Deliverable D 6.3

Data Management Plan - Results

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Report contributors		
Name	Beneficiary Short Name	Details of contribution
Celestino Sánchez	EURNEX	Structure and preparation of the document
Francisca Rosell	Eurecat	First reviewer
Matthias Plehm	SGKV	Second reviewer

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Executive Summary

This Deliverable is the final version of the document created to cover the data management life cycle of the project. The structure of this deliverable is based on the template provided by the European Commission for Horizon Europe projects (European Commission, 2021).

The purpose of the Data Management Plan (DMP) is to provide the Europe's Rail Joint Undertaking (EU JU) with an analysis of the datasets generated or collected by the project. This document is complementary to the actual DMP produced with the open-source online tool Argos, that offers a structured and automated manner for the creation of DMPs for Horizon Europe.

Abbreviations and Acronyms

Abbreviation / Acronym	Description
DMP	Data Management Plan
DoA	Description of Action
DOI	Digital Object Identifier
ER JU	Europe's Rail Joint Undertaking
EU	European Union
FAIR	Findable, Accessible, Interoperable and Re-usable
GDPR	General Data Protection Regulation
RINF	Register of Infrastructure
RNE	RailNetEurope
SG	Stakeholders' Group
UIC RICS	Union Internationale des Chemins de Fer Railway Integrated Coding System
WP	Work Package

1 Background

The present document constitutes the Deliverable “D6.3 Data Management Plan - Results” in the project European Shift Enabler Portal for Freight (ESEP4Freight) and it is the continuation of the D6.2 (Sánchez, 2023). Funding body is the EU-RAIL in the call HORIZON-ER-JU-2022-02.

The main objective of ESEP4Freight has been the creation of a so-called Web Platform (https://intermodal-railfreight.eu) to provide information to relevant actors in the logistics sector to boost the modal shift to rail in the freight transport. The Web Platform includes the modules shown in the figure below.

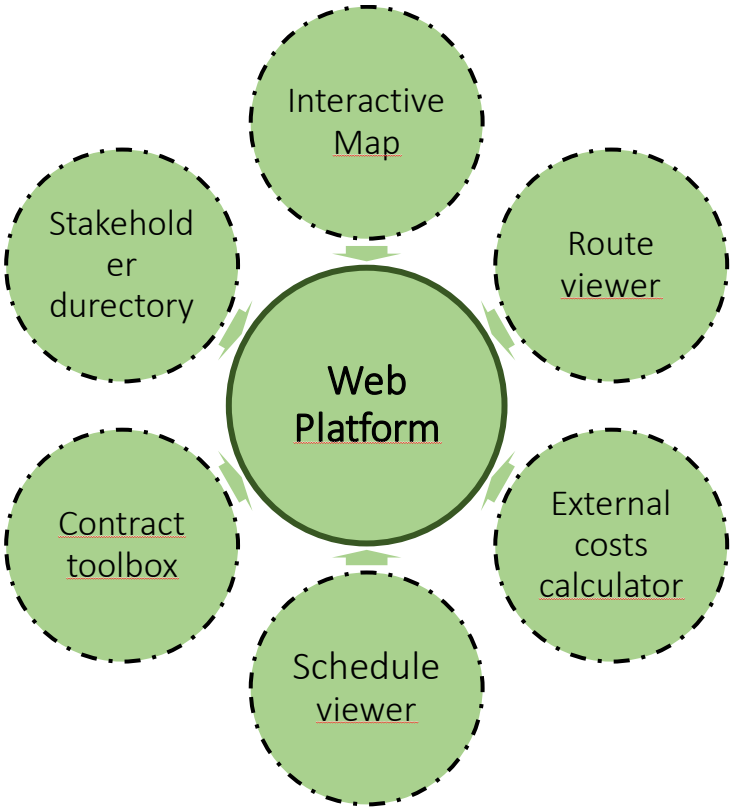

Figure 1. Modules of the Web Platform

These modules have relied on an intensive use (mostly re-use) of data and during the development of the modules, new data and other research outputs has been produced.

