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**ON DIGITAL INLAND NAVIGATION**

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## 1. INTRODUCTION

This document builds on the 'Digital Inland Waterway Area' study<sup>1</sup> commissioned by the Directorate-General for Mobility and Transport in 2016 and published in October 2017: this study is referred to as the DINA Study in this document.

The aim of this document is to describe existing initiatives and tools in the area of digitalisation of inland navigation in an integrated way, including the findings of the DINA study and ongoing Commission initiatives. This document does not intend to draw up a strategy or set out binding measures.

## 2. INLAND WATERWAYS TRANSPORT CONTEXT

### 2.1 State of play

The inland waterways transport (IWT) sector is an integral part of the European supply chain and contributes to the competitiveness of the EU economy. It is also a mode of transport with unused capacities in some geographical regions. At about 37 000 kilometres, with more than 250 inland ports<sup>2</sup> connecting major seaports, cities and industrial centres, the EU's inland waterway network has ample capacity<sup>3</sup> to absorb heavy freight traffic across major industrial areas, in particular the cross-border regions linked by major waterways such as the Rhine, the Danube, the Seine-Scheldt, the Rhône, the Po and the Elbe. In addition, IWT requires cooperation beyond EU borders, for example with Switzerland on the Rhine and Serbia on the Danube.

In 2016, total IWT performance was close to 145 billion tonne-kilometres<sup>4</sup>. While this total represented a 1 % decrease compared to 2015, container transport increased by 4.6 % and today accounts for more than 15 billion tonne-kilometres. Between 2012 and 2016, the number of passengers on European river cruise vessels increased annually by 13 % on average.

NAIADES II, adopted by the Commission in 2013, is the overarching Action Programme for the promotion of IWT for the period 2014-2020<sup>5</sup>. It focuses on making long-term structural changes in the inland navigation sector in order to make it more modern, innovative and attractive. While the initiatives of this Action Programme revolve around diverse topics such as innovation, the smooth functioning of the market, environmental performance and providing quality jobs for a skilled workforce, it also calls for RIS (River Information Services) to be expanded and integrated with the information streams of other transport modes.

**The DINA study** examined the state of play regarding digitalisation in the IWT sector and concluded that the focus so far has mainly been on the provision of RIS by fairway authorities and their use by vessel operators. Taking this as a starting point, the study called for further

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1 *Digital Inland Waterway Area - Towards a Digital Inland Waterway Area and Digital Multimodal Nodes*  
[https://ec.europa.eu/transport/modes/inland/studies/inland\\_waterways\\_en](https://ec.europa.eu/transport/modes/inland/studies/inland_waterways_en)

2 <http://www.inlandnavigation.eu/news/events/inland-waterways-ports-present-vision-for-2030/>

3 <http://ec.europa.eu/transparency/regdoc/rep/1/2017/EN/COM-2017-648-F2-EN-MAIN-PART-1.PDF>

4 [https://www.ccr-zkr.org/files/documents/om/om17\\_II\\_en.pdf](https://www.ccr-zkr.org/files/documents/om/om17_II_en.pdf)

5 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Towards quality inland waterway transport – NAIADES II* (COM(2013) 623 final, 10.9.2013).

developments to meet the needs of all stakeholders. It also identified three categories of actors with different needs and objectives relating to digitalisation:

- IWT users – shippers and logistics service providers;
- the transport sector itself – vessel operators, terminal operators and their links to other modes of transport; and
- public authorities (or agencies operating on their behalf) with certain duties, ranging from collecting and publishing statistics to calamity abatement and managing fairways.

Stakeholders consulted during the preparation of the DINA study, in DINA Expert Group meetings<sup>6</sup> and in other fora related to transport and digital topics (Digital Transport and Logistics Forum, RIS weeks, etc.), underlined the importance of the digitalisation of the sector.

## 2.2. Main EU legislation on digitalisation applicable to the IWT sector

### 2.2.1 Digitalisation in specific IWT legislation

The **RIS Directive**<sup>7</sup> establishes a framework for the deployment and use of harmonised, interoperable and open RIS. It requires Member States to develop and implement RIS in an efficient, expandable and interoperable way and to provide interfaces with transport management systems and commercial activities. Member States must provide RIS users with the data necessary for voyage planning and electronic navigational charts for waterways and notices to skippers are provided as standardised, coded and downloadable messages. In line with the RIS Directive, the Commission laid down technical guidelines and specifications for RIS through five implementing acts<sup>8</sup>.

In accordance with the **Directive on technical requirements for inland waterway vessels**<sup>9</sup>, the Commission maintains the European Hull Database (EHDB). This database contains selected information regarding inland waterway craft, including each vessel's unique European vessel identification number, its name, its dimensions and an electronic copy of the vessel certificate.

