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BOOSTLOG PROJECT

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3	FUNDACION ZARAGOZA LOGISTICS CENTER (ZLC)	ES
4	STICHTING TKI LOGISTIEK (TKI Dinalog)	NL
5	HACON INGENIEURGESELLSCHAFT MBH (HACON)	BE
6	INSTITUTE OF COMMUNICATION AND COMPUTER SYSTEMS (ICCS)	GR
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EXECUTIVE SUMMARY

In the framework of BOOSTLOG activity on Identification and prioritization of R&I gaps, Deliverable 4.1 launched a first set of high relevance topics for freight transport of logistics. The present deliverable builds upon those topics, focussing on a gap and white spot analysis, that will eventually feed BOOSTLOG recommendations for policymakers.

Indeed, this document focuses on analysing existing European funded projects for the most relevant Logistics Clouds and identifying topics poorly or not covered by those projects. These Logistics Clouds stem from the heat map developed in D4.1, including all promising logistics concepts identified by BOOSTLOG stakeholders.

The analysis performed for the present deliverable has been focused on the top ten promising logistics concepts:

1. Data sharing architecture / technology
2. Interconnected logistics networks
3. System of logistics networks: the physical internet
4. Fostering cooperation and collaboration among the logistics chain
5. Supply chain visibility
6. Autonomous operations
7. Autonomous transport
8. E-commerce delivery concepts
9. Supply chain resilience
10. Synchromodality

When comparing these promising logistics topics with the projects identified in Deliverable 2.1 (Detailed Mapping of EU-Funded Research Projects), the following conclusions were derived:

The biggest gap was found in the fields of *autonomous operations* and *autonomous transport.* This was followed by concepts such as e-*commerce delivery*, *system of logistics networks: the physical internet* and *supply chain resilience*.

A medium gap was found for the concepts of *interconnected logistics networks*, *supply chain visibility*, *data sharing architecture / technology* and *synchromodality*.

Finally, the promising logistics concept on *fostering cooperation and collaboration among the logistics chain* was appreciably addressed by the many of projects analysed.

Based on the results above, new recommendations should be issued, mainly to cover the gaps on autonomous operations and autonomous transport.

As a next step, BOOSTLOG will derive concrete recommendations for future research with clear indications of the R&I programme matching the expected impacts as part of Deliverable 4.3.

This analysis will be later complemented in a second iteration of the gap analysis report (Deliverable 4.5), that will also showcase national and regional projects covering the identified gaps, as well as new European projects funded by the first calls of Horizon Europe. Furthermore, market trends (stemming from Gartner Supply Chain Trends, or the DHL Innovation Radar, among others) will be scouted to challenge the identified R&I gaps.

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1 Introduction

1.1 BOOSTLOG project

BOOSTLOG Vision is transforming European freight transport and logistics R&I ecosystem to perform optimally boosting impact generation out of R&I investment contributing to i) EU policy objectives towards climate neutrality, pollution, congestion and noise reduction, free movement of goods, internal security, digital transformation of logistics chains and data sharing logistics ecosystems and ii) *Companies* sustainability and competitiveness generating value for society.

In order to do so, BOOSTLOG has identified 4 main areas of action: i) increase visibility and support valorisation of R&I project Results, Outcomes and Implementation Cases in the freight transport and logistics field ii) develop and implement valorization strategies and guidelines to speed up the technological and organisational innovation uptake, including the creation of the Innovation Marketplace and issue recommendations to increase impact of R&I public funding, iii) Define high potential & priority R&I gaps to make efficient uses of R&I investments and iv) Strengthen R&I impacts communication and Stakeholders engagement in the innovation process.

1.2 Scope of this deliverable

In the framework of BOOSTLOG WP4, "Identification and prioritization of R&I gaps", Task 4.1 launched a first set of promising logistics concepts. The present deliverable builds upon those topics, performing a gap and white spot analysis. The outputs of this analysis, together with D4.1 will feed into the upcoming Deliverable 4.3 (Recommendations for future R&D Logistics Clouds).

This document will be the first version of the gap analysis for R&I Logistics Clouds and will be later detailed in a second iteration that will result into deliverable D4.5.

2 Heat map

The first step to perform the gap analysis targeted by this deliverable is to map existing projects for the most relevant Logistics Clouds. These Logistics Clouds stem from the heat map developed in D4.1 (Definition of high relevance topics for freight transport and logistics), that includes all the promising logistics concepts versus the relevant Key Enabling Technologies (KETs) and the market and societal trends and drivers impacting logistics and transport (all of them collected based on ALICE roadmaps and former national and European projects).

The heat map shows the relevance of the KETs and trends for the promising logistics concepts on a scale of 1-3, scaled from green to red. The same analysis was conducted for the connection between the promising logistics concepts and the technologies. The most important trends in connection with the selected topics are shown in red (Figures 1 and 2). Further detail can be found on D4.1 Definition of high relevance topics for freight transport and logistics (version 1)[1]

[1] Available at the BOOSTLOG webpage: https://www.etp-logistics.eu/wp-content/uploads/2021/12/BOOSTLOG_D4.1_Definition-of-high-relevance-topics-v1_final.pdf

