

31.08.2023

# Port Call Digitalization and Shore Power Solutions

## Results of the Living Lab Application Scenario 2B

### Interconnectivity Demonstration Event, Brussels



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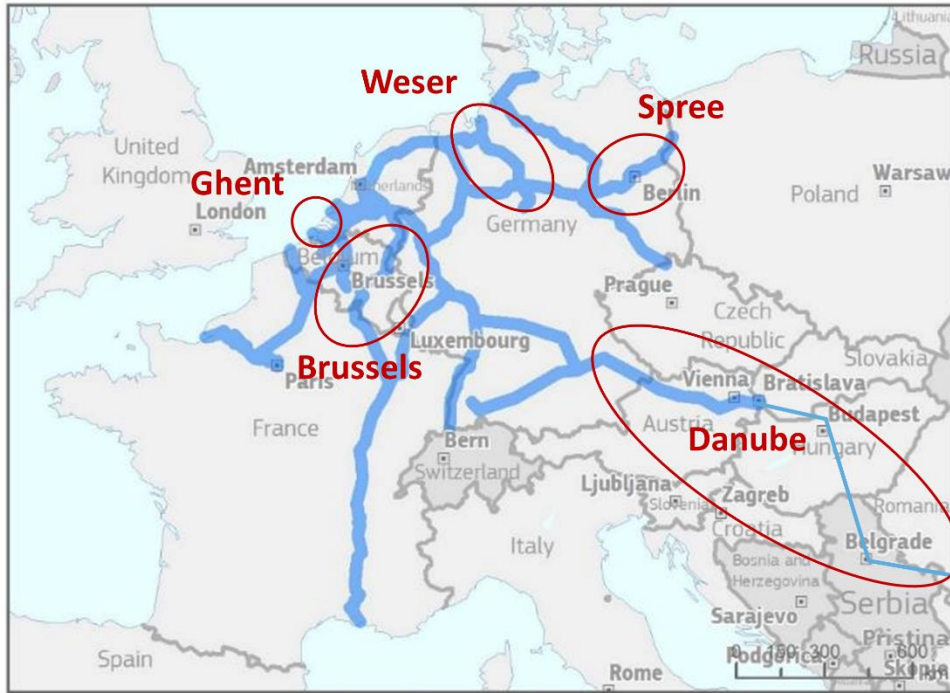
## Our Visions and Innovations:



