



EUROPEAN COMMISSION
 DIRECTORATE-GENERAL FOR MOBILITY AND TRANSPORT
 Director-General

DECISION

AUTHORISING THE USE OF UNIT CONTRIBUTIONS TO SUPPORT ERTMS DEPLOYMENT UNDER THE CONNECTING EUROPE FACILITY (CEF) - TRANSPORT SECTOR

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EU) No 1316/2013 of the European Parliament and of the Council of 11 December 2013 establishing the Connecting Europe Facility, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010 (the CEF Regulation)¹, and in particular Article 7(2)(a)(b)(g) thereof,

Having regard to Regulation (EU, Euratom) No 1046/2018 of the European Parliament and of the Council of 18 July 2018 on the financial rules applicable to the general budget of the Union² (the Financial Regulation), and in particular Articles 125 and 181 thereof,

Whereas:

- (1) Article 181(3) of the Financial Regulation provides that the use of unit costs (and unit contributions derived from them) shall be authorised by a decision of the authorising officer responsible, who shall act in accordance with the internal rules of each Union institution.
- (2) In accordance with Article 8(1) of the CEF Regulation, the work programmes referred to in Article 17 of this Regulation shall establish the forms of grants that may be used to fund CEF actions.
- (3) Article 13(a) of Regulation (EU) No 1315/2013 on Union guidelines for the development of the trans-European transport network defines as a priority the deployment of European Rail Traffic Management System (ERTMS).
- (4) In accordance with Article 7(2)(a)(b)(g) of the CEF Regulation, actions to support telematics applications, including ERTMS, are eligible to receive Union financial assistance in the form of grants.
- (5) In accordance with Article 10(2)(c)(i) and (iii) of the CEF Regulation, the amount of the Union financial assistance shall not exceed 50% for actions covering track-side and on-board components of ERTMS respectively for

¹ OJ L 348, 20.12.2013, p. 129.

² Regulation (EU, Euratom) 2018/1046 of the European Parliament and of the Council of 18 July 2018 on the financial rules applicable to the general budget of the Union, amending Regulations (EU) No 1296/2013, (EU) No 1301/2013, (EU) No 1303/2013, (EU) No 1304/2013, (EU) No 1309/2013, (EU) No 1316/2013, (EU) No 223/2014, (EU) No 283/2014, and Decision No 541/2014/EU and repealing Regulation (EU, Euratom) No 966/2012 (OJ L 193, 30.07.2018)

support not using funds transferred from the Cohesion Fund in the transport sector.

THE FOLLOWING HAS BEEN DECIDED:

Sole Article

The use of the Union contribution in the form of unit contribution is authorised for the deployment of ERTMS under the general envelope of the Transport sector of the Connecting Europe Facility (CEF), for the reasons and under the conditions set out in the Annex I.

Done at Brussels,

Henrik HOLOLEI
Director-General
DIRECTORATE GENERAL MOBILITY
AND TRANSPORT

ANNEX I

1. FORM OF UNION CONTRIBUTION AND CATEGORIES OF COSTS COVERED

The Union contribution for actions supporting ERTMS deployment under the Connecting Europe Facility (CEF) – Transport sector shall take the form of output-based unit contributions covering the following categories of eligible costs:

Table 1: Categories of eligible costs

For on-board deployment:	For track-side deployment:
- Engineering – system design	- Engineering – system design
- Material - Hardware – including European Vital Computer, Antennas, Driver-Machine Interface (DMI), cabling	- Material – Hardware – including balises, GSM-R Antennas, Line-side Electronic Units (LEU)
- Material – Software	- Material – Software
- Testing	- Testing
- Subsystem verification and authorisation procedure	- Subsystem verification and authorisation procedure
- Project management	- Project management

The constituents of ERTMS on-board and trackside equipment are defined in Commission Regulation (EU) No 2016/919 on the technical specification for interoperability to the 'control-command and signalling' subsystems³.

The amounts of the unit contribution to be used are set out in Table 3.

2. JUSTIFICATION

Recourse to unit contributions considerably simplifies, streamlines and reduces the time needed for the financial management of projects, both at Commission, Innovation and Networks Executive Agency (INEA), and beneficiary level. Compared to the 'traditional' system of calculating the grant amount on a detailed budget of estimated actual eligible costs per cost category, a unit contribution shortens the time needed to calculate grant amounts and prevents amendments related to budget variations. It also decreases the workload of the management body and consequently speeds up the payment procedure. Furthermore, it implies additional simplifications at beneficiary level both in terms of application and reporting requirements.

