

Policy areas where a common approach is needed to foster Smart Shipping, based on the current international legal instruments and resolutions

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# 1. De Vlaamse Waterweg nv





budget of  
€ 400 million a year

166 cities and towns  
linked by our waterways

1.315 employees

6.000 jobs in inland navigation  
120.000 indirect jobs

73 weirs

80% of Flemish companies  
within 10km of a waterway

1.076 km  
navigable waterways

131 locks

853,000 TEU a year  
72 million tons a year

78 marinas

800 bridges

930.000 truck loads  
less on our roads a year

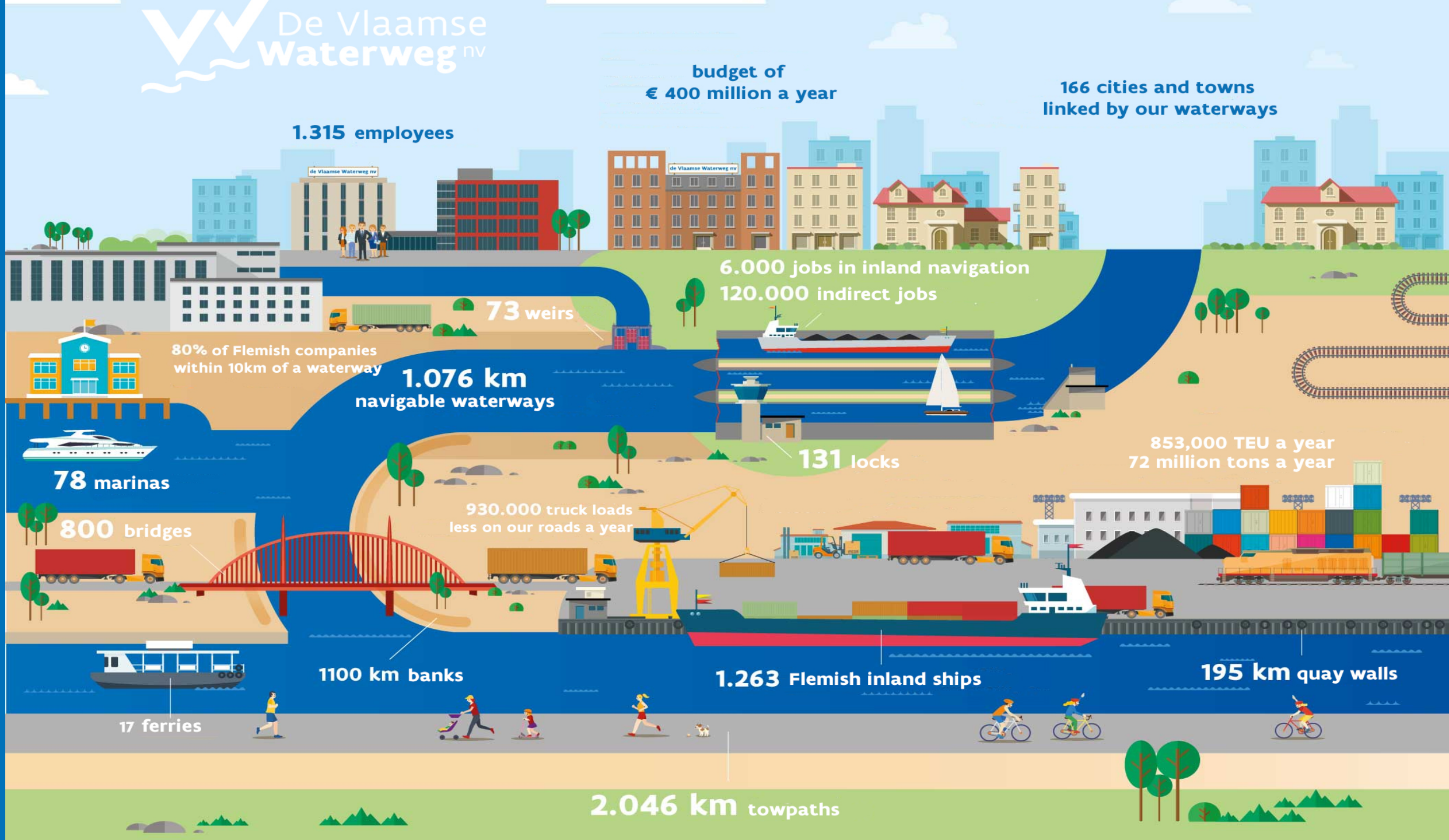
1100 km banks

1.263 Flemish inland ships

195 km quay walls

17 ferries

2.046 km towpaths







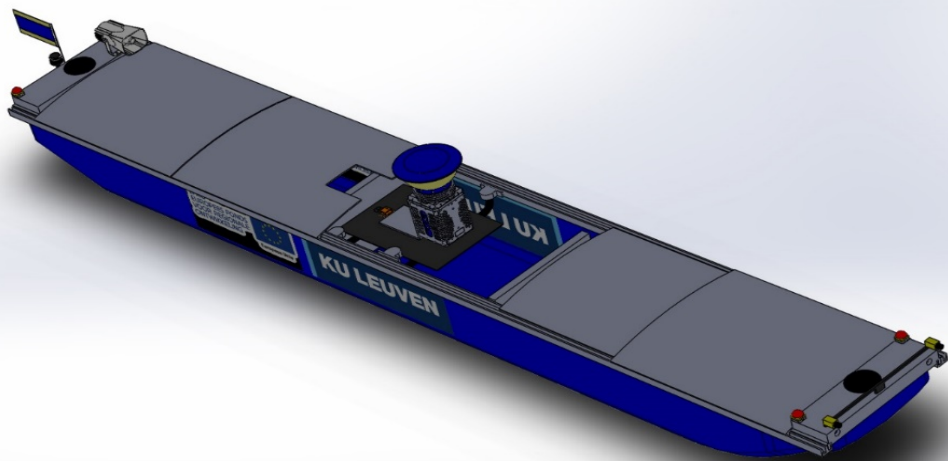




## Federal planning bureau

~ 27% increase in freight transport by 2040

~ 38% increase in inland shipping



VisuRIS  
De Vlaamse Waterweg

Zoeken



Actueel

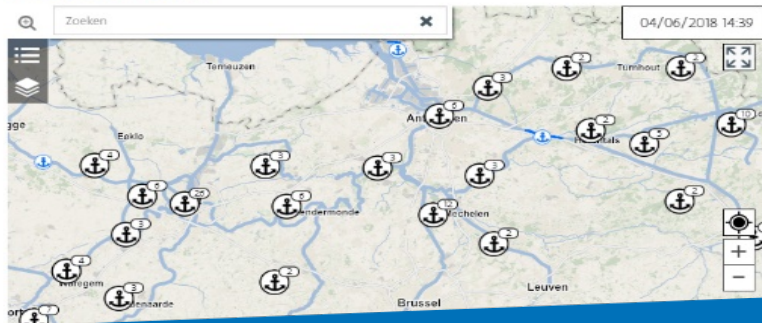
Waterweg

Diensten

Over RIS

Aanmelden >

#### HUDIGDE SITUATIE



#### REISPLANNER

Van

Naar

Bereken reis

Meer opties

Nog geen account?

Registreer je hier!

Registreren

Al een account?

Meld je hier aan!

