
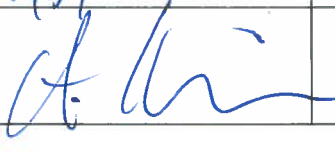
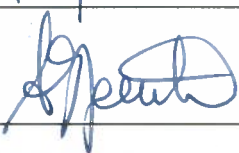


Making the railway system
work better for society.

Report

Facilitation of combined transport (FCT)

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Document History

<i>Version</i>	<i>Date</i>	<i>Comments</i>
1.0	07/09/2018	Public Version

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2. DOCUMENT CONTROL INFORMATION

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3. FOREWORD

Freight transport is a major tool for economic growth and development of regions and for integration among regions. To make transportation more efficient in the entire logistic chain, different modes of transport are used, depending on availability, capacity and costs.

Although for transporting cargo over long distances, rail and waterway transport are more efficient, there are additional cost and obstacles in transshipment with other modes.

In order to minimize technical and administrative barriers to rail transport within European territory, Technical Specifications for Interoperability (TSIs) have been developed. However, several barriers remain in the connection of the various modes of transport with the rail system, which requires additional measures to use them efficiently. For these reasons, the Agency has decided to launch the project “*Facilitation of combined transport (FCT)*” with the purpose of analysing and proposing improvements regarding the integration of freight railway transport with other transport modes, focusing on the rail - road interface.

This report includes the analysis of the current situation of the Combined Transport and proposes concrete solutions for improvement. The proposed solutions include a description of their interfaces and the appropriate mainstream processes to implement them.

The implementation of the above mentioned solutions is outside the scope of this project.

When in this report the terms “short term”, “medium term” and “long term” are used, they are meant respectively “within 1-3 years”, “within 3 – 5 years” and “within 5 – 10 years”.

3.1. Acronyms and abbreviations

The “*Terminology on Combined Transport*”¹ of 2011 by UNECE provides definitions that are commonly used in the context of intermodal transport and within this report. More details on the definition of Combined Transport are provided for in Chapter 7 of this report.

Table 1. Acronyms and abbreviations

CCM	Change Control Management
CEF	Connecting Europe Facility
CER	The Community of European Railway and Infrastructure Companies
COTIF	Convention relative aux transports internationaux ferroviaires
CT	Combined transport
CTD	Combined transport directive
CTO	Combined transport operator
CTP	Combine Transport profile
DG Move	Directorate General for Mobility and Transport
EC	European Commission
EIM	European Infrastructure Manager

¹ United Nations, Economic Commission for Europe (UN/ECE), *Terminology on Combined Transport*, New York and Geneva, 2001, Free download available at: <https://www.unece.org/fileadmin/DAM/trans/wp24/documents/term.pdf>

ELETA	Electronic exchange of ETA information
EN	European Norm
ENRRB	European Network of Rail Regulatory Bodies
EESC	European economic and social committee
EP	European Parliament
EP TRAN	European Parliament transport and tourism committee
ERA	European Union agency for railways
ERFA	European rail freight association
ETA	Estimated time of arrival
EU	European Union
FCT	Facilitation of Combined Transport
HMI	Human machine interface
IC	Interoperability Constituent
ILU	Intermodal Loading Unit
IM	Infrastructure Manager
INF	Infrastructure
IoT	Internet of things
IRS	International railway solutions
ISO	International Organisation for Standardisation
IT	Information Technology
ITU	Intermodal transport unit
LSP	Logistic service providers
NB Rail	NB-Rail Coordination Group in accordance with the principles of 2008/57/EC Art.28(5) & whereas(46), 765/2008 Art R30 & R17(11) and the Blue Guide 2014 (5.2.2&5.2.4).
NRE	National registration entity
NSA	National Safety Authority
OPE	Operation and traffic management
OTIF	Intergovernmental Organisation for International Carriage by Rail
PRIME	Platform of Rail Infrastructure Managers in Europe
RASCOP	Rail Standardisation Coordination Platform for Europe
REFIT	Regulatory fitness and performance programme
RFC	Rail freight corridor
RINF	Register of Infrastructure

RISC	Railway interoperability and safety committee
RNE	RailNet Europe
RU	Railway Undertaking
SERA	Single European Railway Area
SERAC	Single European Railway Area Committee
SME	Small and medium enterprises
TAF	Telematics applications for freight
TEN-T	Trans-European transport networks
TF	Task Force
TIS	Train information system
TO	Terminal operator
TSI	Technical specification for interoperability
UIC	Union internationale des chemins de fer
UNIFE	European railway manufacturing industry
UIP	International union of wagons keepers
UIRR	International Union for Road-Rail Combined Transport
UNCTAD	United Nations Conference on Trade and Development
UN/ECE	United Nations Economic Commission for Europe
WAG	Wagon
WP	Working Party

4. INTRODUCTION

Transportation is one of the essential factors for economic, industrial and foreign trade activities, supporting the growth of economy. Currently, the implementation of multimodal transport is a priority in many countries, because of its potential regarding environmental impacts and relief of road traffic. In that respect, EU Transport Commissioner Violeta Bulc has called for 2018 to be the "[Year of Multimodality](#)" - a year during which the Commission will raise the importance of multimodality for the EU transport system.

Infrastructure investments, the implementation of new technologies, an adaptation of regulatory and institutional framework as well as the improvement of administrative and operational practices in the transport sector can boost the multimodal transport and elevate its competitiveness.

The Agency launched a Task Force in November 2017, following a Workshop on Combined Transport held in Lille on 13 June 2017, with the aim of drafting a report on the topics to be addressed within the EU legislation and European standardization on railways; the desirable outcome is to facilitate the Combined Transport along the networks of the Union rail system.

Four Plenary meetings of this Task Force took place on:

1. 11 December 2017
2. 20 February 2018
3. 24 April 2018
4. 21 June 2018

In addition, one subgroup meeting focusing on topics related to wagon, Intermodal Loading Unit (ILU) and infrastructure was held on 6 February 2018.

The Task Force and the subgroup was chaired by the Agency with the support of representatives of the:

- European Commission (EC)
- International Union for road – rail combined transport (UIRR)
- The Community of European railways and infrastructure companies (CER)
- European rail Infrastructure Managers (EIM)
- European rail manufacturing industry (UNIFE)
- International union of wagon keepers (UIP)
- Association of the notified bodies in the railway sector (NB-Rail)
- European Rail Freight Association (ERFA)
- Intergovernmental Organisation for International Carriage by Rail (OTIF)

This report provides an insight of the main topics identified in order to improve the integration between the land transport modes “rail” and “road” within the combined transport.

5. CONTENT OF THIS DOCUMENT

Chapters 6 and 7 of this report give an overview on the existing legislation applicable to multimodal transport, with a focus on the current developments on Combined Transport legislation.

Chapters 8, 9 and 10 expand on 3 different areas that are deemed relevant for Combined Transport: technical, information and process. Each area is structured as follow:

TECHNICAL AREA

1. Vehicle related topics
2. ILU related topics
3. Infrastructure related topics

INFORMATION AREA

4. Registers related topics
5. Telematics applications for freight topics

PROCESS AREA

6. Operation and Traffic Management related topics
7. Conformity assessment and legislation alignment

Each topic is analysed according to the following scheme:

- › Analysis of the current situation
- › Solution proposal
- › Interfaces management
- › Appropriate mainstream process

Chapter 11 gives general information on the impact assessment of the alternative options for the different topics. The main findings from the IAs have been taken into consideration in the shaping of the solution proposals throughout the topics in chapters 8, 9 and 10. The details of the various IAs are included in Annex 1.

Chapter 12 summarizes the solutions that have been identified to address each single topic, suggesting a way for implementing those solutions.

6. MULTIMODAL TRANSPORT LEGISLATION

The movement of products among different countries imposes the establishment of international multimodal transport legislation, attending the needs of both main actors, the transporters and users.

Since the 1990s, with the active participation of international public and private organizations representing the transporters, users and government interests, many conventions have been held with the purpose of elaborating rules and agreements that regulate the different modes of transport.

There are organizations responsible for promoting and providing technical advice on the preparation of treaties and agreements for each mode of transport, as the United Nations Conference on Trade and Development (UNCTAD). Besides that, these organizations aim at harmonizing the various national laws in the transport field.

Concerning the land transport, there are several economic and regional commissions that have been working on regulation. Overall, it's the United Nations Economic Commission for Europe (UN/ECE) which promotes pan-European economic integration. UN/ECE includes 56 Member States in Europe, North America and Asia, as well as over 70 international professional and non-governmental organizations.

The first international road transport regulation is the *Convention sur le Transport des Marchandises par Route (CMR)* - Convention on Transport of Goods by Road, signed in Geneva in 1956 and by the Geneva Protocol issued in 1978. The CMR establishes rules, as the scope and application of the transport's contract and the responsibility's term relating to the carrier, the delay and the amount of restitutions.

Another act contributing to the development of multimodal transport is the "[Convention concerning International Carriage by Rail](#)" (COTIF 1999). It contains seven Appendices setting out:

- technical functional requirements,
- model contracts for the carriage of passengers and goods.

Regarding EU legislation, the first [Directive 92/106/EEC on Combined Transport](#) was adopted in 1992 and it still plays a relevant role in establishing (or reaffirming) the core principles supporting CT and promoting it within EU transport policy.²

Another relevant piece of EU legislation is the [Regulation \(EU\) No. 913/2010](#) concerning a European rail network for competitive freight. This Regulation requires Member States to establish international market-oriented Rail Freight Corridors (RFCs) in order to meet three main challenges:

- strengthening co-operation between IMs on key aspects such as the allocation of paths, deployment of interoperable systems and infrastructure development.
- finding the right balance between freight and passenger traffic along the Rail Freight Corridors (RFCs), giving adequate capacity for freight in line with market needs and ensuring that common punctuality targets for freight trains are met.
- promoting intermodality between rail and other transport modes by integrating terminals into the corridor management process³.

² <https://ec.europa.eu/transport/sites/transport/files/themes/strategies/studies/doc/2015-01-freight-logistics-lot2-combined-transport.pdf>

³ <http://www.rne.eu/rail-freight-corridors/rail-freight-corridors-general-information/>

Between 2001 and 2016, four railway legislative packages were adopted by EC with the aim of gradually opening up rail transport service markets for competition, making national railway systems interoperable and defining appropriate framework conditions for the development of a single European railway area.⁴

Turning to the Road Transport Strategy⁵, there are four main themes EC is committed upon, out of them one being decarbonisation; in fact, CO₂ emissions from Heavy Goods Vehicles represent around 30% of all road transport emissions. It will not only be the road transport sector, by meeting stricter targets for cleaner transport, to play its part in fighting climate change: EC is also committed to building the required alternative fuel infrastructure, by encouraging new charging solutions and building the legal framework to move more freight off the road. In that sense, the [revision of the directive on Combined Transport](#) will stimulate the combined use of trucks and trains, barges or ships for the transport of goods, by making it more competitive compared to road freight transport only. Reducing the number of lorries on the road will mean a reduction of CO₂ emissions and air pollution by the freight transport sector, as well as reduced congestion and accidents on our roads⁶.

7. VISION OF EU INTERMODAL TRANSPORT⁷

In the EU, Transport is strategic for economy, because it is fundamental for the execution of most of the activities in the society, ensuring the connectivity and mobility, with a direct impact on its social, economic and environmental development.

Transportation ensures the movement of people, goods, services and capital, the four freedoms of movement defining the Single Market, promoting economic growth, regional development and integration among regions.

As a high source of job generation and revenue, an efficient transportation system is able to provide competitiveness and consequent reductions in logistics costs.

The EC aims at promoting efficient and safe transportation with minimum environmental impacts, meeting the needs of transporters and users.

In order to achieve an interconnected, interoperable and efficient transport system in Europe, transport policies have been established, based on two EC priorities: (i) promoting efficiency in the EU single market and (ii) connectivity on a global scale, which are empowered by: decarbonisation, digitalisation, investment, people's benefits, innovation and global leadership.

Besides that, in June 2017, the European Council reaffirmed the commitment of the EU and its Member States to swiftly and fully implement the Paris Agreement on Climate Change, where a transition to a modern and low-carbon economy will need to accelerate.

⁴ https://ec.europa.eu/transport/modes/rail/packages_en

⁵ https://ec.europa.eu/transport/modes/road/road-initiatives_en

⁶ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52017DC0675>

⁷ EC vision is extracted by the European Union Agency for Railways according to:

Delivering TEN-T, facts and figures, SEPTEMBER 2017 - http://www.connectingeu.eu/documents/Delivering_TEN_T.pdf

White paper on transport, Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system, of 28 March 2011 – <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0144&from=EN>

DG MOVE published website and sub-websites, consulted the 5th JAN 2017:

https://ec.europa.eu/transport/home_en

https://ec.europa.eu/transport/themes/logistics_multimodal_en

https://ec.europa.eu/transport/modes/road_en

The first package of proposals was presented in the “Europe on the Move”⁸, in May 2017. The second package has additional measures, including the proposal⁹ for amendment of the Directive on combined transport of goods between the Member States¹⁰, because it is the only legal tool at Union level to directly incentivize the shift from road freight to lower emission transport modes.

According to the proposal for a new Directive of the European Parliament and of the Council amending Directive 92/106/EEC on the establishment of common rules for certain types of combined transport of goods between Member States, the definition of “Combined Transport” reads as follows:

*“**Combined transport**” means carriage of goods by a transport operation, consisting of an initial or final road leg of the journey, or both, as well as a non-road leg of the journey using rail, inland waterway or maritime transport:*

- (a) in a trailer or semi-trailer, with or without a tractor unit, swap body or container, identified in accordance with the identification regime established pursuant to international standards ISO6346 and EN13044, where the load unit is transshipped between the different modes of transport; or*
- (b) by a road vehicle that is carried by rail, inland waterways or maritime transport for the non-road leg of the journey.*

Non-road legs using inland waterway or maritime transport for which there is no equivalent road transport alternative or which are unavoidable in a commercially viable transport operation, shall not be taken into consideration for the purposes of the combined transport operations.”