2 Objective/aims

This document provides the final assessment of the data produced to create the Web Platform.

More precisely, the DMP addresses the following points:

- The purpose of the data collection/generation and its relation to the objectives of the project;
- Types and formats of data to be utilised and generated within ESEP4Freight. This section identifies and describes the (existing) input data that will be utilized and the output data to be generated by the project;
- The origin of the data and the expected size of the data;
- Data storage and conservation. Where the data will be held and the arrangements and responsibilities for managing, updating and maintaining the data.
- Resources needed for data management
- FAIR assessment of relevant datasets

3 Data Summary

A first categorization of data was carried out in D6.2 Data management Plan (Sánchez, 2023). As a result of this process four high-level categories of data were identified.

- **Category 1: Documents and dissemination materials**: deliverables, reports, demonstrations, manuscripts, productions for dissemination, communication purposes.
- **Category 2: Computer software**: including software applications (in binary form), libraries in the form of SDKs, plugins, and respective source code.
- **Category 3: Data and metadata**: materials and datasets resulting from the implementation of the developments; metadata and configuration files; bug logs and feedback logs; developer internal logs and documentation; evaluation and opinions.
- **Category 4: Data for evaluation**: consists of materials or datasets generated or collected by the project used for evaluation purposes. It may include personal data and information of participants in pilots and stakeholder engagement activities.

In this chapter we will focus on Category 3 and especially on those data produced for the development of the Web Platform. The rest of categories will be addressed in Chapter 4.

ESEP4Freight Web Platform has relied on the reprocessing of already available data and the production of their own data. The figure below shows the origin of the data used for each module of the Web Platform.

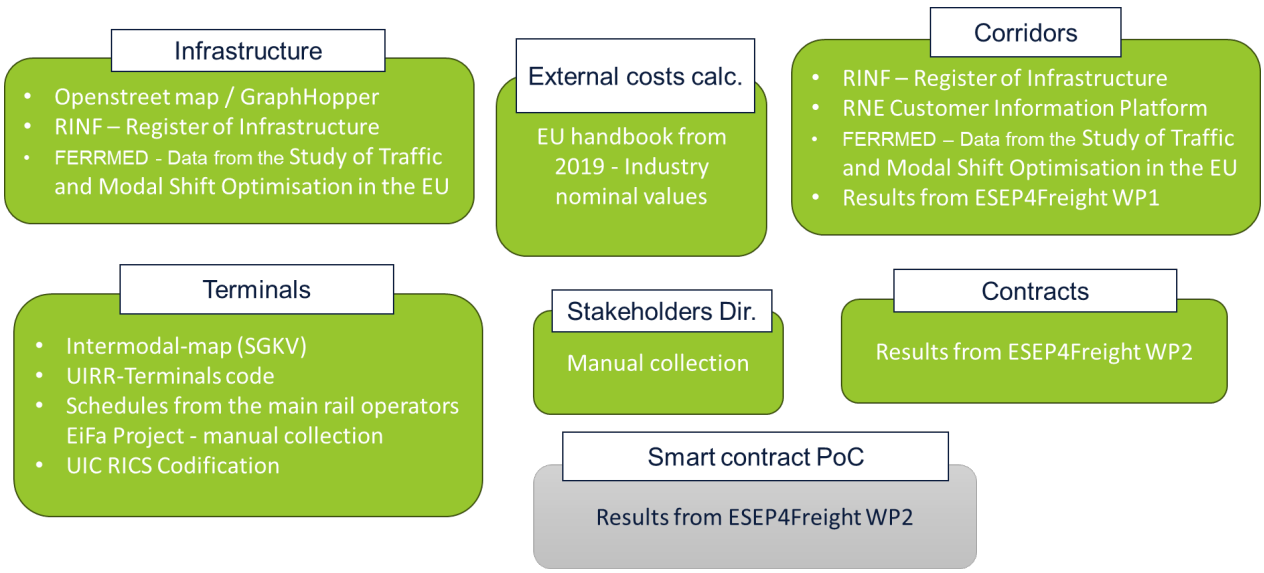

Figure 2. Data origin for each module of the Web Platform.