Aanmelden



## 2. Smart Shipping



# Our Approach

2016-2018

## 1. Identified Benefits

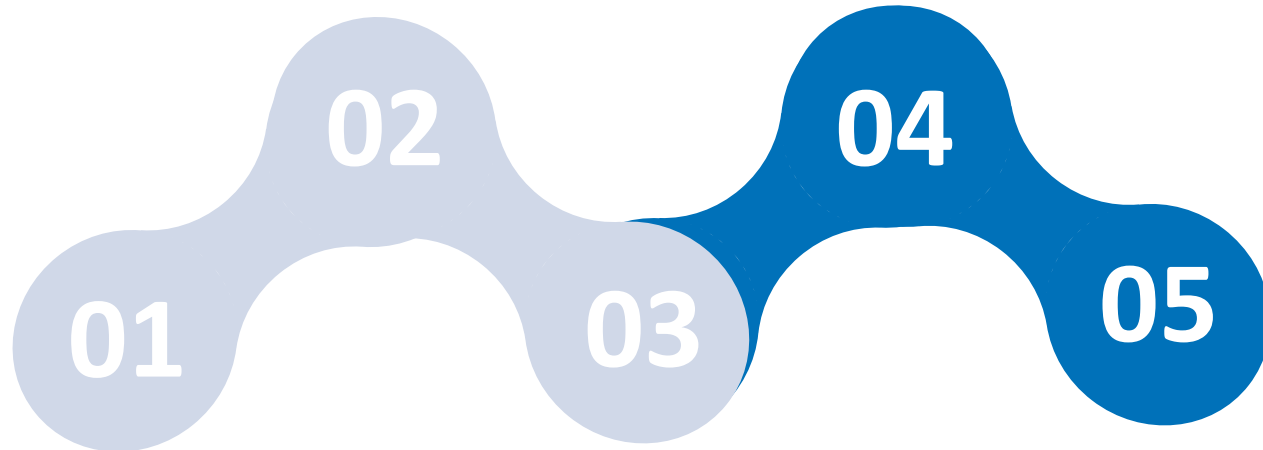
The benefits identified for the people, the organizations and the planet illustrate that the step towards autonomous vessels is something that the authorities should work on.

## 2. Law and regulation - Gaps

It has been identified that the current law and regulations are not adjusted to make autonomous vessel operations possible

## 4. Adjustment law and regulation

After the test cases the best practices and missing gaps in the law and regulation will be filled



## 3. Test areas

Test areas in which autonomous vessels can operate have been approved. It is however still up to the authorities to decide whether it is allowed to test or not.

## 5. Autonomous vessels in legal framework

The autonomous vessels will be able to operate on the Flemish inland waterways within a well defined regulatory framework