The **Directive on the recognition of professional qualifications in inland navigation**<sup>10</sup> facilitates the electronic exchange of information about crew members by setting up a system of national registers and a database to be kept by the Commission. This system will contain

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6 DINA Expert Group meeting report; <http://www.cc.cec/regexp/group/view.do?refGroup=3505>

7 Directive 2005/44/EC of the European Parliament and of the Council of 7 September 2005 on harmonised river information services (RIS) on inland waterways in the Community.

8 Commission Regulation (EC) No 414/2007 concerning the technical guidelines for the planning, implementation and operational use of RIS;

Commission Implementing Regulation (EU) No 909/2013 on the technical specifications for the electronic chart display and information system for inland navigation (Inland ECDIS);

Commission Regulation (EU) No 415/2007 concerning the technical specifications for vessel tracking and tracing systems (as amended by Commission Implementing Regulation (EU) No 689/2012);

Commission Regulation (EU) No 164/2010 on the technical specifications for electronic ship reporting in inland navigation;

Commission Regulation (EC) No 416/2007 concerning the technical specifications for Notices to Skippers.

9 Directive (EU) 2016/1629 of the European Parliament and of the Council of 14 September 2016 laying down technical requirements for inland waterway vessels, amending Directive 2009/100/EC and repealing Directive 2006/87/EC.

10 Directive (EU) 2017/2397 of the European Parliament and of the Council of 12 December 2017 on the recognition of professional qualifications in inland navigation and repealing Council Directives 91/672/EEC and 96/50/EC.

data on crew members' Union certificates of qualification, service record books<sup>11</sup> and vessel logbooks<sup>12</sup> and would be operational by mid-January 2022. There are under preparation delegated and implementing acts envisaged in Directive (EU) 2016/1629 on technical standards for inland navigation vessels and Directive (EU) 2017/2397 on professional qualifications.

### *2.2.2 Dealing with digitalisation across all modes of transport*

The **TEN-T Regulation**<sup>13</sup> establishes guidelines for the development of the trans-European transport network, which also consists of the infrastructure for inland waterway transport. Some of the Regulation's **priorities** deal with **information and communication technology**, such as implementing telematics applications (including RIS), while others deal with multimodality, such as connecting inland port infrastructure to rail freight and road transport infrastructure. Several projects financed by the Connecting Europe Facility (CEF) support the realisation of TEN-T Regulation objectives.

Electronic freight transport documents are used to different extents for various modes of transport. However, two issues hamper their wider use for all modes: limited acceptance by Member States and limited interoperability between the various IT solutions/systems that currently support electronic transport documents<sup>14</sup>. This limits the efficiency of, in particular, multimodal and cross-border transport and, hence, that of the functioning of the EU single market. On 17 May 2018, the Commission therefore adopted a legislative proposal<sup>15</sup> aimed at supporting the **use of freight transport documents in electronic format** across all modes of transport. The draft proposal takes into account recent developments related to data protection<sup>16</sup> and electronic identification for electronic transactions<sup>17</sup>. In addition, it requires measures to be taken to ensure the protection of sensitive commercial data, which is a specific concern for actors in the inland waterways sector. More specifically, the proposal will ensure the acceptance of electronic cargo transport information by the public authorities, the uniform implementation of related measures by the authorities to ensure acceptance, and the interoperability of the IT systems and solutions used. In the same package, on 17 May 2018, the Commission also adopted a legislative proposal<sup>18</sup> related to the establishment of a European Maritime Single Window environment.

### *2.2.3 Cross-cutting legislation*

There are currently two cross-cutting legislative instruments that form the **basic framework for personal data protection**, which are relevant in the context of digital inland navigation:

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11 Service record books are registers recording details of an individual crew member's work history, including navigation time and voyages carried out.

12 The logbook is an official record of the voyages made by the vessel and of its crewing.

13 Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network.

14 SWD(2018) 183 final.

15 COM(2018) 279 final

16 In particular the entry into application of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation – GDPR) (OJ L 119, 4.5.2016) on 25 May 2018..

17 Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC (the eIDAS Regulation) (OJ L 257, 28.8.2014, p. 73–114).

18 COM(2018) 278 final

Regulation (EU) 2016/679 (the General Data Protection Regulation – GDPR) and Regulation (EC) No 45/2001<sup>19</sup>.

The GDPR replaces the Data Protection Directive (Directive 95/46/EC). As of 25 May 2018, it sets forth a single set of rules across the EU to protect and empower all EU individuals with regard to the processing of their personal data and to hold organisations processing personal data of individuals in the EU accountable for their processing activities. It gives powers to the competent supervisory authorities to impose corrective measures, fines and penalties on companies that do not comply with these rules.

Regulation (EC) No 45/2001 is applicable to the personal data processed by EU institutions and bodies. Amendments are currently being worked on and are expected to be adopted in 2018. The provisions of the amended Regulation will be in line with the GDPR.