Actions regarding ERTMS deployment are particularly suited to the utilisation of unit contributions given that it consists in operations that can be implemented and monitored in series, especially considering the size of the fleet and of the network still to be equipped.

2.1. Nature of the supported actions

Train control systems are the mechanisms put in place to ensure that trains stop where necessary and travel at the safe speed for the line. Historically it was the train driver's responsibility to follow the signals, but over time automatic systems were developed to ensure trains stopped automatically when a signal was red. These systems were different in each national railway network and were thus a major barrier to cross border operations. ERTMS is a major industrial programme to harmonise the automatic train

³ Section 5, Annex of the Commission Regulation (EU) No 2016/919 (OJ L 158 15.6.2016, p. 31).

control and communication system and underpin interoperability throughout the rail system in Europe. As the differences among the large variety of national legacy train control systems constitute a very significant barrier to interoperability of the European rail system, deployment of ERTMS will provide the backbone for a digital, connected Single European Rail Area.

ERTMS consists of:

- The ETCS (European Train Control System), the first ERTMS component, is a train control standard, based on in-cab equipment - an On-Board Unit - able to supervise train movements and to stop it according to the permitted speed at each line section, along with calculation and supervision of the maximum train speed at all times. Information is received from track-side ETCS equipment.
- GSM-R (Global System for Mobile Communications - Railways), the second ERTMS component, is the European radio communications standard for railway operations. Based on GSM radio technology, GSM-R uses exclusive frequency bands to communicate the train with traffic control centers and devices beside the track.

At the end of 2017 almost 4.500 kilometers of Core Network Corridors lines were operational with ERTMS and almost 7.000 vehicles were equipped or contracted with ETCS in the EU, a substantial part of which has been supported by EU funding. Nearly the totality of the Italian and Spanish high-speed networks are supervised and protected by ERTMS; so are significant parts of the Swiss, Dutch and Belgian networks. Trains operate in commercial service at 320 km/h with ETCS. ETCS controls freight trains on conventional lines, and on dedicated routes (e.g. Betuwe line). The longest alpine tunnel is operated exclusively with ERTMS. The system is in service in suburban lines with commuter traffic (e.g. Madrid).

Despite this progress much work is still required to achieve an EU-wide deployment. Moreover, as ETCS guarantees backward compatibility, the whole European fleet has to be equipped with B3 in order to be able to operate on B2 and B3 lines. The estimate costs for ERTMS deployment on the Core Network Corridors infrastructure and associated rolling stock are up to EUR 30 billion by 2030.

The ERTMS Business case analysis carried out by the Deployment Management Team⁴ demonstrates that ERTMS has strong system-level benefits, as it will improve safety and punctuality of rail transport, increase the competitiveness of rail freight and increase competition between suppliers for infrastructure managers. Moreover, ERTMS is also seen by the industry as an enabler of digitalization of the railway system. But individual investment cases for operators and infrastructure managers can be challenging. This is particularly the case for international operators.

In order to accelerate ERTMS deployment, financial assistance from the Union is expected to facilitate the mobilisation of resources in a short period of time, in line with the Commission's policy. The recourse to unit contributions is justified by the need of an appropriate form of financing which would simplify the administrative burden. While a budget-based approach involves complex rules related to budget transfers and variations with project implementation subsequently entailing a lot of accounting compliance, a unit contribution approach provides the opportunity to put added value on the quality of the results as well as on the impact of the support. Moreover, the sole use of unit contributions represents a further simplification for applicants ensuring certainty and

⁴ MOVE/B2/2014-670, "Service contract regarding technical support for the deployment of ERTMS along the core network corridors"; report on the Business Case to be published early 2019.

transparency of funding levels in case of selection and proper implementation of the project.

There are two kinds of outputs which could benefit from unit contributions:

- For on-board, an ERTMS Baseline 3 equipped vehicle
- For track-side, an equivalent of 1 double track km (incl. ETCS Baseline 3 and/or GSM-R and/or interlocking deployed)

But vehicles and tracks are in different situations or starting points, which leads to different activities in order to deliver the output. Therefore, unit contributions have to be adjusted in order to be aligned with those specificities, as detailed in the table below:

Table 2: Outputs, activities, and categories of investments eligible for payment of unit contribution.