# Test area

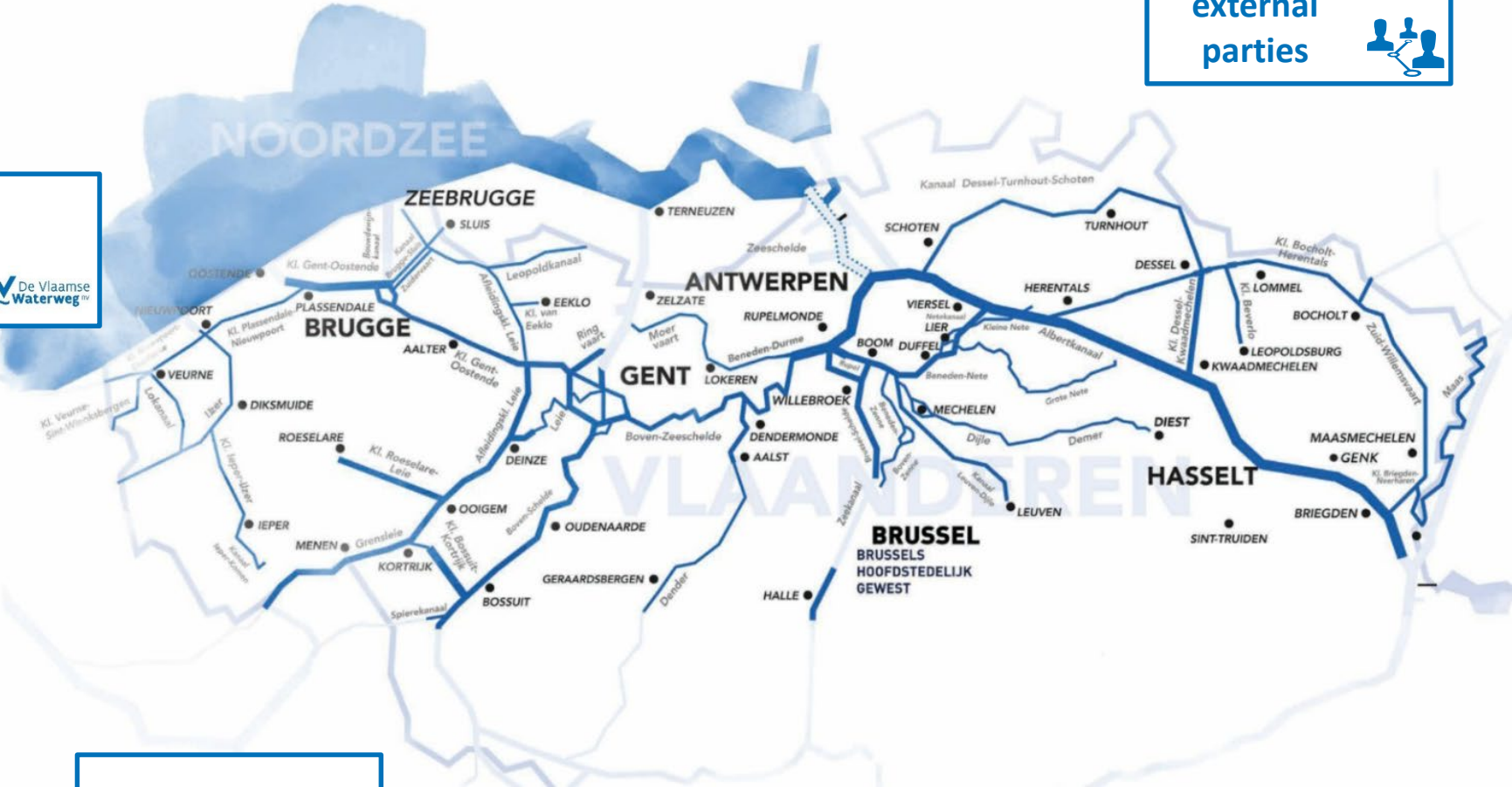
DVW



Open to external parties



1076





# Our Approach

2018-2019

## 1. Identified Benefits

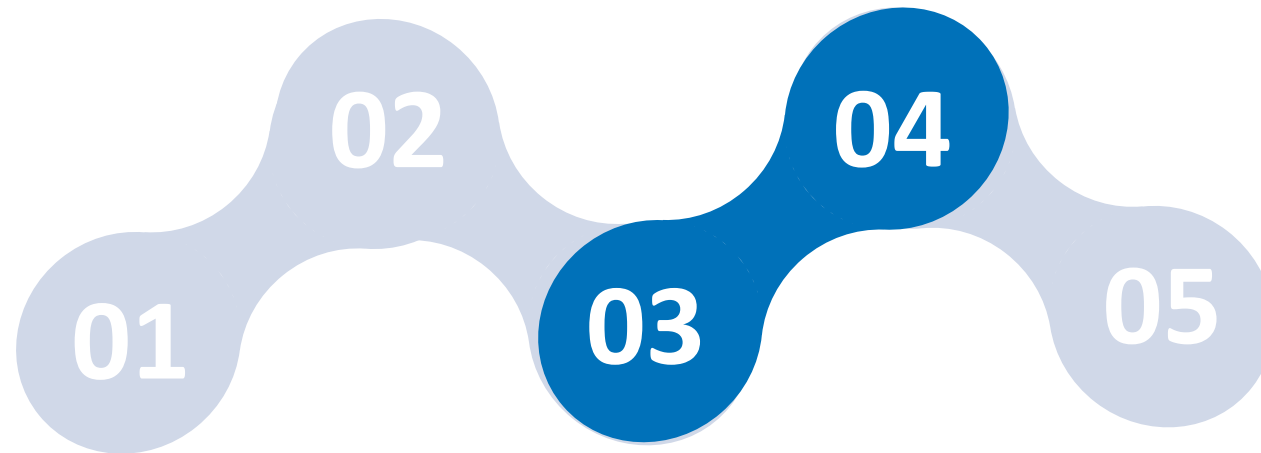
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# Law and regulation

