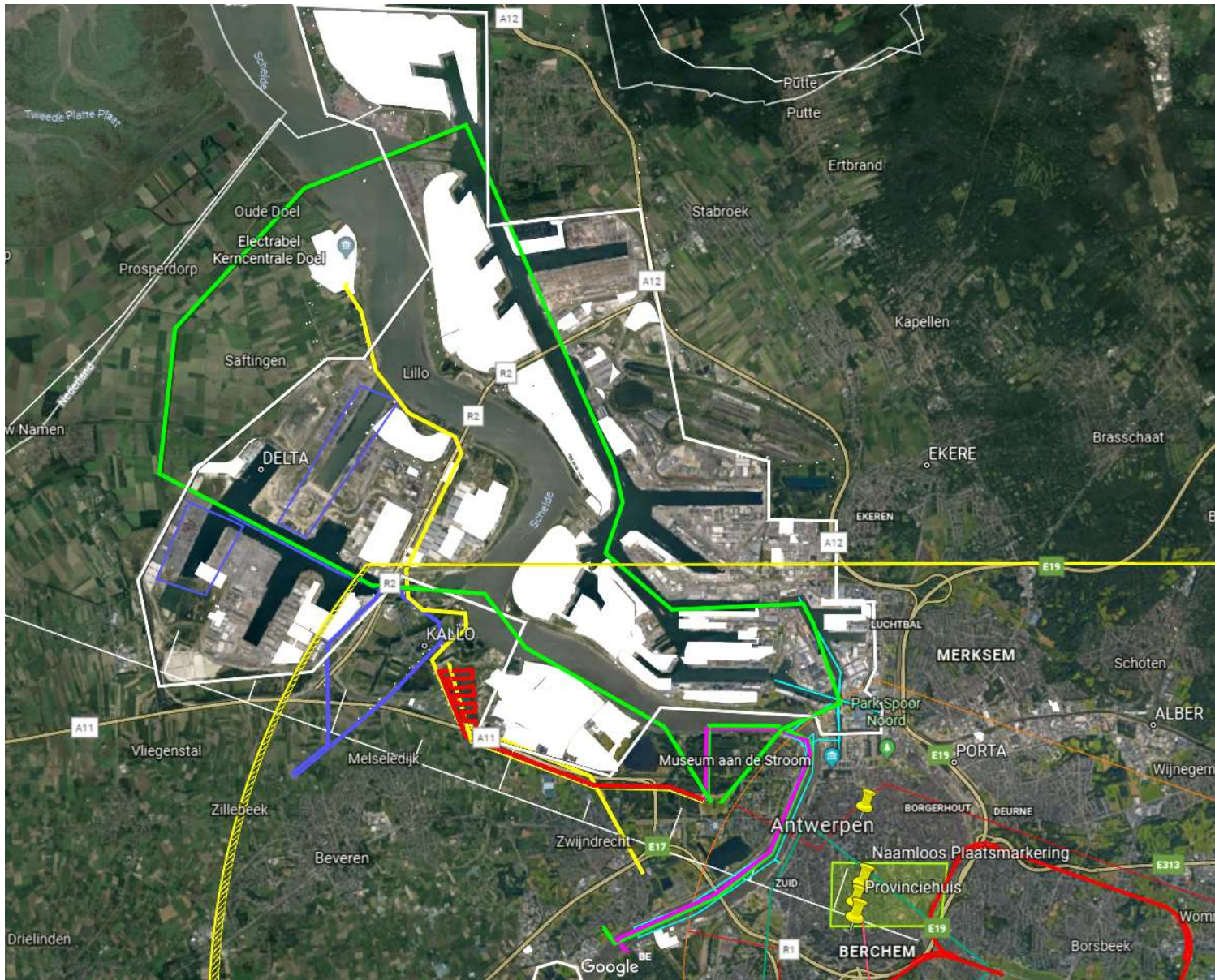






DRONES

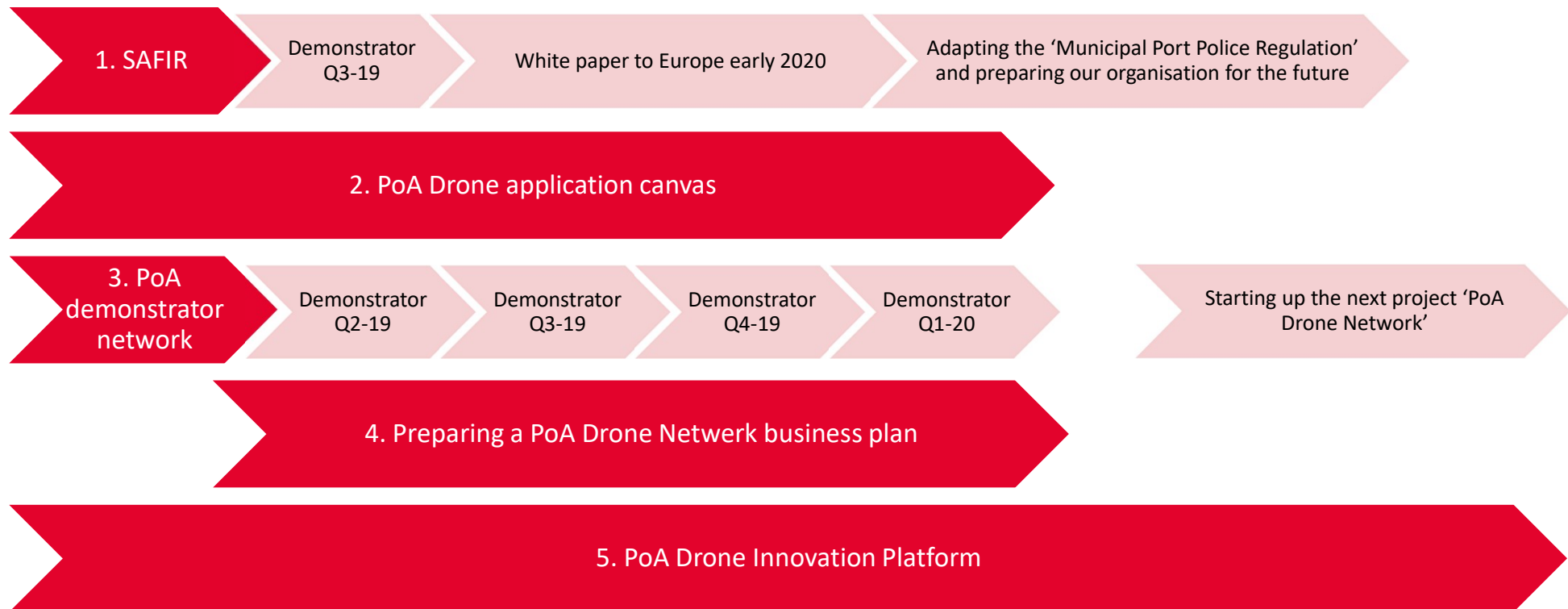




- **BVLOS Oil spill detection Antwerp Port Area**
- Parcel delivery from Wijnegem Shopping Mall
- **Simulated parcel delivery Antwerp Port Border**
- Medical parcel delivery
- **High tension line inspection/mapping**
- Overhead line incident intervention and pylon inspection
- **Port inspection of criminal offenses**
- **Inspection container terminal for Port Authorities**
- Monitoring cooperative and non-cooperative drones