The data generated for the Web Platform can be seen in the table below

Table 1. Datasets Web Platform

Table name	Description	Size (number of rows)	Origin
Node	Operational points extracted from RINF. It contains the name and geographical coordinates	50.905	RINF
Sectionofline	Section of line extracted from RINF. Complemented with manual generation for zones without connection. Each row corresponds to a section of line which origin and destination are elements from the table Node. Related to auxiliary tables that gathers the infrastructure technical characteristics	59.025	RINF+generated
Terminal	Terminals' data. Related with auxiliary tables to complement the terminals main characteristics. Each terminal is related to one and only one node from the Node's table (obtained from the UIR RICS Codification or by geographical coordinates)	1.111	Intermodal map
Schedules	Schedule's main information. Each row corresponds to one connection: terminal origin-terminal destination-MTO. Terminal origin and Terminal destination should exist in the Terminal's table	591	Manual collection
Scheduleday	Detailed timetable for each connection registered in Schedule's table. Each row contains the departure information (week day and local time), arrival information (week day and local time), operator main data, clearance gauge and type of clearance gauge (containers, semitrailers or both)	3.003	Manual collection
Stakeholders	Stakeholders main data. Each row corresponds to one stakeholder, and contains the name, website, target group, contact data and country	343	Manual collection
Terminal_stakeholder	For those stakeholders linked to a terminal. Each row links one stakeholder with one terminal from the Terminals table	28	Manual collection
Operator	Main operator's data	791	Schedules + Terminal
Corridor	One row for each corridor	11	RINF+RNE
Corridorsectionofline	Relationship between corrridors and the tracks that conform the corridor. To represent the corridor on the map and to display the infrastructure characteristics of each section of line	25.186	RINF+RNE

Railgraphnode	Auxiliary table to build the graph for the route calculation. One node for each terminal and two nodes for the origin and destination of each schedule	3.586	Generated
Railgrapharc	Auxiliary table to build the graph for the route calculation. One arc for each connection between the terminal node and the auxiliary nodes, and one arc to represent the timetable. Extra arcs to connect terminals by road for connections between terminals under 500km.	5.939	Generated
Railgrapharcsol	List of section of lines that conforms each arc from the railgrapharc table. To represent the connection on the interactive map	131.470	Generated
Roadgrapharcsol	List of sections for the road routes representation on the interactive map, for the arcs from railgrapharc associated to a road route. Extracted from Graphhopper. Each row contains origina and detination graphical coordinates .	1.052.837	Generated

The data generated during the project for the Web Platform are embedded in the software architecture of the Web Platform and are not available as stand-alone datasets. The data, however, can be openly consulted in the Web Platform under https://intermodal-railfreight.eu.

4 Other Research Outputs

In section 3, the categorization of the project data was presented. The categories are the following.

- **Category 1: Documents and dissemination materials**: deliverables, reports, demonstrations, manuscripts, productions for dissemination, communication purposes.
- **Category 2: Computer software**: including software applications (in binary form), libraries in the form of SDKs, plugins, and respective source code.
- **Category 3: Data and metadata**: materials and datasets resulting from the implementation of the developments; metadata and configuration files; bug logs and feedback logs; developer internal logs and documentation; evaluation and opinions.
- **Category 4: Data for evaluation**: consists of materials or datasets generated or collected by the project used for evaluation purposes. It may include personal data and information of participants in pilots and stakeholder engagement activities.

A repository in Zenodo[1] (Eurnex, 2023) has been created where elements falling within the Category 1 has been included and will be completed once the remaining deliverables are approved. Zenodo automatically assigns a DOI number to all the documents that do not have previously received one. Data from scientific papers may be subjected to temporal embargo if deemed appropriate to shield the research outputs. The online tool Argos has been used to assess the dataset from an ESEP4Freight conference paper (Sánchez Martín et al., 2025) regarding their FAIR principles and other topics of relevance. The result has been included in Appendix 1 – ESEP4Freight DMP in Argos.