## Identified GAPS



### Crew member regulation

- It is under no circumstance allowed for any type of vessel to sail without any crewmember



### Traffic regulation

- The general traffic regulation including the General Police regulation for vessels on Inland Waterways contain several rules from which cannot be deviated

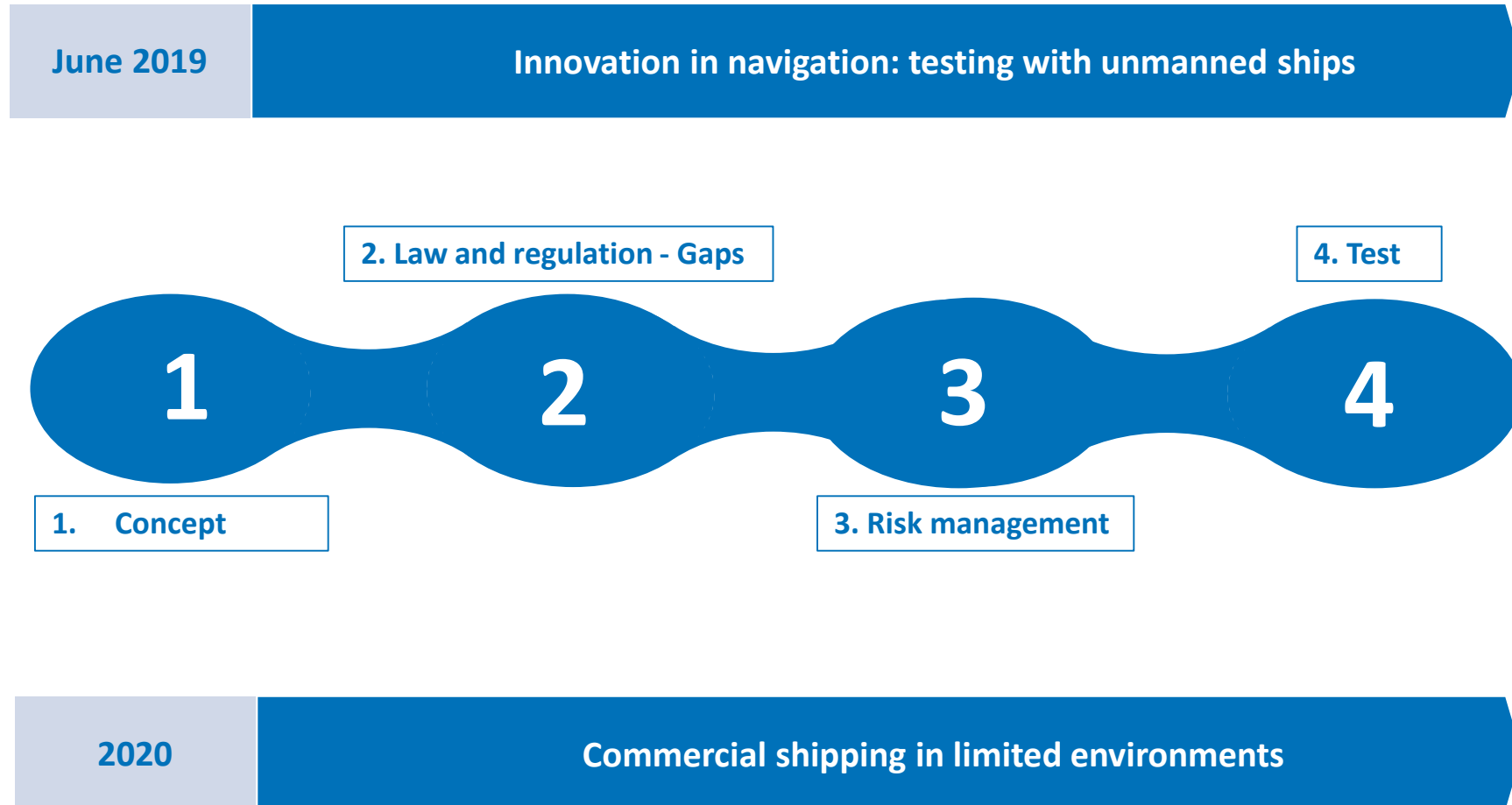


### Dangerous goods

- The transportation of dangerous goods on water has to comply with several strict rules



# Legislative base





### 3. Inland navigation rules



# Overview of the legal framework in inland navigation

- Legal framework Flanders
- International cooperation is needed
- CCNR: Under the Work Programme 2018-2019 of the Police Regulations Committee (RP), "Monitoring developments in the field of automated navigation and investigating the extent to which regulations are necessary" (task IV-18-6) was given a high priority (I).
- UNECE: programme of work for 2018-2019 adopted by the Inland Transport Committee (23-25 February 2018), cluster 5: Inland Waterway Transport: Expected accomplishments: An improved and updated regulatory framework for inland water transport infrastructure and vessels in the ECE region

## Working out an approach

- Defining Gaps/Challenges/Bottlenecks in the legal framework to make automated navigation possible (automated-autonomous):
  - CEVNI (European Code for Inland Waterways)
  - UNECE resolutions/treaties
  - Out of scope: ADN
- Automated navigation:
  - From simple navigation assistance – fully automated navigation
  - Higher automation = more legislation gaps
- Goals:
  - Creating awareness
  - Collaboration - Expertise



## Requirements of automated navigation

- Automated vessels should maximise network safety of the inland waterways network.
- Automated vessels support the market, the aim is to bring new cargo flows to inland shipping. They contribute to the modal shift / split.
- Policy/working areas

# 1. Definitions

- Types of vessels (CEVNI)
  - => Levels of automation (CCNR)