**Digitized and optimized port  
business processes and  
infrastructure management**



# IW-NET Coverage



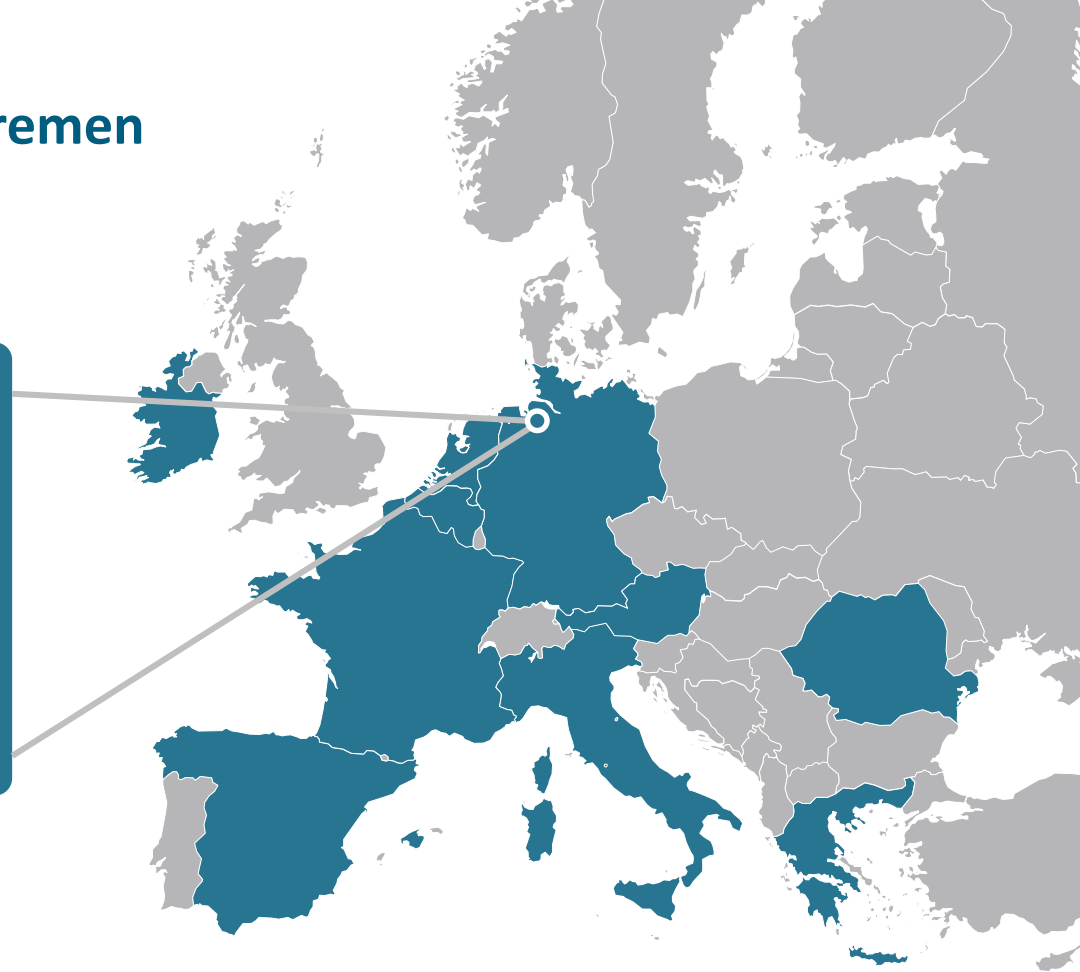
Source: INEA



# Application Scenario: Ports of Bremen

## Twin Ports: Bremen and Bremerhaven

- Among Europe's most important universal ports for containers, vehicles, general and bulk cargo dangerous goods and project cargo
- Mixed-use by seagoing and inland vessels
- Hinterland link via River Weser (TEN-T North Sea – Baltic; Orient/East - Med)