Due to the commercial interest of the software development, no elements derived from Category 3 have been archived in a public repository.

Data derived from evaluation purposes has been included in (Plehm et al., 2025). However, due to confidentiality issues linked to GDPR regulation, it has been decided not to upload the data to a public repository. Therefore, no outputs derived from Category 4 have been archived in a public repository.

[1] https://zenodo.org/communities/esep_for_freight

5 Allocation of Resources

Those data from ESEP4Freight archived in Zenodo will be managed and curated by Eurnex at least during the next five years. The (reduced) costs of the management of the data will be assumed by Eurnex once the project had finished.

6 Data Security

Zenodo, as wide used repository, has their own data protection, backup strategies and also data accessibility and authorship.

Github/Gitlab/Bitbucket, as widely used code repositories, they also have their own protection, backup strategies, and the authorship and intellectual property control by the automated definition of software licenses.

All data required for executing this project has been stored in safe environments at the designed locations of the project partners. Access rights have been restricted to the relevant partners. If data needs had to be transferred among partners, the transfer needs to be done securely, via secure data channels, in an encrypted mode or by doing a physical transfer.

The data for the Web Platform has been stored and hosted on a secure server in Europe with credible data security and backup measures. The data for the web platform is stored and hosted on a dedicated “bare-metal” server provided by Hetzner, located in Helsinki, Finland. Ubuntu 22.04 LTS is used as the operating system. The server is a dedicated physical machine exclusively operated by SGKV. This setup ensures high performance, full control over data management, and compliance with European data security standards.

In cases where sensitive data, such as personal data, have been stored, data privacy and data protection issues have strictly followed the "user decides" principle. End-users had always the possibility to decide which personal or private data to be used.

7 Ethics

Potential ethical issues linked to GDPR regulations have been avoided once it has been decided that data from the evaluation process by the members of the SG will not be publicly available.

8 Conclusions

This document comprises the final version of the DMP. This document describes the framework through which data in ESEP4Freight had been handled. The DMP aimed to provide the Europe's Rail Joint Undertaking (EU JU) with a comprehensive analysis of the datasets generated or collected during the project. This document complemented the official DMP produced using the open-source online tool Argos, which offered a structured and automated approach for creating DMPs in accordance with Horizon Europe requirements.

References

Eurnex. (2023). *ESEP4Freight Zenodo Community*. https://zenodo.org/communities/esep_for_freight?q=&l=list&p=1&s=10&sort=newest

European Commission. (2021). *Data Management Plan Template*. https://www.openaire.eu/images/Guides/HORIZON_EUROPE_Data-Management-Plan-Template.pdf

Plehm, M., Müller, B., Nickel, G., Borgogna, F., & Gómez Fernández, J. (2025). *D4.1. Business cases analysis for intermodal transport solutions* (No. D4.1; ESEP4Freight).

Sánchez, C. (2023). *D6.2 Data Management Plan* (ESEP4Freight).

Sánchez Martín, C., Rosell Camps, F., Tomás Úbeda, A., & Djordjevic, B. (2025). Data for Shifting to Rail Freight Transport: A Review of Free Online Tools. In C. McNally, P. Carroll, B. Martinez-Pastor, B. Ghosh, M. Efthymiou, & N. Valantasis-Kanellos (Eds), *Transport Transitions: Advancing Sustainable and Inclusive Mobility* (pp. 460–466). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-95284-5_65

Appendix 1 – ESEP4Freight DMP in Argos

D6.3. Data Management Plan - Results

Version 0

Description

This DMP will include the resuls of the DMP of the European project Enabler Shift European Portal for Freight (ESEP4Freight).