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	Trends																			
	Distributed Ledger Technology & Blockchain	Next Generation Wireless - 5G	Clouds & Virtualisation	Standardisation & data modeling	Internet of Things	Mobile Computing	Digital Twins	Data Science	Artificial Intelligence	Big Data Analytics	Robotics, Cobots & Automation	Self Driving Vehicles / CCAM	Platooning	Augmented reality	Virtual Reality	Additive Manufacturing / 3D printing	Nano technologies	Alternative fuels & drive train technology	Predictive maintenance
Crowd shipping	2	3	3	1	3	3	1	3	3	2	1	1	1	2	1	1	1	1	1
Shared warehousing	1	1	2	2	1	1	2	1	1	1	2	1	1	1	1	1	1	1	1
Hyperconnected hubs	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	1	1	2
Agility: Plan, forecast and adapt to disruption	3	3	2	3	3	3	3	3	3	3	2	2	2	2	2	3	1	2	3
Influencing consumer behaviour	1	1	1	1	2	1	1	2	2	2	1	1	1	2	2	2	1	1	1
End-to-end international booking systems	2	2	3	3	2	2	2	3	2	3	2	2	2	2	1	2	2	2	2
Dynamic supply and demand planning	2	3	2	3	3	3	3	3	3	2	2	2	1	1	1	1	1	1	2
Flow synchronisation	2	2	2	2	2	2	2	3	2	2	2	2	2	1	1	1	1	1	1
Sustainability assessment tools	2	2	2	2	2	2	2	2	2	2	1	1	1	2	2	1	1	1	1
Autonomous logistics nodes	2	2	3	2	2	2	2	2	3	2	2	2	2	2	2	1	1	2	2
Shared networks	2	2	3	3	3	2	2	3	3	3	2	2	2	2	2	1	1	2	2
Public transport for logistics	2	2	2	2	2	2	2	3	2	3	2	3	2	2	1	1	1	2	2
Modular loading units (PI container)	2	2	2	3	3	2	3	2	2	2	3	2	2	2	2	2	2	1	2
Sustainable logistics sites, incl. warehouses	2	2	2	2	2	1	2	2	2	2	3	2	1	2	2	2	1	2	2
Sustainable fleets & assets	2	2	2	3	2	2	2	2	2	2	2	2	2	2	1	1	2	3	3
Synchromodality	2	2	2	3	3	2	3	3	3	3	2	2	2	2	2	2	2	2	2
Connected corridors and hubs	2	3	3	3	3	2	3	2	2	3	2	2	1	2	2	1	1	2	2
Emissions measurement & reporting schemes	2	2	2	3	2	2	2	2	2	3	1	1	1	2	2	1	1	2	2
Autonomous operations	2	3	3	2	3	3	2	2	3	2	3	3	2	2	2	1	2	2	2
Autonomous transport	2	3	2	3	2	2	2	3	3	3	3	3	2	2	2	1	2	2	2
E-commerce delivery concepts	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	1	2	1
Supply chain visibility	2	2	3	3	3	3	2	3	2	3	1	1	1	2	2	1	1	1	2
Shared transport / pooling and goods consolidation	2	2	2	3	2	2	2	2	3	3	2	2	2	2	1	1	1	2	2
Fostering cooperation and collaboration among the logistics chain	2	2	2	3	2	2	2	3	2	3	2	2	1	1	1	1	1	2	2
Interconnected logistics networks	2	2	3	3	2	2	2	2	2	3	2	2	1	1	1	1	1	2	2
Supply chain resilience	2	2	2	2	2	2	2	3	2	2	2	2	1	2	1	2	2	2	2
System of logistics networks: The Physical Internet	2	2	3	3	3	2	3	3	3	3	2	2	2	2	2	2	1	2	2
Zero emission vehicles / cargo bikes	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	3	2
Data sharing architecture / technology	2	2	2	3	3	2	2	2	2	3	2	2	2	2	1	2	2	2	2

Figure 1. Heat map: promising logistics concepts vs trends

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	Topics																
	Reshoring	Crowd-economy	Personalisation / consumer centricity	On-demand-economy	Urbanisation vs reversed urbanisation	Local-for-local	Climate change	Circular Economy	Resource scarcity and depletion	Sustainability	Skilled workforce shortage	Demographic change	Inclusiveness	New work & social innovation	E-commerce	Covid-19
Crowd shipping	1	2	2	2	2	3	3	1	1	3	1	3	1	2	3	2
Shared warehousing	2	2	2	2	1	2	2	2	1	2	1	1	2	2	2	1
Hyperconnected hubs	2	2	2	3	2	2	3	3	3	3	2	2	2	1	3	2
Agility: Plan, forecast and adapt to disruption	2	3	3	3	2	3	3	3	3	3	2	2	2	3	3	3
Influencing consumer behaviour	1	2	3	2	2	3	3	3	2	3	1	2	2	2	3	2
End-to-end international booking systems	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2
Dynamic supply and demand planning	2	2	2	3	2	2	2	2	2	2	2	2	2	2	3	2
Flow synchronisation	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Sustainability assessment tools	2	2	2	2	2	2	3	3	3	3	2	2	1	2	2	1
Autonomous logistics nodes	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	1
Shared networks	2	2	2	2	2	2	3	3	3	3	2	1	1	2	2	2
Public transport for logistics	2	2	2	2	2	2	3	2	2	3	2	2	2	2	3	2
Modular loading units (PI container)	2	2	2	2	2	2	2	3	2	2	2	1	1	1	2	1
Sustainable logistics sites, incl. warehouses	2	1	2	2	2	2	3	2	2	3	2	2	2	2	2	2
Sustainable fleets & assets	2	2	2	2	2	2	3	3	3	3	2	2	2	2	2	2
Synchromodality	2	2	2	2	2	2	3	2	2	3	2	2	2	2	2	2
Connected corridors and hubs	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Emissions measurement & reporting schemes	2	2	2	2	2	2	3	2	2	3	1	1	1	1	2	2
Autonomous operations	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Autonomous transport	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
E-commerce delivery concepts	2	2	3	3	2	2	2	2	2	3	2	2	2	2	3	2
Supply chain visibility	2	2	2	2	2	2	2	2	2	2	2	1	1	1	2	2
Shared transport / pooling and goods consolidation	2	2	2	2	2	2	3	2	2	3	2	2	2	2	3	2
Fostering cooperation and collaboration among the logistics chain	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2
Interconnected logistics networks	2	2	2	2	2	2	3	2	2	3	2	2	2	2	2	2
Supply chain resilience	2	2	2	2	2	2	3	2	3	3	2	2	2	2	3	2
System of logistics networks: The Physical Internet	2	2	2	3	2	2	3	3	2	3	2	2	2	2	3	2
Zero emission vehicles / cargo bikes	1	2	2	2	2	2	3	2	2	3	2	2	2	2	3	2
Data sharing architecture / technology	2	2	2	3	2	2	3	3	2	3	2	2	2	2	3	2

Figure 2. Heat map: promising logistics concepts vs topics

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3 R&I Logistics Clouds

The next step for the gap analysis is to define the R&I Logistics Clouds against which the projects will be assessed. From the 30 initial promising logistics concepts identified in D4.1, a prioritization of the most relevant concepts was obtained by a survey conducted in WP4 with 65 participants from the sector. The ranking of all the concepts is shown in Figure 3.