As regards IWT, the EHDB contains personal data, as will another database to be set up by the Commission by January 2022<sup>20</sup>. For such databases - but also for any kind of data exchange containing personal data - the provisions of Regulation (EC) No 45/2001 – and of any future revisions of this Regulation – are of key importance when providing safeguards in relation to the processing of personal data by the Commission.

While digitalisation and automation help to make transport systems more efficient, they also make them more vulnerable to cyber-attacks due to their increased levels of complexity and interconnection.

To reduce such risks, the **Network Information Security (NIS) Directive**<sup>21</sup> was adopted in July 2016. This Directive promotes collaboration between Member States and aims to develop their capacity to investigate incidents rapidly and raise awareness of vulnerabilities at national level. In addition, in September 2017, the Commission published a review of the 2013 cybersecurity strategy in which it proposed that the EU Network Information Security Agency (ENISA) be granted a permanent mandate and that a voluntary scheme for cybersecurity certification and labelling be set up to create a cyber-resilient ecosystem<sup>22</sup>.

Another piece of cross-border and cross-sectoral legislation is the **eIDAS Regulation**, which provides a clear regulatory environment to enable secure and seamless electronic interactions between businesses, citizens and public authorities. Electronic identification and trust services are key enablers for building a Digital Single Market and the eIDAS Regulation provides legal certainty for these services beyond national borders. More specifically, the Regulation ensures that people and businesses can use their own national electronic identification schemes (eIDs) to access public services in other EU countries where eIDs are available. Moreover, it creates a European internal market for electronic trust services (i.e. electronic signatures, electronic seals or time stamps, electronic delivery services and website authentication) by ensuring that they will work across borders and have the same legal status as traditional paper-based processes.

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19 Regulation (EC) No 45/2001 of the European Parliament and of the Council of 18 December 2000 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data (OJ L 8, 12.1.2001).

20 Pursuant to Directive (EU) 2017/2397.

21 Directive (EU) 2016/1148 on security of network and information systems (NIS Directive).

22 <https://ec.europa.eu/digital-single-market/en/policies/cybersecurity>

### 2.3 Relevant non-legislative tools

At European level, the following central systems include IWT elements or were developed exclusively for IWT:

- **TENtec**<sup>23</sup> is an information system managed by the Commission that fulfils several functions, including storing infrastructure-related data concerning all modes of transport. For inland waterways specifically, for example, TENtec holds information<sup>24</sup> related to ports, terminals, locks, bridges and mooring places. Data collected for inland waterways parameters are currently being validated and should be available to TENtec users as of October 2018;
- the **European reference data management system** (ERDMS) is a publicly accessible database kept by the Commission which contains data relating to the inland waterway network infrastructure (RIS Index), e.g. location of locks, bridges and terminals and their unique identifiers/location codes. Member States' authorities provide this data. This use of standardised lists and data makes the ERDMS an enabler of interoperability.
- several horizontal tools have also been developed to serve the inland waterway sector in line with the EU's policy on the Digital Single Market. For example, the CEF **Building Blocks**<sup>25</sup> - eID, eSignature, eDelivery, eInvoice and eTranslation – aim to ensure interoperability between IT systems to facilitate the delivery of digital public services across borders, while the relevant rules and regulations (e.g. the eIDAS Regulation and the GDPR) are fully complied with. In addition, the **Internal Market Information System**<sup>26</sup> offers a secure multilingual online tool that helps competent authorities to cooperate across borders while respecting data protection rules.

### 2.4 EU financial support for digital initiatives

In the past decade, there have been a number of – fragmented - private, public and mixed initiatives developing IT solutions for the digitalisation of IWT, which have made some Member State- and regional-level operations more efficient<sup>27</sup>. In addition to national systems, some initiatives have been developed through collaborations between several Member States' authorities.

EU financial support for digital initiatives in the IWT sector has mainly come from the CEF, the European Structural and Investment Funds (ESIFs), the Horizon 2020 programme<sup>28</sup> and the Instrument for Pre-Accession Assistance<sup>29</sup>.

For example, the **Novimar**<sup>30</sup> project – supported by the Horizon 2020 research and innovation programme – is developing a new inland transport concept called the 'vessel train', which consists of a lead vessel, followed by a series of minimally manned, digitally connected

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23 [https://ec.europa.eu/transport/themes/infrastructure-ten-t-connecting-europe/tentec-information-system\\_en](https://ec.europa.eu/transport/themes/infrastructure-ten-t-connecting-europe/tentec-information-system_en)

24 [https://ec.europa.eu/transport/sites/transport/files/tentec\\_omc\\_glossary.pdf](https://ec.europa.eu/transport/sites/transport/files/tentec_omc_glossary.pdf)

25 <https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/About+CEF+building+blocks>

26 [http://ec.europa.eu/internal\\_market/imi-net/index\\_en.htm](http://ec.europa.eu/internal_market/imi-net/index_en.htm)

27 For example, Lavdis (CZ), SlovRIS (SK), DoRIS (AT), PannonRIS (HU), HIR (HU), Veli (FR), ELWIS (DE), MIB++ (DE), BICS (NL) and VisuRIS (Flanders).