- Main infrastructure provider: bremenports GmbH & Co. KG



# Application Scenario: Ports of Bremen

## Current Situation

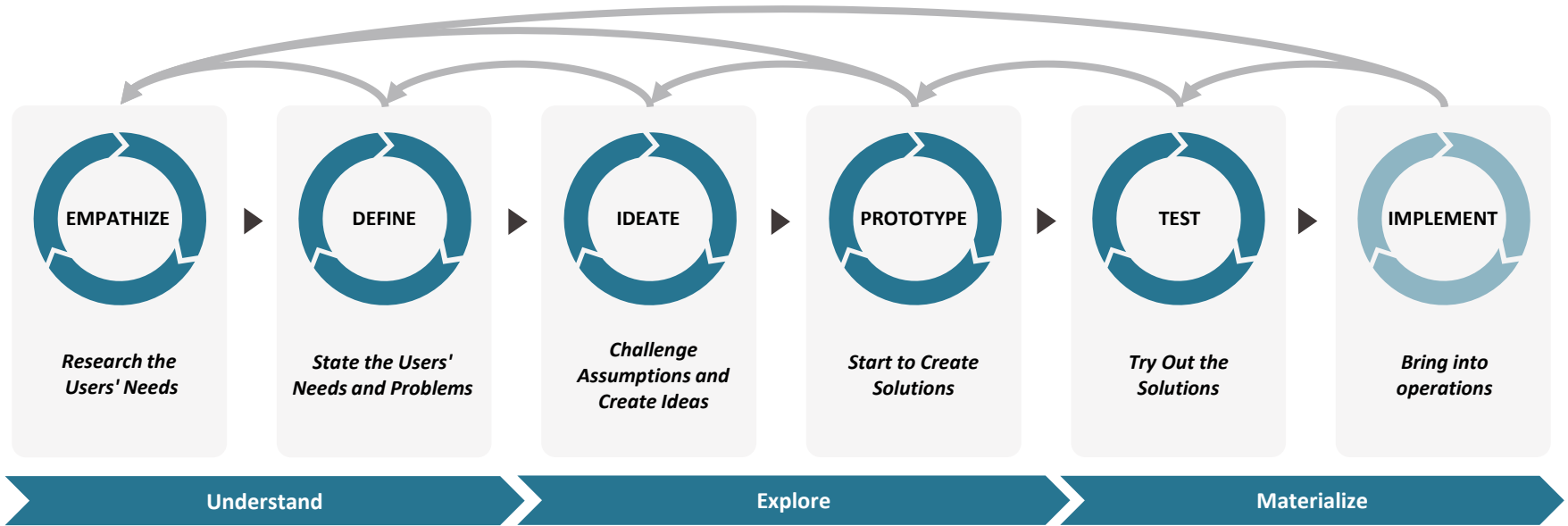
- Communications between port authority and barge operators carried out on short notice via VHF or email
  - Adhoc berth/lock planning
  - Incomplete data collection
- Provision and use of shore power
  - 23 berths equipped with shore power facilities
  - Skippers need to pick up keys at port office
  - Manual meter readings