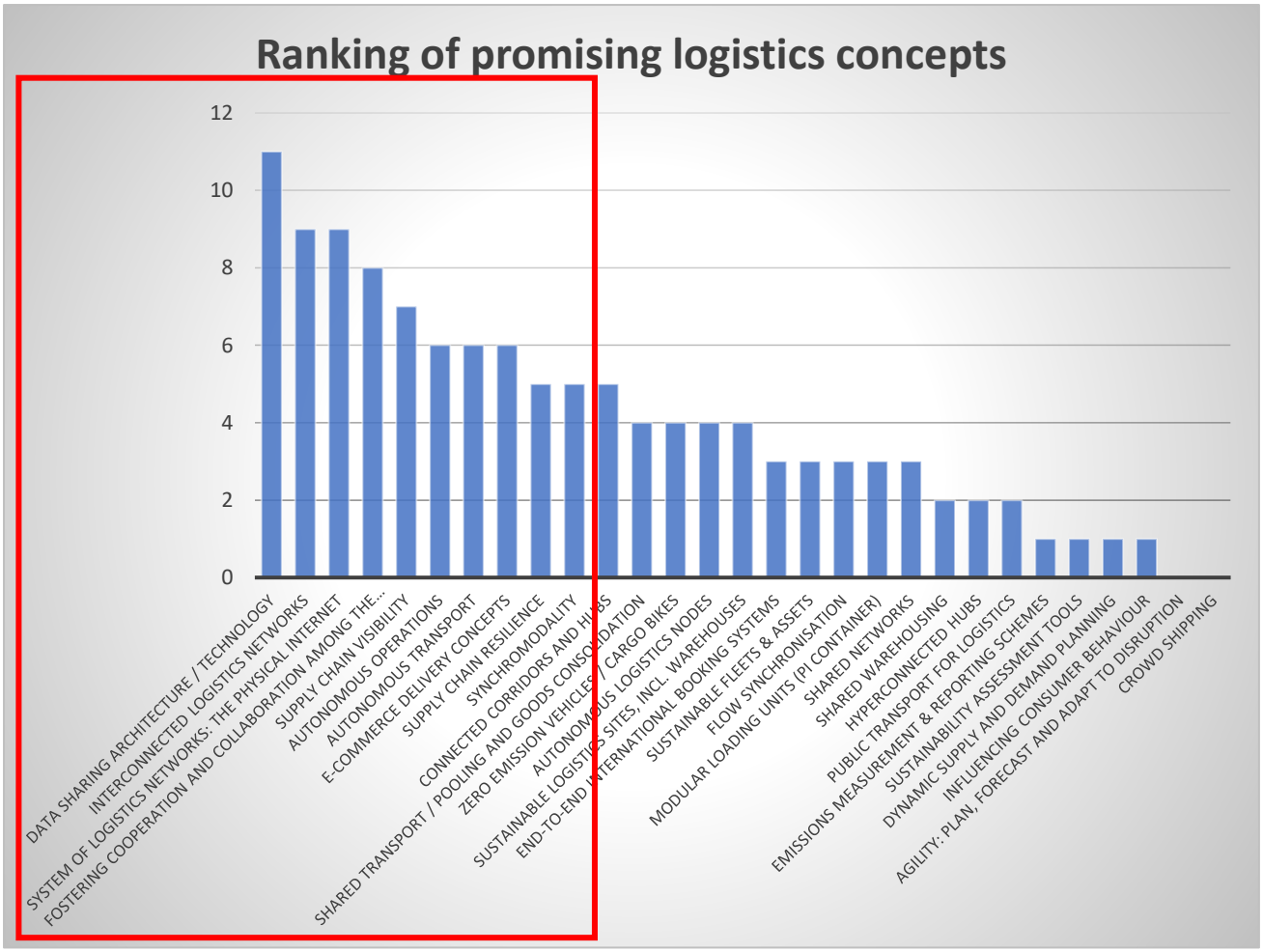

Figure 3. Ranking of promising logistics concepts

The top ten most voted promising logistics concepts are outlined below:

1. **Data sharing architecture / technology**. Development of a data sharing architecture for the logistics sector, which will lead to lowering the thresholds for data sharing between stakeholders in the sector.
2. **Interconnected logistics networks**. Interconnected logistics networks enable shipments to move seamlessly from one to the other network allowing real-time (re)configurable supply chains in (global) supply chain networks for all types of companies and participants.

