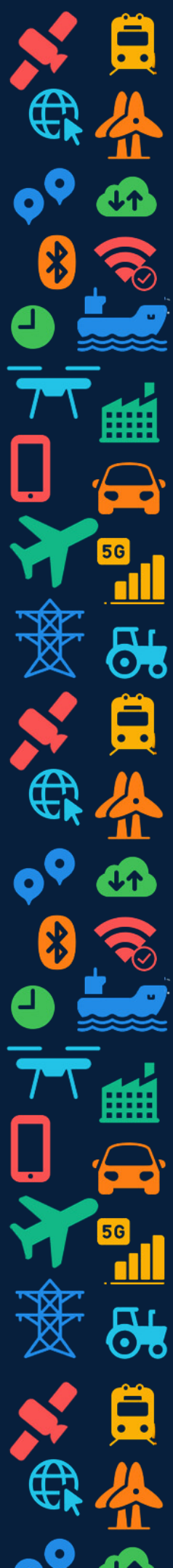




SESSION 2: PNT AND MOBILITY



Cosimo Cervicato
Senior Executive R&D
Grimaldi Group



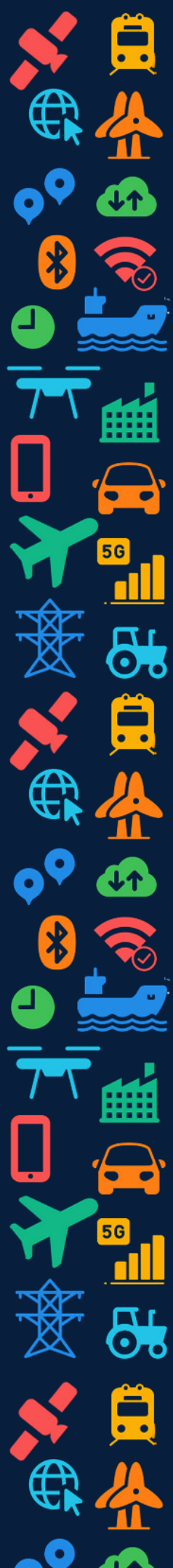
Rasmus Rettig,
Lead Urban Mobility Lab
Hamburg University of
Applied Sciences