## Consequences

- High administrative burden for barge operators → Operational Costs
- Lack of transparency → increased communicative effort
- Use of different media → data quality issues and thus requires high effort for port authority (e.g. for invoicing)
- Lack of visibility for monitoring and control of real shore power usage
- Use of shore power is inconvenient/burdensome



# Our Research Journey





# Key Stakeholders and Users



## IWT Operators

**„decision support before, during and after the port stay“**

- digital port call announcements
- information and transparency during the port call process
- convenient shore power access



## Port Traffic Coordination

**„Earlier and more reliable planning information on inland vessel port calls“**

- Receiving and processing of digital port call announcements within VTMS
- Integration and consolidation of different data sources



## Infrastructure Management

**„cost-effective monitoring of infrastructure facilities“**

- remote control and monitoring of shore power facilities
- Integration of additional infrastructure objects such as water meters, pumps, leak detection etc.

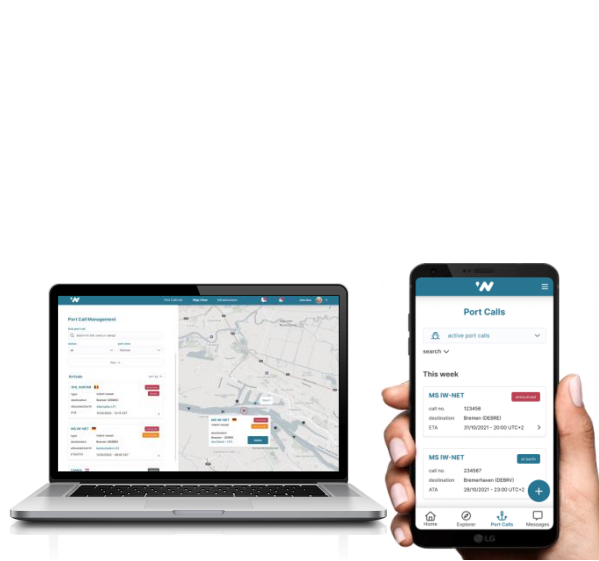




# IW-NET Innovations

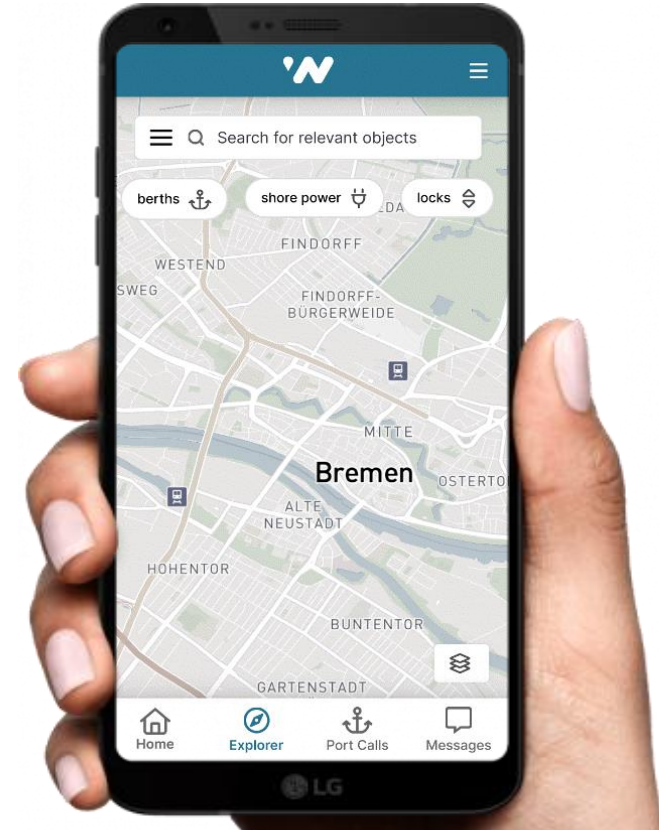
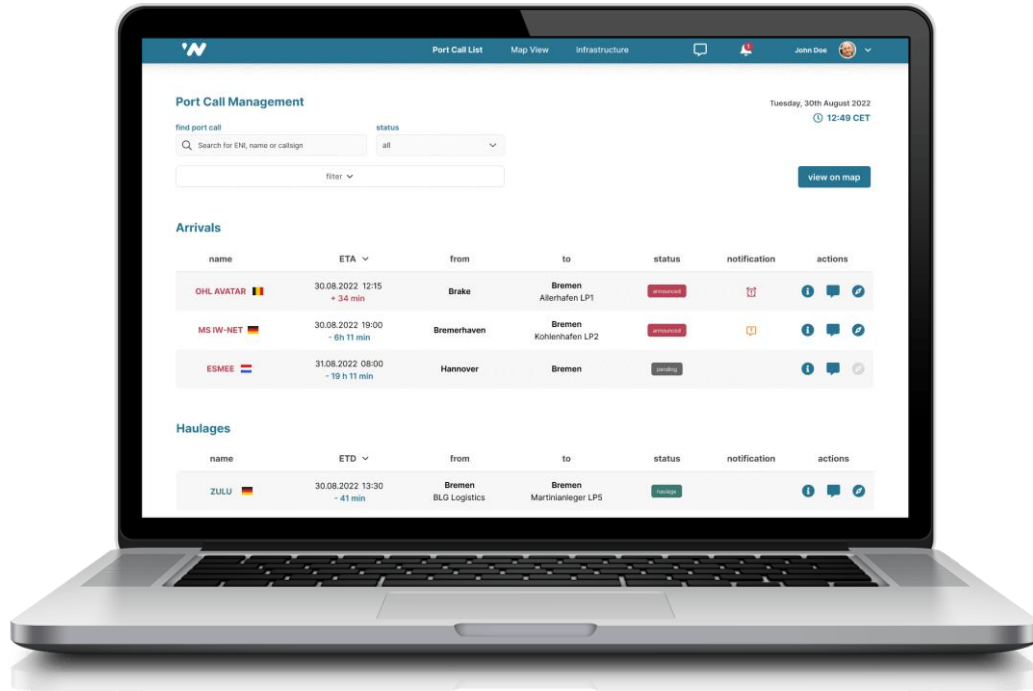