28 <https://ec.europa.eu/inea/en/horizon-2020>

29 The Instrument for Pre-accession Assistance is the means by which the EU supports reforms in candidate and potential candidate countries by providing financial and technical help. Serbia is one of the candidate countries that have waterways connected to EU countries and are benefiting from this assistance.

30 NOVel Iwt and MARitime transport concepts.

follower vessels. This concept aims to reduce operational costs and increase economies of scale by making better use of existing infrastructure. This in turn will lead to better access to urban environments, thereby reducing congestion in populated areas (EU contribution: EUR 8 million by May 2021).

As part of the CEF-funded **RIS COMEX** (RIS Corridor Management Execution) project<sup>31</sup>, 13 partner countries have joined forces to provide cross-border RIS along the relevant ‘corridors’<sup>32</sup> (rivers). Services such as route planning, voyage planning, transport management and traffic management will be provided not just locally, but across borders, based on operational exchange of RIS data with common data quality, equal service level and unique access. The project aims to:

- improve planning capabilities;
- make transport times more reliable;
- reduce waiting and travel times;
- increase the efficiency of inland navigation transport;
- make optimal use of infrastructure; and
- reduce the administrative burden.

The RIS COMEX services will benefit both the authorities (e.g. traffic management) and the logistics sector (e.g. transport management). The project also serves as a platform, bringing together public and private actors and facilitating dialogue between shippers, boat masters and vessel, fleet and terminal operators (EU contribution: EUR 15.6 million; project ends December 2020).

**The pilot implementation of ‘RPIS’, an Upper Rhine traffic management platform**<sup>33</sup> also funded by the CEF, aims to provide a web-based integrated solution for scheduling port calls and facilitating related communication between barges and ports/terminals. A total of 17 terminals in nine ports in three countries (Germany, France and Switzerland) have participated in the pilot. RPIS has three modules: coordination of barge calls, container data exchange and customs. The planning tool for port calls helps barge operators to book a timeslot in advance and helps the ports/terminals to accept or reject the booking or propose another timeslot. It also indicates how long the barge is expected to stay in the port to carry out the operations requested. RPIS takes into account the number of containers to be loaded/unloaded, the distance to the next port, location data provided by AIS<sup>34</sup> and – in the near future – the traffic situation at the locks. It also takes into account times when the port/terminal is unavailable (maintenance works, national holidays, slots already booked, etc.) and provides proactive warnings in the event of changes to the schedule to improve the planning process for all stakeholders (EU contribution: EUR 1 million; project ends in June 2018).

The 2014 and 2015 CEF Transport calls for proposals made EUR 34 million available to support the digitalisation of IWT and inland ports, mainly through RIS-related projects. The 2018 CEF Transport call opened on 17 May 2018 with an indicative budget of

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31 The project consists of two twinned actions: 2015-EU-TM-0036-W (<https://ec.europa.eu/inea/en/connecting-europe-facility/cef-transport/2015-eu-tm-0036-w>) and 2015-EU-TM-0038-W (<https://ec.europa.eu/inea/en/connecting-europe-facility/cef-transport/2015-eu-tm-0038-w>).

32 Danube, Rhine, Amsterdam-Antwerp-Liège, Amsterdam-Antwerp-Brussels, Mosel, Elbe and Dunkirk-Scheldt.

33 <https://ec.europa.eu/inea/en/connecting-europe-facility/cef-transport/2014-eu-tm-0210-s>

34 Automatic Identification System

EUR 450 million<sup>35</sup> and a focus on digitalisation and multimodality, and the Horizon 2020 work programme supports projects related to 'Moving freight by Water: Sustainable Infrastructure and Innovative Vessels'. These ongoing programmes continue to support multimodality and digitalisation in the IWT sector, in areas such as autonomous shipping, sustainability, innovative vessels, and automated and connected inland waterways and ports infrastructure.

### 3. THE FINDINGS OF THE DINA STUDY

The DINA study states that it is imperative for the IWT sector to keep up with digital developments (both horizontal developments and developments in other modes of transport) to improve the sector's competitiveness and ensure that it becomes an active part of a broader multimodal chain.