Rodrigo Castiñeira
Head of Innovation for
Mobility & Technology
Indra



Jeroen Brouwer
Director of Customer Sales &
Analytics
Tom Tom



Cosimo Cervicato
Senior Executive R&D
Grimaldi Group



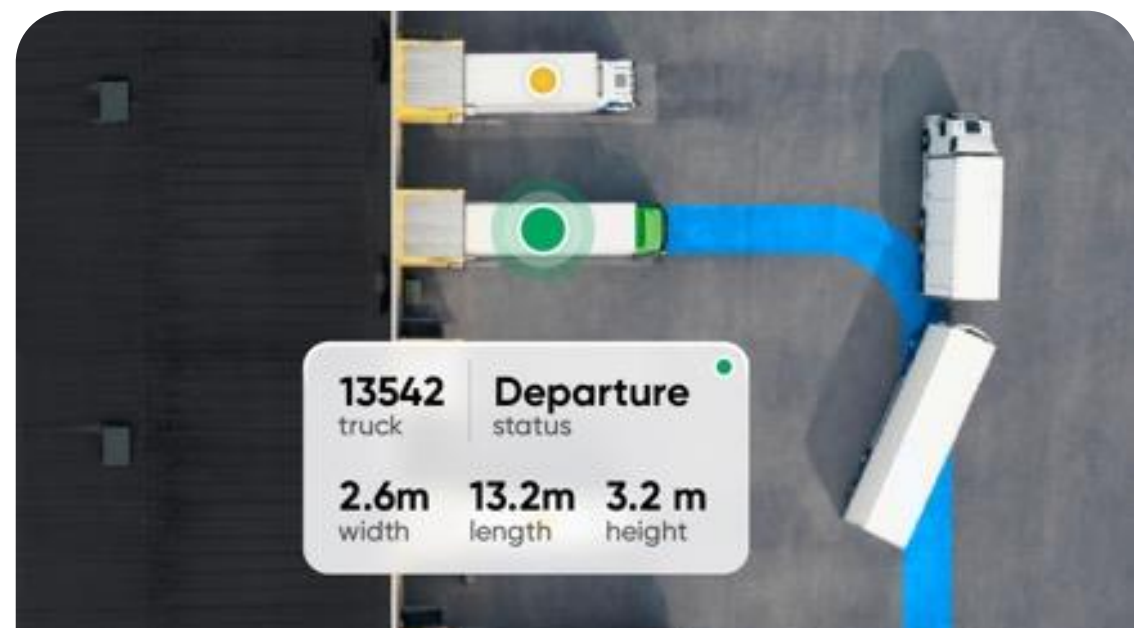
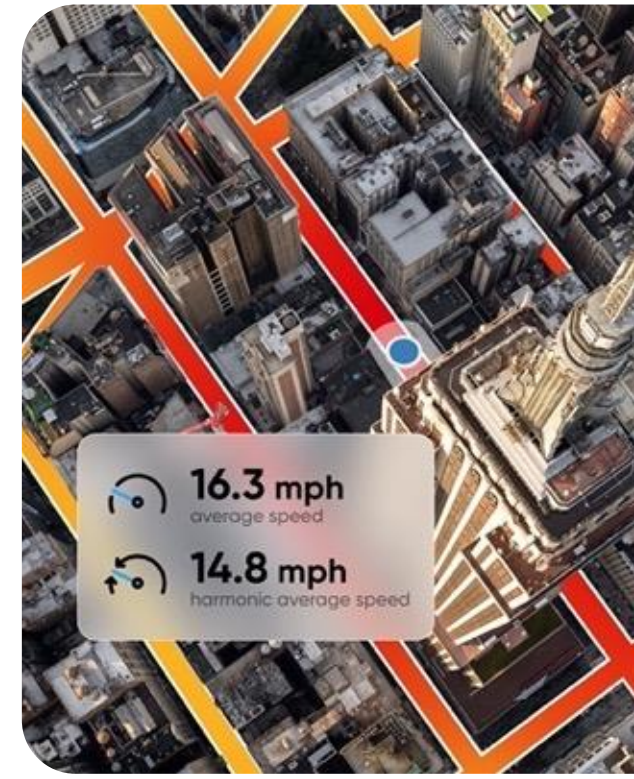
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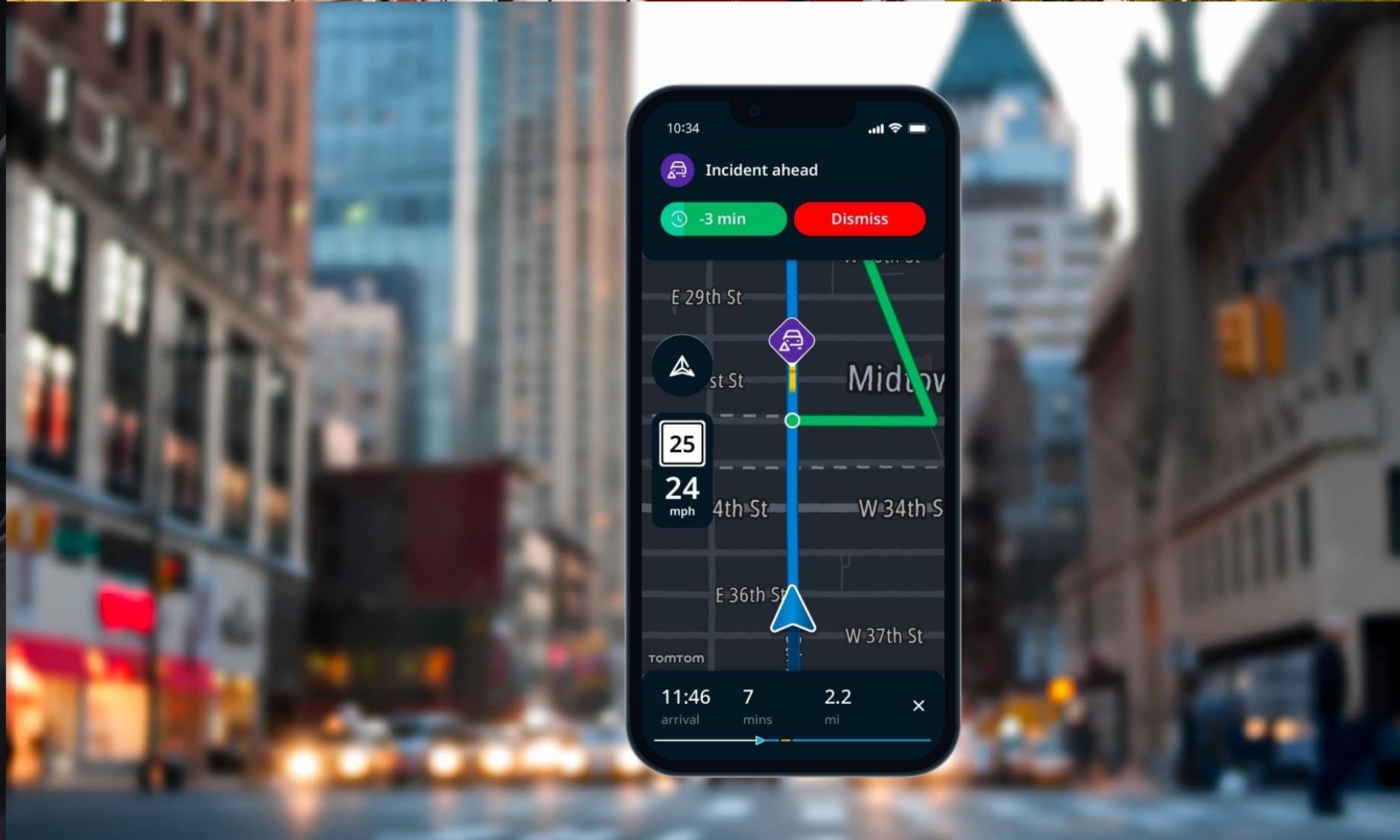