  - ⇒ ERI Ship Identification Number
- Shipmaster (Electronic Ship Reporting): the person *on board*
- Navigational information (VTT): support in *on-board* decision making
  - ⇒ IALA VTS guidelines
- Navigational assistance (VTS): to assist *on-board* navigational decision-making



## 2. Competences and crew qualifications

- CEVNI 1.02.1: Every vessel or assembly of floating material, except vessels in a pushed convoy other than the pusher, shall be placed under the authority of a person having the necessary qualifications. This person is hereinafter referred to as the boatmaster. Boatmasters are considered to possess the necessary qualifications if they hold a valid boatmaster's certificate.
- CEVNI 1.08.2: All vessels, except vessels in a pushed convoy other than the pusher, shall have a crew sufficient in number and sufficiently skilled to ensure the safety of those on board and safe navigation. However, non-motorized vessels in a side-by-side formation and some of the towed vessels in a rigid group are not required to have a crew if the vessel propelling the side-by-side formation or rigid group, or keeping it safely stopped, has a crew sufficiently large and skilled to ensure the safety of those on board and safe navigation.
- CEVNI 1.09.1: When under way, a vessel shall be steered by at least one qualified person of not less than 16 years of age.
- CEVNI 6.30.2: Navigation by radar - When a vessel is navigating by radar, there shall be at all times in the wheelhouse a person holding a certificate required by the competent authorities for that section of the inland waterway and for the type of vessel he navigates and the certificate referred to in article 4.06, paragraph 1 (b), and a second person sufficiently conversant with this method of navigation.
- Other UNECE resolutions: Recommendations on minimum requirements for the issuance of boatmaster's certificates in inland navigation with a view to their reciprocal recognition for international traffic.
- CESNI/QP/CREW: temporary working group for crew qualifications