The **DINA study** identifies **three key issues** that pose a threat to the competitiveness of the IWT sector:

#### 3.1 Inefficient navigation and traffic management

Limited availability of up-to-date information on traffic conditions is a problem for barge operators because it makes it difficult for them to adapt their voyage plans based on real-time conditions (e.g. delays at a certain bridge or lock, berth allocations in ports, updates to terminal calls in a large port with multiple terminals). This leads to unnecessary delays, reduced quality of service (in terms of punctuality/reliability) and unnecessarily high fuel burn (e.g. to compensate for delays). These problems affect all barge operators. It is difficult to quantify upfront the exact savings potential of digitalisation, but studies in road transport have shown that significant gains can be made. For example, the 2014 DHL trend report, *Self-driving vehicles – the road to the future?* showed that truck platooning has the potential to reduce fuel burn by 10-20 %<sup>36</sup>. Similar percentages were shown in projects such as Prominent and VoortVarend Besparen.

Fairway authorities experience similar problems. They need to manage their infrastructure and traffic, which involves operating bridges and locks and handling traffic flows in a safe and efficient manner. This leads to high costs both in traffic management and in investments in infrastructure to ease congestion. Some bottlenecks could be relieved by better planning procedures and planning tools, which would save more money for investments (e.g. investing in an additional lock chamber).

The underlying problem for both sides is the reluctance to share the required detailed voyage plans with the fairway authorities, making it difficult to execute smart navigation schemes in waterway corridors.

#### 3.2 Inefficient integration of IWT in logistics processes

Cargo owners, multimodal terminals and logistics service providers experience high transaction costs when conducting business with barge operators. This is because it is more difficult to find, contract and book a suitable service in IWT than in other modes of transport. Especially for multimodal (containerised) operations, it is important that information about

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35 <https://ec.europa.eu/inea/en/connecting-europe-facility/cef-transport/apply-funding/2018-cef-transport-call-proposals>

36 [http://www.dhl.com/content/dam/downloads/g0/about\\_us/logistics\\_insights/dhl\\_self\\_driving\\_vehicles.pdf](http://www.dhl.com/content/dam/downloads/g0/about_us/logistics_insights/dhl_self_driving_vehicles.pdf)

these services and their availability is readily accessible, and that the services can be managed efficiently’.

Furthermore, there is little information provided about the journey, resulting in logistics inefficiencies at ports and terminals. Terminal operators want to know when a specific barge is going to arrive, in order to plan their internal operations. There are currently no standardised schemes in place to provide this information, making it difficult to optimise processes. This limits the overall use of inland waterways – particularly in multimodal chains. It also represents a potential loss of revenue for barge operators as shippers choose other modes of transport for their operations.

The underlying problem is that barge operators need to make more systematic use of the booking and cargo management systems of shippers and logistics service providers, in order for both parties to exchange information about logistics needs, transport capabilities, bookings and status updates.

### **3.3 Administrative burden and costs involved in complying with and enforcing legislation**

Barge operators need to comply with relevant legislation – both safety-related and non-safety-related (e.g. provision of statistics). In many cases, this includes filing certain declarations to the authorities, e.g. on voyages with dangerous cargo and containerised freight.

Barge operators indicate that they have to file the same data multiple times, either to comply with different aspects of legislation or because they are dealing with multiple jurisdictions in cross-border operations, or both.

Compliance with legislation therefore represents a high administrative burden for barge operators, as well as high costs for the authorities that have to verify their compliance.

The underlying problems are the existing ‘declaration-based’ reporting system and the limited re-use of data by authorities. If new reporting schemes are necessary for inspection and oversight purposes, it is important to re-use existing facilities and data to keep the administrative burden as low as possible.

#### **DANTE project<sup>37</sup> – Improving administrative procedures and processes for IWT on the Danube**

Administrative barriers to goods and passenger transport on the Danube and its navigable tributaries are a major obstacle to the efficient and sustainable use of the Danube as the main water-based transport axis of the region.

The DANTE project identified **225 administrative procedures in total for the Danube**, which runs from the Black Forest in Germany to the Black Sea in Romania.

Tackling, mitigating and eliminating the administrative burden in a coordinated and transnationally integrated manner is the main objective of the project. This is expected to reduce related expenses and lead to better governance and management of this environment-friendly European transport infrastructure.

Reducing the administrative burden (through greater use of RIS tools, for example) may also help IWT to achieve a higher share of the modal split.

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<sup>37</sup> Source: Dante project management; <http://www.interreg-danube.eu/approved-projects/dante>

#### 4. OUTLINE OF FINDINGS FROM THE DINA STUDY AND ONGOING INITIATIVES

Stakeholder consultations during the DINA study and discussions in the DINA expert group<sup>38</sup> and other fora related to transport and digital subjects (such as the Digital Transport and Logistics Forum, RIS weeks, etc.) have brought up the following points to be considered:

- improving navigation and traffic management: this is necessary to make better use of existing infrastructure and to reduce fuel costs for vessel operators;
- integrating IWT with other modes of transport, especially in multimodal hubs: this is necessary to optimise terminal processes and to further integrate IWT in supply chains and multimodal logistics operations, thereby potentially attracting additional customers; and
- reducing the administrative burden by reducing the number of business-to-government declarations via e-government solutions (thereby saving money and improving efficiency) and making law enforcement more efficient and effective.