3. **System of logistics networks: the physical internet**. Full consolidation of logistics flows from independent shippers. Additionally, the Physical Internet proposes to pool resources and assets in open, connected, and shared networks (i.e. connecting existing (company) networks, capabilities and resources) so they can be used seamlessly by network users and partners.
4. **Fostering cooperation and collaboration among the logistics chain**. Solutions that enable stakeholders in the logistics industry to co-operate and collaborate better in order to achieve individual and collective objectives.
5. **Supply chain visibility**. Execution of supply chain processes can improve if those stakeholders responsible and able to take decisions during execution are continuously aware of the performance of processes. This may require visibility of shipment locations, speeds, costs, stages of execution, payment status, etc.
6. **Autonomous operations**. Operations within logistics and/or supply chain management that take fully autonomous decisions without human interference.
7. **Autonomous transport**. The role and importance of humans as driver of a vehicle are being reduced with increasing automation of monitoring, analysis, decision making and actuation (e.g. steering, breaking) functions. Fully autonomous vehicles will only have people inside as passengers.
8. **E-commerce delivery concepts**. Consumers have a choice between different delivery channels, e.g. pick-up at shop, at a locker, delivery at home, at the neighbours etc. Based on this choice, the chain of services (modes, hubs, routing) is designed for maximum efficiency incl. environmental impact, which results in different concepts.
9. **Supply chain resilience**. The supply chain's ability to be prepared for unexpected risk events, responding and recovering quickly to potential disruptions to return to its original situation or grow by moving to a new, more desirable state.
10. **Synchromodality**. Flexible and sustainable allocation of cargo to different transport modes and routes in a network under the direction of a logistics service provider, so that the customer (shipper or forwarder) is offered an integrated solution for its (inland) transport.

The top 10 promising logistics concepts show a trend towards data technologies, the connection of logistics networks, a focus on supply chains as well as autonomous based concepts.

These 10 concepts were selected as R&I Logistics Clouds for the later gap analysis, identifying their connection to the projects mapped in D2.1 Detailed Mapping of EU Funded Research Projects.

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4 Mapping of projects contributions to the Logistics Clouds

As indicated in section 3, the 180+ projects mapped in D2.1 (Detailed Mapping of EU-Funded Research Projects) were assessed against the top 10 promising logistics concepts identified in D4.1. This enabled the identification of the concepts addressed by each project. Figure 4 shows the number of projects addressing the top 10 promising logistics concepts in their execution and delivering results pursuing these concepts.

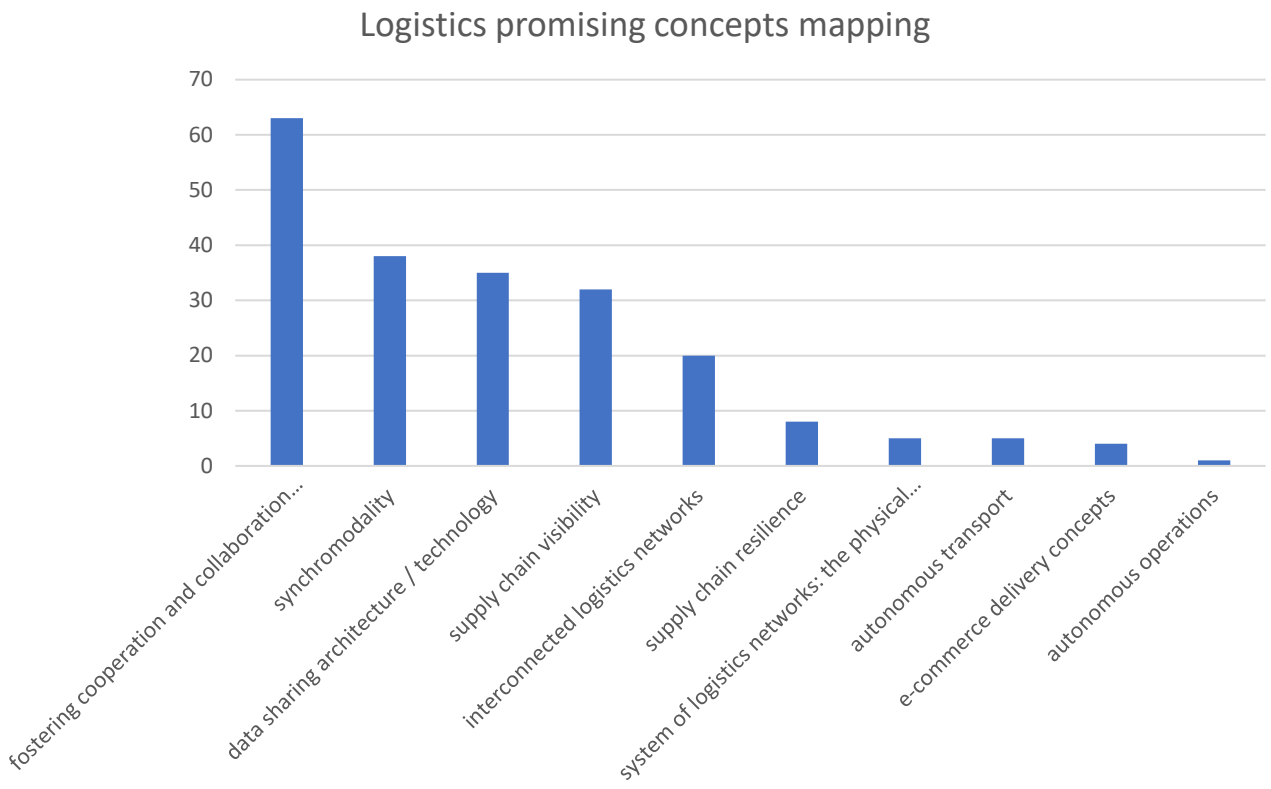

Figure 4. Top 10 logistics promising concepts mapping.

The following table shows the percentage of the projects analysed addressing the top 10 of promising logistics concepts. As can be observed there are some concepts addressed by a significant number of projects (at the top of the table). Some other concepts have been poorly addressed in the projects so far (at the bottom of the table) like *autonomous operations* contemplated in the objectives of only one project.

Table 1. Percentage of projects addressing the top 10 logistics promising concepts.