# Milestones SAFIR

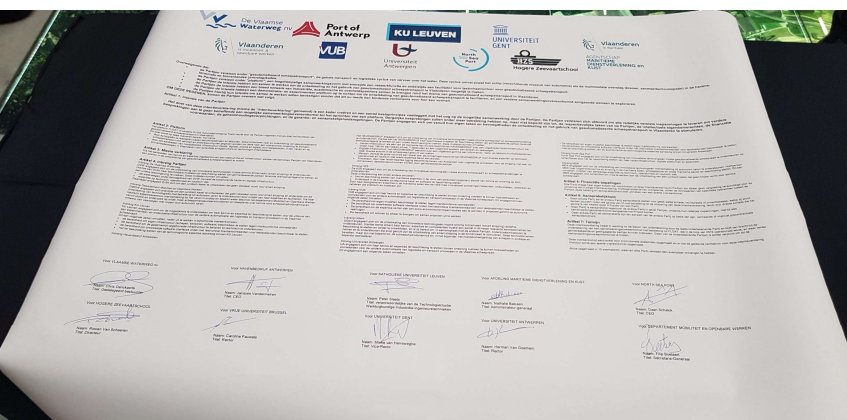






SMART  
SHIPS







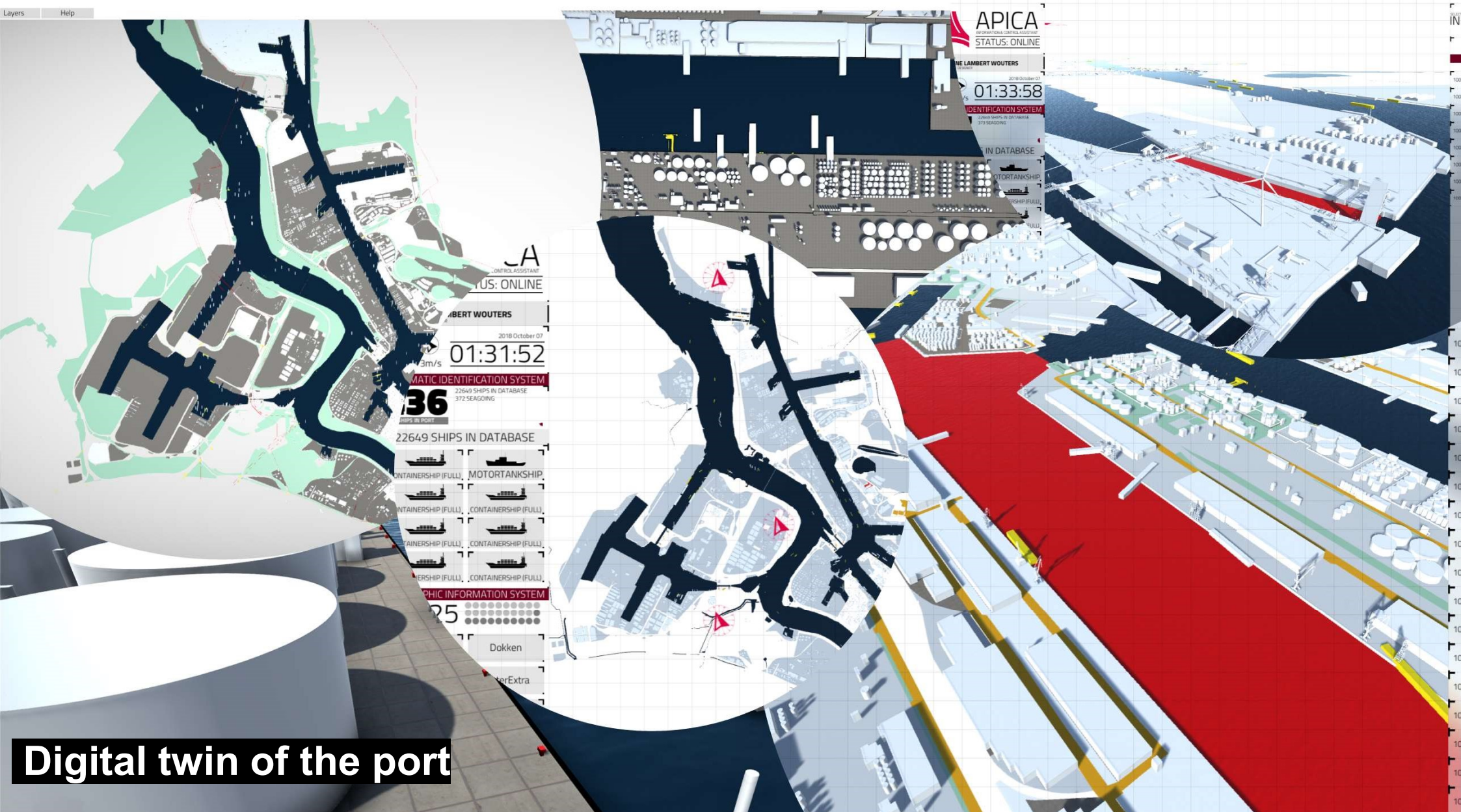




A P I C A

**APICA:**  
**Antwerp Port Information**  
**& Control Assistant**





## Digital twin of the port



USER

CONNECTED USER

 **Wim Wouters**  
XP designer

DAILY DATA

FRI 15 / 12 / 2018

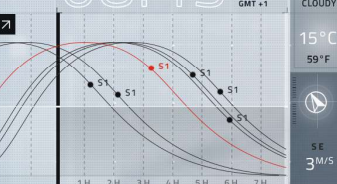
08:43

56" TIMEZONE GMT +1

CLOUDY

15°C 59°F

SE 3M/S



AUTO-ID SYSTEM

SHIPS

93 SEAGOING

NOW 508 SHIPS IN PORT

38% CAPACITY