According to the DINA study all these steps would help reduce paperwork, costs and bureaucracy and improve compliance with legislation. They would help make inland waterways traffic smoother and inland navigation processes more efficient for stakeholders, as well as reducing the sector's impact on the environment.

In addition, using digital technology as an integrated part of governments' modernisation strategies can unlock further economic and social benefits for society as a whole<sup>39</sup>. The digital transformation of governments across Europe is one of the cornerstones of making the Digital Single Market a reality. Effective eGovernment can offer a wide variety of benefits, including making governments and businesses more efficient and saving them money.

##### 4.1 Outline of findings from the DINA study

DINA study findings consist of the following three components:

- **extension of RIS** by providing additional (real-time) data, increasing interoperability and making the services more usable for barge operators thanks to new on-board digital tools and apps. An emphasis could also be placed on improving the integration of existing RIS along corridors and increasing the amount of real-time data shared between infrastructure managers and barge operators. This real-time data exchange could include, for instance, up-to-date information on traffic and other travel conditions beyond the existing notices to skippers;
- a **data platform for barge operators**, providing an environment in which they could maintain their data on vessels, voyages, cargo and crew. It would also serve as an interface between barge operators, their customers and other stakeholders, such as public authorities (for reporting purposes), (inland) ports and terminals. This platform would optimise traffic management (because more data would be available on the voyage plan of an individual vessel) and, at the same time, reduce the administrative burden linked to the various reporting requirements regarding the cargo, the vessel and the crew. Currently around 40 documents are kept on a barge for various purposes. Having this information available in a digital format would reduce the burden for both businesses and authorities<sup>40</sup>.

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38 DINA expert group meeting report;

<http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupMeetingDoc&docid=13034>

39 Recommendation of the Council on Digital Government Strategies, OECD, 2014.

40 DINA Expert Group meeting report; <http://www.cc.cec/regexp/group/view.do?refGroup=3505>

A data-sharing platform serving as a 'digital back office' for more static documents (e.g. vessel certificates, certificates of crew members' qualifications, certificates for various on-board equipment, inspection reports and insurance policies) could also be used by inland waterways authorities, barge operators and other parties. This was also proposed by the river commissions during the DINA expert group meeting<sup>41</sup>; and

- **integrating IWT with booking and transport management platforms of shippers and logistics service providers.** This should increase the amount of information available (related to the whereabouts/planned arrival of a vessel/cargo, bookings, etc.) and help integrate IWT in the multimodal logistics chain.

To facilitate the implementation of the DINA findings, the following short-, medium- and long-term activities are proposed by the DINA study:

- **short-term action:** improving and updating RIS, associated services on a corridor level and shared European databases;
- **medium-term action:** public-private collaboration. This could be accelerated through publicly (co-)funded innovation and deployment programmes, in addition to the ongoing development and management of the required standards. In addition, several aspects of DINA require digitalisation initiatives in the private domain, e.g. the horizontal integration between barge operators and inland ports and the marketing of new on-board equipment; and
- **long-term action:** providing solutions for future digital developments. These would probably be in the areas of integration with other transport modes and digital services for e-navigation/autonomous navigation.

#### 4.2 Stakeholders': proposals for digitalisation<sup>42</sup>

In November 2017, a coalition of inland waterway transport operators and ports proposed its vision towards 2030. Its representatives are convinced that green, smart and congestion-free transport and logistics serving a circular and bio-based economy will only be a reality tomorrow if they can build on a solid policy strategy supported by sufficient and effective implementation tools. "Digitalisation at Work" is part of this vision and it calls for a **Single Window** enabling:

- **Traffic planning:** Optimisation of lock and bridge schedules in cross- border corridors to reduce waiting times, the overall duration of the voyage and to optimise energy use;
- **Route planning:** Provision of network information including its operation status to support route planning. Actual and forecast information on the fairway allowing for more efficient planning.
- **Voyage Planning:** Supporting voyage planners with real-time and predicted traffic information and interface to traffic planning services to ensure best-possible ETAs.
- **Logistics Planning:** Single window access for the exchange of vessel and cargo position information among logistics users to make waterway transport visible in the digital supply chain.

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41 *Ibid.*

42 <http://www.inlandnavigation.eu/news/events/inland-waterways-ports-present-vision-for-2030-bis/>

- Less red tape: Single window services limit multiple reporting. In addition, data are collected and analysed for a more efficient use of the waterway infrastructure.
- Berth management: Berths are the waterway parking spaces. The tool provides online information about available berths & their facilities and allows booking of berth space.