LOGISTICS PROMISING CONCEPTS	PERCENTAGE OF PROJECTS ADDRESSING THE CONCEPT
fostering cooperation and collaboration among the logistics chain	34,24%
synchromodality	20,65%
data sharing architecture / technology	19,02%
supply chain visibility	17,39%
interconnected logistics networks	10,87%

LOGISTICS PROMISING CONCEPTS	PERCENTAGE OF PROJECTS ADDRESSING THE CONCEPT
supply chain resilience	4,35%
system of logistics networks: the physical internet	2,72%
autonomous transport	2,72%
e-commerce delivery concepts	2,17%
autonomous operations	0,54%

A detailed analysis per cloud will be performed to identify the promising concepts addressed by past or existing projects. In Annex I the complete analysis for the Coordination and Collaboration cloud can be found. This analysis will be performed for the rest of the clouds after the release of each cloud report, and will feed into the second iteration of the gap analysis (D4.5).

Indeed, upcoming cloud reports include:

- D2.4 Urban Logistics
- D2.5 Logistics Nodes
- D2.6 Freight and Logistics Data Sharing
- D2.7 Multimodal Freight Corridors and Transport Network

Therefore, a detailed analysis of promising concepts such as e-commerce delivery will be included in D2.4 on urban logistics, while data sharing architecture/technology will be showcased in D2.6 Freight and Logistics Data Sharing.

Other upcoming cloud reports will gather a group of promising concepts. Such is the case of D2.5 Logistics Nodes and D2.7 on Multimodal Freight Corridors and Transport Network, that will include synchromodality, interconnected logistics networks and the Physical Internet, among others.

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5 Gap analysis

From the mapping exercise shown in section 4, the following gaps have been identified. Figure 5 shows the degree of commitment of the projects with the top 10 promising logistics concepts.

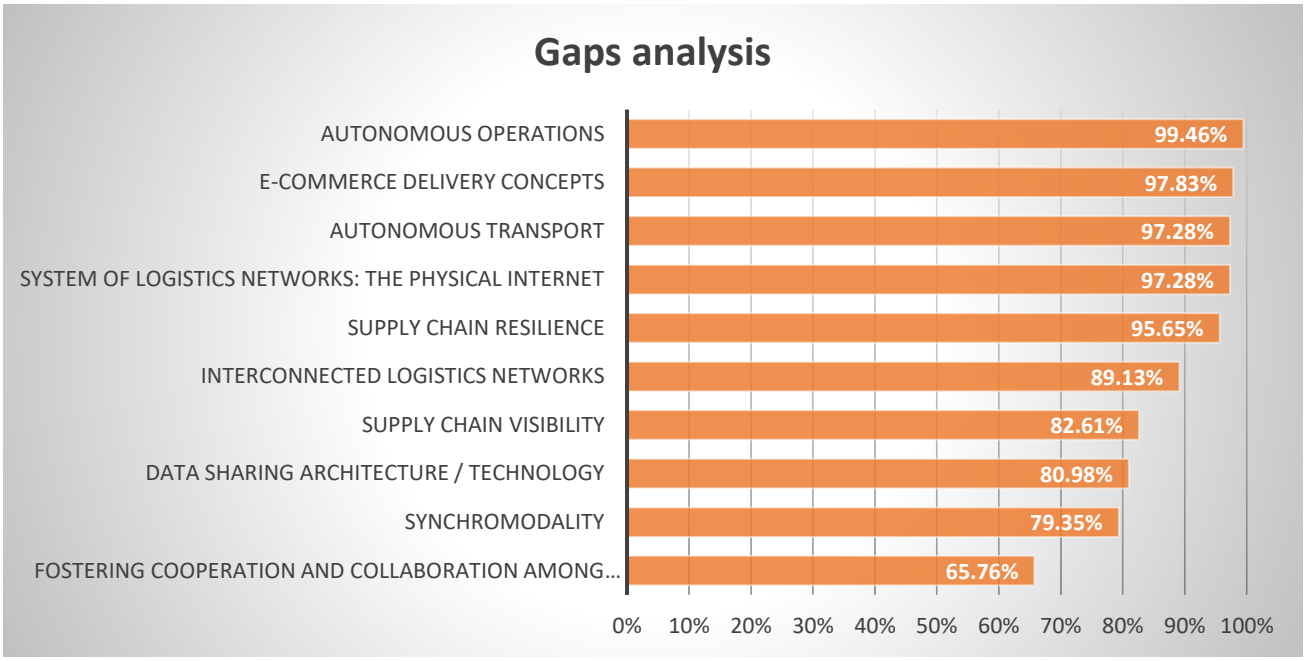

Figure 5. Gaps analysis.

A big gap has been found for the projects ranked with more than 90% in the figure, for all of them more than 95% of the projects analysed did not addressed the concepts. Here the *autonomous operations* concept (hit by only one project) presents the biggest gap of the list. *E-commerce delivery concepts*, *autonomous transport*, *system of logistics networks: the physical internet* and *supply chain resilience*, show also a big gap with less than 10 projects addressing them.

The European Commission has started to address this gap, with a topic in the 2022 call of Horizon Europe programme: *Seamless safe logistics through an autonomous waterborne freight feeder loop service*[2].

A medium gap was found for the concepts of *interconnected logistics networks*, *supply chain visibility*, *data sharing architecture / technology* and *synchromodality*, with a gap higher than 79 %. In this case *interconnected logistics networks* presents a higher gap in relation with the other concepts with only 20 projects addressing the concept (compared with more than 30 projects addressing the other 3 concepts).

The 2021 call in the new Horizon Europe programme already tackled this, with the topic *More efficient and effective multimodal freight transport nodes to increase flexibility, service visibility and reduce the average cost of freight transport*[3].

[2] https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2022-d5-01-05

[3] https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2021-d6-01-07

Finally, one promising logistics concept, *fostering cooperation and collaboration among the logistics chain*, was appreciably addressed by the projects analysed with a gap of 66% and 63 projects addressing it.