159 MOTORSHIP

57 MOTORSHIP

38 CONTAINERSHIP

22.649 SHIPS IN DATABASE

GEO-INFO SYSTEM

GEOGRAPHY

15/25

WATER DOKKEN

SLUIZEN M DUKDALF

STEIGERS DIEPTE

CAMERA NETWORK

ACTIVE

CURRENTLY SELECTED

# BOUDEWIJN SLUIS

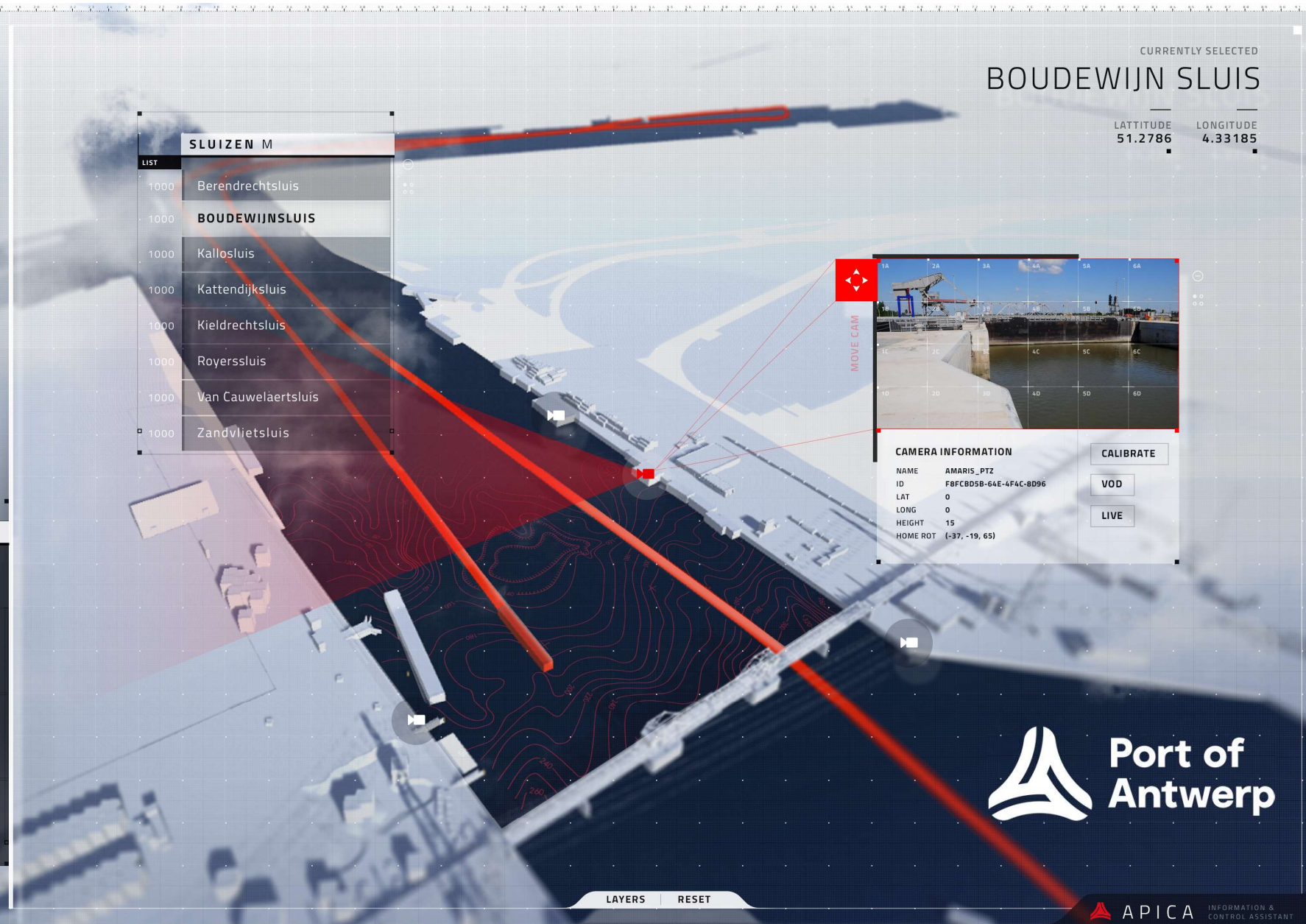
LATITUDE 51.2786 LONGITUDE 4.33185

SLUIZEN M

LIST

- 1000 Berendrechtsluis
- 1000 **BOUDEWIJNSLUIS**
- 1000 Kallosluis
- 1000 Kattendijksluis
- 1000 Kieldrechtsluis
- 1000 Royerssluis
- 1000 Van Cauwelaertsluis
- 1000 Zandvlietluis