Institute of  
Shipping Economics  
and Logistics



bremenports  
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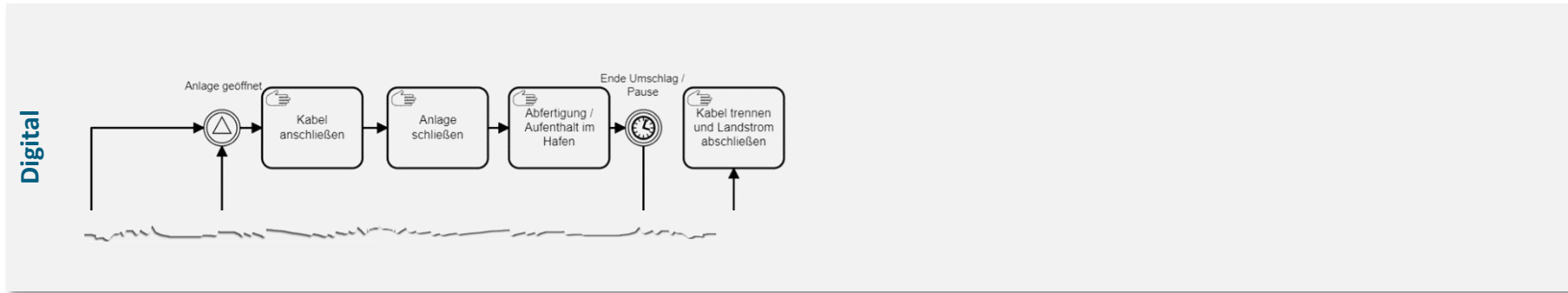
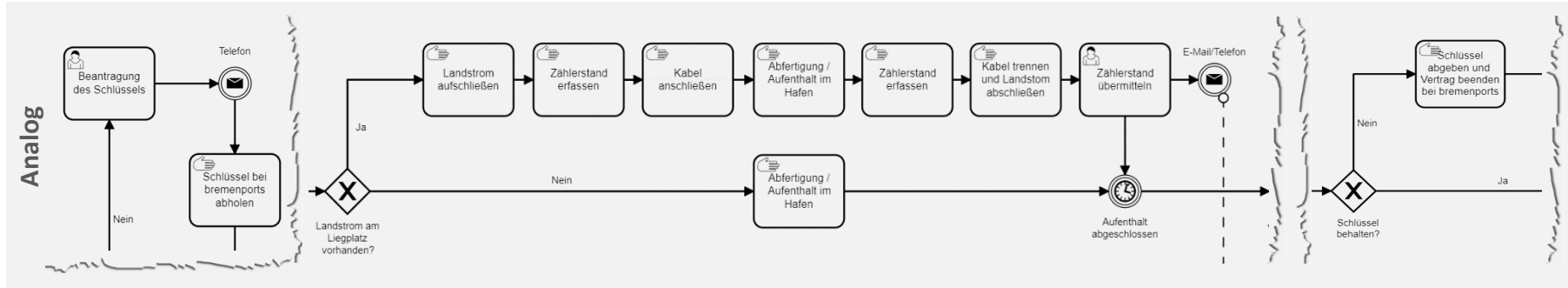
# „Going Digital“ throughout the Port Call