It is worth mentioning that the amendment of the Directive 92/106 is currently being negotiated between EP and Council and that the definition above reflects the current status of the draft amendment: it cannot be excluded that changes to the definition of Combined Transport can occur during this process.

Besides the definition, other important changes are being proposed in the law, with the aim to further increase the competitiveness of combined transport compared to long-distance road freight and therefore foster the shift from road freight to other modes of transport, reducing the transport externalities.

The concept of combined transport itself should include an area wider than Europe; combined transport has to cover very long distances to improve and optimise the different parameters. Extending the idea of combined transport will provide also fundamental benefits to European economies and therefore to European companies and European citizens. In that respect, the CTD essentially covers CT among Member States and clarifies under what conditions and for which part (the intra EU one) of intermodal transport initiated in third countries is eligible as CT, according to the definition of the Directive.

⁸ https://ec.europa.eu/transport/modes/road/news/2017-05-31-europe-on-the-move_en

⁹ 2017/0290 (COD) Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directive 92/106/EEC on the establishment of common rules for certain types of combined transport of goods between Member States

¹⁰ COUNCIL DIRECTIVE 92/106/EEC, of 7 December 1992, on the establishment of common rules for certain types of combined transport, of goods between Member States – OJ L 368/38, 17. 12. 92

8. TECHNICAL AREA

8.1. VRT - VEHICLE RELATED TOPICS

8.1.1. VRT-1: Harmonisation of codification in combined transport

8.1.1.1. Analysis of the current situation

The use of an ILU on a wagon exceeds most of the time the (static) loading gauge. In order to allow the operation of such wagons in a safe way, a codification system of lines, ILUs and wagons has been established to check the compatibility between the loading gauge of the loaded wagon and the gauge of the line. This system is set out in several UIC leaflets and in EN 13044 and the analysis shows that the codification system of wagons is not yet fully harmonised.

The codification system of wagons is set out in UIC 596-6 and widely accepted across EU. This codification system requires to mark the wagon with

- a yellow triangle with black letter ("C" or "P") or
- A white triangle with black letter ("C" or "P") plus a table setting out corrective factors.

Figure 1 below shows an example of each.

The corrective factor is further analysed in topic 8.1.2 VRT-2: Compatibility check: the corrective factor.

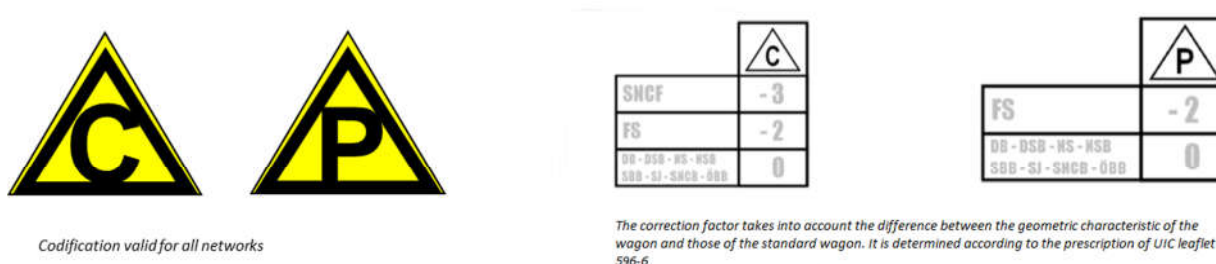


Figure 1. Examples of the codification markings on freight wagons according to UIC 596-6

The marking above is harmonized in the EN 15877-1:2012, which is referred to in the TSI WAG. Markings for combined transport are mandatory in the TSI WAG for wagons fulfilling the optional conditions of the point 7.1.2, of appendix C or both.

The methodology for which the wagon can be marked 'C' or 'P' is also harmonized. However, the calculation method of the corrective factor is not harmonized.

8.1.1.2. Solution proposal

A joint impact assessment was performed for both vehicle related topics VRT-1: Harmonisation of codification in combined transport and VRT-2: Compatibility check: the corrective factor (see Annex 1).

Alternative options have been compared addressing the need to harmonise and, where not yet possible, to transparently set out the method to calculate the corrective factor for wagons intended for combined transport and to make this a prerequisite for the authorisation for placing on the market.

The application of the harmonised part of the codification system set out in UIC 596-6 as well as other UIC-related standards such as the future IRS 50596-6 could be reflected in a European Standard which the WAG

TSI refers to. As it works only for predefined technical solutions, its application should be on an optional basis (e.g. “when [...] then EN XXXXX shall be applied”).

In the medium-long term, a methodology to define a codification system which does not depend on predefined technical solutions should be developed. This system should cover all aspects establishing the compatibility between wagon including its load/loading unit and the route and laid down in a suitable document (e.g, EN Standard). This EN Standard could then be referred to in the relevant TSIs as a mandatory requirement in case the wagon is supposed to be used within CT.

A specific solution for the corrective factor is proposed in point 8.1.2.2 of this report.

8.1.1.3. *Interfaces management*

This point is interfaced with point 8.1.2.

Vehicle related topics (points 8.1.1 and 8.1.2) are strictly linked with the infrastructure related and ILU related topics. In order to guarantee consistency, to avoid duplication and to provide an effective analysis, the solutions proposed within the vehicle related topic will be investigated in close relationship with the solution proposed for infrastructure and ILU topics.

8.1.1.4. *Appropriate mainstream process*

The Agency already has the task to facilitate the combined transport in the framework of the next TSI revision cycle. This is reflected in the in Article 5.3 of Delegated Decision (EU) 2017/1474 of 8 June 2017 supplementing Directive (EU) 2016/797 of the European Parliament and of the Council with regard to specific objectives for the drafting, adoption and review of technical specifications for interoperability:

“The WAG TSI shall include provisions to increase flexibility and efficiency in train composition and the development of intermodal transport. Provisions on automatic coupling shall be included where appropriate.”

Therefore, the next revision of the WAG TSI is identified as the most convenient mainstream process reflecting the findings of point 8.1.1 and 8.1.2. This revision is scheduled to start by end 2018.

8.1.2. *VRT-2: Compatibility check: the corrective factor*

8.1.2.1. *Analysis of the current situation*

The system of codification of wagons including their ILU explained in topic 8.1.1 VRT-1: Harmonisation of codification in combined transport of this report is used to check the compatibility with the codified lines.

A methodology to perform the compatibility check of loaded wagons with codified lines is set out in UIC 596-6. However, this leaflet requires pre-defined technical solutions and a defined operational regime (e.g, UIC 596-6 defines the applicable loading criteria).

However, the compatibility check may require a corrective factor, which takes into account the difference between the geometric characteristics of the wagons compared to a standard wagon. This corrective factor is calculated, where needed, per wagon by all national IMs (see UIC 596-6). However, the request to obtain such a corrective figure can be sent out to various entities (e.g. NSAs); no EU harmonized process is available and the methodologies applied by each IM to calculate the corrective factor are not publicly available.

8.1.2.2. *Solution proposal*

A joint impact assessment was performed for both vehicle related topics VRT-1: Harmonisation of codification in combined transport and VRT-2: Compatibility check: the corrective factor (see Annex 1).

Alternative options have been compared addressing the need to ensure transparency and a harmonised methodology to authorise wagons intended for combined transport and to perform the compatibility check between vehicle, ILU and infrastructure. Based on the qualitative assessment and in accordance with the

principles of the 4th Railway Package and One Stop Shop, it was recommended to consider the option which envisages a partial harmonisation allowing compatibility check by RU as a first step and then to follow it up with a full harmonisation in the medium-long term. Where harmonisation is not yet possible, the different methodologies to calculate the corrective factor should be made publicly available by the relevant networks in a suitable document.

In the short term, the TSI WAG could set out harmonised elements and refer to the different methodologies e.g., via specific cases. In the mid-term, these methodologies should be further harmonised and implemented in those networks where they still do not exist.

8.1.2.3. Interfaces management

This point is interfaced with point 8.1.1.

Vehicle related topics (points 8.1.1 and 8.1.2) are strictly linked with the infrastructure-related and ILU-related topics. In order to guarantee consistency, to avoid duplication and to provide an effective analysis, the solutions proposed within the vehicle related topics will be investigated in close relationship with the solution proposed for infrastructure and ILU topics.

8.1.2.4. Appropriate mainstream process

The mainstream process are covered in point 8.1.1.4 8.1.1.4 for points 8.1.1 and 8.1.2

8.2. LRT - Intermodal Loading Unit (ILU) RELATED TOPICS

The load of the wagons intended for combined transport (CT) can be classified as follows:

- Intermodal loading units (ILU) suitable for rail transport and sea transport,
- Intermodal loading units (ILU) suitable for rail transport and road transport, and
- Road vehicles (Semi-trailers) transported on rail vehicles

8.2.1. LRT-1: Intermodal Loading Units codification system for combined transport, including crane-able and non crane-able semi-trailers

8.2.1.1. Analysis of the current situation

Intermodal Loading Units for road and sea transport are built, assessed and marked in accordance with the standards and leaflets summarized in Figure 2 and Figure 3:

Intermodal Transport Units Fiche UIC n. 592 – 2 nd edition October 2013					
	Type	Dimensions and maximum loads	Markings	Strength ¹	
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;"> Semi – trailers compliance with Fiche UIC 596-5 </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> Roller – units for horizontal transshipment compliance with Fiche UIC 591 </div>	2.1.	ISO container	ISO 668	ISO 1496-1 to 5	
	2.2.	EN 283 containers	point 5	point 8	EN 283
	2.3.	Class C ITUs	EN 284	point 8	EN 283
	2.4.	Stackable class C ITUs	EN 13853	point 8	EN 13853
	2.5.	Refrigerated class C ITUs	EN 12406	point 8	EN 12406
	2.6.	Class A ITUs	EN 452	point 8	EN 452
	2.7.	Stackable class A ITUs	EN 14993	point 8	EN 14993
	2.8.	Refrigerated class A ITUs	EN 12410	point 8	EN 12410
	2.9.	Tank ITUs	EN 1432 - point 5.3	point 8	EN 1432
	2.10.	ITUs which do not fall under points 2.2 to 2.9 but whose dimensions allow them to be coded using UIC Leaflet 596-6	Must be suitable for carriage on wagons with compatibility code C	point 8	point 6.2
	2.11.	ITUs with a base width of > 2 600 mm	Appendix A	point 8 ²	point 6.2
	2.12.	ITUs which, due to their dimensions or weight, may not be freely loaded onto carrying wagons with compatibility code C	Appendix B	point 8	point 6.2
	2.13.	"Flat"-type ITU	ISO 1496	point 8	point 6.2
	2.14.	Non-standardised ITUs carried stacked	Reserved		

Figure 2. Dimensions, maximum loads, markings and strength of Intermodal Loading Units

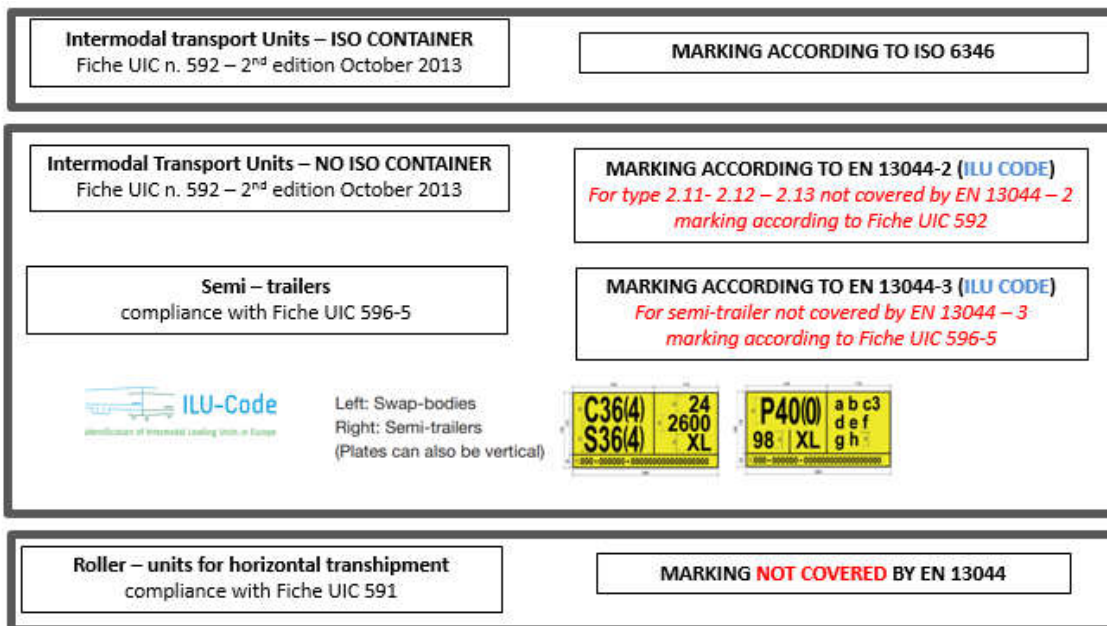


Figure 3. Markings of intermodal loading units

Only ILUs (– no ISO container - and semitrailers) built and assessed in accordance with the relevant EN and UIC leaflets may receive the yellow markings of Figure 3 above.

These markings provide the required information to perform the route compatibility as explained in 8.1.2 VRT-2: Compatibility check: the corrective factor.

The roles and responsibilities of the entities responsible for the conformity assessment of the requirements above would benefit from being further harmonized at EU level. This aspect is analyzed in point 10.2.3 of this report.

Further information on the current situation is given for ISO containers, roller units, semitrailers on bogies, non crane-able semitrailers and rolling highway/rolling road:

ISO containers



The marking is made according to ISO 6346 from the international body for the registration of freight containers (International Container Bureau - BIC) or from National registration organizations affiliated with BIC (table G1 – ISO 6346). ISO containers do not have the “yellow marking” for combined transport. However, the tests and markings performed according to the CSC (Convention for Safe Containers) provide all required information to perform the route compatibility as explained in VRT 2. For the ISO containers, the compatibility with the route is made with a transposition from ISO code and the codification system (C) based on the UIC - Règles de chargement – TOME 2 (see chapter 9).