### 4.3 RIS evaluation and initiative on digital tools for inland waterway transport

#### 4.2.1. *RIS evaluation*

More than 10 years have passed since the RIS Directive was adopted and implemented. In light of the technological developments that have occurred during that time, and given the role of RIS in the DINA study, the Commission has decided to undertake an evaluation<sup>43</sup> of the RIS Directive. The evaluation will verify the extent to which the Directive has been implemented by the Member States and assess its effectiveness, efficiency, relevance, coherence and EU added value. The evaluation will provide the evidence base for a possible revision of the current framework and inform any further decisions on future legislation.

#### 4.2.2. *Digital tools for inland waterway transport*

In a joint statement sent to the Commission in 2016, the social partners representing the IWT sector at EU level<sup>44</sup> and Aquapol<sup>45</sup> expressed their shared interest in developing a coherent and enforceable sectoral legislative framework at EU level. After the Council Directive on working time for inland waterway transport<sup>46</sup> and the Directive on the recognition of professional qualifications in inland navigation, they consider an EU initiative on digital tools to be the next building block in this framework.

In this context, the fact that service record books, logbooks and other official documents related to crew members or vessels exist mainly in paper form is a problem because they represent an administrative burden for users and authorities and are prone to being tampered with.

In autumn 2017, the Commission services started an impact assessment process<sup>47</sup> with the objective of assessing possible tools that could facilitate compliance with and possible enforcement of IWT legislation.

### 4.4 Possible re-use of / synergies with existing solutions from other sectors

More and more areas of economic activity are becoming digitalised. Thus, solutions that have been developed and applied in other areas could be used as part of DINA. Re-using and building on existing systems could significantly shorten the time to market and avoid duplication of efforts and investments.

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43 Roadmap related to the evaluation of the RIS Directive;

[http://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-5329205\\_en](http://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-5329205_en)

44 The European Barge Union (EBU), the European Skippers' Association (ESO) and the European Transport Federation (ETF).

45 The organisation for international police cooperation on the water.

46 Council Directive 2014/112/EU of 19 December 2014 implementing the European Agreement concerning certain aspects of the organisation of working time in inland waterway transport, concluded by the European Barge Union (EBU), the European Skippers Organisation (ESO) and the European Transport Workers' Federation (ETF) (OJ L 367, 23.12.2014, p. 86).

47 *Digital tools for inland waterway transport legislations*, inception impact assessment;

[http://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-6171228\\_en](http://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-6171228_en)

For example, the Commission's Joint Research Centre used the digital tachograph for road transport as inspiration for its preparatory investigations into developing digital tools, as referred to in the previous section<sup>48</sup>.

#### **Example from road transport: digital tachograph**

The tachograph aims to help enforce the rules on driving times and rest periods and monitor the driving times of professional drivers in order to ensure good working conditions and guarantee fair competition and road safety.

Digital tachographs have been in use for road transport since 2006; they allow data to be recorded and stored more securely and accurately than with the previous analogue tachograph. The system is built to ensure that inspections remain simple.

For vehicles registered for the first time as from 15 June 2019, smart tachographs will be fitted with new and advanced features<sup>49</sup>:

- better security mechanisms to make fraud more difficult and reduce the administrative burden, which is expected to save companies EUR515 million per year;
- an interface with satellite navigation systems (GNSS), especially Galileo, EGNOS and the European GNSS Agency;
- a remote communication facility to communicate the tachograph data to police officers on the roadside when the vehicle is moving, thus avoiding unnecessary stops for checks; and
- an Intelligent Transport System (ITS) interface to link the tachograph with other ITS applications.

For example, the Union Maritime Information and Exchange System<sup>50</sup> (SafeSeaNet) was established under the VTMISS Directive<sup>51</sup> and was developed for maritime transport.

#### **Example from Maritime Transport/Vessel Traffic Monitoring: the Union Maritime Information and Exchange System**

Through integration, the system provides operational services that support safety, security and pollution prevention and facilitate efficient maritime transport and traffic. SafeSeaNet acts as a platform connecting the relevant maritime authorities across the EU, allowing data to be exchanged and shared between sectors and across borders.

The system integrates and combines data from diverse sources with information required to be notified by ships when leaving or arriving at EU ports. It also offers – among other services – vessel monitoring, situational awareness and surveillance, and transport facilitation functions, all within the same system, thereby supporting the authorities involved by providing an integrated maritime picture.