Outputs	Activities	Sub-activities	Categories of vehicle / track-side components ⁵	Sub-categories
On-board ERTMS B3 equipped vehicle	Retrofitting of vehicle	Prototype	International	/
			National	/
		Serial	International	/
			National	/
	Upgrade of vehicle	Prototype	International	/
			National	/
		Serial	International	Software
			National	Software
			International	Software & hardware
			National	Software & hardware
Fitment of vehicle				
Track-side 1 double track km equipped	Deployment		ETCS & associated upgrade costs	
			GSM-R	
			Interlockings	
	Upgrade		/	

⁵ International vehicles are vehicles authorized in more than one Member State. National vehicles are vehicles authorized in only one Member State

On-Board - 3 primary eligible activities with the same output:

- (1) Retrofitting, which means the installation of the ERTMS Baseline 3 (B3)-compliant⁶ equipment (hardware, software, Global System for Mobile Communications – Railway (GSM-R) in the case of ERTMS Level 2) on an existing vehicle(s) already in operation and not equipped with a previous version of ERTMS.
- (2) Upgrade, which means deployment of ERTMS B3-compliant equipment on existing vehicle already in operation (authorised by the time the application is submitted) and equipped with Baseline 2 (B2)⁷ or with pre B2 compliant ERTMS⁸.
- (3) Fitment, which means the installation of the ERTMS B3-compliant⁹ equipment (hardware, software, GSM-R in the case of ERTMS Level 2) on new vehicles at the time of their manufacturing. This is to support the replacement of old vehicles with new vehicles equipped with ERTMS, as it may accelerate ERTMS on-board deployment by giving an incentive to vehicle owners not to wait until last moment before replacing it.

Track-side – 2 primary eligible activities with the same output:

- (1) ERTMS deployment, covering:
 - ETCS and associated costs of the infrastructure
 - GSM-R deployment
 - Replacement of interlockings
- (2) ERTMS upgrades, covering equipment with B3 of a line section already in service:
 - equipped with ERTMS/ETCS B2
 - equipped with a version of ERTMS/ETCS not compatible with the sets of specifications laid down in the Commission Regulation (EU) No 2016/919

2.2. Risks of irregularities and fraud and costs of control

The extended use of simplified forms of grants for ERTMS deployment actions may imply certain risks of irregularities and fraud. Therefore, the importance of having effective internal control procedures for fraud prevention and reporting of irregularities is important.

Reporting and control on ERTMS deployment actions will focus on the implementation of the supported actions and the achieved outputs rather than on the eligibility of costs incurred, reducing the workload and scope for error of both participants and managing body.

The essential condition triggering the payment shall be based on the outputs, namely the number of units equipped with ERTMS. The unit is:

- for on-board: an ERTMS Baseline 3 equipped vehicle;
- for track-side: equivalent of 1 double track km (incl. ETCS Baseline 3 and/or GSM-R and/or interlocking deployed).

⁶ ETCS Baseline 3 (B3) means the set of specifications #2 or #3 in table A2 of the Annex A to Commission Regulation (EU) 2016/919, including the latest Agency opinions (ERA/OPI/2017-2 and ERA-OPI/2017-5).

⁷ ETCS Baseline 2 (B2) means the set of specifications #1 in table A2 of the Annex A to Commission Regulation (EU) 2016/919

⁸ Pre B2 means ETCS compliant with specifications older than specifications #1 in table A2 of the Annex A to Commission Regulation (EU) 2016/919

⁹ ETCS Baseline 3 (B3) means the set of specifications #2 or #3 in table A2 of the Annex A to Commission Regulation (EU) 2016/919, including the latest Agency opinions (ERA/OPI/2017-2 and ERA-OPI/2017-5).

The following documents, notably demonstrating the TSI-compliance of the subsystem, will be the basis for assessment of a technical completion of the output:

For the on-board units:

- a copy of the official EC declaration of verification of the subsystem issued by the applicant for each Control Command Signalling subsystem installed on a vehicle including the EC certificate of verification of subsystem from a Notified Body;
- a copy of a complete application for authorisation for placing the Control Command Signalling on-board subsystem in service or the authorisation itself, in case available by the time the final payment claim is due¹⁰.

For the track-side:

- a copy of the official EC declaration of verification of the subsystem issued by the applicant for each Control Command Signalling subsystem installed including the EC certificate of verification of subsystem from a Notified Body;
- a copy of the official positive opinion of ERA according to Article 19 of Directive (EU) 2016/797
- a copy of an application for an authorisation for placing the Control Command Signalling track-side subsystem in service or the authorisation itself, in case available by the time the final payment claim is due.

In terms of costs of control, application of the unit contributions shall result in simplification of the administrative burden at all stages of the action cycle. The final payment procedure will be lighter and solely based on the technical deliverable without verifications of the actual expenditures.