Roller units



The UIC 591 covers the requirements for the roller units, including its marking. The future revision of EN 13044 should harmonise the roles and responsibilities of the entities responsible for the conformity assessment of these requirements.

Semitrailers on bogies



The semitrailer is part of the wagon structure when it is coupled on the bogies. Therefore, the semitrailer structure has to demonstrate that no cracks, significant permanent deformation or ruptures occur under the relevant load cases in the railway domain. This is already covered in Recommendation on 'Amendments for closure of the remaining open points, improvement of implementation rules and technical update in the TSI WAG' (ERA-REC-117-2016-REC).

Non crane-able semi-trailers



The non crane-able semi-trailers are semi-trailer that need a special device in order to be handled. In this case special wagons equipped with a removable "basket", which can be hooked up by the piggy-back arms of a reach-stacker or a crane, are used.

Rolling highway or rolling road



This type of combined transport will be covered by the draft amending Directive on CT and assimilated to semitrailer transport (see art. 1 paragraph 2 point a – of Commission proposal)

8.2.1.2. Solution proposal

For yellow marking (codification plate), more transparency and harmonisation of the entities responsible for the conformity assessment of the requirements is necessary.

The solution proposal is described in CALA-3 (point 10.2.3.2 of this report)

8.2.1.3. Interfaces management

Interfaces are further described in the CALA-3 (see point 10.2.3.3 of this report)

The ILU related topics are interfaced with the VRT-1 and VRT-2 topics.

8.2.1.4. Appropriate mainstream process

See point 10.2.3.4 of this report.

8.3. IRT - INFRASTRUCTURE RELATED TOPICS

8.3.1. IRT-1: Line codification

8.3.1.1. Analysis of the current situation

Railway lines across Europe are codified by the Infrastructure Managers according to a predefined coding system for combined transport, based on fiche UIC 596-6. At present there is no EU official map available. A snapshot of the situation of the lines codified for combined transport in a central area of the EU can be shown with commercial maps in Figure 4 and Figure 5 below (© UIRR, maps version 2013).

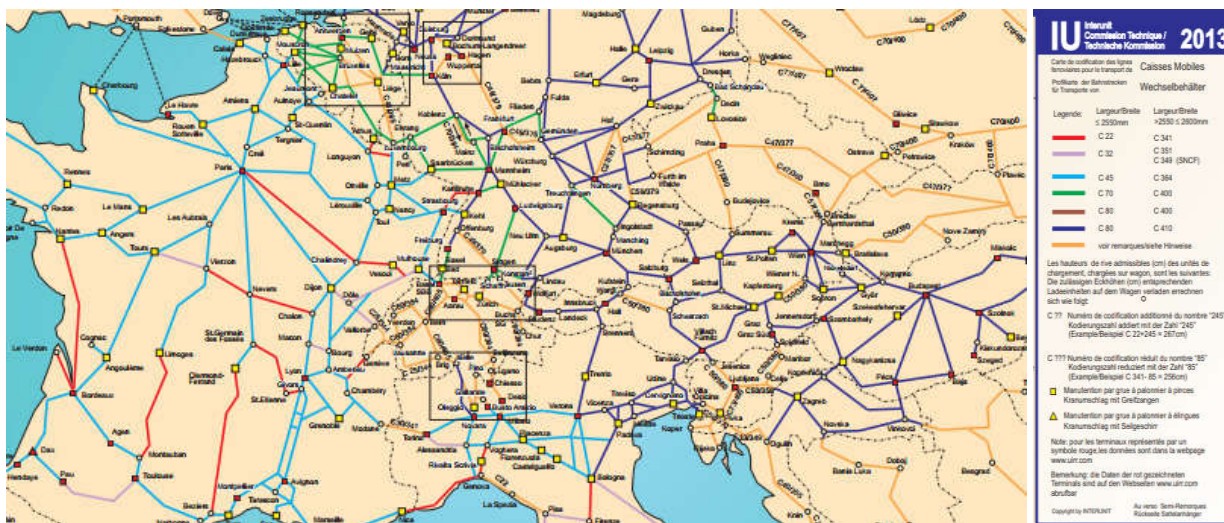


Figure 4. Codification of lines for combined transport for Containers and Swap bodies (code C) (<http://www.uirr.com/en/media-centre/leaflet-and-studies/mediacentre/66-map-of-the-railway-lines-in-ct-version-2011.html>)



Figure 5. Codification of lines for combined transport for Semitrailers (code P) (<http://www.uirr.com/en/media-centre/leaflet-and-studies/mediacentre/66-map-of-the-railway-lines-in-ct-version-2011.html>).

The coding of combined transport lines helps establish which of the combined transport profiles defined in fiche UIC 596-6, when loaded on a given wagon marked for combined transport, can be allowed to run along a given route.

Unfortunately, not all lines across Europe are codified for combined transport and some of the codes shown in the maps above are to be considered only informative: this means that the process of establishing which combined transport profile can be allowed to run along a route, requires specific checks.

The Commission Regulation (EU) No 1299/2014 of 18 November 2014 on the technical specifications for interoperability relating to the 'infrastructure' subsystem of the rail system in the European Union ('INF TSI') does not indicate the "Combined Transport Profile" as a parameter (neither basic nor performance) for defining the Union railway target system.

In that respect, for Freight traffic, INF TSI defines as a performance parameter the "Gauge" and the Infrastructure Managers, when assigning an INF TSI traffic code to their lines, shall choose among the gauges listed in the table shown in Figure 6.

However, the Register of Infrastructure (RINF) provides for information concerning the profiles for the Combined Transport that are allowed to run along a given route.

When the tracks belong to a route for combined transport, IMs have to provide in RINF the codes for the combined transport profile with swap bodies and semi – trailers, as defined in fiche UIC 596-6: several IMs define the profiles for CT by making reference to the "Gauges" as defined above, while others IMs define the profiles for CT by making reference to the real position of the obstacles along the line.

If the tracks don't belong to a route for combined transport and/or the information are not yet available, IMs are not obliged to fill this point in.

Table 3
Performance parameters for freight traffic

Traffic code	Gauge	Axle load [t]	Line speed [km/h]	Train length [m]
F1	GC	22,5 (*)	100-120	740-1050
F2	GB	22,5 (*)	100-120	600-1050
F3	GA	20 (*)	60-100	500-1050
F4	G1	18 (*)	n.a.	n.a.
F1520	S	25 (*)	50-120	1050
F1600	IRL1	22,5 (*)	50-100	150-450

(*) Axle load is based on design mass in working order for power heads and locomotives as defined in point 2.1 of EN 15663:2009+AC:2010 and design mass under exceptional payload for other vehicles as defined in Appendix K to this TSI.

Figure 6. Table 3 of INF TSI indicating the Performance Parameters for Freight traffic

These CTP codes shall be registered in the Register of Infrastructure (RINF). When a codified unit (wagon + loading unit) for combined transport wants to access a given codified route, it shall check that its assigned code is compatible with the code of the infrastructure (Figure 7). If the check is positive, the unit can run along the line. If the check is negative or if the unit is not codified, the unit has to be treated as 'exceptional consignment' and calculations have to be performed in order to determine whether it is compatible or not with the route along which it intends to run.

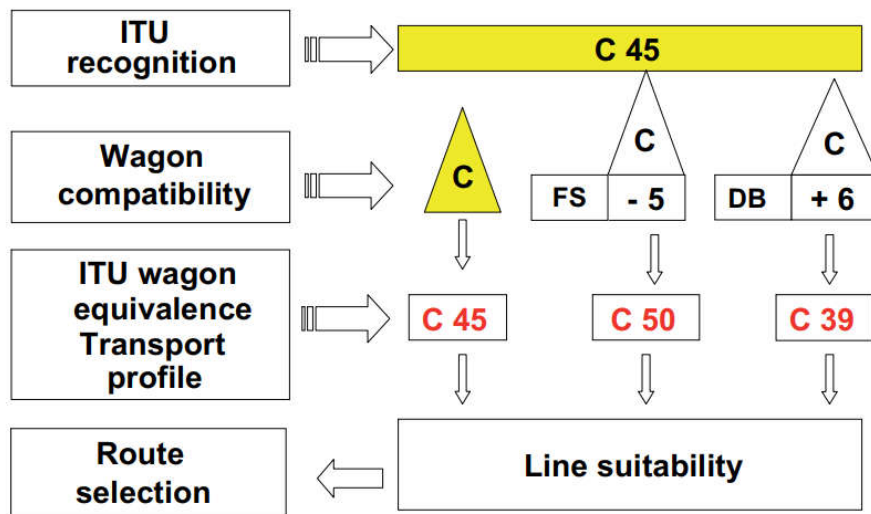


Figure 7. Example of CT route compatibility check, as per UIC 596-6

The way these calculations are performed to ensure compatibility is not harmonized across Europe. In addition, not all Infrastructure Managers have codified their lines for combined transport and/or have not populated the RINF yet.

A quantitative analysis of RINF data has given the following results.

In 2018 Q3, the total length of lines already imported in RINF for 21 (20 MSs and NO) countries of 28 (missing: Estonia, Greece, Hungary, Ireland, Romania, Slovak Republic, Switzerland) is equal to 183.286 km and 76% of them present information on combined transport (57% declared with yes or no codification, and 19% declared with not yet codified).

For 21 countries, the statistic results from RINF present the following information:

- 15 countries have a percentage of population data related to the codification (YES/NOT) higher than 95% of the total length of lines:
- 2 countries (Austria and Croatia) present a percentage of population data (YES/NOT) less than 10%:
- 2 countries (Belgium and Poland) have declared the 100% of their lines are NOT YET codified:
- 2 countries (France and Spain) have not populated the information about codification of their line.

8.3.1.2. Solution proposal

An impact assessment was performed for IRT 1 (see Annex 1).

Alternative options have been compared addressing the need to ensure transparency of the information made available by IMs and thus to increase certainty for performing the compatibility checks between vehicles, ILU and infrastructure. Based on the qualitative assessment, it was recommended to consider a gradual approach:

- › Firstly, a 100% population of RINF is to be enforced (possibly starting with the core network lines), as this Register forms the basis for checking the compatibility between vehicles/trains and routes. In that sense, a qualitative analysis would also be suggested to the countries in order to understand the quality of information populated.
- › Secondly, INF TSI could refer to CT profiles, as basic or performance parameter and define the gauging methodologies.

8.3.1.3. Interfaces management

The infrastructure related topics are strictly linked with the vehicle/ILU related and RINF related topics. In order to guarantee consistency, to avoid duplication and to provide an effective analysis, the solutions proposed within the Infrastructure topic will be investigated in close relationship with the solution proposed for Vehicles/ILU and RINF topics.

8.3.1.4. Appropriate mainstream process

As further explained in point 9.1.1.2, the Agency has drafted and sent to the EC on 27 July 2018, [a recommendation](#) to amend RINF Decision that would make mandatory in RINF the provision of CT profiles for RFC.

In the medium - long term, the subject will be tackled also within the INF WP and possible solutions to be implemented in the INF TSI and that relate to Combined Transport will be proposed.

The option to introduce the profiles for CT in the INF TSI needs to be further investigated as it could bring about possible misalignment between rail and road legislation.

9. INFORMATION AREA

9.1. RRT - REGISTERS RELATED TOPICS

9.1.1. RRT-1: Availability and reliability of the infrastructure data on RINF

9.1.1.1. Analysis of the current situation

The current “register of infrastructure” (RINF) is a static description of the fixed installations of the railway lines. A common computerized interface (RINF CUI) allows the download, validation and import of data by entities (NREs) nominated by Member States. Since March 2015 RINF CUI has been giving access to any “public user” who asks for a user account. Data is property of each Member State and the CUI makes the data available.

A search functionality allows to identify parts of the network corresponding to different parameters and then to export the results.

In RINF, parameters providing the gauge of the track or the category of lines to which the track belongs are mandatory. Those defining the Combined Transport (CT) profiles for containers or for swap bodies according UIC Code 596-6 are only mandatory “when the track belongs to a route for combined transport”.

RINF also indicates where tracks form part of the RFC and to the different categories of the Trans European Network (TEN) (not to the TEN corridors).

RINF Data are provided with validity dates. Data must be updated at least every 3 months. Their correctness is under Member States responsibility, while the data is being provided by each IM. Only a check on the quality of the file (xml) downloaded is performed by the CUI and not on the provided values.

The RINF decision is currently under implementation. Around 61% of the total expected data is already available.

9.1.1.2. Solution proposal

An impact assessment was performed for RRT 1 (see Annex 1).

Alternative options have been compared addressing the need to increase the availability and quality of the relevant parameters in RINF. A quantitative and a qualitative assessment were performed for the respective options.

The option which retrieves the highest Net Present Value is the one entailing the harmonisation of the method for assessing the Combined Transport Codes, with the corresponding data published in RINF and highly reliable.

The current revision of the RINF Decision provides the opportunity to complete the description of the network. According to the [Recommendation](#) sent to EC on 27 July 2018, it will be mandatory to provide in RINF the CT profiles for RFC, TEN network and the references of detailed description of single points (e.g. tunnels) made available by the IM, when it exist.

It could be also fruitful to associate the RFC organisations to the follow-up of the RINF implementation with regards to the correctness of the description of their respective corridor.

9.1.1.3. Interfaces management

The RINF Decision revision referred to in 9.1.1.2 shall define the information that would be made available for the benefit of Combined Transport. The Stakeholders involved in the implementation, provision of data and management are Member States - via the entity they nominated for the RINF implementation (NRE)-, and Infrastructure Managers together with the Agency.

9.1.1.4. Appropriate mainstream process

The Agency has drafted and sent to the EC on 27 July 2018, [a recommendation](#) to amend RINF Decision.

The full RINF implementation is expected by the end of 2020.