This is in line with the results stemming from D2.2 Cloud report - logistics coordination and collaboration, that showed projects funded by the EC in the field of coordination and collaboration during the last two decades.

6 Recommendations for policymakers

The analysis in section 5 shows that 9 of the top 10 promising logistics concepts have been little studied in previous funded projects. The following concepts are worthy to be included as relevant topics in the future Research programs from the European Commission.

1. Autonomous operations
2. E-commerce delivery concepts
3. Autonomous transport
4. System of logistics networks: the physical internet
5. Supply chain resilience
6. Interconnected logistics networks
7. Supply chain visibility
8. Data sharing architecture / technology
9. Synchromodality

6.1 First collection of recommendations

In order to validate the first selection of recommendations proposed in D4.1 to advance logistics research and innovation, they have been compared to the above promising logistics concepts:

1. **Connected networks in a sustainable society**

This action is intended to provide an answer on "How do interconnected networks need to be designed to help resolving resource scarcity?".

It is tackling the gaps on Physical internet, synchromodality, and interconnected logistics networks

2. **Coping with the on-demand economy**

This action is intended to provide an answer on "How can logistics concepts streamline the growing impact of e-commerce channels?"

It targets the gaps on Physical internet, interconnected logistics networks, and e-commerce delivery concepts.

3. **Prepare for disruption – resilience and visibility to the next level**

This action is intended to provide an answer on "How to achieve increased robustness of supply chains using multiplatform forecasting?"

It tackles the gaps on supply chain visibility and supply chain resilience

4. **Modular loading units for e-commerce**

This action is intended to provide an answer on "Are modular loading units (PI containers) potential sustainable concepts for handling the increasing e-commerce flows?"

It is oriented towards the gap on Physical internet.

5. **Requirements for sustainable intermodal networks, fleets and assets**

This action is intended to provide an answer on "Which conditions should be met to enable the implementation of intermodal networks and the utilisation of fleets and assets?"

It targets the gaps on synchromodality, interconnected logistics networks, and data sharing.

6. **Aligning initiatives for sustainability measurement schemes**

This action is intended to provide an answer on "How to measure sustainability impact of research projects?".

This topic is horizontal to the gaps identified.

7. **Aligning initiatives for carbon emission accounting/measuring schemes**

This action is intended to provide an answer on "How to measure and report GHG emissions arising from digitalization of logistics chains?".

It tackles the gaps on interconnected logistics networks, Physical Internet and data sharing.

Based on Deliverable 4.1 and the results analysis performed in this task, new recommendations should be added to cover the gaps on autonomous operations and autonomous transport. These recommendations could build upon the trends showcased in the Logistics Trend Radar issued by DHL Trend Research[4].

Indeed, in its robotics and automation trend, the Radar proposes autonomous driving technologies for both indoor and outdoor mobile assets and new flexible picking and manipulation systems. It also advocates for contactless operations such as parcel lockers, autonomous delivery robots, and in-app signature software.

In order to cover this gap, recommendations should ultimately contribute targeting a supply chain that is both automated and agile, capable of sensing, adapting, and learning as supply and demand conditions change.

[4] https://www.dhl.com/global-en/home/insights-and-innovation/insights/logistics-trend-radar.html

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7 Outline

A new version for the Definition of high impact topics for freight transport and logistics will be issued in the shape of deliverable D4.4. If new Logistics Clouds are identified in that iteration, a new project search will be performed to complement projects mapped in D2.1 and allocate its attributes relevant to the logistics cloud.

This will feed into the second iteration of the gap analysis report (D4.5), that will also showcase national and regional projects covering the identified gaps, as well as new European projects funded by the first calls of Horizon Europe. Furthermore, the market trends (stemming from Gartner Supply Chain Trends, or the DHL Innovation Radar, among others) will be scouted in detail to challenge the identified R&I gaps.

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ANNEX I

The top logistics promising concepts addressed by the projects in the Coordination and Collaboration cloud are identified below.