3. METHOD TO DETERMINE THE AMOUNT OF THE UNION CONTRIBUTION IN THE FORM OF UNIT CONTRIBUTIONS

In accordance with Article 181(4)(c)(i) of the Financial Regulation, the method for determining the unit contributions is based on a combination of (i) an analysis of historical data from CEF applications and (ii) an expert judgement provided by the ERTMS Deployment Management Team¹¹.

3.1. Estimations of unit contributions

The unit contributions are based on the amounts defined in the report ‘Note to support decision authorising the use of a unit cost approach to support ERTMS deployment’¹² which are based on a combination of actual costs in CEF actions¹³ as well as costs identified in the ERTMS Business Case analysis carried out by the Deployment Management Team.

These amounts have then been multiplied by the co-financing rates for various activities to arrive at the final unit contribution, as per section 3.2.

¹⁰ Where applicable (for example a software upgrade may not require a reauthorisation)

¹¹ CONTRACT No MOVE/B2/2014-670, ‘Note to support decision authorising the use of a unit cost approach to support ERTMS deployment’

¹² See footnote 11

¹³ 93 applications for on-board, 110 for track-side for the period 2014-2018

Methodology for the on-board units:

- *Methodology for on-board retrofitting*
 - a) Filtering the raw data from CEF applications in order to exclude applications with (i) uncertainty on the scope of the costs considered or the size of the fleet; (ii) low level of maturity of the application according to INEA. Studies have also been excluded from data set.
 - b) Calculation of the amounts; review of the results (average and dispersion of the values), comparison with data and information collected by the Deployment Management team; iterative process with step (a) until a robust dataset was obtained.
 - c) Cross-validation of the amounts obtained through a bottom-up approach¹⁴.
- *Methodology for on-board upgrades*
 - a) Estimation of the average amount for upgrades (all kinds), based on CEF applications.
 - b) Split of the costs between hardware and software based on the “Cost Benefit Assessment of ETCS Baseline 3” (ERA, 2012)¹⁵.
 - c) Split between prototype / serial and national / international based on the ratio obtained from retrofitting for the same subcategories and scenarios, as the sample was too small for upgrades.
- *Methodology for on-board fitment*

The data used has been collected by the Deployment Management Team.

Methodology for track-side units:

- *Methodology for track-side ETCS and associated upgrade unit costs*
 - a) Filtering the raw data from CEF supported projects in order to exclude applications with uncertainty on the scope of the costs considered or the length of the network. Studies have also been excluded from data set.
 - b) Calculation of the amounts; review of the results (average and dispersion of the values), comparison with data and information collected by the Deployment Management team; iterative process with step (a) until a robust dataset was obtained.
- *Methodology for track-side GSM-R unit costs*
 - a) Filtering the raw data from CEF applications in order to exclude applications with uncertainty on the scope of the costs considered or the length of the network. Studies have also been excluded from data set.
 - b) Calculation of the amounts; review of the results (average and dispersion of the values), comparison with data and information collected by the Deployment Management team; iterative process with step (a) until a robust dataset was obtained.

¹⁴ The bottom-up approach is crossing information from CEF applications and ERA report “Cost Benefit Assessment of ETCS Baseline 3”.

¹⁵ ERA_EE_005319, V1.0, 20/03/2012, European Railway Agency

- Methodology for track-side interlockings unit costs
- a) Filtering the raw data from CEF applications in order to exclude applications with uncertainty on the scope of the costs considered or the length of the network. Studies have also been excluded from data set.
 - b) Calculation of the amounts; review of the results (average and dispersion of the values), comparison with data and information collected by the Deployment Management team; iterative process with step (a) until a robust dataset was obtained.

Additional validation of amounts through cross-referencing with other sources

The estimation of the amounts are consistent with the values in the DG REGIO Assessment of unit costs of Rail Projects¹⁶: for instance, the average costs for ‘signalling, telecommunication & electrification’ from this study is around 400 k€/ km for conventional lines and 500 k€ / km for high speed lines, when the costs estimated here are around 400 k€ / km (no distinction between conventional and high speed lines), for a scope which is supposed to be more restricted¹⁷.

The methodology, cost structure and data used have been validated by the European Union Agency for Railways (ERA) (see Annex II):

‘The Agency has compared the costs represented in the note with the available data on ERTMS costs within the Agency. The Agency confirms that the used values for ETCS on-board serial retrofitting and ETCS trackside deployment in the note are coherent with the ETCS cost indicators used in the Agency Railway System Report. [...]