9.1.2. RRT-2: Registers for vehicle - route compatibility check (digital)

9.1.2.1. Analysis of the current situation

Subgroup 1 of the Working party on revision of the LOC&PAS and WAG TSIs together with the CCS TSI WP and in coordination with the OPE TSI WP, are working to identify the needed parameters for checking technical compatibility between a railway vehicle and a route. However, intermodal loading units and other loads are not taken into account.

9.1.2.2. Solution proposal

An impact assessment was performed for RRT 2 (see Annex 1).

Alternative options have been compared addressing the need to consider the ILU into the scope of the route compatibility check analyses. The option envisaging the full implementation of RINF retrieves recurring benefits of around 0.5 M€/year.

Results of the work on the checking of technical compatibility between a railway vehicle and a route will become an input for further development of RINF and the vehicle-related registers.

The development of new registers recording intermodal loading units requires a process for defining types, assessing the conformity and a registration process with responsible entity(ies) in charge.

9.1.2.3. Interfaces management

The project for further development of RINF and the vehicle-related registers should define the needed interfaces and their management.

9.1.2.4. Appropriate mainstream process

This proposal could be achieved with further development of the RINF and the vehicle-related registers in line with the conclusions of this report on Facilitation of Combined Transport. In line with the objectives of Directive 2016/797 and Regulation 2016/796, the Agency could work on a recommendation to the EC with the details of the solutions proposed in 9.1.2.2.

9.1.3. RRT-3: Registers for operational purposes

9.1.3.1. Analysis of the current situation

In the context of Directive 2008/57, the registers have a traceability purpose, their primary use is administrative and it is considered that they do not serve operational purpose. The responsibility to update the data in the vehicle-related registers is with the data owner. However, the update is not immediate. For RINF, the update of data is done by the responsible entity at least four times per year and it is complex to increase this update frequency, due to the amount of actors to be coordinated at national level.

In IOD 2016/797, Railway Undertakings have to perform route compatibility checks before running along a given route on the basis of RINF. As a result, the purpose of RINF is changed. IT systems of the Agency will facilitate the route compatibility checks.

9.1.3.2. Solution proposal

An impact assessment was performed for RRT 3 (see Annex 1).

To have fully operational registers, alternative options have been compared addressing the need to increase the quality of data, as well as to increase data sharing and data use. While there is a preliminary analysis on the benefits and costs to use registers data as master reference data, analysis should be further developed to take the necessary legal and process modifications into account.

Registers are considered to be a possible source of master reference data for other systems.

Reference data use means that:

- › the data in the registers is accessible via a published interface and used as read-only data by external systems.
- › The interface (and the system of registers) is available according to an agreed service level, is web-based, specifies name, definition, format of each data element. The information is made available at the last update of each data element.
- › The quality of the data is known by means of values of pre-defined quantitative indicators. In such conditions, the user of the reference data is capable to establish a process for the retrieval of data and its use as read-only data with known characteristics.

For a reference data use to be possible a set of preconditions need to be met:

- › Change Control Management in place to guarantee full traceability of changes to specifications and IT tools.
- › Service level agreement defined (e.g. covering aspects such as availability and system performance).
- › Interface (for accessing the data) defined and in place.
- › Known characteristics of data (e.g. as result of the availability of maximum timeframes for update, data format conventions, reference data, procedures for data quality assurance and control, data quality indicators).
- › Analysis of the feasibility and added value of the update frequency of the data.

All these preconditions should be met in order for the registers to be fully operational and to become reference data.

9.1.3.3. Interfaces management

The solution proposed in 9.1.3.2 should define the interfaces, constraints and their management.

9.1.3.4. Appropriate mainstream process

The existing architecture of the registers related to infrastructure and vehicles may be modified to facilitate the use of register's data by any external user or system as reference data. Such result could be achieved when the preconditions defined in 9.1.3.2 are met. The achievement of these preconditions may be part of the development process of registers managed by the Agency. Returns of experience on the use over a given period are necessary before any change aimed at consolidating a new registers' architecture.

9.2. TFF – TELEMATICS FOR FREIGHT TOPICS

9.2.1. TFF-1: Data exchange in the CT chain

9.2.1.1. Analysis of the current situation

The data exchange in CT is getting better organized but probably needs further actions with the various stakeholders (IM, RUs, CTOs, TOs). Otherwise, a smooth information flow could be hampered. For the CTOs, it is essential to get all train running information to be able to inform their customers (LSPs/freight forwarders) on the estimated time of arrival (ETA) at the pick-up in the arrival terminal.

Several projects and initiatives are on-going to optimise the currently unsatisfactory aspects of consignments note for CT, transparent data access/sharing of train running information (for example, through the RNE TIS system), the legal framework for CT and the current use of standards (such as [EDIGES](#) for example). Among these, [ELETA](#) project aims at ensuring that a reliable ETA is made available to all partners involved in a train run, in particular to the involved terminals¹¹. This is one of the crucial parameters for the effectiveness and efficiency of any cross-border and multimodal transport, CT included.

9.2.1.2. Solution proposal

An impact assessment was performed for TFF 1 (see Annex 1).

Alternative options have been compared in qualitative terms with the baseline scenario with the view to address the identified need of increasing consistency, efficiency, transparency and better CT product offering / tracing through enhanced IT exchange.

From among the possible alternative solutions, several could be further explored in the future e.g.:

- implementing a single electronic Consignment Note between third parties / shippers and RUs. TAF would be extended describing different formats from terminals to RUs, IMs, CT operators. This initiative would need to take into account the parallel development triggered by the Digital Logistics and Transport Forum and brought about by the Commission such as the regulation on electronic freight transport information¹².
- the Extension of the “e-RailFreight” project to CT for improving tracing and tracking.
- Enhancing ETA calculation (more on-time and more accurate) at the level of RUs from the transport chain (RNE CEF call project): RNE TIS would need to get in the future train running and ETA information not only from IMs but also from RUs (as open source solution – even with access control). Contracted RU(s) would need to be more “customer oriented” towards CT companies and provide transportation / operation data. A unique European Train ID needs to be sorted out as soon as possible and linked to TIS. For the ETA calculation, it is recommended to use the results of the CEF-supported ELETA project, aimed at having a swift electronic exchange and update of ETA between IMs and to make it available by the concerned community (including terminals) (development of use cases and TAF TSI integration).
- It is desirable that CT operators would not make data access arrangement on individual basis, but on a sector basis.

9.2.1.3. Interfaces management

The Agency will have the task to ensure that data elements from chapter 9.2.1.2 which are in common with

¹¹ See <https://ec.europa.eu/inea/en/connecting-europe-facility/cef-transport/2016-eu-ta-0185-s>

¹² In the revision of the CT Directive, it has been proposed to develop a EU format for an electronic Combined Transport consignment note covering not only railways.

- all kind of registers from chapter 9.1 RRT - REGISTERS RELATED TOPICS (such as location codes or company codes) and
- coding of ILU and BIC

will remain harmonised.

9.2.1.4. Appropriate mainstream process

The Agency would have the task to coordinate and to ensure that data elements referred to in point 9.2.1.3 and their changes are handled appropriately in a non-IT related Agency Change Control Management process (CCM). In this CCM the ultimate goal will be to align the data elements with the official TAF TSI data catalogue.

The Agency would contribute to the ongoing ETA/ETI discussions at European level as to ensure that appropriate solutions will be deployed at a later stage in line with the TAF TSI. For this purpose, it will be investigated whether a soft compliance between above [EDIGES](#) messages and the TAF TSI data catalogue can be demonstrated.

Afore mentioned data elements and ETA related aspects would be considered with a multi modal approach (at least, rail and road).

9.2.2. TFF-2: Sensors: Internet of Things (IoT) harmonization of communication channel and message content

9.2.2.1. Analysis of the current situation

There are sensors on wagons with different HMI solutions but with different communication protocols and formats leading to a patch-work landscape for CT operators and RUs as well.

9.2.2.2. Solution proposal

Standardisation is needed, which should include also wagon-to-wagon interface to the communication channel (partly affecting TAF TSI but also WAG TSI).

Placing sensors should be extended also to intermodal units (swap bodies, containers etc) in the future.

9.2.2.3. Interfaces management

The Agency would have the task to ensure that data elements used for the interfaces in chapter 9.2.2.2 will remain harmonised with the provisions of chapters 9.2.1.2 and 9.2.1.3 .

9.2.2.4. Appropriate mainstream process

In the strict sense it would not be the direct task of the Agency to develop / deploy / supervise the wagon-to-wagon sensors – this should be ideally sorted out by the European rail supply industry and the wagon keepers on a market-based solution. Current developments in Shift2Rail IP5 should be considered, too¹³.

The Agency should ensure that – based on the input of the European rail supply industry and the wagon keepers – arising changes in the communication interfaces should be handled appropriately in a non-IT related Agency Change Control Management process (CCM). In this CCM the ultimate goal will be to align the data elements with the official TAF TSI data catalogue.

¹³ See <https://shift2rail.org/research-development/ip5/>

10.PROCESS AREA

10.1. ORT – OPERATION RELATED TOPICS

10.1.1. ORT1 – Combined transport as exceptional transport

10.1.1.1. Analysis of the current situation

In CT, the upper part of most ILUs, when loaded on wagons or bogies, fouls the admissible loading gauge in several European countries. Their carriage must be, then, covered by the procedures for exceptional transport. However, there is currently no clear definition of what an exceptional transport is. In addition, what is considered as exceptional transport in one Member State might be not exceptional in another. COTIF is mentioning exceptional transport but not at the level of details that allows to have a harmonised situation. It is necessary to distinguish two situations: a train path ordered for exceptional transport and a train path ordered with special conditions. It is also necessary to distinguish between one-off and recurrent exceptional transport.

10.1.1.2. Solution proposal

An impact assessment was performed for ORT 1 (see Annex 1).

Alternative options have been compared in qualitative terms with the view to address the identified objectives:

- Short term – to develop a harmonised definition of exceptional transport
- Medium and long term - to agree on a harmonised process for managing the exceptional transport

Within TSI OPE WP, it was discussed that a common definition should be developed. Having a harmonised definition of exceptional transport within the EU through TSI OPE would allow to develop a common understanding of what an exceptional transport is. The following definition of exceptional transport was been agreed within TSI OPE WP: *“A vehicle and/or the load carried which because of construction, dimensions or weight does not meet the parameters of the route and requires special authority for the movement and may require special conditions over part or its entire journey”*. Following the consultation of the task force on CT, the definition has been amended and the term "design" has been added to the definition as follows: *“A vehicle and/or the load carried which because of construction/design, dimensions or weight does not meet the parameters of the route and requires special authority for the movement and may require special conditions over part or its entire journey”*.

Additionally, it might be necessary to define in the future the interface between IM and RU in more details. At this stage, exceptional transport has been listed as ‘open point’ in TSI OPE which means that national rules can still exist and Member States will have the obligation to notify their respective national rules, if any: this would increase transparency of the national rules on exceptional transport. As a next stage and in future developments of TSI OPE, harmonisation on the rules related to exceptional transport will be investigated. However, the rules for CT should be defined in the TSI OPE application guide

The definition of exceptional transport could be implemented in short-term. Indeed, there is already a proposal that should be presented to RISC this year and voted in beginning of 2019. The closure of the open point in TSI OPE related to exceptional transport could be done in mid-term as it could be treated only during the next revision cycle of TSI OPE.

10.1.1.3. Interfaces management

At this stage, no interface to be managed has been detected.

10.1.1.4. Appropriate mainstream process

The Agency will deliver its recommendation by the end of October 2018. From July to October 2018, a consultation will take place on the revision of TSI OPE where comments might be received including those on the definition of exceptional transport or on the list of open points.

Based on a recommendation from the Agency, TSI OPE may be revised.

10.1.2. ORT2 – Re-routing: crisis management

10.1.2.1. Analysis of the current situation

Sections of the OPE TSI, 4.2.3.6 on degraded operation, 4.2.3.7 on managing an emergency situation as well as Article 54 of Directive 2012/34/EU oblige the IM to define contingency measures or plans in order to reduce the negative impact as a result of degraded operation, technical failure or accident, to manage emergency situations and restore the line to normal operation. These measures and plans must be developed in conjunction with RUs operating on the network and, as appropriate, neighbouring IMs. Although there is an obligation to cooperate between IMs (Article 37 of Directive 2012/34/EU), the cooperation is not always optimal. In case re-routing needs to be organised, it might be complicated in practical terms due to the lack of adequate resources (e.g. train drivers missing route knowledge and language and vehicles not authorised for the neighbouring country) which might eventually impact the whole logistic chain.

10.1.2.2. Solution proposal

It is necessary to improve the cooperation between IMs and the communication between RUs and IMs in the development of contingency measures. It is also necessary to reinforce the cooperation between IMs and planning of the works on the infrastructure. The involvement of RFCs on the development of these measures has been considered.

After the Rastatt incident¹⁴ the EC had provided a platform for exchange for the railway sector. On the basis of this exchange a strategy of contingency management for international disruptions was developed. A first draft handbook containing guidelines on contingency management had been drafted in the beginning of 2018 predominantly by Rail Freight Corridor Rhine-Alpine and DB Netze. The draft was consulted with RUs, IMs (et al in PRIME) and RFCs as well as in SERAC, ENRRB, RISC (NSAs) and with sector organisations like RNE, CER, EIM and ERFA. The handbook has been unanimously approved by European railway infrastructure managers in the RNE General Assembly in May 2018, further endorsements by the industry will follow in the summer 2018. Finally, in June 2019, there should be an evaluation of the impact of this document, the progress on contingency management arrangements and main achievements hosted by the EC.

10.1.2.3. Interfaces management

The EC shall manage the interfaces with principally RNE, PRIME and sector organisations, but also with SERAC, the NSAs via RISC and the regulatory bodies, as defined in Directive 2012/34/EU, in ENRRB. The Agency should be kept informed of the progress in relation to this topic.