# Digitalization Allows for Seamless Processes

## Example: Access and use of shore power



# Efficient Infrastructure Management within the „Internet of Things“

## IW-NET Shore Power Solution

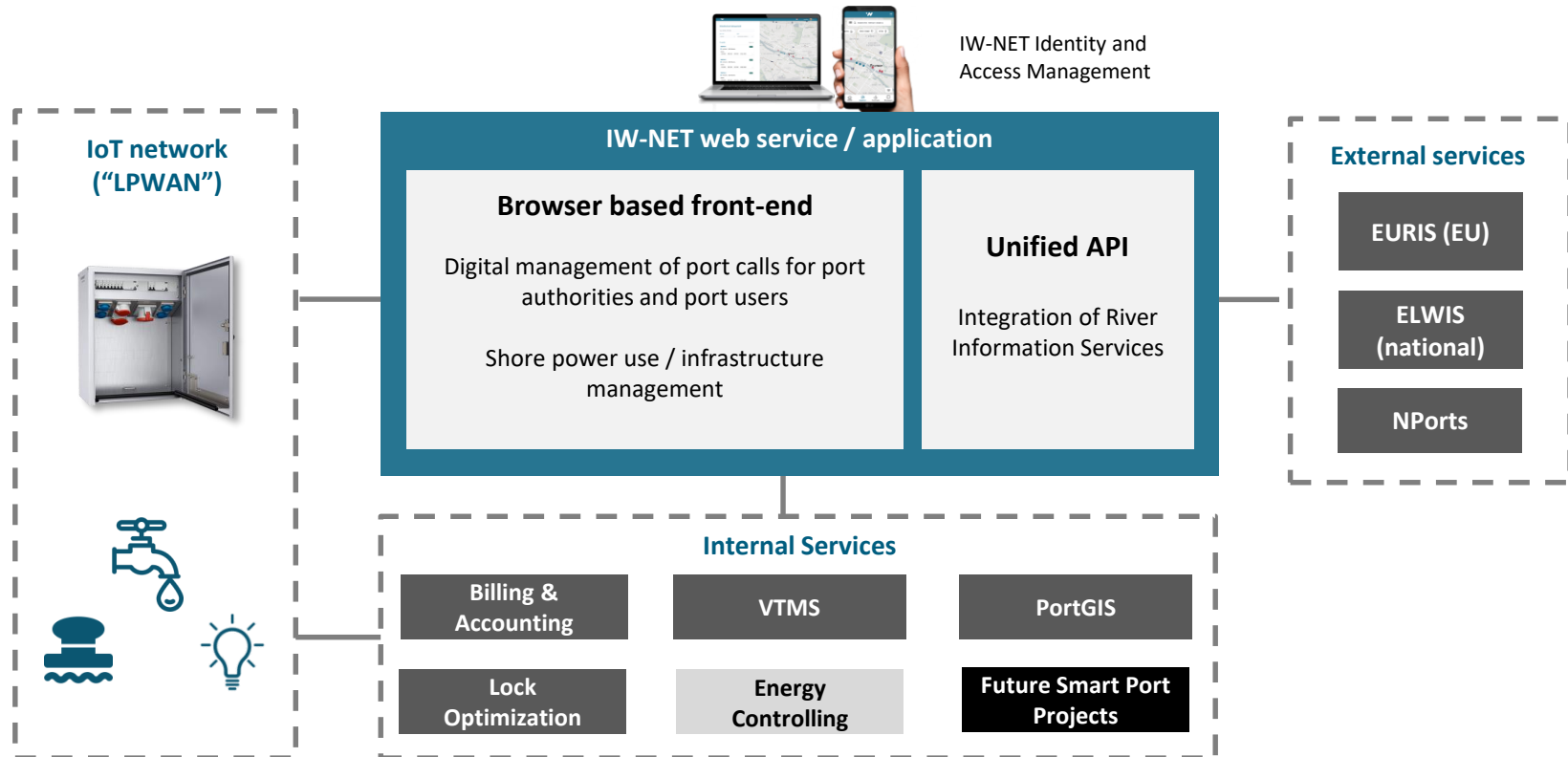
- Access control and detection of the door closing status
- Recording and transmission of meter readings
- Communication with external systems via web interfaces

## Why not something "off the shelf"?

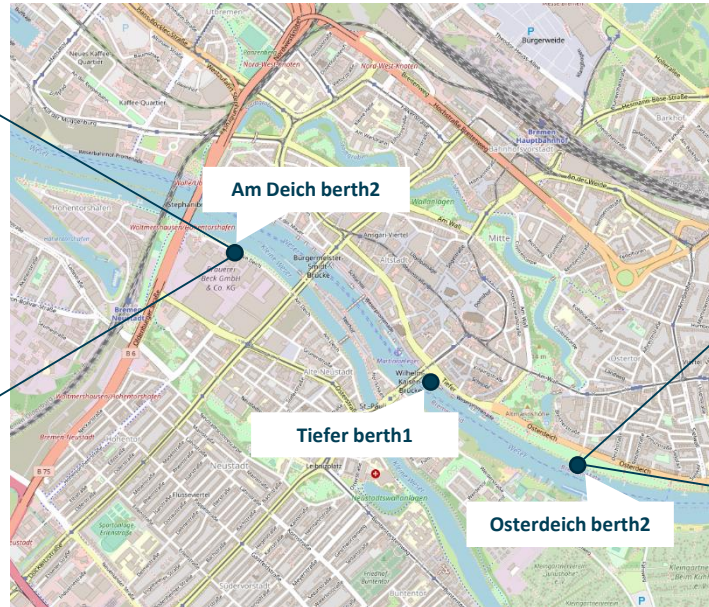
- Need for cost-effective retrofit solution for existing plants
- Direct link of port call management and access authorisation enables use and billing without additional payment systems
- Full control of communications network allows to easily integrate additional sensors