Funder

European Commission||EC

Grant

European Shift Enabler Portal for Freight
(corda____he::101121840)

Researchers

Celestino Sánchez Martín (orcid:0000-0001-8041-0533)

Organizations

European rail Research Network of EXcellence

 DOI: - 25/02/2024

1. Main Info

Title of DMP: D6.3. Data Management Plan - Results

Description:

This DMP will include the resuls of the DMP of the European project Enabler Shift European Portal for Freight (ESEP4Freight).

Researchers:
Celestino Sánchez Martín (orcid:0000-0001-8041-0533)

Organizations:
European rail Research Network of EXcellence

Contact: Celestino Sánchez Martín (cesama@eurnex.eu)

2. Funding

Funding organizations: European Commission||EC

Grants: European Shift Enabler Portal for Freight (corda____he::101121840)

Project: European Shift Enabler Portal for Freight

3. License

4. Templates

Descriptions

Assessment of free online tools providing information on freight transport system

Data associated to the paper "Data for shifting to rail freight transport: a review of free online tools"

Template: Horizon Europe

Type: Dataset

1 Summary

1.1 Brief description of the described research output

1.1.1 What kind of research output are you describing?

Research Data

1.1.2 Is it physical or digital?

Digital

1.1.3 Are you generating or re-using it?

New

1.1.5 What is its format?

Excel file

1.1.6 What is its expected size?

1 Mb

1.1.7 Why are you collecting/generating or re-using it?

- To obtain information
- To make informed decisions

1.1.9 To whom might it be useful ('data utility')?

- Researchers
- Research communities
- Decision makers

Data Management Plan | D6.3. Data Management Plan - Results LICENSE:CC-BY-NC-4.0
DOI: - 25/02/2024

• Industry

2 Links Between Outputs

2.1 Publications

2.1.1 Does the described output support any scientific publication?

Yes

2.3 Software

2.3.1 Does the described output use or support any software?

No

3 FAIR Practices

3.1 Making data and other outputs findable, including provisions for metadata

3.1.1 Making data findable, including provisions for metadata

3.1.1.1 What type(s) of persistent identifier(s) are used for the described dataset / output?

Data identifiers

DOI

3.1.1.2 Will you provide metadata for the described dataset / output?

Yes

TBD

3.1.1.4 Do the metadata use standardised vocabularies?

No

3.1.1.6 Are the metadata searchable?

No

3.2 Making data and other outputs openly accessible

3.2.1 Repository

3.2.1.1 In which repository will the dataset / output be deposited?

Zenodo

Zenodo

3.2.1.2 Is the selected repository a trusted source?

Yes

3.2.1.5 Does the repository(ies) assign datasets / outputs with persistent identifiers?

Yes

3.2.1.7 Does the repository support versioning?

Yes

3.2.2 Data

3.2.2.1 What is the described dataset / output title?

Assessment of free online tools providing information on freight transport system

3.2.2.2 How is the dataset / output shared?

Closed

3.2.2.3 What is the reason of limiting access to the dataset / output?

Embargo

3.2.2.5 Are there any methods or tools required to access the dataset / output?

No

3.2.2.8 Is the described dataset / output supported by a data access committee?

No

3.2.3 Metadata

3.2.3.2 Under which license will metadata be provided?

Creative Commons Zero (CC0)

3.3 Making data and other outputs interoperable

3.3.1 Does your (meta)data use a controlled vocabulary?

No

3.4 Increasing data and other outputs reuse

3.4.4 Do you intend to ensure (re)use by third parties after your project finishes?

Yes

4 Allocation of Resources

4.1 Allocation of resources

4.1.1 What will be the cost of making the described output FAIR?

0

Euro

• Storage

• Archiving

• Re-use

• Security

4.1.2 How will this cost be covered?

Other

5 Security

6 Ethical Aspects

6.1 Ethical aspects

6.1.1 Are there any ethical or legal issues that can have an impact on sharing the described dataset / output?

no

6.1.2 Does the described dataset / output contain sensitive information?

No

7 Other Issues

7.1 Other

7.1.1 Do you make use of other procedures for data management?

No

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