10.1.2.4. Appropriate mainstream process

The EC will continue to work on this topic during 2018. Re-routing will remain an important topic of meetings like SERAC on freight or PRIME and the Agency will continue to be involved in these meetings and, when required, will contribute to the improvement of procedures related to crisis management.

¹⁴ https://ec.europa.eu/transport/modes/rail/news/2018-08-13-rastatt-incident_da

10.2. CALA - CONFORMITY ASSESSMENT AND LEGISLATION ALIGNMENT TOPICS

10.2.1. CALA-1: Revision of the Directive 92/106/EEC

10.2.1.1. Analysis of the current situation

On 8 November 2017, just after the launch of the FCT project, a proposal for the amendment of Directive 92/106/EEC was published on the institutional legislative website EUR-Lex for consultation by the EU Council and Parliament¹⁵.

The main purpose of CALA-1 was therefore superseded and out of the scope and purpose of the FCT Task Force, nevertheless it was decided to keep this work stream in the FCT project to allow stakeholders to discuss among themselves possible proposals for improvement and/or amendment of the CT Directive. Along this line, all sections of CALA-1 were maintained but no proposals for amending the draft CT directive were made in this context.

On 19 April 2018, the European Economic and Social Committee adopted an Opinion¹⁶ on the proposal for amendment of the CT Directive which identifies, amongst others, potential shortcomings and outstanding issues of the proposal.

On 17 May 2018, another Opinion¹⁷ was issued by the Committee on the Environment, Public Health and Food Safety (ENVI) Committee with further proposals for amendments to the proposal for the amendment of the CT Directive.

On 18 May 2018, a draft report¹⁸ with further amendments to the proposal for the amendment of the CT Directive was published by the Transport and Tourism (TRAN) Committee of the European Parliament.

10.2.1.2. Solution proposal

n.a.

10.2.1.3. Interfaces management

n.a.

10.2.1.4. Appropriate mainstream process

n.a.

10.2.2. CALA-2: Analysis of the content of the UIC leaflets and CEN standards

10.2.2.1. Analysis of the current situation

The FCT TF considered that this topic was within the remit, scope and purpose of the RASCOP steered by the Commission and representing, amongst others, many CT stakeholders (UIRR, UIP, UIC, UNIFE, SHIFT2RAIL, CEN, CENELEC, ETSI).

For this reason the FCT TF proposed to put forward the request to DG MOVE to deal with this topic at the level of RASCOP.

UIRR and ERA presented the proposal at the 5th RASCOP Plenary meeting held on 11 April 2018 where the experts of the Platform asked for more elements and details about the request, mainly to identify specific topics they could deal with in the scope of their activities.

¹⁵ Cf. Annex 7 – Bibliography [2]

¹⁶ Cf. Annex 7 – Bibliography [10]

¹⁷ Cf. Annex 7 – Bibliography [12]

¹⁸ Cf. Annex – Bibliography [11]

CER, EIM, UIRR started a preliminary analysis of the relevant UIC leaflets and ISO/EN Standards¹⁹ to identify potential overlaps/duplications, contradictions or areas for improvement, regarded as potentially relevant for RASCOP, and agreed on the non-exhaustive list of topics in Table 2.

DG MOVE informed that proposals, if any, should be submitted for consideration by RASCOP members in advance of the next Plenary meeting that will be held on 16 October 2018, in order to allow RASCOP members time to read and analyse them ahead of the meeting. As mentioned at 5th RASCOP Plenary meeting, these proposals should be sufficiently detailed to allow RASCOP members to take a decision at the plenary meeting. An example of the level of details was provided by DG MOVE.

Table 2: Non-exhaustive list of topics which may be relevant for RASCOP

Topic	Relevant UIC Leaflet/s and documents (non-exhaustive)	Relevant ISO/EN Standard/s (non-exhaustive)
ILU Markings (owner-code)	592, 596-5	EN 13044-1
Non-alignment of UIC-EN Standards for ILU markings (codification plates)	592, 596-5	EN 13044-2 EN 13044-3
ILU (boxes) testing requirements	592	EN 283
Wagons	571-4, 571-5	TSI Wagon EN GCU
Load securing	UIC loading guidelines	EN 12195 Best practice guidelines
Design of swap bodies where requirements may not be the same in the two documents	UIC leaflet 592	EN 283
Roles, responsibilities and requirements of the entity in charge of the codification of Intermodal Load Units (ILU)	IRS 50596-7	EN 13044, ISO 17065, ISO 17020, ISO 17021

10.2.2.2. Solution proposal

Establish an ERA or RASCOP ad-hoc group/s to analyse the outstanding topics identified by the relevant stakeholders and propose solutions to:

- solve overlaps/duplications and contradictions between the UIC leaflets and ISO/EN standards;
- improve clarity, transparency and harmonisation of references

Duration of work for the ad-hoc group/s: short-term

All relevant CT stakeholders would be involved.

10.2.2.3. Interfaces management

The ERA or RASCOP ad-hoc group proposed in 10.2.2.2 should define the interfaces and their management.

¹⁹ A non-exhaustive list of relevant CT UIC Leaflets and EN standards is available in Annex 5.

10.2.2.4. *Appropriate mainstream process*

The Commission facilitates the activities of RASCOP and of all its ad-hoc groups.

The ad-hoc group would prepare a recommendation for the RASCOP Plenary with a proposal to harmonise existing voluntary rules.

The RASCOP Plenary may amend, adopt or reject such a proposal.

10.2.3. *CALA-3: Identification of Member States Conformity Assessment Body (previously referred to as Competent Authority) for codifying intermodal loading unit (ILU)*

10.2.3.1. *Analysis of the current situation*

Due to the railway liberalisation, the roles and functions of the various actors for codifying the ILUs, lines and wagons in CT have not yet been clearly identified and defined.

E.g. the UIC document IRS 50596-7 sets out the requirements, processes and criteria for the entity in charge of the codification of ILUs, called '*competent authority*'.

The EN 13044-2 defines the same entity as '*approved authority*'.

The CT Directive, and its proposed amendment, defines another role for the '*Competent Authority*' (CT Directive, Art. 9a) as the entity which should '*ensure the implementation of this Directive and act as the main point of contact for its implementation*'.

To avoid further confusion on the roles and responsibilities of the body in charge of the certification of the ILU code, the Agency's first recommendation in the FCT TF was to align the terminology in the UIC IRS 50596-7 to the common terminology used in other relevant legislation for similar entities. Following this recommendation, UIC accepted to introduce, in the future version of the document, the term and concept of '*Conformity Assessment Body*'.

The FCT TF agrees on the necessity to define the competences, roles and responsibilities of this '*Conformity Assessment Body*' and proposes it as a potential topic for RASCOP (see previous chapter CALA-2: Analysis of the content of the UIC leaflets and CEN standards).

In case RASCOP refuses the proposal above, a dedicated WG should be set up to deal with this task (see sections 10.2.3.2 and 10.2.3.4).

10.2.3.2. *Solution proposal*

An impact assessment was performed for CALA 3 (see Annex 1).

Alternative options have been analysed with a view to addressing consistency, efficiency, transparency and mutual trust of the codification process for codifying loading units and wagons in the context of CT:

- OPTION 1. Self-regulation
- OPTION 2. CT Directive amendment
- OPTION 3. Have a dedicated 'ILU' TSI
- OPTION 4. Define the ILU as an IC (as for the rear end signal) in the WAG TSI, conformity assessment would then be the same as for any IC;
- OPTION 5 UIC document IRS 50596-7, EN 13044 (TC 119) and other standards (e.g. ISO 17065, 17020, 17021) referenced in the TSI

Based on the qualitative analysis performed, Options 4 and 5 appear to retrieve the expected benefits, while keeping a high degree of feasibility.

10.2.3.3. Interfaces management

The WG proposed in 10.2.3.4 should define the interfaces and their management.

E.g. Interfaces: Member States, Road or Transport Authority

10.2.3.4. Appropriate mainstream process

A dedicated WG should be set up to:

- identify the competences, roles and responsibilities of the Conformity Assessment Body (previously referred to as Competent Authority) for codifying intermodal loading unit (ILU);
- analyse the requirements and processes set out in the UIC document IRS 50596-7 and other relevant legislation;
- perform a gap analysis to compare the requirements and processes of the UIC document IRS 50596-7 to those contained in other relevant ISO standards (e.g. ISO 17065, ISO 17020, ISO 17021) for conformity assessment bodies (e.g. Notified Bodies, Assessment Bodies);
- draft an application guide related to CT (similar to those already available in some companies, e.g. [SNCF guide](#)), once CT elements are integrated in the various TSIs.

Based on a recommendation from the Agency, the TSI WAG could be revised in order to implement the chosen option among those proposed in 10.2.3.2.

Duration of work for the WG: short/medium term

All relevant stakeholders would be involved.

11. IMPACT ASSESSMENT

An impact assessment approach was applied for the large majority of sub-topics, starting with the analysis of the problem, problem drivers and affected stakeholders, based on the collected evidence. Where justified, several alternative options have been identified to address the problem and a comparative analysis has been performed in order to propose the most suitable solutions. In most of the cases the impact assessment is based on a qualitative analysis of the pros and cons of the various options, while quantitative data has been also included where available.

Conclusions of the impact assessment are included in the report for the various topics, while the individual impact assessment fiches are annexed (Annex 1).

With more evidence becoming available over the next period and depending on the information needs, some of the impact assessments could be further developed, based on quantitative methods.

The broader economic impacts brought along with the proposals in this report are also reflected upon, in terms of competitiveness of CT, impacts on Small and Medium Enterprises (SMEs) and environmental externalities.

11.1. Competitiveness of combined transport and modal shift

Intermodal integration is seen by the EC in its White Paper for Transport²⁰ as a main characteristic of service quality, leading to a more efficient freight transport. Any administrative or technical measure that reduces operational costs provides benefits to the intermodal transport providers, by reducing operational costs of single operators in the logistics chain, and thus making it potentially more attractive for each participant. Overall, the competitiveness of combined transport could thereby improve resulting in economic welfare gains.

Moreover, facilitating CT has a potential to produce a modal-shift from road to rail; i.e. to move some freight currently carried exclusively on road to be carried as a CT, where rail represents the significant part of the entire journey. This may lead to a reduction in socio-economic costs (transport externalities).

11.2. Impact on SMEs

The SMEs in particular benefit from the proposed measures to compete with the cheaper long distance road transport as they do not usually neither benefit from economies of scale - available to large enterprises who carry out all parts of the CT operation (organising, transport, transshipment) -, nor can they cross-subsidise between different activities as they usually only carry out one type of activity. An increase of CT operations will have a positive economic effect on SMEs focusing on short distance CT road legs as more road legs need to be carried out. As opposed to long-distance road transport, a CT operation usually involves two different road transport operators at each end of the operation. Furthermore, the price per kilometre of short distance haulage is higher than on long distance operations and thus profitability per kilometre is higher, and there are less losses due to inability to fill empty trucks on the long distance return.

11.3. Environmental impacts: reduction of external costs through modal shift

This impact can be modelled using transport cost data from the COMPETE study²¹ and external costs estimates from CE Delft study²². Data on combined freight transport are taken from Eurostat: in 2016, the CT transport represented 92,000 M t-km (out of 430,000 M t-km of rail transport). (Note that the figure

²⁰ WHITE PAPER Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system /* COM/2011/0144 final */

²¹ COMPETE final report, Analysis of the contribution of transport policies to the competitiveness of the EU economy and comparison with the United States [↗](#)

²² Update of the Handbook on External Costs of Transport (2014), Final report [↗](#)

represents the volume carried by UIRR members only and is thus an underestimation of the total rail-road intermodal transport. It is also not directly comparable to the figure used in the impact assessment of the Combined Transport Directive as the scope of CT in the CT Directive is narrower than rail-road intermodal transport.) We assume the (operating) cost of freight transport in 2016 prices to be 0.065 € per tkm for road and 0.05 € per tkm for rail.

In order to estimate the socio-economic benefits of modal shift (reduced costs of transport externalities), a cross price elasticity²³ needs to be introduced to reflect relative shift of goods transported from road (uniquely) to rail (as combined). The elasticity estimates provided by literature can range from approximately 0 to 5. (Many of the values cluster around 0.5 for bulk freight or 4 for finished goods.) However, the values most commonly accepted are in the range from 0.9 to 1.6. The value applied here is 1.2. At the same time, we consider that 90% of the total freight volume move from road to rail (since there is a minor part of the journey in CT, done by road), and thus apply a correction factor of 0.9 in our model.

