



# Autonomous Inland Vessels

Sim Turf – Chairman UNECE WP on IWT  
Region of Flanders  
Department of Mobility and Public Works  
5<sup>th</sup> MASRWG Conference, London  
January, 16th 2020



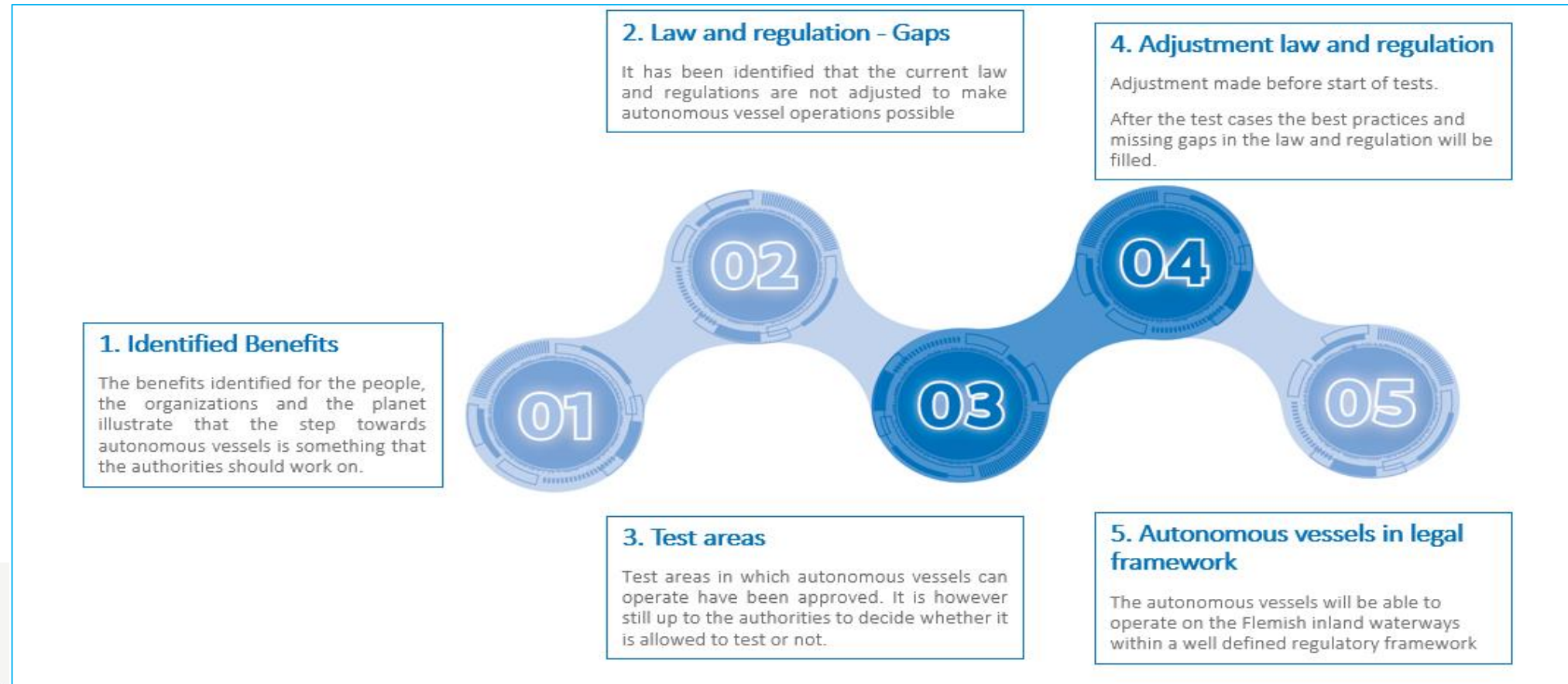
# United Nations Economic Commission for Europe

- ▶ One of the five UN Regional Commissions
- ▶ Inland Transport Committee
  - **Working Party on Inland Water Transport**
  - Harmonization of pan-European IWT-regulation