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Head of Innovation for
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Indra



Jeroen Brouwer
Director of Customer Sales &
Analytics
Tom Tom





**We don't make solutions
for our partners, we make them
with our partners**



Uber



Qualcomm



Bolt

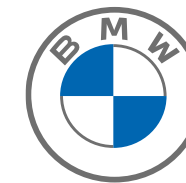
HYUNDAI
MOTOR GROUP



C A R I A D



precisely



alteryx



DAIMLER



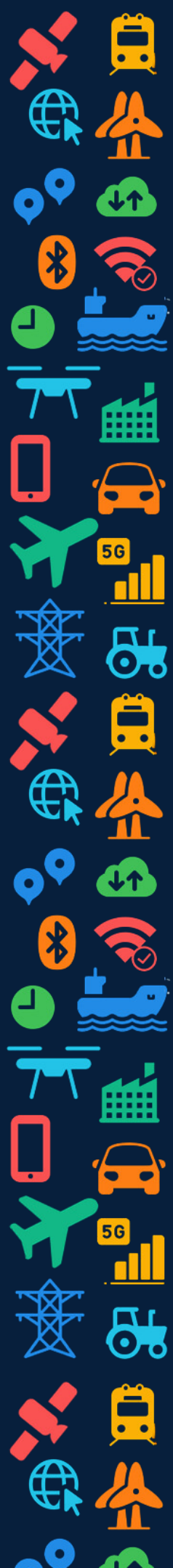
DENSO



Mercedes-Benz



Delphi
Technologies



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NAVISP INDUSTRY DAYS

Cosimo Cervicato
Senior Executive Engineer
Energy Saving, R&D and Ship Design
Grimaldi Group

07-08/11/2023



GRIMALDI GROUP: THE FLEET



The Group controls, or holds, significant shareholdings in **21** port terminals - in the Mediterranean, Northern Europe, the Baltic Sea and West Africa - and in various logistics companies in various countries.