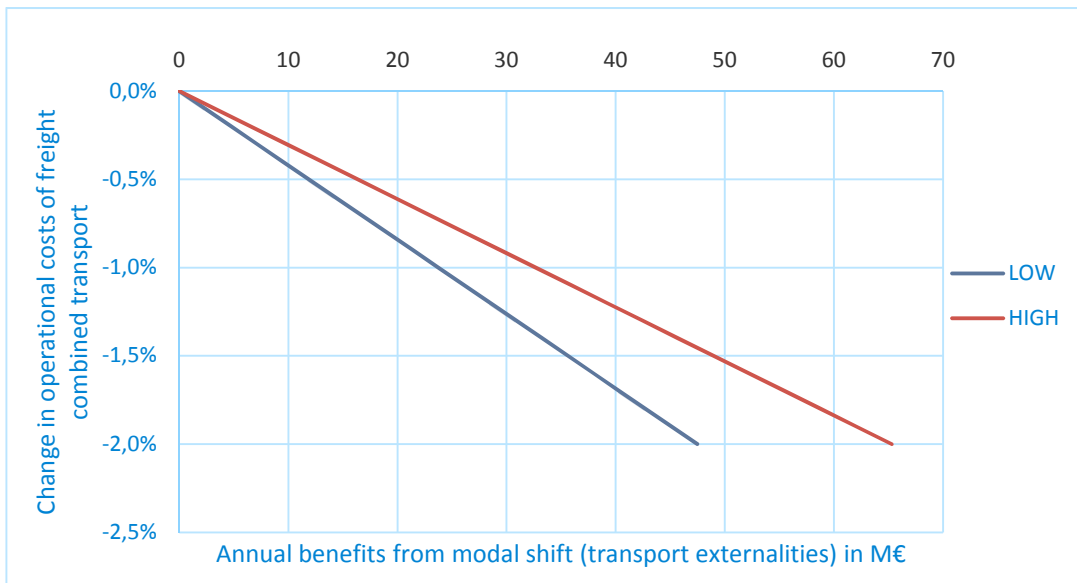
The percentage of ton-kilometres that switch modes in response to combined rail transport costs reduction is calculated (for each combination of origin, destination, and commodity) as:

$$\exp(\epsilon_{r,d} \times \ln[(1+C_d)/(1+C_r)]) \approx R_c \times \epsilon_{r,d}$$

where R_c is the relative change in total shipping costs for one mode versus the other, and $\epsilon_{r,d}$ is the cross price elasticity of the “receiving” mode (here trains) with respect to the “donating” mode (here trucks). (The formula implies that the percentage increase in combined rail transport will be higher for higher values of the cross-price elasticity and relative higher costs increases in road freight transport). The expression inside $\ln[\bullet]$ is the percentage increase in the total cost to ship (a commodity on a route) by the donating mode relative to the receiving mode, based on their respective absolute percentage increases C_d and C_r . So, a 1% decrease in transport costs by combined rail transport leads to a relative shift of 1.08% ($\exp(1.2 \times 0.9 \times \ln(1+0.01))$) of tonnes by road to rail. This means 1,002 million tonne-km per year, assuming the total volume of combined transport of 92,000 million tonne-km.

The following unit costs of externalities are assumed for low and high cost scenario: Road € 27.75 (low) and € 41.61 (high) per tonne-km, rail € 6.04 (low) and 9.01 (high) per tonne-km, as based on the HEATCO guidance. One can then model the effects of percentage change of freight combined transport on socio-economic benefits for different relative changes in unit rail transport costs, using the formulas above.

²³ Here, the cross-price elasticity means the sensitivity of quantity demand change of road freight transport to a change in the price of combined rail transport. In particular, this would in this context express the percentage change of road freight transport that would transfer to combined rail transport for a given percentage reduction in the price of combined rail transport. It is assumed that the corresponding cross price elasticity referring to quantity changes for combined rail transport for price changes in road freight transport is identical.



Reducing the operational costs of combined transport by 1% leads to the annual socio-economic benefits (reduced externalities) of 24-32 M€ per year. Single measures proposed by this report can claim operation costs reduction in the order of magnitude of 0.1%, thus bringing the annual benefit of about some 3 M€, at a very limited costs (administrative measures).

12. CONCLUSIONS

Based on the findings from the individual areas identified in chapters 8, 9 and 10, we have drawn up conclusions relating to each of the following identified topics:

- Vehicles
- Intermodal loading units
- Infrastructure
- Registers
- Telematics applications for freight
- Operation and traffic management
- Conformity assessment and legislation

Vehicles

The current legislative framework for wagons (TSI WAG) already caters for vehicles to be used for CT, by means of a harmonised methodology to identify suitable wagons (“yellow mark”). However, additional information (“The corrective factor”) are needed for a complete identification and to allow compatibility checks between the wagon + load and the route along which it intends to run; in fact, currently there is a lack of transparency and, consequently, no harmonization of the methodologies to calculate the corrective factor and to perform the compatibility checks.

The optimal solution would be to have a full harmonization in the TSI WAG of both the calculation of the corrective factor and the compatibility check methodologies; as a first step, the measure to introduce, the different methodologies as Specific Cases in the TSI WAG appears to be the most feasible: it would improve transparency and would entail completeness of information on wagons for CT already at the “authorisation for placing on the market” phase.

TSI Wagons to be amended by introducing the requirements for calculating the corrective factor for wagons to be used in CT

Intermodal loading units

As described in detail in chapter 8.2, several types of loading units are carried by rail wagons in CT operation and, although several technical specifications and/or European or international standards to which these loading units refer exist, their identification and marking is not covered by any piece of EU legislation on railways. In that respect, the amendment to the Directive 92/106 on CT, once ratified, should help setting out the standards to which loading units for CT shall comply.

There is, however, uncertainty on the roles and responsibilities of the “authority” in charge of the codification and marking of loading units: a number of options to address this issue have been envisaged in chapter 8.2 and, for many of these options, a revision of the TSIs to accommodate the loading units appears to be the optimal solution. The implementation of these solutions, though, needs to be further investigated, in order to avoid possible misalignment between railway and road transport legislation that may occur further to the implementation of one of these solutions: a clear input from the EC to the Agency would be needed, should any of these solution be chosen.

ILU requirements to be introduced in the EU legislation on railways (e.g TSI WAG), as appropriate.

Infrastructures

Railway lines in Europe are assigned an “interoperable” reference profile and a profile specific for CT operations. These information are registered in RINF and are crucial for insuring the compatibility between the vehicles and the routes. Whilst Infrastructure Managers have the obligation to publish in RINF information on profiles for CT, RINF still provides for the possibility of declaring this parameter as “not yet available”: this hinders the process of ascertaining whether a vehicle + load is compatible with a given route.

The envisaged solution is to make mandatory in RINF the publication of the profiles for CT and so that the option “not yet available” will not exist anymore. A [Recommendation](#) has been sent to EC on 27 July 2018, setting out the requirement to declare mandatorily the profiles for CT for all sections of lines belonging to the RFCs.

The register of infrastructure (RINF) to be amended by providing for information on the profiles for CT on all sections of line belonging to the RFCs.

Registers

The registers have currently a traceability purpose and their operational use is limited. However, RINF will become the source of technical data for route compatibility check and its use will increase. The availability and reliability of data published in RINF are under the responsibility of Members States.

Registers will become the source for compatibility between the vehicles/trains and the route along which they intend to run.

Telematic applications for freights

In relation to the data exchange in the CT chain, through the realisation of processes described in chapter 9.2.1.2, the seamless information exchange between different modes of transport will be fostered and the CT operator will gain – as client of the RU – an easier access to more up-to-date and reliable transport information.

The potential benefit in the standardization of sensors (Internet of Things) would be that the CT Operators and wagon keepers would be able to purchase cheaper, more reliable and standardised sensors for their wagons and inter model units because of the standardised protocols and interfaces used by the supply industry. The latter will also benefit from this standardisation and better calculate product lifecycles and offer better cost-benefit-ratio.

TAF TSI to be amended by introducing requirements on elements relevant for CT (e.g. inclusion of ILU / BIC codes, adding CT facets to Operational Points, etc.).

Operation and traffic management

An increase in transparency and in common understanding having a positive impact on CT operation is expected by the introduction in the OPE TSI of a harmonised definition of 'exceptional transport' and of the procedures to manage 'exceptional transport' as 'open point'.

In case of degraded situation, the re-routing of trains, especially involving CT, have been inefficient in certain cases. There is a strong need to improve the cooperation between IMs and RUs in the development of contingency measures. A handbook containing guidelines on contingency management has been developed in 2018 and will be evaluated in 2019.

*OPE TSI to provide for a harmonised definition of exceptional transport and for more transparency in managing it.
A handbook will define guidelines for contingency management in degraded situations.*

Conformity assessment and legislation

Concerning Directive 92/106/EEC, a Commission proposal for amendment is currently in negotiation in EP and Council.

Regarding potential overlaps/duplications, contradictions or areas for improvement in the content of the UIC leaflets and CEN standards, the FCT TF suggested a first list of topics (cf. Table 2) which could be dealt with either by an ad-hoc Task Force, mandated by the Commission, or by the Rail Standardization Coordination Platform (RASCOP), steered by the Commission, whose scope and purpose overlaps with those of this work stream.

In agreement with the Commission, the CT stakeholders will prepare a more detailed and exhaustive proposal for RASCOP to present at their next plenary meeting on 16 October 2018 (amongst the topics suggested by the TF for attention by RASCOP is the definition of the roles, responsibilities, competences, related to the Authority in charge of the certification of ILUs, as described in point 10.2.3).

CT Stakeholders will prepare a proposal for next RASCOP plenary meeting, regarding areas for improvements of UIC leaflets/CEN standards affecting CT.

CT has and will have a crucial role for the realization of the so called “co-modal” approach: the different modes of transport shall not be considered individually but rather as a whole, in order to achieve the best in terms of performances, costs and environmental impact. By doing so, there will be a convergence of interests and each transport mode can play out its respective benefits and advantages. In that respect, rail has the challenge to play the most important role in the ‘CT’ chain, in order to reduce the share of long-distance road transport by shifting part of it to other lower emission modes, in line with the EU’s transport policy. The amendment of the Directive 92/106/EEC on CT will certainly continue to be an effective tool to support this modal shift. At the same time, EU legislation/standardization on railways should evolve into a wider framework including requirements, as harmonised as possible, which would facilitate the CT operation.

ANNEX 1. IMPACT ASSESSMENT OF THE PROPOSED SOLUTIONS***Topic VRT 1 - Harmonisation of codification in combined transport
VRT 2 - Compatibility check: The corrective factor*****Problem**

Problem and problem drivers	<p>Roles and functions of the various actors in CT are not clearly identified and defined, e.g. UIC leaflets use the term ‘Competent Authority’ for the entity in charge of performing the compatibility check between vehicle, ILU (Intermodal Loading Unit) and infrastructure.</p> <p>Lack of transparency and standardised methodology to authorize wagons intended for CT and perform the compatibility check among vehicle, ILU (Intermodal Loading Unit) and infrastructure</p>
Stakeholders	NSAs, Representative Bodies (UIRR, UIP, ERFA, CER, EIM, NB Rail AISBL) Authorizing entities, sector organizations, railway vehicle and infrastructure operators (RUs, wagon keepers, combined road-rail transport companies, IMS)
Magnitude	High, as it is linked to the authorization and compatibility check processes.
Subsidiarity	European Commission/DG MOVE European Union Agency for Railways CEN/CENELEC

Objectives

Specific objectives	<p>Increase transparency and ensure a standardised methodology to authorize wagons intended for CT and perform the compatibility check between vehicle, ILU (Intermodal Loading Unit) and infrastructure.</p> <p>Minimize technical and legal barriers to rail transport within European territory.</p> <p>An increase in clarity and transparency of requirements at vehicle level plus competences, roles and responsibilities of ‘<i>approved authorities</i>’ would increase trust amongst stakeholders and authorities, speed up relevant authorization and compatibility check processes and, depending on the scope and purpose of these authorities, open and widen the business market.</p> <p>In accordance with the EU legislation, it is up to the RUs to perform the compatibility check with the route. For this purpose, the relevant information must be available in TSIs and RINF.</p>
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Options

List of options	<p>Baseline: no harmonized requirements to perform the compatibility check between ILU, wagon and infrastructure. No harmonized set of requirements for the wagons, although some information is available in UIC leaflets (a ‘reference wagon’).</p> <p>Options:</p>
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	<p>define the requirements applicable for the wagons intended for intermodal transport and align the current situation regarding route compatibility with the EU framework by:</p> <ul style="list-style-type: none"> › <i>OPTION 1. Full requirements for both the wagon and the compatibility check transferred to TSIs and harmonized standards and ensured by RU.</i> › <i>OPTION 2. Full requirements for the wagon transferred to TSI and harmonized standards. Compatibility check requirements covered by specific cases at high level. Conformity of the compatibility check ensured by the 'Authority'.</i> › <i>OPTION 3. Full requirements for the wagon transferred to TSI and harmonized standards. Compatibility check requirements covered by specific cases at detailed level. Conformity of the compatibility check ensured by RU.</i>
Impacts (qualitative)	<p>OPTION 1. Full harmonisation - SCORE: 5</p> <p>Fully harmonized requirements for wagons and compatibility check would facilitate both the assessment of new wagons intended for CT and the compatibility check with the infrastructure. All requirements would be set out in TSIs, which are regulations that apply directly without transposition to all Member States.</p> <p>A single methodology for the compatibility check would be available in the EU network.</p> <p>OPTION 2. Partial harmonization not allowing compatibility check by RU - SCORE: 2</p> <p>Same as above, but instead of a single methodology for compatibility check, several methodologies should be defined as specific cases. The specific cases would contain only reference to the applicable national rules and the current 'Authority' (in most cases, the IM, would perform the compatibility check).</p> <p>OPTION 3. Partial harmonization allowing compatibility check by RU - SCORE 4: Same as above but Specific cases would contain the full methodology so the RU would be able to perform the compatibility check.</p>
Impacts (quantitative)	N.a.
Recommended option(s)	<p>OPTION 3 as a first step and OPTION 1 in a second step</p> <ol style="list-style-type: none"> 1. Gather all the current methodologies used to perform the compatibility check and requirements on the wagon. 2. Agree in a WP for the revision of the TSI WAG on the best way to include them in the TSI. Initial proposal should be: requirements on the wagons as an appendix of voluntary application in the TSI WAG and Specific cases describing the full compatibility check methodology. 3. Issue a request for standard to CEN to define a single methodology to ensure the route compatibility in an EN Standard. 4. Once the EN Standard above is developed, refer to it in the TSI and remove all specific cases.

Further work	Dedicated Working party to cover points 1 and 2 above. Prepare a request for Standard covering point 3. A second WP covering point 4 will be launched once the EN Standard covering point 3 is ready.