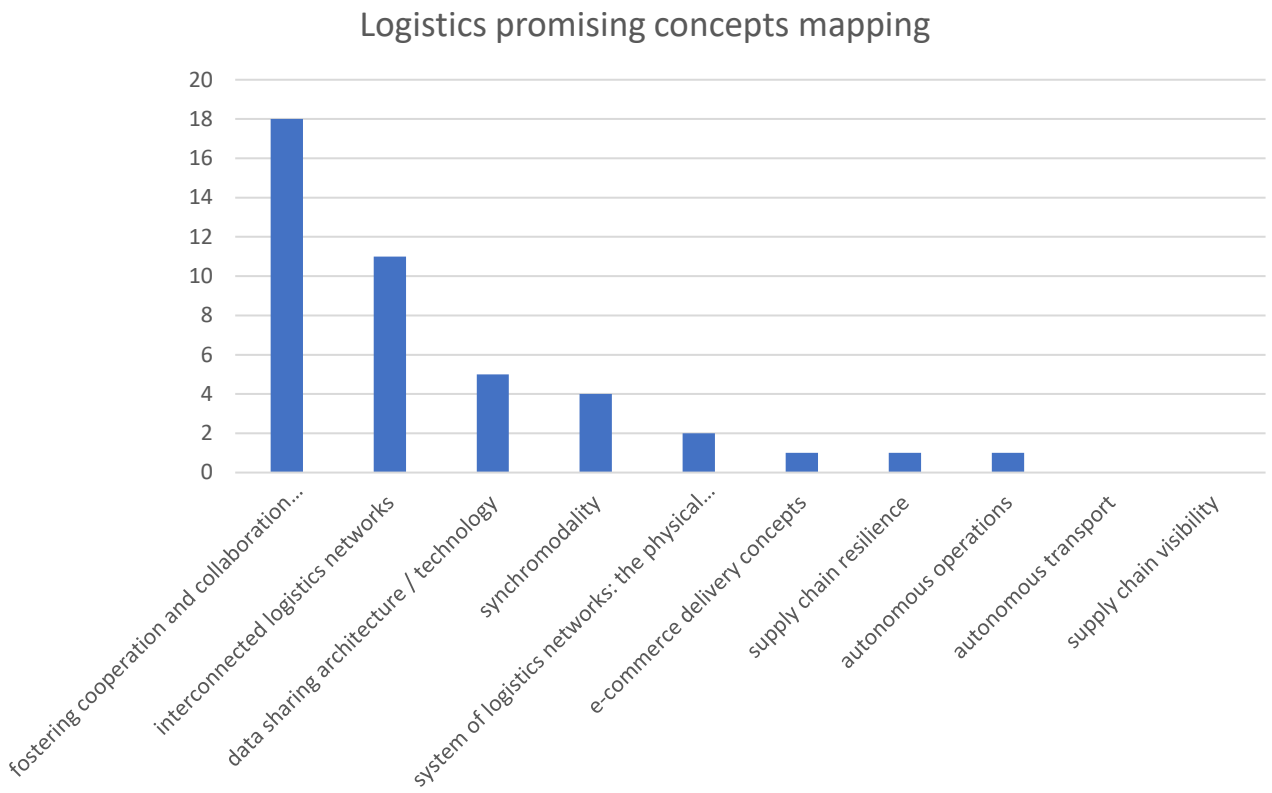

Figure 6. Mapping of logistics promising concepts in coordination and collaboration cloud projects

All the projects included in the Coordination and Collaboration cloud address the concept of "fostering cooperation and collaboration among the logistics chain" as expected. Regarding the other logistics promising concepts, we can see different degree of commitments with the concepts.

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ACRONYM	DATA SHARING ARCHITECTURE / TECHNOLOGY	INTERCONNECTED LOGISTICS NETWORKS	SYSTEM OF LOGISTICS NETWORKS: THE PHYSICAL INTERNET	FOSTERING COOPERATION AND COLLABORATION AMONG THE LOGISTICS CHAIN	SUPPLY CHAIN VISIBILITY	AUTONOMOUS OPERATIONS	AUTONOMOUS TRANSPORT	E-COMMERCE DELIVERY CONCEPTS	SUPPLY CHAIN RESILIENCE	SYNCHROMODALITY
MOSCA	X	X		X						
CITYLAB				X						
NEXTRUST		X		X				X		
NOVELOG				X						
SUCCESS				X						
U-TURN	X			X					X	
MAIN-E				X		X				
PRODCHAIN*										
EURIDICE	X	X		X						X
KOMODA		X		X						
SECURE SCM		X		X						
E-FREIGHT	X	X		X						
CO3				X						
ICARGO		X		X						X
MODULUSHCA		X	X	X						
CLUSTERS 2.0	X			X						X
COG-LO		X		X						
ICONET		X	X	X						
LOGISTAR	X	X		X						X

* No information available

Table 2. Mapping of coordination and collaboration projects versus promising concepts

According to the projects in the Coordination and Collaboration cloud the gaps are shown below.

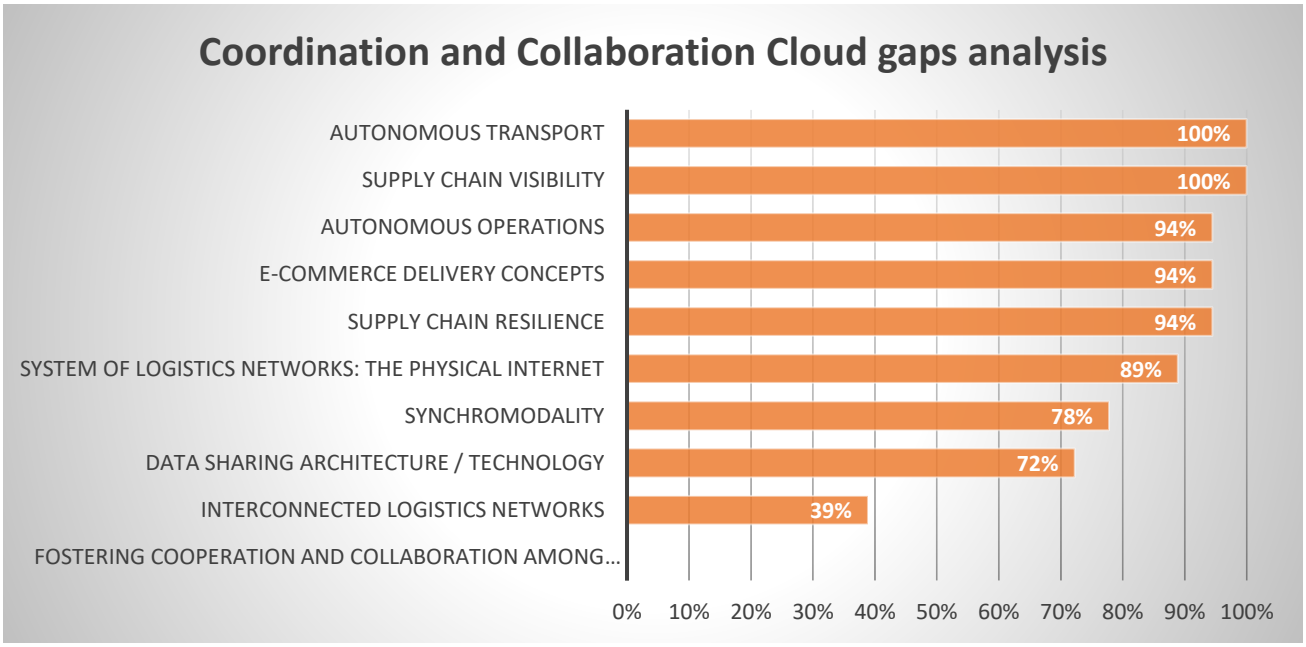

Figure 7. Gap analysis for coordination and collaboration projects

No projects addressing *autonomous transport* or *supply chain visibility* were found. Only one project addressing *autonomous operations*, *e-commerce delivery concepts* and *supply chain resilience* are reported. 2 projects addressed *system logistics networks: the physical internet*, 4 projects addressed *synchromodality*, 5 projects addressed *data sharing architecture / technology* and 11 projects addressed *interconnected logistics networks*.