In particular, the on-board AIS transmitters and on-shore AIS installations required by the VTMISS Directive provide information on the actual time of arrival/departure, allowing near

48 *eIWT – Electronic tool for Inland Waterways Transport*, JRC technical report (2016);

<https://ec.europa.eu/transport/sites/transport/files/2017-03-14-study-eiwt-d4-postws-rev7.pdf>

49 Regulation (EU) No 165/2014 of the European Parliament and of the Council of 4 February 2014 on tachographs in road transport, repealing Council Regulation (EEC) No 3821/85 on recording equipment in road transport and amending Regulation (EC) No 561/2006 of the European Parliament and of the Council on the harmonisation of certain social legislation relating to road transport.

50 <http://www.emsa.europa.eu/operations/maritime-monitoring.html>

51 Directive 2002/59/EC on vessel traffic monitoring.

real-time monitoring and more efficient traffic and transport management.

Since AIS devices are available on both maritime and IWT vessels, and the maritime and IWT AIS tools are interoperable, it is possible that the maritime AIS tools could be re-used and adapted for the IWT sector. Exploring this possibility would also help IWT to play an important role in boosting the effectiveness of intra-EU waterborne transport and trade, as part of the EU maritime transport space without barriers.

Verifying compliance with legislation also entails high costs for the authorities. However, there is potential to make this process more effective and cost-efficient in the IWT sector by using the once-only principle<sup>52</sup>. Currently, in only 48 % of cases do public administrations re-use information about citizens or companies that is already in their possession, rather than requesting it again. According to the Digital Single Market Strategy, the extension of the once-only principle – in compliance with data protection legislation – would generate an annual net saving at EU level of around EUR 5 billion. Furthermore, the findings from a similar initiative from the maritime sector, the Reporting Formalities Directive<sup>53</sup>, suggest that the digital-by-default principle would also prove beneficial for the inland waterways sector.

#### **Example from maritime transport: the Reporting Formalities Directive**

The **Reporting Formalities Directive** (RFD) initiated the creation of national single windows for completing reporting formalities in connection with port calls. The implementation of the Directive was evaluated over the course of 2016 and 2017. According to the evaluation, the introduction of the RFD has resulted in:

- a higher degree of digital reporting;
- increased use of digital forms;
- rationalisation of redundant data reporting in most Member States;
- faster implementation of national standards and national single entry points; and
- and higher degree of coordination of reporting.

This means that, without the RFD, much more reporting would be paper-based instead of digital.

However, the successful implementation of the RFD has been hampered by divergent national approaches to the implementation of National Single Windows and by the lack of harmonised data sets and interfaces. On 17 May 2018, to facilitate the electronic transmission of information in relation to reporting formalities, the Commission therefore adopted a proposal for a harmonised and interoperable European Maritime Single Window environment (EMSWe)<sup>54</sup>, based on National Single Windows.

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52 The EU e-government action plan 2016-2020 defines the once-only principle as follows: ‘public administrations should ensure that citizens and businesses supply the same information only once to a public administration. Public administration offices take action if permitted to internally re-use this data, in due respect of data protection rules, so that no additional burden falls on citizens and businesses’.

53 Directive 2010/65/EU on reporting formalities.

54 COM(2018) 278 final, 17.5.2018.

National systems for Electronic Ship Reporting have been set up in 16 countries. Data exchange via these systems focuses on cargo and voyage information, but cross-border exchange of this information – as required by the RIS Directive – is fully operational only at seven borders (out of 21)<sup>55</sup>.

## 5. CONCLUSION

This document described existing initiatives<sup>56</sup> and tools<sup>57</sup> in the area of digitalisation of inland navigation in an integrated way and presented the findings of the DINA study and ongoing Commission initiatives and tools in the area of digitalisation of inland navigation.

The Commission services will continue ongoing discussions in the meetings of its expert groups dedicated to inland navigation: NAIADES II, DINA, Social Issues and Technical Requirements for Vessels. They will also continue to do so in cross-modal and cross-sectoral fora (such as the Digital Transport and Logistics Forum<sup>58</sup>), as well as in fora related to the maritime sector or other sectors, with the objective of seeking synergies and improving interoperability in logistics and freight transport across Europe.

The information technology dimension is also included in the continuing dialogue with river commissions, RIS experts and the UN-ECE and CESNI, the European Committee for drawing up standards in the field of inland navigation.

Ongoing initiatives by the Commission services - such as the evaluation of the RIS Directive<sup>59</sup> and the Impact Assessment<sup>60</sup> on Digital Tools for Inland Navigation legislation - help frame the discussion on the digitalisation of the inland waterways transport sector.

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55 <http://www.inlandnavigation.eu/what-we-do/digital-policy/>

56 such as the evaluation of the RIS Directive and the impact assessment on digital tools for inland navigation legislation

57 Such as the EHDB or ERDMS

58 <http://www.dtlf.eu/>

59 [http://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-5329205\\_en](http://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-5329205_en)

60 Inception impact assessment: Digital tools for inland waterway transport legislations;  
[http://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-6171228\\_en](http://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-6171228_en)