MOVE CAM



CAMERA INFORMATION

CALIBRATE

VOD

LIVE

NAME AMARIS\_PTZ

ID F8FCBD5B-64E-4F4C-8D96

LAT 0

LONG 0

HEIGHT 15

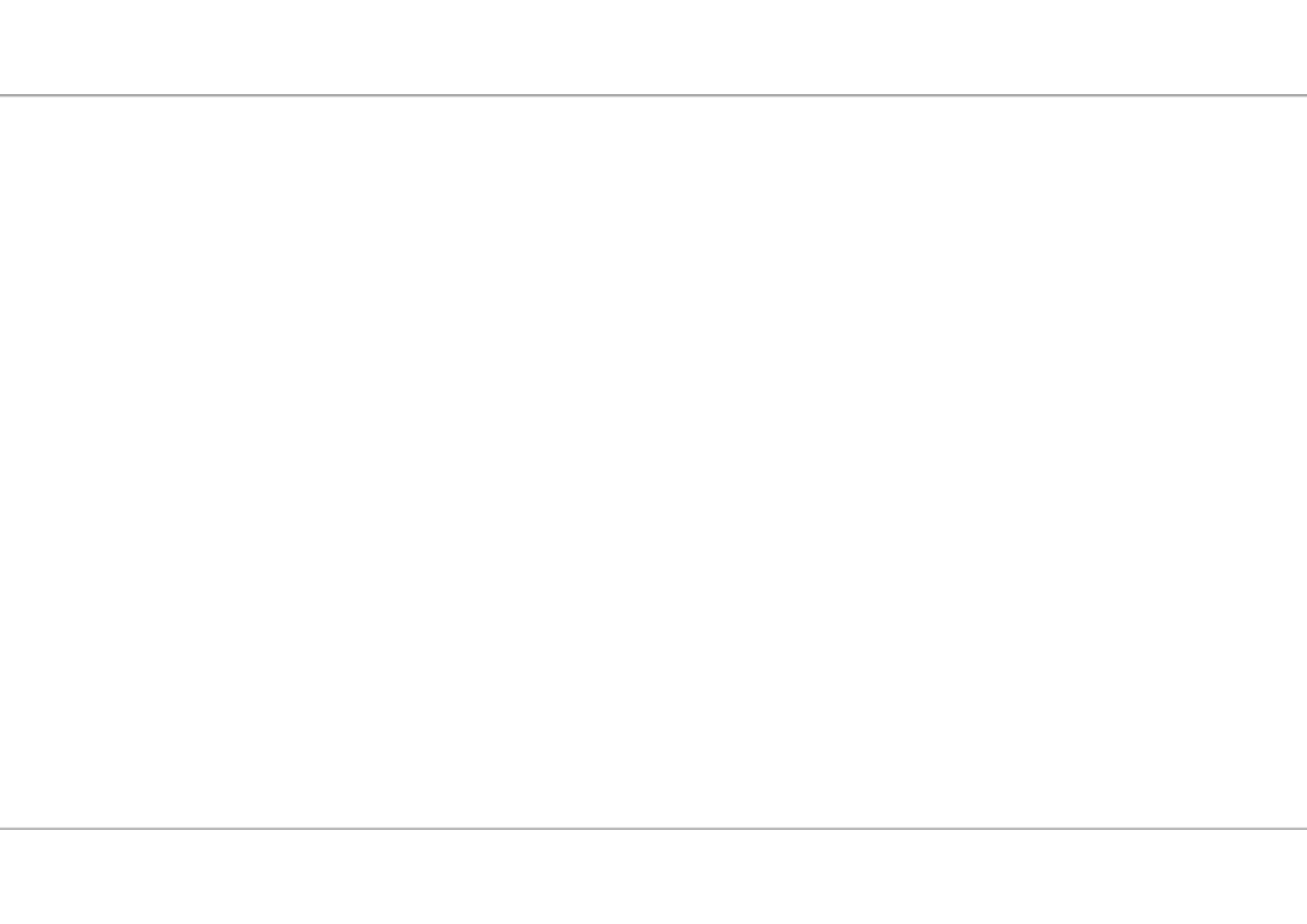
HOME ROT (-37, -19, 65)

Port of Antwerp

APICA INFORMATION & CONTROL ASSISTANT

LAYERS RESET







Port of  
Antwerp

# Innovation platform

Drones – air quality – autonomous shipping

Provide test  
zones of  
different  
complexity

Leverage  
assets as an  
enabler

Facilitate as  
regulator  
with a  
'what if'  
mentality



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WCO IT/TI Conference  
Baku, Azerbaijan – June 12th 2019



**Port of  
Antwerp**