Below, a detailed analysis of the projects addressing each specific logistic concept:

1. **Autonomous transport**- GAP 100% (no projects addressed this promising logistic concept)
2. **Supply chain visibility** – GAP 100% (no projects addressed this promising logistic concept)
3. **Autonomous operations** -GAP 94% (1 project: MAIN-E)
   MAIN-E proved the viability of a more agile solution that relies on the latest developments of distributed optimisation end autonomous agents co-operation theories as well as on the most advanced information technologies. The project developed a networked negotiation platform for manufacturing and logistics integrated planning and control in a SME multi-enterprise environment. It constitutes a milieu providing at the same time an E-business support for a quick set up of dynamic supply chains networks and an integrated production planning & control support for the related extended manufacturing & logistic operations. (From general information)
4. **E-commerce delivery concepts** – GAP 94% (1 project: NEXTRUST)
   NEXTRUST developed a legal framework for collaboration in e-commerce and the legal basis for CITS/ICT, taking into account data and transport security, providing the right elements which should be included in the agreements between the stakeholders. (NexTrust Deliverable 6.7 - Drawing up a legal framework and model contracts to cover logistics collaboration for e-commerce and developing a legal basis for CITS/ICT)
5. **Supply chain resilience** – GAP 94% (1 project: U-TURN)

U-TURN architecture and detailed design specification consolidating the proposed system logic by ensuring that all the software components could be integrated. The design and its implementation take into account the following key perspectives in order to be able to deal with potential issues: Evolution and Interoperability; Performance and scalability; Trust, security and privacy; Availability and resilience. (D4.4 U-TURN Platform Architecture & Design Document Second Version, D4.6 U-TURN Platform Testing Report Second Version)

6. **System of logistics networks: the physical internet** – GAP 89% (2 projects: MODULUSHCA, ICONET)
   MODULUSHCA developed a framework on how Physical Internet can enable an interconnected FMCG logistics system identifying obstacles and success factors to a Physical Internet enabled system. MODULUSHCA also provided business models considering the Physical Internet approach to use the modular cargo units developed in the project as well as the enabling technological assets.
   ICONET developed a Roadmap to pave the way for the required intervention in both development and implementation to achieve the Physical Internet.
7. **Synchromodality** – GAP 78% (4 projects: EURIDICE, ICARGO, CLUSTERS2.0, LOGISTAR)
   EURIDICE developed an information services platform centered on the context of individual cargo items and their interaction with the surrounding environment and the types of users. Among other features the platform provides for synchronisation of schedules across multi-modal routes.
   ICARGO developed a decentralized ICT infrastructure which allows real world objects, existing systems, and new applications to efficiently co-operate, enabling more cost effective and lower-CO2 logistics through improved synchronization and load factors across all transport modes.
   CLUSTERS2.0 developed the Cluster Community System (CluCS), an IT platform managing the resources and the synchronization of operations in the cluster network of hubs, terminals and warehouses (synchronize vehicle movements and logistics operations across various modes and actors to lower CO2 emissions).
   LOGISTAR developed a control and decision-making tool for logistics operations capable of monitoring of goods through the whole logistics chain, allowing an integrated planning of resources and providing dynamic routing relying on synchromodality and horizontal collaboration among agents.
8. **Data sharing architecture / technology** – GAP 72% (6 projects: MOSCA, U-TURN, EURIDICE, E-FREIGHT, CLUSTERS2.0, LOGISTAR)
   MOSCA designed an information system as a platform for future add value services with several modules (shortest path, tour planner, on-line routing, shop restocking planning) implemented in the project.
   U-TURN developed an overall conceptual architecture and detailed design specification of the integrated U-TURN system, through the identification of the functionality and data interfaces between the components.
   EURIDICE developed an information services platform centered on the individual cargo item and on its interaction with the surrounding environment and the user.
   E-FREIGHT developed the E-Freight Next Generation Single Window solution, including a standard framework for freight information exchange covering all transport modes and all stakeholders.
   CLUSTERS2.0 developed the Cluster Community System (CluCS) tool, which is an IT platform dedicated to the coordination and management of multiple proximity hubs with different specializations forming a Cluster.

LOGISTAR developed a real-time decision-making tool and a real-time visualization tool of freight transport using smart algorithms for data processing.

9. **Interconnected logistics networks** – GAP 34% (11 projects: MOSCA, NEXTRUST, EURIDICE, KOMODA, SECURE SCM, E-FREIGHT, I-CARGO, COG-LO, LOGISTAR, MODULUSHCA, ICONET)
   A great number of projects within the Coordination and Collaboration Cloud work toward the interconnection of the logistics clouds by the creation of platforms, technology, frameworks or any other development.
10. **Fostering cooperation and collaboration among the logistics chain** – ADDRESSED 100% in the Coordination and Collaboration Cloud.
    All the projects included in the Coordination and Collaboration Cloud address the area of *Fostering cooperation and collaboration among the logistics chain*. All the projects contribute to the cooperation among different actors of the logistic network addressed and involved direct collaboration in the logistics chain.

The interviews performed in T2.2 to the participants in the projects from the Coordination and Collaboration Cloud revealed some gaps in the concepts considering in the projects. The standardization was the main issue arisen. Standards are missing for the new development and applications of the projects; the standardization is not covered in the topics of the projects and no deference to the need of standards and time needed to their development and implementation is accounted.