Based on internal expert judgement, the values for trackside deployment of GSM-R, interlockings, and on-board fitment are considered appropriate.’

3.2. Application of co-financing rate

The amounts calculated have then been used to estimate unit contributions, by applying a co-financing rate, as set out in Table 3.

In application of Article 10(c)(i) and (iii) of Regulation (EU) No 1316/2013, the maximum funding rate is 50% of the eligible costs. However, given that the unit contributions are based on the data corresponding to the best to date ERTMS Deployment Management Team knowledge with figures based on CEF ERTMS projects' applications portfolio and ERTMS business cases analysis¹⁸, it was considered necessary to apply a differentiated co-financing rate per category of cost and their corresponding scenario and sub-scenario and finally to round the final figures.

Therefore in order to ensure sound financial management (e.g. to ensure the appropriateness of the amount to the output financed) the unit contributions are established by multiplying the estimated amounts per output by the relevant co-financing rate with subsequent rounding of figures.

¹⁶ http://ec.europa.eu/regional_policy/en/information/publications/reports/2018/assessment-of-unit-costs-standard-prices-of-rail-projects-capital-expenditure

¹⁷ Precise scope in the DG REGIO Assessment of unit costs of Rail Projects is not provided but ‘signalling, telecommunication and electrification’ can cover a larger scope than ‘ETCS, associated costs and interlockings’ used here.

¹⁸ See footnote 4

The selected co-financing rates are based on:

- The dispersion observed for the unit costs, in order to avoid over-funding
- The impact of the fourth railway package, as in the short term, only an authorisation by ERA will be required for ERTMS on-board
- EU priorities – for instance, as it is mandatory to equip new rolling stock with ETCS B3, it was decided to limit the support at 25% of the costs

The unit contributions obtained have then been rounded and checked against the results of the ERTMS business cases analysis¹⁹ and against EC rules²⁰.

All of the co-financing rates are below the co-financing rate of 50% as provided by Article 10(c)(i) and (iii) of Regulation (EU) No 1316/2013.

¹⁹ See footnote 4

²⁰ Commission's guidelines on State aid for railway undertakings, OJ C 184, 22.7.2008, pp. 13–31

Table 3: Unit contributions

Activities	Cost category	Scenario	Sub-scenario	Amount identified in report (K€)	Unit contribution after application of the differentiated co-financing rate (K€)	Co-financing rate applied (%)		
On-board ERTMS B3 equipped vehicle	Retrofitting	International	/	/	2.509	900	36%	
			National	/	/	1.352	450	33%
		Serial	International	/	/	255	110	43%
			National	/	/	273	80	29%
	Upgrade	Prototype	International	/	/	1.683	600	36%
			National	/	/	907	350	39%
		Serial	International	Software	/	41	18	44%
			National	Software	/	44	15	34%
			International	Software	Hardware	130	55	42%
			National	Software	Hardware	139	55	40%
	Fitment				100	25	25%	
Track-side 1 double track km equipped	Deployment	ETCS & associated upgrade costs		200	90	45%		
		GSM-R		50	20	40%		
		Interlocking		196	80	41%		
	Upgrade		/	44	20	45%		

All values are per vehicle (not per cab) for on-board and per km of double-track equivalent for track-side

4. SOUND FINANCIAL MANAGEMENT AND CO-FINANCING PRINCIPLES AND ABSENCE OF DOUBLE FINANCING

The methodology described in Section 3 complies with the principles of no-profit, co-financing and absence of double funding as required by Articles 190, 191 and 192 of the Financial Regulation. As can be seen in Table 3, level of support is between 25 and 45% of eligible costs.

As described in the ERTMS Business Case analysis carried out by the Deployment Management Team²¹, without a full deployment on the network, actions deploying ERTMS will not generate revenue.

The emphasis in managing grant agreements/decisions in the application of unit contribution is placed on the quality and level of achievement of measurable objectives, and therefore focused on results rather than inputs.

Financing on the basis of unit contribution where an analysis has been made ex-ante introduces an incentive for the beneficiary to use resources as economically as possible, as the final grant is based on the pre-established unit contributions in function of the type of ERTMS deployment, without further adjustments of the grant amount based on actual expenditure. Moreover applying pre-established unit contributions offers advantages in terms of transparency, predictability and equal treatment of beneficiaries.

Double funding is effectively prevented by controls by Commission services (namely INEA) at the:

- evaluation stage, based on the information provided by applicants in the application forms;
- final payment stage, based on deliverables received identifying particular vehicles benefitting from the CEF support.

²¹ See footnote 4