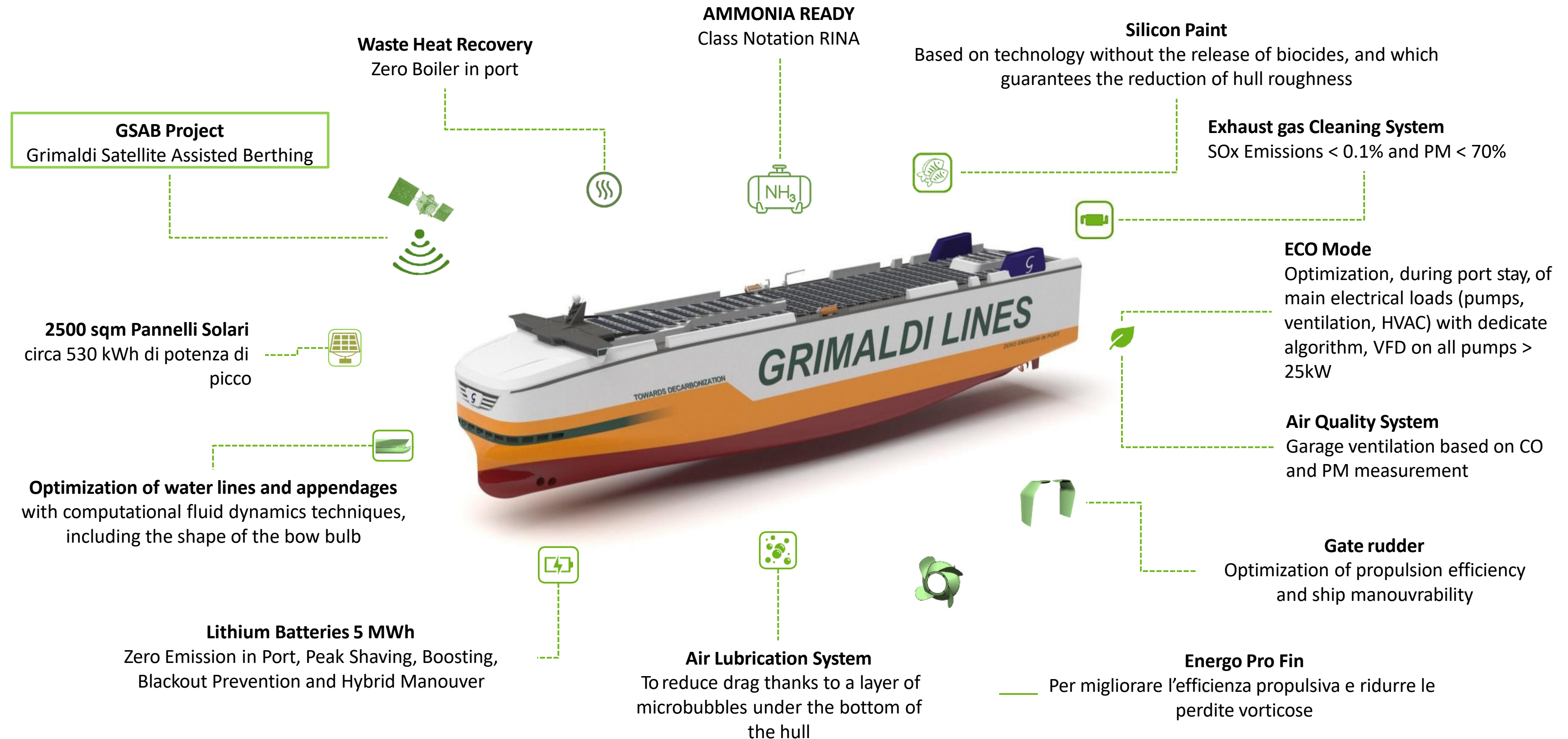
The agency network includes over **90** commercial agencies (of which **32** are directly controlled) in Europe, Africa, North and South America.