# Autonomous inland vessels in Flanders

- ▶ Smart Shipping Program
  - Smart Vessels
  - Smart Infrastructure
  - Smart Communication
  - **Smart Regulation**

# Flemish approach - Regulation



# Step 1: Identified benefits

- ▶ Increased safety
- ▶ Reduction of crew-related costs
- ▶ Possible introduction of new business models
- ▶ Support of the modal shift from road to water
- ▶ ....
- ▶ **The identified benefits illustrate that the step towards autonomous vessels is something the authorities should work on**



# Step 2: Law and regulation - gaps

- ▶ **Crew member regulation**

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

- ▶ **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



# Step 3: Test area

- ▶ The Flemish waterway network = test area for unmanned vessels
- ▶ Test area:
  - To support the development of new technologies
  - To use the results as input for the adjustment of the legal framework
- ▶ Code of conduct
  - Strict rules
  - Limited in time
  - Well – defined section of the waterway

# Step 4: Adjustment law and regulation



















- ▶ Adjustments made before start of the test
- ▶ After the test cases the missing gaps in the law will be filled in
- ▶ Continuous repetition of step 3 (test area) and step 4 (adjustment law and regulation)



# Step 5: autonomous vessels in legal framework

- ▶ The ultimate objective is to create a legal framework that supports the **commercial** use of autonomous vessels in inland navigation
  - Need for international cooperation
    - × Central Commission for Navigation of the Rhine (CCNR)
    - × United Nations Economic Commission for Europe (UNECE)

# CCNR: Definition of levels of automation in inland navigation

Level	Name	Vessel command	Monitoring and responding to navigational environment	Fall-back performance of dynamic navigation tasks
0	NO AUTOMATION			
1	STEERING ASSISTANCE			
2	PARTIAL AUTOMATION			
3	CONDITIONAL AUTOMATION			
4	HIGH AUTOMATION			
5	FULL AUTOMATION			



# Definition of levels of automation in inland navigation

Level	Name	Vessel command	Monitoring and responding to navigational environment	Fall-back performance of dynamic navigation tasks
0	NO AUTOMATION	<p><b>Helmsman performs part or all of the dynamic navigation tasks.</b></p>		
1	STEERING ASSISTANCE			
2	PARTIAL AUTOMATION			
3	CONDITIONAL AUTOMATION			
4	HIGH AUTOMATION			
5	FULL AUTOMATION	<p><b>System performs the entire dynamic navigation tasks (when engaged).</b></p>		

# CCNR Police Regulation

- ▶ Scoping exercise of the CCNR Police Regulation
- ▶ Identify all the possible bottlenecks
- ▶ Two assumptions
  - Captain is not on board but standby in an onshore control centre
  - The vessel is fully automated (level 5)

# UNECE – Working Party on Inland Water Transport

- ▶ Workshop “Autonomous shipping and inland navigation”
- ▶ Resolution “Enhancing international cooperation to support the development of smart shipping on inland waterways”
- ▶ Road map for the international cooperation aimed at the promotion and development of smart shipping on inland waterways

# UNECE – Roadmap

- ▶ **Action 1:** Introducing harmonized definitions of autonomy levels
- ▶ **Action 2:** Review of UNECE resolutions, int. conventions and agreements
- ▶ **Action 3:** Harmonizing approaches for creating a basis for the deployment of smart shipping
- ▶ **Action 4:** Digitalization
- ▶ **Action 5:** Ensuring data protection, cybersecurity, addressing the liability concerns and other relevant issues
- ▶ **Action 6:** Social impact of automation: manning requirements, education and training
- ▶ **Action 7:** Assisting governments, contributing to capacity building and awareness raising, organizing workshops and round tables







**Flanders**  
State of the Art

# Thank you for your attention!

Contact details:

Sim Turf – Policy Advisor Inland Water Transport  
Department of Mobility and Public Works (Belgium)

[Sim.turf@mow.vlaanderen.be](mailto:Sim.turf@mow.vlaanderen.be)