# Blueprint for Future Smart Port Solutions

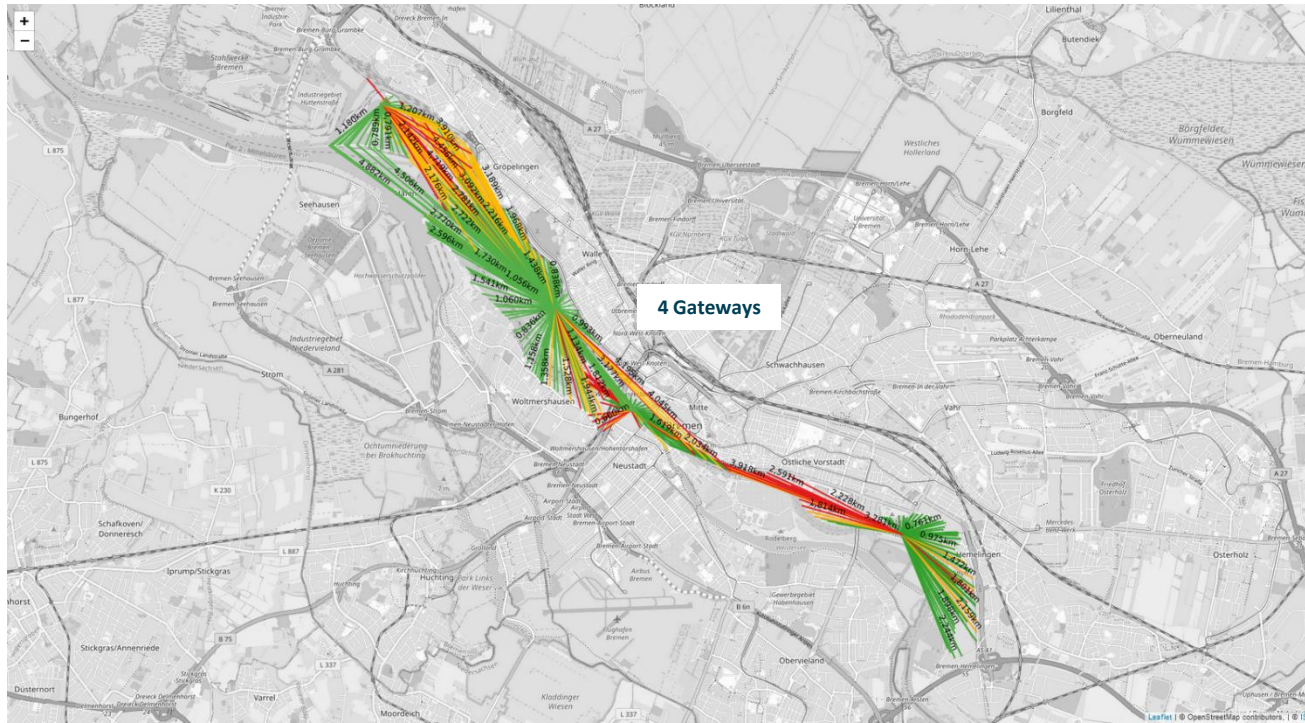


# Pilot Installations in the Port





# Field Tests in Bremen





# Outlook

## Field testing ongoing

- IW-NET web application almost implemented
  - Interface to local VTMS set up
  - Integration of lock decision management system “Tide2Use”
- Installation of IW-NET shore power station and LPWAN within port of Bremen

## Transferability challenges

- Create acceptance and get affected stakeholders "on board"
- Business model evaluation
- Transferability to other corridors

## Laying the Foundation for Smarter Port Services

- Process digitization data foundation for future port services
- Further applications for the established IoT network already in the starting blocks
- Flexible and service-oriented IT architecture as a blueprint for future smart port services