Monitoring

Indicators	OPTION 3 as a first step and OPTION 1 in a second step: <ul style="list-style-type: none">› <i>Notification by MSs of the national rules and methodologies to perform the compatibility check</i>
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Topic IRT 1 – Line codification

Problem

Problem and problem drivers	<p>Railway lines across Europe are codified for CT profile only to a limited extent and some of the codes shown in the maps of Figure 4 and Figure 5 are to be considered only informative. Moreover, RINF does not provide for comprehensive information related to the CT profiles.</p> <p>There is a lack of transparency in the information made available by IMs and this generates uncertainties when compatibility checks among vehicle, ILU (Intermodal Loading Unit) and infrastructure have to be performed.</p>
Stakeholders	Representative Bodies (UIRR, UIP, ERFA, CER, EIM, NB Rail AISBL), sector organizations, railway vehicle operators and infrastructure managers (RUs, wagon keepers, combined road-rail transport companies, IMs)
Magnitude	<p>An increase in transparency and reliability of information made available by the IMs related to the CT profiles would increase trust amongst stakeholders and authorities, speed up compatibility check processes and, possibly, open and widen the business market.</p> <p>In accordance with the Directive EU 2016/797, it is up to the RUs to perform the compatibility check with the route. For this purpose, the relevant information must be available in TSIs and/or RINF.</p>
Subsidiarity	European Commission/DG MOVE European Union Agency for Railways

Objectives

Specific objectives	<p>Ensure transparency of the relevant information for CT regarding the railway lines and CT profiles.</p> <p>Minimize technical and legal barriers to rail transport within European territory.</p>
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Options

List of options	<p>Baseline (Do Nothing): Unreliability of the information in RINF concerning the CT profiles that would be allowed to run on a given line. Access to infrastructure of CT would not improve.</p> <p>Options: Making available the information concerning the CT profiles accepted on the infrastructure:</p> <ul style="list-style-type: none"> › <i>OPTION 1. Full information of the CT profiles accepted on all lines of the Union rail systems made available in the RINF</i> › <i>OPTION 2. Full information of the CT profiles accepted on the lines of the Rail Freight Corridors of the core network Union rail systems made available in the RINF.</i> › <i>OPTION 3. Introduction, as a basic or performance parameter, of the CT profiles in the Infrastructure TSI</i>
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<p>Impacts (qualitative)</p>	<p>OPTION 1. SCORE: 3</p> <p>Pros: Complete transparency throughout the entire Union rail network. IMs would provide complete and up to date information of the acceptable CT profiles on all their lines. Operators would easily check whether their CT trains could access a given infrastructure.</p> <p>Cons: Not all lines are suitable for freight traffic, risk to have unneeded and unreliable information on many lines (secondary, etc.).</p> <p>OPTION 2. SCORE: 5</p> <p>Pros: Same as above, but the obligation for IMs to publish information on CT would be limited to the RFC and optional on the remaining sections of the network.</p> <p>Cons: none</p> <p>OPTION 3 – SCORE: 4.</p> <p>Pros: INF TSI is an EU Regulation directly applicable to MSs and the introduction of the CT profile as a basic or performance parameter would pave the way to the target system of SERA.</p> <p>Cons: possible overlapping between rail and road legislation. Need of a clear mandate from EC to the Agency.</p>
<p>Impacts (quantitative)</p>	<p>N.a.</p>
<p>Recommended option(s)</p>	<ul style="list-style-type: none"> • OPTION 2 in the short term • OPTION 3 in medium – long term, upon mandate from EC
<p>Further work</p>	

Monitoring

	<p>› <i>Monitoring availability of the information for the relevant parameters in RINF</i></p>
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Topic RRT 1 – Availability and reliability of the infrastructure data on RINF**Problem**

Problem and problem drivers	<p>The current RINF is a static description of the fixed installations of the railway lines. A common computerized interface (RINF CUI) allows the download, validation and import of data by entities (NREs) nominated by Member States. The RINF CUI has been accessible since March 2015 to any “public user” who asks for a user account. Data is of the property of each Member State and the CUI makes the data available.</p> <p>A search functionality allows, in a first time, to identify parts of the network corresponding to different parameters and, in a second time, to export the results.</p> <p>Parameters providing the gauge of the track or the category of lines to which the track belongs are mandatory. Those defining the CT profiles for containers or for swap bodies according UIC Code 596-6 are only mandatory “when the track belongs to a route for combined transport”.</p> <p>RINF shows also tracks belonging to the RFC and to the different categories of the Trans European Network (TEN) (not to the TEN corridors).</p> <p>RINF Data are provided with validity dates. Data must be updated at least every 3 months. Their correctness is under Member States responsibility, while the data is being provided by each IM. Only a check on the quality of the file (xml) downloaded is performed by the CUI and not on the provided values.</p> <p>The RINF decision is currently under implementation. Around 61% of the total expected data is already available.</p> <p>The revision of the RINF Decision is ongoing.</p>
Stakeholders	National Registration Entities (NREs), NSAs, IMs
Magnitude	Medium: without the availability of a harmonised method for assessing the CT Codes, there is no warranty that the published data may be used.
Subsidiarity	The topic would benefit from being approached at EU level. In any case, RINF will be implemented with this new parameter.

Objectives

Specific objectives	Increase the availability and trust of the published data.
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Options

List of options	<p>Option 0 (do nothing): parameters related to freight corridors and TENT network are added to RINF but there is no trust for its use.</p> <p>Option 1: the method for assessing the CT Codes is harmonized and used by all IMs and the corresponding data is published and trusted.</p>
Impacts (qualitative)	<p>Option 0: 0 - No added value</p> <p>Option 1: 5 – published data is trusted and used</p>
Impacts (quantitative)	Option 0:

	<p>Costs: one-off: Introduction of one new parameter in RINF: 5 k€ Data collection for the new parameter (all countries): 50 k€ Recurring: Update of data for the new parameter: 10 k€ p.a. Benefits: recurring: 20 k€ p.a. NPV (3%, 20 yrs): 110 k€</p> <p>Option 1: Costs: one-off: Introduction of one new parameter in RINF: 5 k€ Data collection for the new parameter (all countries): 50 k€ Recurring: Update of data for the new parameter: 10 k€ p.a. Benefits: recurring: 50 k€ p.a. NPV (3%, 20 yrs): 573 k€</p>
Recommended option(s)	Option 1
Further work	The main part of the work is on under the umbrella of Infrastructure Managers
Monitoring	
Indicators	Number of values provided in the corresponding RINF parameters compared to the objectives defined by each Member State.

Topic RRT 2 – Registers for vehicle - route compatibility check (digital)**Problem**

Problem and problem drivers	Ongoing work to identify the needed parameters for checking technical compatibility between a railway vehicle and a route. Intermodal loading units as any other loads are not taken into account
Stakeholders	NREs, NSAs, IMs, RUs
Magnitude	Medium: if the data is not available in the RINF it shall be provided free of charge by the IMs by any other means.
Subsidiarity	The RINF Decision

Objectives

Specific objectives	Identification of parameters. Collection and provision of data for the RINF concerns.
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Options

List of options	<p>Option 0: not all parameters are identified.</p> <p>Option 1: not all parameters are provided and available by Member States.</p> <p>Option 2: full implementation of the RINF concerns.</p>
Impacts (qualitative)	<p>Option 0: 1 – not all parameters identified.</p> <p>Option 1: 2 – not all parameters are provided and available.</p> <p>Option 2: 4 – full implementation of RINF concerns.</p>
Impacts (quantitative)	<p>Option 0: As of today, costs of current RINF, limited benefits</p> <p>Option 1. Limited costs of collecting and maintaining additional parameters, at the range of 20 k€ p.a. Benefits mediocre, but above the range of costs.</p> <p>Option 2. Costs associated with the identification, implementation, data collection and data maintenance of new parameters needed.</p> <p>Costs: one-off: introduction of 30 new parameters in RINF: 150 k€ Data collection for the new parameter (all countries): 1.5 M€ Recurring: Update of data for the new parameter: 300 k€ p.a.</p> <p>Benefits: recurring: 0.5 M€ p.a.</p> <p>B/C > 1</p>
Recommended option(s)	Option 2
Further work	The main part of the work is on under the umbrella of IMs

Monitoring

Indicators	Number of values provided in the corresponding RINF parameters compared to the objectives defined by each Member State.
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Topic RRT 3– Registers for operational purposes

Problem

Problem and problem drivers	The registers have currently a traceability purpose and their primary use is administrative. It is considered that, as of today, they cannot serve operational uses. The update of the data in the vehicle-related registers is under the responsibility of the data owner each time there is a modification, but the update is not immediate. For RINF the update of data is done by the responsible Entity at least four times per year and it is complex to increase this update frequency due to the amount of actors to be coordinated at national level.
Stakeholders	NREs, NSAs, Registration Entities, IMs, RUs, Keepers, Entities in charge of Maintenance, Owners, Investigation bodies, Assessment bodies, Notified bodies.
Magnitude	Low: stakeholders already have their systems for operational purposes working.
Subsidiarity	The EC and Member States

Objectives

Specific objectives	Increase the quality of data and share and use of data.
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Options

List of options	Option 0. (do nothing) Administrative use of the registers. Option 1. Registers data is used as master reference data.
Impacts (qualitative)	Option 0: 0 - No added value Option 1: 3 – data is used and considered master reference data by other systems
Impacts (quantitative)	Option 0: costs and benefits as of today implementation. B/C= 5.1 Option 1: costs to set up processes at MSs for daily update of data: 28 x 10 k€ = 280 k€. Costs of daily update of data: 28 x 40 k€ =1.1 M€ p.a. Costs of IT system update (one-off): 1 M€ Cost of IT service assurance (recurring): 0.25 M€ p.a. Benefits: in the range 5-15 M€ p.a. As a result: B/C > 5 <i>The costs of defining, agreeing and implementing associated legal and other processes cannot be established at this stage, but can be high. Exact expected benefits must be further investigated and established in a later stage.</i>
Recommended option(s)	Option 1
Further work	

Monitoring

Indicators	Number of preconditions met
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Topic TFF 1– Data exchange in the CT chain

Problem

Problem and problem drivers	<p>Problem: the TAF TSI and its processes / messages are globally not serving the purpose of CT even though they contain a lot CT related elements.</p> <p>Problem driver: some elements and linked processes such as</p> <ul style="list-style-type: none"> • Enhanced Estimated Time of Arrival, • ILU Coding, • BIC Coding, • Operational Points (drop-off, hand over), • Terminal Operators, • Terminals <p>in the TAF TSI and its Technical Documents are either missing in the CT context or not entirely tailor made for CT purposes.</p>
Stakeholders	RUs, IMs, WKS, Terminal Operators, Combined Road-Rail Transport Companies
Magnitude	If above bullet points are not addressed adequately in the TAF TSI and its Technical Documents then the customer front end (say product offering and tracking by means of IT exchange) will not work in the CT environment.
Subsidiarity	The topic would benefit from being approached at EU level, with the involvement of European Commission/DG MOVE, ERA, INEA etc.

Objectives

Specific objectives	Increase consistency, efficiency, transparency and better CT product offering / tracing through enhanced IT exchange
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Options

List of options	<p>Baseline (do nothing). No enhancement / inclusion of above bullets into the TAF TSI and its Technical Documents. This will keep the CT situation / market share as it is today.</p> <p>Do something options. Include at least one or any mix of the options below:</p> <ol style="list-style-type: none"> 1. inclusion of ILU / BIC codes into the TAF Technical Documents. 2. Adding CT facets to Operational Points. 3. Inclusion of Terminals and of Terminal Operators into TAF TSI and the TAF Technical Documents. 4. Follow-up Enhanced Estimated Time of Arrival in the framework of the CEF “ELETA” project. 5. Inclusion / amendment of any element from the TAF Technical Documents for the purpose of vehicle-to vehicle and vehicle-to-ground communication (IoT) 											
Impacts (qualitative)	<table border="1"> <thead> <tr> <th>Option</th> <th>Pros</th> <th>Cons</th> </tr> </thead> <tbody> <tr> <td>Option 1</td> <td>Better structure and clarity at the level of Consignment and wagon load</td> <td>Longer acceptance / transition in the IT Users’ Community</td> </tr> <tr> <td>Option 2</td> <td>CT related added value IT exchange along the logistics chain will be possible</td> <td>Same as above</td> </tr> </tbody> </table>			Option	Pros	Cons	Option 1	Better structure and clarity at the level of Consignment and wagon load	Longer acceptance / transition in the IT Users’ Community	Option 2	CT related added value IT exchange along the logistics chain will be possible	Same as above
Option	Pros	Cons										
Option 1	Better structure and clarity at the level of Consignment and wagon load	Longer acceptance / transition in the IT Users’ Community										
Option 2	CT related added value IT exchange along the logistics chain will be possible	Same as above										

	Option 3	Same as above	Same as above
	Option 4	Enhanced, more accurate and just-in-time ETA (and ETI) calculation will be possible. Customers's satisfaction will increase.	Same as above
	Option 5	CT related added value IT exchange along the logistics chain will be possible	Same as above
Impacts (quantitative)	N.a.		
Recommended option(s)	Any combination of the "Do something" options		
Further work			

Monitoring

Indicators	Number of TAF messages exchanged / number of participating actors in the Users' Community.
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Topic ORT-1: Combined transport as exceptional transport**Problem**

Problem and problem drivers	There is currently no clear definition of what an exceptional transport is. In addition, what is considered as exceptional transport in one Member State might be not exceptional in another one. COTIF is mentioning exceptional transport but not in the level of details that allows to have a harmonized situation. This uncertainty creates some extra cost to the stakeholders involved. It is necessary to distinguish two situations: a train path ordered for exceptional transport and a train path ordered with special conditions. It is also necessary to distinguish between one-off and regular exceptional transport.
Stakeholders	RUs, IMs, Combined Road-Rail Transport Companies.
Magnitude	In many Member States, CT is automatically considered as exceptional transport. The lack of harmonization of processes in relation to exceptional transport complicates the organisation of the business of the CT operators.
Subsidiarity	It has been already made clear that this topic should be addressed at European level even if, for the moment, no common solution has been found.