### 3. Technical Requirements

- CEVNI 1.08.1: Vessels and assemblies of floating material shall be so constructed and rigged as to **ensure the safety of those on board and safe navigation and to be able to satisfy the requirements of these regulations.**
- CEVNI 1.08.3: The requirements are considered to be complied with when the ship **has a ship's certificate**, issued in accordance with the Recommendations on Harmonized Europe-Wide Technical Requirements for Inland Navigation Vessels (Resolution No. 61), or other recognized ship's certificate, and when the construction and the equipment of the vessel correspond to the content of the ship's certificate.
- Other UNECE resolutions:
  - Recommendations on Harmonized Europe-Wide Technical Requirements for Inland Navigation Vessels
  - Recommendation on electronic chart display and information system for inland navigation (Inland ECDIS)
- CESNI/PT: ES-TRIN



## 4. On board

- CEVNI 1.02.3: When a vessel is under way the **boatmaster shall be on board**; in addition, the boatmaster of floating equipment shall always be on board when the equipment is in operation.
- CEVNI 1.17.1: The boatmaster of a grounded or sunken vessel or of a grounded or broken assembly of floating material shall arrange for the nearest competent authority to be informed as soon as possible. In the case of a grounded or sunken vessel, **the boatmaster or a member of the crew shall remain on board or near the site of the accident** until the competent authority has authorized him to leave.
- CEVNI 7.08: Watch and surveillance - 1. **An efficient watch shall be kept continuously on board** of vessels lying in the fairway.
- Guidelines and Criteria for Vessel Traffic Services on Inland Waterways - Resolution No. 58.
  - 3.3.3: When the VTS is authorized to issue instructions to vessels, these instructions should be result-oriented only, leaving the details of execution, such as course to be steered or engine manoeuvres to be executed, to **the boatmaster on board the vessel**.
  - 1.3 Navigation: Vessel tracking and tracing can be used to support the **active navigation on board**.

## 5. Responsibility and liability

### Responsibility

- Lies with the skipper (CEVNI 1.02.5, 1.02.7, 15.02)
- ⇒ What if there is no skipper?

### Liability

- CLNI: focus on owners
  - Convention relating to the unification of certain rules concerning collisions in inland navigation: liability shall be attached to that vessel.
- => owner, shipper, shore control center, software provider?

## 6. Technical solutions (1)

- CEVNI 1.07.2: The load of the vessel shall not restrict the direct view at a distance of more than 350 m in front of the vessel. If direct visibility astern and aside is restricted during the voyage, this lack of visibility may be compensated for by the use of radar apparatus.
- CEVNI 1.09.3: In order to ensure proper control of the vessel, the helmsman shall be able to receive and give all information and all orders reaching or proceeding from the wheelhouse. In particular, he shall be able to hear sound signals and have a sufficiently clear view in all directions.
- CEVNI Chapter 3 VISUAL SIGNALS (MARKING) ON VESSELS
- CEVNI Chapter 4 SOUND SIGNALS; RADIOTELEPHONY; NAVIGATION DEVICES
- CEVNI 4.01.2: The sound signals given by motorized vessels shall be accompanied by light signals synchronized with them, such light signals shall be yellow, bright and visible from all directions. This provision shall not apply to small craft or to the signal prescribed in article 6.32, paragraph 4 (a), to be given by vessels proceeding downstream and navigating by radar, or to be ringing or pealing of a bell.
- CEVNI Chapter 5 WATERWAY SIGNS AND MARKING