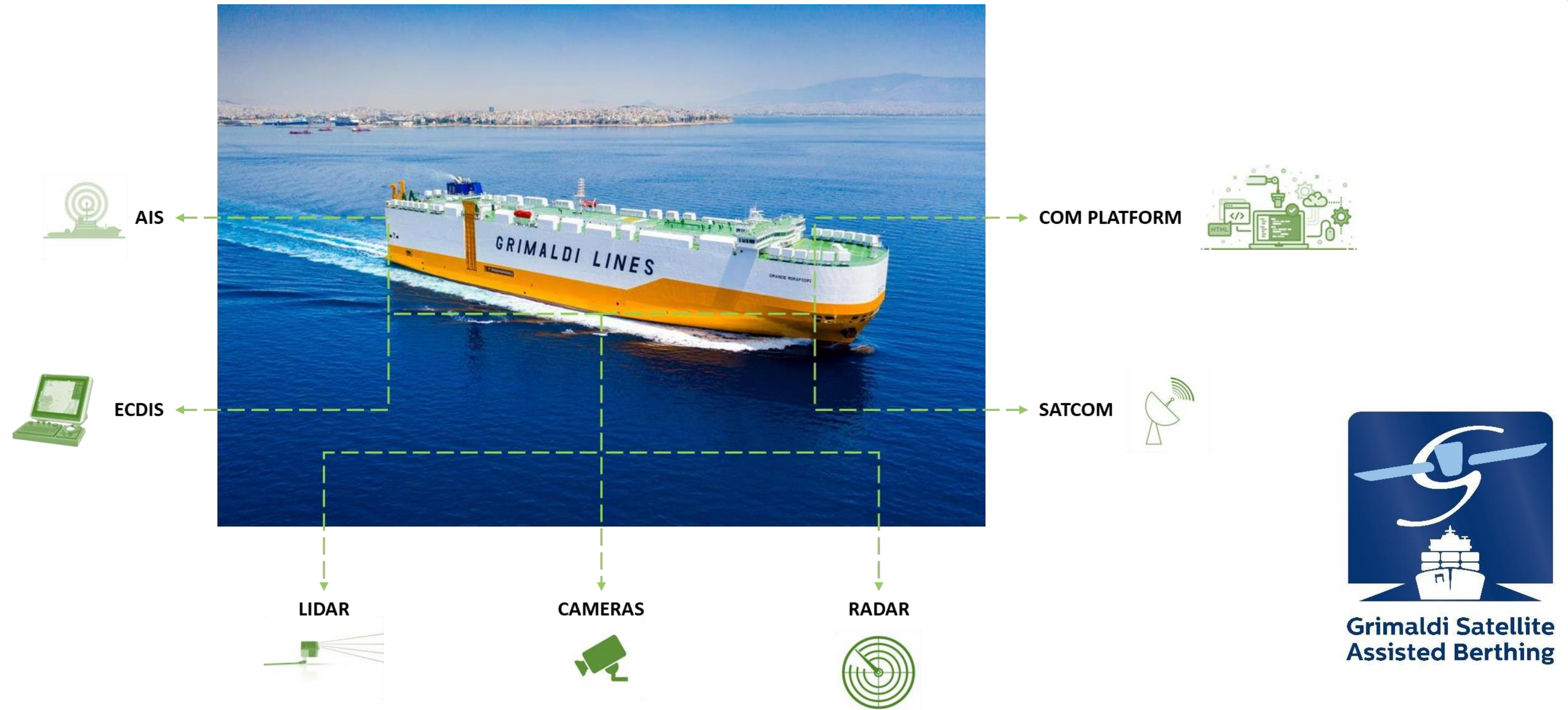
132 owned ships, **27** new buildings
Technologically advanced ships, used on regular scheduled services in a network that connects over **140** ports in **50** countries and **4** continents