Objectives

Specific objectives	The short term objective is to develop a common understanding of exceptional transport. The mid - term objective is to agree on a harmonised process for managing the exceptional transport.
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Options

List of options	Baseline (do nothing). CT operators and, more generally, RUs are confronted to different rules and processes for the management of exceptional transport. Do something options: <ul style="list-style-type: none"> › Option 1. Develop an harmonised definition of exceptional transport › Option 2. Option 1 + Develop an harmonised operational rule on exceptional transport 		
Impacts (qualitative)	Option	Short term	Long term
	Option 1	4	0
	Option 2	5	5
Impacts (quantitative)	N.a.		
Recommended option(s)	Gradual implementation of both options		
Further work			

Monitoring

Indicators	Number of exceptional transport organized according to the harmonised operational rules
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Topic CALA-3 - Identification of the entity in charge of the codification of the Intermodal Loading Units (ILUs)

Problem

Problem and problem drivers	<p>Problem: the role of the Authority for codifying loading units in the CT context is not defined at EU level.</p> <p>UIC leaflets use the term ‘Competent Authority’ for the entity in charge of codifying ILUs, but this entity is not defined in EU legislation.</p> <p><i>E.g. cf. EN 13044 and UIC 592-Appendix O&P:</i></p> <ul style="list-style-type: none"> › for ILU code → ‘certified RU or any other approved authority in the country concerned’ › For ITU code → ‘RU or CT company recognized in accordance with the terms of UIC Leaflet 596-6²⁴’ or ‘Accredited Bodies (AsBo?)’ › UIC Leaflet 596-6 → Details on the plate are given by the RU or, under its responsibility, by one or more bodies designated by the RU (→ SMS?) <p>Furthermore, the proposed amendment of the CT Directive, Art. 9a, defines another role under the term ‘Competent Authority’: the ‘Competent Authority’ is the entity which should ‘ensure the implementation of this Directive and act as the main point of contact for its implementation’.</p> <p>There is currently no EU-wide unique identification of the Authority, and of its roles and functions, for codifying loading units in the CT context.</p>
Stakeholders	Authorising entities, RUs, IMs, wagon keepers, combined road-rail transport companies, conformity assessment bodies
Magnitude	<p>The lack of clarity and transparency of competences, roles and responsibilities of ‘competent authorities’ can have a huge impact due to low trust amongst stakeholders and authorities, slow and/or inefficient and inconsistent ‘approval’ processes.</p> <p>A quantification of the impact of this issue is not possible at this stage.</p>
Subsidiarity	The topic would benefit from being approached at EU level, with the involvement of European Commission/DG MOVE, ERA, CEN/CENELEC etc.

Objectives

Specific objectives	Increase consistency, efficiency, transparency and mutual trust of the codification process for codifying loading units and wagons in the CT context.
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Options

List of options	Baseline (do nothing). No definition of ‘approved authority’ in current EU norms, legislation (but ‘Competent Authority’ defined in UIC IRS 50596-7).
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²⁴ UIC Leaflet 596-6 is expected to be included in IRSS0596-6 end of 2018

	<p>Do something options. Designate the ‘<i>approved authority</i>’ for the codification of Intermodal Load Units (ILU) and define its competences, roles and responsibilities</p> <ul style="list-style-type: none"> › Option 1. Self-regulation › Option 2. CT Directive amendment › Option 3. ILU TSI › Option 4. ILU as an IC (as for the rear end signal) in the WAG TSI › Option 5. Relevant parts of IRS 50596-7 → EN 13044 (TC 119) → future reference in a TSI 																				
Impacts (qualitative)	<table border="1"> <thead> <tr> <th>Option</th> <th>Pros</th> <th>Cons</th> </tr> </thead> <tbody> <tr> <td>Option 1</td> <td>Flexibility.</td> <td>Risk of inconsistent application.</td> </tr> <tr> <td>Option 2</td> <td>Legally binding for all MSs. Clarity and transparency for all stakeholders.</td> <td>Politically difficult to support or justify as a proposal for amendment is already in adoption. Risk of inconsistent transposition in MSs. Time consuming: a new amendment may take years.</td> </tr> <tr> <td>Option 3</td> <td>Same as above.</td> <td>Needs mandate from European Commission. Preparation may take long.</td> </tr> <tr> <td>Option 4</td> <td>Clear and well established assessment procedures already in place for ICs.</td> <td>-</td> </tr> <tr> <td>Option 5</td> <td>Directly applicable in MSs. No risk of transposition ‘errors’ or misunderstandings. Clarity and transparency for all stakeholders.</td> <td>-</td> </tr> </tbody> </table>			Option	Pros	Cons	Option 1	Flexibility.	Risk of inconsistent application.	Option 2	Legally binding for all MSs. Clarity and transparency for all stakeholders.	Politically difficult to support or justify as a proposal for amendment is already in adoption. Risk of inconsistent transposition in MSs. Time consuming: a new amendment may take years.	Option 3	Same as above.	Needs mandate from European Commission. Preparation may take long.	Option 4	Clear and well established assessment procedures already in place for ICs.	-	Option 5	Directly applicable in MSs. No risk of transposition ‘errors’ or misunderstandings. Clarity and transparency for all stakeholders.	-
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Option 5	Directly applicable in MSs. No risk of transposition ‘errors’ or misunderstandings. Clarity and transparency for all stakeholders.	-																			
Impacts (quantitative)	N.a.																				
Recommended option(s)	Option 4 or 5.																				
Further work																					

Monitoring

Indicators	N.a.
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ANNEX 2. TEN-T CORRIDORS

The TEN-T corridor approach is an innovative multi-level governance system for bringing Europe closer to all stakeholders, primarily its citizens.

It has proven to be effective to focus on delivering EU added value. The Core Network Corridors are indeed a powerful instrument of communication, cooperation, collaboration and coordination.

In the framework of their mandate, the European Coordinators have engaged in a very close cooperation with Member States, regions, infrastructure managers of all modes, users and stakeholders at local, regional, national and European level.

In particular, the TEN-T corridor approach ensures that efforts are concentrated on the implementation of cross-border projects but also allows encompassing several relevant aspects of transport investment across different policy areas.

Overall results of TEN-T implementation by 2015²⁵

Railways

- › Standard track gauge of 1435 mm is present on 77% of the rail core network and 76% of the comprehensive rail network;
- › around 81% of the TEN-T (81.3% for the core and 80.6% for the comprehensive network) are electrified;
- › ERTMS is in operation on 9.5% of core network corridors sections.

Roads

- › 74.5% of the core network is compliant with the standards required in the TEN-T guidelines (i.e. motorway or expressway standard), whereas only 58.1% of roads of the comprehensive network fulfil this requirement.

Inland Waterways and ports

- › 95 % of the inland waterway core network is compliant with the standards, corresponding to the CEMT requirements for class IV;
- › on 79.6% of the inland waterway core network, River Information System has been implemented in accordance with EU standards;
- › all seaports of the TEN-T (both core and comprehensive networks) are connected to the TEN-T railway network.

Airports

- › Out of 38 core airports falling under the obligation regarding a connection to the TEN-T rail network, 23 (i.e. 60.5 %) are already compliant with this requirement.

²⁵ On 21 June 2017, the Commission adopted the first Progress report on implementation of the TEN-T network in 2014-2015 - <https://ec.europa.eu/transport/sites/transport/files/com20170327-progress-report-tent-2014-2015.pdf>

ANNEX 3. DIGITALISATION IN TRANSPORT: EXISTING INITIATIVE

Digital technologies in road and rail transport lack standardisation and are not used to their full potential.

President Juncker identified “*Jobs, Growth and Investment*”²⁶ and “*A Digital Single Market*”²⁷ as the first two priorities for EU policy. The goal is to foster growth, competitiveness, jobs and the internal market, in particular through making better use of the opportunities offered by digital technologies.

Specifically in the transport sector, such tools could improve the use of existing resources and the daily life of citizens. In order to take the digital agenda in transport further, the European Commission launched on 1st July 2015 the “*Digital Transport and Logistics Forum (DTLF)*”²⁸.

In transport, digitalisation can significantly improve traffic and transport management through more accurate information on traffic and infrastructure conditions and on the location of vehicles and/or goods.

Better access to and sharing of digital transport (traffic, travel, vehicle, cargo etc.) data for both public and private stakeholders along the supply chain can foster seamless information flows, and open up a wide range of new business opportunities:

- › **Shippers** would benefit from better information on available transport services.
- › **Factories** would have information on goods arrival time to optimise their inventory management and production.
- › **Logistics** service providers would be able to optimise transport operations in real-time and to react to unexpected events.
- › **Public authorities** could benefit from more accurate and reliable information on infrastructure use and cargo, thereby contributing to better efficiency and operational safety of networks.

The development of information pipelines along the TEN-T Corridors would enable continuity and integration of services as well as facilitate administrative requirements through one stop shops and easy access and sharing of data.

The main identified topics²⁹ of the DTLF are:

- › **Challenge 1:** repeated data submission into different systems because of a mosaic of non-interoperable
- › **Challenge 2:** lack of interconnected systems and insufficient confidence in the protection of sensitive data
- › **Challenge 3:** e-transport documents non being recognised by authorities, banks, insurances
- › **Challenge 4:** lack of a critical mass of stakeholders sharing data and exploring new business opportunities

²⁶ http://ec.europa.eu/priorities/jobs-growth-investment/index_en.htm

²⁷ <http://ec.europa.eu/priorities/digital-single-market/>

²⁸ <http://ec.europa.eu/transparency/reqexpert/index.cfm?do=groupDetail.groupDetail&groupID=3280&NewSearch=1&NewSearch=1>

²⁹ This document provides the background elements for the DTLF - <https://ec.europa.eu/transport/sites/transport/files/media/news/doc/2015-04-15-setting-up-dtlf/background.pdf>

ANNEX 4. UIC LEAFLETS AND CEN STANDARDS RELATED TO COMBINED TRANSPORT

UIC leaflets (source: [Guide on codification and certification for unaccompanied combined transport-2009](#))

- › UIC Leaflet 571-4 Characteristics of standard wagons
- › UIC Leaflet 591 Roller units for horizontal transshipment
- › UIC Leaflet 592-2 Land and sea containers
- › UIC Leaflet 592-3 Standard report on acceptance tests
- › UIC Leaflet 592-4 Swap bodies for grab handling
- › UIC Leaflet 596-5 Semi-trailers for grab handling
- › UIC Leaflet 596-6 Coding of ITUs and lines
- › UIC Leaflet 597 Semi-trailers on bogies
- › UIC Leaflet 502 (procedure for exceptional consignments)
- › UIC Leaflet 596-6 (prescriptions for ITUs, carrier wagons and Lines)
- › GCU Appendix 11 Point 3.2 Signs for combined transport wagons
- › Appendix II to RIV, Section 2, sheet 9.1, loading guidelines for swap bodies and containers

CEN standards (source: CEN/TC 119 Intermodal Loading Units and Cargo Securing-ILUCS, [website](#); [Guide on codification and certification for unaccompanied combined transport-2009](#))

- › EN 283:1991-Swap bodies - Testing
- › EN 284:2006-Swap bodies - Non-stackable swap bodies of class C - Dimensions and general requirements
- › EN 452:1995-Swap bodies - Swap bodies of Class A - Dimensions and general requirements
- › EN 1432:1997-Swap bodies - Swap tanks - Dimensions, requirements, test methods, operation conditions
- › EN 12406:1999-Swap bodies - Thermal swap bodies of Class C - Dimensions and general requirements
- › EN 12410:1999-Swap bodies - Thermal swap bodies of Class A - Dimensions and general requirements
- › EN 12640:2000-Securing of cargo on road vehicles - Lashing points on commercial vehicles for goods transportation - Minimum requirements and testing
- › EN 12641-1:2005-Swap bodies and commercial vehicles - Tarpaulins - Part 1: Minimum requirements
- › EN 12641-2:2006-Swap bodies and commercial vehicles - Tarpaulins - Part 2: Minimum requirements for curtain siders
- › EN 12642:2016 Securing of cargo on road vehicles - Body structure of commercial vehicles - Minimum requirements
- › EN 13044-1:2011-Intermodal Loading Units - Marking - Part 1: Markings for identification
- › EN 13044-2:2011-Intermodal Loading Units - Marking - Part 2: Markings of swap bodies related to rail operation
- › EN 13044-3:2011-Intermodal Loading Units - Marking - Part 3: Markings of semi-trailers related to rail operation
- › CEN/TS 13853:2003-Swap bodies for combined transport - Stackable swap bodies type C 745-S16 - Dimensions, design requirements and testing
- › CEN/TS 14993:2005-Swap bodies for combined transport - Stackable swap bodies type A 1371 - Dimensions, design requirements and testing
- › EN 16973:2017-Road vehicles for combined transport - Semitrailer - Vertical transshipment

- › EN ISO 10374:1997-Freight containers - Automatic identification
- › EN ISO 6346:1995-Freight containers - Coding, identification and marking
- › EN ISO 6346:1995/A3:2012-Freight containers - Coding, identification and marking - Amendment 3
- › EN 15877-1 Railway applications – marking on railway vehicles – wagons

ANNEX 5. BIBLIOGRAPHY

- [1] [Council Directive 92/106/EEC of 7 December 1992 on the establishment of common rules for certain types of combined transport of goods between Member States](#)
- [2] [Proposal for a Directive of the EP and of the Council amending Directive 92/106/EEC on the establishment of common rules for certain types of combined transport of goods between Member States](#)
- [3] [Impact assessment on the amendment of Directive 92/106/EEC on the establishment of common rules for certain types of combined transport of goods between Member States](#)
- [4] [Executive summary of the impact assessment](#)
- [5] [“Public consultation on Combined Transport”](#)
- [6] REFIT evaluation of Directive 92/106/EEC ([Final Report](#), [Executive summary](#), [Inception impact assessment](#))
- [7] [Summary report of the public consultation on Directive 92/106/EEC, 2014](#)
- [8] [Intermodality programme/Marco Polo](#)
- [9] [Road - Energy Union: Commission takes action to reinforce EU's global leadership in clean vehicles](#)
- [10] [Opinion of the European Economic and Social Committee](#) (COM/2017/0648 final - 2017/0290 (COD))
- [11] [Draft report of the European Parliament with proposals for the amendment of Directive 92/106/EEC](#)
- [12] [Opinion of the Committee on the Environment, Public Health and Food Safety](#)