## 6. Technical solutions (2)

- CEVNI Chapter 6 RULES OF THE ROAD
- CEVNI 6.03.1: Meeting or overtaking is permitted only when the fairway is unquestionably wide enough for simultaneous passage, taking all the local circumstances and movements of other vessels into account.
- CEVNI 6.20.1: Vessels shall regulate their speed to avoid creating excessive wash or suction likely to cause damage to stationary or moving vessels or structures. In particular, they shall reduce speed in good time, but not to below the speed required to steer safely:
- CEVNI 6.28.7 B: While the lock is being filled or emptied and until they are allowed to leave, vessels shall be made fast and the mooring ropes shall be so handled as to prevent bumping against the walls, gates or protective devices or against other vessels or assemblies of floating material;
- CEVNI 6.28.8: In locks and lock basins it is obligatory to keep a minimum lateral distance of 10 m from the vessels or convoys carrying the marking referred to in article 3.14, paragraph 1

## 7. Communication with the competent Authority

- CEVNI 1.12.4: When a vessel encounters an unknown obstacle on a waterway, the boatmaster shall at once inform the nearest competent authority, specifying as accurately as possible the place where the obstacle was encountered.
- CEVNI 1.14: When a vessel or assembly of floating material has damaged a permanent structure (lock, bridge, groyne, etc.), the boatmaster shall at once inform the nearest competent authority.
- CEVNI: 1.19 – Special instructions: Boatmasters and persons in charge of floating establishments shall comply with any special instructions given to them by officials of the competent authorities in order to ensure safe and orderly navigation.
- CEVNI 6.26.1. Without prejudice to the other provisions of these regulations and to any other provisions applicable, boatmasters shall, on approaching and passing through movable bridges, obey any instructions given to them by the bridge staff to ensure safe and orderly navigation or quick passage. The boatmaster of a vessel shall announce his intention to navigate through the bridge to the bridge operators by means of a long blast or radiotelephone.
- CEVNI 6.26.3. Overtaking when approaching movable bridges is prohibited unless special instructions are given by the bridge staff.
- CEVNI 6.26.6. The bridge operator is obliged to have on or near the bridge a radiotelephone device corresponding to the provisions of Article 4.05. For the entire duration of the navigation through the bridge, the radiotelephone device must remain switched on.
- Electronic ship reporting resolution: Annex – part 4 Messaging Procedures – 4.1 ship-to-authority messaging (2): Ship-to-authority messaging is not confined to messages sent from a ship directly to the authority. **All messages concerning the ship**, sent by or on behalf of the ship, count as ship-to-authority messaging even if sent by shippers ashore.

## 8. Communications between ships

- CEVNI 1.17.2: When a vessel is grounded or sunk, or an assembly of floating material is grounded, in or near the fairway, its boatmaster shall, unless it is obviously unnecessary, as soon as possible and without prejudice to the obligation to display the marking referred to in article 3.25, **give warning to approaching vessels** and assemblies of floating material at suitable points far enough from the site of the accident to enable them to take the necessary action in good time.
- CEVNI Chapter 3 VISUAL SIGNALS (MARKING) ON VESSELS
  - Question: does an automated vessel need a marking?
- CEVNI 4.05.2: Motorized vessels, **excluding small craft** may navigate only if they are equipped with a radiotelephone installation in proper working order for ship-to-ship, nautical information and ship-to-port-authority networks.
- AIS - VHF - ECDIS



## 9. Digital documents

CEVNI 1.10: list of documents available on board

CEVNI 1.11: navigation regulations on board (except for unmanned vessels)

=> Electronic versions

## 10. Recreational navigation

- Interference with recreational navigation



## 11. Emergency situations

- CEVNI 1.16
- 1. In the event of an accident endangering persons on board, the boatmaster shall use every means at his disposal to save them.
- 2. Every boatmaster who is close to a vessel or assembly of floating material which has suffered an accident endangering persons or threatening to obstruct the fairway is required to give immediate assistance insofar as is consistent with the safety of his own vessel.



## 12. Cyber Security

## 13. Infrastructure

- European Agreement on Main Inland Waterways of International Importance (AGN)
- European Code for Signs and Signals on Inland Waterways (SIGNI)
- ECDIS adaptation for unmanned vessels?



- Other policy or working areas?
- Questions?
- Ideas?

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