INNOVATIVE TECHNOLOGY SOLUTIONS

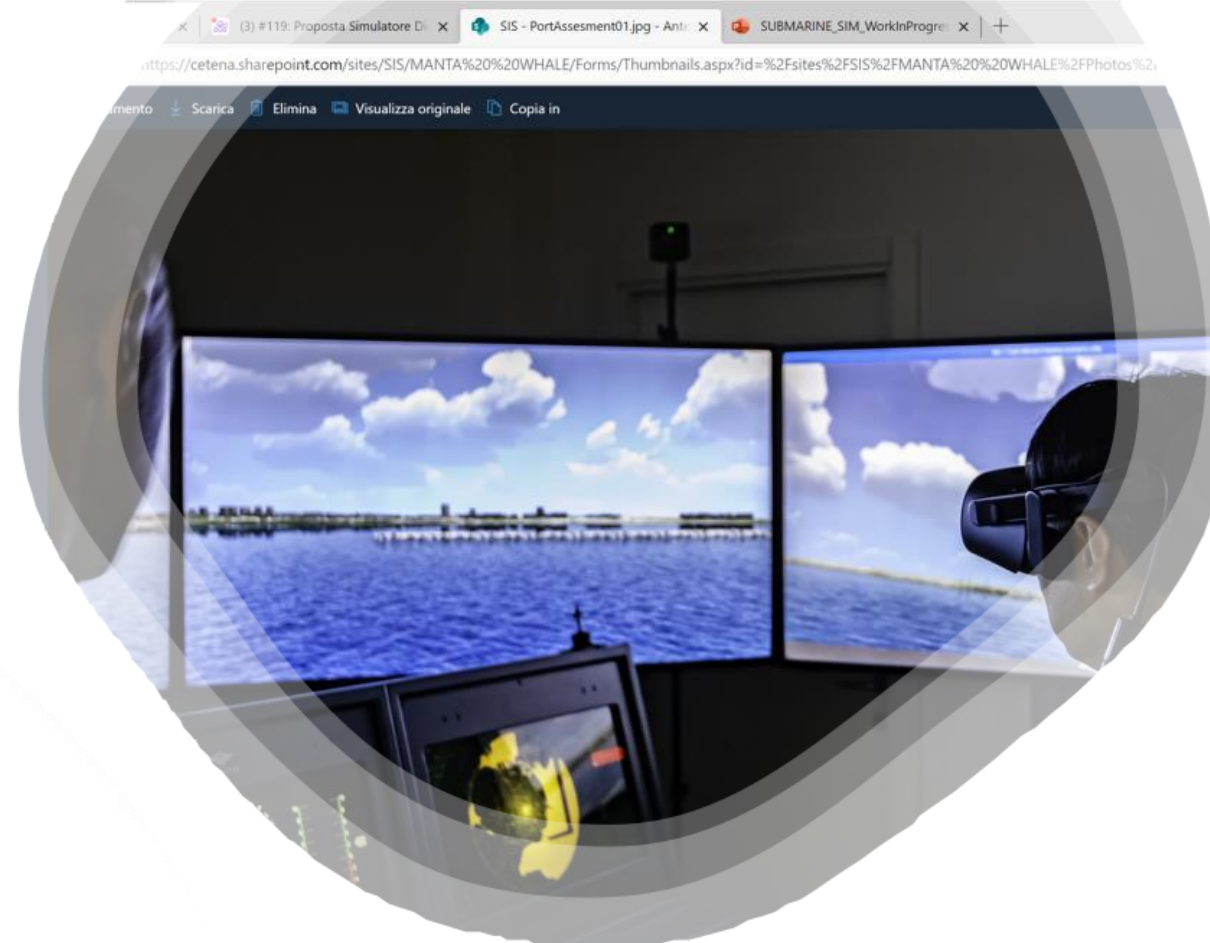


GSAB INNOVATIVE TECHNOLOGY SOLUTIONS

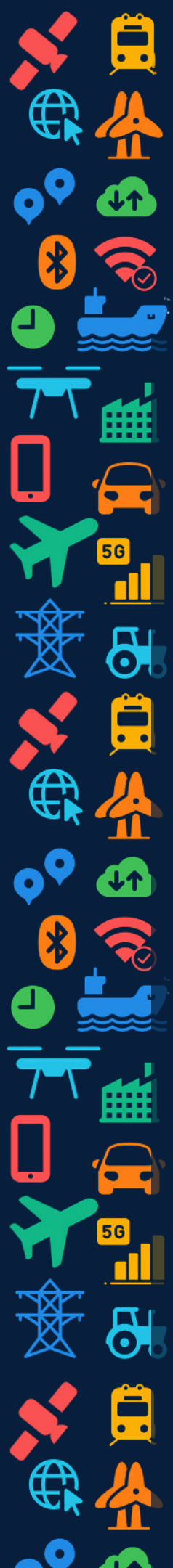


GSAB – Grimaldi Satellite Autonomous Berthing.

Development and demonstration of a navigation support system in port water for the assisted berthing of a large car-carrier ship (200m) that allows to perform automatically high precision operations using advanced technologies for autonomous ships.



Thank You



Cosimo Cervicato
Senior Executive R&D
Grimaldi Group



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Indra

World-leader in providing proprietary solutions for Transport & Defense



Indra Business Units



Rail



Urban &
Interurban



Traffic &
Infrastructures



Airports



Ports

Key partner for Space Solutions

+30 years participating in ESA programmes designing complete satellite communications networks and developing land terminals, surface naval terminals and SATCOM terminals.

STARTICAL, the company owned by Indra and ENAIRE that will manage and exploit a LEO satellite constellation

startical



Key Industry partner in Railway

+30,000 km of railways control and managed by Indra solutions
+4,000 railway stations with
- Founder of Europe's Rail Joint Undertaking





Railway Context

The location of rolling stock (Trains) is a key element for both safety and railway operation. Protection and signaling systems that monitor train position are mainly based on ground-based solutions

ERTMS

- European Railway Traffic Management System (ERTMS) is the European standard for the automatic train protection and command and control.
- ERTMS is mainly used in railway high speed lanes or high density lanes.
- Expensive Infrastructure: 60.000€/Km (Source: European Union Agency for Railways)
- European Target in 2030: 50.000Km of Core Network Corridors equipped with ERTMS in Europe

National class-B systems

- These systems are mainly used in railway low density lanes: short distance trains, cargo trains
- Inefficient Infrastructure: Railway segments are blocked till train is detected
- European Target in 2050: Increase the railway freight transport in 50% in Europe

Green Deal Objectives

Railway related

- By 2030: rail traffic will double in Europe, scheduled collective travel for journeys under 500km should be carbon neutral and automated mobility will be deployed at large scale
- By 2050: rail freight traffic will double and passenger rail traffic will triple

Addressing new trends and current needs



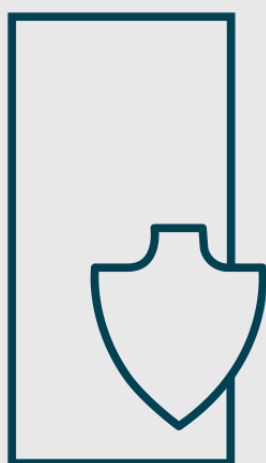
Costs

Reduce the cost of deploying and maintaining signaling systems



Capacity

Enable an increase in transport capacity for passengers and freight



Safety

Improve railway safety on low density lanes with minimum equipment in train protection systems



Global

Promotion of signaling solution at national, European and International level



Position

Allow accurate position of trains to be provided continuously to control center systems



Automation

Increase the degree of automation and security in its exploitation



Competitiveness

By increasing capacity, new operators for freight and passengers have Access to railway infrastructure

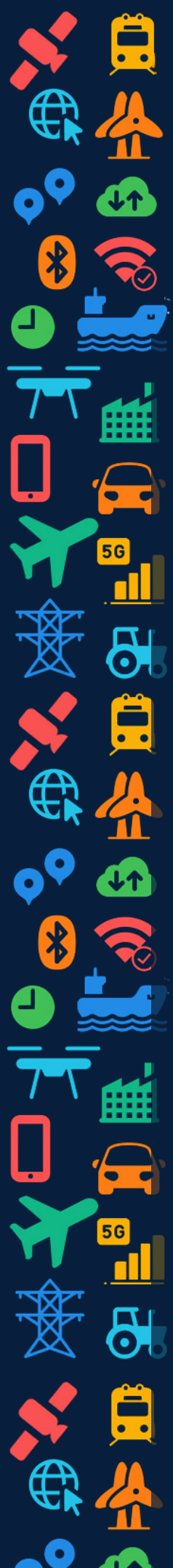
Opportunity for PNT

ERTMS is working on a release that will bring satellite as a component for railway signaling to unlock new opportunities in the sector



Satellite-based Railways Pilots

Within the R2DATO project (FA2), Indra will develop ASTP and perform tests combining different railway position systems with a satellite EGNOS receptor in order to demonstrate the value of Satellite systems in the railway domain.



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INTRODUCTION URBAN MOBILITY LAB @ HAMBURG UNIVERSITY OF APPLIED SCIENCES

RASMUS RETTIG, 7.11.23

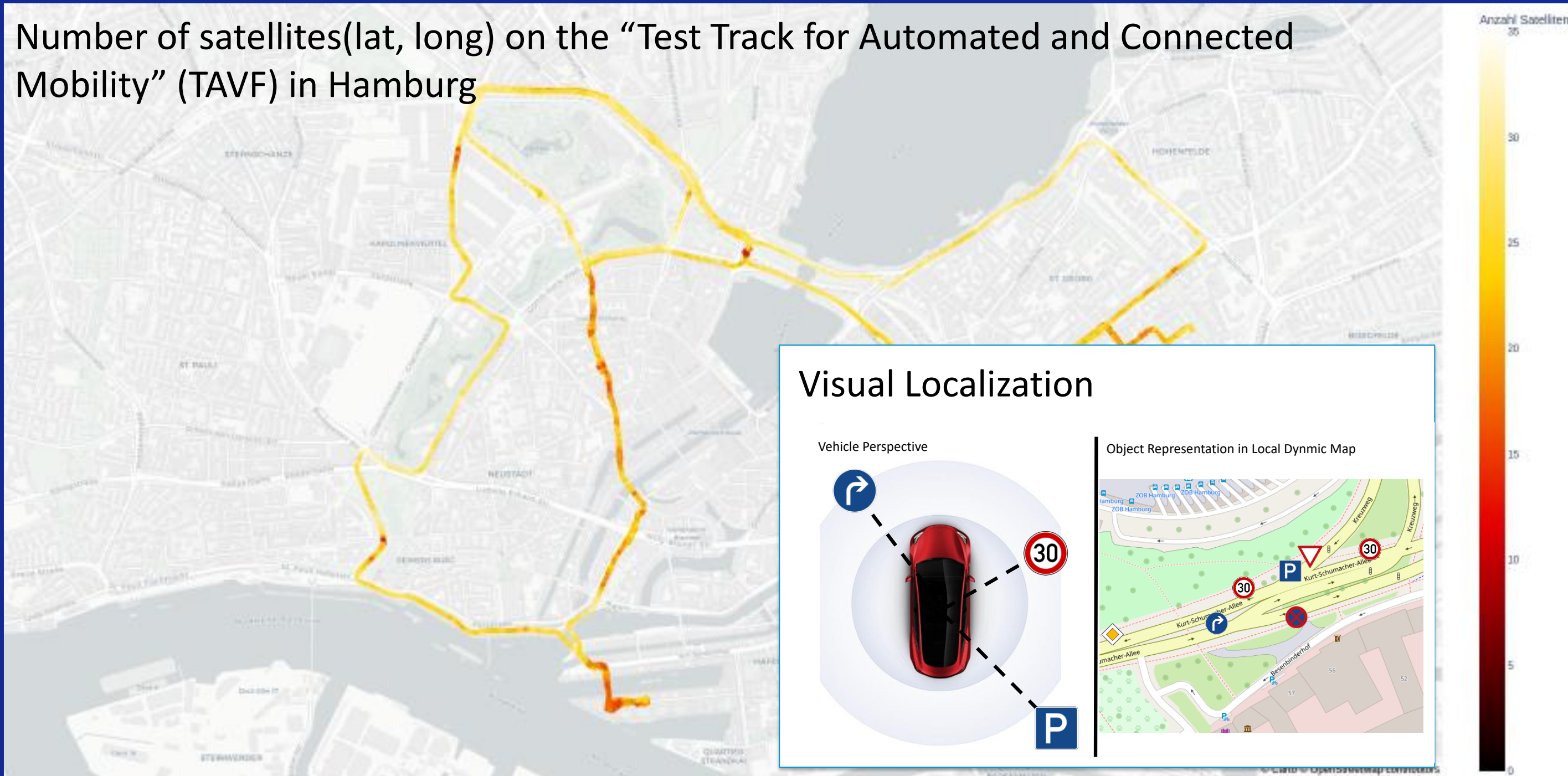


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VISUAL LOCALIZATION IN COMPLEX URBAN ENVIRONMENTS

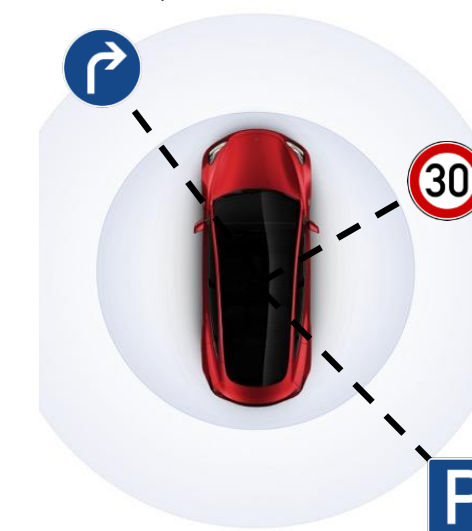
RASMUS RETTIG, 7.11.23

Number of satellites(lat, long) on the “Test Track for Automated and Connected Mobility” (TAVF) in Hamburg



Visual Localization

Vehicle Perspective



Object Representation in Local Dynamic Map

